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# **Expanded Pharmacy Practice in Rural Australia**

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This thesis is submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

At

James Cook University

Division of Tropical Health and Medicine

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November 2021

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## Acknowledgements

I would like to acknowledge the participants in this study who gave their time and shared their perspectives of pharmacy practice. Without their help this thesis would not have been possible. Their commitment to living and working in rural and remote communities emanates the true Australian outback spirit. Thank you all for your contribution.

Words are not enough to express the gratitude I have for my primary supervisor and mentor Professor Beverley Glass. I fondly remember listening to Professor Glass in my undergraduate lectures, and being in awe of Beverley's knowledge, experience, and zest for pharmacy practice. I am so grateful to have been able to learn more from her each year over the last decade. She is a pillar of strength and determination which has kept me forging ahead to success and I am so blessed to have had her along every step of the journey with me. Her support, guidance and encouragement has been unwavering, and I feel very lucky to have been supervised by her through this degree. Thank you, Beverley.

Dr Alice Cairns, thank you for your guidance to see this project to its full potential and perseverance with me as an early career academic. Your lived experience of the delicate balancing act of remote researcher, mother, and wife inspired my hope of completion throughout this degree. Your belief in this project and me has enabled me to grow as a researcher and for that, I am truly grateful. Thank you, Alice.

Catherine Hays has been my absolute literary rock. Her skills with the English language and academic writing are spectacular and having her working alongside me has been a wonderful support to bring this thesis together. Thank you, Catherine.

To the Centre for Rural and Remote Health and James Cook University, thanks for always supporting me and encouraging me to do more in my pharmacy career. Professor Sabina Knight has been a major supporter of my work from the very beginning and I am very grateful for the encouragement and support the centre has afforded me for my degree.

To Associate Professor John Smithson and the Pharmacy Department, College of Medicine and Dentistry, JCU. Thank you for supporting me throughout my degrees, although from afar for this one, it is so greatly appreciated.

To my three sons, Cameron, Elliot, and Desmond. Your love and laughter have been the most welcome reprieve from the long days at work. Thank you for big cuddles and smiling faces. Finally, to my husband Stephen, who has stood by my side throughout this degree and those before it. Thank you for believing in me and keeping me on track with the affirmation, "Just get it done!"

It's finally done, my love.

## Positioning the Researcher

Growing up in a remote outback mining town in Queensland, Australia I was afforded the same opportunities as all bush kids, including schooling through to grade twelve and access to local community sports and church groups. However, at the end of high school, my family and I all experienced enormous uncertainty about being a first in my family to attend University. A decade later with three pharmacy and public health degrees under my belt and still no change in the model of community pharmacy to better service rural and remote communities, I felt I needed to do more.

Working as a pharmacist in a remote community pharmacy is both the most rewarding and frustrating experience. Making small differences to improve a person's health is an absolute win for any health professional. However, the frustration I feel as a community pharmacist with a limited scope of practice is often what defines rural and remote practice. This frustration has ignited my spark to make a difference to rural community pharmacy practice so the true potential of rural pharmacists can be both realised, appreciated, and utilised. In my rural location, I have seen the lines of scope of practice blur as pharmacists stretch to meet the demands of their patients. As a mother, I know first-hand how long a ten-hour drive to specialist medical services for a fifteen-minute appointment can seem and how helpless you can feel trying to navigate the labyrinth of locum GP providers, and stretched hospital services and limited allied healthcare, due to workforce shortages.

I have also had a diverse range of experiences relayed to me as a community pharmacist: speaking to an Aboriginal gentleman who has travelled 600km for rodeo weekend and forgotten his sildenafil box and advising he needs somehow to find a GP appointment to get his medication; watching a struggling new mother make decisions about formula because she can't get her newborn to latch properly; selling a wound dressing to an elderly woman knowing full well the difficulty she is going to have trying to apply it; telling a distressed father on a Sunday afternoon that he is going to need to endure the six hour wait at the local emergency department because I can't be sure that his child's ear pain is not an infection requiring antibiotics are just some of the frustrations experienced, where I have felt that my current scope of practice as a pharmacist is limiting healthcare opportunities for my community. This experience and these challenges are not unique to me but are shared by the community of rural and remote health professionals. It is in my nature to be purposeful and productive, and therefore I need to be an agent of change.

This research has been conducted from an emic (insider) perspective. I live in rural Australia; I identify as a non-Indigenous rural Australian and I am very proud of my rural heritage. My connection to the profession of pharmacy and recognition as a rural pharmacist has built trust and credibility that resonates through this study. The qualitative methodology of interpretive phenomenology<sup>1</sup> was drawn upon as I sought to understand the lived experience of individual rural people, and interpreted findings through a lens of rural Australian culture. As a rural researcher embedded in rural pharmacy practice my lived experiences including awareness and understanding of patient needs, lack of health care/specialist services and the healthcare landscape has shaped the work presented in this thesis. This lived experience and my passion for improvements in rural communities through advancement of the pharmacy profession may resonate an interpretive bias evident in this body of work. However, it is my lived experience that has provided the motivation for the study and the determination for the voice of rural consumers, pharmacists and health professionals to be heard in the hope that improvement in healthcare be made. My experience

conducting this research has provided an opportunity to make authentic change through evidence-based research and provide the knowledge to address the lack of access to healthcare and improve health outcomes for my rural and remote communities – so I am and will continue to be an agent for change.

Reference 1 - Rodriguez A, Smith J. Phenomenology as a healthcare research method. Evidence-Based Nursing. 2018;21:96-98.



## Abstract

### *Introduction*

Expanded practice is emerging for Australian pharmacists. Prescribing, medication dose titration and ordering pathology and imaging are being undertaken by our pharmacist colleagues in Canada, United States of America, and the United Kingdom as part of an expanded scope of practice. However, apart from permission to administer a restricted list of vaccinations to adults, Australian pharmacists' scope of practice has remained largely unchanged from a focus on the medicine supply role for the last decade. In rural and remote Australia, where pharmacists are delivering healthcare to isolated and vulnerable populations, they are well placed to provide expanded services, but there is currently a lack of a structured framework to implement these services.

### *Methods*

This health service research has been conducted in two interconnected phases. The first phase has explored both the existing models of expanded practice and the perspectives of pharmacists, consumers, and health professionals. The second phase designed, developed, and piloted an expanded service for rural community pharmacy. To understand the level of support for expanded pharmacy services in rural Australia, an explanatory sequential mixed-methods design was applied, which included administration of surveys and conducting interviews with pharmacists, consumers, health professionals and relevant stakeholders. The findings from this work were integrated into the PRECEDE-PROCEED Model, which supported the design, development, and piloting of an ear health intervention, LISTEN UP (**L**ocally **I**ntegrated **S**creening and **T**esting **E**ar **a**ND **a**Ural **P**rogram).

### *Result and Discussion*

Rural community pharmacists have reported strong support for the provision of expanded services, with an expectation of improved health outcomes for people living in the bush. Similarly, consumers described confidence in pharmacists' knowledge and skills and expected improved access to healthcare through expanded pharmacy services. Nurses and allied health workers also reported a high level of support for pharmacists to expand their scope of practice in rural areas. Comments including 'limited access to health professionals' and 'all practitioners needing to extend their scope of practice to meet the needs of diverse and isolated communities' were reported. General practitioners' (GPs) perspectives varied from those who were encouraging of pharmacists expanding their scope to support overworked GPs, to those who reported no confidence in pharmacists being able to provide any additional services, other than medication supply. The concept of profitability

and concern around ethical business models were also described as barriers to expanded practice. The PRECEDE-PROCEED Model provided the framework for LISTEN UP, which was designed in consultation with relevant stakeholders to address the burden of ear disease in rural and remote populations. Training pharmacists to perform otoscopy and tympanometry examinations embedded in a model with direct referral to GPs formed the basis of the service. LISTEN UP was piloted in two community pharmacies in rural Queensland, Australia and provided a feasible, accessible, and acceptable model for ear care for rural communities, however adequate funding was found to be essential for the service to be sustainable in the future. A high level of patient satisfaction was reported as well as support from GPs and stakeholder representatives. The pharmacists participating in the trial showed a high level of enthusiasm for the program, however several challenges were reported, including time required for recording data and a lack of funding, which prohibited LISTEN UP from being sustainable. In addition, the time required to conduct the consultations, requiring a second or third pharmacist to be available at the time of the consultation, demonstrated a need to improve the rural pharmacy workforce shortage for expanded practice to be viable. Despite the reported challenges, the participating pharmacists remained supportive of expanded services for rural community pharmacy, but described a need for a more timely, streamlined, and remunerated service to achieve success in the future.

### *Conclusion*

Australian pharmacists, consumers, health professionals, and relevant stakeholders are all supportive of an expanded scope of practice for pharmacists, although the medical profession has some reservations. The PRECEDE-PROCEED Model has been effectively utilised to develop a community pharmacy ear intervention, with high satisfaction shown by consumers for this intervention. However, current remuneration for community pharmacy in Australia is not adequate to allow pharmacists to provide sustainable professional services. This study provides the first insight into the feasibility, accessibility, and acceptability of an ear care intervention and highlights the challenges and enablers to designing, implementing, and sustaining expanded services for rural and remote community pharmacy in Australia.

## Publications in Support of this Thesis (in Chapter order)

- Taylor S, Cairns A, Glass B. *Systematic Review of Expanded Practice in Rural Community Pharmacy*. J Pharm Pract Res. 2019;49(6) p585-600 doi:10.1002/jppr.1619
- Taylor S, Cairns A, Glass B. *Expanded Practice in Rural Community Pharmacy in Australia: Pharmacists' Perspectives*. J Pharm Pract Res. 2021;51 p43-53 [doi.org/10.1002/jppr.1688](https://doi.org/10.1002/jppr.1688)
- Taylor S, Cairns A, Glass B. *Consumer Perspectives of Expanded Practice in Rural Community Pharmacy*. Res Social Ad Pharmacy. 2019;49(6) p585-600 doi:10.1002/jppr.1619
- Taylor S, Cairns A, Glass B. *Health Professional Perspectives of Expanded Practice in Rural Community Pharmacy in Australia*. Int J Pharm Pract. 2020;28 p458-465 doi:10.1111/ijpp.12648
- Taylor S, Cairns A, Glass B. *Expanded Practice for Rural Community Pharmacy: What Are We Waiting For?* Int J Pharm Pract. 2021 [Accepted Sept 2021]
- Taylor, SM, Cairns, A, Glass, BD. *Rural Pharmacists and Stakeholders Perspectives of Expanded Pharmacy Practice: A Descriptive Study*. Aust J Rural Health. 2021; 29: 341– 353. <https://doi.org/10.1111/ajr.12739>
- Taylor S, Cairns A, Glass B. *Expanded Practice in Rural Community Pharmacy: A Macro-, Meso and Micro-level Perspective*. Rural Remote Health. 2021; 21:6158. <https://doi.org/10.22605/RRH6158>
- Taylor S, Cairns A, Glass B. *Role Theory: A Framework to Explore Health Professional Perceptions of Expanding Rural Community Pharmacists' Role*. Pharmacy. 2020; 8,161
- Taylor S, Cairns A, Soloman S, Glass B. *Community Pharmacist Interventions in Ear Health: A Scoping Review*. Primary Healthcare Research & Development. 2021; 22, E63. <http://doi:10.1017/S1463423621000487>
- Taylor S, Cairns A, Glass B. *Developing an Ear Health Intervention for Rural Community Pharmacy: Application of the PRECEDE-PROCEED Model*. Int J Environ Res Public Health. 2021; 18(12):6456. <https://doi.org/10.3390/ijerph18126456>
- Taylor, S.M., Cairns, A., Mantzourani, E. et al. *LISTEN UP (Locally Integrated Screening and Testing Ear aNd aUral Programme): a feasibility study protocol for a community pharmacy-based ear health intervention*. Pilot Feasibility Stud. 2021;7:124. <https://doi.org/10.1186/s40814-021-00856-6>
- Taylor S, Cairns A, Glass B. *LISTEN UP: An Ear Health Intervention for Rural Community Pharmacy*. BMJ Open [Under review - submitted September 2021]
- Taylor S, Cairns A, Glass B. *Expanded Pharmacy Practice Implementation: Lessons from Remote Practice*. Pharmacy [Under review - submitted November 2021]

### **Statement of the Contribution of Others**

Each of the authors of the manuscripts for the publications from Chapters 3-15 of the thesis certify that they have participated in conception, execution, or interpretation for their part of the publication. They have also given their consent for the publication and inclusion of these manuscripts in this thesis.

Selina Taylor    Alice Cairns    Shaun Solomon    Efi Mantzourani    Beverley Glass

## Conferences, Presentations and Awards

### *Oral Presentations*

Taylor S, Glass B. *Rural Pharmacy Workforce*. PSA19 Conference, 26-28 July 2019, Sydney, NSW, Australia.

Taylor S, Cairns A, Glass B. *Expanded Practice in Rural Community Pharmacy: A Systematic Review*. Are You Remotely Interested Conference, 21-24 July 2020, Mount Isa, QLD, Australia.

Taylor S, Cairns A, Glass B. *Application of the PRECEDE-PROCEED model for the development of a community pharmacy ear health intervention for rural populations*. Health Services Research and Pharmacy Practice Conference, 8-9 April 2021, United Kingdom (Virtual).

Taylor S, Cairns A, Glass B. *PRECEDE-PROCEED: A model for the development of a community pharmacy ear health intervention for rural populations*. Outback Allied Health Conference, 20 July 2021, Mount Isa, QLD, Australia.

Taylor S, Cairns A, Glass B. *The PRECEDE-PROCEED Model: Development of a community pharmacy ear health intervention for rural populations*. JCU Cohort Anniversary Conference, 7 September 2021, Townsville, QLD, Australia (Virtual).

### *Poster Presentations*

Taylor S, Cairns A, Glass B. *Health Professional Perspectives of Expanded Roles for Rural Community Pharmacists: Role Theory*. National Allied Health Conference, April 2021 (Virtual).

Taylor S, Cairns A, Glass B. *Health Professional Perspectives of Expanded Roles for Rural Community Pharmacists: Role Theory*. Outback Allied Health Conference, July 2021, Mount Isa, QLD, Australia.

### *Awards*

Centre for Rural and Remote Health, Outback Allied Health Conference, Most Innovative Project. July 2021

James Cook University, Three Minute Thesis Competition (3MT) College of Medicine and Dentistry Final Winner. September 2021

Pharmaceutical Society of Australia, Bowl of Hygeia - Queensland Pharmacist of the Year 2021. November 2021

## Abbreviations

<b>ACT</b>	Asthma control test
<b>ACTRN</b>	Australian and New Zealand Clinical Trial Registry
<b>AHPRA</b>	Australian Health Practitioner Regulation Agency
<b>AMAS</b>	Australian Minor Ailments Scheme
<b>AMI</b>	Acute myocardial infarction
<b>ANHRC</b>	Australian National Rural Health Commissioner
<b>AOM</b>	Acute Otitis Media
<b>aRR</b>	Adjusted risk ratio
<b>ASGS-RA</b>	Australian Statistical Geography Standard-Remoteness Areas
<b>AUD</b>	Australian Dollar
<b>BMD</b>	Bone mineral density
<b>BMI</b>	Body mass index
<b>BP</b>	Blood pressure
<b>CFIR</b>	Consolidated Framework for Implementation Research
<b>CI</b>	Confidence interval
<b>CINAHL</b>	Cumulative Index to Nursing and Allied Health Literature
<b>COPD</b>	Chronic obstructive pulmonary disease
<b>COREQ</b>	Consolidated criteria for reporting qualitative research
<b>CP</b>	Community pharmacy
<b>CRP</b>	C-reactive protein

<b>CV</b>	Cardiovascular
<b>CVD</b>	Cardiovascular disease
<b>DBP</b>	Diastolic blood pressure
<b>Df</b>	Degrees of freedom
<b>ED</b>	Emergency department
<b>EDET</b>	Early detection and early treatment
<b>ENT</b>	Ear, nose, and throat
<b>FIFO</b>	Fly-in-fly-out
<b>FIP</b>	International Pharmaceutical Federation
<b>GPs</b>	General practitioners
<b>HbA1c</b>	Glycated haemoglobin
<b>HF</b>	Heart failure
<b>HIV</b>	Human Immunodeficiency Virus
<b>HOTNORTH</b>	Improving Health Outcomes in the Tropical North
<b>HP</b>	Health professional
<b>ICPC</b>	Integration and continuity of prevention and care
<b>INR</b>	International normalised ratio
<b>K10</b>	Kessler psychological distress scale
<b>LDL-C</b>	Low-density lipoprotein cholesterol
<b>LISTEN UP</b>	Locally Integrated Screening and Testing Ear and Aural Program
<b>LMI</b>	Low and middle income countries

<b>M</b>	Mean
<b>MMM</b>	Modified Monash Model
<b>NARN</b>	Northern Australian Research Networks
<b>NIP</b>	National Immunisation Program
<b>NSW</b>	New South Wales
<b>NCD</b>	Non-communicable disease
<b>OM</b>	Otitis media
<b>OTC</b>	Over-the-counter
<b>PAC</b>	Prevention across the continuum
<b>PBS</b>	Pharmaceutical Benefits Scheme
<b>PGA</b>	Pharmacy Guild of Australia
<b>PhARIA</b>	Pharmacy Accessibility Remoteness Index of Australia
<b>PhD</b>	Doctor of Philosophy
<b>PPE</b>	Personal protective equipment
<b>PPM</b>	PRECEDE-PROCEDE Model
<b>PRISMA</b>	Preferred Reporting Items for Systematic reviews and Meta-Analyses
<b>PRISMA-ScR</b>	Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews
<b>PRECEDE</b>	Predisposing, Reinforcing, and Enabling Constructs in Educational/Ecological Diagnosis and Evaluation
<b>PROCEED</b>	Policy, Regulatory, and Organisational Constructs in Educational and Environmental Development
<b>QLD</b>	Queensland

<b>QCPP</b>	Quality Care Pharmacy Program
<b>RPNA</b>	Rural Pharmacy Network Australia
<b>RPSN</b>	Rural Pharmacy Support Network
<b>RTI</b>	Respiratory tract infection
<b>SARRAH</b>	Services for Rural and Remote Allied Health
<b>SBP</b>	Systolic blood pressure
<b>SD</b>	Standard deviation
<b>SMBG</b>	Self-monitoring of blood glucose
<b>SQUIRE</b>	Standards for Quality Improvement Reporting Excellence
<b>STD</b>	Sexually transmissible disease
<b>TAS</b>	Tasmania
<b>Tdap</b>	Tetanus, diphtheria, and pertussis vaccine
<b>UDRHs</b>	University Departments of Rural Health
<b>URTI</b>	Upper respiratory tract infection
<b>USA</b>	United States of America
<b>USD</b>	United States Dollar
<b>UTI</b>	Urinary tract infection
<b>VIC</b>	Victoria
<b>WA</b>	Western Australia
<b>WHO</b>	World Health Organisation



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# Chapter 1 – Introduction

## 1.1 Background

Australia's rural landscape and remote topography is both vast and varied from tropical rainforests and wetlands to temperate savannahs and deserts.<sup>1</sup> This unique and challenging land is inhabited by equally complex and diverse populations.<sup>1</sup> Providing equitable healthcare to seven million people in sparsely populated rural and remote locations presents a challenge for both the Australian government and healthcare professionals.<sup>2</sup> A wide geographical distribution, low population density, limited infrastructure, rural and remote health workforce shortage and the resulting high costs of delivering healthcare all have a major impact on access to healthcare, resulting in greater burden of disease and poorer health outcomes.<sup>3-4</sup> The dedication, determination and passion of rural and remote pharmacists is commendable, as they provide essential frontline healthcare to some of Australia's most vulnerable populations and are at times the only permanent health workforce in remote outback towns.<sup>2</sup> Rural community pharmacists are widely recognised as integral members of community health teams, however their skills and knowledge are usually focused on the medication supply role.<sup>2</sup> Rural pharmacists want to adopt an expanded scope of practice, but this space is as yet untapped for Australian pharmacists without models to support these expanded services.<sup>5</sup> This highlights that there are opportunities for rural pharmacists to apply their knowledge and skills to further improve the health outcomes of those living in the bush, through the provision of expanded services.

### Rural Health

Rural people are known to be risk takers, yet they may not recognise the additional health risks they are subjected to simply due to the number of kilometers between their home and metropolitan health services.<sup>6</sup> For those living in very remote areas, they are 2.5 times more likely to be admitted to hospital as a result of a preventable cause and have a life expectancy a decade less than metropolitan dwelling populations.<sup>1</sup> A reduced life expectancy, higher rates of disease and injury and less access to healthcare is the harsh reality for these seven million rural and remote Australians and these issues worsen as the distance from capital cities increases.<sup>4</sup>

Healthcare service maldistribution affects particularly, Australia's Indigenous population. The number of Indigenous people living in rural areas increases as the distance from a capital city increases.<sup>6</sup> Although in Australia only 3.3% of the population are Indigenous, in very remote communities they represent half of the population.<sup>7</sup> For Indigenous people, poor health starts at



birth with low birth weights being recorded at more than two times (12.8%) that of non-Indigenous populations (4.9%).<sup>7</sup> Half of Indigenous mothers smoke during pregnancy, a quarter of Indigenous children (<4 years) are not fully vaccinated and two-thirds have not received a child health check.<sup>7</sup> This poor start to a healthy life follows an underprivileged trajectory, which Aboriginal Community Controlled Health Organisations are working toward improving by increasing access to healthcare in remote Australia.<sup>8</sup>

Unique health needs, diverse communities, varying levels of health services and inconsistent access to local healthcare professionals is the recognised state of health for rural and remote communities.<sup>1,4</sup> Individual health needs are as wide-ranging as the landscapes in rural communities.<sup>6</sup> Each community consists of a collection of colourful and often complex health profiles, which compounds the challenges of providing patient-centred-healthcare in rural locations.<sup>4</sup> Limited interprofessional collaboration, and service integration provides a labyrinth style of healthcare that is difficult to navigate for both consumers and healthcare professionals.<sup>1</sup> This state of health provides an opportunity for rural community pharmacy to harness their skills, networks and position in community to improve health outcomes.

Rural and remote Australians are resourceful, resilient people who are essential to our country's economy through agriculture and mining, yet they have the most limited access to healthcare and are losing years of their lives as a consequence.<sup>9</sup> In many cases, it is simply the tyranny of distance that is reflecting the poor health outcomes and thus the role of local rural community pharmacy, a permanent member of the healthcare team, must be considered as we endeavor to improve healthcare provision in the future.<sup>5</sup>

### Rural Pharmacy

Rural and remote pharmacists are frontline healthcare professionals, who are integral to community health and wellbeing.<sup>2,3</sup> Community pharmacists are identified as highly accessible health professionals as community pharmacies are open more days of the week and for longer hours than other health professionals.<sup>3,10</sup> Community pharmacy is a health destination with 462 million individual patient visits annually, representing approximately 18 visits per person.<sup>11</sup> It is well recognised that the number of health professionals, including pharmacists in remote and very remote areas is disproportionate to the health challenges experienced by the populations in these areas.<sup>3</sup> Although workforce shortages remain an issue, community pharmacists have strong connections to community members, have clear understanding of community needs and are well placed to fill gaps in health service delivery due to absence of other health providers.<sup>3</sup>

### Expanded Practice

Expanded practice for pharmacists is described as a knowledge and skill base that is in addition to the usual scope of practice of pharmacists and may include pharmacists undertaking tasks usually provided by other health professionals.<sup>12</sup> Expanded practice is often synonymous and interchanged with the terms 'extended practice' and 'full scope of practice'.<sup>1</sup> However, expanded practice differs from the term 'advanced practice', which includes a high level of clinical and research skills and educational competence.<sup>1</sup> Internationally, pharmacists are working in expanded roles and providing services such as disease screening (osteoporosis, respiratory, diabetes, cardiovascular, kidney), vaccination, prescribing, ordering imaging and pathology and working within collaborative models of care.<sup>13</sup> However, in Australia, apart from vaccination, the pharmacist's scope of practice remains mostly unchanged and limited to the supply role.<sup>5</sup> In rural practice, where access to healthcare and health professionals is limited, effective utilisation and support of those health professionals already in community is essential to improve health outcomes. Expanded models of care where pharmacists are empowered to use their full skillset is likely to be most beneficial in rural and remote settings.<sup>3</sup> Expanded practice for rural community pharmacy may unlock opportunity to improve both health and pharmacy workforce maldistribution.<sup>14</sup> A paradigm shift for the pharmacy profession is however needed to effectively utilise rural community pharmacists to reduce health inequality in rural areas.<sup>3</sup> Significant gaps in remote healthcare combined with pharmacists working in expanded scope internationally providing services including screening and management of chronic and infectious diseases has Australian rural community pharmacists well positioned to contribute to improving health outcomes by providing an expanded practice service.<sup>13</sup>

### Ear Care

Ear care and hearing health is important to overall health and quality of life.<sup>15</sup> The ear's role in hearing, communication and balance is fundamental to wellbeing and disruptions can have long-lasting impacts on education, health and employment.<sup>15-16</sup> Ear complaints are a common presentation in community pharmacy, although pharmacists have limited options available to them for the management of ear conditions.<sup>17</sup> One in six Australians experience some form of hearing loss with 1.3 million cases reported as preventable.<sup>18-19</sup> Indigenous people report a higher burden of ear disease with rates as high as 90% reported for some remote communities.<sup>20-21</sup> A disrupted connection to land, culture and community, and poorer educational, social and behavioral outcomes is a result of Indigenous children experiencing otitis media (OM), younger, more frequently, more severely and for longer durations.<sup>20-21</sup> Ear disease is one small area of health with a large impact on wellbeing and an area where the pharmacy profession could have a significant and positive impact.

## 1.2 Study aims and objectives

The research question for this study is: What are the barriers and enablers for an expanded scope of service delivery for rural community pharmacy?

This research project has two primary aims (Figure 1-1):

1. To explore expanded practice models for rural community pharmacy.
2. To develop and pilot an expanded practice model in rural community pharmacy.

To achieve these aims the following objectives are defined in Table 1-1:

**Table 1-1:** Research project objectives and chapter references

Objective	Chapter
1) Conduct a literature review to examine the current evidence for expanded practice services in the rural and remote community pharmacy context.	3
2) Explore rural community pharmacists' perspectives of expanded services, to identify priority health areas, enablers, and barriers to their implementation.	4, 7, 8, 10, 14, 15
3) Investigate consumer perspectives of expanded pharmacy services in rural and remote settings, including priority health areas and expected enablers and barriers.	5, 7
4) Determine rural and remote health professionals (doctors, nurses, and allied health) perspectives of expanded services to be delivered through community pharmacy.	6, 7, 9, 10
5) Understand stakeholder perspectives of pharmacists providing expanded services in rural community pharmacies.	8
6) Determine a health priority area to develop an expanded pharmacy service for and scope the existing literature for the service.	11, 12
7) Design and develop an expanded pharmacy service using a model to produce a study protocol.	12, 13
8) Implement and evaluate an expanded pharmacy model to examine implementation processes, health outcomes and pharmacist, consumer, and GP perspectives.	14, 15

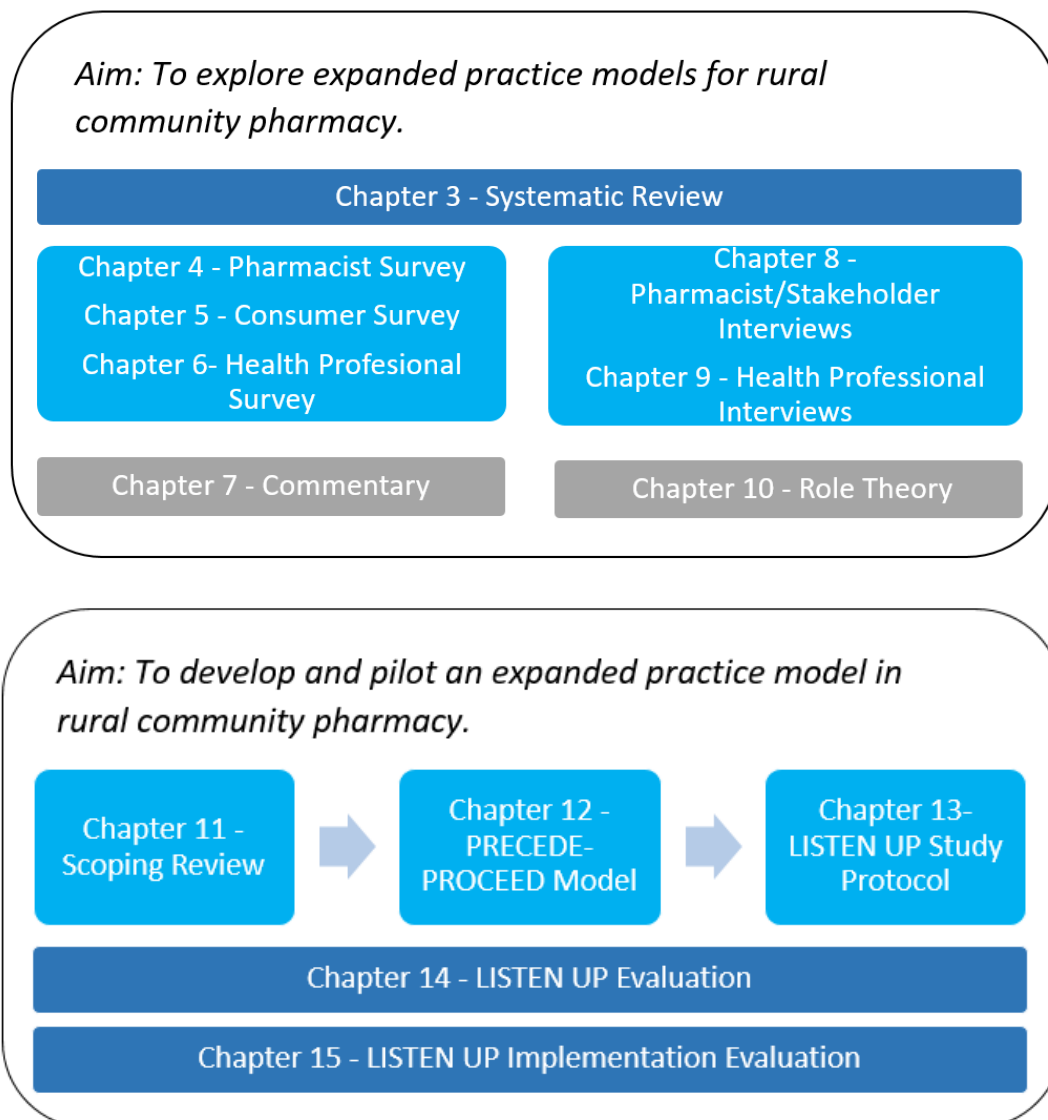
### Study Purpose

This research provides new knowledge to support the implementation of expanded pharmacy practice to address a gap in healthcare, ear health. The development of an expanded practice protocol supported by research on perspectives of consumers, pharmacists, GPs and stakeholders

provides a solid foundation to add to the limited literature exploring expanded pharmacy practice for rural and remote communities.

### 1.3 Structure of the thesis

The structure of the thesis follows a trajectory beginning with Chapter 1, an introduction to the research area and Chapter 2, which outlines the various methodologies, applied to the research. Figure 1-1 provides the outline of Chapters 3 -14 which address the two aims and includes the published articles in sequential order. Chapter 15 is a concluding chapter, which provides an overall conclusion to support future recommendations.



**Figure 1-1:** Thesis outline including aims and related chapters

## 1.4 Significance of the thesis

Expanded practice for rural community pharmacy is a novel and emerging area of practice for the pharmacy profession in Australia. Pharmacy in Australia is however well placed and prepared to provide expanded services, although little research has been conducted on this topic, with the absence of any research focusing specifically on rural and remote communities. This study provides valuable perspectives from relevant stakeholders, including pharmacists, other health professionals, and consumers about expanded practice and highlights challenges and successes of implementation of an expanded practice model. The outcome is a learning paradigm to guide the Australian Pharmacy Profession towards effectively developing a framework for expanded pharmacy practice for the future.

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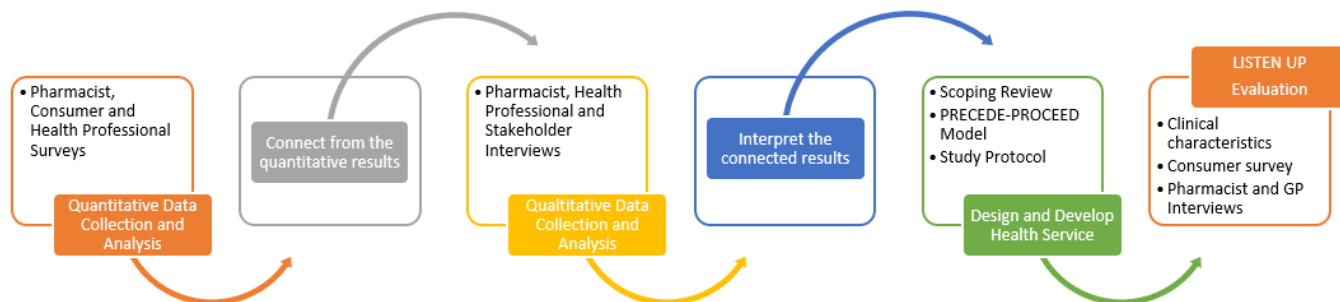
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## Chapter 2 – Methodology

This program of health service research uses a mixed-methods design. Health service research aligns with the aims of this study to investigate social factors, financial systems, organisational structures and processes, health technologies and the effect of personal behaviors on healthcare and well-being.<sup>1</sup> Mixed-methods have been used to complement the strengths of both qualitative and quantitative approaches to characterise this novel area of research more fully than either approach alone.<sup>2</sup> Connecting the quantitative and qualitative components of the research allows the findings to be built upon from the previous approach.<sup>3</sup>

This thesis is situated in and experienced through a lens of rural culture. The purpose of this research was to explore challenges and enablers for an expanded scope of service delivery for rural community pharmacy. The study has been conducted in two phases aligned to the two primary aims. The data collection followed an explanatory sequential design whereby the quantitative component (survey data - Chapters 4,5,6), which provides a general understanding of the research problem is followed by a qualitative component (interview data - Chapters 8,9,10), which refines and explains those statistical results by exploring participants' views in more depth (Figure 2-1).



**Figure 2-1:** Explanatory sequential research design.<sup>2</sup>

Through the data collection, it was revealed that an ear health service would be supported by consumers, pharmacists, and health professionals. Ear care was ranked highly as an important expanded service by consumers and pharmacists in the survey responses.<sup>4,5</sup> Qualitative interviews with GPs and pharmacists reported ear care to be a low-risk service with expectation of improved health outcomes for rural communities.<sup>6,7</sup> A scoping review (Chapter 11) highlighted the burden of ear disease in rural and remote community and the lack of pharmacy-based services aimed at ear care.<sup>8</sup> This led the project to develop a focused ear care service for rural community pharmacy.

The PRECEDE-PROCEED model (Chapter 12) was then applied to develop and pilot a rural community pharmacy-based ear health service, LISTEN UP (Locally Integrated Screening and Testing Ear aNd



aUral Program).<sup>9</sup> The PPM involved an assessment of constructs to support practice and consultation with governing bodies and regulatory authorities.<sup>9</sup> It structured the evaluation of the service pilot and informed planned implementation, process, and evaluation. As the pharmacy profession, transformations to meet patient-centered care the importance of using a model that translates evidence into practice to ensure interventions can be adopted and integrated into clinical and community settings to improve patient outcomes and benefit population health is highly important.<sup>10,11</sup> The final study involved the application of implementation science theory to further analyse data from pharmacist interviews with a particular focus on understanding the pharmacist experience of implementing LISTEN UP.

Table 2-1 provides a summary of the studies included in the thesis, the methods of data collection and analysis and the associated objectives and chapter reference. Detailed methods for each study is described in the manuscripts presented in relevant chapters. This chapter will present the salient features for each of the data collection methods and focus on the integration of these methods to develop a rich and comprehensive understanding of concept and experience of expanded rural community pharmacy practice.

**Table 2-1:** Summary of the studies included in the thesis

Study Type	Data Collection	Analysis	Objective	Chapter
Systematic review	29 articles using the PRISMA protocol <sup>12</sup>	Hong and Pluye Framework <sup>13</sup> Canadian Hierarchy of Promising Practices Evidence <sup>14</sup> National Chronic Disease Strategy action areas <sup>15</sup>	1	3
Pharmacist survey  Consumer survey  Health professional survey	92 pharmacists  406 consumers  121 health professionals  <b>619 participants</b>	Descriptive statistics Frequency analysis Chi-squared tests One-way ANOVA tests with post-hoc Tukey HSD tests	2, 3, 4	4,5,6
Pharmacist interviews  Health professional interviews  Stakeholder interviews	12 pharmacists  13 health professionals  8 stakeholders  <b>33 participants</b>	Inductive and deductive thematic analysis <sup>21</sup> Macro-, meso-, micro-levels WHO framework on integrated people-centered health services <sup>23</sup>	2,4,5	8,9,10
Scoping review	11 articles using PRISMA-ScR <sup>16</sup> and Arksey and O'Malley's methodological framework <sup>17</sup>	Hong and Pluye Framework <sup>13</sup> Canadian Hierarchy of Promising Practices Evidence <sup>14</sup> Deadly Ears Deadly Kids Deadly Communities Framework <sup>18</sup>	6	11
LISTEN UP Design, Implementation and Evaluation  Stakeholder interviews	55 Consumers 7 GPs 10 Pharmacists  <b>72 participants</b>	Descriptive statistics Frequency Analysis Diffusion of Innovation Theory <sup>27</sup> CFIR Framework <sup>30</sup>	7,8	12,13,14,15

### Ethics

James Cook University Human Research Ethics Committee granted ethical approval for both phases the study (H7845 and H8187)(Appendix H).

The study was also registered with the Australian and New Zealand Clinical Trial Registry, Trial Registration: ACTRN12620001297910.

## 2.1 Phase 1

### *Systematic Review*

An initial systematic review was conducted in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines.<sup>12</sup> The review identified peer-reviewed published evidence of expanded practice services in rural community pharmacy. All published data on expanded pharmacy services, in rural or remote areas worldwide with no date or language restriction were included. No restrictions were placed regarding study design as literature on expanded pharmacy practice in rural areas is limited. The studies were then analysed using two quality screens, the conceptual framework proposed by Hong and Pluye 2018<sup>13</sup> and The Canadian Hierarchy of Promising Practices Evidence.<sup>14</sup> The hierarchy describes four levels of evidence, under three categories ranging from best practice to emerging practices.<sup>14</sup> Although two quality screens were applied, articles were not excluded for lack of methodological rigour as it was felt that insight could still be gained from these articles in this emerging area of health service delivery. The Canadian Hierarchy of Promising Practices Evidence was particularly well suited to this review as it aligned studies in a way that recognised effective interventions that may be lacking rigorous program evaluation as well as those that were more formally developed.<sup>14</sup>

Data extracted from the articles, were thematically analysed and categorised according to the National Health Priority Action Council, Australian Government Department of Health and Aging Non-Communicable Diseases (NCDs) strategies which include: prevention across the continuum, early detection and early treatment, integration and continuity of prevention and care and self-management.<sup>15</sup> The framework included elements of coordinated action and is structured to reflect the phases of the patient journey, which is well aligned with the healthcare provided through rural community pharmacies.<sup>15</sup>

### *Surveys*

Findings from the systematic review including barriers and enablers to expanded services, informed the development of surveys and semi-structured interview guides which were utilised to collect data from practicing rural pharmacists, consumers and rural health professionals. These three groups were targeted as those who would be most impacted by expanded pharmacy services provided in rural community pharmacies. Historical reservations of the medical profession emphasise the

importance of a collaborative approach which involves understanding both consumer and health professionals' perspectives in the community to achieve a continuum of care for consumers.<sup>19</sup> Surveys were tailored to each participant group and piloted accordingly.

To collect data from rural pharmacists a cross-sectional study involving a self-administered survey was disseminated to participants (Appendix A). The survey explored Australian rural community pharmacists' perspectives of expanded services, to identify priorities, areas of concern, and enablers and barriers to expanded service implementation. The survey design included basic demographic information, Likert scale questions, open and closed questions, and comment boxes. The survey was disseminated through email and mail databases of pharmacy organisations including Rural Pharmacy Network Australia, Rural Pharmacists Support Network, Services for Australian Rural and Remote Allied Health, Pharmaceutical Society of Australia, Rural Pharmacy Forum, and James Cook University Alumni.

Consumers were engaged in the research via paper-based and online surveys disseminated through rural community pharmacies. (Appendix B) The survey investigated consumer perspectives of expanded pharmacy services in the rural and remote context to provide insight to guide the development of future models of expanded practice. Pharmacies were invited to participate via the Rural Pharmacy Support Network membership list and 20 pharmacies accepted. All pharmacies were provided with 100 paper-based surveys and one pharmacy also provided an online link to the survey on their consumer Facebook page. The survey design included consumers indicating via tick-box, from a choice of 26 services that they would like to see provided by their local pharmacy, multiple-choice questions relating to willingness to pay for services and four-point Likert scale statements about pharmacists providing these services.

Health professional including doctors, nurses, speech pathologists, occupational therapists, physiotherapists, dieticians, exercise physiologists, paramedics, social workers and Aboriginal health workers were invited to complete an online or paper-based survey (Appendix C) through rural health networks including Services for Rural and Remote Allied Health (SARRAH), University Departments of Rural Health (UDRHs), Improving Health Outcomes in the Tropical North (HOT NORTH), Northern Australian Research Network (NARN) and Health Professional Facebook network groups. The survey determined rural and remote health professional perspectives of expanded services to be delivered through community pharmacy. The survey design included indicating via tick-box, from a choice of 26 expanded services that they would like to see provided by their local pharmacy. A four-point Likert scale was also used to rate response to statements about acceptance and support for pharmacists to provide these expanded services.

Data collected from the surveys were analysed using descriptive statistics, frequency analyses, one-way ANOVA tests and chi-squared tests. Associations were examined between rurality, age, gender, health professional discipline, pharmacists' years of practice and number of expanded services chosen. A significance level was set at  $\alpha = 0.05$ . Summative content analysis was applied to open-ended questions exploring enablers and barriers. Data from these studies were synthesised and integrated into the PRECEDE segment of the PPM model to develop the ear care model (Chapter 12).<sup>9</sup>

### *Interviews*

Semi-structured interviews were conducted with pharmacists, health professionals and stakeholders (Interview Guides – Appendix D). The semi-structured interview method is designed to gather information about participants' personal experiences, attitudes, perceptions, and beliefs related to a topic of interest.<sup>20</sup> In this study the interviews were used to explore both new concepts and explain results from the quantitative findings of the surveys. Utilising interviews allowed in-depth data to be collected about expanded practice broadly, as well as an opportunity to fully unpack the lived experience of rural pharmacy, including challenges and enablers to expanded practice implementation. The interview guides were developed in conjunction with findings from the systematic review and the survey data. Identified barriers and enablers from both the systematic review data and survey data provided factors for which the interviews were able to explore more fully, in addition to participants general perceptions of expanded practice.

Data collected from pharmacists, HPs, and stakeholder representatives (Pharmacy Guild of Australia, Pharmaceutical Society of Australia, Australian Government Department of Health Primary Health Network, North and West Remote Health, Royal Flying Doctor Service, and the Queensland Aboriginal and Islander Health Council) were combined for analysis as the focus of these interviews was about broader implementation issues. Pharmacists were recruited to this study through convenience sampling of the Rural Pharmacy Network Australia (RPNA) and the Rural Pharmacy Support Network (RPSN) via email membership lists and Facebook pages. Stakeholders were invited to participate purposively via direct contact at an organisational level. Health professionals were recruited via invitation at completion of participation in the health professional survey.

Analysis of the transcriptions was conducted using hybrid approach of inductive and deductive coding and theme development incorporating both the data-driven inductive approach and the deductive priori template of codes approach.<sup>21</sup> NVivo 12 software provided a platform for data management.<sup>22</sup> To ensure objectivity, assumed knowledge and bias were minimal, a second member of the research team reviewed the first five interview transcripts and coding for all the interviewee

groups. Member checking was also undertaken by five participants, to support credibility and validity of the data. Data saturation was achieved with each interview group, however data collection continued with all participants who had volunteered to ensure that there were no discernible new themes or linkages between themes. None of the interviewees received an incentive to participate. All interviews were conducted face-to-face, via video-conference or telephone at a time convenient to the participant.

The World Health Organisation (WHO) framework for integrated people-centered health services was applied to the analysis of the interview transcriptions.<sup>23</sup> The WHO framework provides five strategies focused on the vision that all people have equitable access to quality health services.<sup>23</sup> The strategies of the WHO framework have been linked to a multi-level lens of perspective, macro-policy, meso-health professional, and micro-consumer and community levels, to provide a framework for the thematic analysis.<sup>23</sup> Utilisation of the WHO framework aligned to the multi-level lens provides an effective way to present the data that is both relevant to different levels of perspective and aligned to the direction of an international health strategy.

After initial analysis of the qualitative data applied to the WHO framework, a clear set of themes emerged that related to the pharmacist's role and how that relates to other professionals. The detailed amount of data that emerged from the health professional interviews relating to this topic demanded a more nuanced exploration of these ideas. Role theory as defined by Conway as 'a collection of concepts and a variety of hypothetical formulations that predict how actors will perform in a given role, or under what circumstances certain types of behaviours can be expected' provided a conceptual framework through which these ideas could be explored in greater detail.<sup>24</sup> Role theory constructs provided a framework through which the perceptions of the health professionals of the role of pharmacists in expanded practice could be explored further. Although this piece of work did not initially sit within the planned structure of this mixed-methods health service research, it did provide valuable insight into professional and workforce issues that may impact implementation of expanded services for rural pharmacies.

## 2.2 Phase 2

The **PRECEDE-PROCEED** model was used to structure and synthesise systematic review, interview, and survey data to inform the development and implementation of an expanded practice pilot study. Findings had suggested various expanded services, which could be piloted in rural community pharmacy, all of which had challenges and enablers to consider. Based on the results combined with consultation with governing bodies, policy makers and regulatory authorities, an ear health model was decided as the expanded service to design and implement.

The PRECEDE-PROCEED Model was adopted to plan and develop an ear health program.<sup>11</sup> A model that supports the translation of evidence with focus on health promotion was well suited to this study.<sup>11</sup> The PRECEDE (Predisposing, Reinforcing, and Enabling Constructs in Educational/Ecological Diagnosis and Evaluation) segment provides an outline of a planning process to guide the development of locally relevant and focused public health programs.<sup>11</sup> This segment involves five phases which encompassed much of the data from the survey and interviews, in addition to a scoping review and consultative process with policy makers, regulatory, and governing bodies.

A scoping review to identify peer-reviewed, published evidence of pharmacists' involvement in ear healthcare interventions with a focus on effectiveness, sustainability, and enablers and barriers was conducted. This review was completed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA-ScR) extension for scoping reviews guideline.<sup>16</sup> All published data on expanded pharmacy services, in rural or remote areas worldwide with no date or language restriction were included. Similarly, to the initial systematic review of expanded services, the eleven scoping review articles were analysed using two quality screens, the conceptual framework proposed by Hong and Pluye<sup>13</sup> and The Canadian Hierarchy of Promising Practices Evidence.<sup>14</sup> As literature on this topic is limited, no restrictions were placed in regard to study design, and as a result, published news articles, narrative articles and editorials were also included. Data were extracted and thematically analysed against the *Deadly Ears Deadly Kids Deadly Communities Framework*.<sup>18</sup> The burden of ear disease is most represented in Indigenous populations as are the high rates for rural and remote communities, knowledge which is embedded within this framework.<sup>25</sup> This framework was developed to reduce the incidence and impact of conductive hearing loss associated with otitis media by intervening at local and national levels and across different sectors.<sup>18</sup> The six key action areas (prevention, screening, surveillance and diagnosis, treatment and support, partnerships, workforce development, information and knowledge) included in the framework were well aligned with the themes of data that were extracted from the articles. Implementation processes identified in the literature were used to inform the development of a local ear health intervention.

A study protocol (Chapter 13) was developed, the study piloted for six weeks then progressed to a six month implementation phase.

### *Evaluation*

The evaluation of LISTEN UP was conducted after six months of data collection. Data collected from participants included patient demographics, clinical characteristics, a satisfaction survey and semi-structured interview after seven days. Pharmacists and GPs were also interviewed using a semi-

structured method pre- and post- the pilot study. During the consultation pharmacists recorded patient details, clinical characteristics of the current episode of care including presenting complaint, duration and treatments tried. Pharmacist examination notes were also recorded as well as recommendations made.

Descriptive statistics summarised the demographic information, clinical characteristics, and survey data. Content analysis was applied to the qualitative data from consumer interviews. Pharmacist and GP interview data were thematically analysed according to a thematic map developed by combining the diffusion of innovation theory and categories adapted from 'Qualitative data analysis for applied policy research'.<sup>26,27</sup> NVivo 12 software was applied to the qualitative analysis.<sup>22</sup>

Diffusion of innovation theory aligns well to this study as expanded practice for rural practice is a new and innovative area of practice. Understanding the elements involved in the adoption of an innovation (practice) is important to reduce uncertainty and slow adoption.<sup>27</sup> The innovation decision process outlines information-processing to reduce uncertainty about the advantages and disadvantages of an innovation and provides structure to consider for the adoption of an expanded practice model for rural pharmacy.<sup>27</sup>

To complete the evaluation implementation science defined as “the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services” provided the Consolidated Framework for Implementation Research (CFIR) to which an additional thematic analysis was applied.<sup>28,29</sup> Also not originally planned for in the structure of the thesis, this additional analysis was conducted to provide an in-depth and detailed understanding of the implementation process of the expanded service in rural practice. The CFIR comprises five major domains, with 39 constructs, relevant to the implementation of a novel intervention.<sup>30</sup> Data collected from pharmacist interviews were analysed according to this framework and reported in Chapter 15.

The sample size prohibited additional statistical analyses, however the qualitative data provided valuable information pertaining to implementation of future expanded services.



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## Chapter 3 – Literature Review

This chapter is the first publication from this study and is published in the *Journal of Pharmacy Practice and Research*. It is a systematic review that provides evidence of rural expanded pharmacy services including the delivery of immunisations, screening, and management of acute and chronic diseases. Cost effectiveness, enablers, barriers, and feasibility of expanded services is also included.

**Taylor S, Cairns A, Glass B. *Systematic review of expanded practice in rural community pharmacy*. J Pharm Pract Res. 2019;49(6) p585-600  
doi:10.1002/jppr.1619**

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

Selina Taylor

Alice Cairns

Beverley Glass

*Permission obtained from JPPR for the inclusion of this published journal article.*

### 3.1 ABSTRACT

*Aim:* The aim of this study was to identify published evidence to inform the development of expanded practice services in rural community pharmacies.

*Data sources:* The search strategy was applied to the following electronic databases: MEDLINE, CINAHL, Emcare, Cochrane and Google Scholar.

*Study selection:* In all, 508 studies were evaluated against inclusion and exclusion criteria, with 29 eligible studies finally included in the review. Services provided needed to meet the described definition of 'expanded practice' and be applied in a rural community pharmacy setting. Expanded services were evaluated against at least one of the following: effectiveness, enablers, barriers and feasibility.

*Results:* The studies included in this review were conducted in the US (n=15), Australia (n=8), Canada (n=2), New Zealand (n=1), England (n=1), Croatia (n=1) and Ghana (n=1). All studies were conducted within the past 22 years, with 11 published since 2015. Cardiovascular disease (n=7), diabetes/metabolic syndrome (n=4), respiratory disease (n=6) and vaccinations (n=5) were the most common diseases or health service targeted in the interventions. Study design varied, reflected in the methodological quality, which included experimental studies (n=27) and retrospective observational cohort studies (n=2). Expanded pharmacy services identified included delivery of immunisations and the screening and management of chronic and infectious diseases, such as osteoporosis, asthma, chronic obstructive pulmonary disease, malaria, diabetes, and cardiovascular and kidney disease.

*Conclusions:* Pharmacists providing these services have an opportunity to improve health outcomes for rural populations.

*Keywords:* extended practice, scope of practice, pharmacy practice, remote, pharmacies, models of care.

## 3.2 INTRODUCTION

Expanded pharmacy practice has been described as a discrete knowledge and skill base that is additional to the recognised scope of the pharmacy profession.<sup>1</sup> It may be applied to pharmacists undertaking tasks usually provided by other health professionals e.g. doctors, nurses, and allied health professionals and is often synonymous and interchanged with the term 'extended practice'.<sup>1</sup> However, expanded practice differs from the term 'advanced practice', which includes a high level of clinical and research skills and educational competence.<sup>1</sup>

Australia is shifting towards harnessing the skills of pharmacists to determine how the pharmacy profession can expand its scope of practice to improve health outcomes, particularly in rural and remote areas.<sup>2</sup> More than 5450 community pharmacies in Australia offer a highly skilled network of primary healthcare professionals providing accessible quality advice and service.<sup>2</sup> Therefore, pharmacists are well placed to provide expanded pharmacy services, but there are limited models and frameworks to support implementation.<sup>2</sup> Integrating expanded pharmacy services into the complex Australian healthcare system also has challenges and lessons may be learnt from successful international models.<sup>2</sup>

Disease screening, vaccinations, non-communicable disease (NCD) management, health promotion and education are key areas where pharmacists have developed and delivered services in rural areas across the world.<sup>2</sup> Additional training or credentialing has been provided for pharmacists to work outside of their standard scope of practice and, in other cases, the work performed has been an extension of their usual role.<sup>3-5</sup>

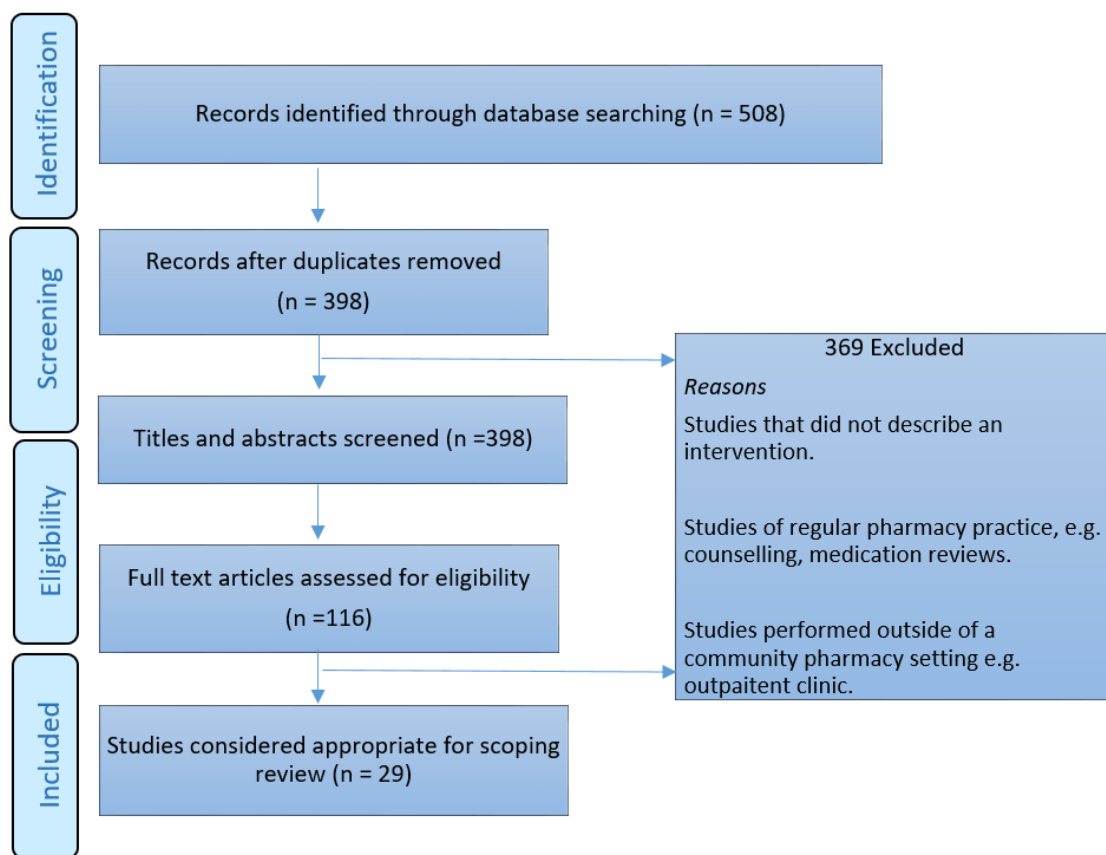
Improved availability of programs to target healthy lifestyles and increase awareness of disease prevention is recognised as valuable for improving the health of rural Australians.<sup>6</sup> However, shortages and maldistribution of health facilities and health professionals affect the possible success of these programs.<sup>6</sup> It is well recognised that the isolated rural population has significantly higher mortality and morbidity rates with mental health, diabetes, cardiovascular and respiratory diseases representing major health burdens.<sup>7</sup> Using innovative models to address the accessibility to (distance, time, cost, and transport availability) and affordability of local health service delivery is pertinent to improving health outcomes.<sup>6</sup>

This systematic review aims to examine the current evidence for expanded practice services in the rural and remote community pharmacy context. This will make a significant contribution to the evidence base for the development of strategies for the implementation of expanded pharmacy practice services.

### 3.3 METHODS

#### Protocol

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.<sup>8</sup> [Figure 3-1]



**Figure 3-1:** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for systematic review<sup>8</sup>



The purpose of the systematic review was to identify published evidence to inform the development of expanded practice services in rural community pharmacies. In particular, the review aimed to answer the following questions: (1) how effective are expanded services in rural community pharmacies (identification of illness, improved management of health conditions, improved access to other health services, financial considerations); (2) what are the characteristics of successful services in rural pharmacies (e.g. level of evidence, area of intervention); (3) what are the enablers and barriers to effective expanded services in rural community pharmacies; and (4) what are the costs of the expanded service (to both the consumer and provider)?

For the purpose of this review, 'expanded practice' was defined as a pharmacist-led intervention that is beyond the usual scope of practice provided in a community pharmacy.

### Eligibility Criteria

All published data on expanded pharmacy services as defined above, in rural or remote areas worldwide with no date or language restriction were included. Studies were included if they self-identified the setting to be in a rural or remote location. There were no restrictions about study design as literature on expanded pharmacy practice in rural areas is limited.

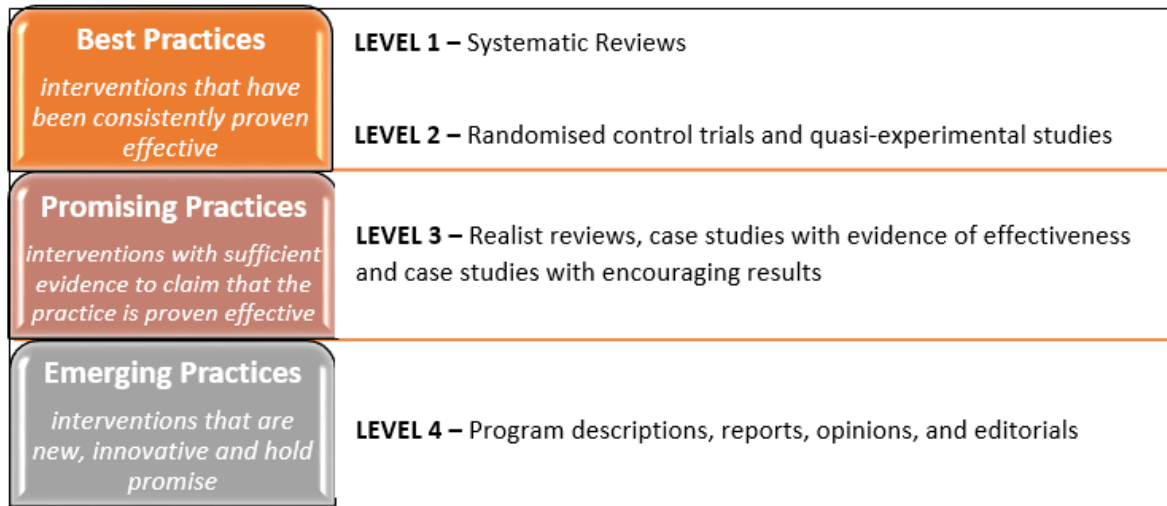
### Search Strategy

A search strategy was developed to identify studies in which the implementation of an expanded community pharmacy service had occurred. The following electronic databases were searched on 22 June 2019 with no date range or language exclusion; MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Emcare and Cochrane Database. Google Scholar was searched using a combination of keywords to find any literature missed in other databases. Keywords and subject headings included pharmac\* AND (rural or remote) AND ('expanded practice' OR 'advanced practice' OR 'extended practice' OR 'professional role\*' OR 'scope of practice' OR 'pharmac\* intervention' OR 'community pharmac\* service\*'). Screening of the reference lists of those articles included in the review was undertaken but provided no additional articles for inclusion.

