

# **Rural outreach by specialist doctors in Australia**



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degree of Doctor of Philosophy**

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# Table of contents

<b>Summary (abstract).....</b>	<b>v</b>
<b>General declaration.....</b>	<b>ix</b>
<b>Publications, presentations and awards .....</b>	<b>xi</b>
<b>Chapter 1: Thesis introduction.....</b>	<b>1</b>
1.1 Introduction.....	1
1.2 Background.....	3
1.2.1 Specialist health services in the Australian health system .....	3
1.2.2 Local access to specialists relative to need.....	5
1.2.3 Strategies to increase access to specialists.....	9
1.3 Research aims and objectives .....	11
1.4 Scope of research .....	11
1.5 Thesis overview .....	12
1.6 General limitations .....	13
1.7 Definition of key terms .....	14
1.7.1 Rural outreach .....	14
1.7.2 Specialist doctors .....	16
1.7.3 Regional, remote and rural.....	17
1.7.4 Sustained outreach services .....	17
1.8 Conclusion .....	19
<b>Chapter 2: Review of the literature .....</b>	<b>21</b>
2.1 Introduction.....	21
2.2 Prevalence of rural outreach .....	22
2.3 Is rural outreach by specialists effective? .....	23
2.4 Types of services and their integration .....	24
2.5 Outreach service regularity and longevity .....	25
2.6 Outreach service distribution .....	26
2.7 Outreach service drivers.....	27
2.8 Reasons for participating.....	28
2.9 Funding of rural outreach.....	29
2.10 Outreach planning .....	30
2.10.1 National level .....	30
2.10.2 State or territory level .....	32
2.10.3 Health service level .....	33

2.11 Conclusion.....	33
<b>Chapter 3: Australia's national outreach policy.....</b>	<b>47</b>
3.1 Introduction .....	47
3.2 National outreach policy.....	47
3.3 Conclusion.....	57
<b>Chapter 4: Research design.....</b>	<b>59</b>
4.1 Introduction .....	59
4.2 A sub-study of MABEL.....	59
4.3 MABEL study design.....	60
4.3.1 Sampling frame and response management .....	60
4.3.2 The questionnaire .....	61
4.3.3 Data management and storage .....	62
4.3.4 Ethics.....	62
4.4 Research method for outreach study.....	63
4.4.1 Using existing data .....	63
4.4.2 Collecting new data .....	64
4.4.3 Piloting new questions.....	67
4.5 Data cleaning and analysis.....	68
4.5.1 Managing response bias and attrition .....	69
4.6 Conclusion.....	72
<b>Chapter 5: Participation in rural outreach work .....</b>	<b>73</b>
5.1 Introduction .....	73
5.2 Prevalence of rural and remote outreach work .....	73
5.3 Conclusion.....	85
<b>Chapter 6: Patterns of rural outreach work.....</b>	<b>87</b>
6.1 Introduction .....	87
6.2 Service distribution and models of outreach .....	88
6.3 Conclusion.....	97
<b>Chapter 7: Sustaining rural outreach.....</b>	<b>99</b>
7.1 Introduction .....	99
7.2 The stability of rural outreach services .....	99
7.3 Conclusion.....	108
<b>Chapter 8: Why specialists participate in rural outreach work .....</b>	<b>109</b>
8.1 Introduction .....	109
8.2 Methods.....	110



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8.3 Cohort .....	111
8.4 What are the reasons? .....	113
8.5 Discussion .....	115
8.6 A sub-finding: length of service .....	116
8.7 Conclusion .....	117
<b>Chapter 9: Financial subsidies for rural outreach .....</b>	<b>119</b>
9.1 Introduction .....	119
9.2 Subsidies and patterns of service .....	120
9.3 Conclusion .....	137
<b>Chapter 10: Summary and implications .....</b>	<b>139</b>
10.1 Introduction .....	139
10.2 Summary of findings .....	139
10.3 Synthesis by key thesis outcomes .....	141
10.3.1 Prevalence of rural outreach .....	141
10.3.2 Specialist characteristics .....	143
10.3.3 Where the specialist resides .....	143
10.3.4 Characteristics of main work .....	144
10.3.5 Characteristics of town visited .....	144
10.3.6 Financial support of rural outreach work .....	145
10.4 Implications of findings .....	145
10.4.1 Complex drivers .....	146
10.4.2 Targeted, coordinated and integrated services .....	149
10.4.3 A perspective for policy .....	153
10.5 Further research .....	165
10.6 General limitations .....	166
10.6.1 Study design and sampling .....	166
10.6.2 Questionnaire items .....	167
10.6.3 Statistical analyses methods .....	168
10.7 Conclusion .....	169
<b>References .....</b>	<b>171</b>
<b>Appendix 1: New outreach questions in wave 7 MABEL survey .....</b>	<b>181</b>

# List of Tables

<b>Table 2.1:</b> Australian research: rural outreach by specialist doctors.....	35
<b>Table 8.1:</b> Characteristics of respondents to the Medicine in Australia: Balancing Employment and Life survey, 2014, compared with the Australian specialist workforce.....	112
<b>Table 8.2:</b> Association between reasons specialists participate in rural outreach work, practice characteristics and outreach service patterns .....	114
<b>Table 10.1:</b> Summary of findings by Chapter .....	140
<b>Table 10.2:</b> Summary of rural outreach by specialist doctors and factors significantly associated with participation and patterns of service provision .....	142
<b>Table 10.3:</b> Speculative strategies to address targeted, coordinated and integrated rural outreach services.....	150
<b>Table 10.4:</b> Areas for further research .....	165
<b>Table 10.5:</b> Summary of how sample and attrition bias were accounted for in various Chapters.....	167

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# Summary (abstract)

Outreach healthcare is an important strategy to increase access to specialist medical services in rural and remote Australia. However, most research evidence about rural outreach work by specialist doctors is in the form of small-scale reports describing and validating outreach services for different specialties and contexts. No research systematically describes such outreach at a state/territory or national level. As such there is poor information to understand the level of workforce participation, where rural outreach services are delivered and the factors that influence rural outreach work.

This thesis aims to systematically describe rural outreach work by specialist doctors in Australia to improve the basis of information for policy development and planning. It includes multiple studies to describe the extent of rural outreach work and the factors influencing participation and patterns of service provision, including service distribution and continuity. The thesis uses data collected between 2008 and 2014 as part of the Medicine in Australia: Balancing Employment and Life (MABEL) study, a large national longitudinal panel survey of Australian doctors.

The findings suggest that rural outreach work is relatively common, involving one in five Australian specialists, mostly males, who participate for a range of reasons. Only 16% of outreach providers worked in remote locations, however as a proportion of all services, 42% were provided in outer regional or remote as opposed to inner regional locations. Outreach services were continued to the same town around half the time and the median length of continuing the main outreach service was six years.

Increasing age did not influence participation but was correlated with remote outreach work. Additionally, mid-career specialists were more likely to continue rural outreach services, as opposed to those in early career or nearing retirement.

A range of specialist types participated, however, generalists and otolaryngologists more commonly provided rural outreach services, worked in remote locations and sustained service provision.

Specialists based in rural areas more commonly participated in rural outreach but three-quarters of all providers were metropolitan-based. Location also influences service distribution. Inner regionally-based specialists were less likely than metropolitan-based specialists to provide remote outreach services. Instead, remote outreach work was mainly undertaken by a combination of specialists living nearby or in metropolitan areas. Metropolitan specialists, whether working in the public or private sector, were more likely to travel to distant locations. Their outreach services were just as stable as those by rural specialists.

Specialists working in private consulting rooms were more likely to participate in rural outreach and private specialists commonly participated to provide complex healthcare in challenging situations. However specialists in private consulting rooms tended to be less likely to work in remote locations. Private rural specialists restricted their travel distance to <300km. Working only privately, as opposed to in mixed or public practice, also reduced the stability of rural outreach services.

Around half of all specialist outreach providers received subsidies for rural outreach work. Subsidies either from the Australian Government's Rural Health Outreach Fund (ROHF) (19%), or another source (27%), were related to longer travel and the provision of services into more remote locations. Additionally, compared with non-subsidised specialists, ROHF subsidies supported specialists working in priority areas, who provided regular services they intended to continue, despite visiting more remote locations.