### Data extraction and Quality Assessment

Given the variety of study designs, two quality screens were applied to the selected papers. Articles were examined based on the conceptual framework proposed by Hong and Pluye.<sup>9</sup> This framework

considers three components; methodological quality, conceptual quality, and reporting quality.<sup>9</sup> Because this topic is an emerging area in the literature, articles were not excluded for lack of methodological rigour because it was felt that insight could still be gained from these articles. In addition, the quality of the evidence was assessed using the Canadian Hierarchy of Promising Practices Evidence.<sup>10</sup> The hierarchy describes four levels of evidence, under three categories, ranging from best practice to emerging practices.<sup>9</sup> [Figure 3-2]



Data were extracted from the articles, analysed thematically, and categorised according to the National Chronic Disease Strategy action areas, which include prevention across the continuum, early detection and early treatment, integration and continuity of prevention and care and self-management.<sup>11</sup> Although some study interventions addressed acute diseases, the NCDs elements could still be aligned to describe the style of intervention applied.

### 3.4 RESULTS

#### Search Results

In all, 508 studies were identified through online database searching; 110 duplicate studies were removed. The remaining 398 studies were screened based on their abstract and title, with a further 282 studies excluded. Most of these studies were excluded because they did not describe a pharmacist-delivered service, or they did not meet the definition of expanded practice. The remaining 114 full-text articles were assessed for eligibility; of these, 76 did not meet the inclusion

criteria and were excluded. The 29 remaining studies were deemed appropriate for inclusion in the present systematic review as per the eligibility criteria.<sup>4-7,12-16,18-36</sup>

### Identification and summary of included studies

The 29 studies included in this review are summarised in Table 3-1. Studies were conducted in the USA (n=15),<sup>14,15,17,19,23-26,29-32,34-36</sup> Australia (n=8),<sup>4-7,16,21,22,28</sup> Canada (n=2),<sup>12,27</sup> New Zealand (n=1),<sup>18</sup> England (n=1),<sup>33</sup> Croatia (n=1),<sup>20</sup> and Ghana (n=1).<sup>13</sup> All studies were conducted within the past 22 years, with 11 published since 2015. Cardiovascular disease (n = 7),<sup>6,7,12,20,22,24,30</sup> diabetes/metabolic syndrome (n = 4),<sup>22,25,29,36</sup> respiratory disease (n = 6)<sup>4,5,15,18,23,33</sup> and vaccinations (n = 5)<sup>14,19,21,32,34</sup> were the most common subjects. The interventions consisted of early detection and early treatment (n=10),<sup>4,6,13,17,22,24,26,28,33,35</sup> including screening and risk assessment studies, and integration and continuity of prevention and care (n=12),<sup>5,7,12,15,16,18,20,23,25,27,29,31</sup> describing education and monitoring services. Five studies described prevention across the continuum,<sup>14,19,21,32,35</sup> including vaccination interventions, and two studies described self-management interventions.<sup>30,36</sup>

The hierarchy of evidence varied significantly in the included studies, as indicated by Table 3-1. Six studies were categorised as Level 2-Best Practice and described well designed interventions that were either randomised controlled trials or quasi-experimental studies.<sup>4,5,12,16,20,22</sup> Four studies were categorised as Level 4-Emerging Practice, but had limited methodological rigor to support the intervention.<sup>7,13,26,33</sup> The remaining articles were categorised as Level 3–Promising Practice; although they did not demonstrate high-level evidence, the context and insight were considered still valuable to report.<sup>6,14,15,17-19,21,23-25,27-32</sup> Methods included both experimental and observational study designs with experimental cohort pilot studies most commonly used.

**Table 3-1: Summary of included studies in the literature review**

Author, Year, Country	NCDs Element	Disease state/Participants (n=X)/Number of community pharmacies (nCP=X)	Intervention/Setting	Study Design  [X]in box indicates if study described enablers, barriers and costs	Outcomes	Level of Evidence
Al Hamarneh <i>et al.</i> , 2018, Canada <sup>12</sup>	ICPC	CVD and CKD  (n=723;290 had CKD and this group was split into an intervention group (n=147) and a control group (n=143))  nCP=56	Biomedical patient assessment: BP, weight, height, waist measurement, HbA1c, lipid profile, CV risk assessment using online tool (Framingham risk assessment equation) and monthly follow-up for 3 months.	Pre-specified subgroup analysis of a randomised controlled trial.  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input type="checkbox"/> Costs	20% reduction in CV risk (p <0.001). Reduction of: 0.2mmol/L in LDL-C (p=0.004), 10.5mmHg in SBP (p<0.001) and 0.7% HbA1c concentration (p <0.001); 19.6% smoking cessation (p = 0.04).	Level 2 – Best practice
Ansah <i>et al.</i> , 2015, Ghana <sup>13</sup>	EDET	Malaria (n=4603)  nCP=24 (shops in Ghana selling	Provide rapid diagnostic malaria blood sample tests before dispensing medicines. 3-day training provided.	Cluster randomised trial providing malaria tests for fever management to reduce overdiagnosis and overtreatment.	74% of intervention group and 27% of control group received appropriate treatment (aRR 2.39; 95% CI 1.69-3.39; p <0.001)	Level 4 – Emerging practice

		antimalarial medicine)		<input type="checkbox"/> Enablers <input type="checkbox"/> Barriers <input type="checkbox"/> Costs		
Bearden and Holt, 2005, USA <sup>14</sup>	PAC	Influenza vaccination  (n=19 628)  nCP=276 (28% rural counties)	Rates of vaccination provided by pharmacists at community pharmacies in rural counties.	Observational retrospective cohort study involving database analysis  <input type="checkbox"/> Enablers <input type="checkbox"/> Barriers <input type="checkbox"/> Costs	Mean of 250 vaccines provided per pharmacy between 2000-2003.	Level 3 – Promising practice
Brown <i>et al.</i> 2017, USA <sup>15</sup>	ICPC	Asthma (n=20)  nCP=1 (1 trained pharmacist - certified asthma educator and physician assistant)	Development and implementation of an asthma education program delivered via telehealth for three monthly sessions then three quarterly sessions.	Single site pilot study. Effectiveness assessed against validated ACT and spirometry readings.  <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers	90% did not meet the threshold for ‘well-controlled asthma’ at baseline. At 3 months, 90% were ‘well-controlled’ and maintained at 9 months. 20 recommended	Level 3 – Promising practice

				<input checked="" type="checkbox"/> Costs	medication changes were authorised.	
Crockett <i>et al.</i> , 2006, Australia <sup>16</sup>	ICPC	Depression (n=106)  nCP=32	Video-conference training for intervention pharmacists by psychologist, psychiatrist and GP. Advised to dispense medication with extra advice, support and written resources as per training. Control pharmacists asked to provide usual care.	<input checked="" type="checkbox"/> Costs  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input type="checkbox"/> Costs	Medication adherence was high in both intervention and control groups (95% versus 96%). Significant improvement in K10 scores for both intervention and control groups (4.7 versus 4, respectively)  No significant change in attitude to drug treatment.	Level 2- Best practice
Elliot <i>et al.</i> , 2002, USA <sup>17</sup>	EDET	Osteoporosis (n=133)  nCP=5	Fracture risk questionnaire followed by calcaneal BMD scan.	Pilot study evaluation of knowledge of skeletal status, assessment of adequacy of calcium intake, determining prevalence of low BMD and determining whether peripheral BMD testing lead to medical interventions.	20% of participants identified as having calcaneal osteoporosis. 30% met criteria for treatment (75% were unaware of their low bone mass). 14% then undertook axial BMD measurements and 9%	Level 3 – Promising practice

				<input type="checkbox"/> Enablers <input type="checkbox"/> Barriers <input type="checkbox"/> Costs	were prescribed medication.	
Emmerton, Shaw and Kheir, 2003, New Zealand <sup>18</sup>	ICPC	Asthma (n=100)  nCP=5	Monthly consultations with the trained pharmacist. Service included patient consultation, systematic assessment, care planning, patient education, recommendations, and referrals.	Pilot study based on a 'problem-action-outcome' method.  <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input type="checkbox"/> Costs	Mean 4.3 medication-related problems were identified per patient, of which 60% were compliance related. 75% received a new or updated asthma action plan. 49% were referred to another health professional. At 6 months, 70% of patients were estimated to have up to 75% of their medication-related problems resolved.	Level 3 – Promising practice
Ernst <i>et al.</i> , 1997, USA <sup>19</sup>	PAC	Influenza (n=343)  nCP=1	Influenza vaccination protocol for identification and screening of patients, administration of vaccine, and treatment of	Evaluation of pilot study of pharmacist-administered vaccination.  <input type="checkbox"/> Enablers <input type="checkbox"/> Barriers	61% reported they had not received the influenza vaccine in the previous year and (45%) would not have gone elsewhere for the immunisation.	Level 3 – Promising practice

			emergencies were developed.	<input type="checkbox"/> Costs		
Falamic <i>et al.</i> , 2018, Croatia <sup>20</sup>	ICPC	CVD (n=131;65 intervention group)  nCP=1 (1 pharmacist)	Intervention group received repeated education and a follow-up plan in addition to discussion with GPs for dosage adjustments and avoidance of drug interactions. Control group was followed-up monthly for 6 months only.	Prospective randomised trial for patients on warfarin therapy over 6 months.  <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input type="checkbox"/> Costs	Time in therapeutic range was significantly higher for the intervention group (93% versus 31%; p <0.001). Proportion of patients in therapeutic range was higher in intervention group (86% versus 8%; p <0.001).	Level 2 – Best practice
Fathima, Saini, Foster and Armour, 2017, Australia <sup>4</sup>	EDET	COPD (n=167;157 completed lung function testing)  nCP=21 (20 pharmacists)	COPD risk assessment questionnaire and lung function testing performed by trained pharmacists.	Pragmatic 6-month cross-sectional (patients), longitudinal (pharmacists) pilot study.  <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input type="checkbox"/> Costs	16%, 23% and 61% were at high, medium and low risk of COPD, respectively. 68 patients were referred to their GP, with 23 being diagnosed with COPD or another respiratory condition. 20 patients were then treated pharmacologically.	Level 2 – Best Practice



<p>Hattingh <i>et al.</i>, 2016, Australia<sup>21</sup></p>	<p>PAC</p>	<p>Influenza (n=15621)</p> <p>nCP=86 (78 pharmacist surveys and 25 pharmacist interviews)</p>	<p>Influenza vaccines provided in community pharmacy.</p>	<p>Mixed-methods with both quantitative and qualitative data through surveys, pharmacy computer records and immuniser pharmacist interviews.</p> <p><input checked="" type="checkbox"/> Enablers</p> <p><input checked="" type="checkbox"/> Barriers</p> <p><input checked="" type="checkbox"/> Costs</p>	<p>15621 vaccines provided in 8 months with no major events and &lt;1% experiencing minor events. Pharmacists agreed or strongly agreed to continue providing vaccinations (99%), that the service improved relationships with other local area health professionals (32%) and that they experienced support from local GPs (27%).</p>	<p>Level 3 – Promising practice</p>
<p>Hourihan, Krass and Chen, 2003, Australia<sup>6</sup></p>	<p>EDET</p>	<p>CVD (n=209)</p> <p>nCP=10 (13 pharmacists)</p>	<p>Health promotion and screening service for CV risk factors.</p>	<p>Evaluation of a standardised health promotion and screening protocol which included a risk factor assessment questionnaire. Participants with elevated parameters were referred to their GPs and required to return for a re-assessment at 3 months.</p> <p><input checked="" type="checkbox"/> Enablers</p>	<p>89% were identified with modifiable risk factors including obesity and limited physical activity. 30% were referred to their GPs. 54% had elevated cholesterol, 18% had elevated BP, 12% smoked tobacco and 24% had risk factors for diabetes.</p>	<p>Level 3 – Promising practice</p>

				<input checked="" type="checkbox"/> Barriers  <input checked="" type="checkbox"/> Costs		
Jackson <i>et al.</i> , 2005, Australia <sup>7</sup>	ICPC	CVD (n=137;518 INR tests)  nCP=16 (22 pharmacists)	INR comparison testing with pharmacy-based tests and laboratory testing.	Pilot study where pharmacists were trained to use INR testing monitors and then conducted pharmacy-based testing for 3 months.  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input checked="" type="checkbox"/> Costs	120 of 518 pharmacy INR tests evaluated against laboratory values and found to be significantly correlated (mean (+SD) 2.32 +- 0.77 and 2.32 +- 0.59, respectively; $r = 0.88$ , $p < 0.001$ ). 9% of 398 additional tests resulted in subsequent warfarin dosage changes.	Level 4- Emerging practice
Krass <i>et al.</i> , 2007, Australia <sup>22</sup>	EDET	CVD/Diabetes (n=289; 149 intervention, 140 control)  nCP=56 (28 control, 28 intervention)	Diabetes service with assessment management and review, support for SMBG, education, adherence support and reminder of checks for diabetes complications.	Multisite control vs intervention, repeated measures design.  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input type="checkbox"/> Costs	Reductions after 6 months in the intervention group in blood glucose and HbA1c of 0.9mmol/L ( $p < 0.001$ ) and 0.97% (95% CI -0.8,-1.14) respectively, compared with -0.27% (95% CI- 0.15, -0.39) in the control group.	Level 2 – Best Practice

Madaras-Kelly <i>et al.</i> , 2006, USA <sup>23</sup>	ICPC	URTI (n=192)  nCP=2	Pharmacist-conducted guided interview with patients who presented with a prescription for a broad spectrum antibiotic in community pharmacy. Attempt to contact prescribers to confirm diagnosis and recommending alternative therapy was included.	Pilot project cohort design with a control phase and an intervention stage.  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input checked="" type="checkbox"/> Costs	3% declined to discuss their symptoms and 7% agreed for pharmacists to contact their prescriber for alternative therapy. Prescribers were receptive to changing to a narrow-spectrum antibiotic for the four participants.	Level 3 – Promising practice
Mangum <i>et al.</i> , 2003, USA <sup>24</sup>	EDET	Hypertension and stroke (n=351)  nCP=1 (1 pharmacist)	Free BP screening and screening for stroke risk using risk assessment tool.	Pilot study evaluation of implementation of BP and stroke risk screening tools.  <input type="checkbox"/> Enablers  <input type="checkbox"/> Barriers  <input type="checkbox"/> Costs	62% had elevated readings. 121 patients were referred to their GP, with 36% having a medication regimen change. 50 patients were screened for stroke; risk results: normal 4%, mild 26%, moderate 32%, high 38%.	Level 3 – Promising practice

<p>McCollum <i>et al.</i>, 2009, USA<sup>25</sup></p>	<p>ICPC</p>	<p>Diabetes (n=12; pharmacy students)</p> <p>nCP=1</p>	<p>Pharmacy students provided patient education and point-of-care testing (HbA1C, blood glucose, BP and lipid profile) of patients with diabetes once a month for 6 months.</p>	<p>A retrospective pre/post design pilot study. Clinical notes / recommendations sent to physician.</p> <p><input type="checkbox"/> Enablers</p> <p><input type="checkbox"/> Barriers</p> <p><input type="checkbox"/> Costs</p>	<p>533 recommendations were made. Three physicians accepted 50-60% recommendations, four accepted no recommendations. Reductions in HbA1c, LDL-C, DBP and weight were significant (p&lt;0.01).</p>	<p>Level 3 – Promising practice</p>
<p>McGuire <i>et al.</i>, 2005, USA<sup>26</sup></p>	<p>EDET</p>	<p>Breast and cervical cancer (n=100 pharmacists; 112 referrals)</p> <p>nCP=28</p>	<p>Pharmacist providing referrals and enrolment packs for patients to undertake mammography and/or pap smears.</p>	<p>Pharmacies enrolled in the program, received continuing education and provided patient information materials regarding cancer.</p> <p>Descriptive statistics were used to characterise study sites and predictors of being a successful referral site.</p> <p><input checked="" type="checkbox"/> Enablers</p> <p><input checked="" type="checkbox"/> Barriers</p> <p><input checked="" type="checkbox"/> Costs</p>	<p>112 referrals were generated for low to moderate income and medically underserved participants.</p>	<p>Level 4 – Emerging practice</p>

Murphy, Gardner and Jacobs, 2018, Canada <sup>27</sup>	ICPC	Mental illness (n=182)  nCP=23	Patient care program including medication management, navigation, education, collaboration, and triage for various mental illnesses.	Mixed-methods (surveys, interviews, enrolment forms, chart abstractions) including a retrospective chart audit to examine outcomes.  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input checked="" type="checkbox"/> Costs	46 of 182 completed the program. 125 health and medication problems were identified and scored with 78% scored as 'resolved' or 'improved' at discharge.	Level 3 – Promising practice
Naunton, Peterson and Jones, 2006, Australia <sup>28</sup>	EDET	Osteoporosis (n=345)  nCP=6 (1 pharmacist)	Pharmacist screening for osteoporosis using a portable heel ultrasound device.	Heel ultrasounds were performed in pharmacy, followed by a follow-up postal survey and telephone interview at 3 months.  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input checked="" type="checkbox"/> Costs	20% were likely to have osteoporosis, 58% were referred to their GP and 42% were treated with medication. Significant improvements in knowledge of osteoporosis and lifestyle changes were established.	Level 3 – Promising practice
Nuffer, McCollum, Ellis	ICPC	Diabetes (n=417)	Pharmacy students provided patient education and point-of-care	A retrospective pre/post design pilot study. Survey of pharmacy students' perceptions of advanced	Clinically significant improvements in HbA1c, SBP, DBP, total cholesterol, LDL-C and	Level 3 – Promising practice

and Turner, 2012, USA <sup>29</sup>		nCP=12 (120 pharmacy students)	testing (HbA1C, blood glucose, BP and lipid profile) of patients with diabetes once a month for 6 months.	pharmacy practice experience. <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input checked="" type="checkbox"/> Costs	triglycerides at 6 months (p <0.001). Pharmacy students rated the program highly for increasing knowledge, confidence, and competency.	
Oser, Fogle and Bennett, 2017, USA <sup>30</sup>	Self-management	Hypertension (n=534)  nCP=25 (mean >3 pharmacists per pharmacy)	Brief consultation with pharmacist discussing medication management and lifestyle behaviour to improve medication adherence and BP control in CP. Patient information and referral to smoking Quit line provided.	A retrospective pre/post design 1-year pilot study followed by Year 2 and Year 3 program measuring patient adherence to BP medication.  <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input checked="" type="checkbox"/> Costs	BP medication adherence increased from 73% before intervention to 89% after intervention.	Level 3 – Promising practice
Patton <i>et al.</i> , 2017, USA <sup>31</sup>	ICPC	AMI, HF, pneumonia, COPD, post joint replacement (n=9)	Comprehensive medication review at CP performed within 72 hours of discharge and follow-up telephone consult at Days 7	A 4-month prospective pilot study evaluating of the number of patients readmitted or visiting ED	No participants were readmitted or attended the ED within 30 days of hospital discharge.	Level 3 – Promising practice

		nCP=2 (1 pharmacist)	and 30 after discharge.	within 30 days of hospital discharge. <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input checked="" type="checkbox"/> Costs		
Rhodes <i>et al.</i> , 2017, USA <sup>32</sup>	PAC	Vaccine-preventable diseases (n=631)  nCP=5 (1 pharmacist)	Pharmacist vaccine screening tool implemented in CPs to identify, evaluate and recommend vaccinations. Recommended vaccines were administered with patient consent.	Evaluation of implementation of screening tool. Any member of the pharmacy team conducted the screening.  <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input checked="" type="checkbox"/> Costs	Screening resulted in administration of 11 influenza, 6 pneumococcal, 5 Tdap and 6 zoster vaccines.	Level 3 – Promising practice
Saini <i>et al.</i> , 2008, Australia <sup>5</sup>	ICPC	Asthma (n=90; 51 intervention group, 39 control group)	Standardised protocols and resources delivered by specially trained community pharmacists. Patients visited the pharmacy at	A parallel-group controlled repeated-measures study. Asthma severity score based on recency, frequency and severity of asthma symptoms and asthma history.	Intervention group demonstrated a significant reduction in asthma severity scores (mean (SD+-) 7.9+- 2.6 vs 10.4 +- 3.1, respectively; p<0.001) and an increase in the	Level 2 – Best practice

		nCP=x* (20 pharmacists;12 intervention, 8 control)  *Number of pharmacies not specified	baseline and 1, 3, and 6 months in the intervention group and at baseline and after 6 months in the control group.	<input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input type="checkbox"/> Costs	proportion of patients owning a written action plan (23% vs 21%; p<0.75).	
Wakeman, Cork and Watwood, 2018, England <sup>33</sup>	EDET	RTIs (n=52)  nCP=1 (1 pharmacist)	Point-of-care CRP testing for RTIs in CP. Patients with cough and cold referred to study <i>via</i> doctor surgery, pharmacy staff or self-referral.	Pilot study including consultation survey, patient symptom scores self-assessment and telephone follow-up interview 3-7 days later.  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input checked="" type="checkbox"/> Costs	44/52 patients undertook a CRP test; 39 received a low result and advised to watch and wait or self-care, which resulted in 38 antibiotic prescriptions avoided. 95% of patients reported they would otherwise have visited their doctor and expected antibiotic therapy.	Level 4 – Emerging practice
Wang, 2003, USA <sup>34</sup>	PAC	Herpes Zoster (n=193)  nCP=3	Pharmacist promotion in community pharmacy of herpes zoster vaccine including press release, flyers, and personalised letters	Prospective intervention study with a pre/post design evaluating the effectiveness of CP-based intervention in increasing vaccination rates for herpes zoster vaccine.	Vaccination rates increased from 0.37% to 1.20% (p <0.001) during the intervention period.	Level 3 – Promising practice



			mailed to eligible patients.	<input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input type="checkbox"/> Costs		
Weidle <i>et al.</i> , 2014, USA <sup>35</sup>	EDET	HIV (n=1540 HIV tests)  nCP=18 [+1 retail clinic and 1 nurse-led HIV testing centre; 106 staff)	Point-of-care HIV testing on oral fluid, counselling services or referral provided by certified and trained pharmacy staff.	Pilot program to determine how to implement confidential HIV testing services. HIV tests required approximately 30 minutes per test.  <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers <input checked="" type="checkbox"/> Costs	24 positive results were identified (16 outcomes unknown, 5 false-positive, 2 positives on patients previously diagnosed with HIV and 1 confirmed new case of HIV).	Level 3 – Promising practice
West <i>et al.</i> , 2003, USA <sup>36</sup>	Self-management	Diabetes (n=30)  nCP=1 (1 pharmacist)	CP developed self-management training program.	Retrospective, non-experimental pre/post design pilot study. Initial assessment with 8 weekly group sessions and individual sessions if needed. Nurse, dietician,	Significant reduction in HbA1c ( $t=5.074$ , $p=0.0005$ ) and glucose levels (from mean (+SD) 260 +/-125 to 139 +/-52mg/dL; $t=4.58$ , $p=0.000$ ). Increased engagement in self-	Level 3 – Promising practice

				and physician formed the team.  <input checked="" type="checkbox"/> Enablers  <input checked="" type="checkbox"/> Barriers  <input checked="" type="checkbox"/> Costs	reported healthy behaviours (daily foot exam, daily glucose monitoring and 30 minutes of exercise daily). No significant change in BMI.	
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Level of evidence refers to categories as per Canadian Hierarchy of Promising Practices.<sup>10</sup>

, the study describes enablers, barriers or costs; , study does not describe enablers, barriers or costs; ACT, asthma control test; AMI, acute myocardial infarction; aRR, adjusted risk ratio; BMD, bone mineral density; BMI, body mass index; BP, blood pressure; CI, confidence interval; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; CPs, community pharmacies; CRP, C-reactive protein; CV, cardiovascular; CVD, CV disease; DBP, diastolic blood pressure; ED, emergency department; EDET, early detection and early treatment; GP, general practitioner; HF, heart failure; ICPC, integration and continuity of prevention and care; INR, International Normalised Ratio; K10, kessler psychological distress scale; LDL-C, low-density lipoprotein cholesterol; NCDs, non-communicable diseases; PAC, prevention across the continuum; RTIs, respiratory tract infections; SBP, systolic blood pressure; SMBG, self-monitoring of blood glucose; Tdap, tetanus, diphtheria and pertussis vaccine; URTI, upper respiratory tract infections.

### 3.5 DISCUSSION

The incidence and cost of both communicable and NCDs is rising.<sup>18,22</sup> The Australian healthcare system will not be able to continue to afford general practice-based intensive disease management for conditions such as diabetes, chronic obstructive pulmonary disease (COPD), asthma and mental illness; thus, there is a need for the development of innovate models of care.<sup>18,22</sup> On average, an Australian consumer visits their community pharmacy 12-14 times a year, compared with five to six visits a year to a doctor.<sup>37</sup> Community pharmacies are well distributed, often operating over extended hours and weekends, which provides a strong platform for service delivery.<sup>2</sup> It is also known that rural residents are less likely than urban residents to obtain preventative health services, and have longer travel distances to primary health services, highlighting that capitalising on existing accessible pharmacy services is paramount.<sup>28</sup> The findings from the studies included in this review provide a summary of potential opportunity for rural and remote community pharmacies to develop and expand service delivery for improved rural health outcomes.

#### Effectiveness

Measured effectiveness of interventions was not clearly reported in any studies; however, all articles reported some positive results. Vaccination interventions (n = 5) involving both screening consumers and administration of vaccinations in community pharmacies were evidently highly successful.<sup>21</sup> These interventions demonstrated high rates of immunisation provision in addition to educating populations about the importance of different vaccinations.<sup>14,19,21,32,34</sup> Influenza was the most common vaccination administered, but pneumococcal, herpes zoster, tetanus, hepatitis, and meningococcal vaccines were also administered.<sup>14,19,21,32,34</sup> None of the vaccination studies indicated that the vaccinations provided would not otherwise be provided at an alternative health setting; however, as a low-risk intervention with no major adverse effects reported, it appears to be a well-received intervention for community pharmacy.

Screening interventions were effective for a variety of disease states. Osteoporosis screening studies effectively identified 20-30% of participants with suboptimal bone density.<sup>17,28</sup> Similarly a COPD intervention identified 54% of participants at high risk of COPD.<sup>4</sup> Significant improvements in medication adherence, disease state knowledge and improved lifestyle were reported in interventions based on mental health, diabetes, and cardiovascular disease.<sup>6,7,12,16,20,22,25,27,29,30,36</sup>

## Enablers

The main themes representing enablers for successful interventions included convenient location, strong relationships between pharmacists and consumers and appropriate facilities. This is also reflected in other studies which show that community pharmacies in rural areas are easily accessible, convenient, and located where regular services, such as medication supply are already provided.<sup>15,36</sup> Some pharmacies also may provide facilities to manage sensitive health issues, including HIV testing. Visiting a community pharmacy is recognised as a socially innocuous act, which can assist to overcome barriers and stigma surrounding alternative healthcare settings (e.g. sexual health clinics).<sup>35</sup> Community pharmacies are also well positioned to engage with a large population for opportunistic screening and risk assessments for various disease states.<sup>35</sup>

McGuire *et al.*<sup>26</sup> indicated that existing relationships between patients and pharmacists, as well as between pharmacists and healthcare providers, has positively influenced intervention success.<sup>26</sup> Interventions are more easily implemented when they are delivered by someone well known to the target population.<sup>26</sup> Participant appreciation of the pharmacist-patient relationship and the value of being taken care of by pharmacists who are compassionate, knowledgeable and empowering was highlighted by Hamarneh *et al.*<sup>12</sup> as an important enabler. Many rural pharmacies have a long-standing attachment to the local community they serve, which facilitates successful interventions.<sup>26</sup> This connection enables pharmacists to easily communicate, share patient information and collaborate with other healthcare providers.<sup>12</sup> Interventions that involved regular referral or recommendations to general practitioners (GPs) enhanced pharmacist-GP relationships and promoted interprofessional collaboration.<sup>21</sup>

Pharmacists are highly skilled in patient counselling and already adhere to confidentiality standards at their practice sites.<sup>35</sup> In some studies pharmacy technicians, ancillary staff members and pharmacy students were involved in screening processes or service delivery to reduce demand on pharmacist time.<sup>25,29,32</sup> Interventions that have clearly documented procedures and guidelines were also effective, because the process for implementation was more easily streamlined into regular pharmacy practice.<sup>21</sup>

Functioning calibrated and low –cost or sponsored equipment were identified as major enablers. Point-of-care testing was used in many interventions and allowed pharmacists to test for malaria, osteoporosis, infectious diseases (HIV, upper respiratory tract infection), and parameters associated with diabetes and cardiovascular risk (blood pressure, HbA1c, lipid studies, International Normalised

Ratio).<sup>6,7,12,13,17,20,22,25,28-30,33,35,36,38</sup> Spirometry equipment was also used in asthma and COPD studies.<sup>4,5,15,18</sup>

### Barriers

Some of the studies included in this review highlighted many barriers to implementing successful interventions. Themes included financial considerations, time and space constraints, lack of patient acceptance and challenging collaboration with other health providers. None of the interventions determined profitability, and few described financial considerations.<sup>27,36</sup>

In some studies, there was limited privacy and no dedicated space to be able to perform services, and this affected the capacity to provide the service.<sup>26,27</sup> Pharmacist workflow demands made it difficult to spend uninterrupted time with patients, which also affected the ability of pharmacies to perform interventions.<sup>23,27,30</sup> Time required to perform the interventions varied from 4 to 45 minutes.<sup>23</sup>

Patient perceptions of pharmacists' scope of practice were also identified as barriers by Murphy *et al.*<sup>27</sup> and Rhodes *et al.*<sup>32</sup> Patients expected doctors to provide some services, such as diabetes management services, vaccinations and cancer screening referrals, rather than community pharmacists.<sup>27,32</sup> There was also resistance from other health professionals in two studies, particularly medical practitioners regarding pharmacists performing some tasks, such as vaccinating, providing referrals and information for cancer screening; however, when the services were described as providing access to medically underserved areas where doctor resources were non-existent, there was improved acceptance.<sup>21,26</sup> Pharmacists reported concern about jeopardising relationships with GPs when implementing vaccination services and recommending changes to antimicrobial prescribing; however, communication and effective collaboration with local healthcare providers reduced this resistance and improved collaborative care.<sup>21,23,27</sup> Difficulty in accessing patient information, including laboratory values from medical centres, was also identified as a barrier.<sup>22</sup>

In some studies, a lack of awareness from patients about the importance of a particular health factor (e.g. controlling blood pressure) resulted in a lack of willingness to participate in the intervention.<sup>30</sup> In a study of vaccination screening and administration, costs, inconvenience and lack of perceived benefit were the reasons provided for patients declining the recommended vaccinations.<sup>32</sup> In a study whereby pharmacists undertook video-conferenced training, technological difficulties, including

problems with internet connections and video-conference links, were also described.<sup>16</sup> In Australian vaccination services, the requirement for two pharmacists to be in the community pharmacy at the time of vaccine administration also proved limiting for very small pharmacies in rural areas.<sup>21</sup> This requirement was for the pilot study only, and no longer applies for vaccination services.

### Feasibility

It is challenging to compare the return on investment for these studies because few have reported financial considerations. Limited or no incentives, reimbursements or payments for services resounded with many of the interventions, and most interventions (excluding vaccination administration) were provided at no cost to patients.

In some American studies, the pharmacists were able to bill patients' private health insurers for the service, particularly if the intervention had been accredited by the required professional bodies.<sup>36</sup> Interestingly, in the study of Hattingh *et al.*<sup>21</sup> 17% of patients who would have been eligible for free vaccinations at their GP preferred to pay for the service at the community pharmacy due to convenience and saving on GP fees.

Training fees, advertising and promotion costs were identified as being an issue with successful implementation where no external funding was provided to support the interventions.<sup>21</sup> However, some pharmacies were able to capitalise on patient purchases and additional sales of products relating to specific diseases to justify the intervention expenses.<sup>36</sup>

Interestingly, in the studies of Krass *et al.*<sup>22</sup> and Murphy *et al.*,<sup>27</sup> intervention pharmacists were reimbursed AUD\$200 - \$495 per participant who completed the program and control pharmacists were reimbursed AUD\$22 per participant. The cost of AUD\$495 per participant is in line with the estimates for reimbursement for medication reviews per time required.<sup>27</sup> However, no additional funding was provided to the community pharmacy to implement or continue the service. Pharmacy assistants were encouraged to recruit participants in the study of Rhodes *et al.*,<sup>32</sup> and gift cards were provided to those who recruited the most participants. In the study of Madaras-Kelly *et al.*,<sup>23</sup> pharmacists were also reimbursed for their services, but no description of the value was included.

### Limitations of the Studies Included

Many of the articles included in this review were limited by study design and subsequent reporting, resulting in limited interpretation of the methodological quality. Overall, methodological limitations across the studies included small sample sizes, single sites, interventions occurring over short durations without follow-up, individual pilot studies, studies without any long-term impact or outcomes, studies without control groups and inadequate adjustment for potential confounders. In addition, it was recognised that pharmacies participating in these studies were likely to be more motivated and early adopters in implementing the services. Although many of these studies did not demonstrate strong research rigor, they provided insight into the potential scope for pharmacists to provide expanded services.

### Implications for Current Practice

The expansion of pharmacy practice in rural areas may address various aspects of health, and consequently may improve health outcomes for rural populations. Expanding vaccination services to include all vaccinations and all age groups in areas where GP:population ratios are low may positively affect disease prevention.<sup>21</sup> In addition, providing access to equipment (e.g. dual X-ray absorptiometry, spirometry and pathology services) will allow pharmacists to expand service delivery to include comprehensive disease state management and screening for illnesses including osteoporosis, asthma, COPD, diabetes and cardiovascular and kidney disease.<sup>4,17,33</sup> Further education and training for pharmacists to identify and support patients with mental illness may improve mental health for rural communities.<sup>16</sup> The development of sustainable models with appropriate training and remuneration may be the turning point for rural health delivery in Australia.

### Limitations of the systematic review

The findings of this review need to be considered in light of the following limitations. The review included studies from multiple countries, in which the pharmacist 'scope of practice' varies widely. Consequently, generalising the interventions to community pharmacies worldwide may be limited by national standards and legislation. Similarly, the characteristics of the rural localities are diverse, and thus application to rural areas broadly can be difficult. In addition, studies that may have been undertaken in rural and remote locations but not self-described as rural or remote will not have been captured using the present search strategy. Although the review used a broad search strategy, only articles published in journals or reports published in the included databases were located.

### 3.6 CONCLUSION

Pharmacists are known as medication experts, and the evidence for expanding their roles beyond supply and medicine management to include supporting health system navigation, disease screening, disease prevention through vaccination, collaboration with other healthcare providers and referral to appropriate healthcare professionals has been presented in this review. The need to develop remuneration models, training programs and evaluate legislative restrictions on pharmacists' 'scope of practice' is essential to progress the emergence of expanded pharmacy practice for rural areas.



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## Chapter 4 – Pharmacist Survey Research

This chapter is an original research article which provides insight into rural pharmacist perspectives of expanded services for rural community pharmacies and is published in the *Journal of Pharmacy Practice and Research*. The research was conducted by questionnaires completed by rural pharmacists and provides evidence of pharmacist support and expected improved health outcomes from expanded service delivery.

**Taylor S, Cairns A, Glass B. *Expanded Practice in Rural Community Pharmacy in Australia: Pharmacists' Perspectives*. J Pharm Pract Res. 2021;51 p43-53 [doi.org/10.1002/jppr.1688](https://doi.org/10.1002/jppr.1688)**

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

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Alice Cairns

Beverley Glass

*Permission obtained from JPPR for the inclusion of this published journal article.*

## 4.1 ABSTRACT

*Background:* Pharmacists internationally have successfully expanded their role to provide service delivery to remote rural communities.

*Aim:* This study evaluated Australian rural community pharmacists' perspectives of expanded services, to identify priorities, areas of concern, enablers, and barriers to their implementation.

*Method:* A self-administered questionnaire was distributed to rural and remote Australian (all states and territories) pharmacists between September and December 2019 and requested respondents to rank health issues and the expanded pharmacy services in their communities that could potentially address these issues. Questions were also included to evaluate health service accessibility, skills/knowledge, workspace limitations, time and support for the implementation of these services. Potential associations between demographic factors and responses were also assessed.

*Results:* Of the 92 returned responses analysed, the top three health concerns were; mental health, cardiovascular disease & diabetes. Depression screening/referral, diabetes management and vaccinations were the top 3 areas rated for expanded services. There was agreement (90%; 83/92) that pharmacists had the skills and knowledge for implementation, while time and space were reported as barriers for 50% (46/92) and 25% (23/92) of pharmacists respectively. Most of the pharmacists (80%; 74/92) felt services were not easily accessible, and (92/92, 100%) agreed that service provision would improve community health outcomes.

*Conclusion:* Rural pharmacists were supportive of the delivery of expanded pharmacy services, describing improved health outcomes and increased access to health services as potential benefits. Successful implementation of these expanded services would require both an understanding of pharmacist resources available and local community health needs.

## 4.2 INTRODUCTION

Exploring innovative ways to improve universal, accessible primary healthcare is essential in rural and remote Australia, which continues to be challenged by restricted access to basic health services.<sup>1,2</sup> People living in these communities have higher death rates, higher disease burden,, and lower levels of health literacy.<sup>3</sup> Access to health services is unequivocal compared to larger cities and towns, with patients needing to travel long distances or relocate to attend health services.<sup>3</sup> The

combination of poorer health and reduced accessibility of these services places a reliance on rural pharmacists, to provide healthcare advice, quality pharmacy services and ensure the safe use of medicines.<sup>4</sup>

Pharmacists are well recognised as medication experts with traditional roles that encompass the safe, effective, appropriate and judicious supply of medicines.<sup>5</sup> They are increasingly developing skills and knowledge to enable them to undertake expanded roles and improve patient outcomes.<sup>6</sup> In Australia, the Pharmaceutical Society of Australia has pledged that the profession aims to identify and unlock opportunities that realise the full potential of pharmacy practice within the healthcare team to improve health outcomes for all Australians.<sup>5</sup> This expansion has been described with terms including 'expanded practice', 'extended practice' and 'pharmacists working to their full scope of practice'.<sup>7-9</sup>

Internationally, rural pharmacists are achieving these outcomes by expanding their role in service delivery to address the health needs in rural locations including services such as disease screening, chronic disease clinics, and point-of-care testing.<sup>10</sup> Positive patient outcomes have been reported from the evaluation of these services. Outcomes reported have included a 20% reduction in cardiovascular risk; faster identification and management of infectious diseases including malaria, Human Immunodeficiency Virus (HIV), respiratory and urinary tract infections (RTIs, UTIs); and significantly improved management of chronic diseases including asthma, chronic obstructive pulmonary disease (COPD), cardiovascular disease, depression, and diabetes.<sup>10</sup>

Other health professionals, are reported to be largely supportive of expanded practice, except for some general practitioners (GPs).<sup>11</sup> GP reluctance to work collaboratively with pharmacists in expanded roles has also been reported in other studies.<sup>12,13</sup> However, more recently there has been a positive response to pharmacists working in both general practice and Aboriginal Community Controlled Health Services.<sup>14-16</sup>

Although expanded services are emerging in Australia and established internationally, there is limited information on the current rural pharmacy workforce perspectives of expanded pharmacy services and the drivers and limitations to providing such services in rural and remote settings. The aim of this study was to investigate rural and remote pharmacists' perspectives of community health issues and expanded service provision, in addition to examining the enablers and barriers to implementing these expanded services.



## 4.3 METHOD

### Study Design

This cross-sectional study involved a self-administered questionnaire which included basic demographic information, open and closed questions, comment boxes and Likert scale questions (see Appendix A for the full questionnaire).

The questionnaire asked pharmacists to rate from 1 (least important) to 10 (most important) health concerns in their community (Appendix A, Section A). They were then asked to identify from 26 examples (see Appendix A, Section B) of expanded services, the 10 most important expanded services needed in their community and rank them in order of importance from 1-10. The 26 listed proposed expanded services were derived from a systematic review of expanded pharmacy services in rural areas.<sup>10</sup> Participants were then asked if they strongly agree, agree, disagree, or strongly disagree to statements regarding pharmacist's skills and knowledge, accessibility of services, workspace availability, time capacity and support for the implementation of expanded services (Appendix A, Section C). Questions relating to remuneration for services (Appendix A, Section D), and enablers and barriers were also included (Appendix A, Section E). Nine rural pharmacists piloted the initial draft questionnaire, and the required changes were incorporated in the final questionnaire. Those pharmacists did not participate in the final questionnaire data collection. The questionnaire was delivered both online and paper-based and took approximately ten minutes to complete.

To assign a rurality assessment to the study, the Modified Monash Model (MMM) was applied. The MMM measures remoteness and population size on a scale of Modified Monash category MM1 to MM7.<sup>17</sup> The classification ranges from MM1 - a major metropolitan city to MM7 - a very remote location.<sup>17</sup>

### Questionnaire Administration

Rural and remote community pharmacists working outside of metropolitan and regional areas (Modified Monash regions MM3-7) were invited to participate via the multiple modes (online and paper) with snowball sampling methods employed to increase the sampling reach. Pharmacy organisations including Rural Pharmacy Network Australia, Rural Pharmacists Support Network, Services for Australian Rural and Remote Allied Health, Pharmaceutical Society of Australia Rural Pharmacy Forum, and James Cook University Alumni group distributed the invitation to participate

to their membership lists. In addition, a manually randomised mailed distribution of 220 rural community pharmacies (MM3-7) were invited to participate. The questionnaire was disseminated between September to December 2019.

### Data Analysis

Descriptive statistics were used to summarise participant characteristics and questionnaire responses. Frequency analyses were performed on the health concerns and expanded service data. Chi-squared tests was used to compare associations between rurality, years of pharmacy practice, years of age, gender, rural pharmacy practice and additional qualifications as dependant variables and major community health concerns, importance of specific expanded services, confidence and motivation to implement expanded services, and remuneration expectations were examined as independent variables. A significance level of 0.05 was used for statistical significance. Enablers and barriers were investigated with open-ended questions and were manually analysed using summative content analysis. Statistical analyses were performed using IBM SPSS Statistic 25.

### Ethics Approval

The James Cook University Human Research Ethics Committee granted ethical approval (H7845) (Appendix H).

## 4.4 RESULTS

A total of 101 rural pharmacists responded to the questionnaire, (74 electronic, 27 via mail). Nine responses were excluded from the analysis: eight were incomplete and one was from a MM1 location (metropolitan), resulting in 92 questionnaires being included in the final analysis. Demographic characteristics are summarised in Table 4-1. The mean age of the pharmacists was 37± 14 years. The mean number of years a pharmacist had been registered was 13 (SD= 12). Gender was evenly distributed between male and female. Fifty-five percent of the pharmacists had worked in rural practice for more than six years. Twenty-seven pharmacists had post-graduate qualifications including vaccination training (12), accreditation to perform medication management reviews (8), graduate certificate of diabetes education (3) and others such as degrees in business, pain management and wound management (13). Responses were received from pharmacists from MM4 (medium rural town) to MM7 (very remote community).

**Table 4-1:** Demographic data for participants (N=92)

Participant characteristics	Number (%)
Age	
- < 25 years	8 (9%)
- 25-35 years	46 (50%)
- 36-45 years	18 (20%)
- 46-55 years	9 (10%)
- 56+ years	11 (12%)
Gender	
- Male	43 (47%)
- Female	49 (53%)
Role	
- Employed Pharmacist	32 (35%)
- Intern Pharmacist	4 (4%)
- Locum Pharmacist	6 (7%)
- Managing Pharmacist	17 (19%)
- Owner Pharmacist	33 (36%)
Number of Years as a Registered Pharmacist	
- < 5 years	30 (33%)
- 6-10 years	21 (23%)
- 11-20 years	22 (24%)
- 21-40 years	15 (16%)
- 40+ years	4 (4%)
Number of years of rural pharmacy practice	
- < 1 years	8 (9%)
- 1-5 years	34 (37%)
- 6-10 years	14 (15%)
- 10+ years	36 (39%)
State	
- Queensland	37 (40%)
- New South Wales	19 (21%)
- Victoria	15 (16%)
- South Australia	7 (8%)
- Western Australia	6 (7%)
- Northern Territory	5 (5%)
- Tasmania	3 (3%)
-	
Modified Monash Categories	
- MM4 – Medium Rural Towns	15 (16%)
- MM5 – Small Rural Towns	42 (46%)
- MM6 – Remote Communities	27 (29%)
- MM7 – Very Remote Communities	8 (9%)

## Health Concerns for Rural Communities

Table 4-2 summarises the aggregated top ten local community health issues as reported by the pharmacists. Mental health was ranked as most important, while speech, language, and hearing deficits were ranked as least important.

Respondents were also provided a text box to describe any other health issues and responses included; all are valid health concerns (2), wound care (2), pregnancy/maternal health, pain management, geriatric medicine, chronic kidney disease, mobility, dermatological issues, alcohol and tobacco use.

**Table 4-2:** Health Concerns and Expanded Pharmacy Services (Ranked in Order of Importance (1 – Most Important))

<b>Health Concerns Ranked in Order of Importance</b>	<b>Rank</b>
Mental health (depression/anxiety/suicide)	1
Cardiovascular disease (hypertension/lipids)	2
Diabetes	3
Acute infections (UTIs/STDs/ear Infections)	4
Vaccinations	5
Respiratory disease (asthma/COPD)	6
Sleep apnoea	7
Osteoporosis	8
Stroke	9
Speech, language and hearing	10
<b>Most Highly Ranked Expanded Pharmacy Services</b>	<b>Rank</b>
Depression screening and referral	1
Diabetes testing and management clinic	2
Vaccinations for all age groups and all vaccinations	3
Asthma management clinic	4
Assessing suicide risk	5
Wound management clinic	6
Urinary tract infection testing	7
Facilitating telehealth with specialists	8
Providing counselling services	9
Cholesterol testing and management clinic	10

## Expanded Services for Rural Community Pharmacies

Pharmacists were asked to rank the ten most important expanded services from a list of 26. The ten services that were ranked the highest (in ranked order of importance) are listed in Table 4-2. The five

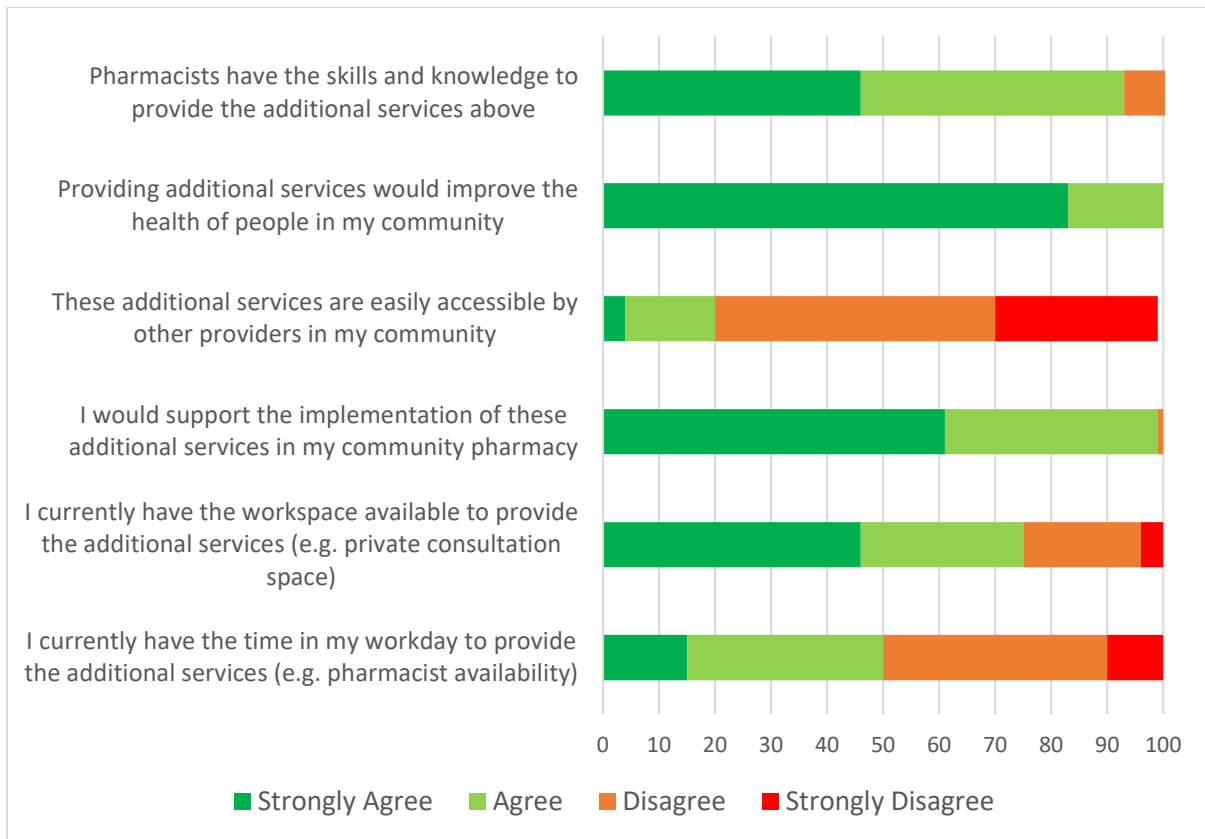
lowest ranked expanded services were; mouth examinations, hearing testing, swallowing screening assessments, speech and language screening and vision/eye examinations.

#### Pharmacists' support of and capacity to implement expanded services

Pharmacists were asked to indicate their response to the statements displayed in Figure 4-1 using a 4-point Likert scale (strongly agree/agree/disagree/strongly disagree). More than 90% (83/92) of participants agreed that pharmacists have the skills and knowledge to provide expanded services. All pharmacists agreed that the expanded services would improve the health of the people in their community and 80% (73/92) agreed that the services are not accessible from other providers in their community. Almost all (99% (91/92)) pharmacists were supportive of the implementation of the services in their community pharmacies. Pharmacists were divided in their perceived capacity to provide expanded services due to time and workspace availability.

Chi-squared tests were used to examine differences in responses for each of the statements listed in Figure 4-1 using the variables of age, gender, role, rurality, years of practice and years of rural practice.

There was a statistically significant difference ( $p=0.01$ ) based on remoteness in the proportion of respondents who strongly agreed with the statement 'These *additional* services are easily accessible by other providers in my community' MM5 (5/42, 11.9%), MM6 (3/27, 11.1%), MM7 (5/8, 62.5%). In other words, the more remote the pharmacist's location, the more they strongly agreed with the statement. No other significant response was identified for any of the other dependent variables tested.



**Figure 4-1: Pharmacists' support of expanded pharmacy services (N=92)**

Enablers and Barriers to Expanded Services

The final section of the questionnaire examined the enablers and barriers to expanded service provision. Pharmacists were provided a tick box question with three enablers and three barriers and an opened ended question which asked them to describe any other potential enablers and barriers. Improved job satisfaction (94% (86/92)), improved remuneration (83% (76/92)) and increased customer satisfaction (90% (83/92)) were all selected via tick box as enablers. Barriers (tick box) reported were inadequate knowledge (54% (50/92), competition with other providers (28% (26/92)) and expected lack of interest from consumers (26% (24/92)). Table 4-3 provides the summary of the data provided in free text boxes in response to open ended questions.

**Table 4-3: Enablers and Barriers to Expanded Services (N=92)**

Enablers:	Frequency of response (N = x)	Barriers:	Frequency of response (N = x)
Improved access to healthcare	6	Limited resources (staff, time, space)	21
Improved patient education, health awareness, health literacy and support	2	Inadequate remuneration (start-up costs, low participant numbers)	9
Take the burden off rural doctors	2	Resistance from GPs/GP associations and other health professionals	8
Improved health outcomes in the community	3	Consumers expecting 'free' services	6
		Cost and accessibility of training	2
Verbatim Quotes			
<p><b>Enablers:</b></p> <p>“Improved availability of services when there is no doctor appointments available for weeks”</p> <p>“To keep patients serviced and healthy due to a lack of full time GP in our community”</p> <p>“Improved equitable access to healthcare for the community”</p>		<p><b>Barriers:</b></p> <p>“Stepping on doctor’s toes in an extremely small community could damage the business so although they shouldn’t have the final say, if they aren’t in agreement, I think any expanded practice would fail”</p> <p>“Roadblocks from doctors – not understanding the training pharmacists have”</p> <p>“Resistance from GPs to expand the scope of practice of pharmacists”</p> <p>“Patients paying for services that they perceive as ‘free’”</p> <p>“Low-income area, patients may not be able to afford services, funding needed”</p>	

Remuneration for Expanded Services

A multiple-choice question asked pharmacists to indicate the remuneration required (\$AUD) for the expanded services to be viable, if there were not equipment costs or expenses. The responses were provided in a value per hour of service delivery. The results from this question were <\$20 per hour (7% (6/92)), \$20-29 (14% (13/92)), \$30-50 (52% (48/92)) and \$50+ (27% (25/92)).

## 4.5 DISCUSSION

Rural community pharmacists are highly qualified and skilled health professionals working in areas with limited health providers and services.<sup>10</sup> These pharmacists are accustomed to the complexity of rural health and the difficulties of health provision in remote locations. Expanding rural pharmacy services to allow pharmacists to work to their full scope of practice has been proposed as a mechanism to improve health outcomes for rural and remote communities.<sup>18</sup> More extensive utilisation of the professional training, skills, and knowledge of rural community pharmacists to compensate for the limited support from other health professionals has been provided as a pathway to improve equity in healthcare for rural and remote areas.<sup>18</sup>

### Health Concerns for Rural Communities

Mental health (depression, anxiety, and suicide) was the most highly ranked health concern. Unsurprisingly, the most highly ranked expanded service aspiration was depression screening and referral. Although the rates of mental illness in rural and remote areas are reported to be similar to that of major cities, access to mental health services is limited.<sup>19</sup> Tragically, mortality from suicide and rates of self-harm increase with remoteness and is almost double the rate of that reported in major cities.<sup>19</sup> Pharmacist provision of a mental health service to assist with identification and referral processes, including the utilisation of telehealth services in cases where face-to-face appointments with clinicians is not possible, is an opportunity to support greater access to mental health services in rural and remote areas. Crockett *et al.* reported improved medication adherence and significant improvement in K10 scores (with K10 being the measure of psychological wellbeing used in the study) from a service whereby pharmacists were trained to provide extra advice and written resources when dispensing medications for the management of depression.<sup>20</sup>

Cardiovascular disease (hypertension/dyslipidaemia) was the second most highly ranked health concern, although cholesterol management was only rated the tenth most aspired to, expanded service. The lower ranking of cholesterol management may be due to the service being considered “routine” practice for many community pharmacies and general practices.

Diabetes was the third most highly ranked health concern and the second most highly ranked aspiration for expanded service. In a study of rural GPs’ knowledge, attitudes, and practices towards diabetes management, it was reported that almost half (n=87, 45.5%) of the GPs’ self-reported learning needs related to pharmacological management.<sup>21</sup> This highlights a potential window of



opportunity for a collaborative expanded model of service delivery for diabetes. A multidisciplinary approach that includes pharmacists in the management of diabetes has been trialled in the United States of America (USA), whereby an 8-week program was managed as a team, involving a nurse, dietician, and GP.<sup>22</sup> The trial, although small (N=30), demonstrated a significant reduction in HbA1c ( $p=0.0005$ ) and increased engagement in self-reported health behaviours.<sup>22</sup>

#### Pharmacists' support of and capacity to implement expanded services

A study of American community pharmacists aimed to gauge pharmacists demand to participate in the provision of expanded primary health services in the community.<sup>23</sup> The study found that pharmacists were four times more likely to change their employment to one that provided expanded services and this willingness to change was higher if pharmacists worked in rural areas.<sup>23</sup>

Pharmacists participating in our study also had a high level of interest in providing expanded services with more than 90% of respondents agreeing that they would support expanded services in their community, that the services would improve the health of the people in the community and that they have the skills and knowledge to provide these services. This overwhelmingly positive response reflects a willingness from participants to move forward with the design and development of expanded services.

The expanded services proposed in the survey were not currently easily accessible within their community. This belief by rural and remote pharmacists is congruent with what is known about access (or lack of) to health services in rural and particularly remote areas.<sup>3</sup> Pharmacies present a unique health space which is widely accessible, even in rural and remote locations. As 70% of people in regional areas are located within 2.5 kilometres from a pharmacy, the accessibility of services able to be provided by community pharmacies is advantageous.<sup>24</sup>

#### Enablers and Barriers for Expanded Services

The majority (>80%) of pharmacists in this study reported that providing expanded services would be enabled by improved job satisfaction, improved remuneration and increased customer satisfaction. Perceived improved patient outcomes and increased access to health services were also commonly reported drivers for considering the implementation of expanded practice. Barriers frequently identified included resource issues such as pharmacy staff, time, and workspace. Interestingly, half of the participants chose inadequate knowledge as a potential barrier, though 90% reported confidence in their skills and knowledge to provide expanded services. It is unknown

whether the expected barrier of inadequate knowledge was a reflection on the pharmacy profession broadly, rather than individual competence or an example of unconscious incompetence. Further investigation into this would provide further insight and be useful in considering training requirements for pharmacists for future expanded services.

Expected resistance from GPs and other health providers was also described. A lack of GP support was also a reported barrier in a pilot study of a chronic disease management program in rural Australia, whereby inadequate collaboration with GPs in addition to program costs and insufficient staff levels made sustainability of the intervention unlikely.<sup>25</sup> Improved pharmacist job satisfaction and good patient acceptance reported as enablers concurs with the findings of this study.<sup>25</sup>

Service viability was also described as a barrier, with concerns that patients would either not be willing or able to pay for services or that they would expect the services to be provided free of cost. Pharmacists have traditionally provided free advice and service and thus a shift to a pay-per-service model is a barrier to be considered. Interestingly in a study of an influenza vaccine service in England, of 89,011 people who chose to pay privately to receive their vaccine, 22% were eligible to receive their vaccination at their GPs free of cost.<sup>26</sup> They chose however to pay at a community pharmacy due to accessibility, convenience, and a preference for the pharmacy environment.<sup>26</sup> This indicates a willingness of consumers to pay for expanded community pharmacy services if they perceive value in the service and convenience of use.

#### Remuneration for Expanded Services

There are no current funding models available for rural expanded pharmacy services. When asked to indicate the required remuneration, a value of AUD\$30-50 per hour was chosen by half of the pharmacists in this study. Although there is no nominal value of a standard pharmacist service fee for comparison, pharmacists earn on average \$30 per hour.<sup>27</sup> Professional pharmacy programs currently provided in Australia including MedsCheck and Diabetes MedsCheck services are remunerated at AUD\$65 and AUD\$98 respectively.<sup>28</sup> These programs are funded on a per service provided model rather than per hour of time, thus making comparison difficult.<sup>28</sup> A performance based pharmacy payment model to remunerate pharmacists for their service in addition to dispensing medication has also been proposed.<sup>29</sup> Remuneration issues are therefore an important consideration when developing expanded services to ensure any new services are financially viable and sustainable into the future.

## Study Limitations

This study was conducted in rural or remote locations with a large proportion of the respondents from Queensland. The survey design had inherent limitations including response bias and a limited depth of information. Future qualitative studies would be useful to provide an in-depth understanding of expanded pharmacy services. In addition, due to the multiple methods of recruitment utilised an overall response rate to the questionnaire was not able to be provided.

## 4.6 CONCLUSION

Rural pharmacists have demonstrated a high level of support for expanded practice with expected outcomes that improve the health and wellbeing of rural and remote people. As with any new health service barriers are expected, however all the services proposed in this study have been trialled or are provided in other countries, thus providing a platform for the Australian pharmacy profession. It is expected that further work at both a local community needs level and at a national policy level, in addition to further development of inter-disciplinary collaborative patient-centred care is needed for expanded practice to be successfully introduced into rural Australia. This study, however, provides valuable information to be considered in the design and development of expanded pharmacy services in rural and remote practice.

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## Chapter 5 – Consumer Survey Research

This chapter is an original research article which provides insight into rural consumer perspectives of expanded services for rural community pharmacies. It is published in the journal *Research and Social Administrative Pharmacy*. The research was conducted by questionnaires completed by rural consumers and provides evidence of consumer support for expanded practice.

**Taylor S, Cairns A, Glass B. *Consumer Perspectives of Expanded Practice in Rural Community Pharmacy*. Res Social Ad Pharmacy. 2019;49(6) p585-600 doi:10.1002/jppr.1619**

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

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*Permission obtained from RSA for the inclusion of this published journal article.*



## 5.1 ABSTRACT

*Background:* People living in rural and remote regions have mortality and morbidity rates worse than their counterparts in metropolitan cities. Distance to access healthcare and limited access to health professionals highlights the need for expanded pharmacy services to address the health disparity facing rural and remote Australia.

*Objectives:* Examining consumers' perspective of expanded pharmacy services with a view to improving the health of their local community is a focus of the study.

*Methods:* A questionnaire was provided to 20 rural and remote community pharmacies across Australia, to be administered to pharmacy consumers during July-September 2019. The questionnaire involved consumers choosing expanded services that they would like to see provided by their local pharmacy. The data were manually entered, exported into IBM SPSS Statistic 25, and summarised using descriptive statistics.

*Results:* 406 consumers from rural and remote locations completed the questionnaire. Vaccinations, chronic disease management and mental health services represented eight out of the ten most frequently chosen services. Over 95% of respondents agreed or strongly agreed that they would support the expanded services and that pharmacists have the required skills and knowledge to deliver these services. Findings indicated that the remote and very remote participants chose all of the 26 services more frequently than those in large and medium towns. Age also significantly influenced the frequency of choosing services, including osteoporosis testing, vision and eye checks, counselling services, swallowing checks, diet checks and breastfeeding advice and support.