This thesis addresses an important gap in systematic knowledge and understanding of rural outreach work. Such work is relatively common, by a range of specialists, mainly based in metropolitan areas and working in different practice sectors. However, complex drivers influence participation and patterns of rural outreach work, which broadly operate at individual, organisational and economic levels. Instead of a simple response, rural outreach work is likely to require multilevel policy and planning. Further, based on the extent and range of rural outreach

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services provided via different models in both regional and more remote locations, systems are likely to be needed to ensure outreach services are appropriately targeted, integrated and coordinated.

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I would like to thank my supervisors, Doctor Matthew McGrail, Professor Just Stoelwinder and Adjunct Associate Professor Catherine Joyce who, through their consistent teaching and mentorship, widely extended my learning about research, the health system and rural health.

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Being involved in both the Schools of Public Health and Preventive Medicine and Rural Health at Monash University allowed me to develop an understanding of research in different contexts. I am incredibly grateful for the comradery of staff and fellow PhD candidates.

This research was strongly enhanced by input from a diverse range of stakeholders from government, not-for-profit agencies, hospitals and the private sector who gave willingly of their time to provide perspectives of current rural outreach practice, policy and programs.

My mum deserves special thanks for helping me to dream I could reach this milestone.

Finally, I sincerely thank my husband and four children for their love and support. Family holidays to rural and remote areas during the doctorate provided critical periods of reflection and first-hand experience of distance, health services and the people of outback Australia.

An Australian Postgraduate Award from the Australian Government enabled this research.

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# General declaration

In accordance with Monash University Doctorate Regulation 17.2 Doctor of Philosophy and Research Master's regulations the following declarations are made:

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes four original papers published in peer reviewed journals and two manuscripts, one of which has been submitted for publication. The core theme of the thesis describes the extent and characteristics of rural outreach work by specialist doctors and the broad factors influencing service patterns at a national level. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the candidate, working within the School of Public Health and Preventive Medicine, under the principal co-supervision of Doctor Matthew McGrail and Professor Just Stoelwinder as well as principal supervision of Associate Professor Catherine Joyce, until November 2014.

The inclusion of co-authors reflects research involved a collaboration of multiple researchers working in a team.

In the case of chapters 3, 5, 6, 7, 8, 9 and 10 my contribution to the work involved the following:

Thesis chapter	Publication title	Publication status	Nature and extent of candidate's contribution
3	Adoption, implementation and prioritization of specialist outreach policy in Australia: a national perspective	Published in the <i>Bulletin of the World Health Organization</i>	Conception, identification and collation of literature and drafting of manuscript

5	Rural outreach by specialist doctors: a national cross-sectional study of supply and distribution	Published in <i>Human Resources for Health</i>	Conception, identification and collation of literature, data analysis and drafting of manuscript
6	Service distribution and models of rural outreach by specialist doctors in Australia: a national cross-sectional study	Published in the <i>Australian Health Review</i>	Conception, identification and collation of literature, data analysis and drafting of manuscript
7	The stability of rural outreach: a longitudinal study of specialist doctors in Australia	Published in the <i>Medical Journal of Australia</i>	Conception, identification and collation of literature, data analysis and drafting of manuscript
8	Why specialists participate in rural outreach work?	Unpublished manuscript	Conception, identification and collation of literature, data analysis and drafting of manuscript
9	Subsidies to target specialist outreach services into more remote locations: a national cross-sectional study	Unpublished manuscript, submitted to <i>Australian Health Review</i>	Conception, identification and collation of literature, data analysis and drafting of manuscript
10	Shaping rural outreach healthcare policies: the need for multilevel approaches	Unpublished manuscript, submitted to the <i>Bulletin of the World Health Organization</i>	Conception, identification and collation of literature, data analysis and drafting of manuscript

I have not renumbered sections of published papers in order to generate a consistent presentation within the thesis.

Signed:

Date: 22 May 2016



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# **Publications, presentations and awards**

## **Peer reviewed publications**

O'Sullivan BG, Joyce CM, McGrail MR. Adoption, implementation and prioritization of specialist outreach policy in Australia: a national perspective. *Bulletin of the World Health Organization* 2014;92(7):512-9. doi: <http://dx.doi.org/10.2471/BLT.13.130385>

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O'Sullivan BG, Stoelwinder, J, McGrail, MR. The stability of rural outreach services: a national longitudinal study of specialist doctors. *Medical Journal of Australia* 2015;03(7):297.e1-297.e6. doi: 10.5694/mja15.00369

## **Media and non-peer reviewed articles**

O'Sullivan B. MABEL PhD student tackles rural outreach. *Rural Pulse*. 2014. Available from: [http://www.rdaa.com.au/Uploads/Documents/Rural%20Pulse%20--%20January%202014\\_20140507102319.pdf](http://www.rdaa.com.au/Uploads/Documents/Rural%20Pulse%20--%20January%202014_20140507102319.pdf) [Cited 7 February 2016].

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Bush specialist services 'need support'. Herald Sun National Breaking News. 5 October 2015. Available from: <http://www.heraldsun.com.au/news/breaking-news/bush-specialist-services-need-support/story-fni0xqi4-1227556994087?sv=ccfd977ac6f7fcf4a5a41c7d72a80d9f> [Cited 6 February 2016].

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## Peer reviewed presentations and posters

O’Sullivan B, Joyce C, McGrail M (2014). *Australia’s global lead on national outreach policy*. Oral presentation to the Public Health Association of Australia Conference, Perth, 15-17 September.

O’Sullivan B, Joyce C, McGrail, M (2014). *Patterns of medical specialist outreach to meet indigenous health need in remote Australia*. Poster presentation to the Public Health Association of Australia Conference, Perth, 15-17 September.

O’Sullivan B, Joyce C, McGrail M, Stoelwinder, J (2015). *Planning integrated outreach: service patterns from the metropolitan and rural hubs*. Oral presentation to the 13<sup>th</sup> National Rural Health Conference, Darwin, 25-27 May.

O’Sullivan B, Stoelwinder J, McGrail M (2015). *Targeting outreach: the influence of Australia’s rural outreach policy?* Oral presentation to the 9<sup>th</sup> International Health Services and Policy Research Conference (2015), Melbourne, 7-9 December.

## Non-peer reviewed presentations

O’Sullivan B, Joyce C, McGrail M. (2014). *Targeting remote service provision through outreach*. Oral presentation to the Emerging Health Policy Research Conference, Sydney, 2 October.

O’Sullivan, B, Joyce, C, McGrail, M (2014). *Rural outreach by medical specialists in Australia*. Oral presentation to the MABEL Research Forum, Melbourne, 10 April.

O'Sullivan B, McGrail M, Stoelwinder J. (2015). *The stability of rural outreach: a longitudinal study of specialist doctors in Australia*. Oral presentation to the MABEL Research Forum, Melbourne, 24 April.

## **Awards**

Monash University Postgraduate Travel Award, 2013

# **Chapter 1: Thesis introduction**

## **1.1 Introduction**

Rural and remote Australians, despite having overall greater health needs than metropolitan populations, have much poorer access to local specialist medical services (1, 2). Specialist doctors commonly base their main practice in metropolitan areas or large regional centres, because apart from personal reasons, specialist services are less economically viable in small populations on a full-time basis and depend on a baseline amount of infrastructure, staff support and co-practice opportunities with other specialists and primary health care providers. Beyond large regional centres, which generally have a range of local specialist services and large hospitals, rural healthcare mainly consists of smaller public hospitals and primary care clinics. These facilities rarely employ full-time specialist doctors. Instead they use a range of solutions to help people access specialist services when needed. Alternatively, people in need of specialist care may choose to independently travel to receive services. However, long distances, poor transport options, restricted social and economic resources and cultural factors place rural and remote Australians at a distinct disadvantage to seeking specialist care away from where they reside and work. This is exacerbated when regular specialist care is needed for chronic or complex illness.

Outreach healthcare is one of a suite of health system strategies to address workforce maldistribution, with the potential to improve access to specialist services in rural and remote towns according to need. Rural outreach is characterised by specialist doctors travelling away from their usual work location to provide services, normally for a few days at a time in a specific town/s, on a regular basis. Outreach services vary in nature depending on the specialty and the local context, such as the local health need for the service, local workforce capacity or facilities. Specialists can provide such services independently as private clinics or as part of public healthcare.

Rural outreach has a long history in Australian healthcare with the first records of specialist outreach occurring in the 1940s (3) but the evidence base is poor. Over the last ten to fifteen years the published literature about rural outreach work by specialists has slowly increased, with

results suggesting such services improve early intervention, deliver culturally-appropriate care and achieve health outcomes in line with metropolitan-based clinics (4-7). However, most of the published literature continues to be in the form of local-level descriptive studies of various specialty services in different rural contexts. These are mainly limited to informing provider-level participation in outreach (8, 6). Together, they suggest specialist doctors are interested and invested in rural outreach work and capable of developing effective and sustained service models. However, in 2011, the World Health Organization noted the need for more systematic research to help inform outreach policy development and planning (9).

There are no state or national level studies which describe patterns of participation and predictors of service distribution and sustainability. Such evidence is important to understand how common rural outreach work is, who is participating and the patterns of service delivery. Developing a more systematic national level picture of rural outreach work is important to extend the current evidence away from whether outreach is effective, to inform its current application and implications for health system policy and planning.

Despite the lack of policy-relevant evidence at the time, in 2000 Australia forged ahead and instituted a unique structured national policy to subsidise selected specialist doctors for providing outreach services to rural areas of need (10). The policy was initiated by the Australian Government Health Minister at the time, the Hon Dr Michael Wooldridge who identified the lack of services for rural communities. The intent and structure of the policy has not been clearly articulated in the published literature and it is unknown as to whether the policy, in its current form, is well-targeted.

This thesis outlines an important body of research describing the patterns of rural outreach work by specialist doctors in Australia. The research reported in this thesis describes the extent of rural outreach work and the range of specialist doctors participating. Further, it explores how the characteristics of specialists, their practice arrangements and financial support structures influences rural outreach service patterns.

In this foundational chapter, the background, rationale and aims of the thesis will be covered, followed by a thesis overview.

## **1.2 Background**

Achieving an adequate and balanced supply of health care workers in rural and remote areas is a major global problem and a significant focus of the World Health Organization (9, 11). The WHO Program to increase access to health workers in rural and remote areas has, since 2009, been considering innovative and evidence-based incentives and policies to distribute health workers into the right place at the right time (11, 12). The Mason review of the Australian Government Health Workforce Programs in 2013, noted that distribution is the most significant health workforce issue Australia faces nationally (13).

In Australia, and internationally, much of the focus on improving access to rural health care has been on developing primary health care services in rural areas (14). Primary health care is efficient and effective at addressing the bulk of community non-acute health need (14). In contrast, there is comparatively little written about access to specialist doctors for populations in regional, rural and remote areas.

As part of the multi-disciplinary health care team, medical specialists are integral in enabling surgical intervention, sophisticated diagnostic testing and high-level decision-making. Additionally, specialists work closely with primary health staff, for the optimal management of complex acute and chronic illness (15). Comprehensive multi-disciplinary healthcare, inclusive of specialist services, can minimise the potential for acute exacerbations and complications which can be costly and life-threatening, particularly when people are geographically isolated.

### **1.2.1 Specialist health services in the Australian health system**

In Australia specialist health services are accessed either through referral from a general practitioner to private services in the community, or directly at public hospitals. About 33% of Australia's specialist doctors work solely in the public sector, 19% solely in the private sector and 48% a mix of public and private sector practice (16). Of the wide range of specialist types, some more commonly work in private practice such as psychiatrists, whereas other specialists are largely based in public hospitals, such as intensivists. This is often because different specialties

require different types of equipment, physical infrastructure and adjunct health workers specific to the range of health problems they manage and interventions they undertake.

### ***Private hospital or out-of-hospital specialist services***

The Australian Government partly covers the cost of out-of-hospital or private services through a universal health financing scheme, Medicare. This scheme provides a rebate which the Australian government agrees to pay for different types of clinically-relevant services according to the Medicare Benefits Schedule.

Registered specialists are paid on a fee-for-service basis and have rights to set fees for their services above the Medicare rate of reimbursement (17). Individuals may purchase private health insurance, (subsidised by the Australian Government), with the potential to finance some or all the private hospital out-of-pocket costs of care if specialists charge fees above the Medicare rate.

The capacity for people in rural and remote areas to access Medicare-funding, which is intended for all Australians, depends on their access to doctors and other eligible practitioners (18). Additionally, very few private hospitals are located outside of large metropolitan areas, and rural and remote populations are less likely to have private health insurance (19).

### ***Public hospital specialist services***

Specialist care in public hospitals is governed by the six state and two territory governments. The healthcare budget to achieve this is supported by state/territory and Australian Government funds. Specialists employed in public hospitals are generally paid on a salaried or sessional basis for public patients who incur no direct (out-of-pocket) costs for specialist services received. Private inpatients within public hospitals are charged a fee-for-service, rebated by Medicare, with the potential for some of the costs to be supported by private health insurance.



The range and quality of the clinical infrastructure of state-based public hospitals is used by both public and private specialists. Private specialists can pay public hospitals a fee for room hire and per procedure, to treat private out-patients.

Public hospital services tend to be planned according to a health and hospital network. In rural areas, this normally incorporates multiple hospitals and healthcare facilities across different towns within a regional boundary. With escalating costs of hospital-based healthcare competing for limited budgets, the states and territories aim to contain hospital-costs or maintain or increase revenue from hospital-based services. This includes keeping as many non-urgent cases out of the public hospital system, unless the admission of such cases improves hospital performance (e.g. expedient surgeries) or specifically builds revenue (e.g. private specialists treating private patients in public hospitals). Employed managers and individual hospital boards allocate funding across public hospital services within budget agreements, including staffing, infrastructure and services. They are also involved in decisions concerning the deployment of employed medical staff. Such decisions need to account for the hospital's service capacity and in the interests of retaining staff, often include considerations as to the doctors' interests.

### **1.2.2 Local access to specialists relative to need**

The specialist medical workforce is the fastest growing but most maldistributed group of doctors in Australia (20). Compared with general practitioners a higher proportion of all Australian specialists base their main practice in metropolitan areas (n=22,249 of 26,329) (1). Only 15% of specialists and 30% of the Australian population, live in a rural or remote area, spanning over 98 per cent of the land mass (1, 2). Access to specialists (measured as full-time equivalent (FTE) per 100,000 population) diminishes with increasing remoteness from 152.8 per 100,000 population in metropolitan areas, to 78.8, 58.2 and 33.0 in inner regional, outer regional and remote areas respectively (1).

Maldistribution of specialists in rural areas is poorly examined but likely to occur for multiple personal, professional and economic reasons. A survey of specialist colleges found that most specialist services are not economically viable on a full-time basis in small populations and

depend on a baseline amount of infrastructure, staff support and co-practice opportunities with other specialists. This problem is exacerbated for specialists and sub-specialists who are procedurally-based or have higher infrastructure needs (21). Further, most specialist training is based in metropolitan areas, so commonly specialist registrars graduate with limited exposure to rural specialist work from their vocational training. Although the supply of medical specialists in the Australian workforce is increasing (20), the geographic distribution of specialists into rural areas remains a concern. Annual health workforce surveys reported by the Australian Institute of Health and Welfare suggest that the proportion of specialist doctors living in rural areas has not changed over time (1, 22).

The relative need for specialist care varies across populations in rural and remote areas. This is based on different living conditions, health risk factors, health status and how easily it is to access health services, including different types of specialist intervention, locally or nearby.

Remote areas are typified by younger populations and a higher proportion of Indigenous people who have a high burden of chronic disease (2, 23), and a range of mostly preventable and poorly managed health problems. For example, the prevalence of trachoma (24), otitis media (25) and rheumatic heart disease (26) remain high relative to global expectations. The poor health status of remote communities is exacerbated by poverty, poor educational and employment opportunities, lower access to fresh produce, higher prevalence of disease risk factors and poorer access to essential services.

Remote communities tend to be very isolated and some have no primary or specialist health services. Others have simple community health clinics, staffed by remote area nurses and Indigenous health workers (IHW), and possibly intermittent medical staff (4, 27). These clinics often have limited physical and clinical infrastructure. Procedural and diagnostic care in remote clinics is likely to be very limited in scope, depending on the requirements for sterile conditions or ability to use mobile equipment.

In some larger remote towns with local medical staff, role substitution by general practitioner (GP) proceduralists, particularly GP anaesthetists, GP obstetricians and GP surgeons can

substitute specialist services. However, the GP procedural workforce has diminished over time (20).