*Conclusion:* This study demonstrates that consumers believe that the health of the people in their community will improve with the provision of expanded services. These preliminary findings provide useful baseline information suggesting the development of expanded pharmacy services in rural and remote communities is likely to be well accepted by consumers.

*Additional keywords:* extended practice, scope of practice, pharmacy practice, remote, pharmacies, models of care

## 5.2 INTRODUCTION

Higher death rates and poorer health outcomes are a harsh reality for Australians living in rural and remote areas, compared to those living in major cities.<sup>1</sup> Distances to health services are vast and access to specialists is limited with workforce shortages and maldistribution of healthcare providers contributing to these poor health outcomes.<sup>1-3</sup> In the rural or remote setting medication supply is complex and may be provided by nurses, doctors, Aboriginal Health Workers, or pharmacists working within hospitals, primary healthcare clinics or community pharmacies.<sup>4</sup> Rural community pharmacies are ideally placed to provide a variety of services, including disease screening and management, vaccinations and health promotion.<sup>5</sup> These pharmacists already provide regular services to a range of individuals in both good and poor health, particularly to those who may not have regular contact with other health professionals.<sup>6</sup> Despite successful international models, there are limited programs in Australia to support rural pharmacies to expand service delivery to reduce the health disparity in these regions.<sup>7</sup> Understanding pharmacy consumers' views and perspectives regarding expanded pharmacy services is therefore essential to inform improved and innovative health service delivery in Australia.

Expanded pharmacy practice has been described as a distinct knowledge and skill base that is in addition to the recognised scope of the pharmacy profession.<sup>8</sup> The term expanded pharmacy services has also been aligned with reference to pharmacists working to their 'full' or 'enhanced' scope of practice.<sup>9</sup> Thus, it may be applied to pharmacists undertaking activities usually provided by other health professionals e.g., doctors, nurses, and allied health professionals.<sup>8</sup>

Primary healthcare is pivotal to addressing Australia's health needs related to both acute and chronic disease.<sup>10</sup> Community pharmacists are one of the most frequently consulted health professionals and are often a first-contact primary health provider, particularly in rural areas.<sup>11,12</sup> In Australia, traditional pharmacist roles include dispensing medications, providing advice and primary care.<sup>13</sup> More recently, community pharmacists have been involved in a variety of service-based programs, including MedsCheck<sup>13</sup> (medication review program), Diabetes MedsCheck<sup>13</sup> (diabetes management program), smoking cessation, lipid management, emergency contraception supply and immunisation.<sup>11,12,14,15</sup> These models of service delivery have become part of regular practice and their inclusion into community pharmacy practice has highlighted pharmacists' knowledge, skills and motivation to extend their practice and service delivery.

In a study of rural Western Australian pharmacy consumers Sunderland *et al.*<sup>12</sup> reported that 88% of those consumers (N=483) had not discussed diet or exercise and 65% had never discussed preventing health problems with their pharmacist. In another study by Um *et al.*<sup>10</sup>, consumers described multiple barriers to pharmacists providing an expanded weight management service, including a perceived lack of time, expertise, and available space. While these two studies have highlighted that rural community pharmacy is underutilised, Wirth *et al.*<sup>16</sup> have provided a positive perspective from a survey of pharmacy consumers (N=824) conducted in Malta relating to pharmacists expanding their service delivery to include liaising with primary and secondary healthcare physicians (91%) and the provision of diagnostic testing (87%).

Internationally, rural community pharmacies are trialling and providing expanded services including disease screening, chronic disease clinics and point-of-care testing with the United States of America leading the change.<sup>7</sup> These models identified by a systematic review conducted by Taylor, Cairns and Glass, although innovative, have limited evidence for effectiveness, sustainability and feasibility.<sup>7</sup> However, they highlight the potential role of pharmacists to provide services including management clinics for chronic diseases (asthma, diabetes, respiratory conditions and depression), screening for chronic diseases (cardiovascular disease, osteoporosis and cancer), and point-of-care testing for diseases (malaria, Human Immunodeficiency Virus (HIV)).<sup>7</sup>

As expanded practice is emerging for pharmacy in Australia, there is limited relevant literature particularly on the perspectives of rural and remote consumers. However, it is essential to understand consumer perspectives to effectively design and develop successful models of expanded practice. Therefore, the aim of this study was to investigate consumer perspectives of expanded pharmacy services in the rural and remote Australian community pharmacy context. This study provides first insight into consumer perspectives and may be utilised to guide the development of future models of expanded pharmacy practice.

## 5.3 METHODS

### Study Design

A descriptive cross-sectional survey was used. A quantitative approach involved the design of a questionnaire, which involved consumers indicating via tick-box, from a choice of 26 services that they would like to see provided by their local pharmacy, multiple-choice questions relating to willingness to pay for services and four-point Likert scale statements about pharmacists providing

these services. The four-point scale was used as a neutral response would provide no useful information for this study. The 26 services included were developed from the service models identified in the systematic review of expanded practice in rural community pharmacy.<sup>7</sup> Twelve rural consumers piloted an initial draft questionnaire with the required minor language changes incorporated into the final questionnaire design. The questionnaire is included as Appendix B.

### Questionnaire Administration

Pharmacies were invited to participate via the Rural Pharmacy Support Network Australia membership list. The Rural Pharmacy Network Australia is a staff group of the Australian Rural Health Education Network which supports pharmacists, pharmacy interns and pharmacy students throughout regional, rural, and remote Australia.<sup>17</sup> Invitation for the pharmacies to participate was provided only once, due to the timely acceptance by 20 pharmacies. Three pharmacies, which withdrew from the study due to staffing changes, were replaced by three new pharmacies, who had expressed interest in participating. Each pharmacy was provided 100 printed paper questionnaires. Questionnaires were returned twice at two-week intervals, for four weeks. A response rate record was to be kept by the pharmacies. In addition to the paper questionnaire, one pharmacy provided an online link to consumers via their Facebook page.

### Study Sites

Twenty pharmacies initially agreed to participate in the study representing all states and the Northern Territory of Australia. To assign rurality in this study, the Modified Monash Model has been applied. The model measures remoteness and population size on a scale of Modified Monash category MM1 to MM7.<sup>18</sup> MM1 is classified as a major metropolitan city and MM7 is a very remote location.<sup>18</sup> MM1 category – Metropolitan Area pharmacies and MM2 category – Regional Centre pharmacies were excluded from the study.

### Study Participants

Pharmacy staff members administered the questionnaire to pharmacy consumers during July-September 2019. Consumers over the age of 18 who were independently able to complete the questionnaire in English were invited to participate. Those who were unable to complete the questionnaire (illness, language etc) or under the age of 18 were excluded from the study. Convenient sampling was applied whereby participants were approached by pharmacy staff during

various times of the day and week of normal operating hours throughout the duration of the study. Participants were provided a paper questionnaire to complete and return. An accurate response rate was not able to be maintained by the pharmacies however they reported that consumers were generally interested to participate. The online questionnaire was provided via a link for participants to independently complete. The questionnaire took approximately five minutes to complete, and no incentives were provided.

### Sample Size

Sample size was calculated using estimates of the number of pharmacy consumers. The size of the pharmacies, varied significantly, from daily consumer numbers of 20-250 per pharmacy. Given this broad range using an estimate of 120 consumers per day per pharmacy for a 4-week period (data collection period) for 20 community pharmacies the population size was estimated to be 56000. With an alpha level of 0.05, a power of 90% and a margin of error of 5%, the calculated sample size required is 382.

### Data Analysis

The data from the questionnaires were manually entered into Microsoft® Office Excel with the resulting data set then exported into IBM SPSS Statistic 25 and summarised using descriptive statistics. The data was entered by the primary author and checked by a second researcher. Online responses were collected using an online survey tool, which was imported for inclusion in the analysis. Multiple response questions were coded yes or no for each response i.e., the multiple dichotomy method. Frequency analyses were performed on the demographic data to determine the demographic profiles of the participants. To examine associations between relevant variables, one-way ANOVA tests with post-hoc Tukey HSD tests were conducted, with significance set at <0.05 for all analyses.

### Ethics Approval

James Cook University Human Research Ethics Committee granted ethical approval (H7845) (Appendix H).

## 5.4 RESULTS

A total of 450 questionnaires were returned. Forty-four (44) questionnaires were excluded from the analysis, 27 were incomplete and 17 were excluded as the consumer home postcode was in MM1 or 2 (metropolitan). Questions completed by 406 consumers were therefore included in the final analysis. One pharmacy provided an online link to consumers via their Facebook page and 37 responses were obtained online.

Pharmacies included in the results of this study represented Queensland, Victoria, New South Wales, Western Australia, and Tasmania. Pharmacies representing South Australia and the Northern Territory withdrew from the study and did not return any data. Of the 15 pharmacies who returned completed questionnaires, four were in the MM category 3-4, ten in MM5-6 and one in MM7.

Approximately one-third of respondents were men and two-thirds were women. The mean age of the participants was 48.1 years (SD = 18), with an age range from 18-98 years. A summary of the demographic data is provided in Table 5-1.

**Table 5-1:** Demographic data for consumer survey participants (N =406)

Participant characteristics	Number (%)
Age	
- < 25 years	48 (12%)
- 25-35 years	83 (21%)
- 36-45 years	54 (13%)
- 46-55 years	54 (13%)
- 56+ years	167 (41%)
Gender	
- Male	131 (32%)
- Female	274 (68%)
- Other	1
MMM Categories	
- MM3 – Large Rural Towns	33 (8%)
- MM4 – Medium Rural Towns	48 (12%)
- MM5 – Small Rural Towns	130 (32%)
- MM6 – Remote Communities	172 (42%)
- MM7 – Very Remote Communities	23 (6%)
State	
- QLD	239 (59%)
- NSW	120 (30%)
- VIC	15 (4%)
- WA	13 (3%)
- TAS	19 (5%)

(QLD – Queensland, NSW – New South Wales, VIC – Victoria, WA – Western Australia, TAS – Tasmania)

#### Consumers' perspective of expanded pharmacy services

Consumers were asked to choose which expanded services they felt their community pharmacy should provide to improve the health needs of their community. Eighteen respondents selected all of the twenty-six suggested services and forty chose more than twenty services. Approximately 20% of the participants selected greater than 50% of the services and only 8% of the consumers selected fewer than three services. The top ten most frequently selected services were chosen by > 40% of the consumers and are listed in Table 5-2. Vaccinations, chronic disease management and mental health services represented eight out of the ten most frequently chosen services. In contrast, speech pathology services were the least frequently selected services by less than 15% of respondents. The questionnaire allowed respondents to describe any other additional services they desired in a free text box. Three participants each suggested pathology services and skin assessments. Other

suggested services included *allergy services, body fat analysis, hands on services, anything that helps a person’s health and post-natal information, care, and advice.*

**Table 5-2:** Community Pharmacy Expanded Services Rated by Consumer Preference

Top 10 Expanded Services	Response Rate N =X (%)	Bottom 10 Expanded Services	Response Rate N =X (%)
Vaccinations for all age groups	229 (56%)	Speech and language tests	57 (14%)
Diabetes checks and clinic	211 (52%)	Swallowing checks	61 (15%)
Wound care clinic	199 (49%)	Telehealth/On-TV screen appointments	71 (18%)
Depression/Mental Health tests	196 (48%)	Mouth checks	87 (21%)
Asthma clinic	185 (46%)	Exercise tests and advice	91 (22%)
Heart checks and advice	184 (45%)	COPD breathing tests	102 (25%)
Hearing tests	170 (42%)	Counselling services	107 (26%)
Suicide Prevention	172 (42%)	Sexually transmitted disease (STDs) tests	109 (27%)
Cholesterol tests and advice	167 (41%)	Bone tests (Osteoporosis)	120 (30%)
Sleep tests and advice	162 (40%)	Foot checks	121 (30%)

When considering the age variable, there is a difference in the mean number of expanded services chosen between the four age groups (<25 years, 25-35 years, 36-55 years, 55+ years),  $F = 3.044$ ,  $p < 0.05$ . Post-hoc tests with Tukey analysis indicated that mean number of expanded services chosen is significantly higher in the >55-year-old age group ( $M=10.02$ ,  $SD=7.135$ ) compared with <25 year old age group ( $M=7.25$ ,  $SD=5.114$ ),  $p < 0.05$ . There was no difference in mean number of expanded practice services chosen for the other groups.

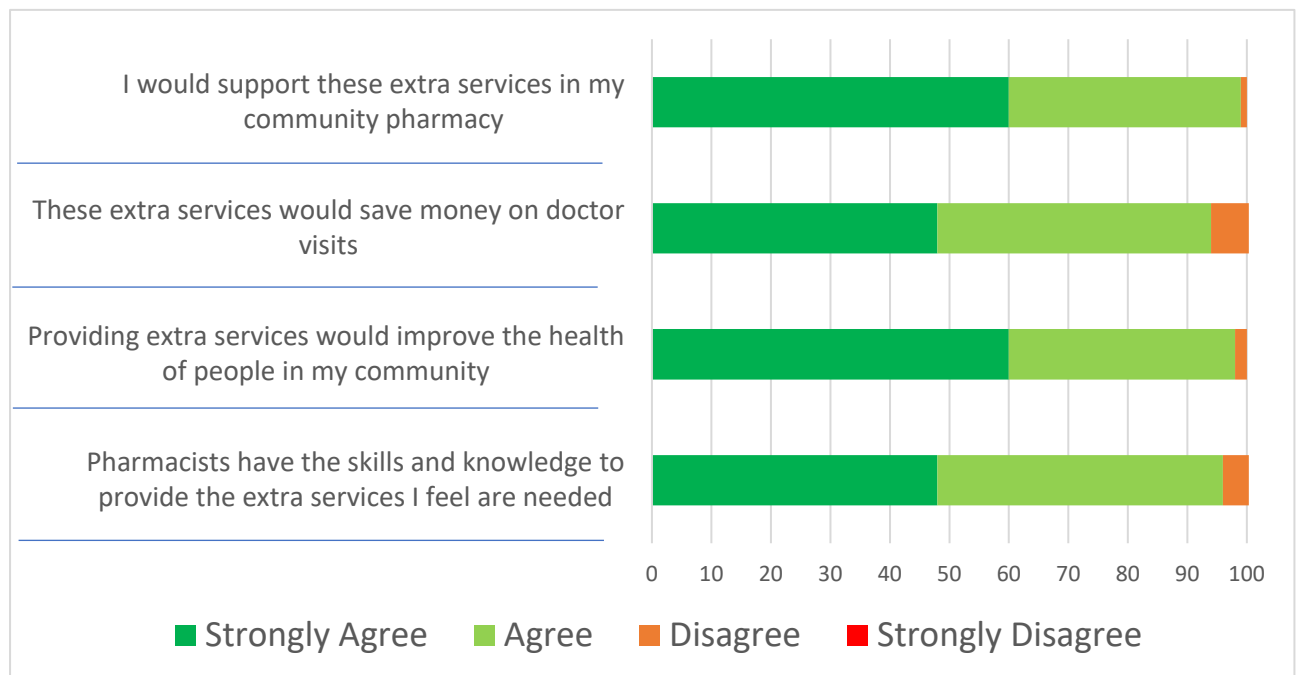
There is also a difference in the mean number of expanded services chosen between the three rurality categories (MM3-4, MM5, MM6-7),  $F = 9.668$ ,  $p < 0.05$ . Post-hoc tests with Tukey analysis indicated that mean number of expanded services chosen is significantly higher in the MM5 ( $M=9.98$ ,  $SD=6.632$ ) and MM6-7 group ( $M=9.54$ ,  $SD=6.795$ ) compared with MM3 group ( $M=6.31$ ,  $SD=4.170$ ),  $p < 0.05$ . There was no difference in mean number of expanded practice services chosen between the MM5 and MM6-7 groups. There was also no significant difference the number of expanded services chosen between male and female participants.

Consumers’ support and acceptability of expanded pharmacy services

Figure 5-1 represents the consumer responses to four statements using a 4-point Likert scale. Ninety-six percent of the participants agreed or strongly agreed that they would support the expanded services in their community pharmacies, while ninety-eight percent agreed or strongly



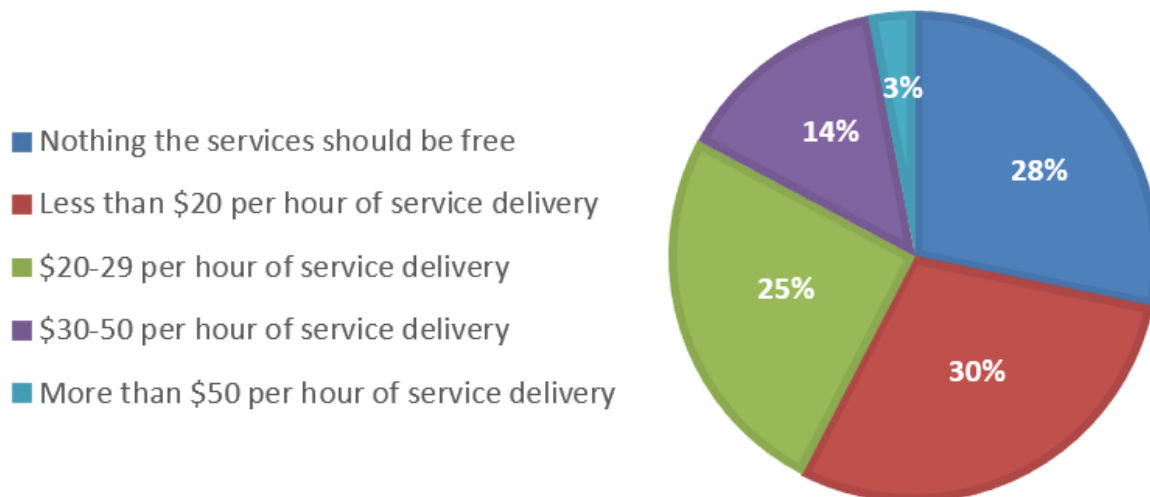
agreed that these services would save money on doctor visits. Ninety-four percent of participants agreed or strongly agreed that the provision of these expanded services would improve the health of the people in their community and 96% agreed or strongly agreed that pharmacists have the skills and knowledge to provide the suggested services.



**Figure 5-1:** Consumer responses to support for expanded service statements

Consumers’ willingness to pay for expanded pharmacy services

Consumers were asked to indicate their willingness to pay for the suggested services, provided with five options. Approximately one-third of the participants thought the services should be provided at no cost to the consumers, one-third were willing to pay less than \$20 per hour of service delivery and 3% of the participants were willing to pay more than \$50 per hour of service [Figure 5-2]. Although not asked specifically some consumers had included comments on the paper questionnaire stating that *the services should be free for Pensioners and Indigenous patients and other people should pay for the service.*



**Figure 5-2:** Consumers’ willingness to pay for expanded pharmacy services

When comparing willingness to pay across variables of gender, age and rurality, males were less willing to pay and less willing to pay more,  $p < 0.05$ , with 37% of males expecting that the services be provided at no cost compared to females (24%) and only 12% of males were willing to pay more than \$30/hour for services compared to females (20%). However, age and rurality had no statistically significant influence on participants’ willingness to pay for services.

One-way ANOVA tests were performed to examine the difference in the types of services chosen by age group, gender and rurality. There was no significant difference in the types of services chosen between male and female participants. Table 5-3 indicates where there was a statistically significant difference in the frequency of preference for these services between the four age groups.

Approximately one-third of the older age group (55+ years) chose services that commonly manage ailments of older people including osteoporosis, vision/eye checks and swallowing checks. Table 5-4 indicates the frequency of preference of the services across the three rurality categories and demonstrated that the remote and very remote participants (MM6-7) chose each of the 26 services more frequently than the participants in large and medium towns (MM3-4). This difference was notable with approximately 70% of respondents living in remote or very remote locations (MM6-7) choosing each service compared with less than 10% who live in large and medium towns (MM3-4).

**Table 5-3:** Influence of age on consumers preferred expanded pharmacy services

	<25 years	25-35	36-55	55+	X <sup>2</sup> – value Df=3
Osteoporosis	15%	25%	28.3%	31.7%	6.95
Vision/Eye checks	14.1%	28.9%	24.2%	32.8%	7.50
Counselling services	12.1%	25.2%	30.8%	31.8%	3.89
Swallowing checks	13.1%	27.9%	31.1%	27.9%	4.39
Diet checks and advice	14.4%	24.4%	26.9%	34.4%	6.154
Breastfeeding advice and support	12.1%	25%	29.5%	33.3%	3.860

\* P &lt;0.05

**Table 5-4:** Influence of rurality on consumers preferred expanded pharmacy services.

	MM3-4	MM5	MM6-7	X <sup>2</sup> – value Df=2
Osteoporosis Testing	3.3%	22.5%	74.2%	51.68
Asthma Clinic	7.6%	23.8%	68.6%	61.44
Depression/Mental Health Tests	10.7%	27.6%	61.7%	33.11
Hearing tests	4.7%	21.2%	74.1%	82.94
COPD breathing tests	3.9%	11.8%	84.3%	61.88
Vaccinations	9.2%	26.2%	64.6%	65.36
Diabetes checks and clinic	7.1%	22.3%	70.6%	91.53
Speech and Language tests	1.8%	10.5%	87.7%	36.88
Urinary tract infection testing	4.6%	18.4%	77%	79.11
Cholesterol tests and advice	6%	24.6%	69.5%	58.99
Heart checks and advice	5.4%	20.1%	74.5%	93.63
Mouth checks	1.1%	11.5%	87.4%	62.10
Vision/Eye Checks	5.5%	14.1%	80.5%	68.31
Wound care clinic	6.0%	22.1%	71.9%	92.33
Sexually transmitted disease testing	3.7%	14.7%	81.7%	61.60
Foot checks	4.1%	21.5%	74.4%	50.88

Counselling services	8.4%	18.7%	72.9%	31.97
Swallowing tests	0%	4.9%	95.1%	53.50
Diet checks and advice	7.5%	19.4%	73.1%	61.79
Sleep tests and advice	4.3%	16.0%	79.6%	99.81
Exercise tests and advice	3.3%	14.3%	82.4%	50.77
Ear checks	8.9%	16.5%	74.7%	61.17
Breastfeeding advice and support	2.3%	20.5%	77.3%	71.48
Suicide prevention	5.8%	25.6%	68.6%	59.69
Drug and alcohol testing	2.9%	23.2%	73.9%	63.97
Telehealth/On-TV screen appointments	4.2%	9.9%	85.9%	41.05

\* P <0.05

## 5.5 DISCUSSION

Rural Australian consumers' perspectives of expanded pharmacy services is an area that is not well represented in the literature. Globally, pharmacists are providing various expanded services, however in Australia, the provision of these services in community pharmacies is limited and importantly models of delivery have not been developed specifically for rural practice.<sup>7</sup> This study has demonstrated the rural and remote context that resonates with the work undertaken by the Pharmaceutical Society of Australia to examine pharmacy consumer perspectives, where over 1000 consumers indicated a desire for greater specialisation and increased pharmacy services from the pharmacy profession.<sup>19</sup>

When comparing variables in the data, differences were identified across age, gender, and rurality categories. The age group >55 years selected more services than the <25 year age group which aligns with the expected health needs of these population groups.<sup>20</sup> Similarly, those living in remote and very remote locations selected significantly more services than those closer to metropolitan cities, which is potentially a reflection of lack of health professionals and services available in those areas. Gender made no difference to the number of services selected, however did significantly influence consumers' willingness to pay for services.

### Consumers' perspective of expanded pharmacy services

The results of our study clearly demonstrate strong consumer support for expanded pharmacy services. Services addressing chronic disease management including diabetes, heart disease and respiratory disease were frequently chosen by consumers, as services they felt would benefit their community. Desire for mental health services was also strongly represented, with 45% of Australians expected to experience a mental health illness.<sup>21</sup> Additionally, with 50% of consumers expected to develop a chronic disease, the need expressed is undoubtedly aligned with the current or expected health needs.<sup>22</sup>

Significant differences between the number of services selected and the number of participants who chose each service were identified between rural categories MM3-4 compared with MM6-7. Those living in remote and very remote communities (MM6-7) chose significantly more services indicating that this population group is more interested in expanded service delivery from community pharmacy as alternative services (e.g., allied health services) may not be easily available for them. Not surprisingly, services targeted at older people including osteoporosis screening, vision and eye checks and swallowing checks were chosen more frequently by the older participant group (55+ years). However, diseases that predominately affect younger people including sexually transmitted diseases and drug and alcohol testing did not have a higher response rate in the younger age groups.

Although this study did not elicit whether any of the proposed services were already being provided by the participating pharmacies, knowledge about consumer awareness of pharmacy services could be useful when applying the evidence to developing models of service. In a systematic review on expanded services conducted in the United Kingdom, it was identified that consumers were unaware that these services were being provided and this contributed to their lack of utilisation.<sup>23</sup> The review also identified a lack of strategies that could effectively promote pharmacy services.<sup>23</sup>

### Consumers' support and acceptability of expanded pharmacy services

Although there are no similar studies on rural Australian consumers' perspectives on expanded services, some comparisons can be made with studies conducted in metropolitan areas. In the study by Um *et al.* on a weight management service in community pharmacy, fifty percent of the participants expected this service to be provided at no cost, compared to the 28% of participants in our study.<sup>10</sup> This may also indicate that consumers place a higher value on services that may be considered more critical than weight management and further investigation into willingness to pay

for specific expanded services may be useful. This disparity may also be representative of the location of the studies, whereby metropolitan consumers may have access to other weight loss providers and thus see pharmacies only as providers of products, which are purchased. In addition, the obesity crisis that affects 63% of Australians may be a reason why consumers expect weight loss services be provided at no cost.<sup>20</sup>

In the study by Wirth *et al.* to determine the consumer perception of community pharmacy services and expanded professional services in Malta, it was reported that diagnostic testing was rated as important for 87% of respondents and management of chronic diseases was important for 68% of their respondents.<sup>16</sup> This aligns with the high rating of services for chronic disease management and diagnostic services in this study e.g., diabetes checks and cholesterol testing.

Previous studies have indicated that consumers do not recognise the extent of pharmacists' training and skills and view them as shopkeepers rather than health educators.<sup>10</sup> Our study contradicts these findings, with almost all the participants agreeing that pharmacists have the skills and knowledge to provide expanded services needed for their community. This may however also reflect the rurality of the consumers included, with the apparent lack of alternative services causing these consumers to value what might be offered through community pharmacy.

In the systematic review of pharmacy services in the United Kingdom, support for expanded pharmacy services was positive for those consumers that were more acquainted with the pharmacy setting.<sup>23</sup> Ease of access and convenience were also commonly described facilitators for consumer utilisation of pharmacy services.<sup>23</sup> This resonates with our findings that anecdotally, rural consumers have a positive relationship with their local community pharmacy and often are able to access the pharmacy easily compared to other health services.

#### Consumers' willingness to pay for expanded pharmacy services

Males more frequently expected the services to be provided at no cost and were half as likely to pay >\$30 per hour than females. This contrasts with a study by Naik-Panvelkar *et al.* that found differences in consumers' willingness to pay for a pharmacy asthma management program related to age, income, and education, but not for gender.<sup>24</sup> Additionally no difference in willingness to pay identified in this study was attributed to rurality or different age groups. This may be due to our study asking about willingness to pay for expanded services broadly, rather than for a specific service.

## Limitations

This study is limited in that the questionnaire was provided to consumers by pharmacy staff and participants may have been more positive in their responses to appease these staff and their pharmacists. In addition, the pharmacies who nominated to participate in the study may have been more interested in expanded practice and this may have been reflected the data collected from their stores. A further limitation is that the non-probability sampling method used may not completely represent this diverse population. The pharmacies were unable to collect an accurate response record and consequently a response rate is not able to be reported. The study which although provides new insight into consumer perspectives of expanded pharmacy services, includes participants that were not evenly distributed by population or state thus limiting the generalisability of these findings.

## 5.6 CONCLUSION

Consumers' perception of expanded pharmacy services in rural community pharmacies provides valuable insight to support the development of future services. Understanding what consumers value regarding local pharmacy services provides knowledge to ensure appropriate services are developed to meet consumers' needs. This study has provided new evidence to indicate that rural consumers agree that various expanded services would improve the health of their community. More consumers are willing to pay for expanded services, than those who expect the services be provided at no cost and there was wide agreement that pharmacists have the skills and knowledge to provide the proposed services. Age influenced service selection for age related services, whereby older people had a higher preference for services such as osteoporosis and vision checks indicating that consumer demographics would also need to be considered for effective service development. People in less remote areas (MM3-4) had significantly less preference for most of the expanded services, indicating that these services would be best aimed at populations in MM5-7. The considerable support by way of willingness to pay and valued services indicated by consumers highlights the need to further consider the implementation of these services for rural and remote Australian communities.

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## Chapter 6 – Health Professional Survey Research

This chapter presents research conducted by questionnaires completed by health professionals working in rural and remote locations across Australia. It is published in the journal *International Journal of Pharmacy Practice*. This original research article confirms support from health professionals for rural pharmacists to provide expanded pharmacy services.

**Taylor S, Cairns A, Glass B. *Health Professional Perspectives of Expanded Practice in Rural Community Pharmacy in Australia*. Int J Pharm Pract. 2020;28 p458-465 doi:10.1111/ijpp.12648**

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

Selina Taylor

Alice Cairns

Beverley Glass

*Permission obtained from IJPP for the inclusion of this published journal article.*

## 6.1 ABSTRACT

*Background:* Expanded pharmacy service delivery for rural and remote Australia has potential to address the rural health disparity. Pharmacists practicing to their full scope are recognised as being most beneficial in rural and regional communities, where access to health professionals is not comparable to those in metropolitan areas. However, research on health professional (HP) perspectives on expanded pharmacy practice is limited.

*Objectives:* To determine rural and remote HP (doctors, nurses, allied health, and other health professionals) perspectives of expanded services to be delivered through community pharmacy.

*Methods:* Australian rural and remote HPs participated in a questionnaire survey which explored views on expanded pharmacy services in their local communities. Potential expanded pharmacy services were provided, and participants were asked to indicate what expanded pharmacy services would benefit their local community and their level of support for the services. Analysis of the data included frequency analyses and one-way ANOVA tests with post-hoc Tukey HSD tests using IBM SPSS Statistic 25.

*Results:* Health professionals (N=121) from rural and remote locations participated. Sexually transmitted disease testing, vaccinations, diabetes, and asthma management were the most frequently chosen services that HPs agreed would improve the health of people in their community. Doctors chose the least number of services (mean = 1 services) compared with all other HP's (mean = >5 services). Sixty-eight percent of participants agreed/strongly agreed that providing these additional services would improve health, with participants (73%) agreeing/strongly agreeing that they would support the implementation of these additional services, not otherwise available in their community. Comparing professional groups, doctors were half as supportive of expanded pharmacy services, when compared with all other health professionals.

*Conclusion:* This study confirms the importance of a collaborative, local model to deliver expanded pharmacy services for rural communities. Health professionals were found to largely support expanding pharmacy practice, agreeing about the improved access to healthcare that would be provided for people living in rural and remote Australia.

*Additional keywords:* extended practice, scope of practice, pharmacy practice, remote, models of care, rural

## 6.2 INTRODUCTION

Expanding the scope of practice for an Australian pharmacist is emerging, with terms including 'expanded practice', 'extended practice' and 'pharmacists' full scope of practice', being used to describe the extension of their role.<sup>1-3</sup> The terms 'expanded practice' and 'extended practice' are often synonymous and interchanged, however these terms differs from 'advanced practice', which includes a high level of clinical and research skills and educational competence.<sup>3</sup> Rural community pharmacists have potential to address some of the challenges of healthcare access and poor health outcomes for rural and remote populations, through this expanded practice.<sup>4,5</sup> These expanded services have been described as additional to the tasks routinely undertaken by pharmacists and include some services that would usually be provided by other health professionals for example doctors, nurses and allied health professionals.<sup>3</sup>

The rural classification system used in this study is the Modified Monash Model (MMM) which is based on the Australian Statistical Geography Standard-Remoteness Areas (ASGS-RA) framework.<sup>6</sup> Previously the PhARIA (Pharmacy Accessibility Remoteness Index of Australia) classification system (based on the ARIA Accessibility Remoteness Index of Australia) was utilised.<sup>7</sup> PhARIA is based on a combination of the degree of remoteness, both geographic and professional (road distance to the five closest pharmacies), of pharmacies.<sup>7</sup> The MM model was developed to acknowledge difficulties in workforce recruitment in remote communities and is now considered most appropriate as it has improved categorisation of metropolitan, regional, rural and remote areas according to both geographical remoteness and town size.<sup>7</sup>

The Pharmacy Guild of Australia (PGA) has recently submitted a paper to the National Rural Health Commissioner to describe how rural pharmacies can achieve equity of access for patients to primary healthcare services in regional, rural and remote Australia.<sup>4</sup> With 65% of Australians living in regional areas within 2.5kms of a community pharmacy, these pharmacies are well placed to deliver medicines, professional health services and health advice, which are considered to be highly accessible.<sup>4</sup> The PGA describes that the benefits of pharmacists practicing to their full scope are most pronounced in rural and regional communities, where access to health professionals is limited and health outcomes are lower than in metropolitan areas.<sup>4</sup> The PGA advocates that quality and access to healthcare for rural, regional and remote areas should be equal to that available in metropolitan areas and that unique needs-based models need to be designed and developed to achieve this goal.<sup>4</sup>

It has been suggested that a range of health professionals should be working to their respective full scope of practice to achieve better health outcomes, although this is controversial with some professional groups including general practitioners (GPs) disagreeing.<sup>8</sup> However pharmacists are often perceived to be 'shop keepers' and business people, which does not align with their delivery of healthcare.<sup>8,9</sup> This is often voiced by GPs and has been identified as a major barrier as to why GPs do not support pharmacists to expand service delivery or prescribe medications.<sup>8</sup> GPs report that they have close relationships with pharmacists with effective working arrangements, when it relates to medication management, however are reserved in their support for expanded pharmacy services citing concerns about fragmented care.<sup>8</sup> GPs have also questioned pharmacists' competence to provide holistic care in an expanded practice setting, indicating that pharmacists do not possess the clinical or communication skills required.<sup>10</sup> Although GPs agree there is benefit in pharmacists delivering services for chronic disease management, they have reported a lack of confidence in pharmacists' skills to utilise extensive laboratory tests, which are in this context necessary from their perspective.<sup>11</sup> When considering pharmacists providing vaccination services, GPs have expressed concern with patients receiving a reduced quality of healthcare.<sup>12</sup> In contrast however, there have been positive perceptions from GPs about pharmacists undertaking repeat prescribing.<sup>10</sup> GPs reported reduced workload in situations where pharmacists were providing repeat prescriptions that involved no diagnosis and only limited clinical decision making.<sup>12</sup>

Exploring HPs' perspectives of pharmacists providing expanded services in a rural setting is an important step to identify potential barriers and enablers to expanded practice. Most literature examining health professional perspectives of expanded pharmacy services has reported on the GP-pharmacist interaction, while perspectives of other health professionals are rarely presented. Understanding all rural health professionals and thus all rural health provider's perspectives of expanded practice is imperative to ensure that future models are developed with multi-disciplinary evidence to support an integrated and collaborative model of expanded pharmacy practice. Thus, the aim of this study is to explore rural and remote HPs' perspectives of expanded pharmacy services to be delivered through community pharmacy to rural and remote communities.

## 6.3 METHODS

### Study Design

This study was a descriptive cross-sectional survey of rural and remote health professionals in Australia (Appendix C).

### Survey Development

The survey comprised a two part questionnaire. In Part one, health professionals were presented a choice of 26 potential expanded pharmacy services (depression screening, providing counselling services, assessing suicide risk, speech and language screening, swallowing screening and assessments, drug and alcohol testing, facilitating telehealth, osteoporosis screening, asthma management, COPD spirometry services, hearing testing, dietary assessments and advice, physical activity assessments and advice, sexually transmitted disease testing, foot examinations and diabetes checks, breastfeeding advice and support, vaccinations, diabetes testing and management, urinary tract infection testing, cholesterol testing and management, atrial fibrillation testing, wound management, vision/eye, ear and mouth examinations) and asked to indicate via a tick-box, those services that they would like to see provided by their local community pharmacy. There was no limit to the number of services that could be chosen. The services listed were extracted from a systematic review of rural expanded pharmacy services globally and the order they were presented randomised. The questionnaire allowed a free text option for other services to be proposed using an open-ended question. Part two required participants to use a four-point Likert scale (strongly agree, agree, disagree, strongly disagree) to rate their response to statements about their acceptance and support for pharmacists to provide these expanded services. Demographic information including age (in years), gender (m/f/other), location of work (postcode), occupation, and specialty was also collected. The initial questionnaire was reviewed by three experts for face validity and content validity. Modifications were made and then the questionnaire was piloted by eight rural health professionals for reliability (using test-retest) with recommended minor changes incorporated into the final design.

### Survey Dissemination

Australian rural health professionals were invited to participate throughout various rural health networks including Services for Rural and Remote Allied Health (SARRAH), University Departments of

Rural Health (UDRHs), Improving Health Outcomes in the Tropical North (HOT NORTH), Northern Australian Research Network (NARN) and Health Professional Facebook network groups. The survey was provided in both online and paper-based forms depending on organisational preference. Data were collected from July to September 2019. To be eligible to participate in the study participants were required to identify as a health professional working in a rural or remote location of Australia according to the Modified Monash Model categories 3 – Large Rural Town, 4 – Medium Rural Town, 5 – Small Rural Town, 6 – Remote Community or 7 – Very Remote Community.<sup>13</sup> Participants received no incentives for completing the questionnaire that took approximately ten minutes to complete.

### Data Analysis

To explore the type and frequency of additional services that health professionals felt community pharmacists should provide, a multiple dichotomy method was used to code each proposed service as yes for a ticked response or no for a non-response. Rurality was measured using the Modified Monash Model which measures remoteness and population size on a scale of MM1 to MM7 category.<sup>6</sup> Postcodes were allocated to the relevant MM category, which were then grouped for analysis.<sup>6</sup> The model MM1 is classified as a major metropolitan city, while MM7 is a very remote location.<sup>6</sup> MM1 category – Metropolitan Area and MM2 category – Regional Centre HPs were excluded from the study as were pharmacists. The health professionals' occupations were categorised into Doctors, Nurses, Allied Health (Speech Pathology, Occupational Therapy, Physiotherapy, Dieticians, and Exercise Physiologists) and other which included all other health professionals (e.g., Paramedics, Aboriginal Health Workers and Social Workers). To explore the health professionals' support and acceptance of the various expanded pharmacy services, the ten most and least commonly selected services were identified using frequency analysis. To examine associations between number of pharmacy services selected (0-26) and demographic variables (age, gender, occupation, and rurality), one-way ANOVA tests with post-hoc Tukey HSD tests were conducted, with significance set at <0.05 for all analyses. Analyses were conducted using IBM SPSS Statistic 25.

### Ethics Approval

The study was granted approval by James Cook University Human Research Ethics Committee (H7845)(Appendix H) on 17/7/2019.



## 6.4 RESULTS

Health professionals (N=121) from all six states of Australia (New South Wales, Victoria, Queensland, South Australia, Western Australia, and Tasmania) and the Northern Territory completed the questionnaire. Approximately 80% were female and age was normally distributed, with a mean age of 38.5 years (SD=17). A summary of the demographic data is provided in Table 6-1. Questionnaires were completed both online (67) and in paper-based form (54), non-parametric testing was undertaken and there were no statistical differences in response between the two methods.

**Table 6-1:** Demographic data for health professional survey participants (N =121)

Participant characteristics	Number (%)
Age	
- < 25 years	12 (10%)
- 25-35 years	41 (34%)
- 36-45 years	33 (27%)
- 46-55 years	17 (14%)
- 56+ years	18 (15%)
Gender	
- Male	25 (21%)
- Female	96 (79%)
Location (MMM Categories)	
- 3	2 (2%)
- 4	7 (5%)
- 5	28 (23%)
- 6	70 (58%)
- 7	14 (12%)
State	
- QLD	76 (63%)
- NSW	10 (8%)
- VIC	12 (10%)
- NT	2 (2%)
- SA	14 (11%)
- WA	5 (4%)
- TAS	2 (2%)
Health Professional	
- Doctor	44 (36%)
- Nurse	24 (20%)
- Allied Health	42 (35%)
- Other	11 (9%)

(QLD – Queensland, NSW – New South Wales, VIC – Victoria, Northern Territory, SA – South Australia, WA – Western Australia, TAS – Tasmania)

Health Professionals' support of expanded pharmacy services in their community

The mean number of expanded pharmacy services chosen by the participants was 4.60, ranging from 0-26. The ten most frequently chosen services were selected by one in five participants and are listed together with the less commonly chosen services in Table 6-2. Services targeting chronic disease including diabetes testing and management, asthma management, depression screening, and Chronic Obstructive Pulmonary Disease (COPD) spirometry services were chosen by >20% of the participants. One participant in fact chose all 26 expanded services, 15 chose >10 services and 22 participants chose no services.

**Table 6-2:** Community Pharmacy Expanded Services Preference Ratings by Health Professionals

10 <b>Most</b> Frequently Selected Expanded Services	Response Rate n (%)
Vaccinations for all age groups and available vaccinations	40 (33%)
Diabetes testing and management clinic (e.g. HbA1c testing)	40 (33%)
Asthma management clinic	38 (32%)
Sexually transmitted disease testing (e.g. urine dipstick testing)	37 (31%)
Urinary tract infection testing (e.g. urine dipstick testing)	34 (21%)
Depression screening	28 (23%)
Hearing testing	27 (22%)
Breastfeeding advice and support	27 (22%)
Drug and alcohol testing	27 (22%)
COPD spirometry services	24 (20%)
10 <b>Least</b> Frequently Selected Expanded Services	Response Rate n (%)
Conducting swallowing screening assessments	4 (3%)
Providing counselling services	9 (7%)
Atrial fibrillation testing	9 (7%)
Speech and language screening	10 (8%)
Mouth examinations	10 (8%)
Assessing suicide risk	11 (9%)
Vision/eye examinations	11 (9%)
Providing physical activity assessments and recommendations	13 (11%)
Ear examinations	17 (14%)
Osteoporosis screening (e.g. heel bone scanning)	18 (15%)

There was a statistically significant difference in the mean number of expanded services chosen between males and females ( $F = 12.586, p < 0.05$ ); and the four health professional categories ( $F = 13.387, p < 0.05$ ). The mean number of expanded services chosen was significantly higher in the

female group (M=5.38, SD=5.147) compared with the male group (M=1.64 SD=2.039),  $p < 0.05$ , which comprised 60% Doctors. Nurses (M=7.04, SD=5.827), Allied health (M=6.40, SD=4.067) and the other group (M=5.27, SD=6.650) endorsed a greater number of expanded pharmacy services compared with Doctors (M=1.39, SD=2.423),  $p < 0.05$ . There was no difference in mean number of expanded practice services chosen between the Nurse, Allied health, and other groups.

There was also a statistically significant difference in the mean number of expanded services chosen between the three rurality categories (MM3-4, MM5, MM6-7),  $F = 12.909$ ,  $p < 0.05$ . Post hoc tests with Tukey analysis indicated that the mean number of expanded services is significantly higher in the MM3-4 (M=9.78, SD=7.496) and MM5 group (M=6.82, SD=5.396) compared with MM6-7 group (M=3.31, SD=3.703),  $p < 0.05$ . There was however no difference in mean number of expanded practice services chosen for groups MM3-4 and MM5.

The questionnaire also allowed a free text option for other services and responses included *onwards referrals, palliative care, pain management, advice on inhalers, spacers and glucometers, prescribing limited medications, infectious disease prevention and weekend educational workshops on diabetes, cardiovascular disease and influenza*. There were also 18 comments from doctors suggesting pharmacists should not be conducting any of the suggested services and should be focusing on their trained area of expertise, which is medication management.

#### Health professionals' support and acceptability of expanded pharmacy services

Figure 6-1 represents all participants' responses to five statements using a 4-point Likert scale. A majority (73%) of participants agreed or strongly agreed that they would support the implementation of the expanded services, if the services were not available and more than half (57%) would support them if the services were already available. Almost half (43%) of the participants disagreed or strongly disagreed that the expanded services are easily accessible in their community by other health providers. When asked whether providing the expanded services would improve the health of people in the community, two-thirds agreed or strongly agreed with this statement. However less than 50% of the participants agreed or strongly agreed that pharmacists have the skills and knowledge to provide the additional services.

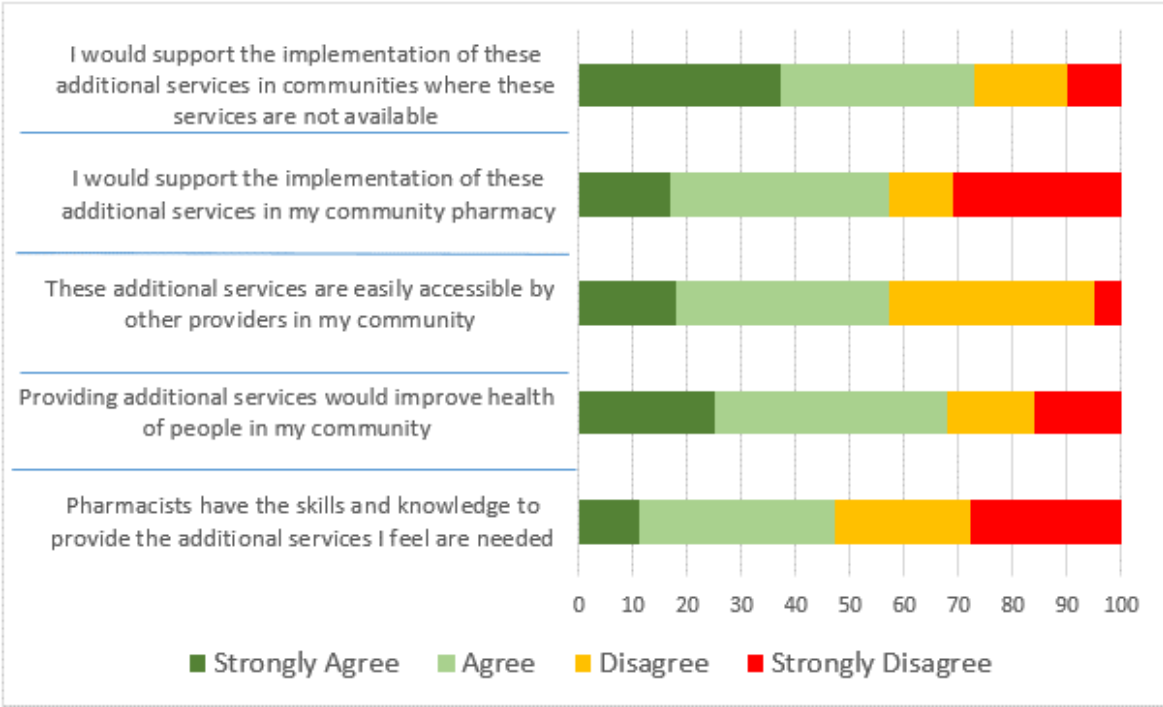


Figure 6-1: Health professional responses to expanded service statements (N =121) (%)

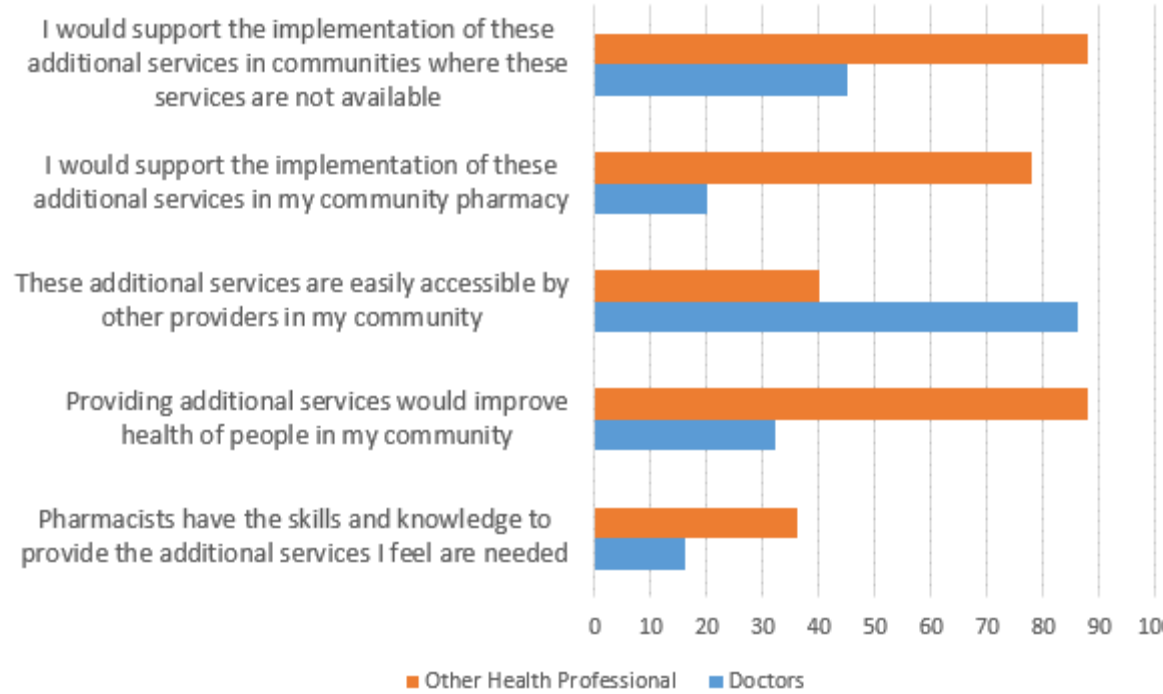


Figure 6-2: Comparison of agreement to statements for doctors and all other health professionals (%)

Figure 6-2 provides a clear illustration of the disparity between responses of doctors and all other health professionals to the provision of expanded services by pharmacists. In this figure, responses have been grouped into doctors only and all other health professionals (including nurses and allied health professionals). A majority (88%) of other health professionals would support the implementation of these additional services, where they are not available compared to less than half (45%) of doctors. One third of doctors agreed or strongly agreed that the provision of the additional services would improve the health of the people in their community, compared with other health professionals (88%). Other health professionals were twice as confident as compared to doctors, that pharmacists have the skills and knowledge to provide the expanded services.

## 6.5 DISCUSSION

Expanded pharmacy services are evolving internationally and the potential benefits for rural and remote communities in Australia have been highlighted.<sup>13</sup> This study has demonstrated both supportive and opposing viewpoints, with significant differences in responses found for occupation, gender, and rurality variables. Interest in pharmacists providing expanded services including sexually transmitted disease testing, vaccinations, diabetes, and asthma management were found. Broadly HPs expect that pharmacists providing expanded services would improve the health of people in their local communities, particularly in areas where the services would not otherwise be available. Thus this study provides great insight for future consideration for expanded practice for rural pharmacists.

The strengths of this study lie in its setting in rural and remote Australia, which is often under-represented in the literature. The objective of understanding rural and remote HPs perspectives has been achieved through appropriate use of a survey design. Although distributed to HPs in various health sectors with differing rurality, many responses were collected from Queensland, Australia. In addition, the method of recruitment, may have led to health professionals with a strong view on the topic of expanded practice (either positive or negative) to participate, and therefore the findings may not be representative of the entire rural and remote health workforce.

### Community Pharmacy Meeting Unmet Needs in the Community

There was agreement in health professionals' choice of expanded pharmacy services to meet needs in the community whereby, the ten most highly rated services were chosen by one in five participants. These services were predominately focused on chronic disease management, which is

aligned with the report from the International Pharmaceutical Federation (FIP) illustrating pharmacy's role in reducing non-communicable diseases (NCD) in the community.<sup>14</sup> The report provides a survey of the services that community pharmacies are providing globally to manage NCDs.<sup>14</sup> It was reported that the most significant barrier to pharmacists providing services in NCD management was limited financial support or remuneration. The second most common limitation is lack of acceptance and support by other healthcare professionals.<sup>14</sup>

In this expanded practice study, eighteen participants, all doctors, provided written comments stating that pharmacists should not be providing any expanded services. This opposition by the medical profession has been reported in the media with GPs concerned that pharmacists do not have the diagnostic skills required to identify health issues arising from a consultation, and that pharmacy-based preventative care programs may result in duplicated services, wasted resources, fragmented care and poorer health outcomes for patients.<sup>15</sup>

Allied health professionals chose on average 6.4 services that they felt would address unmet needs in their community compared with an average of 1.4 services for doctors. This strong opposition was not evident in the responses by other health professionals, indicating that doctors were most opposed to expanded pharmacy services. It is proposed that collaborative practices and shared evidence of the value of pharmacists' interventions with other health professionals is important to gain the doctors recognition and support.<sup>14</sup>

The least frequently chosen services included examinations (eye, ear, and mouth), speech, language and swallowing assessments, and mental health services including providing counselling and assessing suicide risk. It is difficult to determine whether these services were not supported as they are already adequately provided or because they are too different from traditional pharmacist roles. This uncertainty reinforces the importance of developing unique, local needs-based services that considers demographics, socioeconomic status, literacy and health literacy, chronic disease burden and access to number and type of health professions and health services.<sup>4</sup>

#### Health professionals' support and acceptability of expanded pharmacy services

Other than doctors, all other health professionals as a group indicated they were supportive of the implementation of expanded pharmacy services, and they felt these would improve the health of their community. The doctors who participated were reserved in their support for the services in all questions. This distinctive difference may reflect doctors' reservations, which have been reported

previously as impacting the patient-doctor relationship, incursion into their practice, professional self-sufficiency and resistance to change.<sup>8,10</sup>

From an Australian perspective, it has been identified that minimal collaboration occurs in primary care and that links between general practice (GP) and allied health, including pharmacy are poorly developed.<sup>16</sup> This may explain why GPs in this study were only half as supportive in acknowledging the skills and knowledge of pharmacists compared with the other health professionals. Doctors have been reported to question the training pharmacists undergo, their clinical and communication skills and their competence to provide holistic care for patients.<sup>10</sup> In a study examining pharmacist-general practitioner relationships relating to the provision of a pharmacy asthma service, it was identified that GPs and pharmacists had a limited professional relationship and a lack of understanding of each other's roles.<sup>16</sup> GPs' and pharmacists' perceptions about asthma management were also mismatched.<sup>16</sup> GPs considered that asthma was well managed in the community and that asthma care had improved significantly in the last ten years.<sup>16</sup> In contrast pharmacists, described patients that were easily identifiable as poorly controlled with concerns regarding poor adherence, self-management and a reluctance to engage in their asthma care.<sup>16</sup> These significantly different perceptions of a common chronic disease in community may explain the notable difference in perceptions of the need for expanded services identified in this study. Doctors have however, reported positive views about pharmacists increasing their roles in medication management, patient education, and collaborating within general practice settings.<sup>8</sup> These services are seen by doctors as valuable as they saved doctors time and benefited their patients.<sup>8</sup>

### Implications for Practice

Greater understanding of rural HPs perspectives of pharmacists providing expanded services is important for the future of professional pharmacy practice. Collaboration is needed between health professionals and providers in rural communities to enable community pharmacists to work to their full scope of practice. Recognising what services health professionals and the community feel are needed in rural locations will facilitate their support for the delivery of these expanded services by pharmacists.

## 6.6 CONCLUSION

Health professional perspectives on expanded pharmacy services in rural and remote community is important for the development of successful and sustainable models of care. As the Australian pharmacy profession recognises the benefit of increasing the role of pharmacists particularly to improve health outcomes in rural and remote areas, understanding the level of support of other health providers is necessary. Health professionals have identified services including vaccinations and chronic disease management services as potential solutions to address unmet needs in rural communities. The different level of support for these services between health professionals, with doctors being the least supportive, highlights the need for greater collaboration between doctors, other health professionals and pharmacists. This will facilitate the development of locally relevant expanded pharmacy models of service to overcome these professional reservations and contribute to the successful development of expanded pharmacy services to better serve the needs of these communities.



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## Chapter 7 – Commentary

This chapter provides a comparative summary of the three pieces of original research in Chapters 4, 5 and 6. It demonstrates the similarities and differences in perspectives of the three stakeholder groups pharmacists, consumers, and health professionals. It is published as a commentary in the *International Journal of Pharmacy Practice*.

**Taylor S, Cairns A, Glass B. *Expanded Practice for Rural Community Pharmacy: What are we waiting for?* Int J Pharm Pract. 2021 [Accepted Sept 2021]**

### **Authors' contributions**

Selina Taylor conducted the original research presented in this commentary and drafted the manuscript for the commentary. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

Selina Taylor

Alice Cairns

Beverley Glass

*Permission obtained from IJPP for the inclusion of this published journal article.*

## 7.1 ABSTRACT

*Objective:* To synthesise stakeholder (consumer, pharmacist, and health professional) perspectives of expanded pharmacy practice in rural and remote community pharmacy.

*Methods:* Comparison of perspectives of stakeholder groups identified by four studies has highlighted the expected outcomes and anticipated barriers to expanded pharmacy practice. Aligning the studies has identified priority areas of health for which pharmacists may be able to provide expanded service delivery.

*Key findings:* Expanded pharmacy services are supported by consumers, pharmacists and health professionals and are expected to improve health outcomes for rural and remote populations. Barriers will need to be overcome for expanded services to be sustainable in the future.

*Conclusion:* The pharmacy profession will need to undertake a paradigm shift to professional practice and work towards this should begin to reduce the health inequality for rural populations.

In response to positive international models advocating for community pharmacists to provide expanded services, terms such as 'expanded pharmacy practice', 'pharmacists' full scope of practice' and 'extended practice' have evolved.<sup>1</sup> Internationally, rural pharmacists have improved patient outcomes and reduced the burden on healthcare systems by offering services including point-of-care testing for infectious diseases (e.g. malaria, HIV) and chronic disease management (e.g. HbA1c, cholesterol, spirometry), as well as disease screening and mental health management.<sup>1</sup> For rural and remote communities, higher mortality and morbidity rates, vast distances to access specialist healthcare and limited local healthcare providers are all the accepted norm.<sup>2</sup> Rural community pharmacists are highly skilled, accessible health professionals, that can change this norm by providing access to equitable primary healthcare services in regional, rural and remote Australia.<sup>3</sup> This paper demonstrates the high level of support for Australian pharmacists working in the outback to expand their scope to improve remote healthcare.

A comparison of four studies exploring major stakeholder groups, pharmacist, consumer and health professional perspectives of pharmacists providing expanded services through rural community pharmacies in Australia has been undertaken using the same methodological approach.<sup>4-7</sup> Perspectives were sought through questionnaires (pharmacists n=92, consumers n=406, health professionals n=121) and semi-structured interviews with health professionals (n=23) located in Modified Monash Model categories 3-7 (large rural towns – very remote communities).<sup>4-7</sup>

### Expanded Services Ranking

There was agreement between the stakeholder groups in their ranking in order of importance of the proposed expanded services from a list of 26 expanded models provided internationally.<sup>4-6</sup>

Consensus of the importance of specific services from these groups (pharmacists, consumers and health professionals) is shown in Table 7-1 and will be significant in guiding the direction and development of future expanded services.

**Table 7-1:** Importance of expanded services ranked by consumers, pharmacists and health professionals.<sup>4-6</sup>

	Pharmacists	Consumers	Health Professionals
1	Depression screening and referral	Vaccinations for all age groups	Vaccinations for all age groups and available vaccinations
2	Diabetes testing and management clinic	Diabetes checks and clinic	Diabetes testing and management clinic (e.g. HbA1c testing)
3	Vaccinations for all age groups and all vaccinations	Wound care clinic	Asthma management clinic
4	Asthma management clinic	Depression/Mental Health tests	Sexually transmitted disease testing (e.g. urine dipstick testing)
5	Assessing suicide risk	Asthma clinic	Urinary tract infection testing (e.g. urine dipstick testing)
6	Wound management clinic	Heart checks and advice	Depression screening
7	Urinary tract infection testing	Hearing tests	Hearing testing
8	Facilitating telehealth with specialists	Suicide Prevention	Breastfeeding advice and support
9	Providing counselling services	Cholesterol tests and advice	Drug and alcohol testing
10	Cholesterol testing and management clinic	Sleep tests and advice	COPD spirometry services

## Barriers and Enablers

Qualitative data from the studies provides insight into challenges and motivators that are expected if expanded practice in Australia extends within the pharmacy profession.<sup>7</sup>

In order for any proposed model to be accepted, it is essential that expanded pharmacy services are uniquely tailored to the community demands, gaps in service provisions are addressed and current healthcare resources are not duplicated.<sup>7</sup>

*“Depends on what sort of services are provided locally and if they are filling gaps that aren’t being provided by other services within their communities...if your doctor’s flat out doing other stuff than that seems like a reasonable option for pharmacists to do those sorts of things.” (General Practitioner – South Australia)*

Health professionals agreed that the proposed expanded services described were not easily accessible by other providers within their community.<sup>7</sup> However, this consensus was not shared by the doctors, questioning whether doctors are aware of service availability.<sup>7</sup> Resolution of this differing perspective will be crucial to ensure newly developed services are locally relevant and integrated with existing health services.

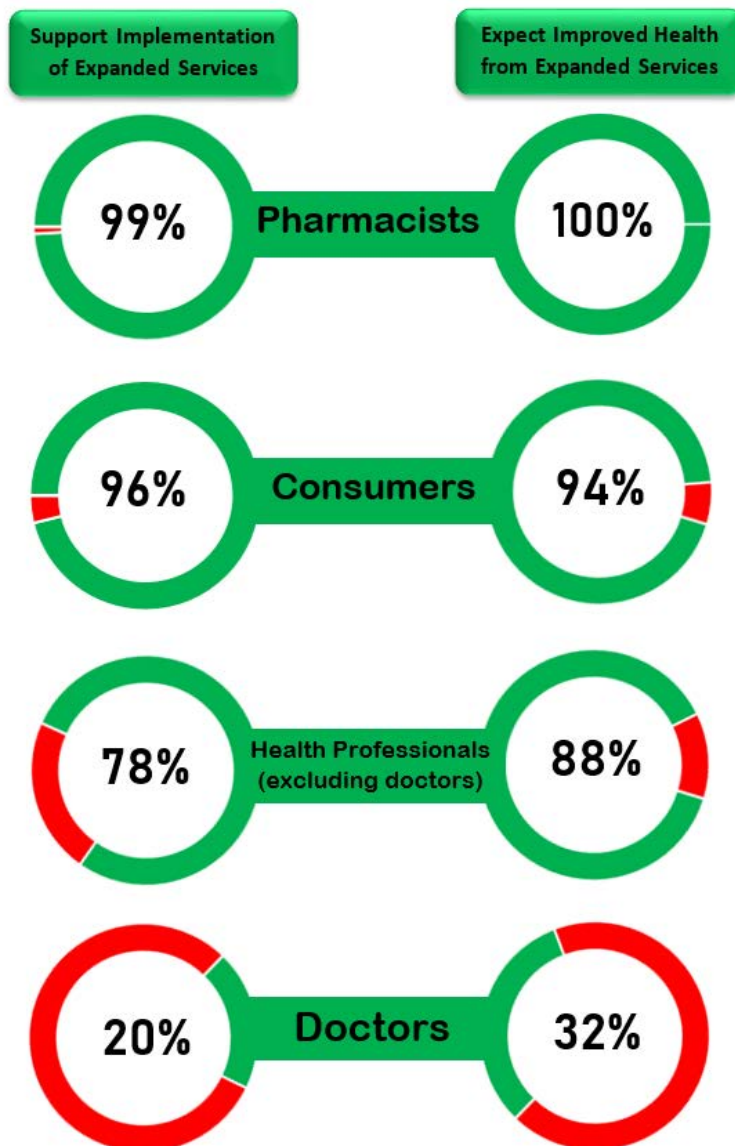
Doctors and their professional associations have voiced strong resistance to pharmacists expanding their scope, with this viewpoint published in the media and identified as a major barrier for expanded services provided internationally.<sup>8</sup> Their concerns include service duplication, fragmented care and poorer patient health outcomes due to a lack of pharmacists’ skills.<sup>8</sup> Doctors have however expressed positive views about pharmacists increasing their roles in tasks that they value to save doctors’ time and benefit their patients such as, medication management, patient education, and collaborating within general practice settings.<sup>7</sup> However, given the limited services available in rural and remote locations, there is a case for pharmacists and in fact other health professionals as well to expand their contribution to primary healthcare.

*“In rural and remote areas, we don’t have enough skills, we don’t have the people available so I think that any one of us that is a health professional with a little bit of a broadened scope of practice does help out the clients but also the other health professionals within the area.” (Integrated Allied Health Manager – Podiatrist - Queensland)*

Rural consumers overwhelmingly support the implementation of expanded pharmacy services, and are in agreement with pharmacists and other health professionals that these services would improve the health of people within their communities.<sup>4-6</sup> [Figure 7-1] Rural community confidence also outweighs that of doctors, with belief that pharmacists do have the skills and knowledge to provide



expanded services.<sup>4</sup> But we do have to ask the question about pharmacists capacity in terms of time and space, especially in recognition of workforce shortages. We must also consider pharmacists that are sole proprietors and the requirement for quality assurance measures with respect to equipment and pharmacists' advice.



**Figure 7-1:** Agreement of stakeholder groups to support the implementation of expanded pharmacy services and the expectation of improved health outcomes from expanded pharmacy services.<sup>4-6</sup>

Pharmacists in Canada have been hesitant to deliver expanded services with internal concerns about their skill level, decision making ability and the need for hands-on patient contact.<sup>9,10</sup> However this reluctance was not shared by Australian rural pharmacists who are confident that they are already skilled to provide expanded services but recognise additional training may be required for some

services.<sup>6</sup> Despite the hesitancy from the doctors, allied health professionals have suggested that pharmacists could upskill with additional training including peer-peer training from other health professionals available within local communities.<sup>7</sup>

A potentially significant contributing factor to health professionals, especially doctor's reluctance to endorse pharmacists, appears to be a lack of awareness of the training and the skills pharmacists have to provide expanded services.<sup>7</sup>

*'I find it hard to comment on pharmacists because I don't really comprehensively understand all their training that they are doing or have done...'* (General Practitioner – Queensland)

A fee-for-service payment structure is a potential barrier to expanded practice that is shared internationally.<sup>1</sup> It has often been widely expected that pharmacists provide many services at no cost requiring a potential paradigm shift for consumers in the future for these models be sustainable.

*"Pharmacies offer free screening, free this, free that. So, from my cultural background, I would expect for a service to be free at the pharmacist".* (Speech Pathologist – Queensland)

*"In our community, no, people don't like to pay, unless they are dying, and even then...there is a bit of a culture out here that there is that expectation that it should be government funded..."* (Occupational Therapist – Queensland)

Suggestions that in addition to consumers paying for services, government funding including the Medicare Benefits Scheme (MBS) should be factored into the design of an appropriate remuneration model, provided that the services are meeting a community need and improving patient outcomes.<sup>7</sup>

*"Either the pharmacist copping it on the chin, or its going be the patient paying for the entire cost, but I think there is a role for Medicare stepping up and saying these are the item numbers that pharmacies can access."* (General Practitioner – South Australia)

Expanding the scope of practice for all rural health professionals is also a consideration, with nurses already having taken the lead and working in an expanded capacity, which has been widely accepted by communities and health providers. There could be agreement that all health professionals, working in isolated areas, with limited access to health providers, could be trained to provide expanded services.<sup>7</sup>

*"Every field, allied health, nursing, medicine all needs to work in expanded practice format. Everyone just shifts a little bit further out to create more coverage."* (Public Health Nutritionist – Queensland)

## Call to Action

Although we have no doubt that improvement and innovation in healthcare provision for rural and remote communities can be addressed by expanded practice, to deliver on this, change is needed. Barriers need to be removed to improve health access in areas where the most vulnerable and unwell Australians live. The need to work towards developing an innovative model of expanded pharmacy services for these rural and remote communities is needed and needed now.

*Consumers* – get loud about the disadvantage you are faced with when accessing local healthcare.

*Pharmacists* – advocate for your communities and profession at every opportunity.

*Government* – look at the potential the rural pharmacy profession presents and harness their passion for healthcare.

Message to Governments and the Pharmacy Profession...*what are we waiting for?*

## 7.2 REFERERNCES

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## Chapter 8 – Pharmacist and Stakeholders Interviews

This chapter is the first qualitative study presented in this thesis and it is published in the *Australian Journal of Rural Health*. The research was conducted by semi-structured interviews with rural pharmacists and relevant stakeholder representatives. This original research article confirms support from stakeholder groups and rural pharmacists for the provision of expanded pharmacy services. It also highlights multi-level enablers and barriers that need to be addressed for successful and sustainable expanded pharmacy service implementation in rural practice.

Taylor, SM, Cairns, A, Glass, BD. *Rural pharmacists' and stakeholders' perspectives of expanded pharmacy practice: A descriptive study*. Aust J Rural Health. 2021; 29 p341– 353. <https://doi.org/10.1111/ajr.12739>

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

Selina Taylor

Alice Cairns

Beverley Glass

*Permission obtained from AJRH for the inclusion of this published journal article.*

## 8.1 ABSTRACT

*Objective:* To explore pharmacist and stakeholder perspectives of pharmacists providing expanded services in rural community pharmacies.

*Design:* A descriptive qualitative study with an ethnographic lens of rural culture collected data via in-depth semi-structured interviews with stakeholder representatives and rural and remote pharmacists.

*Setting:* Regional, rural, and remote practice settings as defined by the Modified Monash Model MM3 – MM7.

*Participants:* Twelve rural or remote pharmacists and eight stakeholder representatives from various government and professional organisations participated in the study.

*Main Outcome Measure:* Macro, meso and micro level perspectives of pharmacists providing expanded pharmacy services in rural community pharmacies.

*Result:* At the macro-level both pharmacists and stakeholders agreed that governance is needed to clarify the terms used to describe expanded practice as a first step to developing an expanded practice framework. The meso-level revealed that pharmacist participants expected expanded practice to improve rural pharmacist recruitment and retention through improved professional satisfaction. The importance of effective collaboration and coordination with other healthcare providers in a community was described by pharmacists and stakeholders to ensure success of expanded services. All participants agreed that sustainability of these services relied on appropriate remuneration. At the micro-level expanded pharmacy services are expected to save consumers time and money as patients are redirected into appropriate healthcare settings.

*Conclusion:* Enablers and barriers across policy, health professional, consumer and community levels need to be addressed to design and develop sustainable expanded pharmacy services to improve health service provision in rural and remote communities.

*Keywords:* expanded practice, rural and remote, scope of practice, model of care

What is already known?	What this paper adds?
<ul style="list-style-type: none"> <li>• The Australian health system is under strain to meet the demands of the growing and aging population.</li> <li>• Internationally pharmacists are working at an expanded scope of practice providing innovative models of care to meet healthcare needs.</li> <li>• Rural pharmacists are highly trusted, skilled and valued members of the healthcare team.</li> </ul>	<ul style="list-style-type: none"> <li>• Pharmacists and stakeholders are advocating for strong governance to support the design and development of an expanded practice framework for Australia.</li> <li>• Rural pharmacists see a need for an expanded scope of practice for pharmacists and expect consumers to be supportive of these additional services.</li> <li>• Effective collaboration and appropriate remuneration are needed for expanded practice to be sustainable.</li> </ul>

## 8.2 INTRODUCTION

The Australian health system is under strain as the population grows and ages.<sup>1</sup> Waiting times for general practitioners (GPs) are long and GP shortages are of concern, particularly in rural and remote locations.<sup>1</sup> The cost of visiting GPs is also deterring patients with a reported 1.3 million Australians choosing not to visit a GP or specialist as the cost was too high.<sup>1</sup> A recent report found that one-fifth of all patients who visited an emergency department did so because a GP was not available.<sup>1</sup> As patients face difficulty accessing GPs, they are attending already overburdened after-hours care and hospital emergency departments.<sup>1</sup> This highlights the urgent need for the health system to adapt to better meet the health needs of all Australians.

Pharmacists practicing at their full scope or at an extended scope of practice have potential to relieve pressure on the Australian health system.<sup>1-2</sup> Although the terms ‘expanded practice’, ‘extended practice’ and ‘full scope of practice’ are often interchanged, they all describe an extension of the pharmacist’s role to include performing tasks usually provided by other health professionals (HPs), in addition to pharmacists’ usual medication management services.<sup>3-5</sup> Internationally, examples of pharmacists working to their full scope of practice in innovative models of care have been reported in the United Kingdom and Canada.<sup>1,6</sup> Rural expanded practice services including the delivery of immunisations, chronic and infectious disease screening and management services identified by Taylor *et. al.* highlights the models of care to be considered for Australian pharmacy practice.<sup>6</sup>

In Australia, patients typically visit an emergency department or a GP when they have a health concern.<sup>1</sup> In regional, rural and remote areas, a lack of GPs and limited access to after-hours GPs has



patients presenting to emergency departments resulting in growing healthcare costs for the Government.<sup>1</sup> Pharmacists are accessible, highly qualified health professionals who offer advice and treatment for a range of common ailments.<sup>1,2,7</sup> Patients regularly attend pharmacies, with an estimated 451 million individual patient visits occurring in Australia in 2019.<sup>1</sup> Pharmacists all across Australia regularly refer patients to GPs or emergency departments, even for minor ailments as they are not supported by clinical or financial models that allows them to practice to their full scope.<sup>2</sup> The benefits of pharmacists working to their full scope of practice is more pronounced in rural and remote communities where there is less access to health professionals (particularly GPs) and health outcomes are lower than urban areas.<sup>2</sup>

The aim of this study is to explore pharmacist and stakeholder perspectives of pharmacists providing expanded services in rural community pharmacies.

## 8.3 METHODS

### Study Design

An ethnographic lens of rural culture has been applied to this descriptive qualitative study.<sup>8</sup> Rural ethnography allows concepts of isolation, limited resources, and low socioeconomics to be explored within the in-depth qualitative study which is important to ensure findings can be related to place.<sup>9</sup> The consolidated criteria for reporting qualitative research (COREQ) was applied to this study.<sup>10</sup> Data collection was achieved using in-depth semi-structured interview technique. Rural and remote pharmacists, as defined using the Modified Monash Model MM3 – MM7 (large, medium, and small rural towns and remote and very remote communities), were included.<sup>11</sup> The researchers live and work in a regional and remote locations and thus have a global interest in rural health.

### Participants, Setting and Recruitment

All members of the Rural Pharmacy Network Australia (RPNA) and the Rural Pharmacy Support Network (RPSN) were invited to participate in an interview via email and Facebook pages. This convenience sampling method recruited twelve Australian community pharmacists working in rural or remote locations who nominated to participate. One participant had knowledge about the researcher and the project from previous participation in a prior study. No other connections to the researchers or the project were made prior to the study. Stakeholders were invited to participate purposively via direct contact at an organisational level. Eight stakeholder representatives were

included from organisations who are major contributors to health service delivery in rural and remote settings including Pharmacy Guild of Australia, Pharmaceutical Society of Australia, Australian Government Department of Health Primary Health Network, North and West Remote Health, Royal Flying Doctor Service and the Queensland Aboriginal and Islander Health Council. No incentives were provided for participating.

### Procedure and Semi-structured Interview

All participants who volunteered to participate were provided with an information sheet describing the project and returned written consent prior to the interview. All interviews were undertaken by ST (PhD candidate), a female rural pharmacy academic who has undertaken tertiary training in qualitative research and published previous rural qualitative studies. Interviews were conducted at a time convenient to the participant and were audio-recorded. Sixteen interviewees were at their workplace during the interview, four were at their home. There were no non-participants present. No interviews were conducted face-to-face due to COVID-19 restrictions. Examination of the literature and previous research informed the schedule of interview questions and it was piloted with three rural pharmacists, not included in this study (Appendix D). A definition for expanded practice is beyond the scope of this study, however for the purpose of the interviews and to provide some clarification, examples of expanded services were provided to the participants.

Interview recordings were transcribed verbatim, and participants, people and places were de-identified in the transcription process. Basic demographic data including age, gender, occupation and postcode were also collected in the interview. Field notes were recorded and revised.

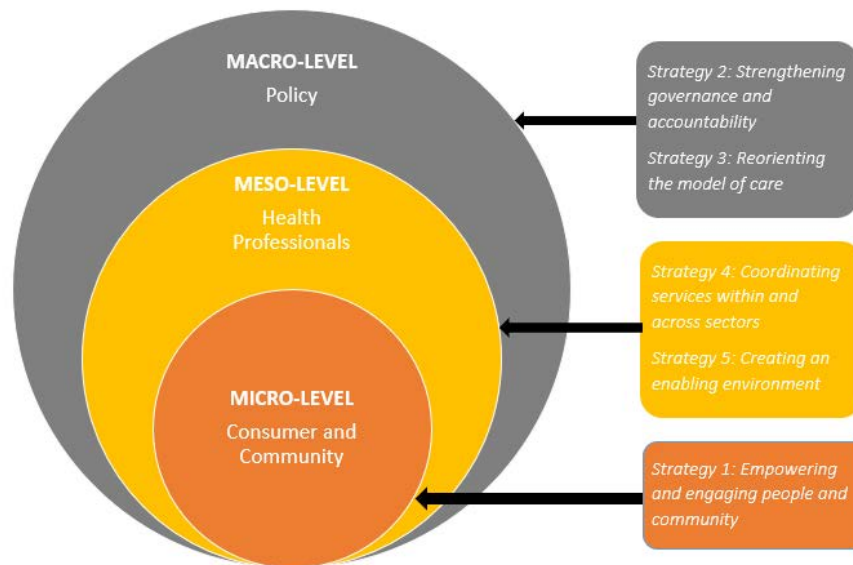
### Data Analysis

Data were analysed using a hybrid approach of inductive and deductive coding and theme development using NVivo 12 software.<sup>12,13</sup> This style of thematic analysis incorporated both the data-driven inductive approach and the deductive priori template of codes approach.<sup>13</sup>

Transcriptions were read multiple times and an initial code list was created from the first seven transcripts. Thematic analysis followed and codes which were conceptually similar were categorised into emerging themes, using an ethnographic technique of domain analysis.<sup>8</sup> Objectivity, assumed knowledge and bias were minimised by a second member of the research team, who also analysed the first eight interviews and discrepancies were resolved. Four participants were involved in a member checking process to support credibility and validity of the data. These participants were

provided with their coded transcript and code book to ensure code/theme interpretations were an accurate and representative portrayal of their voice. Minor changes were made to their transcripts in this process. No new themes emerged after analysis of fifteen transcripts, thus theoretical sufficiency was considered achieved. However, five additional interviews were conducted to ensure no new themes emerged from additional interviews.

A theoretical framework was applied to the analysis based on the World Health Organisation (WHO) framework for integrated people-centered health services.<sup>14</sup> The WHO framework provides five strategies to address the vision that all people have equitable access to quality health services.<sup>14</sup> The strategies have been linked to a multi-level lens of perspective, macro-policy (strategy 2 and 3), meso-health professional (strategy 4 and 5), and micro-consumer and community (strategy 1) levels to provide a framework for the thematic analysis.<sup>14</sup> [Figure 8-1]



**Figure 8-1:** Thematic analysis framework adapted from the World Health Organisation (WHO) Framework on integrated, people-centred health services.<sup>14</sup>

### Ethics Approval

James Cook University Human Research Ethics Committee granted ethical approval (H7845) (Appendix H).

## 8.4 RESULTS

Twenty interviews were conducted: twelve with rural and remote pharmacists and eight with stakeholder representatives. The interview duration ranged from 13 to 60 minutes, averaging 36 minutes. Pharmacist participant demographics are summarised in Table 8-1.

**Table 8-1:** Demographic data for pharmacist participants (N =12)

Participant characteristics	Number (%)
Age	
- 25-35 years	5 (42%)
- 36-45 years	4 (33%)
- 46-55 years	1 (8%)
- 56+ years	2 (17%)
Gender	
- Male	4 (33%)
- Female	8 (67%)
State	
- Queensland	4 (33%)
- New South Wales	3 (25%)
- South Australia	2 (17%)
- Victoria	1 (8%)
- Tasmania	2 (17%)
MMM Categories	
- MM3 – Large Rural Towns	1 (8%)
- MM4 – Medium Rural Towns	1 (8%)
- MM5 – Small Rural Towns	4 (33%)
- MM6 – Remote Communities	5 (43%)
- MM7 – Very Remote Communities	1 (8%)

Table 8-2 provides the data categories derived from the thematic analysis with a description of the codes incorporated. Direct quotations are numbered (PX-Pharmacist or SX-Stakeholder) with a non-identifying descriptor included.

**Table 8-2:** Coding table aligned to the World Health Organisation (WHO) framework on integrated people-centered health services strategies.<sup>15</sup>

Name	Code Description	Exemplar
<i>Strategy 1 - Empowering and engaging people and community</i>		
Pharmacy connection to community	Descriptors relating to pharmacy and pharmacists' connection to rural and remote communities.	<p><i>'We are a highly trusted profession, particularly in our community people really trust what you do, they'll trust the services.'</i> (P11-MM6)</p> <p><i>'Part of pharmacy is that people know it's most convenient...just being able to walk in and talk with the most accessible health professional available in Australia... is your pharmacist.'</i> (P4-MM6)</p>
Existing expanded services	Description of expanded services that pharmacies are currently offering.	<i>'I brought a chronic pain service pharmacist on board...pharmacy plays quite a large role in chronic pain management in a multi-disciplinary approach.'</i> (S7-MM1)
Expected consumer demand	Expectation of consumer demand for expanded services.	<i>'Most patients are very warm to the fact that they can get services from pharmacies. The classic example is vaccination.'</i> (P10-MM5)
Expected consumer outcomes	Expectation of consumer outcomes that would arise from providing expanded services.	<i>'Well, it could only be a positive because anything that helps improve the consumers' health and avoids them having to go into a doctor's clinic or into hospital, it's only going to keep the community more productive.'</i> (P2-MM3)
<i>Strategy 2 – Strengthening governance and accountability</i>		

Governance	Responsibility of the government and professional associations to provide health service governance and frameworks for expanded services.	<p><i>'I would love a formalised minor ailment service that was transferable to everything that we could do now and in the future.'</i> (P1-MM4)</p> <p><i>'I think the Pharmacy Guild needs to support it.... is enhanced practice something on the Guild's agenda?'</i> (S15-MM6)</p>
Accountability	Responsibility to ensure pharmacists are insured and supported when providing expanded services.	<i>'There's got to be things like regulatory assurance, professional indemnity insurance, Pharmacy Board, AHPRA (Australian Health Practitioner Regulation Agency), all those sorts of legal bits and pieces'</i> (P3-MM5)
Terminology	The importance of clearly defining terminology to describe expanded practice.	<i>'An undefined term though, expanded practice...it encompasses a lot of things.'</i> (P8-MM6)
<i>Strategy 3 – Reorienting the model of care</i>		
Access and availability of health professionals	Current accessibility and availability of health services and health professionals. e.g., waitlists, consistency of providers, rapport building.	<p><i>'In rural areas we haven't got those health resources and services that they do have in the cities. Here there is one doctor, yes, they do squeeze many people in if they must, but to make an appointment is difficult.'</i> (P10-MM5)</p> <p><i>'There's often a lack of service, they might have to wait two weeks to see a GP for example. There's a lack of health professionals right across the board.'</i> (P11-MM6)</p>
Defining expanded service priorities	Recognising local disease burden and gaps in current	<i>'In most instances it really is about trying to fill those needs</i>

	health service delivery to ensure a targeted approach.	<i>and fill a consumer gap.’ (S6-MM1)</i>
Patient-centred healthcare	Ensuring services have a person-centred primary healthcare approach.	<i>‘Making sure a patient is able to access a service at an appropriate time through an appropriately trained healthcare professional conveniently and have choice in how to do that.’ (S6-MM1)</i>
Expected pharmacist outcomes of expanded services	Expected outcomes that could result from the implementation of expanded pharmacy services.	<i>‘An incentive to come out to do rural and remote work is to actually extend your scope of practice when you’re out here.’ (S17-MM6)</i>
Technology innovation	Incorporating technology in expanded service delivery. e.g. telehealth, dispensing software and electronic health records.	<i>‘They seem to focus on rural areas having lots of online services and that doesn’t always necessarily fit what people are after.’ (P1-MM4)</i>
<i>Strategy 4 – Coordinating services within and across sectors</i>		
Coordination and collaboration	Relationships with existing health professionals including communication and appropriate referrals.	<i>‘We have a wonderful relationship with GPs, we work as a team.’ (P10-MM5)</i>  <i>‘The doctors, if they don’t know that a service is happening, or what’s happening at the pharmacy, they get really put off by anything new.’ (P1-MM4)</i>
<i>Strategy 5 – Creating an enabling environment</i>		
Pharmacist capacity	Pharmacists’ capacity to provide expanded services in current workflow.	<i>‘If it’s a single pharmacist, you can’t dispense and provide services at the same time.’ (P16-MM5)</i>  <i>‘A goal could be that every pharmacy in Australia should be able to hire a second pharmacists through</i>

		<i>professional services.’ (P12-MM5)</i>
Training	Training considerations including quality, cost and relief staff.	<i>‘The training needs to be there, but then there needs to be the backfill of support to allow those people to do that training, that in itself is a challenge.’ (P3-MM5)</i>
Space and equipment	Space and equipment considerations to provide expanded services.	<i>‘Most rural pharmacists would have a room because I’ve now got two private consult rooms.’ (P1-MM4)</i>  <i>‘We have a vaccination room and two consult rooms. That is very important for providing a professional service. Privacy was always an issue, now less so.’ (P10-MM5)</i>
Remuneration	Remuneration considerations for pharmacist services. e.g., consumers’ willingness to pay.	<i>‘Even though customers say they’d be happy to pay for the services, my experience for pretty much everything we’ve ever tried is unless it’s heavily subsidised or it’s free then they don’t tend to do it.’(P11-MM6)</i>

## **MACRO-LEVEL - POLICY**

### **Strategy 2: Strengthening governance and accountability:** <sup>14</sup>

Both stakeholder and pharmacist participants discussed accountability and clinical governance as important issues. Further exploration of these ideas was challenging as there were many different opinions about what ‘expanded practice’ was and the way it differed from ‘full scope of practice’ and ‘extended practice’. The pharmacy associations preferred the terminology ‘full scope of practice’. Some pharmacist participants had difficulty in identifying whether services provided in their pharmacies such as Webster packing, blood glucose, blood pressure and cholesterol testing were expanded or standard practice.



*'Expanded or enhanced, denotes that it's something above and beyond the scope of a pharmacist. So, I prefer talking about pharmacists practising at full scope and enabling legislation to allow pharmacists to practise through the full extent of their scope.'* (S6-MM1)

All pharmacist participants wanted professional pharmacy associations to advocate for a national approach to support the development and clinical governance of expanded services. Jurisdictional issues between states and territories in Australia were described as a barrier to implementing these services nationally.

*'Moving from singular state and territory approvals is an issue that's acknowledged with some consistency across the country needed as an important part of moving these services forward.'* (S6-MM1)

Without a clear governance structures, professional role conflict was raised as a potential and present risk.

*'You will always see the Australian Medical Association go on about pharmacists treading into the doctors' space, and I think that's a really political thing'* (P8-MM6)

The importance of participatory governance was raised in respect to involving community participation in policy development.<sup>14</sup> The unique setting of rural and remote practice was identified and the need for approaches to be adapted for this environment were described.

*'Remote pharmacy in Queensland is a wonderful case in point of being the most decentralised state in the country and having legislation that's been informed by people who are mainly in metropolitan areas. They miss the demand and need in some of the remote areas and the necessity to have a level of flexibility in legislation.'* (S7-MM1)

### Strategy 3: Reorienting the model of care: <sup>14</sup>

Reorienting the model of care has identified themes including access and availability of health professionals, defining expanded service priorities, patient-centered healthcare, expected pharmacist outcomes of expanded services, and technology innovation. Despair and frustration in relation to the current availability and accessibility of health professionals in rural and remote areas was expressed by most participants. Difficulties with attracting and retaining health professionals, extensive waiting times to see both GPs and allied health professionals and vast distances required to travel to access many services was described.

*'We only have flying doctors coming to the community every couple of weeks and they only stay in the community for a couple of days. The clinic can be booked up a month or two ahead and people won't see any doctors until a couple of months later.'* (P9-MM7)

*'We don't have a medical centre within a 300 km radius.'* (P5-MM5)

Defining health priority areas was described as important when considering expanded services in rural practice. Ensuring that services were not duplicating existing services and that any new services responded to an unmet need was discussed as important.

*'During the drought we found that we were having lots of conversations with farmers who couldn't afford things and who were really down because of the drought. So, all my pharmacists and all my staff have accredited mental health first aid training.'* (P1-MM4)

*'If pharmacy can provide a service for the patient who wouldn't be able to see the doctor on the same day it's appropriate. Or otherwise, they would need to drive about one hour or so to the hospital to see the doctor and it means sitting there for five to six hours before they can be seen.'* (P9-MM7)

The importance of patient-centred healthcare was discussed with a focus on ensuring that the patients remain the priority in developing expanded services. Profiting from pharmacies and resistance from the medical profession was discussed in context of those issues being less important than ensuring that consumers can access quality healthcare from any provider in their community.

*'What about the consumer, why does doctors' territory even come up, that should not be the primary consideration for any health professional because we all took an oath to do good and do better, so the first thing that should be said is, what is best for the consumer, always.'* (P4-MM6)

Participants described expected pharmacist outcomes from expanded practice. Professional satisfaction of pharmacists was discussed, and it was expected that if pharmacists were able to practice to their full scope then they would be more satisfied professionally and more willing to remain in their roles.

*'We're trained to have a greater scope of practice, job satisfaction-wise it absolutely is essential. We can't be churning out scripts for 30 or 40 years, it's just not professionally satisfying. The biggest leaving group is the 35-year-olds that do churn out scripts for 15 years and then go, I'm out. So, for professional satisfaction as well as much as anything else, I think we need to seriously look at scope of practice.'* (P5-MM5)

*'We've got this network of 5400 pharmacists; we've got all these bright people with a four-year degree...full of information and we're training them to be thoroughbreds and then they come into community pharmacies and they become draft horses.'* (P10-MM5)

Concern for professional burnout was also raised by participants. Understaffing in rural areas and pressure by pharmacy owners on young pharmacists to generate income through remunerated services has pharmacists working in stressful environments.

*'Make sure that this doesn't become a burden and create all sorts of issues such as mental health...and psychological issues, because eventually they will say, bugger this, I'm going back somewhere else.'* (P3-MM5)

## **MESO-LEVEL – HEALTH PROFESSIONALS**

### **Strategy 4: Coordinating services within and across sectors:** <sup>14</sup>

Engaging and consulting with all health providers including GPs and hospital staff when designing and developing expanded services was described as essential for the services to be successful. Maintaining good professional relationships with health providers in their communities with particular emphasis on GPs was described by eight participants.

*'In rural communities especially because there's a limited number of GPs, our relationships are 10 out of 10. Because we work as a team, we know each other, we live in the same community. We both have the patient as the primary person in the transaction.'* (P10-MM5)

The significance of these providers in both accepting referrals and directing patients to appropriate pharmacy services was discussed.

*'If we're going to have extended services let's not set up silos, let's have an incorporated, integrated sort of thing with other local healthcare providers.'* (P3-MM5)

Some participants described a current lack of collaboration with health providers, even in remote settings, as detrimental to health service provision and a critical barrier to implementing expanded services.

*'It's already fragmented because we don't get much communication from the doctors and if we do, we're having to really push hard to get the proper response...They don't have the resources in terms of time to have those really good relationships and meetings to make sure that patients do get their continuity of care.'* (P2-MM3)

A lack of support from GPs was also expected from some participants with comments made about providing services within community pharmacies without outside promotion to avoid negatively impacting existing relationships with GPs.

*'Some of the services that we offer, we don't actually advertise, say, vaccinations because I don't want to upset my relationship with GPs in town.'* (P4-MM6)

#### **Strategy 5: Creating an enabling environment:**<sup>14</sup>

Creating an enabling environment to provide expanded services was discussed most frequently by participants. This included pharmacist capacity, training, space, equipment, and remuneration. Ongoing issues such as difficulty attracting and retaining rural pharmacists was widely discussed. Pharmacist participant's views on pharmacists' capacity varied widely. Some explained that their pharmacies had adopted new workflow design and employed additional pharmacists to be able to provide a range of professional services, and others described themselves as sole-pharmacists with limited time to do anything in addition to dispensing medicines.

*'If you've got a pharmacy that's only going to put one pharmacist on, they can't do all those services. We always have two pharmacists on at any one time and one is focused on professional services and the other one is focused on checking the prescriptions and the traditional supply and demand of that.'* (P4-MM6)

Suggestion of the need to provide support to pharmacies to allow them to implement services and ensure they are viable was made.

*'They need someone to financially support the second pharmacist for six months, develop all of the professional services, get the income coming through from those services to then be able to say that, yes we can sustain a second pharmacist.'* (P3-MM5)

Both pharmacists and stakeholders agreed that ensuring pharmacists are adequately trained by accredited providers to provide expanded services would ensure consumer and health professional confidence in expanded services.

*'Having a level of training so that pharmacists have the knowledge and skills to perform the tasks that are associated with whatever area of scope and practice that they're looking to do more in is important for health professionals and consumer confidence.'* (S6-MM1)

An issue with turnover of pharmacists and the ability to retain pharmacists who had undertaken additional training was also raised.

*'The transient nature of pharmacists is difficult. When you're putting training into a program and then somebody that's critical to that program then moves into another role or just leaves town.'* (P4-MM6)

Private consultation rooms were described as necessary for providing services. All pharmacist participants except one had private rooms available at their workplace.

*'Private rooms have been really good to educate our customers that we can do more than just provide your prescription and it does give a safe space to talk to them about their health, in a private and secure setting. And that has been a really positive experience for us.'* (P4-MM6)

There was consensus that remuneration is critical to the success of any expanded services. Participants indicated that if these services were remunerated appropriately, allowing their sustainable delivery, workforce recruitment and retention due to increased professional satisfaction would improve.

*"For these services to be long term and become a part of the line-up of the primary healthcare landscape, funding is important. It might see more pharmacists moving to rural practice."* (S6-MM1)

Pharmacist participants described professional services (not expanded services) that they provide at no cost to increase consumer loyalty and provide a competitive edge. However, the need to ensure pharmacists are remunerated for their time, whether that be from government or consumers, was described as important. Appropriate remuneration is expected to allow pharmacies to employ additional pharmacists to provide expanded services and save government funding by reducing patient numbers presenting to emergency departments.

*'The biggest barrier is the willingness to pay and who funds something like that?'* (P11-MM6)

*'I don't know many pharmacies now whose professional services are generating an income but it's about building rapport with our community.'* (P4-MM6)

Conflicting comments were made regarding consumers' willingness to pay. Some participants did not expect consumers to pay and instead expected them to wait in hospital emergency departments and others described success with services that they had implemented whereby consumers paid for consultations.

*'I have pharmacist services where consumers are paying for private pharmacist consultations over tele-health. There is precedent and they'll pay, it's all about the demonstrated value and quality that they get and embedding that into a service.'* (S7-MM1)

#### **MICRO-LEVEL - CONSUMER AND COMMUNITY**

##### **Strategy 1: Empowering and engaging people and community:<sup>14</sup>**

Participants described a strong connection between rural pharmacy and community. Convenience, accessibility and relationship building with consumers were core aspects discussed with regard to pharmacists being well respected and trusted in their communities.

*'We see a lot of our customers almost on a weekly basis. We're probably one of the best healthcare providers to help determine what someone's usual health state is...we see a lot of people coming to us before they go to doctors. So, we're very much working in that screening area anyway.'* (P2-MM3)

Pharmacists were also described as the constant in a rapidly changing health workforce for rural and remote areas.

*'The pharmacist might be the most consistent health service in a particular remote area or region and there's certainly a number of regions, particularly in Queensland where there is no core practitioner but there is a pharmacy.'* (S6-MM1)

Existing expanded services were discussed from state, national and international perspectives. The Queensland urinary tract infection trial<sup>15</sup> was described as an innovative service that was needed in

rural and remote settings where getting immediate GP appointments were difficult. Many participants were immunisers, and they described the success of the pharmacist immunisation program in increasing vaccination rates and improving access for patients.

*'Vaccinations are a very important thing...it's now one of the accepted pharmacy services...a significant number of people who receive that vaccination for flu do so through community pharmacies. So, it's definitely part of our landscape and it definitely fits within the part of the healthcare team to provide that service.'* (S6-MM1)

Consideration of the demand from consumers for expanded services had conflicting response. Participants explained that they expected that consumers would have a positive attitude towards pharmacists providing expanded services. They described patients' willingness to pay for vaccination services even though they would be able to receive free vaccinations at their GPs, the convenience was enough to justify the cost for them.

*'We're quite a dusty little town and lots of people with health issues, asthma or COPD (chronic obstructive pulmonary disease), which qualifies them to get the funded NIP (National Immunisation Program). The funny thing is, some of them don't actually want to go up to the doctors so they come to me and they're willing to pay for it. I feel a bit annoyed that we can't give them the free one because they are entitled to it.'* (P16-MM5)

In contrast some participants described consumer groups that would rather attend hospital than pay a fee for service at a pharmacy. In addition, concern that pharmacists may not be well received if providing services that are traditionally provided by doctors was raised, however the changing landscape of health was recognised whereby consumers are becoming more receptive to innovative models of care.

*'Even though they might be happy to go to a pharmacy if there's a cost of even AUD\$25 they are probably more likely to go up to the emergency department and wait for five hours.'* (P11-MM6)

*'The only barrier might be comments like, pharmacists don't do this, but I think that will be overridden if it's meeting a gap, if you're cutting down time for me, as a*



*patient.’ (S15-MM6)*

Frustration and concern regarding poor patient outcomes in rural areas and the connection to limited health services were made.

*‘In rural areas, we know that people die at a younger average age than in metropolitan areas and that basically is a crime. People in rural areas die at a younger age because they don’t have the same amount of medical services available to them than they do in the cities.’ (P10-MM5)*

In addition, patient time and health system cost savings were expected with consumers being shifted out of hospital emergency departments and referred into more appropriate primary care settings.

*‘You’ve taken a step out of that process, so you’ve saved a doctor’s visit. You’ve potentially saved the Commonwealth some money and you’ve saved the patient some time, particularly because if they’re going to have to wait one or two weeks for an appointment, they may decide not to do that, or not to go to the doctor.’ (S15-MM6)*

## 8.5 DISCUSSION

Pharmacists’ and stakeholders’ perspectives are highly valuable in providing insight into micro-, meso- and macro-level considerations to guide the design and development of expanded services. The importance of strong governance and the need for distinct clarity around terminology to describe a framework is essential to ensure that health professionals, pharmacists and the wider community understand the expanding role of rural community pharmacists. The importance of appropriate training and continued professional development to support pharmacists and encourage retention of the rural pharmacy workforce through professional satisfaction has also been highlighted. In addition, the expected improved consumer outcomes with savings in patient time and cost, as they are redirected to available care providers has been proposed. However, to ensure viability of any innovative service, appropriate remuneration, which may be from consumers or government funding, will be essential for sustainability in future practice.

Strong governance requires a participatory approach to policy formulation, decision-making and performance evaluation at all levels of the health system.<sup>14</sup> The findings from this study describe a significant lack of governance in Australia to support expanded practice. The first step in this process is standardising the terminology used around expanded practice. At present the terminology is confusing for both stakeholders and pharmacists. In Australia there is no clearly defined vernacular and as a result terms including extended, expanded, enhanced, and advanced are often interchanged.<sup>5</sup> The lack of clarity around terminology has pharmacists uncertain if services they are currently providing are expanded or standard practice. Peak professional bodies have called for a formal and system-wide recognition of expanded practice to improve the support for expanded roles in rural and remote settings by 2023.<sup>2</sup> Developing a clear definition of expanded practice that can be understood by all health professionals and the community will be the first step in developing governance structures to support these expanded practice models.

Currently, there is no formal policy or framework to support pharmacies to implement expanded services and consequently few pharmacies have been able to successfully implement new and innovative professional services. Jurisdictional boundaries between states in Australia provide another barrier to expanded practice due to the need for any new service to pass individual state legislation and this has been seen with the recent introduction of the Queensland Pharmacist urinary tract infection (UTI) trial.<sup>15</sup> The trial is an endorsed model of care whereby eligible trained community pharmacists can provide empirical treatment to non-pregnant women with acute uncomplicated cystitis through the supply of antibiotics.<sup>15</sup> The trial would be more robust if it were implemented nationally, however individual states and territories would need to work through policy level barriers. This highlights the need to review jurisdictional legislation to ensure that trialed expanded services can be easily implemented at a national level upon successful completion. The importance of coordination and collaboration with other health providers when developing and implementing expanded services was highlighted in this study. This has also been found in a trial of an Australian Minor Ailments Scheme (AMAS).<sup>16</sup> This trial utilised co-design to collaborate with primary health networks and general practitioners to utilise integrated information technology platforms to generate referrals from pharmacists to doctors and create a bidirectional communication line between pharmacists and GPs.<sup>16</sup> In the AMAS trial 894 patients participated with 524 receiving care through the minor ailments scheme, the remaining receiving usual pharmacy care.<sup>16</sup> Those who received care through the minor ailments scheme had significantly higher rates of appropriate medical referrals, adherence to referrals, appropriate recommendation of nonprescription medicines, self-reported symptom resolution or improvement and self-reported health related quality of life.<sup>16</sup> The success of the AMAS trial has demonstrated significant

opportunity for pharmacists, GPs and health professionals to better collaborate for improved healthcare for their patients.<sup>16</sup>

The need for remunerated services was a major finding in this study. Historically, pharmacists providing services at no cost has placed the profession in a difficult position financially and often impacted the sustainability of services.<sup>17</sup> Expectation that appropriate remuneration for services would allow pharmacies to offer viable services for which they could staff with additional pharmacists available to focus on professional services was a common finding in this study. In the rural and remote context where significant health and socioeconomic disadvantage exists, inherent discrimination faces patients who are unable to access timely appointments with bulk-billing GPs.<sup>18</sup> Thus patients may be more willing to pay for a service due to extensive GP waiting times, or it may mean that government funding will be required to ensure patients are able to access care in appropriate settings. The urgent need for viable remuneration models has been reverberated by the International Pharmaceutical Federation that has called for the development of a successful remuneration model to be developed to promote the sustainability of professional services that is integrated into broader health system strategies and therefore, funding plans.<sup>19</sup>

Although this study found that expanded services are expected to be valued by communities, opposing viewpoints on consumers' willingness to pay for services were identified. Some pharmacists described successful services such as vaccinations whereby consumers were choosing to pay for pharmacy services even though they would be eligible for funded vaccinations at their general practitioners. This finding has also been found by a Western Australian vaccination study in which more than 2000 consumers who were eligible for funded vaccines chose to pay at participating pharmacies.<sup>20</sup> In contrast other pharmacists in this study described previous failed services when consumers were required to pay and an expectation that consumers would rather wait in hospital emergency departments than pay for a pharmacy service. In survey study (N=406) of rural consumer perspectives of expanded practice it was found that one-third of consumers would not pay for services, one-third would pay less than AUD\$20 and one-quarter would pay AUD\$20-29 per hour of service delivery.<sup>21</sup> This demonstrates that although understandably some consumers currently would not be willing or able to pay, a greater percentage of consumers are willing to pay for services that they value. This in addition to Government funding options needs to be considered when developing a framework.<sup>21</sup>

The rural pharmacy workforce shortage was described in this study and raised as a potential barrier to expanded practice.<sup>22</sup> However there was an expectation that pharmacists being able to work to a

full scope of practice in remote settings, may encourage more pharmacists to choose to work rurally and this may improve the pharmacy workforce shortage. In Canada, where expanded services are far more embedded into the health system, pharmacist personality traits and workload have been found to play a role in pharmacists' willingness to provide expanded services.<sup>23</sup> The importance of training was also found by this study to ensure that any service provided was of high quality and provided by appropriately trained pharmacists. Ensuring pharmacists receive accredited training will provide the community and other health professionals with confidence that the service they are receiving is of professional excellence. This is expected to cement the trusted connection between the local community and rural pharmacists, as valued members of the healthcare team, which has been made many times before and reinforced in this study.<sup>24</sup>

### **Limitations**

Participants were recruited via convenience sampling thus the findings are not generalisable to the population. Volunteer selection bias may be present in this study, whereby those with strong opinions, whether positive or negative, were more motivated to participate. This may have resulted in data saturation being achieved early. In addition, data were not analysed with respect to the different types of roles of community pharmacists, e.g., owner, manager, or years of experience and this may have influenced perceptions. Future studies into this area would benefit from exploring the different opinions from various community pharmacist groups related to positions and years of experience. Stakeholder demographics were omitted from the article due to privacy issues.

## 8.6 CONCLUSION

Internationally, pharmacists are successfully providing expanded services through minor ailment schemes that are recognised, respected, valued, and most importantly funded by national health systems. These services are seeing patients being redirected into pharmacies to receive appropriate care at a significantly reduced cost in both time and money for both the consumers and the health system. Rural pharmacists working in an environment where patient access to health services is limited and health outcomes are poor are well placed to provide expanded services. Rural pharmacists and stakeholders have identified considerations for designing and developing expanded services and have highlighted the urgent need for this work to be done to create an integrated framework of expanded practice. The expansion of services in rural and remote practice is expected to improve pharmacists' professional satisfaction and health service access and as a result potentially improve health outcomes.

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## Chapter 9 – Health Professional Interviews

This chapter is the second qualitative publication from this study and is published in the journal *Rural and Remote Health*. The research was conducted by semi-structured interviews with health professionals working in rural and remote locations across Australia. This original research article provides multi-level enablers and barriers from the health professional perspective to be considered for rural pharmacists to provide expanded pharmacy services.

**Taylor S, Cairns A, Glass B. *Expanded practice in rural community pharmacy: a macro-, meso and micro-level perspective*. Rural Remote Health. 2021; 21:6158. <https://doi.org/10.22605/RRH6158>**

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

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Beverley Glass

*Permission obtained from RRH for the inclusion of this published journal article.*



## 9.1 ABSTRACT

*Background:* Expanding community pharmacists' scope of practice in rural and remote locations has the potential to improve access to healthcare and health outcomes. Internationally, a lack of support from other health professionals (HPs) has presented a barrier to the uptake of expanded pharmacy models. However, rural allied health workers including pharmacists already work across an extended scope using generalist and specialist skills to meet unique community needs with limited infrastructure for support. Limited data on expanded practice from Australia prompted this study to explore Australian rural and remote doctor, nurse, and allied health perspectives of expanded pharmacy services in non-metropolitan settings.

*Methods:* An ethnographic lens of rural culture was applied to this descriptive qualitative study. Semi-structured, in-depth interviews were conducted with HPs working in rural and remote locations in Australia. Inductive and deductive thematic analysis was guided by a multi-level lens of macro- (policy level), meso- (HP level) and micro- (consumer and community level) perspectives. The World Health Organisation (WHO) framework for integrated people-centred health services provided strategies to align to the theoretical framework for the analysis.

*Results:* Twenty-three rural and remote HPs (doctors (8), nurses (4), allied health professionals (11)) participated. Key themes identified included: supportive government and funding provisions (macro); collaboration with other health providers (meso); ensuring pharmacists have the required knowledge, skills, quality assurance and safety measures in place (meso); pharmacists' capacity including time and space (meso) and opportunity to empower and engage consumers through rural community pharmacies (micro).

*Conclusions:* As pharmacists internationally continue to develop their expanded scope of practice, these results provide the first evidence for Australian rural pharmacists to consider when planning for and developing expanded practice models. Recognition of challenges and motivators for pharmacists' expanded practice are highlighted. Engagement of both government and rural health providers are seen as crucial for expanded models of pharmacy practice to evolve to deliver improved health outcomes for rural and remote communities.

*Keywords:* extended practice, models of care, pharmacy practice, pharmacies, remote, scope of practice

## 9.2 INTRODUCTION

An expanded role for pharmacists, although emerging in Australia, has been a priority for pharmacy associations globally.<sup>1</sup> Terms including ‘expanded practice’, ‘extended practice’ and ‘pharmacists’ full scope of practice’ describe the extension of the pharmacist’s role.<sup>2-4</sup> Expanded services are described as tasks usually provided by other health professionals (HPs) and offered in addition to pharmacists’ usual medication management services.<sup>4</sup> Rural Australian community pharmacists have been recognised as being well positioned to expand services to address adversities of healthcare access for rural and remote populations.<sup>5</sup>

The Australian National Rural Health Commissioner (ANRHC) has suggested that rural allied health workers, including pharmacists, already work across an extended scope using generalist and specialist skills to meet diverse community needs with limited infrastructure.<sup>6</sup> The Pharmacy Guild of Australia (PGA) has recently submitted a paper to the ANRHC describing the benefits of pharmacists practicing to their full scope, particularly for rural and regional communities, where healthcare resources are limited, and health outcomes are far worse than in metropolitan areas.<sup>5</sup> Access to quality healthcare, regardless of how remote people live, should be equal to that available in metropolitan areas and as a result, cost-effective, innovative, needs-based models should be given due consideration.<sup>5</sup>

Low acceptance by other healthcare providers, in particular general practitioners (GPs) has been described as a major barrier to pharmacists’ ability to provide these expanded services.<sup>1</sup> Considering that a shared care, multidisciplinary person-centered approach has been proposed by the ANRHC to improve access, distribution, and quality of healthcare, understanding HPs’ perspectives of expanded pharmacy services is important.<sup>6</sup> There is also a need to identify expected barriers and enablers for expanded practice in Australia. Predicting informal and formal factors which shape both individual and organisational behaviour, and ultimately practice outcomes when implementing new services is challenging.<sup>7</sup> The macro-, meso-, and micro- analytic frame can be effective in health research to understand these complex interactions.<sup>7</sup> Current literature examining HP perspectives of potential expanded pharmacy services has largely reported on the GP-pharmacist interaction<sup>8-11</sup>, while perspectives of other HPs are underrepresented. For the pharmacy profession to undertake a paradigm shift to expanded practice, perspectives of other health professionals on how to design the extended role in a collaborative way is important to understand.<sup>7</sup> Thus, this study aimed to explore

rural and remote health HPs' (doctors, nurses, and allied health) perspectives of expanded pharmacy services in rural and remote settings.

### 9.3 METHODS

#### Study Design

A descriptive qualitative study with an ethnographic lens of rural culture was conducted.<sup>12</sup> In-depth semi-structured telephone or face-to-face interviews with 23 rural HPs were completed. Rural and remote is defined using the Modified Monash Model and all participants working in MM3 – MM7 (large, medium, and small rural towns and remote and very remote communities) were included.<sup>13</sup>

#### Participants, Setting and Recruitment

92 Australian rural HPs participated in a questionnaire about expanded pharmacy practice during July-September 2019.<sup>14</sup> Participants were recruited through various Australian rural health networks and invited to participate in a subsequent interview and received no incentives for participating in the survey or interview.<sup>14</sup>

#### Procedure and Semi-structured Interview

All HPs who expressed an interest in participating were provided with a description of the project and on agreement to participate, written consent was obtained.<sup>14</sup> The interview was scheduled for a time and location convenient to the participant. Previous current research in the area and examination of the literature informed the schedule of interview questions (Appendix D).

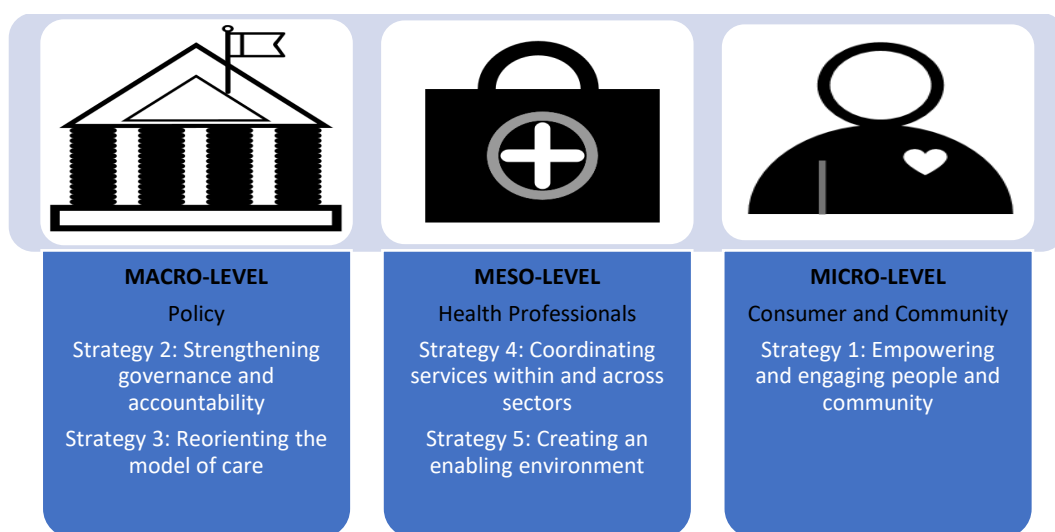
Interviews undertaken by an experienced rural pharmacy academic were audio-recorded and de-identified in the transcription process. Participants provided basic demographic data including, age, gender, occupation, and postcode.

#### Data Analysis

All interviews were transcribed verbatim. Data were analysed by multiple readings of the transcripts, with coding and categorising into emerging themes. To ensure objectivity, assumed knowledge and bias were minimal, a second member of the research team reviewed the first five interview

transcripts and coding. Member checking was also undertaken by five participants, to support credibility and validity of the data. These participants were provided with a coded transcript and code book, to determine if the code/theme interpretations were fair and representative and to ensure an accurate portrayal of their voice. Participants were provided the opportunity to make changes to their transcript and provide suggestions for data interpretation, however none chose to do so. Data saturation was achieved after 15 interviews, however the researcher continued to interview (and include in analysis) the remaining eight participants, who had volunteered to ensure that there were no discernible new themes or linkages between themes.

Preliminary conventional content analysis of eight transcripts and field notes allowed the development of an initial list of codes, which were inserted into a coding manual with codes that were conceptually similar grouped together using an ethnographic technique of domain analysis.<sup>12</sup> The preliminary analysis was undertaken manually and a refined analysis using a hybrid approach of inductive and deductive coding and theme development followed for all the transcripts using NVivo 12.<sup>15</sup> The World Health Organisation (WHO) framework for integrated people-centred health services provided the theoretical model with the multi-level lens of macro- (policy level), meso- (health professional level) and micro- (consumer and community level) perspectives applied to the analysis.<sup>16</sup> Within the WHO framework, five strategies have been proposed to address the vision that all people have equal access to quality health services.<sup>16</sup> These strategies have then been aligned with macro- (strategy 2 and 3), meso- (strategy 4 and 5), and micro- (strategy 1) levels to provide a framework for the thematic analysis. [Figure 9-1]



**Figure 9-1:** Thematic analysis framework based on the World Health Organisation (WHO) Framework on integrated, people-centred health services.<sup>16</sup>

## Ethics Approval

James Cook University Human Research Ethics Committee granted ethical approval (H7845) (Appendix H).

## 9.4 RESULTS

Of the 92 HPs' who participated in the questionnaire, 29 provided contact details to participate in an interview, six were unable to be contacted. Twenty-three interviews were conducted, duration from 17 to 50 minutes, averaging 29 minutes. Participant demographics are summarised in Table 9-1. Participants were in Queensland (17), New South Wales (1), Victoria (2), Northern Territory (1) and South Australia (2). A broad range of allied HPs (n=11) participated with no more than 2 from each discipline. Disciplines included occupational therapy, physiotherapy, speech pathology, exercise physiology, public health nutrition, podiatry, and Indigenous health. Medical professional specialities (n=8) included general practice (7), emergency retrieval (2), women's health, Indigenous health, and mental health with some doctors specialising in more than one area. Nursing specialities (n=4) included midwifery (3), chronic disease, remote practice, and emergency retrieval.

**Table 9-1:** Demographic data for health professional participants. (N =23)

Participant characteristics	Number (%)
Age	
- < 25 years	2 (9%)
- 25-35 years	5 (22%)
- 36-45 years	7 (30%)
- 46-55 years	2 (9%)
- 56+ years	7 (30%)
Gender	
- Male	5 (22%)
- Female	18 (78%)
Occupation	
- Allied Health	11 (48%)
- Nurse	4 (17%)
- Doctor	8 (35%)
MMM Categories	
- MM3 – Large Rural Towns	1 (4%)
- MM4 – Medium Rural Towns	0 (0%)
- MM5 – Small Rural Towns	4 (17%)
- MM6 – Remote Communities	16 (70%)
- MM7 – Very Remote Communities	2 (9%)

Data categories derived from the thematic analysis are provided in Table 9-2, together with a description of the codes incorporated. HPs' direct quotations are numbered (PX-) with their primary occupation provided.

**Table 9-2:** Coding table aligned to the World Health Organisation (WHO) framework on integrated people-centred health services strategies.<sup>16</sup>

Name	Code Description	Exemplar
<i>Strategy 1 - Empowering and Engaging People and Community</i>		
Rural health	Descriptions of health diseases and concerns within rural and remote communities.	<i>'The high rates of mental illness compared to the national average.'</i> (P11-General Practitioner)
Proposed expanded pharmacy service	Perspective of pharmacists providing of various potential expanded pharmacy services.	<i>'They should be able to prescribe a certain list of medicines.'</i> (P1-Public Health Nutritionist)
Engaging consumers and communities in health	Connection to people and opportunity to engage rural and remote residents including specific cultural considerations.	<i>'You could attack people as they come through the door and do some screening or provide some referral pathways for them right then and there.'</i> (P8-Podiatrist)
<i>Strategy 2 - Strengthening Governance and Accountability</i>		
Accountability	Responsibility of the government to provide equitable health services to marginalised groups.	<i>'They are going to have to recognise the need for more staff, more funding.'</i> (P22-Aboriginal Health Worker)
Resources	Utilisation of current resources including local health professionals and providers to meet the health needs of consumers.	<i>'If you can get an appointment with a doctor then do it through the doctor but if your doctor's flat out doing other stuff than that seems like a reasonable option for pharmacists to do those sorts of things.'</i> (P6- General Practitioner)
Integration and coherence	Integration of pharmacists into general practice and expected coherence of health service delivery.	<i>'Pharmacies actually being in GP buildings...a multidisciplinary approach...you would have one health centre, and everyone is there...one stop shop, instead of everyone's egos competing.'</i> (P23-Registered nurse/midwife)

<i>Strategy 3 - Reorienting the Model of Care</i>		
Access	Current accessibility of health services and health professionals. e.g., waitlists, consistency, rapport.	<i>'It's a six-month waiting period to see the occupational therapist.'</i> (P7-Nurse Practitioner/Midwife)
Technology	Innovating and incorporating new technologies in expanded service delivery. e.g. telehealth, electronic health records.	<i>'If pharmacist was identifying patients that needed exercise physiology referral and they were supporting that referral with a telehealth consultation.'</i> (P16-Exercise physiologist)
Defining health service priorities	Understand local burden of disease, antibiotic resistance patterns and gaps in health service delivery to ensure a targeted approach.	<i>'Depends on what sort of services are provided locally and if they are filling gaps that aren't being provided by other services and the availability of services within their communities.'</i> (P6-General Practitioner)
Holistic, preventative, comprehensive healthcare	Ensuring healthcare has a person-centred primary healthcare approach with a focus on health promotion and well-being.	<i>'If we eat well, sleep well, move well, we will have better mental health ... so teaching good primary healthcare techniques and principles first and foremost.'</i> (P23-Registered Nurse/Midwife)
Outcomes of expanded services	Expected outcomes that could result from the implementation of expanded pharmacy services.	<i>'This could actually increase referral pathways into allied health professionals or specialist appointments.'</i> (P8-Podiatrist)
<i>Strategy 4 - Coordinating services within and across sectors</i>		
Coordination and collaboration	Coordinated and collaborative practice with multidisciplinary models, effective communication, and appropriate patient referrals.	<i>'I would be happy for a pharmacist to be part of the team, but I think it would be bad if it was in isolation.'</i> (P4-General Practitioner)
Expanded practice for other health professionals	Perspective of other health professionals providing expanded services.	<i>'I really think we should expand the provision of allied health and GPs or nurses, nurse practitioners, rather than getting a pharmacist to do it.'</i> (P5-General Practitioner)
Expanded practice for pharmacists	Perspective of pharmacists providing expanded services.	<i>'That's not the pharmacists' area of expertise, they have the expertise in the drugs.'</i> (P9-General Practitioner)

<i>Strategy 5 - Creating an Enabling Environment</i>		
Pharmacist - community connection and accessibility	Pharmacists' connection to local community and relationships with consumers. Accessibility for all extended times and places.	<i>'Pharmacies are so well accessed within rural communities; I think that you really are a pivotal place where people attend and go to and you are generally kind of seeing what their health looks like through their medications and what they are buying within those pharmacies.'</i> (P8 – Podiatrist)
Quality assurance and safety	Pharmacists' skills and knowledge limitations, equipment confines and risks to patients and pharmacists.	<i>'They have got to think about things like STIs, whether it could be herpes, I'm worried about them missing more serious things, herpes can present as pain on urinating so can STIs.'</i> (P9-General Practitioners) [Context: Managing urinary tract infections]
Pharmacist conflict of interest	Professionalism concerns of pharmacy and financial conflicts of interest resulting from business models of community pharmacies.	<i>'It is a very clear conflict of interest if a pharmacist is going to portray themselves in a way that will remind the patient of being a doctor then they need to be not making profit over selling junk. It is a very clear, very clear conflict of interest.'</i> (P4-Doctor-Emergency retrieval)
Health professional resistance	Resistance to expanded services due to encroaching on other disciplines specialty areas of practice.	<i>'There will be a bit of push back from other professions, the doctors will be horrified that you are stepping into doctor areas or the nurses will be horrified that you're stepping into here.'</i> (P7-Nurse Practitioner /Midwife)
Pharmacist capacity	Time, space, equipment, and staffing considerations to provide expanded services.	<i>'Do they really have the capacity to be able to sit down and do a half an hour suicide risk assessment or 15-minute foot check.'</i> (P11-General Practitioner)
Pharmacist skills and knowledge	Perspective of pharmacists' current skills and knowledge	<i>'Communication, they have to learn communication, use</i>



	and the required training to provide expanded services.	<i>culturally appropriate ways, they have to have cultural awareness.' (P22-Aboriginal Health Worker)</i>
Funding and payment systems	Factors to consumer for remuneration of pharmacist services. e.g. government funding, consumer payment.	<i>'In our community, no, people don't like to pay, unless they are dying, and even then... there is a bit of a culture out here that there is that expectation that it should be government funded.' (P15-Occupational Therapy)</i>

## **MACRO-LEVEL - POLICY**

### **Strategy 2: Strengthening governance and accountability:**<sup>16</sup>

This overarching strategy includes the following themes: accountability, resources, integration and coherence.