The capacity for remote residents to independently access specialist medical services in larger service centres is restricted due to the high level of geographic isolation and the lack, or cost of transport. Aeromedical retrieval services are important to enable remote people to receive higher-level care in larger hospitals with relevant staff and infrastructure when needed. However retrievals are costly (funded variably by state/territory governments, the Australian Government and the community), time-consuming to organise (28), and inefficient for the management of complex, chronic illness. Instead, comprehensive primary healthcare, supported by medical specialists, onsite, is recommended to manage such patients (29).

In rural and regional areas, the demographic and epidemiological profile of the population varies. Compared with metropolitan areas, rural and regional towns tend to have variable aged populations depending on their industry and aesthetic qualities such as recreational amenity and climate (30). At a population level there may be specific risk factors, related to local industrial exposures, such as mining or agriculture. Akin with remote areas, the socio-economic status and health risk factors of people living in rural and regional areas is worse than populations of metropolitan areas (23).

The health service infrastructure in rural and regional towns varies. Smaller towns like Orbost (population: 2,452) or Bairnsdale (population: 11,820), located 3.5-4.5 hours east of Melbourne, tend to be based around public healthcare facilities like multi-purpose clinics or small hospitals. These are mainly staffed by primary health care practitioners, including general practitioners. Where specialists are employed in small hospitals, they tend to be generalists like general physicians and general surgeons able to work across a range of internal and surgical medical areas. Rather than incurring costs for providing access to a diverse range of specialists when such services may only be needed sporadically, public hospitals tend to use a range of systems to enable patients to access more specialised medical services, and healthcare infrastructure when needed, but this frequently requires patients to travel to larger regional or metropolitan locations.

Larger regional centres like Traralgon (population 24,590), located two hours east of Melbourne and 1.75-2.5 hours west of Bairnsdale and Orbost, with a direct catchment of 75,000 people in the Latrobe Valley are more likely to provide access to a wider range of local specialist healthcare, working in both public and private arrangements. However, regional public hospitals usually lack the full range of specialist types or number of specialists needed to provide comprehensive care locally. Budget limitations often mean that regional health and hospital boards prioritise the specialist areas of care that can feasibly be maintained within local workforce capacity and cost restraints. Sustaining full-time private specialists in regional areas is often dependent on the level of community need and people's capacity and willingness to pay. The capacity to pay is often lower in rural areas where a higher proportion of residents have no private health insurance (19). Even in larger regional populations that have the potential to support full-time practice, it can be difficult to recruit permanent specialists (31). Altogether, this means that larger regional centres commonly have gaps in certain areas of specialty care, which impact the capacity to address all local community health needs.

Transferring or referring rural patients to larger hospitals or specialists in metropolitan settings is predicated on enabling safe and high quality patient care, but it is costly to the patient and the health system, drains work away from rural and regional practitioners and can result in poor continuity of care once patients return home.

People living in rural towns and regional centres usually face less of a distance barrier compared with remote populations to accessing specialists in larger nearby service centres. However, the cost (loss of income and cost of travel and accommodation) and inconvenience (based on work and family commitments) of travelling to access higher-level health services in metropolitan locations elevates the potential that they delay seeking care and limit attendance at follow-up appointments. This can result in more complex and poorly managed illnesses than experienced by metropolitan counterparts.

Compared with general medical services, which are universally and regularly needed, specialist care can potentially address rural population need if provided on an intermittent basis, in regular communication with local staff managing patient care. A survey of regional health services revealed that of 166 specialist service gaps identified, 74 could be delivered by visiting specialists

(32). There are few estimates as to the level of access to different specialty services needed at a population level that account for population distribution. Most basic measures are based on population size alone. For example, the 2007-2012 National Indigenous Eye Health Survey suggested that of 10,000 Indigenous people screened, around 131 would need surgery from an ophthalmologist to correct cataract and trichiasis, requiring a 0.3 FTE ophthalmologist (33). Another report on the ICEE/AHMRC NSW Aboriginal Eye and VisionCare Program suggested 15% of 8000 indigenous people who underwent eye screening, required intervention of an ophthalmologist (34). From the perspective of judging whether specialist services would be viable, the Australian Medical Workforce Advisory Committee used a survey of specialist colleges to estimate the population catchments for resident and outreach specialist services (21). However these population standards have not been tested.

### **1.2.3 Strategies to increase access to specialists**

A range of strategies are used in Australia to help improve access to specialist services in rural and remote areas. They include permanent recruitment to build rural workforce capacity of resident specialists, improving locally-available comprehensive care and attracting other specialists to rural areas. These approaches will not necessarily address access to services in smaller towns. It is also a poor solution for states and territories that have few larger regional centres and widely dispersed populations.

Other non-recruitment strategies include telehealth, patient assisted transport, aero-medical retrieval and outreach healthcare. The applicability of these strategies varies according to context: the nature of the health condition, patient or health worker willingness to travel, the local resources (workforce and infrastructure), availability of infrastructure and support systems (e.g. telecommunications equipment) and financial viability. It is common for rural health services to use different strategies to enable access to different forms of specialist care, and for strategies to be used in combination, depending on the context of the presenting condition, rather than being mutually exclusive.

Outreach healthcare is thought to be suitable in situations where health workers are willing to travel, the site of visiting has relevant infrastructure and resources specific to the area of care (or

mobile equipment can be transported), and such services can be sustained over time with intermittent, regular visits. Ongoing outreach is considered particularly suitable to support chronic and complex conditions where regular patient travel is impractical and costly. Further, it is applicable to promote culturally-appropriate care, where the qualities of mainstream health services can act as a barrier to health service use (4). As opposed to telehealth, outreach enables face to face contact, locally based procedures and co-working opportunities with local staff. By physically visiting, specialist also increase their knowledge of the local context, staff and resources.

As a mobile workforce strategy, outreach has the potential to adapt to changing conditions between different towns within the same region. This is relevant to manage situations where towns go through population growth or decline or periods of social or economic change including a reduction in locally available services (35).

The next chapter, Chapter 2 summarises the literature about rural outreach by specialist doctors over the last twenty years. It shows the current evidence is mainly based on case studies or local-service evaluations describing and validating specialist outreach services, particularly in the remote Australian context. This evidence is generally useful to account for the heterogeneity of rural or remote contexts, the range of specialists, various service goals and the barriers and enablers to outreach service success. It provides the basis for validating that rural outreach service models can work in a range of specific settings and suggests that specialist doctors are interested in the work. However, the evidence base described in Chapter 2 is weak for informing policy development and planning.

It is evident there is a need for more systematic research evidence of rural outreach by specialist doctors to inform policy development and planning. This includes establishing how commonly specialist doctors participate and the broad system-level influences on their participation and patterns of service delivery. Understanding this is important to inform the development of recommendations for targeted policy development and planning which synchronises with workforce activity.

## 1.3 Research aims and objectives

The aim of this research is to systematically describe rural outreach work by specialist doctors in Australia to improve the evidence base for policy development and planning.

The research objectives are:

*To describe the extent of rural outreach work and the types of specialist doctors participating and;*

*To explore the factors influencing participation and patterns of rural outreach service provision, including service distribution and sustained outreach service delivery*

Key research questions include:

1. What is the nature of the current national policy to support specialist medical outreach in rural Australia? (See Chapter 3)
2. What is the extent of rural outreach, the characteristics that influence participation in rural outreach and service provision in remote areas? (See Chapter 5)
3. What are the main patterns and models of rural outreach service delivery and what influences these patterns? (See Chapter 6)
4. How sustained is rural outreach and what factors influence service stability? (See Chapter 7)
5. Why do specialists participate in rural outreach work and do their reasons influence service patterns? (See Chapter 8)
6. Are subsidies for the cost of rural outreach work, and particularly subsidies via the Australian Government Rural Health Outreach Fund (RHOF), related to the provision of outreach services into more remote locations? (See Chapter 9)

## 1.4 Scope of research

This body of research is the first national level study of rural outreach by medical specialists. Rather than focusing on describing and justifying outreach at a local level, which is largely the

focus of the existing evidence, it acknowledges there is only limited information of the nature required to support policy development and planning. In particular, there is a lack of systematic, national level information describing outreach participation and patterns of service to understand how policy and planning can be appropriately targeted. This research uses self-reported data from a national longitudinal survey of Australian doctors, obtained between 2008 and 2014.

## 1.5 Thesis overview

This thesis is arranged into ten chapters, including the current Chapter (Chapter 1), as the introduction.