Supportive governance from pharmaceutical, medical and allied health associations, in addition to government backing, was described by participants as essential for the effective development of expanded pharmacy services.

*'The Government would have to be on board with it, more support for the pharmacist and the community. You've got a specialist person there, why wouldn't you give them the extra training to utilise them in other areas?...There is not enough doctors...Why can't they use a pharmacist?' (P22-Aboriginal Health Worker)*

Participants felt that the Australian Government should be accountable to ensure equitable access to healthcare for rural and remote people and that an expanded pharmacy model would potentially provide this access for some services.

*'There is a lot of value in the idea [expanded pharmacy practice],...the roll out would probably be hard...government could support it in remote areas...consumers would benefit from it, ultimately consumers would benefit from pharmacists being able to do more screening and identifying of issues.'* (P14-Physiotherapist)

Integration of pharmacists into general practice and multidisciplinary teams was discussed by participants, as an alternative model of expanded pharmacy practice. Participants suggested this integration would ensure coherence of health messages and patient care.

*'Integrating pharmacists into GPs where they could actually do medication reviews inside the practice would be much more useful than being separated...it should be part of a team...it should not be fragmented or stand-alone...one of the risks is that we are getting more fragmented with the silos...it makes it more confusing for the patients.'* (P10-General Practitioner)

### Strategy 3: Reorienting the model of care:<sup>16</sup>

Reorienting the model of care to embrace expanded practice incorporated themes including, access, technology, defining health service priorities, holistic, preventative, and comprehensive healthcare and expected outcomes of expanded services.

Isolation and the distance to healthcare providers, waiting two to six weeks to see a GP, visiting specialists two to three times a year and the inability to attract or retain allied HPs were described as common problems for rural and remote communities. Consequences of the limited level of service provision described by participants included visiting practitioners only being able to provide care to the most high-risk patients. Participants from remote communities frequently spoke about the dependence on nurses to screen and provide ongoing care for all conditions. Patients attending emergency departments for issues that could be easily managed in general practice was described as occurring regularly because of the difficulty and costs associated with accessing GPs.

*'To get an appointment the normal way like a phone call or the internet, about a six to seven week wait...I work in a rural community where we could quadruple the amount of GPs and we might just be able to meet demand.'* (P11-General Practitioner)

*'Allied health is not always stationed in a rural setting. Often they are fly-in-fly-out ...or their caseloads are just ginormous...they only see the children who are disordered as opposed to delayed.'* (P12-Speech Pathologist)

Most participants saw the potential for pharmacists to expand their clinical practice to address the unmet need described. Strategies to support this included better utilisation of telehealth including considering pharmacists as facilitators for telehealth appointments.

*'...whether it happens through the local hospital, pharmacy or doctor ... it's important for towns to have that telehealth service. That's a very good service for patients so they don't have to travel.'* (P6-General Practitioner)

Participants identified key considerations for developing an expanded pharmacy model. These included local healthcare needs, local health service capacity and deficits, and community demographics. This was described as particularly important in Indigenous communities. The importance of a community consultation process to develop any future expanded pharmacy service

model was made. Participants felt the visiting nature of many allied health services and medical specialists was an enabler for the development of expanded pharmacy as pharmacists are often permanent members of the community, available extended hours, and weekends.

Pharmacists providing preventative care services including screening and education was explored by several participants. The capacity for pharmacists to provide fast-tracked referrals to either visiting HPs or facilitate timely telehealth appointments was suggested as a model that could significantly improve patient access. Concerns about pharmacists being able to implement procedures to ensure appropriate communication to all health providers and recall systems to follow-up patients was also discussed.

*'We should be focusing on primary healthcare, first and foremost, stop treating the acute, start planning for primary care, maybe in 40 years, we will solve some issues...there are some primary healthcare elements that any HP can actually deliver...including a pharmacist, nurse, doctor or psychologist.'* (P23-Registered Nurse/Midwife)

The expected outcomes of pharmacists providing expanded services were both positive and negative. There was optimism that pharmacist-delivered services would improve consumer engagement, health outcomes and increase the provision of collaborative care amongst health providers in rural and remote communities. There were expectations that pharmacists would be able to provide more appropriately directed referrals with adequate information for visiting specialists prior to them arriving in a community. In addition, an expected reduced demand on GP services was also a possibility which would allow GPs more time to provide quality healthcare and reduce patient waiting times.

*'The more that pharmacists are able to expand their services and use their skills the better. It will take the pressure off local GPs, emergency departments and hospitals.'* (P18-Registered Nurse)

There was however some concern that pharmacists providing screening services for conditions including mental health or diabetes would be identifying and referring more people into an already overloaded system, resulting in patients having longer waiting times to receive treatments. Alternatively, other participants expected a positive outcome as it would demonstrate true health need and potentially increase funding for these services.

## **MESO-LEVEL – HEALTH PROFESSIONALS**

At the meso-level challenges and enablers to implementing expanded services that require further consideration were described.

### **Strategy 4: Coordinating services within and across sectors:**<sup>16</sup>

Coordination and collaboration amongst HPs were a core discussion point. All allied HPs and nurses expressed support for expanded pharmacy practice, however, GPs were less accepting.

*‘I have both fears but also hopes, so in areas where there is clear need to improve access to primary care services, I can see that an expanded role for community pharmacists would be fantastic.’ (P20-General Practitioner)*

There was consensus amongst the allied HPs participating, that those working in resource poor, isolated areas were regularly expanding their scopes of practice for the benefit for their patients, without additional training.

*‘All allied health fields, nursing and medicine need to work in expanded practice format. Everyone just shifts a little bit further out to create more coverage...there needs to be a bit more of everyone being given more skills to do more.’ (P1-Public Health Nutritionist)*

GPs were also supportive of pharmacists undertaking clinical measurements and altering medication regimens providing it was in a collaborative manner, with rapid communication and referral back to GPs for ongoing care.

*‘If I’ve got a patient who is consistently above target with their BP...I would be happy for a pharmacist that I trust to call me and say, ‘we have done some out of clinic readings and they are consistently this’ That would be appropriate, or at least as long as they communicate it, maybe adjust medication and arrange appropriate GP follow-up.’ (P11-General Practitioner)*

Participants described what they believed would improve the likelihood of success of implementing an expanded pharmacy model. These included strong professional relationships, common patient-centered goals and co-location of service providers to improve efficiency of resource use and referral

pathways. Frequently discussed as a potential enabler was a model that included effective communication between providers and shared medical records.

*'If it's in a rural community where you work collaboratively with your local pharmacy and you know that the patient, they are better off going to the pharmacy than they are to emergency, then they should be able to.'* (P11-General Practitioner)

#### **Strategy 5: Creating an enabling environment:** <sup>16</sup>

Creating an enabling environment for expanded services included concepts of pharmacist accessibility, pharmacist and community connection, quality assurance and safety, HP resistance, time and space, pharmacist skills and knowledge and funding considerations.

Pharmacists and pharmacies were recognised as widely accessible and well connected to people in rural and remote communities, with extended operating hours and various services attracting consumers.

*'The pharmacist we have here has a really good reputation...consistency of people already on the ground is important, utilising the current community pharmacist would be a big enabler.'* (P2 – Occupational Therapist)

*'I trust a good pharmacist, in a small town they are one of the most very respected people because they're open on the weekends, they do little favours for you, they help you navigate the medical system.'* (P17-General Practitioner)

Quality assurance and safety was described as a concern by many participants. Risks of expanding scope of practice for pharmacists included the potential for providing incorrect information, inadequate quality of care and causing patient harm. Concerns over patients delaying seeing doctors in preference for pharmacist services and the consequence that this delay may cause (e.g., worsening conditions) were also described. Similarly concerns around misdiagnosis due to underlying or complex health issues was discussed. GPs raised concerns over missing opportunities with patients to undertake comprehensive healthcare assessments if patients were not attending GP practices for services such as vaccinations. Equipment issues such as point-of-care testing inaccuracies, inadequate specificity, quality control and calibration requirements and costs were raised. The potential increase in antibiotic resistance from inappropriate prescribing of antibiotics

was also highlighted.

Concerns about pharmacists not having the time required for complex patients, patients having health concerns identified without the capacity for management and patients disengaging from services due to receiving mixed messages and having too many people involved in care were also discussed.

*'I have seen in Indigenous health where too many people get involved in chronic disease and they get too many mixed messages and the patients give up.'* (P9-General Practitioner)

Conflict of interest was a theme described often by GPs and less commonly by allied HPs. Pharmacists' financial interest through business models and a desire for profitability was highlighted as a competing interest that could be detrimental to patients involved in expanded services. Specific mention was made about pharmacists prescribing and the need for separation between a prescriber and the person profiting from providing the medicine.

Time and space considerations were described by participants who suspected that pharmacists would not have the required time to provide expanded services and noted an already evident shortage of pharmacists in rural and remote areas.

*'It's about capacity too, we talk a lot about pharmacists doing extra stuff, but do they actually have capacity.'* (P7-Nurse Practitioner/Midwife)

Pharmacists' skills and knowledge to provide expanded services was described as pertinent to the provision of expanded services. Participants' confidence in the capability of pharmacists to provide expanded services varied depending on the service. Many participants made mention of the fact that they did not know what level of training pharmacists received and based their comments on professional and personal interactions with pharmacists.

*'I find it hard to comment on pharmacists because I don't really comprehensively understand all their training...community pharmacists are probably better equipped than hospital pharmacists...they are highly trained, if you think about a pharmacist...I think they are the most medically minded of all the allied health.'* (P11 – General Practitioner)

*'They have the skills to do some prescribing. I think they probably know the medications better than GPs so in terms of other assessments I don't really know what they learnt in their course. '(P1-Public Health Nutritionist)*

Participants suggested pharmacists providing expanded practice could have an additional title, to indicate additional training or skill to provide assurance to the community and other HPs.

*'There would have to be strict standards if you are saying you are providing extended services, you would have to have a title, expanded practice pharmacist, something behind them to make sure you have ticked all your boxes, so maybe it is an accreditation.'* (P8-Podiatrist)

Participants empathised with how difficult training and upskilling can be due to cost and isolation and suggested using other local or visiting HPs to upskill the pharmacist.

Most participants agreed that pharmacists should be remunerated for expanded services, however they expected that consumers would not be willing to pay for the services. It was suggested that pharmacies often advertise free services and consequently consumers would expect expanded services to be provided at no cost also.

*'What I've seen is that pharmacies offer free screening, free this, free that. So, I think that at least from my cultural background, I would expect for a service to be free at the pharmacy.'* (P12-Speech Pathologist)

*'Ultimately at this point, either the pharmacist is copping it on the chin and just hoping that they picked up a few bits and pieces that they can put through their till. It's going be the patient paying for the entire cost, but I think there is a role for Medicare stepping in and saying these are the item numbers that pharmacies have and can access like the optometrists.'* (P6-General Practitioner)

## **MICRO-LEVEL - CONSUMER AND COMMUNITY**

The micro-level of the analysis examines HP perspectives of current rural health issues, specific expanded services rural pharmacists could provide and the potential of these services to empower and engage people with health.



### **Strategy 1: Empowering and engaging people and community:**<sup>16</sup>

Participants reported chronic conditions including mental health, diabetes, cardiovascular, renal, and respiratory disease as the most prevalent health concerns in rural communities. Infectious diseases including dermatological conditions, otitis media, rheumatic heart disease and bronchiectasis were also common conditions for very remote participants. Many of these conditions are related to socio-economic disadvantage, cultural diversity of rural populations and limited access to health services.

*'A lot of it is socially related just because of some of the unique characteristics of the population out here, e.g., Indigenous population, shift work population, FIFO (fly-in-fly-out) population, the people who are living and working out here who are estranged from their families of origins and support systems and the high rates of alcohol abuse out here, which is the accepted culture in this town.'* (P11-General Practitioner)

Participants recognised that pharmacists are well positioned to engage with a large proportion of community members. Many participants were supportive of pharmacists providing screening services including mental health, diabetes, cardiovascular disease, acute infections (urinary tract and sexually transmitted infections) and speech and language disorders, provided strong referral pathways were in place. There was also consistent support for pharmacists to provide patient education particularly around health-literacy and self-management. Allied health participants were generally supportive of pharmacists prescribing and saw this as a way of reducing GP burden.

*'People come into your pharmacy two times a week if people are on multiple medications. You are making contact a lot more than what a speech pathologist or a physiotherapist or even sometimes a GP would see the patient so for that reason [pharmacists] would be really good to screen stuff.'* (P3-Physiotherapist)

Participants proposed that pharmacists' connection to their communities and patients have them well placed to recognise changes in patients' conditions and the need for further action. This connection is particularly important for Indigenous clients who may be resistant to travelling for healthcare.

*'Some people don't even realise anything is wrong or don't think anything is an issue, they are home and that's all that matters. If there was someone there, to identify an issue then*

*you may be able to get a tele link set up. It's just that you're that go between, that link you know.'* (P22-Indigenous Health Worker)

*'By having a relationship with the patient, pharmacists are in a much better position to actually recognise deterioration or change in that patient.'* (P23-Registered Nurse-Midwife)

## 9.5 DISCUSSION

Literature regarding rural and remote HP's perspectives of expanded pharmacy practice is limited. Exploration of perspectives will therefore go some way to providing direction to guide the Australian pharmacy profession to develop effective and sustainable expanded pharmacy models in a rural and remote context.

### **MACRO-LEVEL - POLICY**

The first National Rural Health Strategy developed 25 years ago described the need for 'innovative models of rural service delivery...to meet the diverse healthcare needs of rural communities'.<sup>17</sup> Although recognised, there is still no national strategy, and no specific mention of the current or potential contribution of rural community pharmacies to meet the healthcare needs of our rural and remote communities.<sup>17</sup> This highlights the need for the Australian pharmacy profession to raise their profile and progress rural community pharmacy on the national health agenda.<sup>17</sup>

Expectation that the Australian Government provide support and governance for expanded pharmacy services was raised as pertinent to the success and financial sustainability of expanded models. The Pharmacy Guild of Australia has proposed that pharmacists should have access to Medicare Benefits Schedule funds when delivering services to consumers irrespective of where the pharmacist is practicing (within community pharmacies, GP practices or multidisciplinary teams).<sup>18</sup>

Results from this study have highlighted the importance of community consultation to ensure that development of an expanded pharmacy model is based on individual community needs. This local problem-solving approach would be likely to ensure that expanded services were filling gaps, and not duplicating current health services. It is a regular frustration that much of the current health funding is ineffective and wasted in rural and remote communities as a 'one size fits all' approach is applied to service provision.<sup>17</sup> However, a local approach may not be conducive to macro-level advocacy. Strong community engagement in all aspects of the health service provision, particularly

in Indigenous communities, is well recognised.<sup>17</sup> However, funding models and health system structures often do not support this level of innovation.<sup>17</sup>

Generally, HPs in this study were supportive of expanded pharmacy practice models that focused on preventative, holistic care as part of the primary healthcare team.<sup>17</sup> Expanded pharmacy models were identified in this paper as one potential strategy to resolve the barrier of rural health workforce maldistribution and address health service gaps. This has been identified in international studies where pharmacy-based services and ambulatory care pharmacists have reduced GP burden and demonstrated significant economic savings.<sup>19</sup>

### **MESO-LEVEL – HEALTH PROFESSIONALS**

This level encompassing HPs and health organisations was most frequently discussed. Although expanded practice for pharmacists was supported in this study, there was some lack of consensus from GP participants. There was agreement in the value of pharmacists performing medication management tasks and particular mention of the value of pharmacists working within GP practices or Primary Healthcare centres. This aligns with previous studies that have demonstrated GP support for pharmacists to work within their current scope of practice to assist with tasks including providing advice to patients, particularly about medicines and reviewing medications.<sup>10</sup> However, previous studies have also raised GP concerns about fragmentation of care, if pharmacists were to undertake additional roles, and this was also found to be a concern for some GP participants in this study.<sup>9-10</sup>

A wide agreement from allied HPs about the benefit of all rural allied HPs providing expanded practice for areas of need was found in this study, however some GP participants only supported expanded practice for nurses.

Resistance from other professionals should however not deter innovation in this area. The physiotherapy profession globally has been progressing their expanded practice (advanced physiotherapy practice)<sup>20</sup> to include diagnosis, triaging surgical candidates, ordering diagnostic imaging or laboratory tests and prescribing/injecting medicines.<sup>19</sup> This has been in response to GP shortages and rising healthcare costs.<sup>20</sup> Australian physiotherapists have expressed support for some of these models.<sup>20</sup> Likewise rural pharmacists have also reported very high levels of support for the implementation of expanded pharmacy services for their rural and remote communities.<sup>21</sup>

The importance of coordination and collaboration to deliver patient-centred care cannot be underestimated. Canadian pharmacists working in expanded roles have described a lack of a team based approach from other health providers and particularly GPs not valuing services pharmacists can provide.<sup>1</sup> This reluctance to work collaboratively was also identified in this study, however many participants described this approach as achievable if the expanded models are developed in consultation with healthcare providers working in the practice. GP concerns about pharmacists' skills and knowledge to provide quality healthcare were also identified. This is not specific to GPs or pharmacists, as a lack of understanding other professionals' roles and competencies has been described as one of the main barriers to interprofessional collaboration in primary care.<sup>22</sup>

Environmental considerations of expanded practice were discussed in depth in this study. Concerns about pharmacists' time available and ability to provide quality assurance and safety were put forward as major barriers. Many participants acknowledged the existing pharmacist shortage in the rural workforce and expected this to be a limiting factor to expanded practice. This concurs with other studies of expanded practice in rural areas internationally.<sup>23</sup>

#### ***MICRO-LEVEL – CONSUMER AND COMMUNITY***

Rural community pharmacies' ability to empower and engage people in health through community pharmacy accessibility was described as an enabler to expanded practice. Rural pharmacists were described as well-respected HPs with strong connections to people in their communities. Participants recognised that pharmacies are often accessible at times when other providers are not and are well placed to provide patient education and empower patients to self-manage their own health. The PGA reiterates this by stating that on average patients visit their community pharmacy 14 times per year.<sup>24</sup> A recent survey of rural and remote pharmacy consumers identified 96% (N=406) were supportive of expanded pharmacy services and 94% expected that the expanded services would improve health outcomes of people in their community.<sup>25</sup> Viability however depends on high uptake to support any funding models or to substantiate claims for improved health access. Canadian pharmacists providing expanded services have identified low levels of understanding amongst the public about expanded services as a major barrier.<sup>1</sup> This highlights the importance of community education and promotion as part of any implementation strategy for an expanded practice model.

## Limitations

Although participants involved were from various health sectors, states, and territories with differing rurality, many interviewees were from Queensland, Australia. Therefore, the results may be applied broadly to rural practice and not specifically to health settings or localities. In addition, other stakeholders including pharmacists, policy makers, local government planners and consumers were not part of the interview panel and thus further study to explore additional enablers and barriers to expanded practice for rural pharmacy and provide a more in-depth analysis of macro factors is needed.

## 9.6 CONCLUSION

Expanding pharmacy practice in the rural and remote context has been proposed as an initiative to improve rural people's access to quality healthcare. Barriers to expanded practice have been identified across all levels of health including, political support, funding considerations, environmental suitability, pharmacist capacity and community uptake. Despite these barriers positive outcomes are expected including a more cohesive approach to healthcare, improved referral pathways and increased empowerment of consumers in self-management. This study provides pharmacists and rural health leaders the first insight into potential barriers and facilitators of expanded pharmacy practice in rural and remote Australia from the group perspective of other HPs. Expanded pharmacy practice will only evolve if both government and rural health providers are engaged to contribute to the design and development of models to deliver better health outcomes for rural communities.

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## Chapter 10 – Health Professional Interviews - Role Theory

This chapter is the third qualitative publication from this study and is published in the journal *Pharmacy*. The research was conducted by analysis of interview data from health professionals working in rural and remote locations across Australia. This original research article identifies role theory and its categories in the context of rural pharmacists expanding their scope of practice to provide expanded services.

**Taylor S, Cairns A, Glass B. *Role Theory: A Framework to Explore Health Professional Perceptions of Expanding Rural Community Pharmacists' Role.* Pharmacy. 2020; 8,161**

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

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*Permission obtained from Pharmacy for the inclusion of this published journal article.*

## 10.1 ABSTRACT

Pharmaceutical care is a concept which has moved the pharmacy profession from their primary focus on the product to optimising drug therapy for the individual patient. Expanded pharmacy practice beyond pharmaceutical care will further challenge the role perceptions that other health professionals have about pharmacists. Role theory as a philosophical perspective was used to explore rural and remote health professionals' beliefs on pharmacists expanding their clinical role by conducting twenty-three semi-structured interviews. Five role theory categories described the data, role ambiguity, role conflict, role overload, role identity and role insufficiency. The health professionals interviewed were found to be uncertain about the boundaries between the traditional roles of the pharmacist compared to that of the expanded roles. A perceived lack of accountability by pharmacists was a major contributor to role conflict, which in turn was found to impact the ability of pharmacists and other health professionals to work collaboratively. Perspectives of other health professionals on pharmacists adopting expanded practice models has highlighted significant concerns with role conflict and role identity. Acknowledging and developing clear strategies to address these concerns is essential to ensure that expanded pharmacy practice can be effectively integrated to improve access to health services and thus health outcomes for rural Australians.

*Keywords:* pharmacy practice; model of care; expanded practice; extended practice; full scope of practice

## 10.2 INTRODUCTION

A pharmacist can be defined as a person whose job is to prepare medicines and to sell or supply them to the public in a store or in a hospital.<sup>1</sup> This definition, although accurate, essentially represents only the supply function performed by pharmacists. The role of the pharmacist has however evolved since the early 1900s, when pharmacists were apothecaries preparing drug products for medicinal use.<sup>2</sup> By the 1950s, large-scale manufacturing of most therapeutic agents shifted pharmacists' responsibility to still include some compounding but mainly to dispensing and labelling commercial products.<sup>2</sup> During the mid-1960s, pharmacists assumed a more patient-orientated role and the concept of clinical pharmacy developed.<sup>2</sup> This signalled the start of a rapid transition period of expansion and integration of professional functions and closer interaction with doctors and other health professionals.<sup>2</sup> A pharmaceutical care model was developed in the 1990s to highlight the pharmacists' role in 'the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life'.<sup>3</sup> In the early 2000s, pharmacists

were finally recognised as drug experts who would collaborate with patients, doctors and other health professionals to optimise medication management to achieve positive health outcomes.<sup>2</sup>

Twenty years later, the pharmacy profession has witnessed major developments in health service delivery, especially in metropolitan cities, although these advancements are often not apparent in rural and remote areas.<sup>4</sup> For those living rurally, complex health profiles, shorter life expectancies, higher rates of disease and injury, and poorer access to and use of health services is accepted as the norm.<sup>5</sup> Rural community pharmacists have been identified as highly skilled health professionals who are ideally placed to address these shortcomings by providing a variety of expanded services, including disease screening and management, vaccinations and health promotion.<sup>6</sup> For rural pharmacists working in this challenging environment, their role is often poorly defined with ambiguous boundaries to their recognised scope of practice.<sup>7</sup>

Pharmacists are now well recognised as medication experts with a primary role of ensuring the safe, effective and judicious supply of medicines.<sup>8</sup> However, they are increasingly expanding their role by developing skills and knowledge to provide expanded services.<sup>9</sup> Community pharmacists are becoming more widely accepted in non-dispensing roles in settings including multidisciplinary clinical teams, general practice, aged care and Indigenous Health Services.<sup>8</sup> As the role of the pharmacist continues to evolve, it is expected that pharmacists will be embedded into all settings where medicines are used or provided in future practice.<sup>8</sup> Various prescribing models including, adapting a prescription and initiating/managing drug therapy have been implemented internationally.<sup>2</sup> In addition, rural community pharmacists worldwide have been trialling and providing expanded services, which include point-of-care testing for chronic disease management (e.g., HbA1c/cholesterol/spirometry), infectious diseases (e.g., malaria/HIV), disease screening, immunisation and mental health management.<sup>10</sup>

This expansion of the role of the pharmacist has resulted in various terms being put forward to describe these new roles, including expanded pharmacy practice, pharmacists' full scope of practice, extended practice and a rural scope of practice for pharmacists, all implying the provision of services in addition to medication management.<sup>10-14</sup> These terms are often used interchangeably and with little clarity surrounding their definition.<sup>10-14</sup> The terms are distinct from advanced practice which describes an acquired higher level of expertise to achieve a higher performance level.<sup>13</sup> This highlights a lack of understanding of both the expanded roles and terminology used by pharmacists, other health professionals and the wider community.

### Role Theory

Role theory is defined by Conway as ‘a collection of concepts and a variety of hypothetical formulations that predict how actors will perform in a given role or under what circumstances certain types of behaviours can be expected’.<sup>15</sup> Role theory can also serve as a conceptual framework, which can be used to relate the properties of an organisation or an individual.<sup>16</sup> A description of behaviours, characteristics, norms and values of a person or position in the context of role theory can provide a valuable framework to examine role perceptions.<sup>17</sup> This makes role theory ideal to provide a conceptual framework to explore the perceptions of the role of the pharmacist in expanded practice.

The aim of this study is therefore to explore rural and remote health professionals’ (doctors, nurses and allied health) beliefs of rural community pharmacists’ role in expanded pharmacy practice.

## 10.3 METHODS

### Study Design

An ethnographic lens of rural culture was applied to this descriptive qualitative study.<sup>18</sup> Rural health professionals were interviewed using an in-depth semi-structured interview process.

### Participants, Setting and Recruitment

During July–September 2019, rural Australian health professionals were invited through various rural health networks after completing a questionnaire to nominate to be interviewed.<sup>19</sup> To be eligible for inclusion in the study, these health professionals needed to be working in a rural or remote location as defined by the geographical classification system Modified Monash Model, i.e., working in large, medium, and small rural towns (MM3-5) or remote and very remote communities (MM6-7).<sup>20</sup>

### Procedure and Semi-Structured Interview

All health professionals who expressed interest in participating in an interview were contacted by email; provided with an information sheet; and if agreeable to the interview, returned written informed consent. Interviews were audio recorded and de-identified in the transcription process. Demographic data including age, gender, occupation, and postcodes were collected. The schedule of

interview questions was informed by previous research in the area and review of the literature (Appendix D).

### Data Analysis

All interviews were transcribed verbatim, coded, and categorised into emerging themes. Objectivity assumed knowledge and bias were minimised, and five participants were engaged in a member checking process to ensure that their code/theme interpretations were an accurate representation of their voice. After 15 interviews, data saturation was achieved; however, the remaining eight participants who had volunteered to participate were included in the interview and analysis process to ensure that no emergence of new linkages or themes occurred.

The initial conventional content analysis of ten transcripts and field notes resulted in the creation of an initial code list. A coding manual containing the initial codes was then developed, and those codes that were conceptually related were combined into categories using an ethnographic technique of domain analysis.<sup>18</sup> Analysis was initially performed manually on paper, followed by a refined analysis, with the assistance of software program NVivo 12<sup>21</sup>, using a hybrid approach of inductive and deductive coding.<sup>22</sup>

A simplified role theory framework derived from Hardy and Conway 1988 has been applied to the analysis.<sup>23</sup> The framework describes role constructs that are related to a role episode (cycle of role sending, a response by the focal person and the effects of that response on the role senders).<sup>16</sup> Five role constructs derived from Hardy and Conway 1988 were found in the analysis and termed as themes [Table 10-2].<sup>23</sup>

## Ethics Approval

James Cook University Human Research Ethics Committee granted ethical approval (H7845) (Appendix H).

## 10.4 RESULTS

Twenty-three interviews were conducted face-to-face (7), via video conference (2) and via telephone (14). The interview duration ranged from 17 to 50 min, with an average duration of 29 min.

Demographic data is summarised in Table 10-1.

**Table 10-1.** Demographic data for role theory participants (N = 23).

Participant characteristics	Number (%)
Age	
- < 25 years	2 (9%)
- 25-45 years	12 (52%)
- 46+ years	9 (39%)
Gender	
- Female	18 (78%)
- Male	5 (22%)
Occupation	
- Allied Health	11 (48%)
- Nurse	4 (17%)
- Doctor	8 (35%)
MMM Categories	
- MM3/4/5 – Small/Medium/Large Rural Towns	5 (21%)
- MM6 – Remote Communities	16 (70%)
- MM7 – Very Remote Communities	2 (9%)

The health professionals interviewed were in Queensland (17), New South Wales (1), Victoria (2), Northern Territory (1) and South Australia (2). They included: doctors (n = 8) specialising in general practice (7), emergency retrieval (2), women's health, Indigenous health, and mental health; nurses (n = 4) specialising in midwifery (3), chronic disease, remote practice, and emergency retrieval; and allied health (n = 11) including occupational therapy (2), physiotherapy (2), speech pathology (2), exercise physiology (2), public health nutrition, podiatry, and Indigenous health. The mean age was 42.3 years (SD = 13), with an age range from 23–59 years. Direct quotations are numbered (PX-) with each health professional's primary occupation provided.

Participants were initially asked to describe the major health concerns for their rural community. Mental health; diabetes; and cardiovascular, renal, and respiratory disease were the most prevalent health concerns described with infectious diseases including dermatological conditions, otitis media, rheumatic heart disease and bronchiectasis reported as common for very remote communities.

*'Chronic disease is a huge concern; being isolated from specialists is a huge health concern. We have experienced mental health concerns with drought, floods and purely isolation as well.'* (P8—Podiatrist)

Participants were also asked if there is a need for community pharmacies to provide expanded services to address gaps in health service delivery. Responses for this comment varied with some participants describing well-serviced communities without the need for pharmacies to expand service delivery and those who described very limited access to health services and the potential expectation that pharmacies could address many gaps in health service delivery.

*'I think it's a great idea. In rural and remote areas, we don't have enough skills; we don't have the people available, so I think that any one of us that is a health professional with a little bit of a broadened scope of practice does help out the clients but also the other health professionals within the area.'* (P8—Podiatrist)

Health professional perspectives of the expanded role of the pharmacist are influenced by political context, professional experiences, and personal interactions with the pharmacy profession. Five major themes based on the role theory framework described the perspectives of the health professionals. Table 10-2 provides definitions of the role constructs and examples from the data.<sup>23</sup>



**Table 10-2.** Definition of role constructs and examples.<sup>22</sup>

<b>Role Construct</b>	<b>Definition</b>	<b>Example</b>
Role ambiguity	Disagreement on the role expectation associated with a lack of clarity of those expectations	<i>'A lot of the time, we just don't know who to go to or who to refer to, and that's both from the health professionals and a pharmacist: just not having a sound understanding of who provides what service.'</i> (P2—Occupational Therapist)
Role conflict	The focal person perceives existing role expectations as being contradictory or mutually exclusive	<i>'Pharmacists want to sell something to make money, and when they're going to be providing the diagnostic and other services, then the incentive is going to be overwhelming.'</i> (P5—General Practitioner)
Role overload	Inadequate resources relative to the possibility of excessive demands	<i>'Time, not having enough time to do all of those things because you are busy doing other things.... You would have to really try and figure out your niche and what you wanted to do or provide, then focus on that level rather than broadening your scope the whole way.'</i> (P8—Integrated Allied Health Manager-Podiatrist)
Role identity	The individual's interpretation of role expectation, that is, position-specific norms identifying the attitudes, behaviours and cognitions required and anticipated for a role occupant.	<i>'When you are doing lots of different things, you're like, 'Hang on a minute, how does this even relate to you?'... You need to have that capacity to bring it back to some core set of beliefs and structure around your professional identity.'</i> (P15—Occupational Therapist)
Role insufficiency	Disparity in fulfilling role expectations, obligations or goals as perceived by self or significant others	<i>'I've been to the chemist and never have seen the pharmacist. Some girl comes out and just gives you the pills. You know, where's that comprehensive consult, or discussion about new medication? It's not there.'</i> (P17—General Practitioner)

### Role Ambiguity

Allied health participants described various levels of uncertainty about a pharmacist's role compared to doctors who felt they had a better understanding of the pharmacist's traditional role. Inadequate knowledge about pharmacist training and even what tasks were considered standard practice for a pharmacist was commonly reported.

*'It would be a benefit for services like remote nurses to understand what is in the pharmacy scope of practice and what you can offer. I don't really know.... I just make ad hoc use of what I can, but I don't really know what you can actually offer and do.'* (P7—Remote Nurse Practitioner)

This lack of clarity was also found for pharmacists' understanding of other health professionals.

*'Having a chat [with] our local pharmacist about what it is that we do, she was like, 'Wow, I didn't realise how broad it was,' and that's really important for us to know because, quite often, pharmacists are the front base in terms of medicine and access to healthcare that clients go to, and for her to advocate who she needs to see for whatever it is they are presenting with is important. The pharmacist here seems to have a limited understanding of what the services are.'* (P2—Occupational Therapist)

The notion that the pharmacy profession operates independently of the medical and allied health groups was also noted. Some participants suggested expanded practice may better incorporate the pharmacy profession.

*'Pharmacy has sort of sat in that awkward middle ground: Are you medical? Are you with the psychologists that don't fit either? Are you actually allied health? Where do you fit in allied health? I think you've always been sort of floating. Doing the expanded services is either going to drag you more into the medical field with the nurses or more towards allied health. You might get adopted somewhere.'* (P3—Physiotherapist)

### Role Conflict

Professional conflict between doctors and pharmacists was most frequently described, and the expectation that pharmacists would be taking business away from other health providers by providing expanded services was also discussed. However, it was recognised that, for some expanded services, information and education is freely available and often not of high quality, and consequently, evidence-based pharmacy services would be an improvement on what is currently provided.

*'The other barrier would be the other health professionals in the area: the doctors might be saying 'You're taking bread from my table, or you're not qualified to provide that service and*

*those sorts of issues', but I think that depends on the services within the town. If the town is strapped for services, anyone with a bit of health knowledge is good.... People are getting dietary advice from their next-door neighbours, and that doesn't put the dieticians out of business.'* (P6—General Practitioner)

Concerns were raised about community pharmacists not being able to separate their business role from their professional services role. Expectations that pharmacists would not be able to provide an entirely professional service due to selling of high sugar foods and products with no evidence-base in conjunction with evidence-based pharmaceuticals was described.

*'Pharmacists could even change some of the things they have in their shops. They dabble in a bit of Darrell Lea [chocolate] stands, placement of that's really important if it's not near the counter. They definitely could influence what people are buying.'* (P1—Public Health Nutritionist)

In contrast, there was recognition that pharmacists are already providing a professional service from within retail pharmacies.

*'Sometimes, it's hard to be the recommender and the provider of a particular treatment... The conflict of interest would be an interesting thing for pharmacists. But I suppose for pharmacies, people are always coming in saying they want something for something, and pharmacists are always recommending things from their shelves.'* (P6—General Practitioner)

General practitioners also raised issues about pharmacists adopting a prescribing role with concern about the extent of training required to prescribe appropriately and quality control processes needed for safe prescribing.

*'I don't know how long pharmacists are going to expect to do extra training for. It's certainly not going to be years unless they all change their profession. So, that's my issue with prescribing, is that we have to know what we're prescribing for.'* (P5—General Practitioner)

*'If [pharmacists] are doing the prescribing, whose checking on them to make sure they are getting it right?'* (P10—General Practitioner)

Many other health professionals were supportive of expanding the scope of practice but agreed that structure and collaboration were needed to ensure clarity and acceptance about pharmacists' expanded role.

*'Have a conversation and collaborate, approach it cooperatively and have a partnership particularly with the GPs (general practitioners). We have been good buddies for a long time back. That sort of partnership can work really well.'* (P6—General Practitioner)

Comments were made about other professions including nurses who have adopted expanded practice and the issues they face with role conflict. Other health professionals, particularly doctors, were reported to be defensive about nurses and nurse practitioners expanding into their professional practice areas, and the issues that can arise for this role conflict were expected to be experienced by pharmacists.

*'You're encroaching!' might come from the medical side. I know as nurses we do get that from certain avenues if they think that we are stealing their work.'* (P19—Registered Nurse)

*'There will be things to manage about push back from other disciplines and other areas because people in health do get very protective of their patch.'* (P7—Remote Nurse Practitioner/Midwife)

In response, it was proposed that practitioners who might be resistant to expanded services and who are not working remotely need to re-evaluate who they expect to provide the health service role if they themselves are not willing to work in small communities.

*'If they are really worried about it treading on their toes, why aren't they out in community doing more? Why aren't they going to the people? What's their reason for not coming to the people? That's where the problem is out there. People don't want to come to them. They don't want to leave their home. They have to cater for them at some point, you know, go to the communities to work.'* (P22—Indigenous Health Worker) (Context: doctor resistance)

## Role Overload

Participants expressed concern about overload and that the pharmacist would be stretched too thin to be able to provide quality service. Inadequate resources including a shortage of pharmacists' time and the lack of availability of pharmacists in the rural workforce was also noted.

*'Can I expect someone to step into that role and be like, 'Yeah, let's give this a go,' when you're expanding your practice in many different areas at the same time, while you're trying to learn everything at once? How can you learn everything very well if you're putting that much pressure on yourself?' (P3—Physiotherapist)*

Some doctors saw the usual role of the pharmacist as sufficient and, thus, felt expanded practice was an unnecessary burden for the pharmacist.

*'The pharmacist role is enough by itself without training for expanded practice.'* (P5—General Practitioner)

It was also suggested that an extension of the pharmacist role may be detrimental to the rural pharmacy workforce in that the expected overload would deter pharmacists from rural practice.

*'They burn out and they don't want to be a pharmacist anymore, and they go back to the city and do something else.'* (P15—Occupational Therapist)

## Role Identity

The importance of role identity was discussed by participants describing the value in pharmacists reflecting on what their core business is and how expanded practice models may detract from this core business.

*'You would need to be really careful about how you define expanded practice and how you link that to what pharmacy is and what pharmacists do. What it's all about? What does it mean? Why am I a pharmacist if I am doing what a nurse is doing? Particularly for newer graduates, lack of professional direction, you can diversify so much that you take away from what is core....'* (P15—Occupational Therapist)

An individual approach to expanding the pharmacist's role was also discussed in the context of each pharmacist having a different level of training, experience, and interest in providing expanded practice based on their experience within their rural community.

*'It is very pharmacist dependent because it is based on the extra skills that they may not have learnt, so that's the good thing about remote pharmacists compared to city pharmacists.'*  
(P4—Emergency Retrieval Doctor)

Consideration of a specific title or accreditation for pharmacists who are trained to provide expanded services was suggested to aid recognition by other health professionals and the community. Similarly, a separation of community pharmacists from those providing professional clinical services was suggested.

*'There should be two sorts of pharmacists: those that are paid a salary, work remote and go by the evidence, and they need to be separated from retail people who have a pharmacy degree and sell rubbish to patients who can't afford it.'* (P4—Emergency Retrieval Doctor)

### Role Insufficiency

Participants expressed concern about pharmacists not managing to undertake their usual medication management tasks effectively and, consequently, not being able to assume an expanded practice role. It was also noted that pharmacists have various skills related to medication management that are not being used effectively.

*'It's a shame because we are not using pharmacists enough in the role that they have got.'*  
(P13—General Practitioner)

Other health professionals including allied health and nurses were suggested as more suitable to perform an expanded role.

*'I don't think pharmacists can step into that role. If anyone can step into that role, it should be a nurse practitioner.'* (P9—General Practitioner)

In contrast, some participants felt the skills required to provide some expanded services included, for example, patient counselling that pharmacists are already well trained to provide, therefore not requiring further education.

*'Low-level counselling type service is a service gap too. We have plenty of psychologists, but the sort of services that the minister used to provide, or the trusted friend used to provide, those sorts of services, would be ok.'* (P6—General Practitioner)

In addition, although it was recognised that pharmacists may not currently have the skills required to provide expanded services, with appropriate training, they may be upskilled to be competent to practice within an expanded scope.

*'Irrespective of your background, you need to be trained to do that. A doctor wouldn't do a hearing test unless they were trained to do it, so if they do the same training as everyone else, I would have no problem with pharmacists doing it.'* (P4—General Practitioner—Emergency Retrieval)

A solution to the anticipated role insufficiency is adopting a collaborative and integrated approach, whereby pharmacists would perform expanded roles within a multidisciplinary team. It is expected that a collaborative model would raise the profile of the pharmacy profession and increase the acceptance of expanded pharmacy practice.

*'It might actually help if they built their structures to actually link in more broadly with the other health services to link and to raise awareness of the role of how the pharmacist can help.'* (P7—Remote Nurse Practitioner)

## 10.5 DISCUSSION

Appreciating the dynamics and interactions of key individuals in expanded models of care is important in developing frameworks, roles, and scope of practice.<sup>17</sup> The necessity to set new practice standards and to establish cooperative relationships with other healthcare professionals is not new for pharmacy and was identified in 1990 by Hepler and Strand with the introduction of 'pharmaceutical care'.<sup>3</sup>

Rural pharmacists in Australia are widely recognised as the most accessible healthcare provider with the potential to deliver a much greater role in the health system.<sup>8</sup> This is common across many countries including Canada and New Zealand that share similar rural issues including a lack of access to health professionals working across vast distances and the consequent emergence of health professionals working to their full scope of practice.<sup>10</sup> The development of expanded services provided by rural pharmacists internationally is demonstrating small but positive impacts on health outcomes in rural and remote communities.<sup>10,14</sup>

Pharmacists' traditional role has been predominately to dispense medicines coupled with clinical review of prescriptions, labelling and professional activities such as medicine counselling to ensure medicines are used safely and effectively.<sup>8</sup> As the scope of the pharmacist continues to evolve, it is important to understand the role theory that underpins other health professionals' perspectives of an expanded role for rural community pharmacists.

A lack of understanding of health professionals' roles and competencies has been recognised as a major barrier to effective interprofessional collaboration in primary healthcare provision.<sup>24</sup> This role ambiguity is also closely tied to role identity, which is highly subjective and based on an individual's (pharmacist's) interpretation of role expectation.<sup>17</sup> Both role ambiguity and identity were frequently identified in this study, with many participants being unsure of the boundary between pharmacists' standard role compared to what would be considered an expanded role and how this expansion of practice would affect the pharmacist's professional identity. Some participants were also uncertain of pharmacists' standard role, and this highlighted the lack of integration of the pharmacist in collaborative care. The lack of clarity about projected roles and expectations, indicative of role ambiguity<sup>17</sup>, is also an issue for pharmacists internationally and particularly in Australia, which has not yet developed a clear framework for expanded practice and consequently terms including extended, expanded and advanced are often used interchangeably, affording confusion.<sup>13</sup> This is despite peak professional pharmacy bodies in calling for a formal and system-wide recognition of advanced levels of practice and better support for expanded roles in isolated practice settings by 2023.<sup>28</sup> Role ambiguity is thus detrimental to the advancement of the pharmacy profession and its ability to collaborate with other professionals. An approach to expanding pharmacy practice, where role identity and role ambiguity is addressed from the outset, would greatly assist pharmacists and other health professionals in connecting with and understanding pharmacists' professional identity and thus in improving professional practice and collaboration. Consequently, it is recommended that pharmacy associations both within Australia and internationally develop a clear and concise



definition of expanded practice that can be understood by all contributors to healthcare and the community.

Role conflict can occur when role occupants who have specific role expectations or certain behaviours associated with them are combined but incompatible.<sup>17</sup> Consequently, one person or group is unable to meet the expectation of another.<sup>17</sup> Nursing participants described instances where they regularly experienced role conflict with other health professionals, particularly the medical profession, with respect to their expanded scope of practice, and therefore, it is likely that pharmacists would experience similar tension. This was demonstrated in this study by a lack of support from GPs for pharmacists to undertake prescribing roles due to inexperience and limited training. In addition, concerns about pharmacists separating their retail businesses from professional practice were raised by some participants. These contributing factors to role conflict align with role boundary issues, scope of practice and accountability.<sup>25</sup> Doctors have also described concerns about accountability of the pharmacy profession, describing themselves as being ultimately accountable for patient care.<sup>25</sup> This notion was not shared by other professionals when exploring interprofessional conflict, with non-GP health professionals seeing themselves as each being accountable for their own work.<sup>25</sup> Any new professional practice model will be required to have a clear delineation of accountability and an expanded scope of practice for the pharmacist is no different.

Pharmacists have themselves raised concerns about their ability to fulfil role expectations in relation to expanded practice. Role insufficiency issues including touching patients, administering injections, making decisions and taking responsibility for decision making were discussed as challenges to providing expanded practice.<sup>26</sup> The question of 'what is a pharmacist' and concern about readiness and ability to assume expanded practice tasks in Canada were identified, and this provides insight into whether pharmacists feel they have the skills and knowledge to expand practice.<sup>26</sup> In Australia, rural pharmacists do not appear to share the same concern. Evidence from a national study found that 91% of rural and remote pharmacists surveyed felt they had the skills and knowledge to implement expanded practice.<sup>27</sup> Regardless of pharmacists' general feeling of competency, any expansion of practice should consider the availability of training to support pharmacists to ensure the provision of quality care for consumers. This notion has been cemented by a review of the literature reporting that pharmacists exhibit attitudes and attributes which favour their involvement in a wide range of healthcare services including expanded practice.<sup>28</sup> Ongoing systemic change is however required to facilitate system-wide extensions of pharmacists' scope of practice.<sup>28</sup>

Role overload can occur in rural and remote healthcare workers when the demands of a particular role exceed the individual person's capacity to perform that role.<sup>17</sup> This lack of capacity is usually due to limitations in time, skill level and education or to complexity of the task.<sup>17</sup> Participants in this study described role overload as likely to occur in expanded practice for rural pharmacists due to limited staff and time available in an already highly occupied professional group. This concern was also shared by rural pharmacists in a study that identified barriers to expanded practice including time and space in addition to the longstanding concern of rural pharmacist workforce shortage.<sup>27</sup> Internationally, Canadian pharmacists expressed a desire for detailed instructions in terms of how to implement an expanded scope of practice, and this may reduce the impact of role overload.<sup>29</sup> This raises an important consideration for the feasibility of an expanded role for rural pharmacists in light of current rural workforce shortages.

### Limitations

Volunteer selection bias may be present in this study, and as such, it is not possible to ensure that all health professional perspectives are presented. Data saturation may have been achieved prematurely because of volunteer selection bias, whereby those with strong opinions, whether positive or negative, were more motivated to participate. However, a strength of the study is that it did include a range of health professionals from various locations to provide rigor and limit bias.

## 10.6 CONCLUSION

The evolving role of the rural pharmacist and the issues associated with the development of expanded scope of practice can be related to role theory. The lack of a clear boundary for the role of the pharmacist and consequent role ambiguity are major contributors to both role and interprofessional conflict. The development of a clear scope of practice including role delineation and competencies would potentially reduce this role conflict. In addition, the development of a system-wide acknowledgement of an expanded scope will also allow pharmacists and other health professionals to better understand pharmacists' professional identity in the context of expanded practice. Shared and clarified accountability for pharmacists working in an expanded role are also likely to reduce role conflict, particularly with medical doctors. Ensuring that pharmacists providing expanded practice services are well resourced, trained, and confident is also expected to limit problems with role overload and role insufficiency. This study has identified the many aspects of role theory that need to be carefully considered and worked through to ensure that the expanded scope

of the pharmacy profession is smoothly implemented in Australia and widely accepted by pharmacists, health professionals and the community.

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## Chapter 11 – Ear Health Scoping Review

This chapter presents a scoping review of published evidence of pharmacists' involvement in ear healthcare interventions. This original research article is published in the journal *Primary Healthcare Research and Development*. Findings from this review have informed the development of an ear health intervention for rural community pharmacy.

Taylor S, Cairns A, Solomon, S, Glass B. *Community Pharmacist Interventions in Ear Health: A Scoping Review*. *Primary Healthcare Research & Development*. 2021; 22, E63. <http://doi:10.1017/S1463423621000487>

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

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Shaun Solomon

Alice Cairns

Beverley Glass

*Permission obtained from PHCRD for the inclusion of this published journal article.*

## 11.1 ABSTRACT

*Background:* In Australia, around 3.6 million people suffer from hearing loss, more than 1.3 million with preventable hearing conditions. Ear diseases are prevalent in Indigenous populations, particularly children and are associated with poor educational outcomes and subsequent high rates of unemployment and incarceration. In Australia, rural and remote communities have rates of middle ear perforations five times the rate that the World Health Organisation regards to be a significant public health problem.

Barriers to accessing ear health services have been identified including gaps in testing during the 'early years' and difficulty in accessing these services. Reducing the risk of hearing loss through improved ear healthcare can directly impact the ability to learn and develop. Collaboration between community, health providers and government are crucial to ensure necessary support for change. An opportunity presents for rural community pharmacists, who are both qualified and accessible, to provide an ear health program and thus improve health outcomes for both Indigenous and non-Indigenous Australians in their communities.

*Aim:* The aim of this study was to identify published evidence of pharmacists' involvement in ear healthcare interventions to inform the development of ear health services to be delivered in rural community pharmacy in Australia.

*Data sources:* The search strategy was applied to the following electronic databases: MEDLINE, Scopus, CINAHL, Emcare, Cochrane, Google Scholar and Google.

*Study selection:* A total 8427 articles were identified and evaluated against inclusion and exclusion criteria, with eleven eligible articles suitable for inclusion in the review. Articles were included if they described an ear health intervention in a community pharmacy setting. The interventions reported in the articles were evaluated for their effectiveness, sustainability, and enablers and barriers to their provision. The articles were also thematically analysed using the *Deadly Ears Deadly Kids Deadly Communities Framework*. The articles included were conducted in Australia (n = 4), England (n = 4), United States of America (n = 2) and Brazil (n = 1), from 2009 onwards. The ear health interventions identified included hearing screening (3), otoscopy pilot studies (2), audiometry services (1), specific education for undergraduate pharmacy students (2) and a pharmacy-based clinic (3).



*Conclusions:* Improving ear health of both Indigenous and non-Indigenous peoples through services provided in community pharmacy presents as an important opportunity for rural pharmacists. Pharmacists are accessible and thus well placed to improve ear healthcare and resultant quality of life for these vulnerable populations. Further study to develop ear health models of care in community pharmacy will require a pharmacist training program, funding, and support from pharmacy stakeholders and the community.

*Keywords:* ear health, expanded pharmacy practice, Indigenous ear health, models of care pharmacy practice, scope of practice.

## 11.2 INTRODUCTION

Ear healthcare is a complex and multifaceted area of health with significant gaps in prevalence data and burden of disease outcomes.<sup>1</sup> Indigenous populations, in particular, experience high rates of ear disease with strong links to social determinants of health, presenting significant challenges for managing ear disease.<sup>1</sup> Globally, Indigenous populations are at a high risk of hearing loss with an estimated 6.1% of the world's population living with hearing loss and an annual cost of unaddressed hearing loss of 750 billion USD.<sup>1,2</sup> Ear problems are increasing with the World Health Organisation proposing that by 2050, if no change is made, the global number of people with disabling hearing loss would reach 900 million, double that of 2019.<sup>1</sup> These global numbers have been progressively increasing with 90% of the burden of hearing loss representing low and middle income countries (LMI).<sup>1</sup> In Australia, it is Indigenous Australians that experience the greatest burden of disadvantage and disability due to hearing problems.<sup>1</sup>

A similar situation of hearing loss, is occurring in Australia, with around 3.6 million people suffering from hearing loss and more than 1.3 million diagnosed with preventable hearing conditions.<sup>3</sup> The Australian healthcare system is recognised as the second best in the world, yet Australia still has some of the highest rates of chronic middle ear disease in Indigenous children.<sup>1</sup> Middle ear disease in Australian Indigenous peoples is considered by the World Health Organisation (WHO) to be a 'massive public health problem', double the prevalence of what is deemed an emergency public health situation.<sup>1</sup> Australian Indigenous children experience otitis media (OM) at a younger age at first episode, with a higher frequency of infection, with greater severity and greater persistence than non-Indigenous children.<sup>1,4</sup> In some remote communities in Northern and Central Australia, the prevalence of middle ear disease or otitis media (OM) is as high as 50% in children under three years

of age.<sup>1</sup> The consequences of ear disease is poorer educational, social and behavioural outcomes, and disrupted connection to land, culture and community, which can result in more frequent contact with the criminal justice system.<sup>1</sup>

Inadequately trained human resources and a lack of infrastructure and supplies has been described as key challenges to the provision of ear and hearing care internationally.<sup>1</sup> First nations people often have limited access to healthcare which can result in delayed diagnosis, treatment and management of middle ear disease, which contribute to prolonged periods of hearing loss and impairment.<sup>5</sup> In addition, Australia currently experiences shortages of rural and remote healthcare workers able to provide ear health and this is predicted to worsen in the future.<sup>6</sup> In 2016 a book was published on 'Hearing Healthcare of Adults: Priorities for Improving Access and Affordability'.<sup>7</sup> This title describes hearing health services and has a section describing the professionals involved in hearing healthcare.<sup>7</sup> Audiologists, hearing instrument specialists, otolaryngologists, and primary care providers described as GPs and nurses are included, though there is no description for Indigenous Health Workers or Pharmacists.<sup>7</sup> This highlights the limited consideration for other health providers, who may have better access to communities, including community pharmacists who are permanent members of rural communities, to be considered as health professionals involved in ear healthcare.

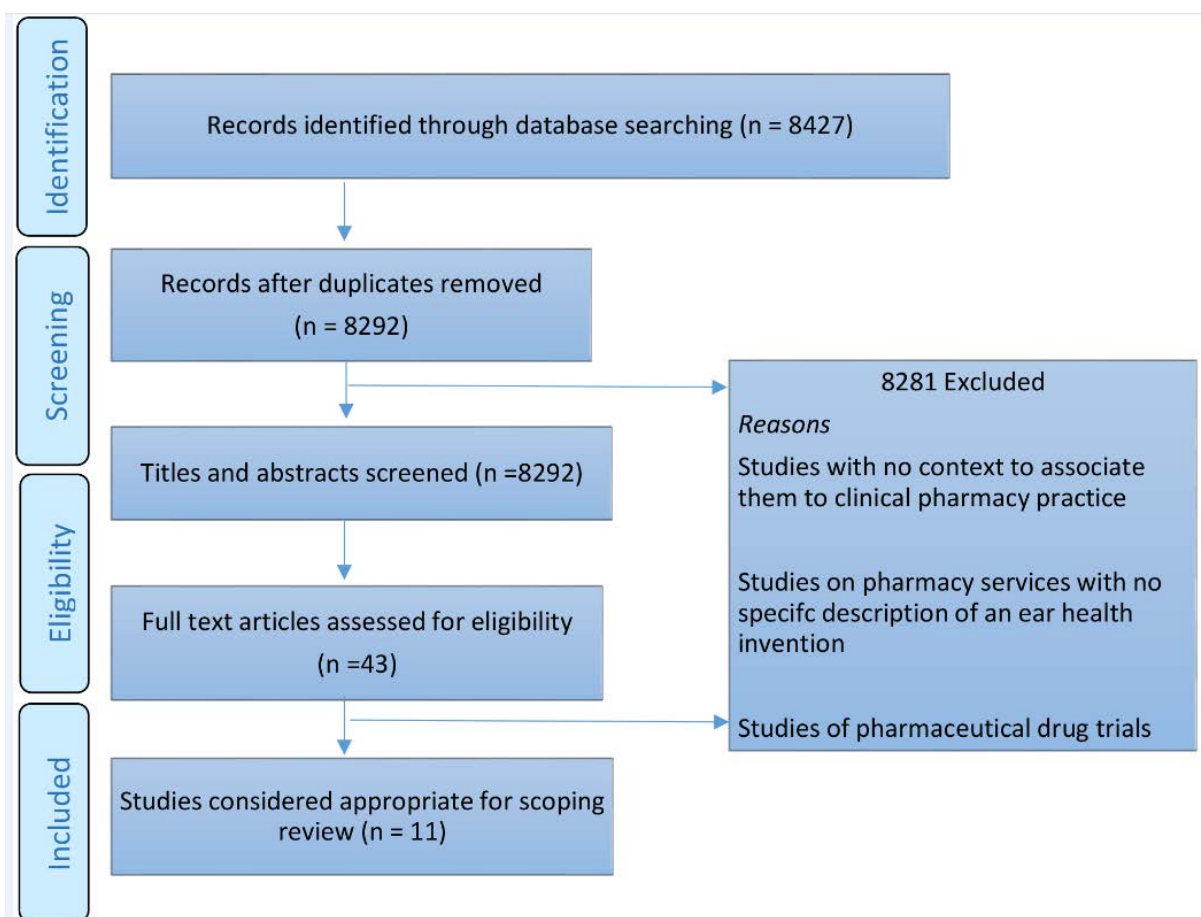
Urgent work is needed to develop sustainable and accessible models of care in rural and remote Australia to address this issue.<sup>1,5</sup> Of importance is the need to ensure healthcare is provided in a way that embraces culturally responsive care, which is an extension of patient-centred care that includes focused attention on social and cultural factors.<sup>8</sup> Community pharmacists may offer an opportunity to address some of this need. Globally there are examples of pharmacists working in expanded roles to better address health needs by the provision of services in addition to traditional medicine supply roles.<sup>9</sup> In rural and remote areas, pharmacists are trusted and accessible health professionals, who are trialling expanded services to meet local community needs.<sup>10</sup> Therefore, community pharmacists as a contributing health provider to close the gap on ear disease is an innovative strategy to consider for Australian communities.

This scoping review aims to identify published evidence of pharmacists' involvement in ear healthcare interventions to inform the design and development of ear health services to be delivered in rural community pharmacy in Australia.

## 11.3 METHODS

### Protocol

A scoping review was conducted using the Arksey and O'Malley's methodological framework.<sup>11-13</sup> The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA-ScR) extension for scoping reviews guideline.<sup>11,14</sup> [Figure 11-1] An initial review of the Cochrane database for systematic reviews and other databases undertaken to determine whether reviews existed or were in progress did not identify reviews on ear health intervention by pharmacists.



**Figure 11-1:** PRISMA Flow Diagram for systematic review<sup>11</sup>

The purpose of this scoping review is to identify published evidence of pharmacists' involvement in ear healthcare interventions to inform the development of ear health services to be delivered in rural community pharmacy in Australia. In particular, the review aimed to explore effectiveness (are there positive outcomes?), sustainability (can the model be continued long term?), and enablers and barriers to these pharmacy-based ear health interventions.

## Search Strategy

An initial search of MEDLINE and Scopus was conducted to identify key words found in the title, abstract and index terms appropriate for the search strategy. Keywords identified were (pharmac\* OR 'Drug Store' OR 'Drug Stores' OR Drugstore\* OR apothecar\* OR chemist) AND (ear OR ears OR 'vestibulocochlear apparatus' OR 'vestibulocochlear system' OR hearing OR hypoacusis OR hypoacusis OR deafness). A second search using all identified keywords and index terms was then conducted on May 18, 2020 in the databases MEDLINE, CINAHL, EmCare, Informit and Scopus. In addition, the first twenty pages of Google and Google Scholar keyword searches were included. The reference lists of all identified records and articles were also searched for additional studies and resulted in none being found.

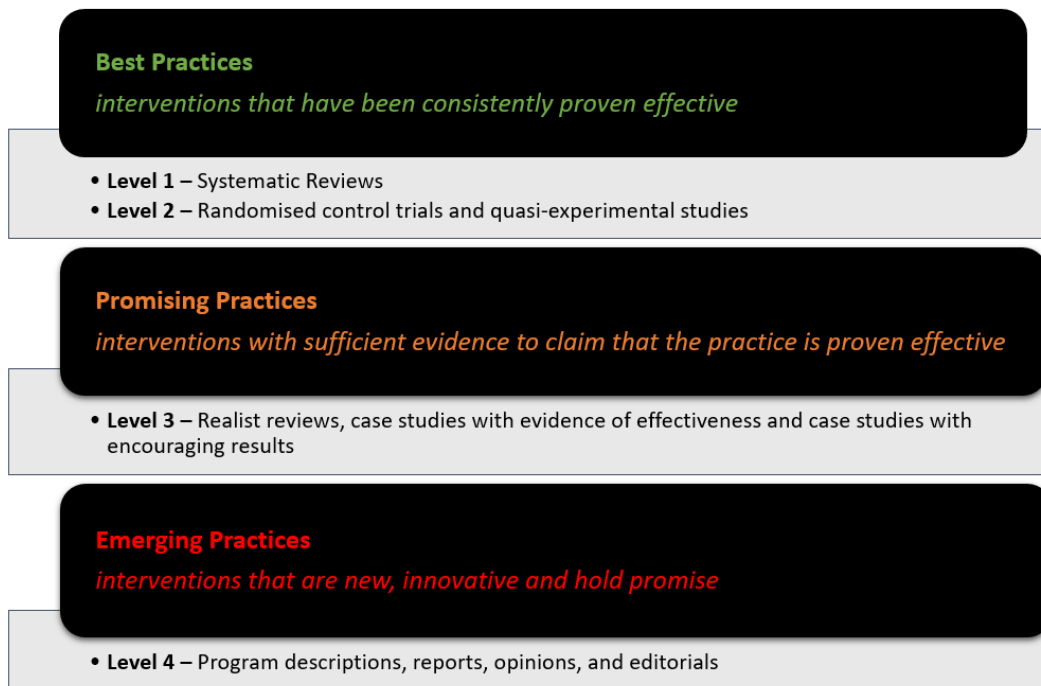
Study participants included pharmacy undergraduate students, intern pharmacists, registered pharmacists, pharmacy assistants and consumers. For studies to be included in the scoping review there needed to be a clear connection between an ear health intervention and pharmacy. The context of the studies included was university curriculum, community, and retail pharmacies. Studies reporting services provided by hospital pharmacies were excluded.