Chapter 2 summarises a broad-ranging review of the literature, mainly focused on the Australian context.

Chapter 3 is a narrative review of the background and introduction of Australia's national policy, the Rural Health Outreach Fund (RHOF) to subsidise rural outreach work by medical specialists, which was published in the *Bulletin of the World Health Organization*. The aims and structure of the policy are described.

Chapter 4 outlines the broad research design. The thesis research was nested within a large longitudinal survey of Australian doctors, the Medicine in Australia: Balancing Employment and Life (MABEL) survey.

Chapter 5 is a cross-sectional analysis of the characteristics of specialist doctors participating in rural outreach work and the factors predicting participation in remote compared with any rural outreach work, published in *Human Resources for Health*.

Chapter 6, published in the *Australian Health Review*, is a cross-sectional analysis of the spatial distribution of service and models of rural outreach by specialist doctors living in metropolitan versus rural locations.



Chapter 7, published in the *Medical Journal of Australia*, is a longitudinal study of specialists identifying the factors affecting the stability of rural outreach services by medical specialists in Australia.

Chapter 8 is an unpublished cross-sectional study about the reasons specialists participate in rural outreach work, and whether they relate to the specialist's employment context and influence the initiation, distribution and longevity of rural outreach services.

Chapter 9, is a cross-sectional study submitted to the Australian Health Review, as to whether subsidies for the cost of rural outreach work, and particularly subsidies via the Australian Government Rural Health Outreach Fund (RHOF), relate to the provision of outreach services into more remote locations.

Chapter 10 summarises the findings and synthesises the implication of the research findings. It includes a perspective for outreach healthcare policy, submitted to the Bulletin of the World Health Organization.

## **1.6 General limitations**

The thesis is limited to a discussion of rural outreach work by individual medical specialists, rather than team-based outreach, outreach work by other types of health workers or other types of outreach work. Moreover, it uses quantitative data rather than describing the qualities of the outreach services. It is restricted to studying broad-level factors influencing participation and patterns of rural outreach work, limited to the covariates already embedded in the MABEL survey.

The thesis relies on self-reported data from medical specialists, as part of Medicine in Australia: Balancing Employment and Life survey (MABEL), a longitudinal panel study of Australian doctors. Self-reporting means there is some potential for reporting error. Chapter 4 includes a specific discussion about how response and attrition bias were managed in the thesis, which is further

summarised in Chapter 10. Briefly, the characteristics of the respondents were compared with national medical workforce data. Where available and relevant, sample weights were applied to analyses and attrition bias was tested.

The size of the existing MABEL survey limited how many additional questions could be added to the wave 7 survey in 2014 in relation to this thesis aim and objectives. A range of studies in this thesis rely on cross-sectional analysis, such that only associations rather than causality could be explored.

Based on the specific nature of Australian geography, the Australian health care system, the way specialist services are structured and specialist doctors are remunerated, the results are only broadly generalizable to other countries. However, Australia provides a useful context for this research because it has a unique national policy to support rural outreach, about which evidence can usefully inform other countries.

## **1.7 Definition of key terms**

This thesis uses a number of key terms which are defined as follows.

### **1.7.1 Rural outreach**

Outreach is a broad term that is used across different industries to describe service provision from areas of high to low capacity to meet a specific goal, normally to increase access for marginalised groups. Specialist outreach services, as one form of medical outreach, requires separate analysis from general medical workforce outreach due to the unique workforce dynamics (36), remuneration patterns (17), and clinical practice requirements of specialist doctors.

Based on work evaluating the effectiveness of the Northern Territory's specialist outreach service based in Darwin, Gruen et al (37) (2003) defined specialist outreach as a broad term covering a "heterogeneous group of activities" influenced by specialist discipline and community context

and including “...planned and regular visits by specialist-trained medical practitioners from a usual practice location (hospital or specialist center) to primary care or rural hospital settings....”

Bowman et al (5) (2008) defined outreach to a regional area as “a model of health care, whereby a specialist health service is provided to a community on a visiting basis”.

Both definitions suggest that a core element of outreach work involves travelling to provide services at a location, away from the main practice, in smaller hospitals or the community, on a visiting basis. Physical travel, implied within the term visiting, is important to delineate outreach from telehealth services, which are virtual in nature (9). The term “visiting” also implies outreach involves a short-stay in the community, which is a feature evident in various reports of specialist outreach work, outlined in Table 2.1 of Chapter 2. Short visits of a few days, structured around the main practice, differentiates outreach services from locum work which commonly involves staying for a longer period (a week or more) to temporarily fill the position of another worker, not necessarily as a secondary practice.

Gruen’s definition also specifically notes that outreach is planned and regular. Although this was not explicitly stated in Bowman’s definition, his outreach service was systematically organised around weekly regional visits to the same location, by commercial air flight (5). Other descriptive studies of rural outreach by specialists in Table 2.1 of Chapter 2 commonly identify systematically visiting a particular town to address a regional population-based service goal. Once again, this is a difference from both retrieval and locum services, which involve travelling to various locations, driven by the needs of individual patients, or to back-fill an existing position.

Regularity implies services are re-delivered to the same community at specific intervals. The regularity of outreach services has not been measured systematically. However, reports of outreach in Table 2.1 of Chapter 2 suggest it varies by specialty, context and distance. Outreach services over long distances may be provided less frequently than ones that involve shorter-distance travel. In remote locations, outreach services may be delivered at intervals more than six months apart (4). Services that are newly instituted may be provided irregularly, until they are more established, known and trusted in the rural or remote town. Further, service regularity can increase or decrease over time depending on changes in local workforce capacity (35). As such,

regularity on its own is not definitive of outreach. However, re-visiting a specific town is likely to be a reasonable indicator of planned service delivery.

At a policy and service level, the term outreach is commonly used inter-changeably with the phrase fly-in, fly-out which concerns service providers travelling in and out of communities by plane. However, in this thesis, outreach is not demarcated by use of a particular mode of transport.

In summary while there is some agreement that outreach services involve travel by health workers away from their normal practice location to address regional population health service goals, it is important to differentiate outreach from other short-term workforce strategies by the fact that services involve physical travel, to a specific town, normally for a few days at a time, with some regularity which varies according to the broader context.

In this thesis, **rural outreach** is defined as specialist doctors travelling away from their normal practice to provide services in a specific rural or remote town. Such services normally involve re-visiting the same town on a planned basis, normally for a few days at a time.

## 1.7.2 Specialist doctors

Specialists and sub-specialists are medical practitioners who have been trained at a postgraduate level and accredited to provide “holistic opinion on often complex patients” (38). They are the fastest growing but most maldistributed sector of the medical workforce. Specialists can be grouped in several ways, by the body part they treat e.g. cardiologist, their technical skill e.g. surgery or by the population they treat e.g. paediatricians (38). A common breakdown used for simplified reporting by the Australian Institute of Health and Welfare (AIHW) is that of “physicians” (who specialise in internal medicine), “pathologists” (who specialise in pathology), “surgeons” (who specialise in surgery) and “other” (including a wide range of specialties related to different specialty colleges namely: psychiatrists, anaesthetists, obstetricians and gynaecologists, ophthalmologists and dermatologists) (22). In this thesis specialist doctors have completed advanced medical training to gain accreditation with a specialist college. Generalist specialists include general physicians and general surgeons.

### **1.7.3 Regional, remote and rural**

This research uses the terms regional or remote according to the Australian Statistical Geographical Classification of Remoteness Areas (both variants ASGC-RA and ASGS-RA are used depending on the period of data), which is based on population size and distance by road, to the nearest larger service centres. The Classification has five levels:

- Major cities of Australia
- Inner regional Australia
- Outer regional Australia
- Remote Australia
- Very remote Australia.

For the purpose of researching predictive factors, this thesis uses “remote” to mean the two categories of Remote or Very remote. It uses “regional” to mean the two categories of Inner and Outer regional unless specifically defined in another way for the purpose of the particular research questions in this thesis.

Major regional centre is used to define the regional centre with the largest population catchment and service base, within a geographic boundary.

More broadly, the term “rural” is used to define all locations other than Major cities, as referred to the ASGC-RA or ASGS-RA classification.

### **1.7.4 Sustained outreach services**

Sustainable health service delivery is a clear goal of rural health as expressed in the National Rural and Remote Health Innovation and Reform Strategy 2013 (39). However, sustainable health services and sustained services, lack clear definition. The term sustainable is implied to include program inputs and processes which increase the potential for services to be lasting or long-term. Sustained services are assumed to be the outcome of such inputs, however the components of sustained services, as the objective measure of interest in this thesis, lacks delineation. The

evidence concerning both sustainable and sustained services is discussed with respect to specialist healthcare and more specifically, outreach service delivery.

Of the reports describing sustainable specialist services, the main one is by the Australian Medical Workforce Advisory Committee who proposed sustainable specialist services are: “clinically appropriate and adaptable to the needs and expectations of the local community, is provided on a regular basis and is well integrated with local primary care services” (21). Population catchments are thought to influence the sustainability of specialist services, mainly by affecting financial return. However, given outreach services are provided on an intermittent basis, they are not as affected by population size, and considered potentially sustainable, even in small communities (21).

A qualitative survey of stakeholders involved in the Northern Territory’s remote specialist outreach services supported the definition of sustainable specialist services by the Australian Medical Workforce Advisory Committee applies to outreach services. Their work additionally suggested that sustainable outreach services also require an adequate regional specialist base (40). This suggests that one difference between permanent and outreach specialist service sustainability could be the workforce capacity in a hub location. This reflects the fact outreach work is a secondary practice, which needs to be balanced against the main workload. Both definitions described above are focused on sustainability, as program inputs and processes, rather than defining the components of sustained outreach services, as an outcome.

The main source of information about sustained outreach services, the outcome measure of interest, is from a study by Gadiel et al in 2004, including eight case studies of specialist outreach services to rural areas that had been sustained for at least five years to establish influential factors (35). Although sustained outreach was initially implied as years of service and benchmarked at a minimum five years, a broader theory of sustained outreach was proposed, suggesting it is likely to consist of both the continuity and strength of the outreach service. It was suggested that continuity was the cycle of intermittent visiting, continued over time. This could be extrapolated to consist of both the regularity of service provision as well as the time period over which the specialist continues to re-visit. The regularity of outreach services, as discussed in

1.7.1, is likely to legitimately vary according to the service context and both service regularity and rate of ongoing outreach service provision have never been systematically studied.

Gadiel et al did not define the strength of the service, but it is potentially influenced by the service qualities noted in the definition of sustainable specialist services above, including how well the outreach service addresses local need and supports and develops the capacity of local health services. This is related to capacity building theory where the effect of the investment/intervention lasts beyond the period of direct investment, by developing human and institutional resources and problem-solving capability (41). Service strength is hard to measure systematically, however, it is potentially important to consider when interpreting quantitative measures like service continuity. Notably, it could increase as a result of service continuity to the same town, or equally has the potential to increase demand for regular, ongoing services.

In summary, there is limited information to clearly define sustainable and sustained specialist services and sustained outreach services. Building on the theory proposed by Gadiel et al in 2004 (35), this thesis defines sustained outreach services, as those that continue visiting on an ongoing basis, with the rate of visiting adjusted to local need. Sustained outreach services also develop local health service capacity to increase the potential for independent practice beyond the period of the specialist's visit. This is more likely if rural outreach services are provided to the same town over time. Based on the evidence to date, the exact factors influencing sustained outreach require more systematic investigation.

In this thesis, **sustained outreach services** are defined as those re-visiting a specific rural town on an ongoing basis, with the rate of visiting adjusted to meet local need. They also develop the capacity for local health services to manage independently between outreach visits.

## 1.8 Conclusion

In this Chapter, the foundation for the thesis research was outlined. The overall research aim, scope, general limitations and thesis structure and definitions have been described. Overall, rural outreach services have the potential to increase access to specialist services in rural Australia. However, most of the evidence about rural outreach by specialists is in the form of local-level

studies describing and validating the practice. There is a lack of systematic research exploring the extent of rural outreach work and patterns of outreach service provision. Such information is needed to inform the policy development and planning of outreach as a strategy within the context of Australian healthcare. It is also likely to inform other nations considering using outreach to improve access to services in areas of need. In Chapter 2, the existing literature about rural outreach work by specialist doctors is described.



# Chapter 2: Review of the literature

## 2.1 Introduction

In Chapter 2, a broad-ranging review of the literature is reported to summarise an over-arching perspective of what is known about rural outreach work by specialist doctors, aside from separate literature reviews conducted to inform the background to individual research questions presented in each Chapter. This includes Chapter 3, which specifically reviewed policy evidence.

The search methods were deliberately broad and included the grey and published literature. This was because literature in rural outreach and informing policy on this topic is broadly distributed. Grey literature was searched based on terms “outreach” “visiting” “mobile”, “hub and spoke” and “Fly-in/FIFO” through general Google searches and specifically on key websites of government departments, Health Workforce Australia, rural health workforce agencies, the World Health Organization and specialist medical colleges. Outreach programs, evaluations and activities that were identified via the published literature, through stakeholder discussions and at conferences were followed-up to source documents. This included a number of internal reports and policy documents from specific programs such as the National Indigenous Eye Health Outreach Program and the Maari Maa service evaluations. Evidence was also examined from major reports like the Mason review, the Evaluation of the Medical Specialist Outreach Assistance Program, the submissions and final Report of the Parliamentary Inquiry into fly-in, fly-out and drive-in, drive-out workforce practices in regional Australia. Face to face meetings were conducted with stakeholders at various levels in the health system to gain additional insight into current programs and to access relevant documents. These included meetings with the Royal Flying Doctors Service, health service managers, state and Commonwealth policy-makers, specialist experts in the field, rural health workforce agencies and rural specialists. Evidence of rural and remote health system structures across varied geographic regions was informed by personal travel, focusing on north-west and south-east Victoria, western New South Wales and remote and regional South Australia during the course of the thesis.

The peer review published literature was searched via Medline using search terms “outreach”, “FIFO”, “hub and spoke”, “consultant specialist”, “visiting specialist” “mobile service” “mobile surgical”. These terms for “outreach” were also entered into electronic searches for specific journals, mainly concerned with specialists or rural health, and where other outreach publications had eventuated. Journal websites included in this strategy were: Rural and Remote Health, the Medical Journal of Australia, The Australian Journal of Rural Health, Surgery, The Journal Paediatric and Child Health, Australian Health Review and The Australian and New Zealand Journal of Surgery. Reference lists of articles or policies identified were reviewed and chased up for relevant information.

The majority of published research originates in Australia, although there are restricted examples from other countries including Africa (42), South Africa (43, 44), China (45), India (46), Canada (47), the United States of America (48-50) and New Zealand (51). This suggests that rural outreach is used in a range of developing and developed countries to improve access to specialist services in rural locations. However, on the basis of the thesis aiming to describe participation and patterns of work in the context of the Australian health system, geography and the specialist medical workforce, this Chapter mainly draws on Australian studies.

## **2.2 Prevalence of rural outreach**

The prevalence of rural outreach work in Australia was first measured at a national level in 2012, via the Australian Health Professional Registration Authority annual workforce survey. The results showed that 9,289 (12.3%) medical practitioners (of 75,258 general practitioners and medical specialists working clinically), worked some clinical hours in a regional or remote location other than that of their main job (1). Overall 3,792 (41%) provided these services to inner regional locations. The prevalence of outreach by specialist doctors was not specifically reported nor linked to predictors since the purpose of the annual workforce survey is to monitor and report trends.

A number of surveys were undertaken through collaboration by the Australian Medical Workforce Advisory Committee in liaison with relevant specialist Colleges in 1997 and 1998, which reported the rate of outreach for three specialties: general/vascular surgery, otolaryngology and dermatology (52-54). Specialists were asked if they provided outreach services to rural areas. Of 39% general/vascular surgeons (n=475) who responded, rural outreach work was reported by 15% (53/365) of metropolitan-based general surgeons, and 24% of 110 rural general surgeons. Of 55% (n=136) of dermatologists who responded, 41% of metropolitan-based dermatologists provided rural outreach services. Of 39% (n=99) of otolaryngologists who responded, 29% (n=22) of metropolitan-based otolaryngologists reported rural outreach work. These surveys suggest that the rate of rural outreach work varies by different specialty types and according to where specialists live, however, the data are outdated, the response rates were low with no clarity about response bias, outreach was not clearly defined and the rate of outreach participation by rural-based specialists was not reported in two of the surveys.