## Eligibility Criteria

All published data on ear health interventions provided in pharmacies with no date or language restriction were included. As literature on this topic is limited, no restrictions were placed in regard to study design, and as a result, published news articles, narrative articles and editorials were also included.

## Data Extraction and Quality Assessment

Two authors reviewed the search results and applied two quality screens to the included articles, which varied in study design. Hong and Pluye 2018 provides a conceptual framework that considers three components; methodological quality, conceptual quality, and reporting quality.<sup>15</sup> Although articles were examined using this framework, due to the emerging nature of this topic, all articles were included regardless of their methodological rigour, as they all provided valuable insight into the topic. The second quality screen was conducted using the Canadian Hierarchy of Promising Practices Evidence.<sup>16</sup> This hierarchy provides four levels of evidence, in three categories ranging from best practice through to emerging practices.<sup>16</sup> [Figure 11-2]



**Figure 11-2:** Canadian Hierarchy of Promising Practices Evidence.<sup>16</sup>

Data were extracted and thematically analysed against the *Deadly Ears Deadly Kids Deadly Communities Framework*.<sup>17</sup> This framework aims to reduce the incidence and impact of conductive hearing loss associated with otitis media by intervening at local and national levels and across different sectors. Although articles included in this scoping review were not exclusively targeting otitis media, the structure of this framework can be applied to ear health broadly, as it has been in this review. There are six key action areas included in the framework:

- Key Action Area 1 – Prevention
- Key Action Area 2 – Screening, Surveillance and Diagnosis
- Key Action Area 3 – Treatment and Support
- Key Action Area 4 – Partnerships
- Key Action Area 5 – Workforce Development
- Key Action Area 6 – Information and Knowledge

## 11.4 RESULTS

### Search Results

A total of 8427 studies were identified through online database searching (Emcare (111), Medline (12), Cinahl (31), Scopus (7671), Informit (202), Google Scholar (200) and Google (200). In the screening process 135 duplicate studies were removed and the remaining 8292 studies were screened based on their abstract/title; 8249 studies were excluded. Most were excluded as they did not describe a pharmacy-delivered intervention with specific mention of ear health or were studies of a drug trial or drugs with ototoxic effects. The remaining 43 full-text articles were assessed for eligibility, with 32 full-text articles not meeting the inclusion criteria. These articles were excluded. The 11 remaining studies were deemed appropriate for inclusion in this scoping review.

### Identification and summary of included studies

The 11 included studies are summarised in Table 11-1. The studies included were conducted in Australia (n = 4), England (n = 4), United States of America (n = 2) and Brazil (n = 1). All studies were conducted since 2009, with two published after 2016. The ear health interventions identified included hearing screening (3), otoscopy pilot studies (2), audiometry services (1), specific education for undergraduate pharmacy students (2) and a pharmacy-based clinic (3). The two otoscopy pilot studies described the same intervention that was reported by two different authors, with different perspectives, in two different professional practice journals and are thus reported separately in Table 11-1.<sup>18, 19</sup>

The studies represented only two hierarchies of evidence, which were Level 3 – Promising Practices (n=4) and Level 4 – Emerging Practices (n=7). The Level 3 articles included a retrospective cohort study, a cross-sectional descriptive study and two evaluation studies. The Level 4 articles were opinion letters (n=1) service advertisements (n=1), and articles from professional pharmacy practice magazines (n=5). These Level 4 articles, although lacking methodological rigor, still provided insight into ear health interventions, and thus were included in the review. None of the studies were conducted with Indigenous populations.

The *Deadly Ears Deadly Kids Deadly Communities Framework* guided the analysis of the studies.<sup>17</sup> None of the studies included Key Action Area 1 – *Prevention* or 6 – *Information and Knowledge*. Key Action Areas 2 – *Screening, Surveillance and Diagnosis* (n=7), 3 – *Treatment and Support* (n=8) and 5

– *Workforce Development* (n=6) were most linked to the articles. Key Action Area 4 – *Partnerships* could also be related to four articles.

**Table 11-1:** Summary of articles included in the scoping review

Reference	Country	Intervention Type/Description	Number of Participants	Study Design [X] in box indicates if study described effectiveness, sustainability, enablers, and barriers	Outcomes	Level of Evidence/Key Priority Area
Duncan, Clark and Wang, 2016	United States of America	Pharmacy-based clinic  Examination of costs and utilisation of people <20 years receiving care for AOM in retail pharmacy clinics.	5101 episodes of care for acute otitis media (AOM)	Retrospective cohort study  <input type="checkbox"/> Effectiveness <input checked="" type="checkbox"/> Sustainability <input type="checkbox"/> Enablers <input type="checkbox"/> Barriers	Pharmacy-based retail clinic visits for AOM cost USD \$30-130 less than community pharmacy visits. Antibiotic prescription fill rate was higher for retail clinic episodes (95.4%) than other provider community episodes (82.8%).	Level 3 – Promising Practice  Key Priority Areas – 3 – Treatment and Support
Pisano and Miller, 2018	United States of America	Undergraduate pharmacy student training  Online program to train students to counsel patients with hearing loss for improved medication adherence and understanding.	92 students	Impact evaluation of online education module on working with people with hearing loss  <input checked="" type="checkbox"/> Effectiveness <input type="checkbox"/> Sustainability <input type="checkbox"/> Enablers <input type="checkbox"/> Barriers	80% agreed the module improved understanding of psychological consequences of hearing loss and ability to counsel patients with hearing loss	Level 3 – Promising Practice  Key Priority Areas – 3 – Treatment and Support 5 – Workforce Development
Souza Anacleto de Araújo <i>et al.</i> , 2019	Brazil	Undergraduate pharmacy student training	35 pharmacy schools	Cross-sectional descriptive study	18 of 35 pharmacy schools included a sign language course in their	Level 3 – Promising Practice



		Examination of sign language courses available in pharmacy schools in Brazil.		<input checked="" type="checkbox"/> Effectiveness <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers	curriculum, all of which were elective courses.	Key Priority Areas – 3 – Treatment and Support 5 – Workforce Development
Postscript Magazine, 2016	Australia	Hearing screening service	-	Professional Practice Journal	Highlights the opportunity for pharmacy assistants to identify and refer patients to a hearing specialist.	Level 4 – Emerging Practice
		Opinion piece targeted at pharmacy assistants to increase knowledge of hearing loss.		<input type="checkbox"/> Effectiveness <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input type="checkbox"/> Barriers		Key Priority Areas – 2 - Screening, Surveillance and Diagnosis 4 - Partnerships
Lakhani and Eynon-Lewis, 2009	England	Pharmacy-based clinic	-	Opinion article	Described lack of support for pharmacists to provide ear health service due to no formal training in the condition.	Level 4 – Emerging Practice
		Opinion piece related to pharmacy management of ear complaints.		<input type="checkbox"/> Effectiveness <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers		Key Priority Areas – 3 – Treatment and Support 5 – Workforce Development
The Australian Journal of Pharmacy, 2014	Australia	Hearing screening service	> 1000 participants	Professional Practice Journal	Free hearing checks provided in community pharmacies by external provider.	Level 4 – Emerging Practice
		News article describing a hearing screening service provided in community pharmacy		<input type="checkbox"/> Effectiveness <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input type="checkbox"/> Barriers		Key Priority Areas – 2 - Screening, Surveillance and Diagnosis 4 - Partnerships

		by partnership with external hearing services.				
Australian Pharmacist, 2016	Australia	Hearing screening service  News article describing hearing screening service provided in community pharmacy by partnership with external hearing services.	-	Professional Practice Journal  <input type="checkbox"/> Effectiveness <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input type="checkbox"/> Barriers	Free hearing checks provided in community pharmacies by external provider with referral for full hearing assessment if required. Duration 15mins.	Level 4 – Emerging Practice  Key Priority Areas – 2 - Screening, Surveillance and Diagnosis 4 - Partnerships
Warnbro Pharmacy, 2020	Australia	Audiology service  Community pharmacy webpage describing audiology service provided in community pharmacy by partnership with external hearing services.	-	Service advertisement  <input type="checkbox"/> Effectiveness <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input type="checkbox"/> Barriers	Free service including otoscopic inspection, air conduction tone test and if required referral for full hearing assessment. Duration 15-30mins.	Level 4 – Emerging Practice  Key Priority Areas – 2 - Screening, Surveillance and Diagnosis 3 – Treatment and Support 4 - Partnerships
Independent Community Pharmacist, 2016  *Note this study describes the same intervention as reference (Weinbren, 2016)	England	Otoscopy pilot service News article describing community pharmacy service whereby pharmacists use otoscopy to improve ear health management.	-	Professional Practice Journal  <input type="checkbox"/> Effectiveness <input checked="" type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input type="checkbox"/> Barriers	Description of a six-month pilot program with pharmacists trained by specialist nurses to examine an ear with an otoscope, diagnose and treat appropriately.	Level 4 – Emerging Practice  Key Priority Areas – 2 - Screening, Surveillance and Diagnosis

						3 – Treatment and Support 5 – Workforce Development
Hall <i>et al.</i> , 2019	England	Pharmacy-based clinic  Pharmacy service provided by trained pharmacists to provide self-care strategies, supply of non-prescription medicines or specified prescriptions only medicines, including antibiotics.	408 patients (32% diagnosed with otitis media)	Evaluation of intervention  <input checked="" type="checkbox"/> Effectiveness <input checked="" type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers	Of 408 patients, 32% were diagnosed with acute otitis media. Overall, 309/408 patients were followed up, 85% had not seen another health professional. 96% participants were satisfied with the service.	Level 3 – Promising Practice  Key Priority Areas – 2 - Screening, Surveillance and Diagnosis 3 – Treatment and Support 5 – Workforce Development
Weinbren, 2016  *Note this study describes the same intervention as reference (Independent Community Pharmacist, 2016)	England	Otoscopy pilot service  News article describing community pharmacy service whereby pharmacists use otoscopy to improve ear health management.	-	Professional Practice Journal  <input checked="" type="checkbox"/> Effectiveness <input checked="" type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Enablers <input checked="" type="checkbox"/> Barriers	Six month otoscopy pilot with positive feedback and potential savings to general practitioner time.	Level 4 – Emerging Practices  Key Priority Areas – 2 - Screening, Surveillance and Diagnosis 3 – Treatment and Support 5 – Workforce Development

## Effectiveness and Sustainability

Effectiveness and sustainability were the least commonly described elements of the interventions included in this review. In a North American study by Hall *et al.* 408 patients were seen by a pharmacist providing an ear nose and throat service (32% otitis media cases). When participants were contacted 5 days later, 85% reported that they had not seen another health professional for their complaint and none had attended a hospital emergency department providing some indication that the pharmacy-based service was effectively managing otitis media.<sup>20</sup> It is important to note that pharmacists were able to prescribe antibiotics in this study.<sup>20</sup> In this study only 4.4% of participants (N=408) identified as Black, Asian or Minority Ethnic groups.<sup>20</sup> In a study, training pharmacy students to counsel patients with a hearing loss, there was strong agreement from the students that the training program had enhanced their understanding of hearing loss (89%, n=82) and improved their ability to identify and repair communication breakdowns (78%, n=72).<sup>21</sup> This study purely represented students perceptions post training, no assessment of their skill was undertaken.<sup>21</sup> Sustainability was not formally evaluated in any of the included studies, however three studies described the inability to attract continuous funding and the importance of undertaking feasibility studies and economic evaluations for future models.<sup>18-20,22</sup> In addition, articles describing audiologist services being provided by external providers within communities pharmacies were described as continuing services.<sup>23-25</sup>

## Enablers and Barriers

Enablers identified in the articles include positive outcomes, funding availability, consumer access to community pharmacy, cost savings for consumers and improved connection of pathways to health providers. A study of an ear, nose, throat and eye pharmacist service which included prescribing medicines, reported a >97% patient satisfaction rate, agreement that pharmacies are appropriate places to provide extended care services, agreement to use the service again and recommend it to others.<sup>20</sup> This service was funded by the North West Midlands Urgent and Emergency Care Network including training and supply of equipment.<sup>20</sup> Medicines recommended for the patients were purchased either by the patient or funded by the Pharmacy First Common Ailments Service.<sup>20</sup> In addition top up funding was provided by the Local Professional Network for Pharmacy.<sup>20</sup> In the United Kingdom, where a scheme has been implemented to allow pharmacists to manage minor ailments, including prescribing medicines for ear complaints, has seen almost 20,000 pharmacist consultations occur over three years with an estimated 12 300 general practitioner (GP) appointments being freed up during this period.<sup>26</sup>

Other reported enablers across all studies were pharmacist accessibility whereby pharmacies are described as easily accessible by most populations, the frequency of which people visit a community pharmacy, acceptability of the service by patients, saving GP time, reduced cost to the patients compared to GP visits, improved referral to hearing experts, stronger partnerships with hearing health professionals and local community, and a reduced burden on health systems.<sup>18,19,23,24,27</sup>

Funding and consequently sustainability was also identified as a barrier with difficulty attracting funding to support ear health interventions reported.<sup>18</sup> In particular, consideration of cost implications for training and equipment were described as a barrier to be considered for services that were to be developed at a national level.<sup>20</sup> Consequently most of the interventions have been conducted as pilots and no long term financial investment has been secured to support the interventions to continue.<sup>18</sup> Although there are limited funding models to support pharmacy-based ear health interventions, it has been determined that retail clinics are a less-costly alternative to GP settings for the treatment of episodes of acute otitis media.<sup>22</sup> A cost reduction of between USD \$30-\$130 has been reported as well as confirmation that retail clinics were not duplicating GP services, in that patients visited one or the other service, not both.<sup>22</sup>

Barriers identified through qualitative feedback provided in an opinion article written by doctors included: a lack of confidence in pharmacists ability to provide ear care interventions due to a lack of formal training; doctors belief that pharmacists are not equipped to make a differential diagnosis and that pharmacists would be working on a 'best guess' basis.<sup>26</sup> In addition, there was concern that ear conditions may worsen because of a delay in patients seeking medical treatment, which may affect the outcomes for conditions including malignant otitis externa, herpes zoster infection, perichondritis, foreign body in the ear, referred pain from a tumour or temporal arteritis.<sup>26</sup>

## 11.5 DISCUSSION

There is a recognised urgent need for action to prevent and manage ear diseases and hearing impairment in Indigenous populations.<sup>17</sup> Indigenous populations have some of the highest rates of middle ear disease globally, which has led to significant financial investment and human resource application to address this stark inequity in hearing health.<sup>1</sup> However prior investment has not produced a national data set or a national governance framework.<sup>1</sup> It's not effectively reached remote locations, integrated telehealth or considered the community pharmacists role in ear

health.<sup>1</sup> This highlights an opportunity to consider how community pharmacists can contribute to improving ear health in rural and remote communities.

#### Key Action Area 1 – Prevention

The prevention strategy encompasses stakeholder education, healthy lifestyle behaviours and improved public and environmental health.<sup>17</sup> None of the studies found in this scoping review described an intervention that included preventative strategies. This finding is of great importance given the frequency which patients visit their community pharmacy, an estimated fourteen times per year.<sup>28</sup> Pharmacies are well placed to engage in health promotion and the promotion of healthy lifestyles is described as one of the five core roles of a pharmacist.<sup>29</sup> Pharmacies' extended opening hours and no need for appointments for advice makes them a highly accessible health provider.<sup>29</sup> A review of pharmacists involvement in public health has however found that pharmacists have low confidence in providing public health services.<sup>29</sup> Pharmacists reported barriers including limited time, inadequate counselling space, a lack of consumer demand, and expected negative consumer reaction.<sup>29</sup> However, consumers viewed pharmacists as appropriate providers of public health with high levels of satisfaction for those who had experienced a pharmaceutical public health service.<sup>29</sup> This highlights the opportunity for pharmacists to provide a greater role in health promotion and to discuss prevention strategies for ear disease with their patients, however work is needed to unpack this potential.

#### Key Action Areas 2 – Screening, Surveillance and Diagnosis

Screening, surveillance and diagnosis to effectively manage ear conditions using a standardised and systematic approach is a major objective of the *Deadly Ears Deadly Kids Deadly Communities Framework*.<sup>17</sup> Working within 5700 community pharmacies across Australia are highly trained medication experts with knowledge and skills in health promotion.<sup>28</sup> An average Australian lives within 2.5kms of their local pharmacy and visits 14 times per year.<sup>28</sup> This frequent and accessible health professional and patient connection provides an opportunity for pharmacists to engage people in healthcare and improve health outcomes.

In the study by Hall *et al.*, less than 5% of participants identified as Black, Asian or a Minority Ethnic groups. This highlights an important gap in that the service described by the study wasn't able to target the highest risk population group, limiting the generalisability of this study to an Australian Indigenous context. This finding is important to consider when developing future models to ensure

consideration of how to ensure Indigenous Australians, and particularly children are included in the service delivery of innovative ear health interventions. Currently, community pharmacies are well recognised as easily accessible in rural communities, however remote communities may be located some distance from a pharmacy and thus accessibility for those most isolated and most vulnerable may still present a challenge.<sup>28</sup>

### Key Action Area 3 - Treatment and Support

No study included in this review made specific mention on how they were ensuring the service was providing culturally appropriate treatment and support for patients, families, and communities for ear health. It is known that providing culturally safe healthcare can contribute to improved health among Indigenous people.<sup>30</sup> Culturally safe care is characterised by a genuine partnership between patients and healthcare providers in which: power is shared; the life experiences, views and beliefs, especially cultural beliefs are respected, and Indigenous histories and social impacts are acknowledged.<sup>30</sup> It is known that some Indigenous people feel culturally unsafe when using mainstream health services and this could include accessing pharmacies, which results in a reluctance to seek care.<sup>30</sup> Culturally safe practice should underpin all health professionals practice and the Pharmaceutical Society of Australia has provided a guide to assist pharmacists to provide high quality care for Indigenous populations.<sup>8</sup> The guide has a focus on building relationships, understanding local protocols, communication and the provision of appropriate pharmacy services.<sup>8</sup> The importance of ensuring any newly developed pharmacy models are provided in the most culturally appropriate way is essential to ensure the most at risk population groups can comfortably access the services.

### Key Action Area 4 – Partnerships

Pharmacists are one of the most trusted health professionals.<sup>28</sup> Public opinion surveys report that 95% of patients are satisfied with their community pharmacy.<sup>28</sup> This scoping review, identified four publications that described this connection between community pharmacists and their local communities as being a major enabler for ear health interventions.<sup>18-20,23</sup> The opportunity for pharmacists to engage community members in ear health services, both within community pharmacies and through referral to hearing specialists, is an efficient method to improve partnerships and consequently improve ear health outcomes. Ensuring pharmacy-based ear interventions are linked to existing service providers will reduce the risk of fragmented patient care and improve community engagement with all services.<sup>17</sup>

### Key Action Area 5 - Workforce Development

In Brazil there is national legislation that requires all university health professional programs to include sign language as an elective course, except for speech pathology, for which the course is mandatory.<sup>31</sup> It has been found that for pharmacy courses in Brazil, only half of the university curriculums meet the requirement and offer a sign language course.<sup>31</sup> This is interesting as even in countries where there is legislation to include training specifically to target hearing impaired consumers in university courses, this is not occurring. For Australia there is no requirement to offer any training for university students to work with people who are hearing impaired and consequently it does not occur formally. It is clear that students learning sign language or a cultural language relevant to their communities for specific health- and pharmacy-related terminology would enhance patient care and medication safety.<sup>31</sup>

Three studies reported pharmacists receiving additional training to use an otoscope to examine an ear.<sup>18-20,22</sup> This was the only report of pharmacists undertaking any additional training to deliver ear health services. This is of importance as concerns about pharmacists' skills and training to provide expanded services have been raised by other health professionals.<sup>10,32</sup> It is important that when developing any new intervention that the providers are appropriately trained to provide the service to ensure that vulnerable patient groups are not receiving sub-optimal care.

### Key Action Area 6 – Information and Knowledge

The importance of maintaining accurate data and information by developing standard protocols for the collation and reporting of accurate ear and hearing health data is highlighted in this key action area. No studies found in this review described the integration of the pharmacy data into a larger health database. This is an important consideration as concern for pharmacy services to contribute to fragmented patient care has been identified as a risk to expanded pharmacy practice and improved integration will reduce this risk and improve patient care.<sup>10,32</sup>

Overall, there are only a small number of ear health interventions by pharmacists being conducted.<sup>18-20,22</sup> Evidence demonstrating rigorous evaluation of ear health models to demonstrate effectiveness or the ability of the models to be sustained in the future is not found in the literature. There were no randomised controlled studies or longitudinal studies found in this review and no studies which demonstrated a significant level of intervention effectiveness or long-term sustainability. This is an important consideration for the development of innovative models of



pharmacist-led ear health interventions. Ensuring appropriate evaluation of both effectiveness and sustainability are needed to be incorporated into the design of interventions to ensure they can be provided past trial phases into future practice to improve ear health outcomes.

### **Limitations**

The study is limited in the search strategy whereby articles that may include an ear intervention as part of a larger intervention that did not describe ear/s in the title, abstract or keywords would not have been found.

## 11.6 CONCLUSION

There is very little evidence to support wide adoption of a pharmacy implemented ear health model of care. Regardless, closing the gap between Indigenous and non-Indigenous Australians in hearing health is of high social and economic value and solutions to the barriers of accessibility and engagement are urgently needed. A community pharmacist is accessible, highly trained and is thus well placed to pilot innovative ear health interventions, particularly in rural, remote, and Indigenous communities, where shortages of other health professionals are acute. Future study to explore the design, development, and trial of ear health models for community pharmacy practice will require community and stakeholder consultation and support, a pharmacy training program and funding to ensure sustainability.

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## Chapter 12 – Ear Health Intervention - Application of the PRECEDE-PROCEED Model

This chapter describes the application of a planning model to design, develop and pilot an ear health intervention for rural community pharmacy. This original research article is published in the journal *International Journal of Environmental Research and Public Health*.

**Taylor S, Cairns A, Glass B. *Developing an Ear Health Intervention for Rural Community Pharmacy: Application of the PRECEDE-PROCEED Model*. Int J Environ Res Public Health. 2021; 18(12):6456.**

<https://doi.org/10.3390/ijerph18126456>

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

Selina Taylor

Alice Cairns

Beverley Glass

*Permission obtained from IJERPH for the inclusion of this published journal article.*

## 12.1 ABSTRACT

Unaddressed hearing loss affects an estimated 466 million people worldwide, costing over USD\$750 billion globally, with rural communities being particularly disadvantaged, due to greater inequity in access to healthcare services.

This mixed-methods study aimed to use the PRECEDE-PROCEED model to develop and pilot a rural community pharmacy-based ear health service, LISTEN UP (Locally Integrated Screening and Testing Ear aNd aUral Program).

The PRECEDE process involved an assessment of the predisposing, reinforcing, and enabling constructs to support practice change through a scoping review; stakeholder surveys and interviews; and consultation with governing bodies and regulatory authorities. The PROCEED segment structured the evaluation of the service pilot and informed planned implementation, process, impact, and outcome evaluation.

The pilot study conducted in February 2021 included 20 participants, with the most common ear complaints presented being pain, pressure, or blockage. All these participants reported high levels of satisfaction with the service, would recommend the service to others, and would attend the pharmacy first before seeing a GP for future ear complaints.

The PRECEDE-PROCEED model provides a comprehensive model to guide the design of the LISTEN UP program, an innovative model, expanding services offered by rural community pharmacies, with preliminary results demonstrating high consumer satisfaction.

Keywords: expanded practice, scope of practice, models of care, rural health workforce, extended primary healthcare, pharmacist

## 12.2 INTRODUCTION

The human ear is an extraordinary organ with intricate anatomy and complex physiology.<sup>1</sup> Its role in hearing, communication, and balance is fundamental and disruptions to ear health can significantly impair a person's function and ability to engage with their environment.<sup>1</sup> Globally, hearing loss is estimated to affect 466 million people, resulting in a loss of communicative ability, social isolation, loneliness and frustration.<sup>2</sup> Of the 34 million children worldwide with deafness or hearing loss, 60%

are a result of preventable causes.<sup>2</sup> The global costs of unaddressed hearing loss is estimated to be USD\$750 billion.<sup>2</sup> Furthermore, the burden of hearing loss is increasing with 900 million people projected to have disabling hearing loss by 2050.<sup>2</sup>

In Australia, one in six people experience some form of hearing impairment with 1.3 million reportedly experiencing preventable hearing loss.<sup>3,4</sup> Conductive hearing loss in Aboriginal and Torres Strait Islander peoples is a major public health problem, with rates as high as 90% reported in some remote communities.<sup>5,6</sup> Australian Indigenous children experience otitis media (OM) younger, more frequently, more severely, and for longer durations than non-Indigenous children with consequences of poorer educational, social and behavioural outcomes, and disrupted connection to land, culture and community.<sup>5</sup> Early detection and intervention particularly for children has been recognised as important to improve development and educational outcomes.<sup>2</sup>

The main barrier to universal ear and hearing healthcare is the lack of access to appropriately trained health professionals in low resource communities internationally and within Australia.<sup>5</sup> Limited availability of ear, nose and throat (ENT) specialists (78% of global population have <1 ENT per million population), audiologists (93% have < 1 per million population) and speech pathologists (83% have <1 per million population) is a major contributor to the global service gap in health system capacity for ear services.<sup>7</sup> Expanding community pharmacists' roles to support screening and early identification of ear and hearing complaints should thus be considered to improve the capacity to deliver these services in rural communities.

To date rural pharmacies have had limited involvement in ear health interventions including screening services<sup>3</sup>, otoscopy pilot studies<sup>2</sup>, audiometry services<sup>1</sup> and pharmacy-based clinics.<sup>3,8</sup> These global studies identified in a scoping review have highlighted the potential for pharmacists to expand their scope of practice to address gaps in ear health services for rural and remote communities.<sup>8</sup> Globally, pharmacists are working in expanded roles to better address health needs by providing professional services in addition to traditional medication supply.<sup>9</sup> In Australia, this opportunity for pharmacists to work to their full scope of practice has been limited.<sup>10</sup> This is despite the fact that community pharmacists as health providers are accessible and have the potential to close the gap on ear disease, and be better utilised to meet rural community health needs.

This study used the PRECEDE-PROCEED model (PPM)<sup>11</sup> to guide the planning, implementing, and evaluation of LISTEN UP (Locally Integrated Screening and Testing Ear aNd aUral Program), a

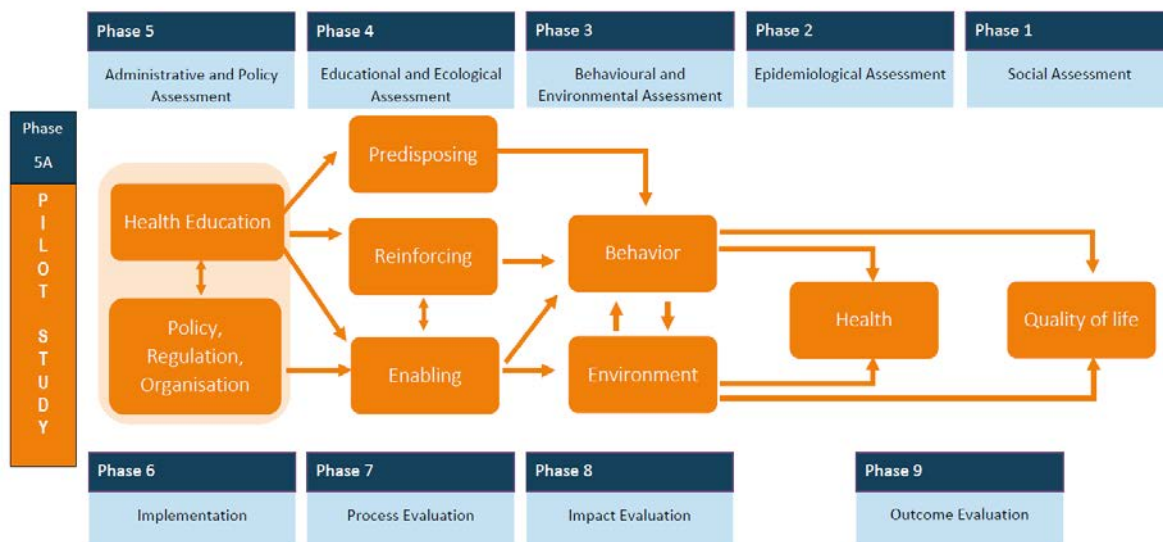


population ear health program delivered by community pharmacists in two remote communities in Australia.<sup>12</sup>

### 12.3 METHODS

#### Study design

This mixed-method study applied the PRECEDE-PROCEED Model<sup>12</sup> to plan and develop an ear health program. [Figure 12-1]<sup>13</sup> Models that support the translation of evidence into practice are known to improve implementation of community health programs.<sup>13</sup> In addition the PPM has a focus on health promotion, which is a core role for community pharmacists.<sup>13</sup> For the pharmacy profession, a transformation to meet patient-centered care is occurring and the importance of using a model to ensure interventions can be adopted and integrated into clinical and community settings to improve patient outcomes and benefit population health is vital.<sup>14</sup>



**Figure 12-1:** Generic Representation of the PRECEDE-PROCEED Model *Source:* Green and Kreuter, 1999, p. 34

The PPM has two distinct components, the first, PRECEDE (Predisposing, Reinforcing, and Enabling Constructs in Educational/Ecological Diagnosis and Evaluation) provides an outline of a planning process to guide the development of locally relevant and focused public health programs.<sup>11</sup> The second phase, PROCEED (Policy, Regulatory, and Organisational Constructs in Educational and Environmental Development) provides structure to implement and evaluate the intervention developed in the previous PRECEDE segment.<sup>11</sup> The focus of this paper is on the first five phases of

the nine-phase planning model. The fifth phase situated in the PROCEED component was adapted to include a pilot study, which allowed the developed ear health program in the PRECEDE segment to be trialed before implementing and evaluating the final model.

### Ethics Approval

James Cook University Human Research Ethics Committee granted ethical approval (H7845 and H8187) (Appendix H) for the study.

### PRECEDE Planning Model Component

Scoping and systematic reviews, and studies including both qualitative and quantitative methods, involving community consultation with the public and health professionals, who work in rural and remote locations in Australia were undertaken in this component of the application<sup>8, 15-21</sup>, Table 12-1 provides the components of the PRECEDE-PROCEED model in the context of LISTEN UP.

**Table 12-1.** Components of the PRECEDE/PROCEED model in the context of LISTEN UP

<b>Construct</b>	<b>Definition as applied to this study</b>	<b>Data Source</b>
<i>Phase 1 - Social Assessment</i>	Determine desired outcomes and goals of LISTEN UP for rural consumers, pharmacists, and health professionals.	Questionnaire and interviews. <sup>16-18</sup>
<i>Phase 2 - Epidemiological Assessment</i>	Determine measurable, time-limited, health-related objectives of LISTEN UP.	Systematic review <sup>15</sup> , scoping review <sup>8</sup> and interviews. <sup>19,20</sup>
<i>Phase 3 - Behavioral and Environmental Assessment</i>	Identify key environmental and behavioral factors that may impact, or influence LISTEN UP. Develop sub-objectives of LISTEN UP.	Systematic review <sup>15</sup> , scoping review <sup>8</sup> and interviews. <sup>19,20</sup>

<i>Phase 4 – Educational and Ecological Assessment</i>	Determine modifiable factors (predisposing, enabling, and reinforcing) that would result in behavior change and a sustainable change process.	Systematic review <sup>15</sup> , scoping review <sup>8</sup> and community consultation.
<i>Phase 5 - Administrative and Policy Assessment</i>	Investigation and application of policy, regulation and law surrounding community pharmacy practice.	Consultation with policy makers, regulatory and governing bodies.
<i>Phase 5A – Pilot Study</i>	Pilot the intervention for six months.	Pilot study data and consultation with pharmacists.
<i>Phase 6 – Implementation</i>	Implementation of the intervention for six to twelve months.	
<i>Phase 7 – Process evaluation</i>	Assessment of the intervention exposure, the extent to which the program is implemented as designed and participant appraisal of the intervention.	Participant demographic data.  Participant satisfaction survey.  Pharmacist interviews on feasibility, barriers, and enablers to intervention implementation.
<i>Phase 8 – Impact evaluation</i>	Assessment of the behavioral and environmental sub-objectives by identifying untreated ear conditions in the community, improving collaboration with GPs through targeted referrals and utilisation of telehealth technologies.	LISTEN UP complete data set.  Pre- and post- interviews with GPs and pharmacists.
<i>Phase 9 – Outcome evaluation</i>	Assessment of public health impact through exploration of patient experience of accessing ear care.	LISTEN UP complete data set. Pre- and post- interviews with GPs and pharmacists.

## Intervention Context and Setting

LISTEN UP is being delivered by two rural community pharmacies in Queensland, Australia. The first site (population 18,000; 17% Indigenous population; Modified Monash Model (MMM) category 5 – remote community) is a remote mining town situated 1,000 kilometers from tertiary medical facilities and 1,800 kilometers from a capital city.<sup>22,23</sup> It is a town with three community pharmacies, three GP practices and a small 80 bed hospital. The second site (population 6000; 6% Indigenous population; MMM category 4 – medium rural town) is a rural agricultural town situated 350 kilometers from a capital city and tertiary medical facilities.<sup>22,23</sup> It is serviced by a small 32 bed hospital, one GP practice and two community pharmacies.<sup>22,23</sup>

## Procedure and Participants

Phase 1-5: Data from the literature and research were synthesised and disseminated to participating pharmacies during formal meetings to discuss and inform the development of the model. This information was also shared with the advisory panel which was formed by inviting interested stakeholders, governing bodies, regulatory authorities, and community organisation representatives to participate in the pilot study in an advisory capacity. This provided an opportunity to ensure the model would fit the pharmacy, community, and profession.

Pilot Study: Patients aged >13 years presenting to the participating pharmacies with an ear complaint were invited to receive the LISTEN UP service. Pharmacists (with additional training) conducted an examination including a brief history, hearing screening, otoscopy and tympanometry assessments following a study protocol (Figure 12.2)<sup>24</sup>, and patients were recommended no treatment, pharmacy only treatment or referral to a general practitioner (GP) if required.<sup>24</sup>

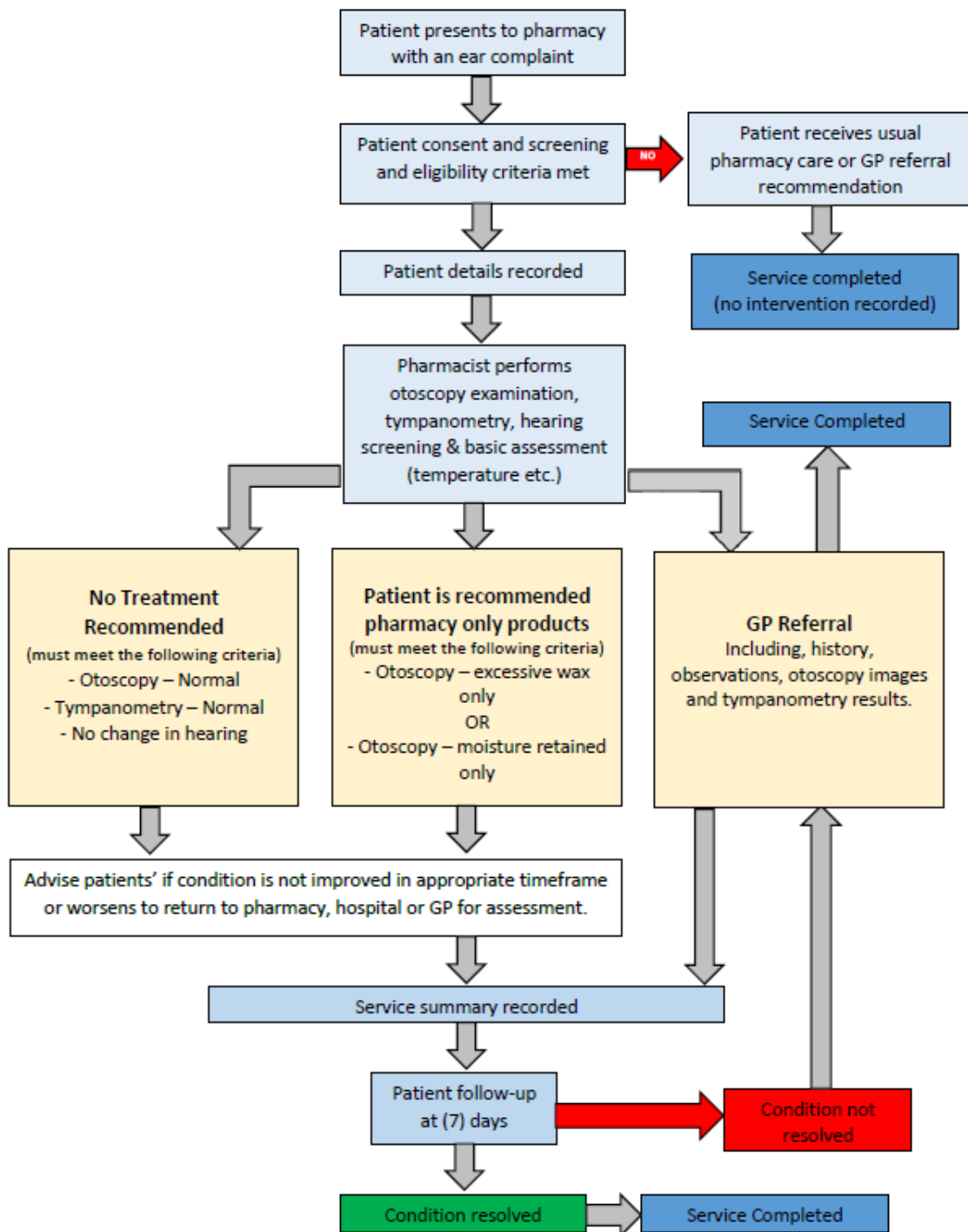


Figure 12-2: Study Protocol for LISTEN UP.<sup>24</sup>

### Data Collection

Phase 1-5: Data collected included questionnaires completed by stakeholders including consumers, pharmacists, and health professionals.<sup>16-18</sup> Expanded pharmacy services were ranked by participants,

the level of support for expanded pharmacy services was explored, and consumers’ willingness to pay for services examined.<sup>16-18</sup> Interviews were conducted with pharmacists and stakeholders to further explore perceptions, and barriers and enablers to expanded pharmacy services, specifically relating to ear services.<sup>20-21</sup>

Pilot Study: Pharmacists recorded patient data on a service summary record and a GP referral template. Patients also completed a satisfaction survey and received a follow-up phone call at seven days, which was transcribed and analysed to explore outcomes including prescribed medications and referrals.<sup>24</sup> The LISTEN UP satisfaction survey was based on a survey for a sore throat study in the UK, where pharmacists are delivering consultations including clinical scoring and point-of-care testing.<sup>25</sup>

### Data analysis

Descriptive analysis of questionnaire data, thematic analysis of interview transcripts and review of consultation data were undertaken.<sup>16-21</sup>

## 12.4 RESULTS

### PRECEDE

The results of the PRECEDE component of the planning model are presented and summarised in Table 12-2.

**Table 12-2:** PRECEDE Results with linkage to data source.

Data source	Related Phase	Results relevant to Model
Systematic review <sup>15</sup>	Behavioral and environmental assessment	Limited expanded service models in rural pharmacy practice. No ear services identified. Barriers and enablers explored and considered for LISTEN UP model.

Scoping review <sup>8</sup>	Behavioral and environmental assessment	Limited pharmacy ear health services in community pharmacy. Barriers and enablers explored and considered for LISTEN UP model.
Consumer questionnaires <sup>16</sup>	Social assessment	Hearing health ranked seventh of 26 expanded pharmacy services.
Health professional questionnaires and interviews <sup>17,19,21</sup>	Social assessment	Hearing health ranked seventh of 26 expanded pharmacy services. Varying levels of support for pharmacists to provide expanded services depending on profession and location.
Pharmacist questionnaires and interviews <sup>18,19</sup>	Social assessment  Educational and ecological assessment	Expected improved health outcomes and increased access from pharmacists providing expanded services. Consensus that the management of ear health in pharmacy could be improved.
Stakeholder interviews <sup>19</sup> including: Pharmaceutical Society of Australia, Pharmacy Guild of Australia, Aboriginal Medical Service, and Australian Primary Health Network	Educational and ecological assessment	Consensus for rural pharmacists to increase service delivery for ear care.
Policy and regulatory meetings	Administrative and policy assessment	Administrative requirements, indemnity insurance, scope of practice and training incorporated into model.
Specialist health professional interviews	Educational and ecological assessment	Training and education recommendations and best practice suggestions to be incorporated into model.

Advisory panel	<p>Educational and ecological assessment</p> <p>Administrative and policy assessment</p> <p>Continuing through PROCEED segment.</p>	Positive response to the model with minor suggestions incorporated.
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*PRECEDE - Phase 1 – Social Assessment*

A social assessment of rural consumers, pharmacists, and health professionals was undertaken. During this phase data were collected via questionnaires that enabled participants to rank the importance of an ear health strategy for rural community pharmacies. Overall, hearing tests were ranked as the seventh (from twenty-six services) most important expanded pharmacy service by health professionals and consumers.<sup>16,17</sup> Although, other expanded services were ranked more highly, discussions with rural pharmacists identified ear health as an unmet healthcare need in their populations. In addition, there was recognition of the profound impact of unmanaged ear conditions on quality of life for both children and adults, and particularly for Indigenous populations.<sup>5,7</sup>

*PRECEDE - Phase 2 – Epidemiological Assessment*

A systematic<sup>15</sup> and scoping review<sup>8</sup> and interviews<sup>19,20</sup> were undertaken to gather knowledge of expanded pharmacy services broadly, expanded services in rural pharmacy settings and pharmacy ear services. There were a limited number of articles found in both the reviews, however findings from the reviews informed the design of the interview question guides. Discussion of challenges and opportunities in rural pharmacy practice broadly and specifically for an ear service was undertaken during the interviews. Questions were asked of community pharmacists and experts in the ear, nose, and throat specialty about what problems affect the ear health of the community, what needs to change to improve ear care and what role community pharmacists can play in ear care. The findings were used to develop two primary objectives of the six-twelve month ear health pilot study:

- To improve rural consumer access to ear healthcare; and
- To determine pharmacist level of preparedness and confidence to examine an ear and make appropriate recommendations or referrals following a protocol.



### *PRECEDE - Phase 3 – Behavioral and Environmental Assessment*

A scoping review revealed limited research into ear health models provided in community pharmacy (no Australian studies) with some studies reporting hearing testing being provided in community pharmacies by external audiology services in Australia.<sup>8</sup> Previous research has identified key behaviors of people attending community pharmacy for ear complaints. It was found that ear complaints are common in children, in which case pharmacists regularly provide pain management options and recommend referral to general practice and more commonly to emergency departments, due to the lengthy wait for a doctor's appointment.<sup>20</sup>

Interviews with pharmacists identified instances, where pharmacists, particularly those working in coastal regions, are providing an informal ear care service and using otoscopy to examine patients' ears.<sup>20</sup> In addition discussions about private consultation rooms, workload difficulties particularly for sole pharmacists, and remuneration considerations were held.<sup>20</sup> Interviews with health professionals highlighted concerns about the role of the pharmacist and pharmacists' skills and knowledge to diagnose or treat ear conditions.<sup>20</sup> Consequently, the pilot study protocol was developed without the pharmacists diagnosing or treating any ear conditions that they would not usually manage and instead requires the pharmacists to provide, for data collection purposes only, a clinical impression of the condition and describe what treatment or referral they would make if there were no restrictions.<sup>24</sup>

Following this phase of the assessment, secondary objectives of the ear health strategy were developed:

- To identify untreated ear conditions in rural communities, which may lead to reduced complications, developmental delay and functional impairment.
- To improve collaboration between community pharmacy and general practitioner (GP) services.
- To provide targeted patient ear health referrals to GP practice; and
- To support engagement of telehealth using video-otoscopy and timely transfer of care.

#### *PRECEDE - Phase 4 – Educational and Ecological Assessment*

We identified potential factors that would need to be modified to effect change in ear care services in community pharmacy. These factors were identified based on discussions with stakeholders, rural pharmacists and community leaders, recent research, and a review of the literature.<sup>8, 15, 18-20</sup> Existing consumer outcome expectations when presenting to community pharmacies with an ear complaint were identified as either a product recommendation or verbal referral to a GP or emergency department. Similarly, pharmacists expected the same outcomes, when consulting a patient with an ear complaint.

Training was a major consideration in developing the intervention. Ear, nose, and throat specialists were consulted on the skills in otoscopy and tympanometry that were required for pharmacists to effectively conduct an ear examination. Consequently, each participating pharmacist undertook nationally credentialed training in ear health. This training was delivered by mixed mode with online and face-to-face components and included the development of skills in otoscopy and tympanometry.<sup>26</sup> The training includes 55 hours of online training and 16 hours of workshops.<sup>26</sup> The training delivered by Benchmark group was a purposely designed once-off hybrid of other ear education training programs (including training for nurses, doctors and Indigenous health workers).<sup>26</sup> Topic areas included foundations of ear health including anatomy and physiology, theoretical and practical sessions on ear condition recognition and assessment, as well otoscopy and tympanometry skills.<sup>26</sup> The following competencies were part of the training units: EHHPEH002 - Promote, educate, and manage ear health, EHHAEH001 - Assess ear health, EHHPEA004 – Paediatric, and TYMPTY001 - Perform tympanometry.<sup>26</sup>

Reinforcing a behaviour is an important construct in social cognitive theory and it requires a behaviour to be repeated and sustained.<sup>27</sup> As this service is focused on acute presentations of ear complaints to a community pharmacy, the reinforcing factor is that this service was implemented as a pilot service and will continue as a permanent service after the pilot concludes. The pharmacies will retain the equipment and thus be able to continue to offer the service and sustain the ear care focus for their communities. In addition, the behaviour changes through the non-pharmacological advice and health promotion provided during the service is a reinforcing factor of the model.

### *PRECEDE - Phase 5 - Administrative and Policy Assessment*

Based on the analysis of assessments in Phases 1-3, we constructed a preliminary ear health intervention for rural community pharmacy. Through consultation with the two community pharmacies involved in the study, the capacity of the pharmacies to implement an ear health intervention was explored. Both pharmacies reported adequate pharmacists, time, and space for the project. The primary capital expense was the purchase of an equipment package including a video-otoscope, tympanometer and consumables for each pharmacy. Funding was also required for the training.

An advisory panel was then formed with representatives from key stakeholder organisations including Pharmaceutical Society of Australia, Pharmacy Guild of Australia, Gidgee Healing (Aboriginal Medical Service), and Australian Primary Health Network. Consultations were conducted and minor changes such as wording on documentation were implemented. The advisory panel provided expertise to this project and confidence that the study was appropriate and acceptable in practice and well aligned with the current rural pharmacy landscape. General practitioner engagement followed, whereby GP practices were invited to participate in the project. In each site, a GP service agreed to participate and their contribution to the project was to provide the link between the community pharmacy consultations and GP presentations. Participants who were seen at the pharmacy and required a GP referral would be connected to the GP service with a same-day or next-day appointment.

Policy, regulation, and legal requirement were discussed through consultations with representatives from Pharmaceutical Society of Australia, Pharmacy Guild of Australia, The Pharmacy Board of Australia, Pharmaceutical Defence Limited and the Department of Health. It was agreed that a pharmacist's scope of practice is determined by an individual pharmacist and with the proposed training, the LISTEN UP service was within the pharmacist's role with respect to both regulation and the law.<sup>28</sup>

### PROCEED

The study protocol for LISTEN UP is registered with the Australian and New Zealand Clinical Trial Registry: ACTRN12620001297910 (Figure 12-2). This project has been approved by the Human Research Ethics Committee, James Cook University (H8187) (Appendix H). A detailed study protocol has been published in the Pilot and Feasibility Studies Journal.<sup>24</sup>

Phase 5A – Pilot Study

The pilot study started on the 1<sup>st</sup> of February 2021. During the six-week pilot 20 participants presented to the pharmacy with an ear complaint. One participant had a fever within 72 hours and was excluded from the trial and one participant’s data record was incomplete and thus excluded. Demographic and clinical data from the pilot study are reported in Table 12-3. The average age was 44 years with a range from 20 to 71 years. Two-thirds of the participants were female. Sixteen of the participants were able to be contacted for a follow-up interview, with eleven identified as Caucasian and five as Aboriginal or Torres Strait Islander.

**Table 12-3:** Patient demographic and clinical data for PPM (N=18)

Age (years)		Gender	
19-24	3 (17%)	Female	12 (67%)
25-34	5 (28%)	Male	6 (33%)
35-44	1 (5%)	Ethnicity	
45-54	3 (17%)	Caucasian	11 (61%)
55-64	4 (22%)	Indigenous	5 (28%)
65 and above	2 (11%)	Unknown	2 (11%)
Presenting Complaint (N = number of patients)		Pharmacist’s Clinical Impression (N = number of patients)	
Pain/Pressure	11	Ear wax impaction	6
Blocked (wax/water)	10	Ruptured ear drum	3
Hearing Impairment	3	Unsure	3
Itch	2	Normal ear	2
Other	2	Inflammation	2
		Calcification	2
		Otitis media	2

Otoscopy examinations occurred in 16 of the consultations with 12 reported by pharmacists as normal. Tympanometry assessments were conducted for 14 participants and 10 were reported as normal by the pharmacists. Pharmacist recommended products included wax dissolvents (n=7) or analgesic therapy (n=3) and four participants were not recommended any treatment. Four patients were referred to and attended GP appointments. At the seven-day follow-up five participants symptoms had completely resolved, three were improving, one was not improving and this participant was referred to the GP. One participant who was recommended no treatment had attended the emergency department at the hospital and no treatment was recommended. Of the four participants who attended the GP, two cases were resolved and two were not and those

unresolved cases had follow-up appointments in place with the GP. Four participants were unable to be contacted for the follow-up.

Patient satisfaction results are provided in Table 12-4. All participants agreed or strongly agreed that the pharmacist explained the aims of the LISTEN UP service well, that they were satisfied with how the pharmacist checked their ears and recommended treatment options, that they had the opportunity to raise questions or concerns relating to the service, and that they would recommend the LISTEN UP service to others. Participant satisfaction themes were focused on convenience, timeliness, professionalism, and knowledge of pharmacists. All participants stated they would pay for the service in the future and the value ranged from AUD\$15-\$200.

**Table 12-4:** Patient Satisfaction Survey Results

Questions with Yes/No answer option	Yes
Before coming to the pharmacy today, I tried to see a GP about my ear	6 (33%)
If the service was not available today, I would have gone to my GP	13(72%)
If the service was not available today, I would have gone to the hospital	10 (50%)
Next time I have an ear problem I will come to the pharmacy instead of a GP	18 (100%)
Free Text Comments	
'Very good reassurance about my ears.'	
'Service exceeded my expectation.'	
'I am satisfied with how the pharmacist checked my ears. Great service.'	
'Excellent support, information was great, feel reassured. Thank you.'	

### *Phase 6 – Implementation*

Program implementation commenced March 2021.

### *Phase 7 – Process Evaluation*

Process evaluation was conducted at completion of Phase 5A – Pilot Study. In addition to the results provided, discussions were held with the pharmacists about the program and any improvements that were needed. Both pharmacies had the same equipment availability, a similar number of pharmacists employed, and strong dedication to professional service provision. However, only one of the participating pharmacies had begun the program, and the other reported that difficulties such as workload, hesitation around the documentation processes, and other competing business priorities which had been impacting on their ability to commence LISTEN UP. Additional support through site visits has been offered to this pharmacy to facilitate the implementation of LISTEN UP.

For the pharmacy that had participated in the pilot, two of the pharmacists had conducted all the consultations and those two pharmacists had dedicated time to focus on over-the-counter requests. Barriers reported by the pharmacists included difficulty in providing the consultation in a timely manner that allowed for documentation to be completed, frustration at needing to refer patients to a GP for conditions that could be managed in the pharmacy, and not being remunerated for the service. Pharmacists expected that if their scope of practice expanded to include prescribing for minor ailments, LISTEN UP would save both time and money. Consideration for future research would include having dedicated face-to-face implementation sessions at every site to ensure all pharmacists are confident to begin the program on completion of the training.

There were also initial reports of difficulty in making patients timely appointments at the GP practice. Consultation with the GP practice identified scheduling difficulties being associated with extended waiting times for GP appointments, and the GP practice was then able to prioritise the referrals from the pharmacies to ensure the project could maintain fidelity.

To determine the efficacy of the LISTEN UP program approximately 200 participants will be required to partake in the service for an appropriate sample size.<sup>24</sup> This will allow for measures including intervention exposure, fidelity, and participant appraisal to be examined on a robust volume of data. *As there were minimal changes incorporated after the six-week pilot study, the data from the pilot will be included in the twelve month pilot evaluation.*

## 12.5 DISCUSSION

In Australia, around 3.6 million people suffer from hearing loss, with more than 1.3 million hearing conditions that could have been prevented.<sup>4</sup> When left untreated, hearing loss and ear disease can affect a child's learning and development and those with untreated hearing loss may also be at risk of developing other health problems.<sup>4</sup> Barriers to accessing ear care services have been identified including gaps in testing during the 'early years' and difficulty in accessing health services.<sup>29</sup> In rural and remote populations, the burden of ear disease is under-reported with widely recognised and profoundly negative impacts on patient outcomes, particularly for Indigenous people.<sup>3</sup> Rural community pharmacists have been identified as highly qualified and easily accessible health professionals in rural and remote communities.<sup>10</sup> However, data for patients presenting with ear complaints to rural or remote community pharmacies is unavailable. In many rural communities, Indigenous populations can be as high as 20%-80% and thus the likely prevalence of hearing issues

would be significant. Thus, a paradigm shift of the role of rural community pharmacists to provide an ear health program that has the potential to improve health outcomes for rural and remote populations.

The lack of literature combined with knowledge of pharmacists providing unregulated ear care services highlights the importance of developing a structured ear care model for rural community pharmacy and the pharmacy profession more broadly. Historically pharmacists have provided advice at no cost and this has been recognised as a barrier to pharmacists being able to provide sustainable professional services.<sup>30</sup> There is expectation that consumers would not be willing to pay for pharmacy services, and thus either a fee for service model whereby consumers pay or by attracting government funding if the model was found to be successful would improve the sustainability of LISTEN UP.<sup>30</sup>

Another enabling factor identified in the literature was high quality training for the pharmacists providing the service.<sup>8</sup> We attracted approximately AUD\$20,000 in funding to provide a training and equipment package for pharmacists to two rural community pharmacies and discussed the opportunity with the participating pharmacists to continue to provide a financially viable service after the intervention period is completed. The importance of ensuring that pharmacists providing professional services are well trained to do so has been identified by pharmacists themselves who described concern about their skills for expanded services.<sup>20</sup> This was also the opinion of other health professionals, who were largely supportive of pharmacists providing expanded services if adequate training has been provided.<sup>17, 18, 21</sup>

The LISTEN UP pilot study has demonstrated very high levels of patient satisfaction and intention to return to the pharmacy for ear complaints in the future. This satisfaction, aligns with the sore throat study conducted in the United Kingdom, which may indicate the beginning of a shift in consumer health-seeking behavior towards pharmacy-based services.<sup>25</sup>

Difficulty with incorporating a new service into the workflow and managing the additional workload for professional services in pharmacy has been reported in the literature.<sup>15, 31</sup> Pharmacist availability and additional time required to complete documentation associated with services have been described as barriers to service delivery.<sup>15, 31</sup> LISTEN UP has been successfully implemented into a pharmacy which operates with the equivalent of four full-time pharmacists, with a strong focus on professional services. The pharmacy has a dedicated pharmacist providing professional services

during all operating hours and this behavioral change and focused time for service provision has seen LISTEN UP easily implemented as part of the pharmacy's suite of professional services.

The discussion and collaboration with the GPs before the pilot and agreement by them to facilitate timely appointments has been crucial to the program. In other studies, a lack of collaboration from GP providers has been reported as a major barrier to the success of professional pharmacy services.<sup>23, 34</sup> GPs have been described as unsupportive of pharmacy services broadly and although GPs have been reported to be accepting of pharmacists' involvement in medication management, they were less accepting of expanded services.<sup>15, 34, 35</sup>

### *Phase 8 – Impact Evaluation*

Findings from the clinical data of patient presentations will demonstrate if the program is effectively identifying untreated ear conditions. In addition, the follow-up phone call to determine if the conditions have resolved will determine if the program is effectively managing ear conditions to reduce complications, developmental delay, and functional impairment.

Interviews with pharmacists and GPs pre- and post-intervention will determine whether the project has improved collaboration between community pharmacists and GPs. GP perspectives as to whether the protocol is ensuring they are receiving targeted referrals and whether the utilisation of telehealth and video-otoscopy is resulting in timely transfer of care will be identified in the interviews with the GPs post the intervention period.

Pharmacy-based referrals to GPs and telehealth services with GPs offered through pharmacy have been reported previously in the literature. In a study about GPs' (N=414) attitudes towards minor ailment management, there is agreement (77%) that patients should visit a pharmacist about minor ailments before visiting the doctor and that the pharmacists' role is to provide advice on appropriate course of action with referral to GP if necessary (90%).<sup>36</sup> GPs are also offering telehealth services for patients from within the community pharmacy, further strengthening a link between GP and pharmacy and optimising a continuity of care for patients.<sup>37</sup>

### *Phase 9 - Outcome Evaluation*

The outcome evaluation will include data from patient satisfaction surveys, patient follow-up phone call transcripts, consultation data and interview transcripts from pre and post interviews with



pharmacists and GPs. This data will be evaluated to determine if the LISTEN UP program has improved rural consumer access to ear healthcare and whether pharmacists are prepared and confident to provide an ear health service following a protocol.

### **Limitations**

This study is limited due to sample size and number of participating pharmacies. The sample size notwithstanding, this pharmacy pilot service is the first attempt to improve ear health of rural populations who are extremely vulnerable due to lack of access to appropriate services. The qualitative component of the study has also allowed for a deep understanding of challenges and enablers to developing and implementing an ear health service.

## 12.6 CONCLUSION

The impact of ear disease in rural and remote communities is profound. Extreme lack of access to health providers working in ear health and increased severity of ear disease will continue to impact education, employment, and social opportunities. The PRECEDE-PROCEED model can be effectively applied to undertake a stepwise approach to design, develop, and evaluate an innovative model of care. LISTEN UP is a community pharmacy ear program that has been piloted in two remote Australian communities with promising results, reflected in the highly positive consumer feedback. Although difficulties have arisen with implementation across more than one site, the PRECEDE-PROCEED model may be used to identify implementation issues earlier before major investment has occurred. Successful application of the PRECEDE-PROCEED model to LISTEN UP may confirm its usefulness in the development of other services where gaps in existing service provision have been identified.

**Institutional Review Board Statement:** The study was approved by the Human Research Ethics Committee of JAMES COOK UNIVERSITY ((H7845 (17 July 2019) and H8187 (18 August 2020)) (Appendix H).

**Clinical Trials Registration:** LISTEN UP is registered with the Australian New Zealand Clinical Trials Registry (ANZCTR). ACTRN: ACTRN12620001297910

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## Chapter 13 – LISTEN UP - Study Protocol

This chapter is the published study protocol for LISTEN UP (Locally Integrated Screening and Testing Ear aNd aUral Programme). LISTEN UP is a community pharmacy-based ear health intervention which involves trained community pharmacists providing an expanded service to manage ear complaints. This study protocol is published in the journal *BMC Pilot and Feasibility Studies*.

Taylor, S.M., Cairns, A., Mantzourani, E. *et al.* ***LISTEN UP (Locally Integrated Screening and Testing Ear aNd aUral Programme): a feasibility study protocol for a community pharmacy-based ear health intervention.*** *Pilot Feasibility Stud* 7, 124 (2021). <https://doi.org/10.1186/s40814-021-00856-6>

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass, Efi Mantzourani and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

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*Permission obtained from BMC Pilot and Feasibility Studies for the inclusion of this published journal article.*

## 13.1 ABSTRACT

*Background:* Ear disease is a major cause of preventable hearing loss and is very common in rural communities, estimated to affect 1.3 million Australians. Rural community pharmacists are well placed to provide improved ear healthcare to people who are unable to easily access a general practitioner (GP). The purpose of this study is to apply an ear health intervention to the rural community-pharmacy setting in Queensland, Australia, to improve the management of ear disease. The aims are: (1) to evaluate the feasibility, potential effectiveness, and acceptability of a community pharmacy-based intervention for ear health, (2) to evaluate the use of otoscopy and tympanometry by pharmacists in managing ear complaints in community pharmacy and (3) to evaluate the extended role of rural pharmacists in managing ear complaints, with the potential to expand nationally to improve minor ailment management in rural communities.

*Methods/Design:* This is a longitudinal pre- and post-test study of a community-pharmacy-based intervention with a single cohort of up to 200 patients from two rural community pharmacies. Usual care practices pertaining to the management of ear complaints will be recorded prior to the intervention for eight weeks. The intervention will then be piloted for six weeks, followed by a six-twelve month impact study. Patients aged >13 years presenting to the pharmacies with an ear complaint will be invited to participate. Trained pharmacists will conduct an examination including a brief history, hearing screening, otoscopy, and tympanometry assessments. Patients will be referred to a general practitioner (GP) if required, according to the study protocol. Patients will complete a satisfaction survey and receive a follow-up phone call at seven days to explore outcomes including prescribed medications and referrals. Pharmacists and GPs will complete pre- and post-intervention interviews. Patient, pharmacist, and GP data will be analysed using descriptive statistics and thematic analysis for the qualitative data.

*Discussion:* This study will demonstrate the implementation of a screening and referring ear health intervention in rural community pharmacy. Feasibility, potential effectiveness, and acceptability of the intervention will be assessed.

*Trial Registration:* Australian and New Zealand Clinical Trial Registry Number:  
ACTRN12620001297910

*Keywords:* community pharmacy, rural and remote, pharmacy practice, scope of practice, ear.

## 13.2 INTRODUCTION

Ear care is recognised as important for the health of the population.<sup>1</sup> Ear disease is increasing globally with the World Health Organisation (WHO) proposing that by 2050 we can expect 900 million people to have disabling hearing loss, twice that of 2019.<sup>2</sup> In Australia, more than 1.3 million people are living with a hearing condition that could have been prevented.<sup>3</sup> In rural and remote communities, the prevalence rate of middle ear diseases is as high as 50% in children under three years of age, double the prevalence recognised by WHO as a ‘massive public health problem’.<sup>1,2</sup> As well as the health consequences, unmanaged ear disease correlates with poor educational, social, and behavioral outcomes.<sup>1</sup>

Access to trained healthcare providers and a lack of infrastructure and supplies have been recognised as major challenges to providing ear care internationally.<sup>1</sup> There is currently a shortage of healthcare workers in rural and remote communities able to provide ear healthcare, which is predicted to worsen in the future.<sup>4</sup> Despite these shortages, there have been a number of innovative models of care developed to utilise consistently accessible healthcare professionals such as pharmacists to improve ear care.<sup>5</sup> A scoping review of community pharmacist interventions in ear health identified eight studies, whereby pharmacists provided a targeted ear health service, including hearing screening (4 in Australia), an otoscopy pilot study (1 in England) and pharmacy-based ear clinics (1 in USA; 2 in England).<sup>5</sup>

Pharmacists are trusted and accessible health professionals, who are motivated to meet local community needs.<sup>6</sup> Internationally, rural pharmacists are providing innovative models of care and working at expanded scopes of practice to better meet health needs.<sup>7</sup> Pharmacists, consumers, and health professionals living in rural and remote locations in Australia are supportive of pharmacists expanding their service delivery to improve patient outcomes.<sup>8-10</sup> Rural pharmacists in Australia work in a unique setting with complex patients and limited access to health services and the potential for them to improve ear healthcare is unknown. A new pilot program was developed to explore the impact of a pharmacist ear care intervention on patient related outcomes.

Pilot and feasibility studies are an important step in the development of successful interventions for health.<sup>11</sup> There is emerging acknowledgement of the value of pilot studies to better understand the conduct and applicability of an intervention to allow the results to be better applied to patient care.<sup>11</sup>



This paper describes the research protocol of the pilot, LISTEN UP (**L**ocally **I**ntegrated **S**creening and **T**esting **E**ar **a**ND **a**Ural **P**rogram), a rural community pharmacy-based intervention to improve the management of ear health in the community in Australia.

### Research aims

This study aims to: (1) to explore the feasibility, potential effectiveness, and acceptability of a community pharmacy-based intervention for ear health, (2) to evaluate the use of otoscopy and tympanometry by pharmacists in managing ear complaints in community pharmacy, and (3) to evaluate the extended role of rural pharmacists in managing ear complaints, with potential to expand nationally to improve ear care minor ailment management in rural communities.

## 13.3 METHODS

### Study design and setting

This is a longitudinal pre- and post-design study of a community-pharmacy-based intervention piloted in two rural community pharmacies in Queensland, Australia. Co-design has been applied to this study with stakeholder, health professional, pharmacist, and consumer perspectives from previous research utilised in conjunction with community consultation to inform the design of this study.<sup>8-10</sup> Prior to the intervention, participating pharmacies will collect usual care data for 8 weeks beginning November 2020. The intervention will then be piloted for six weeks at each pharmacy and then refinement and improvements will be made before the longitudinal impact study is conducted for six-twelve months.

### Ethics approval

This project has been approved by the Human Research Ethics Committee, James Cook University (H8187) (Appendix H).

## Pharmacies

### Pharmacy eligibility criteria

Community pharmacies that meet the following criteria are eligible to participate as a study site:

- Participating pharmacists must hold unconditional registration with the Australian Health Practitioner Regulation Agency (AHPRA).<sup>12</sup>
- Maintain accreditation standards for quality assurance under the Quality Care Pharmacy Program (QCPP).<sup>13</sup>
- Have a private counselling area within the pharmacy that is separated from the common pharmacy counter, where one-to-one consultations can be conducted.
- Have a high daily 'walk-in customer' number of more than 100 customers per day.
- Have suitable information technology including a computer with internet access, printer, and scanner.
- Are classified as rural or remote by the Modified Monash Model classification system categories 4-7.<sup>14</sup>
- Are in Queensland, Australia due to COVID-19 interstate restrictions around travel for training.

### Recruitment of pharmacies

Pharmacies who have participated in earlier research on rural expanded pharmacy practice will be invited to express an interest to participate in the LISTEN UP program. Those pharmacies who are interested will be phoned by the principal investigator to provide further explanation of the study and obtain consent. Two pharmacies will be enrolled in the study. Each pharmacy will be linked with at least one participating general practitioner. An invitation to participate with an information sheet and informed consent form will be provided to each pharmacist at the participating pharmacies and each GP at the participating general practices.

### Pharmacist training

Each participating pharmacist will undertake nationally credentialed training in ear health including otoscopy and tympanometry. This training will be mixed mode with online and face-to-face components. The training includes 55 hours of online training and two full days of workshops and is

provided by the Benchmarque Group.<sup>15</sup> The training will include the following units of competencies: EHHPEH002 - Promote, educate, and manage ear health, EHHAEH001 - Assess ear health, EHHPEA004 – Paediatric and TYMPTY001 - Perform tympanometry.

Only pharmacists who have successfully completed the required training will be eligible to participate in the study. Completed certificates of training will be provided to the principal investigator.

All training, including training materials will be consistent with national standards and will be tailored to suit the needs of community pharmacists. In addition, pharmacists will be provided with a list of recommended supplemental readings and resources. A member of the research team who is a pharmacy academic will also provide face-to-face and virtual training to the pharmacists on documentation processes for the project.

### General Practitioners (GPs)

#### *General practitioner eligibility criteria*

GPs that meet the following criteria are eligible to participate in the study:

- Hold unconditional registration with the Australian Health Practitioner Regulation Agency (AHPRA).
- Have capacity to provide timely appointments (within 48 hours) for participants referred to them for review.
- Have suitable information technology provisions including a computer with internet access, printer, and scanner.
- Are classified as rural or remote by the Modified Monash Model classification system categories 4-7.<sup>14</sup>
- Are in Queensland, Australia due to COVID-19 interstate restrictions around travel for training.

#### *Recruitment of GPs*

At each pharmacy location, all GP practices within a 25km radius will be invited to participate in the study.

## Participants

### *Sample size*

The sample size was calculated using the formula  $n = Z^2 P (1-P)/d^2$ , where n=sample size, Z = Z statistic for a level of confidence = 1.96 (for a level of confidence of 95%), P = expected prevalence or proportion = 0.14 (14%) and d = precision = 0.05 (5%).<sup>16</sup> To our knowledge, there is no published community pharmacy-based ear health interventions of similar nature, therefore no standard reference could be applied to accurately determine prevalence required to calculate the sample size. However, we have calculated a sample size based on data from the Australian Government Department of Health, which estimates 14% of Australians suffer from hearing loss<sup>3</sup> n = 185 + 10% for missing data = 203 participants.

Given the calculated sample size, it is expected that each of the two participating pharmacies would recruit 100 patients into the study during the impact study.

### *Recruitment of participants*

Potential participants will be recruited from walk-in customers who present at participating pharmacies seeking advice or products for an ear complaint. Pharmacists will invite these patients to participate in the study, provide an information sheet (with verbal explanation), ensure patient meets eligibility criteria and completes an informed consent form. Informed consent obtained from study participants is in written form.

### *Participant eligibility criteria*

To be eligible for participation in the study, patients must

- be aged 13 years or older (to be able to independently provide informed consent, those between 13-16 years can consent for self or parent/guardian may provide consent)
- be able to understand the English language at a level appropriate to provide informed consent (pharmacists will use professional judgement to determine if participants are able to provide informed consent)
- attend a participating pharmacy as a 'walk-in' customer seeking help for an ear complaint

Patient will be excluded from the study if they:

- are < 13 years old
- have inadequate health literacy or English language skills to provide informed consent
- have obvious major trauma to the ear
- are a high COVID19 risk patient (e.g., travelled in a COVID19 hotspot within 14 days)
- have not consented

### Intervention participants

Participant's temperature will be measured in the waiting area, if >37.5 Celsius COVID19 precautions will be implemented and additional personal protection equipment (PPE) applied, including face mask, gloves, and face shield. Pharmacists will conduct the consultation with eligible consenting participants in a private consultation space. Pharmacists will then document a brief history of the ear complaint including symptoms, duration, and treatments tried by the patient on a template service summary document (Appendix E) provided to them. Pharmacists will then examine the ears using otoscopy and tympanometry. If the complaint is hearing related, pharmacists will perform a hearing screening test using the *Sound Scouts* application.<sup>17</sup> *Sound Scouts* is an application based hearing check that can be used in persons over the age of four years to detect conductive hearing loss, sensorineural hearing loss and difficulties listening in noise.<sup>17</sup>

### Equipment

The otoscope used in this study is the MedRx video otoscope. The tympanometer is the Amplivox Otowave 102. Hearing screening will be conducted using the *Sound Scouts* application with Senheiser HD 300 headphones.

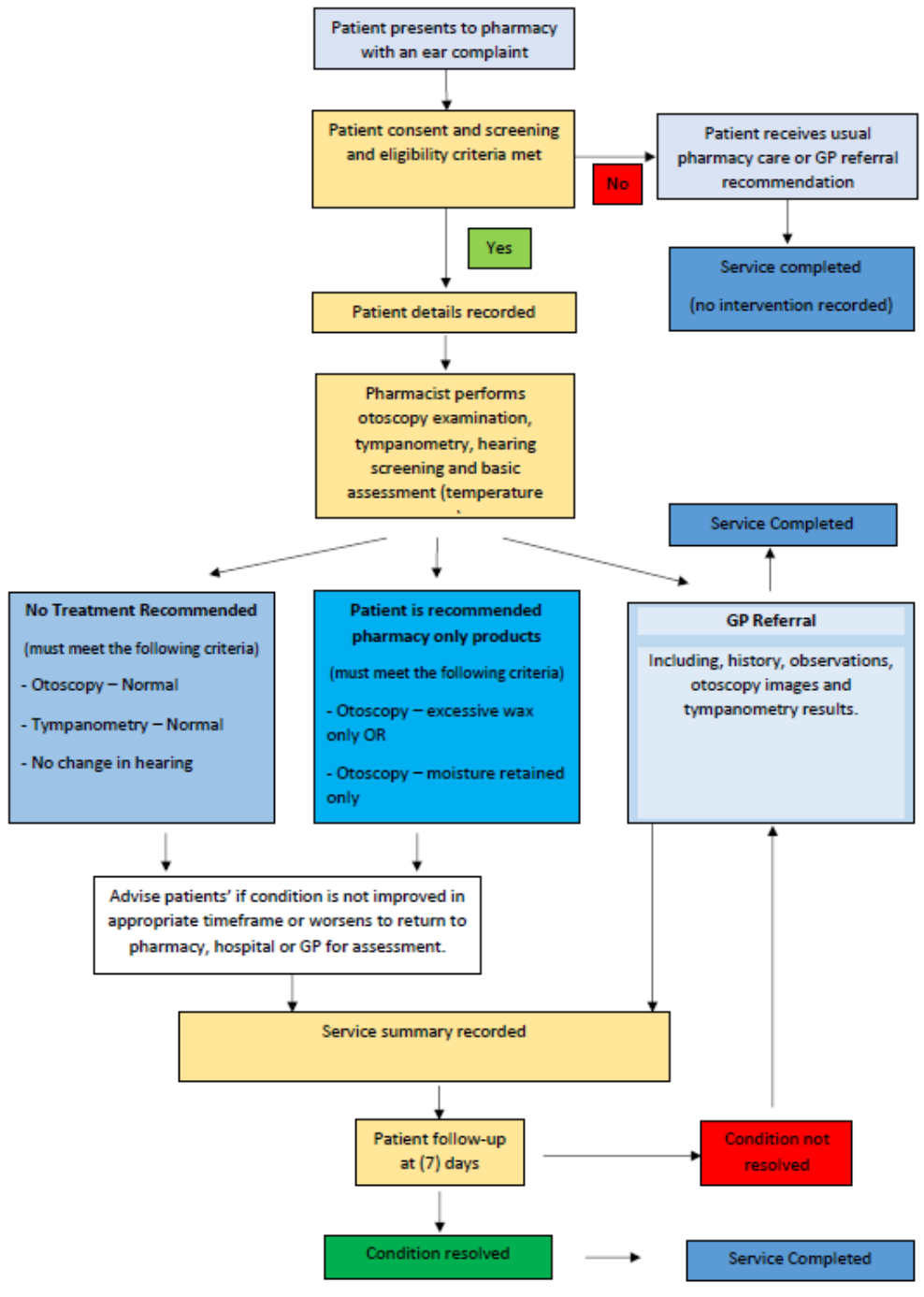
### Patient data collection

Patient data collected includes full name, postcode, age, gender, allergies, medicines, medical conditions, pregnancy/breastfeeding status, temperature, brief history of the ear complaint including symptoms, duration, and treatments tried by the patient, otoscopy, tympanometry, and hearing screening findings/results. This information will be documented on the service summary record. This record will contain all the information collected by the pharmacists from the patient consultation. It was developed in consultation with an advisory group (consisting of stakeholder

representatives from various organisations in the health sector), is formatted in Microsoft Office and is stored on a password protected hard drive.

### Protocol

Pharmacists will follow a protocol to determine the pathway [Figure 13-1] for the patient. If otoscopy and tympanometry assessments are normal and hearing is not affected, the pharmacist may recommend no treatment and advise patient to monitor and seek medical advice if condition does not improve or worsens. If otoscopy indicates excessive wax only or moisture retention from water activity only and no other symptoms are present, the pharmacist may recommend pharmacy products including ear drops containing drying agents or wax dissolvents. All other patients will be referred to a GP with an appointment made by the pharmacist before they leave the pharmacy. Pharmacists will be able to book appointments with the GPs via a public online booking platform or via telephoning the GP practice. If the pharmacist is unable to make a timely appointment with a GP, the patient will be recommended to attend the local emergency department. Participants will be asked to complete a patient satisfaction survey and consent to a follow-up phone call in seven days.



**Figure 13-1:** LISTEN UP Study Protocol

GP Referral

The GP to which the patient has been referred will be emailed a password encrypted file with all the patient data including temperature, brief history of the ear complaint including symptoms, duration and treatments tried by the patient, otoscopy, tympanometry and hearing screening findings/results.

### Pharmacist recommendations

Pharmacists will be asked to record their actual recommendations and recommendations they would have made if they had an expanded scope including if they would have recommended a prescription medicine, or referral to other service providers including audiometrists, speech pathologists, or ear, nose, and throat specialists. This information will be collected for research purposes only as current practice does not allow Australian pharmacists to recommend prescription medicines or refer patients to specialty services.

### Follow-up

A member of the research team will phone all patient participants seven days after their pharmacy consultation to explore the patient outcomes from the intervention. Patients will be asked about the condition of their ear complaint (improvement/deterioration), their satisfaction with the pharmacy intervention (Likert scale), if they were referred to a GP, if they attended the GP appointment and what advice, prescription or referral they had received from the GP. If the patient indicates further deterioration of the condition, a lack of improvement or a concern about the complaint, the researcher will offer to refer the patient to the GP and/or advise the patient to seek further medical advice.

### Data Saturation

Total population sampling will be conducted in this study. We will attempt to interview all GPs and pharmacists by inviting them to participate in an interview three times. In addition, all participants will receive a follow-up phone call four times, including at least one out of normal business hours, to ensure as many as possible participants receive the follow-up phone call.

### Study measurements and outcomes

Data pertaining to patient, pharmacist and GP experiences of the ear health intervention will be collected via semi-structured interviews pre- and post-intervention with pharmacists and GPs, service summary documentation, patient satisfaction surveys and seven-day follow-up interviews with patients (Table 13-1). These data collection tools were developed in house to suit this innovative model. Pharmacist and GP interviews will include questions pertaining to perceptions of expanded pharmacy services, current local landscape of ear health (incidence, access to services)



and expected/actual outcomes of the LISTEN UP project including pharmacist capacity, patient receptiveness, and GP/pharmacist/patient interaction. Usual care data will be recorded for eight weeks prior to the intervention. The usual care data will include a non-identifiable record of ear complaints presenting to the pharmacy, the description of the complaint and the pharmacists' recommendations.

**Table 13-1:** Data collection methods for pre-, during and post-intervention phases

	Patients	Pharmacists	General Practitioners
Pre-Intervention	Record of usual care in pharmacy for 8 weeks	Semi-structured Interview	Semi-structured Interview
During Intervention	Patient Satisfaction Survey	Service Summary Document	
Post-Intervention	Semi-structured Interview (7-day follow-up)	Semi-structured Interview	Semi-structured Interview

Usual care data will record patient age groups, type of complaint (ear pain, ear wax, swimmers' ear, ear itch, hearing loss or other), duration of the complaint, pharmacist recommendations (pharmacy products, verbal GP referral, verbal emergency department referral, or other).

Initial study measurements are pharmacist and GP perspectives of ear health in the community, this described study protocol, expected outcomes, and anticipated enablers and barriers. This data will be collected prior to the study beginning via semi-structured interviews to explore the expected feasibility of the study. The interviews will be repeated post-study and the data collected from pre-intervention will be compared with data collected from these interviews to measure a change of opinion with pharmacists and GPs post-intervention.

Pharmacists will record the consultation data on a service summary document (Appendix E). This document will also collect pharmacist recommendations for the patient, including recommendations they would have made if they had an expanded scope of practice such as prescription medicines and specialist referrals. This data will be compared with data provided by the patients at the 7 day follow-up phone call about the medicines they were prescribed and any referrals they may have received. In addition, qualitative data relating to the patient experience of the pharmacy service and patient perceived outcomes of the ear complaint will be collected during the patient interviews.

## Study measurements

The study measurements collected in the intervention include pharmacist views, pharmacist recommendations, GP views, and patient views. These measurements are aligned to the primary and secondary outcomes of the study (Table 13-2).

**Table 13-2:** Summary of study measurements aligned to study outcomes.

Measurement	Instruments	Pre-study	During study	Post-study	Primary Outcome	Secondary Outcome
Pharmacist Views	Semi-structured interview	X		X	1a	1,2
Pharmacist Recommendations	Service summary document		X			1,2,3
GP Views	Semi-structured interview	X		X	1c	1,2
Patient Views	Satisfaction survey			X	1b	1,2
Patient Views	Semi-structured interview			X	1b	1,2,3

## Study outcomes

The outcomes of this study will be assessed against the objective of implementing a rural community pharmacy-based 'model of care' to improve the management of ear complaints in the community.

### *PRIMARY*

- (1) To evaluate the feasibility, acceptability, and potential effectiveness of a community pharmacy-based intervention for ear health by exploring:
  - a. Pharmacist views of:
    - i. Pharmacist capacity and competence to provide the intervention (motivation, confidence, competence, experience of training, capacity (workflow/workload)).
    - ii. Patient acceptance
    - iii. Pathway to GP service (timeliness of appointment, GP staff attitudes).

- b. Patient views of the service in terms of access, alternative healthcare options, satisfaction, and willingness to pay (confidence/acceptance of pharmacist service, referral process, timeliness of pharmacist consult/GP consult).
  - c. GP views on appropriateness of pharmacist referrals, collaborative care with pharmacists (use of telehealth).
- (2) To evaluate the use of otoscopy and tympanometry by pharmacists to improve specificity of ear condition management in community pharmacy by comparing:
- a. Usual care data with intervention data pertaining to pharmacist recommendations.
  - b. Pharmacist recommendations on the patient service summary record compared to GP prescriptions and referrals described by patients at the seven-day follow-up phone call.
  - c. Patient acceptance of pharmacists performing examinations with an otoscope and tympanometer.

## *SECONDARY*

- 1) To evaluate the extended role of rural community pharmacists in managing ear complaints as a minor ailment in the community by evaluating, patient, GP, and pharmacist perspectives of a community pharmacy-based ear health pre- and post- intervention.
- 2) To evaluate the potential for implementation of a national model of community pharmacy-based interventions to improve the management of minor ailments in rural communities.
- 3) To provide evidence to guide the scheduling of medicines to allow pharmacists to better manage minor ailments in community pharmacies.

## Data analysis

Data collected via semi-structured interviews will be transcribed verbatim and thematically analysed both inductively and deductively, using NVivo 12 software program.<sup>18-19</sup> Data collected from the patient surveys and patient service summary record will be analysed using descriptive statistics and frequencies using IBM SPSS Statistics 25 for Windows.

## 13.4 DISCUSSION

The protocol and methods outlined will inform the development of an intervention framework for managing multiple minor ailments in the rural community pharmacy setting in Queensland, Australia. Positive outcomes from this study may demonstrate feasibility, potential effectiveness, and acceptability of such an intervention. Internationally, expanded practice is becoming common practice and is widely accepted in many countries, however evidence to support expanded models of care in rural settings both internationally and in Australia are exceptionally limited and thus this protocol will add to the evidence base.<sup>7</sup>

Preliminary discussions with professional pharmacy associations and professional indemnity insurers have been conducted and there is a high level of support for this program.

### **Limitations of the study protocol**

This is a small pilot study of a complex intervention, with no control group. If the pilot testing indicates feasibility and effectiveness of this intervention, it will be important to validate the study with larger numbers in varied locations with a control group to comprehensively determine effectiveness and scalability. In addition, it was deemed out of scope for the small scale pilot protocol to include an economic evaluation of the study and thus a larger study would be required to examine economic sustainability.

## 13.5 CONCLUSION

Ear disease is recognised as a major public health concern for rural and remote communities, especially due to accessibility of health professionals, requiring innovative strategies for effective management. Patients with ear complaints regularly present to community pharmacies seeking help due to difficulty in accessing GPs outside of metropolitan locations. Currently, pharmacists provide recommendations based on symptomatic descriptions of ear complaints provided by patients. Pharmacists are in an appropriately positioned location to provide improved ear care and are well placed to ensure patients can access timely healthcare. To our knowledge, this is the first community pharmacy-based study providing a specific ear health intervention in rural pharmacy practice to enable a pharmacist to improve the management of ear complaints.

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## Chapter 14 – LISTEN UP - Evaluation

This chapter presents the findings for the LISTEN UP pilot study and is published in the journal *BMC Open*. The research data was collected from two rural pharmacy sites in Queensland, Australia. Consumers, pharmacists, and general practitioners contributed to this research. This original research article has been submitted to the journal *BMJ Open* and is under review.

**Taylor S, Cairns A, Glass B. *LISTEN UP: An Ear Health Intervention for Rural Community Pharmacy*. BMJ Open [Under review - submitted September 2021]**

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

Selina Taylor

Alice Cairns

Beverley Glass



## 14.1 ABSTRACT

Ear disease in rural and remote communities is occurring at high rates, with limited access to health services and health providers contributing to the problem. Community pharmacists are well placed to provide expanded services to improve ear health in rural communities. An ear health service model involving pharmacists in rural community pharmacy was trialed.

**Objective:** To evaluate the feasibility, accessibility, and acceptability of a pharmacist-led intervention for ear disease in consumers presenting to community pharmacy.

**Design:** Prospective pre-post intervention.

**Setting:** Two rural community pharmacies across Queensland, Australia.

**Participants:** People aged six months or older, who present with an ear complaint to a participating community pharmacy.

**Intervention:** Trained pharmacists conducted ear examinations using otoscopy and tympanometry on consumers following a protocol. They made recommendations including no treatment, pharmacy only products, or GP referral. Consumers were contacted seven days later for follow-up.

**Results:** Fifty-five rural consumers participated in the study. The most reported complaints were 'blocked ear' and 'ear pain'. Pharmacists recommended over-the-counter products to two-thirds of the participants and referred one-quarter to a GP. Ninety percent of the consumers were highly satisfied with the service and would recommend the service. All consumers described the service positively with reference to convenience, improved confidence and appreciation of the knowledge gained about their ear complaint. Pharmacists were motivated to upskill and manage workflow to incorporate the service and expected both consumers and GPs to be more accepting of future expanded services because of LISTEN UP. However, without funding to provide the service, during the trial other remunerated pharmacy tasks took priority over providing LISTEN UP.

**Conclusion:** Rural community pharmacists can provide an acceptable and accessible ear health service, however it is not feasible without a clear funding structure to provide resources including additional pharmacists, equipment and training.

**Trial registration number:** ACTRN12620001297910

What is already known about this subject?	What are the new findings?	How might it impact on clinical practice in the foreseeable future?
Ear disease is a major public health problem in rural and remote Australia, with disease burden having lifelong impacts.	Rural community pharmacists can follow a protocol to provide an acceptable and accessible ear health service.	Adequate funding to support rural community pharmacists to provide an ear health service will reduce costs and improve health outcomes.

### Strengths and Limitations of the Study

- This study is the first in Australia to present a structured ear care intervention for rural community pharmacy.
- This study provides valuable data pertaining to expanded practice broadly and considerations for expanded services in the rural and remote context.
- The study, although included only two community pharmacies, does provide evidence of the success of an expanded scope of practice that could be applied to rural and remote settings both within Australia and internationally.

## 14.2 INTRODUCTION

The ear, when working well, is a complex organ with receptors that respond 100,000 times every second, which allows hearing, a sense through which humans communicate, express thoughts, gain an education, and engage socially.<sup>1-3</sup> Disadvantage resulting from hearing loss is well recognised with poorer employment opportunities and higher incarceration rates.<sup>2</sup> The impact of ear disease for young people is profound and includes poorer educational outcomes, social and behavioral outcomes and a disrupted connection land, culture and community.<sup>2</sup>

The World Health Organisation (WHO) has identified that globally 1.5 billion people experience some decline in their hearing throughout their life course, with many more at risk of hearing loss due to preventable causes.<sup>1</sup> WHO has proposed an integrated people-centred approach to ear and hearing care service provision to provide a coordinated service across the continuum of care.<sup>1</sup> The provision of a comprehensive, safe, effective, timely, efficient and acceptable service by a motivated and skilled workforce operating in a supportive environment is expected to provide equal access to quality ear and hearing care.<sup>1</sup> This overarching approach is a gold standard to work towards, however in current practice, limited trained health professionals in ear health, a lack of resources

and barriers to accessing ear care services impacts ear health, especially in rural and remote communities.<sup>2</sup>

In Australia, one in six people experience some form of hearing impairment with an expected increase as the population ages.<sup>4</sup> Australia has a first world healthcare system, however reports rates of chronic ear disease as high as 50% for remote Indigenous communities in Northern and Central Australia.<sup>2</sup> This enormous burden of ear disease is expected to worsen with an estimated 900 million people to be affected worldwide by 2050 if no change to care is made.<sup>2</sup>

Pharmacists play an essential healthcare role in both clinical and community settings.<sup>5</sup> Beyond medication dispensing, stewardship, and safety, pharmacists are often the first point of contact, especially in rural communities, playing a critical role in triaging care and referring community members to other health professionals.<sup>5</sup> In many cases, the pharmacist is the only permanent health professional in a rural community.<sup>5</sup> Pharmacies often serve as the local hub for community healthcare services, particularly in meeting the needs of rural communities, where disadvantage, limited health literacy, and poorer health outcomes persist.<sup>5</sup> In rural and remote Australia, community pharmacists provide a highly skilled workforce with accessibility extended afterhours and weekends, with potential to provide services to address the ear disease in these vulnerable communities.<sup>2,5</sup>

Despite rural community pharmacists' knowledge and embedded role in community, pharmacy ear care service provisions are limited without any structured service model. A scoping review of pharmacists' involvement in ear healthcare interventions found eleven articles worldwide, including pharmacies partnering with audiometry services for hearing screening, an otoscopy pilot study, a pharmacy-based ear clinic and targeted education for undergraduate pharmacy students.<sup>6</sup> Pharmacists in Australia did not provide ear services, instead they reported audiometry services offering hearing screening through the pharmacy.<sup>6</sup>

Internationally, rural pharmacists are expanding their scope of practice and providing innovative services to meet the needs of communities for improved health outcomes.<sup>7</sup> Expanded services including immunisations, screening and management of chronic and infectious diseases have reported positive outcomes in rural practice, where access to health professionals are limited.<sup>7</sup> Recent research into the perspectives of consumers, pharmacists, health professionals and stakeholders regarding rural pharmacists providing expanded services has highlighted support for these expanded services, despite some reservation from the medical profession.<sup>8-12</sup> In response to

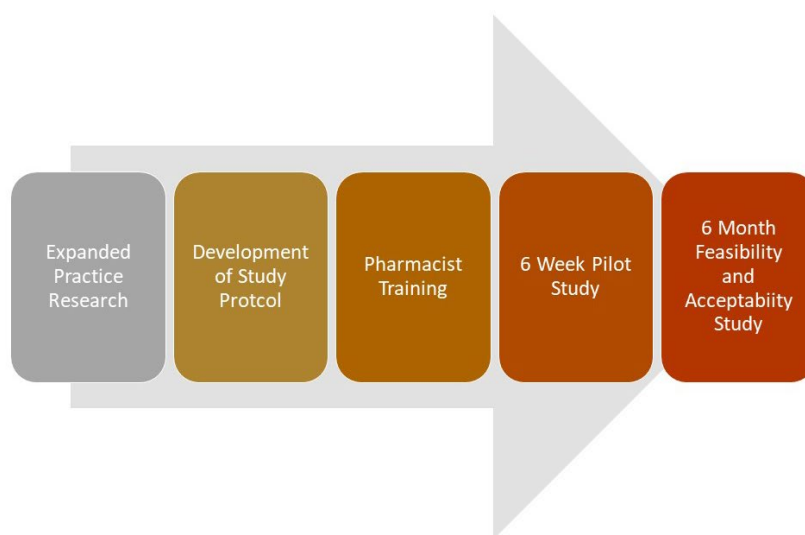
this, a community pharmacy-based ear health service model was developed and trialled in two rural pharmacies in Australia.<sup>13</sup> The aim of this study is to determine the feasibility, accessibility and acceptability of the service model.<sup>13</sup>

### 14.3 METHODS

The PRECEDE-PROCEED model was used to provide a framework to develop the research protocol for this study, LISTEN UP (**L**ocally **I**ntegrated **S**creening and **T**esting **E**ar **a**nd **a**Ural **P**rogram). LISTEN UP is a community pharmacy-based intervention to improve the management of ear health in rural communities in Australia.<sup>13,14</sup> The PRECEDE component included an assessment of the predisposing, reinforcing and enabling constructs to support practice change through a scoping review; stakeholder surveys and interviews; and consultation with professional authorities.<sup>14</sup> The PROCEED segment incorporated the evaluation of a six week service pilot and informed planned implementation, process, impact and outcome evaluation of the service.<sup>14</sup> The SQUIRE guidelines have provided a framework to report the new knowledge from this study.<sup>15</sup>

#### Study Design

The prospective pre- and post-design study is described in Figure 14-1.



**Figure 14-1:** Prospective pre- and post-design study

Prior to the study commencing, the two participating pharmacies collected usual care data as a comparator for 8 weeks beginning November 2020. During this time twenty-three ear complaints were recorded as presenting to the pharmacy (child (8), adult (15)). These complaints were ear pain (35%) and ear wax (35%), swimmers' ear (17%), hearing loss (4%) and other (discharge, fever, insomnia, blocked ear, vertigo) (4%).

The intervention was then piloted for six weeks at each pharmacy<sup>14</sup> before the six-month study was conducted from February – July 2021.

### **Ethics Approval**

This project has been approved by the Human Research Ethics Committee, James Cook University (H8187) (Appendix H).

### **Setting and Recruitment**

Pharmacies who had participated in previous research on rural expanded pharmacy practice were invited to express an interest to participate in the LISTEN UP study.<sup>8,10,12</sup> Two community pharmacies (Modified Monash Model (MMM) category 6 – remote community, population 18,000 and MMM category 4 – medium rural town, population 6000) expressed interest and were enrolled in the study. General practitioner (GP) practices at the intervention sites were invited to participate and one practice at each of the sites volunteered. An invitation to participate with an information sheet and informed consent form was provided to each pharmacist at the participating pharmacies and each GP at the participating general practice. Participating pharmacies met eligibility criteria including being classified as rural or remote by the Modified Monash Model classification system categories 4-7.<sup>13-16</sup>

Each participating pharmacist undertook nationally credentialed training in ear health including otoscopy and tympanometry. This training was delivered via mixed modes with online and face-to-face components over 55 hours including two full days of workshops provided by the Benchmark Group.<sup>15</sup> The training addressed the following units of competencies: EHHPEH002 - Promote, educate, and manage ear health, EHHAEH001 - Assess ear health, EHHPEA004 – Paediatric ear health assessment and TYMPTY001 - Perform tympanometry.

Consumer participants were recruited into the study via convenience sampling through community pharmacy, when they presented with an ear complaint. Initially ethics approval had been granted for persons 13 years or older, however in June 2021, additional approval was granted for children from six months of age.

### **Data Collection**

Data were collected from consumers, pharmacists, and GPs (Table 14-1). Data relating to the feasibility (the extent of the service to be provided viably), acceptability (the level of approval of the

service) and accessibility (the extent of being easily able to receive/provide the service) of LISTEN UP were collected via multiple mixed-methods (Table 14-1).

**Table 14-1:** Data collection sources and methods.

	Consumer	Pharmacist	General Practitioners
Pre-Intervention		Semi-structured Interview [FAS]	Semi-structured Interview [FAS]
During Intervention	Consumer Satisfaction Survey [AS]	Service Summary Document [F]	
Post-Intervention	Semi-structured Interview (7-day follow-up) [FAS]	Semi-structured Interview [FAS]	Semi-structured Interview [FAS]

**[Legend: F Feasibility data source; S Accessibility data source; A Acceptability data source]**

All interviews were undertaken by ST, a rural pharmacy academic. Interviews were conducted with pharmacists and GPs face-to-face and online, and with consumers via phone. Interview recordings were transcribed verbatim, and participants, people and places were de-identified in the transcription process. Field notes were recorded and revised.

### **Intervention**

A study protocol (Chapter 13) which pharmacists followed to provide the intervention involves trained pharmacists providing otoscopy and tympanometry assessments on consumers presenting to community pharmacy with ear complaints and includes an integrated direct referral pathway to local GP providers.<sup>13</sup>

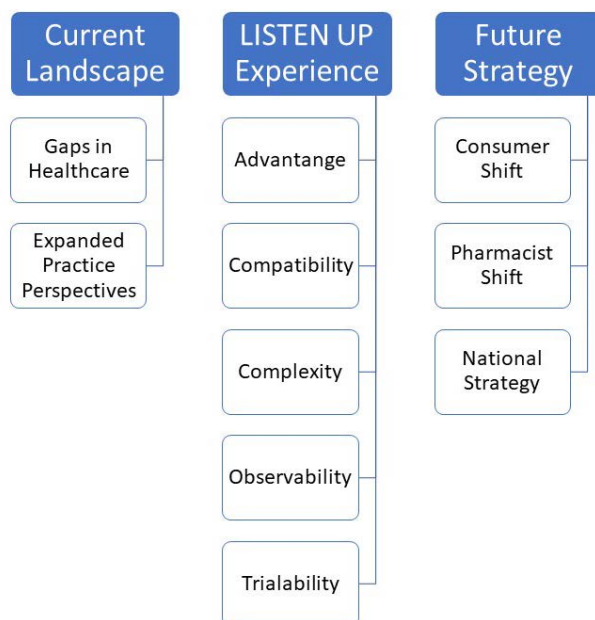
Consumers who presented to the pharmacy with an ear complaint and met the eligibility criteria were invited to participate. To be eligible, participants were required to understand the English language at an appropriate level to provide informed consent, have no obvious major trauma to the ear and not be a high COVID19 risk consumer (e.g., travelled in a COVID19 hotspot within 14 days). Participants were then provided a written information sheet and returned a signed informed consent sheet.

Pharmacists used the 'service summary document' (Appendix E) to record consumer demographics, and details relating to the current episode of care including the presenting complaint, duration of the complaint, and treatments tried. Pharmacist examination notes were recorded including temperature, otoscopy (normal/abnormal), tympanometry (normal/abnormal), brief notes, and a clinical impression. Pharmacists completed a tick box list of usual recommendations and expanded practice recommendations. If consumers required a referral to a GP, the pharmacists made the appointment with the consumer for the same-day or next-day. Consumers were offered a brief

satisfaction survey directly after their LISTEN UP consultation. All consumers were then followed-up with a phone call by a member of the research team at seven days (Interview Guide - Appendix F). If their condition was unresolved, they were referred to the GP. Hearing screening via the *Sound Scouts* application with Sennheiser HD 300 headphones was also available, however no hearing screens were conducted during the trial period. The MedRx video otoscope and Amplivox Otowave 102 tympanometer were used in this study.

### Outcome and data analysis

Demographic information, clinical characteristics (Appendix H) and survey data were analysed using descriptive statistics, with qualitative data from consumer interviews analysed using content analysis. Pharmacist and GP interview data were analysed using a hybrid approach of inductive and deductive coding and theme development exploring specifically for feasibility, accessibility and acceptability data.<sup>17</sup> This style of thematic analysis incorporated both the data-driven inductive approach and the deductive priori template of codes approach.<sup>17</sup> Diffusion of innovation theory and categories adapted from ‘Qualitative data analysis for applied policy research’ were combined to form a thematic map which provided a framework for the analysis (Figure 14-2).<sup>18-19</sup> NVivo 12 software was used for all of the qualitative analysis.<sup>20</sup>



**Figure 14-2:** Thematic Map

Transcriptions were read multiple times and an initial coding tree was created from the first four transcripts. Thematic analysis continued and codes which were conceptually similar were

categorised into emerging themes, using an ethnographic technique of domain analysis.<sup>21</sup>

Objectivity, assumed knowledge and bias were reduced by involvement of a second member of the research team who also analysed the first five interviews, and any discrepancies were resolved. A member checking process was conducted with three participants to support validity of the data.

#### 14.4 RESULTS

Fifty-five consumers participated in the trial (mean age = 42 years). One in five participants were Aboriginal and 85% of participants were over 19 years of age (ethics approval for children younger than 13 was gained halfway through the trial). Duration of the ear complaint ranged from 1 – 30+ days (mean = 39 days/median = 3 days). Prior treatment included analgesia (paracetamol and anti-inflammatories) (n=11), cleaning using cotton buds (n = 6), ear drops (n=9) and other (n=11). Other treatments tried included ear candles, hair dryer, antibiotics from home, nasal spray/rinse, oral decongestants, antihistamine, essential oils, complementary medicines, heat pack and vertigo treatments from home.

Otoscopy examination was performed for 52 (95%) participants (normal n=20 (40%), abnormal n=31 (60%)). Tympanometry was conducted for 45 (82%) participants (normal n = 27 (60%), abnormal n=18 (40%)). Reasons for being unable to complete tympanometry included equipment failure (1), consumer unwilling to be examined (4), ruptured ear drum (1), ear canal too large (1), unknown (3).

Table 14-2 represents the pharmacists reported clinical impressions based on their identification of presenting pathology and the recommendations they made following the protocol.

**Table 14-2:** Pharmacists clinical impressions and recommendations for presenting complaints.

Clinical Impression		Recommendation	
Normal ear	8 (15%)	No treatment	7
Wax impaction	21 (38%)	OTC products	36
Otitis externa	3 (5%)	Referral to GP	14
Otitis media	6 (11%)	Other	7
Other	4 (7%)		
Unsure	13 (24%)		

OTC (over-the-counter). Other clinical impressions: ruptured ear drum (3), poor compliance of tympanic membrane (1), sinus congestion (1). Some participants received more than one recommendation.



Pharmacists recommended over-the-counter (OTC) products to two-thirds of the participants. OTC products recommended included wax removal drops (19), analgesia (11), drying agent ear drops (1), decongestant nasal spray (3), oral decongestants and antihistamines (3). One-quarter of the participants were referred to a GP.

Seven participants were recommended no treatment at all. Pharmacists also recorded ‘other’ recommendations for seven participants and these included referral to emergency department (3) and watch and wait (4).

Pharmacists were asked to indicate via tick-box if they would make any additional recommendations. One-third of consultations recorded no expanded recommendations. Expanded recommendations that were made included prescribing a medication currently only available on a doctor’s prescription (3), referral to an ear, nose and throat specialist (11), referral to speech therapy (4), referral to audiometry (24) or other (9).

Directly after the consultation at the pharmacy, participants were asked to complete a satisfaction survey. Data from this survey are presented in Table 14-3.

**Table 14-3:** Consumer satisfaction survey results

	Agree	Strongly Agree
The pharmacist explained well the aims of the LISTEN UP service to me	5 (9%)	50 (91%)
I am satisfied with how the pharmacist checked my ears and decided if I needed treatment	3 (5%)	52 (95%)
I had the opportunity to raise questions or concerns related to the service	5 (9%)	50 (91%)
I now feel more confident about managing my ear problem	5 (9%)	50 (91%)
I am satisfied with the LISTEN UP service	5 (9%)	50 (91%)
I would recommend the LISTEN UP service to others	6 (11%)	49 (89%)
Questions with Yes/No answer option	Yes	
Before coming to the pharmacy today, I tried to see a GP about my ear	15 (27%)	
If the service was not available today, I would have gone to my GP	34 (62%)	
If the service was not available today, I would have gone to the hospital	25 (45%)	
Next time I have an ear problem I will come to the pharmacy instead of a GP	54 (98%)	
Free Text Comments		
‘Very good reassurance about my ears’		
‘Service exceeded my expectation’		
‘I am satisfied with how the pharmacist checked my ears. Great service.’		
‘Excellent support, information great, feel reassured. Thank you’		

NOTE: Available survey answers range 5 point Likert (strongly disagree – strongly agree)

*Consumer Post-Intervention Data (Acceptability and Accessibility of Service)*

Table 14-4 provides the qualitative data from the follow-up phone calls conducted by a member of the research team. At 7 days, three participants had not attended their scheduled GP appointment.

Reasons for not attending GP appointment included being unable to wait for the appointment (1), leaving town directly (1), or attending scheduled hospital appointment instead (1).

Data from these interviews were analysed using quantitative content analysis. Every participant described their experience at the pharmacy with a positive term (e.g., marvelous, wonderful, better than a doctor's surgery) and these affirmations were recorded 89 times. Participants reported being surprised that pharmacists were able to provide ear health services. More advertising and using the video-otoscope to examine other parts of the body (e.g., throat) were the only two service improvements recommended. Most participants (87%) reported they would pay for this type of pharmacy service, with suggested amounts ranging from AUD\$1-20 (33%), and \$21-50 (33%). The average value that participants were willing to pay was AUD\$33 with values of AUD\$100, \$150 and \$200 also suggested.

**Table 14-4:** Qualitative content analysis table of consumer interviews

Theme	Description	Count	Exemplars
Informative	Appreciation of the detailed information provided and the visual tour of the ear.	48	<p><i>'I got to see the inside of my ear which I had never done before and have it explained to me which was really good.'</i></p> <p><i>'Was really helpful in explaining what the issue was and what she was treating me with that day.'</i></p>
Confidence	Trust, comfortability and confidence of the pharmacists' skills and knowledge to provide the service.	41	<p><i>'They were trained very well...very knowledgeable.'</i></p> <p><i>'What the doctor does is less, the pharmacist was more thorough.'</i></p>
Availability of local GP appointments	Difficulty in being able to make a GP appointment in an appropriate timeframe.	32	<p><i>'When I need to book to see a GP it takes two weeks.'</i></p> <p><i>'You have no choice when your kid is sick here but to go to the hospital and wait for 7.5 hours because there is no GP appointments.'</i></p>
Willingness to pay	Explanations of participants' willingness to pay or not pay for the service.	30	<p><i>'I would pay because it was so quick, easy and inclusive.'</i></p> <p><i>'I don't pay for the doctors so I wouldn't pay for the pharmacist.'</i></p> <p><i>'You have to pay at the doctors, so I don't see a difference.'</i></p>
Reassurance	A feeling of reassurance about the ear complaint.	29	<p><i>'I felt more comfortable about why I was having pain and treatment.'</i></p> <p><i>'Put my mind at ease so I didn't need to go to the doctor.'</i></p>
Pharmacy convenience and accessibility	Positive associations with pharmacy accessibility and immediate service provision.	29	<p><i>'It was convenient, you didn't have to book an appointment.'</i></p> <p><i>'Going to the pharmacy was easier because if I need something for my ears you have it there already.'</i></p>
Expanded scope for pharmacists	Support for pharmacists to provide other expanded services or an extension of this service (e.g., prescribing and syringing)	9	<p><i>'If the pharmacists can see it's infected, they should be able to give me the drops (antibiotics).'</i></p> <p><i>'Pharmacists are definitely trained to give you medications if you need them for something like a simple ear infection so giving them capabilities to be able to do that would be fantastic and it would relieve a lot of pressure off GPs.'</i></p>

As well as information presented in Table 14-4, some consumers highlighted the opportunity to use telehealth GP services with the imaging provided from the service to overcome some of the barriers to accessing local GP services, including cost of appointments/lack of bulk-billing and distances to access GPs of up to 600 kilometers.

#### *Pharmacist and GP Interview Data (Pre- and Post-) Feasibility and Acceptability of Service*

Semi-structured interviews were conducted with participating pharmacists and GPs pre- and post-the intervention and analysed according to the thematic map, Figure 13-2. The interview duration ranged from 13 to 73 minutes with an average of 25 minutes.

Prior to the service trial, pharmacist and GP's expectation of the acceptability and feasibility of the service was explored in the context of ***the current rural health landscape***.

Due to ***gap in accessible healthcare*** in the rural communities where the trial was undertaken, consumer ***acceptability*** was expected by both participant groups.

Pharmacists described difficulty with accessing health professionals, wait lists in excess of two weeks for GP's and allied health professions as well as a lack of permanent healthcare providers and rapid turn-over of staff as having a negative impact on consumer care.

*'Getting in to see a health professional is difficult, and then relationships as well, when they keep turning over, where our pharmacists seem to be pretty steady. A lot of remote areas that have visiting clinics, what happens when they're not visiting, who do they go and see?'* (P1 – Pharmacist)

*'There's a real scope for pharmacies to offer extra services, especially in rural areas ...Purely geographically a lack of access to services, and I don't think just because you live in a rural area your health should be hindered.'* (P5 – Pharmacist)

The pharmacists reported an ***advantage*** they expected of LISTEN UP was to increase rapport building with GPs through the direct referral process. GPs though, reported concerns about pharmacists taking work from junior doctors but recognised that in rural Australia the lack of health providers broadly means there is enough work for all.

*'Providing services in rural communities across the board is very difficult, and anyone who can bring services where they aren't already should be encouraged.'* (GP6 – General Practitioner)

After the trial, GPs described the service and direct referral pathway as **compatible** with their current practice. They reported that all of the referrals they received were appropriate. GPs perceived LISTEN UP to be an advantageous method of screening individuals who present to community pharmacy and setting them on a trajectory for GP care. They also expected young children to be more comfortable in the pharmacy setting.

*'The foot traffic at a pharmacy is quite a lot daily. So, the pharmacists are seeing people coming from different practices and bringing their prescriptions and whatever else they buy there. So, having a good coverage of the community is an entry point for them to have that ear looked at.'* (GP2- General Practitioner)

The pharmacists felt the structured approach and protocol supported the delivery and professionalism of the service.

*'We don't have existing ear care services, so this model has all the advantages because it's actually a model and actually a service.'* (P2 – Pharmacist)

GPs however, described a level of increased anxiety in consumers who had been referred and suspected this may be due to the language used by pharmacists when referring consumers.

Pharmacists identified enabling factors (*feasibility*) to the implementation of an ear health expanded practice model. These included the willingness of pharmacists to develop **expanded practice** models and their professional skills.

*'We're familiar with the upskilling required, and we're enthusiastic about doing more application of health services, rather than hiding behind the dispensary. I think that the pharmacists coming through now are craving that and wanting that.'* (P1 – Pharmacist)

There was an expectation that this expanded service may be a springboard for further service development and for both consumers and health professionals to be more accepting of an expanded scope for pharmacists.

*'I am expecting advancement in our placement in the minds of the community that we service, of what we can actually achieve and what we can do as a pharmacist for them.'* (P1 – Pharmacist)

*'I hope it will bring about some results that will elicit a meaningful change in terms of broadening our scope of practice.'* (P5 – Pharmacist)

Pharmacists reported the recent growth in professional service areas such as vaccinations had pharmacists feeling well placed to provide other expanded services for their communities. This was

also identified as an enabler as some of the challenges of role conflict with GP's has already been addressed and relationships between the professional groups had adjusted to new service models.

*'When we started the immunisation program, there was a lot of resistance there and now that it's a known kind of service, it's great, but at first, it was like we were taking from their role.'* (P8 – Pharmacist)

After the trial pharmacists continued to report a positive **pharmacist behaviour shift** towards expanded pharmacy broadly. Pharmacists described the trial solidifying and extending their interest in working to their full scope.

*'I really have enjoyed pushing that scope, learning something new, delving into a new domain. I think we need to keep doing it as pharmacists. We need to offer as much care as we can for people, and we need to push ourselves to do that, and not just rest on dispensing a script, especially if we want to be valued members of the healthcare system going forward.'* (P2 – Pharmacist)

**Consumer behaviour shift** through increased confidence and knowledge of the potential for expanded pharmacy roles was a reported benefit of the trial.

*'People started to see us as actual health professionals that are available to the community, that you can actually touch and feel, that you have access to without an appointment.'* (P4-Pharmacist)

Prior to the trial, pharmacists reported that advice on ear complaints was commonly sought by consumers with up to two presentations each day. They reported an overall lack of confidence with managing ear complaints based on symptomatic description from consumers and reported referring most ear complaints to a GP or hospital emergency department (ED). Pharmacists expected an improvement in their skills and knowledge in the management of ear complaints and the ability to provide better ear care in community.

*'My conversation is always...I can't look in your ear. I can understand your symptoms, I'm hearing what you're saying, but it covers a lot of different things and I can't make that decision on what you're telling me, and I also don't have much to offer you.'* (P5- Pharmacist)

After the trial pharmacists reported increased **observability** and increased confidence in managing ear complaints because of having more information (otoscopy and tympanometry results) for decision making. The imaging of the ear canal was one of the most valued aspects of the service,

improving pharmacist and consumer confidence in the service. Pharmacists were able to provide reassurance to patients and explain the anatomy and pathophysiology to consumers in real time.

*'It's really nice showing them what their eardrum looks like and explaining to some why they don't need antibiotics.'* (P2 – Pharmacist)

*'Anything that we can get more data from to help us be more definitive and clearer in our referral pathways is helpful.'* (P2-Pharmacist)

Pharmacists reported being comfortable with recommending wax dissolvent and drying agents but identified a barrier of the service model was the restriction of not being able to prescribe antibiotics or medicines only available with a doctor's prescription. There was optimism that the trial would positively influence more products to be downscheduled to become available for pharmacists to provide.

*'My hope is that I don't have to say that I'm sorry that I can't help you today, I wish I could do more.'* (P4 – Pharmacist)

After the trial the pharmacists reported that the skills learnt during LISTEN UP, including the training improved their confidence in managing ear complaints from below average to 7+ out of 10.

The training alone however was not deemed enough to improve confidence. Pharmacists discussed the **complexity** of the training provided and suggested that more face-to-face case studies were needed in addition to more content related to clearly identifying various pathology (**trialability**). Some pharmacists who had not conducted many consultations during LISTEN UP felt the training needed to include a greater volume of case examples to improve their confidence to provide the service.

*'I don't have the confidence for a diagnosis at all and it's just purely from not doing enough and not getting feedback.'* (P3-Pharmacist)

Confidence however, improved with clinical experience and an enabler was the structured LISTEN UP protocol, supporting decision-making. Pharmacists reported needing to conduct at least ten consultations in the community pharmacy before feeling confident to provide the service independently.

*'I think I needed the first five to ten hours of practice, mainly just to get comfortable with actually how to talk to consumers and look inside the ear and all the techniques. But after that, I felt very comfortable.'* (P4-Pharmacist)

The flexibility and capacity of the current pharmacy service model was both an enabler and barrier to LISTEN UP. Prior to the trial, pharmacists expected the trial to fit into the current no-appointment

necessary workflow with strategies such as having additional pharmacists available to focus on professional services, advising consumers of longer wait times for prescriptions, and asking consumers to come back to collect medicines.

*'I'm very confident that there's going to be no problem with that. You just need to change your operational flow to support more hands-on time with the clients.'* (P1 – Pharmacist)

After the trial, workflow demands however were identified as a barrier to both the trial and expanded practice generally. It was highlighted that a number of consumers received a consultation by a pharmacist, but the occasion was not documented for the trial. Time required for the documentation process and competing dispensary demands were reported as the reasons for this occurring. In addition, it was noted that as influenza vaccinations increased, the availability of the consultation room was limited, and this inhibited the ability to offer LISTEN UP.

*'I'd say there's double the number of people who we probably could have done, that we haven't done, because it wasn't the right time, we were too busy.'* (P8-Pharmacist)

The length of the consultations was also raised as a potential barrier, with concerns when only one pharmacist was on-duty and expectation that it would be difficult to be able to offer the service during those times.

*'Time is the biggest factor; we are often under the pump with the supply role so I think the clinical service can press you that little bit further.'* (P7 – Pharmacist)

All pharmacists reported a lack of funding as a major barrier to LISTEN UP. They were concerned about the amount of time the consultations would take the lack of remuneration for the trial and no clear funding pathway for subsequent service provision.

*'Taking into consideration our hourly rate and if you don't actually sell anything...no remuneration would be a big barrier.'* (P6 – Pharmacist)

The **compatibility** of the service with rural practice was reliant on the number of pharmacists available at the pharmacies. Evidence of consumers being asked to come back at a time when more pharmacists were available was reported. This was compounded by the lack of remuneration associated with the trial and thus the priority being placed on services that were profitable such as vaccinations, or dispensary tasks.

*'If there were just two [pharmacists], then we're stretching it a bit. And we just definitely wouldn't offer it if there was just the one pharmacist. If they came in on a weekend, we'd*



*ask them to come back during the week.’ (P4 – Pharmacist)*

Consumer and community support was highlighted as an enabler for the trial. The pharmacists expected that their local communities would be highly receptive of the service and they were pleased that the local GPs were also supportive of the trial and happy to be involved. After the trial pharmacists reported that they felt the service-built trust, rapport and confidence from consumers.

### **Future directions**

Integration of the documentation process into existing dispensary software was not achieved for this trial however would be a focus for future services.

*‘If we could have it incorporated into our workflow to make it easier, part of a platform we already use, that would be cool, because technology makes things easy for us, and integrated technology is even better.’ (P4 – Pharmacist)*

The importance of the direct referral pathway with guaranteed appointment availability was also expected to be a major enabler for the trial however it is highly unlikely this could be a permanent feature of future service models given the burden this place on an already stretched GP workforce. However, maximising digital technologies could further enhance timely medical assessment. Images and results provided by the pharmacists would enable GPs to conduct a telehealth appointment for the consumer for an immediate diagnosis and treatment.

*‘You would have done all the work because the only barrier to effectively diagnosing a consumer with an ear problem by telehealth is not having a look in the ear. But if we are presented with the photo ... then absolutely you will be able to make a diagnosis and treat the consumer effectively by telehealth using this model.’ (GP1 – General Practitioner)*

When asked about whether LISTEN UP should be rolled-out as a **national strategy**, all pharmacists agreed that it is a service community pharmacists can and should be providing, taking into consideration discussed barriers that this service would need to address. There was focus placed on the greater need in rural and remote settings and an uncertainty about how the service would be received in metropolitan settings.

*‘I think every pharmacist should be able to have the skills and knowledge to be able to look in someone’s ear and decrease doctor’s visits and ED referrals if it’s a simple wax impaction or something like that.’ (P3- Pharmacist)*

## 14.5 DISCUSSION

Exploring the feasibility, accessibility, and acceptability of an ear health intervention from a health system, pharmacist and consumer level is integral to considering future expanded practice services for rural community pharmacy. This study has provided the first insight into the challenges and motivators for pharmacists to provide an ear care service and offers considerations for implementation of other expanded services going forward.

### ***Health System Level***

WHO has recognised the major health burden ear disease presents for rural and remote communities and has called for change to be made to ensure all people have equal access to quality ear and hearing care across the life course.<sup>1</sup> Access to health providers trained in ear health has been identified as a major barrier to ear care previously, with difficulty increasing with distance from metropolitan areas.<sup>2</sup> This study has found that consumers having difficulty accessing GP appointments consequently present to emergency departments for ear complaints. In addition, pharmacists prior to the intervention reported regularly referring consumers to emergency departments, due to an inability to access timely GP appointments. In a study of GP-type presentations to emergency departments undertaken at one of the ear trial sites, it was found that half of all presentations over a six month period were GP-appropriate problems.<sup>22</sup>

LISTEN UP has provided the improved access to ear care by upskilling permanent and highly accessible health professionals, local community pharmacists. Consumers also reported the immediate access and the integrated pathway of GP referral as a major benefit to the service. GPs reported the referrals they received were appropriate and most consumers were able to be managed by pharmacists with analgesia and reassurance. The provision of a screening and referral service within local community pharmacies is an effective model to redirect ear complaints from emergency departments to appropriate settings.

### ***Pharmacist Level***

The provision of expanded services is an emerging area for Australian pharmacists.<sup>23</sup> To date no formal protocols have been developed to support pharmacists to provide expanded services, despite major developments for pharmacists' scope of practice internationally.<sup>7</sup> Research has reported rural pharmacists are supportive and interested to provide expanded services with expectation that such services would improve health outcomes and could address current gaps in healthcare.<sup>10,12</sup> LISTEN UP has confirmed that pharmacists were motivated to provide an expanded ear health service. They

described a lack of options currently available to manage ear complaints in community pharmacy and the regularity of referring consumers to emergency departments. After completing the formal training for the service, pharmacists reported improved confidence in managing ear complaints, but uncertainty in identifying pathology and making prescribing recommendations. They expected their confidence would improve with practice and thus suggested longer trialability of the service to further develop their skills. They also reported wanting a very detailed protocol to be provided to guide them to provide the service.

This lack of confidence in clinical abilities has been reported to be a major barrier to advancement of the pharmacy profession previously.<sup>24</sup> The culture of feeling inadequately prepared for unfamiliar tasks and fear of making definitive decisions has been linked to pharmacists' personality traits and thus the profession needs to make a transition from scientist to consumer-centred practitioner to successfully work in an expanded scope of practice.<sup>24</sup>

In addition, concern has been raised that expanded practice may not be feasible for rural practice as those pharmacies are already short-staffed and under-resourced.<sup>25</sup> Findings from LISTEN UP align with this, with recognition that three pharmacists are required to be able to offer expanded services and many rural and remote community pharmacies are unable to recruit and maintain that number of pharmacists. In addition, the time required to complete documentation was identified as a major barrier to the service implementation, mostly due to the pharmacists receiving no funding to provide the service with no cost to consumers. Without a dedicated professional practice pharmacist, consumers were unable to be offered the LISTEN UP service, thus limiting feasibility and defeating the purpose of expanded practice for rural community pharmacy.

### ***Consumer Level***

Findings from this study have highlighted a high level of acceptance from consumers with reports of trust and confidence from consumers for their local pharmacists. It has reported high levels of consumer satisfaction and a willingness to return for the service in future. Consumers have also reported a willingness to pay for the service due to the convenience and accessibility it provides. This willingness to pay for expanded services has been previously identified, however there is also recognition that those who are most vulnerable are likely not to be able to pay for the service and thus alternative funding models need to be considered.<sup>8</sup>

This study provides first insight into the feasibility, accessibility, and acceptability of expanded practice for rural community pharmacists and identifies challenges that need to be addressed for this expanded pharmacy practice to be a sustainable model of healthcare delivery for rural and

remote communities. A larger trial with multiple sites is needed to further consider this model of care, however adequate funding is essential to ensure high quality training, sufficient pharmacist numbers and low-cost provision for consumers.