Despite their weaknesses, these remain the only published data about the prevalence of rural outreach at a state or national level in Australia or elsewhere.

At a local level, a range of case studies of remote, rural and regional towns suggest that a large number of different specialty doctors provide outreach services (55) but the prevalence of outreach service provision in remote versus regional locations has not been systematically studied.

## **2.3 Is rural outreach by specialists effective?**

Most research about outreach, whether from Australia or abroad, focuses on whether rural outreach by specialists improves health system or health outcomes, which is important for building policy rationale, particularly where there are nuances in practice types, health conditions and health service contexts that bear separate analysis.

The base of outreach research in Australia generally commenced with a systematic review by Gruen et al in 2003 (37). The review encompassed metropolitan and rural outreach services and

summarised a finding that outreach as a healthcare model works in practice if it is multi-faceted, including integrating with, and supporting local primary health services. However, it specifically noted few high quality studies and very few studies of outreach in disadvantaged and geographically isolated populations. As such, the findings of the systematic review were somewhat inconclusive about whether specialist outreach is effective in rural and remote settings. Further most of the reports reviewed related to psychiatry and included post-hoc service evaluations which were not planned prior to service implementation. Importantly, the systematic review stimulated further research about rural outreach by specialists.

Most reports about rural outreach in Australia have been published over the last ten to fifteen years, in the form of case studies and local service evaluations which describe and validate rural outreach by different specialties in different contexts. The Australian research is summarised in Table 2.1 at the end of this Chapter. Increasingly the studies include pre and post implementation measures, and comparisons with service outcomes in metropolitan locations.

These results suggest that integrated and multi-faceted outreach services in rural areas can improve early intervention, chronic disease management and enable simple surgical procedures, reduce hospitalisations and achieve similar health outcomes to metropolitan-based clinics (4-7). However, the published reports are limited to informing whether outreach works by specialty and specific context. Further, there may be a large number of services that have not been reported and a degree of publication bias, not reporting negative service outcomes, such as short-term, poorly integrated services that did not influence health service or health outcomes.

## **2.4 Types of services and their integration**

The published reports of Australian outreach broadly suggest that rural outreach work is relevant to a range of specialist types. These include internal medicine specialists (mainly paediatrics, endocrinology, cardiology, respiratory and renal) to support chronic diseases and child health or; surgical specialists to support basic procedures within the limits of the local facilities and staff support.

When taken together, these reports describe adaptable outreach services specifically focused on addressing a service goal/s (Table 2.1). Most examples are of specialists visiting within multi-disciplinary teams which complement the capacity of local services. Indigenous health workers (IHW) were used in remote locations in some cases to coordinate community care and support culturally appropriate service provision (4, 26). Alternatively where the rural health site has existing GPs and /or specialist nurses and other specialist services, specialists visited the outreach site on their own and worked in liaison with local services (for referrals and case management) (56, 57).

In the reports available, most rural outreach services by specialists targeted clinical service delivery, but also focused on introducing clinical care protocols, systems to streamline and provide best practice healthcare (26, 58) and specific plans to integrate with, engage and support local staff (59, 26). In some cases the amount of up-skilling was restricted by a lack of time (GP and specialist) and lack of specific funding (35) and challenging to sustain in situations of high turnover of primary health staff (27). In most cases, specialists provided support between visits via teleconference, telephone and email. However, in one example, the specialist limited the amount of support between visits due to the demands this placed on the main practice (56). GPs or local teams often maintained responsibility for ongoing patient management, whereby specific handovers or patient notes were often provided by the visiting specialist/visiting team (60).

## **2.5 Outreach service regularity and longevity**

Appraising the reports of rural outreach in Australia, in Table 2.1, the regularity of services varied from visiting once per week to twice per year. In some examples, the regularity of services increased when more substantial funding became available (15) or due to demand (61).

The length of time rural outreach services were provided varied among the examples in Table 2.1. The majority of published case studies provide examples of services provided for more than three years but the case studies are likely to be weighted towards positive outcomes.

## 2.6 Outreach service distribution

As they are based on local-level services, existing reports of Australian outreach provide poor quality information to understand service distribution. However, it is useful to describe in what locations, the reports are focused.

Most of the reports in Table 2.1 show specialists providing rural outreach services in the Northern Territory, Queensland and New South Wales. There is limited reporting about outreach services in Tasmania, Victoria, South Australia and Western Australia.

Around half of the evidence is based on outreach services arising from major cities, mainly Brisbane, Sydney and Melbourne. The rest concerns specialists providing outreach services from regional centres, mainly Darwin and Cairns, with additional examples of services from Alice Springs, Port Augusta, Newcastle, Warrnambool, Sale and Wangaratta.

Most of the reports describe outreach services provided to remote locations, especially those based in Queensland, the Northern Territory, South Australia and Western Australia. Remote locations of service provision included the Torres Strait Islands and remote far north Queensland, Katherine, Gove and central regions of the Northern Territory, Coober Pedy and nearby remote Aboriginal communities in South Australia and the Wheat belt and Goldfields region of Western Australia. In New South Wales, examples of remote locations visited include Broken Hill, Wilcannia, Menindee and Mungindi.

There are also several examples of specialist doctors providing outreach services to rural or regional towns mainly in Victoria, New South Wales and South Australia, including to Horsham, Hamilton, Terang, Cobden, Portland, Bairnsdale, Beechworth, Benalla, Bright and Mansfield, Myrtleford, Yarrawonga, Griffith, Wagga Wagga, Moree, Taree, Port Macquarie and the Fleurieu region. Several services based in major hospitals in Brisbane also visited multiple regional centres including Cairns, Townsville, Mackay, Rockhampton, Hervey Bay, Toowoomba and Gold Coast or multiple rural and remote towns, including Indigenous communities (7, 26). In one example a team of physicians spanning multiple Queensland hospitals and two private practices provided respiratory outreach services to eleven sites across six health areas of Queensland (59).

The distance travelled to provide outreach services ranged from 30km to up to 1000km. The transport used mainly consisted of car and commercial or chartered plane, varying based on factors such as distance and availability. Use of commercial flights was affected in one case by changing schedules (35). Light planes were considered necessary to reach remote locations such as Weipa (35).

## **2.7 Outreach service drivers**

There is only limited evidence about the potentially wide range of drivers of rural outreach services in Australia. Available information from descriptive research in Table 2.1 suggests outreach services are likely to be driven in three main ways: 1) initiated by specialists working in different practice arrangements (public hospitals, university departments or private practice); 2) instigated by state or territory health departments (59, 62) or health service managers in major hospitals to address policy or regional health service priorities, like implementing a regional chronic disease service plan (15) or; 3) initiated by rural/remote communities or community health services to address a locally-identified need (60, 61).

Most published examples describe specialists who exercise a choice to participate in rural outreach work. There were only a few reports that mentioned organisational approval and employment conditions played a part in enabling participation of hospital or university-employed specialists. In three reports, hospital specialists were allowed to participate on the basis that outreach would be cost-neutral to the hospital (35), revenue-raising by assigning activity back to the hospital, increasing the use of operating theatres in smaller hospitals (35), or reducing hospitalisations for minor conditions treatable in the community (4). In a small-scale qualitative study of surgical outreach in the Northern Territory, specialists and hospital administrators alike commented on the challenges of balancing outreach work with their commitment to hospital-based roles (40). Several examples included specialists in senior leadership positions advocating services within the main organisation they work in (26, 35).

Rural outreach services can equally occur under a mandatory employment arrangement (9). There is no data to estimate how prevalent this is in the Australian context. Only one case study described a situation where outreach work was expected by specialists employed at the public hospital. However, as opposed to a mandatory arrangement, the specialists were aware of the organisation's expectations prior to recruitment, the organisation structured the specialist's public sector employment to accommodate outreach work (employed as staff specialists 0.5-0.7 FTE) and specialists had the right to nominate service schedules and manage the service's financial viability (35).

In only two examples, outreach services were initiated by rural health clinics to address a service need (chronic disease management support and infectious disease management) (60, 61). In both of these cases, the rural health service initiated links with specialists working in major public hospitals. In one example the service was purposefully structured this way to build capacity for ongoing service delivery, rather than linking with individual specialists (60).