## 14.6 CONCLUSION

Hearing is key to human function and its loss impacts the whole society. Ear care in rural community pharmacy is often fraught with uncertainty and referral to emergency departments. LISTEN UP provides a feasible protocol for trained pharmacists to provide immediate ear care with an accessible integrated pathway to general practice if needed. This model has been developed and accepted with extensive consultation and provides a framework for similar expanded services to be modeled on in the future. Rural community pharmacists remain motivated to provide expanded services, however sufficient funding and a paradigm shift for the pharmacy profession is essential for expanded services to be sustainable and thus contribute to improving healthcare in rural and remote communities.

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## Chapter 15 – LISTEN UP - Implementation Evaluation

This chapter is the final publication from this study and is published in the journal *Pharmacy*. The publication was produced from additional analysis of data from semi-structured interviews with pharmacists who participated in the LISTEN UP study. This original research article provides insight into the implementation process of an expanded pharmacy service rural pharmacy practice.



**Taylor S, Cairns A, Glass B. *Expanded Pharmacy Practice Implementation: Lessons from Remote Practice*. Pharmacy [Under review - submitted November 2021]**

### **Authors' contributions**

Selina Taylor conducted the research and prepared the manuscript. Beverley Glass and Alice Cairns supervised the research and reviewed the manuscripts prior to submission.

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## 15.1 ABSTRACT

Expanded pharmacy practice is emerging for the Australian pharmacy profession, with their international counterparts already providing services including immunisations, screening and management of chronic and infectious diseases, health promotion, prescribing, ordering imaging and pathology, and working within collaborative models of care. Rural community pharmacists are recognised as integral members of healthcare teams, providing accessible medication supply and health advice to seven million people in Australia who call rural and remote regions home. Although rural community pharmacists are highly skilled and knowledgeable health providers, there are no structured models to support them to provide expanded services to improve health outcomes in their communities. To address this, a community-pharmacy-based health service model was designed and developed to provide an accessible ear care service (LISTEN UP – Locally Integrated Screening and Testing Ear aNd aUral Program) and pharmacist’s perspectives of the implementation of LISTEN UP were explored in the context of a remote community setting.

**Keywords:** model of care, extended practice, rural pharmacy, innovation, pharmacy services.

## 15.2 INTRODUCTION

Rural pharmacists are integral members of the healthcare team and are at times the only permanent health professionals in small remote communities.<sup>1</sup> Rural community pharmacists provide accessible healthcare including medication supply, stewardship and safety and are often the first point of call for health advice for seven million rural and remote Australians.<sup>1,2</sup> They are dedicated health professionals who provide pharmaceutical services to local communities, however their full scope of practice is not well utilised or understood.<sup>3,4</sup>

Australia’s vast and varying landscape is home to resilient, rural, and remote people who are major contributors to Australia’s economy through agriculture and mining industries.<sup>5</sup> A reduced life expectancy, higher rates of disease burden and injury and complex health profiles are some of the adversities for rural people, predominately due to the distance from metropolitan healthcare settings.<sup>2,5</sup>

Rural pharmacists internationally are trialling an expanded scope of practice to provide innovative, targeted health services to meet the needs of their communities and improve health outcomes.<sup>6</sup> Expanded practice (also known as extended practice) has evolved to include immunisations, screening and management of chronic and infectious diseases (including diabetes, cardiovascular disease, sexually transmitted infections) and health promotion.<sup>6,7</sup> However in Australia, despite rural community pharmacists’ knowledge and embedded role in community, pharmacists are unable to

access structured or funded models of care to provide expanded services, apart from a limited schedule of immunisations.<sup>1</sup> This, together with a poorly defined role with ambiguous boundaries of their recognised scope of practice has rural pharmacists challenged to provide appropriate care to these vulnerable and complex populations.<sup>4</sup>

In response to this, a community pharmacy-based health service model was developed and piloted to provide an accessible ear care service in two rural towns in Australia.<sup>8,9</sup> The service (LISTEN UP – **L**ocally **I**ntegrated **S**creening and **T**esting **E**ar **a**nd **a**Ural **P**rogram), provided a structured protocol for trained pharmacists to conduct ear examinations including a brief history, hearing screening, otoscopy and tympanometry assessments with an embedded referral pathway to a general practitioner (GP) if required.<sup>8</sup>

The aim of this study is to explore the pharmacist perspectives of the implementation of a community pharmacy-based ear health service in their rural communities.

### 15.3 DATA AND METHODS

#### Study Design

A qualitative approach informed by an ethnographic lens of rural culture was used to explore pharmacists' perspectives of a rural community pharmacy-based ear health service.<sup>10</sup> Rural pharmacists were interviewed using an in-depth semi-structured interview style.<sup>8</sup> This is part of a larger mixed-methods health services research project.<sup>10</sup>

Implementation science<sup>11</sup>, defined as 'the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services', has provided the theoretical framework, specifically the Consolidated Framework for Implementation Research (CFIR)<sup>12</sup> for this study. The CFIR comprises five major domains, incorporating 39 constructs, relevant to the implementation of a novel intervention or policy.<sup>13</sup> Damschroder (*et al.* 2009) has detailed a description of each of the constructs, with a rationale and definition.<sup>13</sup> (Table 15-1)

#### Participants, Setting and Recruitment

During February-July 2021, all pharmacists (n=10) who were participating in the LISTEN UP health service were invited via email to be interviewed.<sup>10</sup> The two trial sites were defined by the geographical classification system Modified Monash Model, as a MM5 (small rural town) and MM6 (remote community).<sup>14</sup>

### Procedure and Semi-Structured Interview

Participating pharmacists were provided with an information sheet and if agreeable to the interview, returned written informed consent. Interviews were audio recorded and de-identified in the transcription process. Interviews were conducted prior to and at completion of the LISTEN UP service. Demographic data including, gender, years of practice, post graduate qualifications and postcodes were also collected. The schedule of interview questions was informed by previous research in the area and a review of the literature (Appendix D).<sup>3,4,6,15-19</sup>

### Data Analysis

All interview recordings were transcribed verbatim, coded, and categorised into emerging themes. Objectivity, assumed knowledge and bias were minimised by engaging six participants in a member checking process to ensure their code and theme interpretations were an accurate representation of their perspective.

The initial conventional content analysis of five transcripts and field notes incorporated both the data-driven inductive approach and the deductive priori template of codes approach.<sup>20</sup> A coding manual containing the initial codes was then developed and those codes that were conceptually related were combined into categories using an ethnographic technique of domain analysis.<sup>21</sup> Analysis was performed with the assistance of software program NVivo 12<sup>22</sup>, using a hybrid approach of inductive and deductive coding.<sup>20</sup>

The CFIR was adapted and applied to the analysis.<sup>12</sup> Eighteen constructs derived from CFIR were found in the analysis and termed as codes related to the domains termed as themes (Table 15-1).<sup>13</sup> The four constructs relating to the implementation process (planning, engaging, execution, reflection, and evaluation) structured the discussion for this study.

### Ethics Approval

James Cook University Human Research Ethics Committee granted ethical approval (H8187) (Appendix H).

## 15.4 RESULTS

Interviews were conducted both pre- and post-intervention. In all, twenty interviews were conducted with ten pharmacists, nine interviewees were female. The length of time they had been practicing varied from one to twenty-four years, with an average of eight years with three pharmacists having completed post-graduate qualifications. The interview duration ranged from 14-62 minutes, averaging 30 minutes.

Table 15-1 provides the data categories derived from the thematic analysis with a description of the codes incorporated based on the CFIR.<sup>13</sup> Direct quotations are numbered (PX-Pharmacist) with a non-identifying descriptor included.

**Table 15-1:** Definition of Role Constructs and Examples

Theme	Codes	Definition	Exemplar
Characteristics of the intervention	Relative advantage	Perception of the advantage of implementing the intervention versus an alternative solution.	<i>'It's really nice showing them what their eardrum looks like and explaining to some why they don't need antibiotics.'</i> (P10)  <i>'We don't have existing ear care services, so this model has all the advantages, because it's actually a model and actually a service.'</i> (P7)
	Adaptability	Degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.	<i>'We are already doing consultations on wound care, and on skin care, people already come and see us for that type of stuff so the LISTEN UP model with the GP referral pathway would be good.'</i> (P9)
	Trialability	Ability to test the intervention in the organisation and to be able to undo the implementation if warranted.	<i>'From a training perspective, we need to see more abnormal photos and the variance. Seeing lots of examples, so you're more familiar, so you know how to accurately diagnose or even some real-time feedback would be good.'</i> (P7)  <i>'I felt like I needed the first five, ten hours of practice, mainly just to get comfortable with, actually, how to talk to patients and look inside the ear at all the techniques. After that, I felt very comfortable.'</i> (P4)
	Complexity	Perceived difficulty of the implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, intricacy, and number of steps for implementation.	<i>'The process and referral have worked really well. Paperwork is always a pain, in general that's probably the one limiting factor if someone just wants to come in quickly, get something done and go out.'</i> (P7)

	Design quality	Perceived excellence in how the intervention is bundled, presented, and assembled.	<p><i>'That's why all our pharmacists need to be trained in this, and that's with our vaccination service too, we will not have somebody on our team that's not vaccination trained. We all need to upskill together.'</i> (P1)</p> <p><i>'We don't have a central spot to be able to record everything, so the fact that we have to open another document, prepare another thing. No just being able to click on the patient, write the patient notes, observations, referrals, whatever, and close it – it needs to be integrated.'</i> (P3)</p>
	Cost	Cost of the intervention implementation including investment, supply, and opportunity costs.	<i>'We do need some remuneration, because I am spending 15 minutes in the consult room with the person to say, come back and see me, so I can spend another 15 minutes with you in two days' time, which I'm not getting any money for.'</i> (P7)
Inner setting	Structural characteristics	Social architecture, age, maturity, and size of the organisation.	<i>'On the weekends or nights where there's only one pharmacist there, it's pretty difficult to facilitate. So that's the time, when I've been there, where we'd be like, can you come back tomorrow?'</i> (P1)
	Networks and communications	Nature and quality of the webs of social networks and communication within the organisation.	<i>'When making appointment for patient, the GP administration staff was the hurdle. The doctors were so on board with it, they loved it.'</i> (P9)
	Culture	Norms, values, and basic assumptions of the organisation.	<i>'We prefer to be doing professional services, that's what we like doing, none of us actually like being in the dispensary...that's where they get the kicks from, that's where you feel like you've done a great job, warm and fuzzy.'</i> (P1)
	Implementation climate	Absorptive capacity for change and shared receptivity of involved individuals to an intervention.	<i>'The GPs here are so supportive of pharmacists. A lot of them are really thankful for the role that pharmacists can play in bridging the gap. If there wasn't a gap them maybe there'd be problems, but the doctors here are really super aware of how much of a gap there can be in rural health.'</i> (P5)
Outer setting	Patient needs and resources	Extent to which the patient needs (including barriers and facilitators to the needs) are known and prioritised by the organisation.	<i>'It's in a timely manner is the biggest problem. So we may have the services, but you can't get it quick enough and you just might have to travel for it.'</i> (P2)

	Cosmopolitan	Degree to which an organisation is networked with other external organisations.	<i>'I think the doctors themselves were all on board, and really excited about it, because I think also, they saw that we were valuing their time.'</i> (P5)
	Peer pressure	Mimetic or competitive pressure to implement an intervention.	<i>'I don't think we've really robbed any other health practice from those services. We're just doing things that probably wouldn't have been captured because there's no appointment necessary.'</i> (P1)
Individuals involved	Knowledge and beliefs about the intervention	Individuals' attitudes toward and value placed on the intervention.	<i>'It's actually a really good idea, and a really good step forward. It'll take the burden off a lot of the GPs as well and giving people greater access by not having to see their GPs. So, I have, overall, positive thoughts towards rural pharmacists expanding their scope.'</i> (P10)
	Self-efficacy	Individual belief in their own capabilities to execute the course of action to achieve implementation goals.	<i>'Pre-trial confidence with ear complaints would be a three or a four and post-trial let's say seven, only because I feel, unfortunately, I didn't get that much practice. Because of working part time, I didn't get to get so many cases.'</i> (P6)
	Individual stage of change	Characterisation of the phase an individual is in as they progress toward skilled, enthusiastic, and sustained use of the intervention.	<i>'I think expanded practice is very important, given that in rural and remote communities it's hard to get primary healthcare in the form of a GP appointment. So, for there to be expanded pharmacy services so that people can get their healthcare needs met, it's very important. And that's why we need expanded scope in the practice, because within our standard scope we wouldn't be able to help quite a large section of people get their primary healthcare needs.'</i> (P4)
	Other personal attributes	Other personal traits	<i>'I'm actually used to doing sleep apnoea consults, which can take up to 40 minutes sometimes. And, because we make a solid profit out of it, I don't feel bad taking that time. So, maybe I'm just more used to that consultative practice.'</i> (P6)



## Characteristics of the Intervention

Participants described numerous **advantages** of the LISTEN UP service. Broadly there was a perception that the service-built rapport with consumers and GPs. Increased trust, returning customers and consumers recognising community pharmacy as a healthcare destination rather than a medication supply store were highlighted.

*'It's one of those things like vaccination services, that changes people's perception of what a pharmacy can offer and what a pharmacist can do. It stops people thinking that pharmacy is just for your medication.'* (P1)

Acknowledgement was made that ear care in current pharmacy practice was not routinely or comprehensively provided and that the visual aid provided by the video-otoscope allowed pharmacists to engage, reassure and educate patients about their ear health.

*'I felt as though I was getting a lot more engagement with the patients when I was actually showing them (their ear canal) and being able to show them why I was thinking the way I was thinking regarding their treatments.'* (P4)

The **adaptability** of the service was highlighted as an enabler. Participants expected that the LISTEN UP model could be adapted and applied to other services, which could be delivered in community pharmacy such as advanced hearing testing, wound care, and the management of minor ailments. Similarly, one of the sites had difficulty making required GP appointments for their patients, however they were able to adapt the service model to provide the referral documents and examination results to telehealth GP service providers to ensure timely access to care.

Some participants lacked confidence in providing the service after the training was completed due to a lack of **trialability**. Suggestions of increasing the number of case studies provided during the training, having more people to examine during the training, and having feedback from an expert for the first 10-20 examinations were made. For some participants a lack of prior knowledge about ear health contributed to their lack of confidence and for others there was hesitation and uncertainty about providing a physical service.

*'I can tell normal versus abnormal, but the severity of the abnormality, I'm not sure, I think it's just a function of not looking at a lot of ears. But also, getting some real-time feedback would be great as well, but you've got no one to really verify it with.'* (P7)

The **complexity** of the service was described with most of the difficulty being associated with completing the documentation required to deliver the service, which was not integrated into the

existing pharmacy software programs. Some of the pharmacists managed this by utilising a pharmacy assistant to complete the documentation and others omitted the documentation process entirely.

*'Some pharmacists don't actually record it when we do it, so we probably are seeing and doing a lot more than what we've recorded.'* (P2)

Overall participants were happy with the **design quality** of the service. Positive comments described included consumer acceptance of the service, no charge to consumers, the pre- and post- workshop training components and ensuring all pharmacists employed in the two pharmacies completed the training. Some participants expressed desire for more explicit training on the clinical guidelines (including prescribing guidelines) for ear pathologies as well as training specifically targeted for the pharmacy profession. In addition, a more detailed protocol with less decision making was suggested.

*'We need better pharmacy-specific stops. What to do, step by step, this is what we do, this is when we refer, this is how it sits, this is where you record it, how you record it.'* (P7)

The embedded referral process, whereby pharmacists were able to book same-day or next-day appointments with GPs was also described as an integral component of the model.

*'As part of the trial, we can guarantee that today you'll see a doctor if it is important enough. We'll see whether we can manage it in the pharmacy. If we can't do it then you can see your doctor today, which is something I don't think otherwise we'd be able to offer.'* (P3)

**Cost** of the intervention was a major enabler to service uptake. The service was provided at no cost to the consumers, however the pharmacists were not remunerated for the time spent providing the service, though all equipment and training was funded. As there was no remuneration for the service, at busy times the service was not prioritised and not offered to consumers. Pharmacists expected that patients would not be willing to pay for the service unless there was an opportunity to prescribe antibiotics if required.

*'If I could offer the same service as a GP, there'd be value in it, because it would be saving them either a trip to hospital emergency department or a \$45 out-of-pocket expense for an on-day GP appointment. But if I can't give them the piece of paper and the antibiotics at the end of it, it's just not valuable.'* (P1)

### Inner Setting

Within the inner setting of the pharmacy participants described several **structural** characteristics that contributed to the implementation and execution of the service. The number of pharmacists working at one-time was a limiting factor to service being offered to the consumers. All participants agreed that the service was not offered if there was only one pharmacist working, e.g., on a weekend, and some suggested that three pharmacists on duty at any one time were required to be able to provide the service.

*'We're pretty fortunate with our staffing to be able to do it, but if I was here alone, I don't do it.'* (P3)

*'It would have affected workflow if there was only one to two pharmacists on, but because we have three or four on, on the daily, it was easy to integrate in.'* (P9)

In addition, the availability of the consultation room influenced the pharmacists' capacity to offer the service. As vaccination services increased with COVID 19 and Influenza, the availability of the LISTEN UP service was reduced.

*'We only have one room, so I think if it's we are busy with flu vaccinations, it makes it really difficult to offer another service...we pretty much, have somebody vaccinating all the time.'* (P1)

The number of potential consumers that would be missed, who were served by pharmacy assistants, was also discussed. Some strategies that were employed to minimise this were putting alerts on ear products so when they were scanned on a register, that would flag the LISTEN UP service, however it was identified that the pharmacy assistants would also require appropriate training about the LISTEN UP service to know when to offer it to consumers.

The importance of the **network and communication** process between the pharmacy and the GP practice was described as vital to success of the service. Initially pharmacists reported difficulty with making GP appointments for consumers within an appropriate time (same-day or next-day), however this was a barrier attributed to the administrative reception staff who were not aware of the service.

*'A lot of the times they would say that they didn't have an appointment available that day or the following day and then I'd speak to the doctor and get an appointment...but it was a lot of going back and forth, and that would take up a lot of my time.'* (P10)

All participants reported a strong connection to professional pharmacy practice **culture**. Pharmacist owners reported professional services as a valued aspect of their business model.

*'Doing professional services well, shows that we are reliable, we're trustworthy, we have the knowledge, we have the education and the passion, as well, to do it and to implement it.'*

(P1)

The **implementation climate** proved to be a challenge for some pharmacists in management roles. Those with competing priorities, such as dispensary tasks, found it difficult to dedicate the time required to providing the LISTEN UP service including the documentation process.

*'Time is the biggest factor. We're often under the pump with the supply role, so I think clinical service can press you that little bit further. That's where you need to have an adequately staffed pharmacy to be able to provide clinical services.'* (P8)

However, a shift towards dedicating pharmacists to professional services was also recognised, and strategies including utilising pharmacy assistants to support consumers to complete any required documentation and supporting intern pharmacists to deliver the professional service were described to operationalise the delivery of expanded services.

### Outer Setting

**Patient needs and lack of resources** were mostly linked to access to GPs. Pharmacists agreed that difficulty in getting a timely appointment at a GP was a major problem for their community, resulting in more complex pharmacy presentations. In addition, the costs and distances required to access a GP appointment and very limited bulk-billing services was forcing consumers to attend hospital emergency departments (EDs). Pharmacists expected that the LISTEN UP service would support the redirection of consumers into appropriate healthcare settings.

*'People don't get access to prescription medicines, or routine medicines that they need in a timely manner. So, things generally compound, and they have to get to a worse state before they'll see doctors.'* (P4)

The degree to which there is a positive professional relationship (network) between the pharmacy and the local GP practice (**cosmopolitan**) was reported as an enabler to the service, however this support might not translate beyond the local relationships to enact broader policy or practice change.

*'The GPs are really supportive of us. Not so sure about the medical associations, they tend to*

*have a different perspective.’ (P9)*

Participants did not describe any **peer pressure** from other pharmacy competitors due to the innovative nature of the service, however they did describe prior anecdotal resistance from the medical professional towards pharmacists providing expanded services.

#### Individuals Involved

During the engagement phase of the implementation of the service, all participants reported positive attitudes (**knowledge and beliefs**) towards expanded practice broadly and specifically to the LISTEN UP service.

*‘I’m very passionate about working at an expanded scope, and very passionate about bridging the healthcare gap between rural and metropolitan. I want to do everything I can to make sure that just because we live in a rural area, it doesn’t mean that we’re disadvantaged in terms of our access to healthcare.’ (P7)*

**Self-efficacy** of participants varied widely from those who were very confident to provide the service, to those who lacked confidence, and this was closely connected to the number of consultations that those pharmacists had provided. Pharmacists who conducted most of the services were quite comfortable with continuing the service into the future.

*‘I’m still not confident, and I think that’s just purely from not looking at a lot of ears.’ (P7)*

All participants were motivated to work at an expanded scope and to implement the LISTEN UP service. The **individual stage of change** amongst the participants varied between determination and action, as some pharmacists were already providing expanded services such as vaccinations.<sup>23</sup>

*‘I’ve always been a big advocate for expanded practice. People that are drawn to work in health want to help and want to better themselves and do more research, so yes, we’re perfectly placed.’ (P1)*

**Personal attributes** such as a preference for usual pharmacy tasks compared to professional services and the recent implementation of other professional services such as pain or sleep clinics impacted on the pharmacists’ motivation to participate in the LISTEN UP service.

*‘I probably haven’t been one of the drivers of the trial. There are others in my pharmacy who much prefer it than I do, so I’m usually the one where I’m like, go on, get in there, and I’ll do this stuff out here and keep the pharmacy running.’ (P2)*

## 15.5 DISCUSSION

Expanded pharmacy practice globally has shown potential to improve consumer access to healthcare and patient health outcomes.<sup>24</sup> In previous research, consumers and health professionals have reported some resistance to expanded practice, however when focusing on rural Australia, pharmacists, consumers, health professionals and stakeholders are all supportive of expanded practice for rural and remote areas with an expected improvement in health for their local communities.<sup>3,15-18,24</sup>

The analysis of the implementation of an innovative expanded health service has identified various factors to consider improving the success of future services. This study has reported pharmacist perspectives of various constructs connected to the CFIR framework of implementation.<sup>13</sup> The lessons learnt from the implementation of LISTEN UP can be applied to the four stages of implementation: planning, engaging, executing, and reflecting and evaluating.<sup>12</sup>

### Planning

During the planning stage it was recognised that the LISTEN UP service needed to be aligned with local burden of disease and existing available ear care providers. The pharmacists described ear health to be a problem in their community, which is aligned with national reports of ear disease of rural Australia.<sup>25</sup> In addition, difficulty in accessing GP appointments and needing to travel extensive distances to specialist ear services were proving to be a major barrier for consumers in their community.<sup>18</sup> Reports of people delaying attending GP practices and instead attending hospital emergency departments potentially further impacts on the health of remote populations.<sup>2,26</sup> These issues are likely to worsen and compound when the full impacts of COVID-19 on primary healthcare are realised<sup>27</sup>, thus highlighting the need to support rural community pharmacies to play a larger role in primary healthcare, through the provision of expanded services.

Training was also an important consideration during the planning stage of LISTEN UP. Previous research had highlighted the importance of high quality training to ensure that pharmacists were able to provide an expanded service safely and effectively, and this was described by both rural pharmacists and health professionals.<sup>3,18</sup> In addition, a lack of understanding of the level of training pharmacists receive had health professionals uncertain about pharmacists' capability to provide expanded services.<sup>4</sup> Some pharmacists who participated in the trial, although they found the training valuable, still lacked confidence with clinical decision making and suggested that a more structured protocol that reduced decision making would have improved their confidence providing the service. A similar trial being conducted in Australian pharmacies managing urinary tract infections has a very

clear and directed protocol and this model was suggested by the pharmacists.<sup>28</sup> The lack of confidence to make clinical impressions and decisions has been previously reported and suggested to be an area of pharmacy practice that will need to be strengthened for expanded service implementation in the future.<sup>4,29,30</sup>

### Engaging

The culture of professional practice is emerging in community pharmacy as the profession evolves from a model of medication supply to a pharmaceutical care model.<sup>31</sup> The pharmacies that participated in this trial both have a progressive approach to pharmaceutical care. This is essential for expanded practice implementation as previously tasks such as preparing dose administration aids and performing blood pressure checks have been considered as an advancement in pharmacy services and for some pharmacies would still be considered expanded practice.<sup>18</sup> However, as we have learnt from our international counterparts, rural community pharmacists have the potential to play a much larger role in healthcare.<sup>6</sup>

Collaboration with GPs has been integral to LISTEN UP. The embedded referral pathway to appropriately timed GP appointments has allowed patients to fast-track into an appropriate healthcare setting. Concerns about the level of GP support for expanded practice has been identified previously<sup>32</sup>, however workload pressures on rural GPs has assuaged concerns provided services are delivered safely.<sup>18</sup> Diverting minor ailments from emergency departments to more appropriate primary healthcare providers (pharmacies and GP's) is embedded in health service policies.<sup>33</sup> A third of ED presentations are able to be diverted to GPs or pharmacies and in Queensland alone, 612 ED presentations were for ear wax blockages over a six month period.<sup>33</sup> In rural and remote areas, GP appointment wait times can be many weeks, further supporting the need to provide expanded community pharmacy models of care as pharmacists are the most accessible healthcare professional in many of these communities.<sup>18,34</sup>

### Execution

The execution stage of the LISTEN UP trial identified two limiting factors for the pharmacies to be able to offer the service to consumers: number of pharmacists working at one time and availability of a private consultation room. Both the pharmacies were well staffed with pharmacists; however, afterhours and weekends saw single on duty pharmacists not being able to prioritise the LISTEN UP service. It has been identified that community pharmacists place importance on providing professional services, however competing essential pharmacy activities hamper their ability to dedicate the time to provide those services.<sup>35</sup>

In addition, both pharmacies had private consultation rooms, however one pharmacy had only one room, which was often being utilised and prioritised for vaccination services. These two barriers have been recently identified by other rural health professionals also as the two biggest challenges to pharmacists providing expanded services.<sup>18</sup> Although private consultation rooms reduce retail space, most community pharmacies have constructed a private room to be able to offer vaccination services, however guidelines about specifications of pharmacy consultation rooms have not been published.<sup>36</sup>

### Reflection and Evaluation

On completion of the LISTEN UP trial, all participants described the need for government funding for the service to be viable and sustainable for the future. Although consumers reported a willingness to pay for this service and expanded services broadly, it is well recognised that the most vulnerable patients are likely not to have the ability to pay for the service.<sup>10</sup> In particular, the Australian Indigenous populations are likely to experience financial constraints as a barrier to accessing professional services and given their health outcomes are the poorest in the country, a government funded program is needed to remove the additional barrier of cost.<sup>37</sup>

## 15.6 CONCLUSION

The implementation of expanded services in rural community pharmacy is a staged process with many considerations. Examination of pharmacist perspectives of the implementation of the LISTEN UP service has highlighted important lessons, which can be applied to the design and development of future expanded pharmacy practice. A targeted service, for which pharmacists are adequately trained to provide, which has embedded collaboration with GPs is essential. Such a service needs to be provided by community pharmacists with a strong culture of professional practice with pharmacist time and private consultation space readily available. Funding is critical for expanded services such as LISTEN UP to be sustainable and this funding should be directed from either government, or other sources, rather than consumers. Expanded practice for rural community pharmacy is a pivotal strategy to reduce the barriers to accessing primary healthcare for rural and remote Australians. Lessons from this remote practice model has the potential to provide valuable insight generally into the design and development of future models of expanded pharmacy practice.



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## Chapter 16 – Conclusion and Recommendations

### 16.1 CONCLUSION

Expanded pharmacy services in Australia are an emerging area of practice. The health services research in this thesis has sought to advance the implementation of expanded models through the identification of enablers and barriers for an expanded scope of service delivery for rural community pharmacy.<sup>1</sup> Expanded practice models in rural community pharmacy have been explored by reviewing the literature and the perspectives of consumers, stakeholders, pharmacists and other health professional perspectives using a mixed-methods explanatory sequential research design.<sup>2</sup> This multi-layered approach has sequentially connected and built upon quantitative and qualitative data to design, develop and evaluate an expanded practice service.<sup>2</sup>

Looking through an ethnographic lens of rural culture, it is disheartening to note that although Australians have one of the highest life expectancies in the world, our rural and remote populations fare significantly worse than metropolitan populations for almost all health indicators, risk factors, burden of disease, and death rates.<sup>3,4</sup> These indicators reflect both the high rates of socio-economic disadvantage and Indigenous populations with high disease burdens and inequitable access to primary healthcare services.<sup>5</sup> The Australian Government states that Australia's health system is one of the best in the world, providing safe and affordable healthcare for all Australians, yet this is challenged by many, including health professionals providing care to these vulnerable populations.<sup>5</sup>

Medicare, the foundation of the Australian health system has been in place since 1984, covering all the costs for all Australians of public hospital services and some costs for other health services including GP appointments.<sup>6</sup> Incorporated in Medicare is the Pharmaceutical Benefits Scheme (PBS) which subsidises medicine costs to all Australian citizens and permanent residents.<sup>6</sup> From an outsider perspective this looks good, however rural people will say that bulk-billing GPs (when the doctor bills Medicare directly, accepts the Medicare benefit as full payment for their service, and the patient does not pay) are fictitious resulting in frequent emergency department presentations for ailments that should have been diverted to GP or pharmacy settings.<sup>7-9</sup>

Internationally, pharmacists have demonstrated significant savings in healthcare costs through the provision of expanded services.<sup>10</sup> This achievement has been through the recognition of pharmacists as key contributors to health service delivery and a collaboration between patients, pharmacists, and other health professionals to meet patients' health goals.<sup>10</sup> In Canada, although there are differences between provinces and territories, pharmacists' scope of practice has been extended to

include renewing prescriptions for continuity of care, changing drug dosage/formulation, making therapeutic substitutions, initiating prescription drug therapy, administering a drug by injection and ordering and interpreting laboratory results.<sup>11</sup>

In the United States, in response to growing healthcare demands and shortages of healthcare providers, pharmacists have advanced their role in community-based pharmacy settings.<sup>12</sup> The community-based pharmacist practitioner role has been developed to create, advance and influence team-based care, and provide direct patient care to meet healthcare needs.<sup>12</sup> This work includes education, medication optimisation, chronic condition management and care coordination.<sup>12</sup>

In the United Kingdom (UK), although their rural populations are not as isolated as Australia's, they are still characterised by poor clinical conditions and outcomes.<sup>13</sup> Pharmacists are forging ahead with advanced pharmaceutical services and innovative trials for the management of sore throat and other minor ailments.<sup>13,14</sup> Although rural populations in the UK don't readily utilise the advanced pharmaceutical services that are available, this must also be attributed to the fact that advanced services are not well established in rural areas.<sup>13</sup>

Comparatively in Australia, despite the Australian Government promoting an integrated approach to health, pharmacy is not represented in the emerging models of care.<sup>15</sup> However pharmacists are beginning to make inroads by providing vaccinations with the first two year pharmacist-vaccine trial in 2014 and more recently the administration of the COVID-19 vaccination.<sup>16,17</sup> In addition, remunerated consultant pharmacist roles including conducting comprehensive home medicine reviews, and pharmacist roles embedded in GP practices and aged care facilities are slowly seeping through the country.<sup>15</sup> Apart from vaccinations and these sparsely available consultancy roles, pharmacists' predominant role is that of medication supply, particularly in rural and remote communities, where there are significant workforce shortages.<sup>18</sup>

The Pharmaceutical Society of Australia has reported almost sixty rural communities in Australia which have a local community pharmacy and no medical centre.<sup>19</sup> These communities, like many others, rely heavily on their local pharmacist for healthcare, although remuneration available to pharmacists to provide services in addition to medication supply are limited.<sup>20</sup> These community pharmacies are often viewed as a retail business by patients rather than a healthcare centre due to profit also being achieved through the supply for example of giftware and toys.<sup>21</sup> Thus the provision of expanded services, requiring a private consulting area needs to be accompanied by a paradigm shift in patients' perceptions and associated appropriate funding to compensate for the space for the consulting room lost from retail sales.

Professional bodies in Australia continue to advocate for the pharmacy profession. The Pharmaceutical Society of Australia's Pharmacists in 2023 report envisages pharmacists practising to full scope and driving greater efficiencies in the health system.<sup>22</sup> The Pharmacy Guild of Australia's future vision identifies community pharmacy as health hubs facilitating the provision of cost-effective and integrated healthcare services to patients.<sup>15</sup>

There is no simple solution to improve health for rural and remote populations, however it is recognised that an aging population and health workforce shortages are critical challenges for rural and remote people that are likely to become worse.<sup>23</sup> Thus a more strategic approach to health workforce planning is needed. More than a decade ago, the National Rural Health Alliance made recommendations for the Australian Government to improve rural workforce and healthcare including consideration of altered scopes of professional practice for health professionals.<sup>23</sup> During this time, for the pharmacy profession, developments in this area have been minimal. The time for consideration is well past, the time for change is now. Rural health must improve, and pharmacists are well placed to make a significant contribution to better health outcomes for these populations.<sup>22</sup>

This study and the LISTEN UP trial have provided a springboard for the design and development of other expanded services for rural community pharmacy. Barriers and enablers need to be closely examined to ensure that any new service is meeting a community need and has strong foundations for sustainability into the future. Rural and remote people, although faced with adversity through poor health and harsh living environments, remain in our country as major contributors to the Australian society and economy. As highly qualified, passionate, and motivated health professionals, pharmacists' skills need to be harnessed to better address gaps in healthcare to improve health outcomes for the resilient folk living in the bush – expanded practice is one strategy that will facilitate this change.

## 16.2 FUTURE DIRECTIONS AND RECOMMENDATIONS

The following recommendations, which are essential for expanded pharmacy services to be successful for rural practice are based on the health service research reported on in this thesis.

### RECOMMENDATION 1

**Expanded practices in rural and remote areas should be focused on individual community healthcare needs, not duplicating existing services, but instead meeting an identified gap in health service delivery.**

Rural and remote communities' health needs are diverse and varied depending on the locality and population. Gaps in healthcare can change within short distances depending on the health professionals and health services available in an individual community.<sup>24</sup> The development of expanded services must include a locally focused and tailored approach using local advisory groups.<sup>25</sup> Ensuring expanded services are delivered with cultural competence is critical for uptake, particularly for vulnerable populations including Indigenous Australians.<sup>26</sup>

Understanding the local profile of the burden of disease to identify priority services that are required and consideration of existing permanent and visiting health providers are important to ensure any new expanded service is not duplicating an existing service.<sup>24</sup> Expanded practice should support access to services, ensuring that the communities' needs are met, and services are designed and delivered appropriately for each community. This may include consideration of cultural practices, local pharmacy capacity, and consumer priorities.

The LISTEN UP trial proved to be a successful expanded service and part of its success can be attributed to the existing gap in local ear services at the trial sites and consumer demand for better ear healthcare accessibility for their community.

### RECOMMENDATION 2

**All health professionals, including pharmacists and allied health professionals should be working to an expanded scope of practice in rural and remote areas, with additional training and upskilling as required.**

Rural and remote communities are usually serviced by permanent and visiting health professionals and the availability of particular health professionals in each community varies.<sup>27</sup> However, in some locations there is a total gap in service, with no locally based service provider available.<sup>27</sup> What is common in rural locations is that most communities don't have access to all primary healthcare professionals regularly.<sup>27</sup> This checkerboard availability of services motivates health professionals, who work in rural and remote locations to work at an expanded scope of practice to better meet the



health needs of their patients.<sup>28</sup> Rural and remote health professionals describe themselves as rural generalists, who are already stretching their scopes of practice without formal training or recognition. They recognise that additional training and upskilling may be required and are supportive of undertaking professional development to expand their scope of practice.<sup>28</sup>

However, there is a lack of funding for allied health jobs, career pathways and professional development opportunities, further worsening workforce shortages.<sup>27</sup> In response to this the Allied Health Rural Generalist Pathway has been developed to create a career pathway in rural generalist practice for rural and remote health professionals including pharmacists.<sup>29</sup> This pathway is expected to improve allied health professional recruitment and retention by fostering a fit-for-purpose workforce. The potential for an expanded scope of practice to increase job satisfaction and subsequently improve health professional recruitment and retention for rural and remote practice, is also an expected outcome of expanded practice. This recommendation is aligned with the *Allied Health Expanded Scope Strategy* posited by the Australian National Rural Health Commissioner.<sup>30</sup> The priority area of this report is to maximise opportunities and address persistent challenges for an expanded scope of practice: *expand allied health scope of practice to improve patient access to high-value healthcare.*<sup>30</sup>

This study has identified that pharmacists supported expanded practice for pharmacy and all health professionals in rural practice. Following the LISTEN UP pilot study, pharmacists reported requiring more time to practice their new skills before feeling confident to apply the skills in practice. This trialability and ensuring that any health professional providing expanded services is both competent and confident to provide an expanded service is an important factor to consider when developing expanded services. This cements the notion that an expanded practice framework for all allied health professionals should be developed to provide sustainable workforce capacity and capability.

### RECOMMENDATION 3

**Expanded practice models must be developed in collaboration with other health providers in communities, creating multidisciplinary teams, where possible with robust referral pathways embedded into service models.**

A collaborative approach to expanded service delivery is important for any new service to be accepted by a community.<sup>31</sup> Early and regular consultation with existing health providers and relevant stakeholders in the design stage of an expanded service is integral to future uptake of the service within the community.<sup>31</sup> Utilising all available opportunities to create multi-disciplinary teams to provide inter-professional and expanded services is a method to provide an advanced skill mix for service provision and enable peer-to-peer learning and skill-sharing between professions.<sup>32</sup>

Ensuring all expanded services have a robust referral pathway embedded into the model is integral, as identifying problems without adequate referral pathways provides no improvement in health service delivery and instead may worsen consumer concern.<sup>25,28</sup> Greater application of multidisciplinary teams will increase consumer access and improve the efficiency of health service delivery.<sup>32</sup> For the pharmacy profession, where pharmacists traditionally work independently, greater integration into multidisciplinary teams may also improve job satisfaction and promote attraction and retention of pharmacists for rural areas, resulting in improved continuation of healthcare providers for rural and remote communities.<sup>20</sup>

One of the most valued aspects of the LISTEN UP trial was the integration of a direct referral pathway to GPs. This integration required support from the local GPs who in the past have been skeptical about expanding the scope of practice of pharmacists. The GPs in this case were involved in the early design of the trial and were supportive of the final protocol and remained supportive of the trial when it was conducted.

#### RECOMMENDATION 4

**Funding is essential for expanded services to be sustainable. Whilst consumers are willing to pay for services, a lack of government funding requiring a fee-for-service model may disadvantage vulnerable patients.**

Pharmacists are one of the most frequently accessed health professionals which is partially attributed to their provision of advice and recommendations at no cost.<sup>25</sup> This research has identified that consumers are willing to pay for expanded services, a result which pharmacists did not anticipate.<sup>33</sup> When developing expanded pharmacy services, the introduction of a fee-for-service could be appropriate, however consideration of the costs of the equipment, pharmacist training and time may result in the fee being unaffordable for many consumers. In addition, although consumers stated that they were willing to pay for expanded services, the value of universal healthcare, exemplified through funding structures such as Medicare and PBS, should provide protection for vulnerable populations such as aged pensioners and Indigenous people who may be unable to afford a fee.<sup>6</sup> A fee-for-service would result in those who are most vulnerable being further disadvantaged and the expanded services not targeting those populations who may require them the most.

During the LISTEN UP trial, pharmacists were trained and provided with the equipment at no cost, however they were not remunerated for providing the consultations. As a result, other pharmacy tasks that generated income were prioritised over LISTEN UP. This resulted in some consumers not being offered the service during busy periods and the number of consultations declining over time. A minor ailment scheme piloted in Australia provided an economic evaluation, which concluded that

pharmacists providing an expanded service including consultation was more costly than usual pharmacy care.<sup>6</sup> One of the major costs in the analysis was the pharmacists time to deliver the consultations calculated at an hourly wage of AUD\$29.37.<sup>25</sup> The costs of a pharmacist wage compared to a GP hourly rate of AUD81.00 or an average hospital emergency department presentation of AUD705 shows clear potential for pharmacist-led expanded services to provide significant cost savings.<sup>34</sup>

This highlights the importance of ensuring than all expanded services are adequately remunerated for resources, training, and the provision of the service, including documentation and administration time. The source of funds is also an important consideration, with many participants suggesting that government funding should be available for pharmacists to provide expanded services if they are meeting a healthcare gap and thus reducing future healthcare costs of poorly managed conditions.

#### RURAL PHARMACIST POSITION STATEMENT

***Rural people deserve better healthcare and rural pharmacists can be an integral to the delivery of this better healthcare.***

***The Australian Government therefore needs a new strategic approach with a focus on rural and remote populations. It is time to develop community focused, individualised, and remunerated expanded services with embedded referral pathways to be provided by all healthcare professionals working in rural and remote practice.***

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## Appendix A – Pharmacist Survey

I acknowledge that:

- taking part in this study is voluntary and I am aware that I can stop taking part in it at any time without explanation or prejudice and to withdraw any unprocessed data I have provided;
- that any information I give will be kept strictly confidential and that no names will be used to identify me with this study without my approval.

By completing this survey 'to explore the implementation of expanded pharmacy service in rural community pharmacy' I **consent to participate in the project.**

**QUESTION 1** – Identify the top ten health issues/concerns for your community by rating their importance with **(1)** being the **MOST** important and **(10)** being the **LEAST** important.

- |   |  |
|---|--|
| <input type="checkbox"/> Mental Health (Depression/Anxiety/Suicide)             | <input type="checkbox"/> Acute infections (UTIs/STIs/Ear infections) |
| <input type="checkbox"/> Vaccinations   | <input type="checkbox"/> Sleep Apnoea                                |
| <input type="checkbox"/> Respiratory Disease (Asthma/COPD)                      | <input type="checkbox"/> Osteoporosis                                |
| <input type="checkbox"/> Cardiovascular Disease<br>(Hypertension/Dyslipidaemia) | <input type="checkbox"/> Speech, Language, Hearing Deficits          |
| <input type="checkbox"/> Diabetes   | <input type="checkbox"/> Stroke                                      |
|   | <input type="checkbox"/> Other: _____                                |

**QUESTION 2** – Identify the top ten expanded services in order of importance with **(1)** being the **MOST** important and **(10)** being the **LEAST** important. **(Please note page 2 also)**

- |  |   |
|--|---|
| <input type="checkbox"/> Depression screening [e.g., conducting depression screening using validated tools, refer to appropriate services]                                       | <input type="checkbox"/> Providing counselling services [e.g., conduct cognitive behavioural therapy or alternative counselling service, refer to appropriate services]   |
| <input type="checkbox"/> Speech and language screening [e.g., using validated tools, refer to appropriate services]  | <input type="checkbox"/> Undertaking dietary assessments and advice [e.g., conduct dietary assessment, provide dietary advice, refer to appropriate services]   |
| <input type="checkbox"/> Assessing suicide risk [e.g., conducting suicide risk screening using validated tools, refer to appropriate services]                                   | <input type="checkbox"/> Conducting sleep assessments/testing [e.g., sleep apnoea testing using validated tools, provide treatment with supervision, refer to appropriate services]                             |
| <input type="checkbox"/> Drug and alcohol testing [e.g., conduct urine dipstick or breath testing, provide advice, refer to appropriate services]                                | <input type="checkbox"/> Providing physical activity assessments and recommendations [e.g., conduct exercise screening using a validated tool, provide exercise recommendations, refer to appropriate services] |
| <input type="checkbox"/> Facilitate Telehealth appointments with specialists [e.g., psychologists, endocrinologists, cardiologists, lactation consultants etc.]                  | <input type="checkbox"/> Sexually transmitted disease testing [e.g., urine dipstick testing, treatment with medications under supervision, refer to appropriate services]                                       |
| <input type="checkbox"/> Osteoporosis screening [e.g., Heel Bone Scanning with DXA, Calcium, Vitamin D and Exercise assessment, refer to appropriate services]                   | <input type="checkbox"/> Foot examinations and diabetes checks [e.g., conduct diabetes foot exams, refer to appropriate services]   |
| <input type="checkbox"/> Asthma management clinic [e.g., Spirometry testing, development of action plans, medication adjustment with supervision, refer to appropriate services] |   |

- Hearing testing [e.g., audiometry testing, refer to appropriate services]
  - COPD spirometry services [e.g., Spirometry testing, development of action plans, medication adjustment with supervision, refer to appropriate services]
  - Vaccinations for all age groups and all available vaccinations
  - Diabetes testing and management clinic [e.g., HbA1c testing, medication adjustment with supervision, lifestyle modification advice, refer to appropriate services]
  - Urinary tract infection testing [e.g., urinary dipstick testing and recommending treatment with/without supervision, refer to appropriate services]
  - Cholesterol testing and management clinic [e.g., point-of-care cholesterol testing, medication adjustment with supervision, lifestyle modification advice, refer to appropriate services]
  - Vision/Eye examinations [e.g., using examination tools to inspect the eyes, provide treatment where appropriate or referral to appropriate services, conduct vision assessments]
  - Conducting swallowing screening assessments [e.g., conduct basic swallowing screening using validated tools, refer to appropriate services]
  - Breastfeeding advice and support [e.g., provide individualised breastfeeding support, examine breastfeeding technique, offer recommendations, refer to appropriate services]
  - Ear examinations [e.g., conduct ear examinations using otoscope, provide treatment where appropriate, refer to appropriate services]
  - Atrial fibrillation testing [e.g., point-of-care AF testing, refer to appropriate services]
  - Mouth examinations [e.g., using examination tools to inspect the mouth, provide treatment where appropriate or refer to appropriate services]
  - Wound management clinic [e.g., apply appropriate dressings and products to manage wounds, referral to appropriate services]
  - Other (please list)
- 

**QUESTION 4** – Please place a tick in the box that best suits your answer to the following statements.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Pharmacists have the skills and knowledge to provide the additional services above				
Providing <i>additional</i> services would improve health of people in my community				
These <i>additional</i> services are easily accessible by other providers in my community				
I would support the implementation of these <i>additional</i> services in my community pharmacy				
I currently have the workspace available to provide the additional services (e.g., private consultation space)				

I currently have the time in my workday to provide the additional services (e.g., pharmacist availability)				
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**QUESTION 5** – How much remuneration would be required for the services above to be viable if there were no equipment costs/expenses (e.g., only expense is time)? *Select only one response*

- Nothing, the services could be free
- Less than \$20 per hour of service delivery
- \$20-\$29 per hour of service delivery
- \$30-\$50 per hour of service delivery
- More than \$50 per hour
- Other (please specify): \_\_\_\_\_

**QUESTION 6** – *Please complete the following text box*

<p><i>The following are <b>enablers</b> for expanded practice in my pharmacy:</i></p> <p><input type="checkbox"/> Improved job satisfaction</p> <p><input type="checkbox"/> Improved remuneration</p> <p><input type="checkbox"/> Increased customer satisfaction</p> <p><input type="checkbox"/> Other: _____</p> <p>_____</p> <p>_____</p>	<p><i>The following are <b>barriers</b> for expanded practice services in my pharmacy:</i></p> <p><input type="checkbox"/> Expected lack of interest from consumers</p> <p><input type="checkbox"/> Inadequate knowledge</p> <p><input type="checkbox"/> Competition with other providers</p> <p><input type="checkbox"/> Other: _____</p> <p>_____</p> <p>_____</p>
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**QUESTION 6**– *Please complete the following questions.*

<p>a) What is your age in complete years?</p> <p>_____</p>	<p>b) What is your gender?</p> <p><input type="radio"/> Male</p> <p><input type="radio"/> Female</p> <p><input type="radio"/> Other, please specify</p> <p>_____</p>	<p>c) What is your postcode?</p> <p>_____</p>	<p>d) What is your role?</p> <p><input type="checkbox"/> Employed pharmacist</p> <p><input type="checkbox"/> Intern pharmacist</p> <p><input type="checkbox"/> Locum</p> <p><input type="checkbox"/> Pharmacy manager</p> <p><input type="checkbox"/> Owner/partner</p> <p><input type="checkbox"/> Other – please specify</p> <p>_____</p>
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e) What year did you qualify as a registered pharmacist?  <hr/>	f) How many years have you practiced as a rural pharmacist? <input checked="" type="radio"/> 1 year <input type="radio"/> 1 year – 5 years <input type="radio"/> 6 year – 10 years <input type="radio"/> 10 years +	g) Please list any <b>additional</b> qualifications or specialties you have attained.  <hr/> <hr/>
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**Thank you for completing our survey. We appreciate the time it takes you to complete the survey and value your opinion.**

**If you would like to be a part of our focus groups, please answer the question below.**

----- 

As part of this research project, the researchers are conducting focus groups to gather more information, if you would be willing to participate in a focus group could you please provide your name, email, phone contact, and best available day/time for the focus. These may be conducted via videoconference/Skype/Zoom. ***This information will be kept separate from the survey data to maintain confidentiality.***

Name:	Phone:
Email:	Best contact (day/times):

Appendix B – Consumer Survey

I acknowledge that:

- taking part in this study is voluntary and I am aware that I can stop taking part in it at any time without explanation or prejudice and to withdraw any unprocessed data I have provided;
  - that any information I give will be kept strictly confidential and that no names will be used to identify me with this study without my approval.
- By completing this survey ‘to explore the implementation of expanded pharmacy service in rural community pharmacy’ I **consent to participate in the project.**

**THESE QUESTIONS ARE ABOUT HEALTH SERVICE NEEDS IN THE COMMUNITY**

**What EXTRA services do you feel this community pharmacy should provide to improve the health needs of the community? (Tick all that apply)**

<input type="checkbox"/> Bone tests (Osteoporosis) <input type="checkbox"/> Asthma clinic <input type="checkbox"/> Depression/Mental Health tests <input type="checkbox"/> Hearing tests <input type="checkbox"/> COPD breathing tests <input type="checkbox"/> Vaccinations for all age groups <input type="checkbox"/> Diabetes checks and clinic <input type="checkbox"/> Speech and language tests <input type="checkbox"/> Urinary tract infection (UTI) tests <input type="checkbox"/> Cholesterol tests and advice <input type="checkbox"/> Heart checks and advice <input type="checkbox"/> Mouth checks <input type="checkbox"/> Vision/Eye checks <input type="checkbox"/> Wound care clinic	<input type="checkbox"/> Sexually transmitted disease (STDs) tests <input type="checkbox"/> Foot checks <input type="checkbox"/> Counselling services <input type="checkbox"/> Swallowing checks <input type="checkbox"/> Diet checks and advice <input type="checkbox"/> Sleep tests and advice <input type="checkbox"/> Exercise tests and advice <input type="checkbox"/> Ear checks <input type="checkbox"/> Breastfeeding advice and support <input type="checkbox"/> Suicide prevention <input type="checkbox"/> Drug and alcohol testing <input type="checkbox"/> Telehealth/On-TV screen appointments <input type="checkbox"/> Other (please list) _____
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**How much would you be willing to pay for any of the EXTRA pharmacy services you selected above?**

- Nothing the services should be free
- Less than \$20 per hour of service delivery
- \$20-\$29 per hour of service delivery
- \$30-50 per hour of service delivery
- More than \$50 per hour

**THE NEXT QUESTIONS ARE ABOUT THE EXTRA SERVICES YOU WOULD LIKE YOUR COMMUNITY PHARMACY TO PROVIDE.**

Please place a tick in the box that best suits your answer to the following statements.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Pharmacists have the skills and knowledge to provide the extra services I feel are needed				
Providing extra services would improve health of people in my community				
These extra services should be provided by other health professionals e.g., doctors, nurses				
These extra services would save money on doctor visits				
I would support these extra services in my community pharmacy				

1) What is your age in complete years? _____	2) What is your gender? <input type="checkbox"/> Male <input type="checkbox"/> Other, please specify _____ <input type="checkbox"/> Female _____	3) What is your home postcode? _____
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*Appendix C – Health Professional Questionnaire*

I acknowledge that:

- taking part in this study is voluntary and I am aware that I can stop taking part in it at any time without explanation or prejudice and to withdraw any unprocessed data I have provided;
- that any information I give will be kept strictly confidential/anonymous and that no names will be used to identify me with this study without my approval.

By completing this survey 'to explore the implementation of expanded pharmacy service in rural community pharmacy' **I consent to participate in the project.**

**THESE QUESTIONS ARE ABOUT UNMET SERVICE NEEDS IN THE COMMUNITY**

**What *ADDITIONAL* services do you feel community pharmacies should provide to improve the health needs of the community?**

<input type="checkbox"/> Osteoporosis screening [e.g. heel bone scanning] <input type="checkbox"/> Asthma management clinic <input type="checkbox"/> Depression screening <input type="checkbox"/> Hearing testing <input type="checkbox"/> COPD spirometry services <input type="checkbox"/> Vaccinations for all age groups and all available vaccinations <input type="checkbox"/> Diabetes testing and management clinic [e.g. HbA1c testing] <input type="checkbox"/> Speech and language screening <input type="checkbox"/> Urinary tract infection testing [e.g. urinary dipstick testing] <input type="checkbox"/> Cholesterol testing and management clinic <input type="checkbox"/> Atrial fibrillation testing <input type="checkbox"/> Mouth examinations <input type="checkbox"/> Vision/Eye examinations <input type="checkbox"/> Wound management clinic	<input type="checkbox"/> Sexually transmitted disease testing [e.g. urine dipstick testing] <input type="checkbox"/> Foot examinations and diabetes checks <input type="checkbox"/> Providing counselling services <input type="checkbox"/> Conducting swallowing screening assessments <input type="checkbox"/> Undertaking dietary assessments and advice <input type="checkbox"/> Conducting sleep assessments/testing <input type="checkbox"/> Providing physical activity assessments and recommendations <input type="checkbox"/> Ear examinations <input type="checkbox"/> Breastfeeding advice and support <input type="checkbox"/> Assessing suicide risk <input type="checkbox"/> Drug and alcohol testing <input type="checkbox"/> Facilitating Telehealth appointments with specialists <input type="checkbox"/> Other (please list) _____ _____ _____ _____
--	--

**THE NEXT QUESTIONS ARE ABOUT THE *ADDITIONAL* SERVICES YOU WOULD LIKE COMMUNITY PHARMACIES TO PROVIDE.**

*Please place a tick in the box that best suits your answer to the following statements.*

	Strongly Agree	Agree	Disagree	Strongly Disagree
Pharmacists have the skills and knowledge to provide the additional services I feel are needed				
Providing <i>additional</i> services would improve health of people in my community				
These <i>additional</i> services are easily accessible by other providers in my community				

I would support the implementation of these <i>additional</i> services in my community pharmacy				
I would support the implementation of these <i>additional</i> services in communities where these services are not available				

1) What is your age in complete years? _____	2) What is your gender? <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other, please specify _____	3) What is your work postcode? _____	4) What is your occupation? _____ Specialty: _____
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**Thank you for completing our survey. We appreciate the time it takes you to complete the survey and value your opinion.**

**If you would like to be a part of our interviews, please answer the question below.**

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As part of this survey, the researchers are conducting short telephone interviews to gather more information, if you would be willing to participate in a telephone interview could you please provide your name, email, phone contact, and best available day/time for the interview. This information will be kept separate from the survey data to maintain confidentiality.

Name:	Phone:
Email:	Best contact (day/times):

*Appendix D – Pharmacist, Health Professional and Stakeholder Interview Guide*

1. Introduction – we are interested in hearing about your thoughts about expanded pharmacy services in rural and remote community pharmacies. Expanded pharmacy services are an extension of the recognised scope of the pharmacy profession. It is applied to pharmacists undertaking tasks usually provided by other health professionals e.g., doctors, nurses, and allied health and is often synonymous and interchanged with the term extended practice.

2. Demographics

<p>1) What is your age in complete years? _____</p>	<p>2) What is your gender?  <input type="checkbox"/> Male  <input type="checkbox"/> Female  <input type="checkbox"/> Other, please specify          _____</p>	<p>3) What is your home postcode? _____</p>	<p>4) What is your occupation? _____</p>
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3. In your opinion, what are the major health concerns for your rural community?
4. What are your thoughts about rural community pharmacies providing expanded services?
5. Is there a need for community pharmacies to provide expanded pharmacy services in your community? Can pharmacies address any gaps in health service delivery?
6. Can you describe any expanded pharmacy services that would benefit your community? (interviewer to describe 5-10 expanded services for consideration if none are known)
7. What difficulties/barriers do you think might need to be overcome to implement expanded services? (Provide details of LISTEN UP for Pre-trial Interview)
8. What aspects/enablers would make expanded pharmacy services successful for your community? (Provide details of LISTEN UP for Pre-trial Interview)
9. What are your thoughts on remuneration for pharmacies providing services? (Provide details of LISTEN UP for Pre-trial Interview)
10. What impact do you think expanded services might have on health professional-pharmacist relationships?
11. Are there any other comments about expanded pharmacy practice you would like to make before we finish?
12. (Post-trial Interview) Implementation and evaluation focus.



## SERVICE SUMMARY DOCUMENT

- Patient has received and reviewed information about the trial and research evaluation.
- Patient has signed an informed consent form to participate in the trial and research evaluation.
- Patient meets eligibility criteria to participate in the trial.

Date: \_\_/\_\_/\_\_\_\_ Time: \_\_\_\_\_

Patient Contact Details			
First Name:		Last Name:	
Address:			
DOB:		Gender:	Male/Female/Other
Allergies:		Medical Conditions:	
Pregnant?		Breastfeeding	
Medications:			

Episode of Care			
Presenting Complaint:			
Duration of Complaint:		Treatments tried:	
Pharmacist Examinations:	Otoscopy	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	Tympanometry <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal
	Temperature:		
Brief Notes:			

Attach images and results

Pharmacists clinical impression: Eg. Otitis externa, wax impaction	
Recommendations Made	
Pharmacist Recommendations	<input type="checkbox"/> No treatment <input type="checkbox"/> Pharmacy-based treatment (please specify: _____) <input type="checkbox"/> Referral with appointment made to GP <input type="checkbox"/> Other (please specify: _____)
Expanded Practice Recommendations [RESEARCH PURPOSES ONLY]	
<input type="checkbox"/> Prescription-only medicine (please specify exact drug/strength/dose: _____) <input type="checkbox"/> Immediate emergency department referral <input type="checkbox"/> Specialist ENT Referral <input type="checkbox"/> Speech Therapy Referral <input type="checkbox"/> Audiometry Hearing Test Referral <input type="checkbox"/> Other (please specify: _____)	

Time completed: \_\_\_\_\_

*Appendix F – Interview Guide for Consumers (7-day follow-up)*

**1. Introduction of self and purpose of the call.**

Please feel free to speak freely. There is no right or wrong answer to the questions, it is your views and opinions that we are interested in. I would like to assure you that all of the transcribed material resulting from this discussion will be anonymised in the final report.

Before we start, can I check that you have read the information sheet and you have signed the consent form? Whenever you are ready, please can you confirm that you are happy for me to start the recording? If you have any questions throughout the interview, please let me know.

**2. Demographics**

<p>1) What is your age in complete years?</p> <p>_____</p>	<p>2) What is your gender?</p> <p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p> <p><input type="checkbox"/> Other, please specify</p> <p>_____</p>	<p>3) What is your home postcode?</p> <p>_____</p>	<p>4) Ethnicity</p> <p><input type="checkbox"/> Caucasian</p> <p><input type="checkbox"/> ATSI</p> <p><input type="checkbox"/> Other, please specify</p> <p>_____</p>
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3. Please could you tell me about your initial feelings towards seeing a pharmacist for your ear complaint?
4. Please can you describe to me your experience at the pharmacy? (who explained what, how was examination conducted, need for referral/treatment etc)
5. How confident did you feel at the end of the consultation about the result?
6. After having your ears examined at the pharmacy, were you referred to a GP?
7. If yes, did you attend? What treatment or referrals did you receive?
8. If no, can you please explain why?
9. How are you feeling today? Has your ear complaint been resolved? (?Need to re-refer)
10. Overall, tell me about your satisfaction with the LISTEN UP service – [Question: 1 am satisfied with the LISTEN UP service – 0 – worst – 10 best.
11. Is there anything you would like changed about the service.
12. Would you pay for this service and what value in the future? \$10, \$20, \$30, \$40, \$50
13. Is there any other comments about the LISTEN UP service you would like to make before we finish?

Clinical characteristics Table (N=55)

Age (years)	0-6	3 (5%)
	7-18	0 (0%)
	19-34	14 (25%)
	35-54	19 (35%)
	55+	19 (35%)
Gender	Female	29 (53%)
	Male	26 (47%)
Ethnicity	Aboriginal	10 (18%)
	Caucasian	39 (71%)
	Other	6 (11%)
Complaint (more than 1 per N)	Blocked	28
	Pain	25
	Hearing	7
	Dizziness	3
	Itch	5

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has been removed

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