## **2.8 Reasons for participating**

The reasons specialists participate in rural outreach have not been studied as the main subject of any research. Summarising the Australian case studies outlined in Table 2.1 suggests the specialist's interests in outreach work vary, ranging from improving outcomes in disadvantaged population groups (6, 26, 35, 40, 58), building financial return or growing the main practice (8, 35), supporting rural health workers with their complex caseload (25) and maintaining a personal connection to a region (35). Rural outreach work has also been described as professionally interesting and rewarding (8, 35, 56).

One survey of American specialists visiting 11 rural hospitals in Massachusetts suggested the main reasons for participating were to grow the practice and provide healthcare to under-served populations (48). However such reasons accounted for less than 30% of respondents, the study was limited to a single state and are not generalisable to the Australian context based on differences in health system and clinical remuneration structures.



## 2.9 Funding of rural outreach

Economic aspects of rural outreach work are multilevel, including remuneration of specialists and other health workers for clinical services, the costs of clinical infrastructure (rooms and equipment) and the costs of travel and accommodation for the outreach worker (travel, travel-time or back-filling and accommodation). The financial impact of outreach work has the potential to influence either health workers, patients and/or the health system depending on how outreach services are structured.

There is only scant information about the types of financial arrangements underpinning rural outreach work in the Australian context (Table 2.1). Apart from poor information about infrastructure and travel costs, the influence on specialists is hard to interpret because the specialist's practice sector and remuneration for outreach work is often not mentioned (Table 2.1). The information available suggests outreach services are potentially supported by a complex range of funding arrangements, including funding by the state or territory government (infrastructure and salaried payment for travel time), the Australian Government (Medicare billing, policy funding via the Medical Specialist Outreach Assistance Program (MSOAP/MSOAP Indigenous Chronic Diseases) or RHOF and grants), private industry and not-for-profit agencies. Service insecurity was noted to be an important issue for specialists lacking recurrent funding (35).

Several specialists providing outreach on a private basis, with no support for travel costs noted that the financial viability of the service was a key issue (35), as compared with specialists whose travel time and costs are covered by salaried arrangements (35). Some of the ways financial viability was managed included reducing costs by securing concessions on room hire, equipment and accommodation (35), increasing patient throughput by visiting larger regional catchments, maximising the clinical caseload and investing in equipment at the outreach site to improve scope of practice (35) and charging out of pocket fees to patients (35).

Turner et al (2011) studied the influence of clinical remuneration on clinical throughput (surgery and clinical consultation rates taken from clinical notes) within nine rural and remote ophthalmology outreach services (63). Based on cross-sectional analysis, fee-for-service or

salaried/capped payment were the most common forms of clinical remuneration. Some services combined a fee-for-service remuneration with a guaranteed baseline payment to cover the specialist's financial return in situations of reduced clinical throughput. By comparing fee-for-service and salaried arrangements, Turner et al showed that fee-for-service for surgical throughput increased clinical throughput 3.2 times and surgical throughput 2.3 times. It had a similar effect on technical efficiency if paid for clinical consultation. However, qualitative interviews with the specialist providers highlighted that many were concerned about covering base costs, particularly in areas of lower clinical throughput. This suggests that financial return from a fee-for-service system is not necessarily well-balanced against the costs of outreach work.

Overall, more information is needed to identify the influence of economic factors on rural outreach work, including patterns of service.

## **2.10 Outreach planning**

There is limited information about the current state of outreach planning in Australia. Existing activity can be summarised according to a range of national, state and health service-level initiatives.

### **2.10.1 National level**

The main form of national rural outreach planning occurs as part of Australia's formal outreach policy, instituted by the Australian Government in 2000. Chapter 3 outlines the characteristics of the policy, which has been refined over time and is currently called the Australian Government Rural Health Outreach Fund (RHOF). The policy aims to provide subsidies for selected specialists who provide rural outreach services in areas of need. An externally contracted evaluation in 2011, highlighted some of the planning challenges related to the policy include judging the areas of need in a systematic way. Other issues include managing the integration and coordination of policy-funded services with respect to local resident and other outreach services (10). As described in Chapter 3, areas of service need are decided by a formal needs assessment process conducted by state and territory-based fund holders. The needs assessment is centred on

national priority areas of care, currently spanning chronic diseases, maternal and child health, mental health and eye and ear health. Within the needs assessment, fund holders use existing epidemiological and demographic data and consultations with local services to guide decisions about regional population health need and service gaps. Specialists receiving policy subsidies are expected to liaise and work with local services, although this is likely to be difficult to monitor.

Other than the national specialist outreach policy, the Royal Flying Doctors' Service (RFDS) is a national level, not-for-profit organisation, which apart from inter-hospital transfers and emergency aero-medical retrievals, provides mobile primary care clinics, mainly in isolated locations (29). The mobile clinics are planned at a regional level, in liaison with local community and mainstream health services. Whilst the clinics mainly address primary health care, specialist services are included as required, based on clinical needs. The RFDS receives funding from the Australian Government, state/territory governments as well as the community.

The need for improved planning of outreach services at a national level was recommended in a recent Parliamentary Inquiry of fly-in, fly-out work practices (64). The Inquiry was stimulated by the need to assess the impact on rural communities of the growth of such practices in the mining sector. Whilst mainly focused on the mining sector, a sub-theme included outreach healthcare services. The Inquiry validated outreach health service delivery to overcome the tyranny of distance facing many rural and remote Australians. However it suggested that outreach health services should be acknowledged and included in regional service planning, including provisions for adequate infrastructure and funding (Recommendations 19 and 20). The Inquiry recommended a potential locus for outreach planning could be Regional Development Australia (RDA) Committees in consultation with respective Medicare Locals. However, planning rural outreach by specialist doctors is likely to be more complex depending on the drivers at play.

Limited research suggests there are a range of challenges to outreach service coordination. A study of ophthalmologic and optometry outreach coordination was conducted by Turner et al using interviews and clinical notes from nine remote outreach services covering different regions Australia-wide (65). It compared a qualitative rating of service coordination with service efficiency outcomes. Limited to a small sample size of nine, it showed a trend for higher coordination to improve clinical efficiency, although this was not significantly associated.

Stakeholders interviewed in the study noted it was challenging coordinating outreach services funded and governed from different sources, e.g. state or territory governments, the Australian Government and not-for-profit organisations.

### **2.10.2 State or territory level**

There are only two documented examples of state or territory government planning of rural outreach by specialists. The Queensland government introduced hub-and-spoke service arrangements, as part of its rural health service delivery platform in 2010 (66). However the feasibility and operationalisation of the hub-and-spoke strategies for specialist services remains to be reported. Such models involve health workers providing services in a key regional centre as well as several nearby smaller towns on an interim basis. This model has been accused of being limited by the under-supply of regionally-based specialists and inflexible to changing needs (35).

The Northern Territory, which contains predominantly remote communities, has had a formally planned program of surgical outreach services from Darwin Base Hospital since 1997 (4). A range of surgical specialists were interested in providing surgical and gynaecological outreach services to remote communities. They individually consulted the community, local councils, respective specialist colleges, hospital managers and Northern Territory Health. Through discussions between the Territory government and the Australian Government, points of alignment were noted between the services offered by the individuals. A planned Specialist Outreach Service eventuated, consolidating surgical, ophthalmological, ear nose throat and gynaecological services to three locations under one umbrella. It attracted seed funding from the Australian Government via the Commonwealth Office of Aboriginal and Torres Strait Islander Health. The Service continues with recurrent funding from the Territory government. It is now underpinned by a specific requirement that other outreach services in the Territory communicate with planned services (67). Importantly, it did not initially incorporate physician outreach, which was already occurring in the Territory, led by individual specialists (35).

### **2.10.3 Health service level**

There is some indication of various outreach services being planned from major tertiary hospitals. Several have a strong state or territory-wide focus and receive state government funding. However, rather than being planned by the state or territory government, the locus of planning tends to be particular clinical leaders, coupled with interested specialists, working at metropolitan and rural tertiary public hospitals. Examples include a state-wide cardiology service to 18 sites across rural and remote Queensland from the Prince of Wales public hospital Brisbane (26); paediatric outreach from Cairns Base hospital to 17 public health community clinics in far north Queensland (25, 35); respiratory outreach from the Royal Children's Hospital Brisbane to seven regional sites across Queensland (7); paediatric outreach from Port Augusta to 17 towns covering around 80% of the land mass of South Australia (35); and surgical outreach from Sir Charles Gardiner Hospital, Perth to five small rural and remote towns in the Wheat belt, Goldfields and Pilbara regions of Western Australia (35, 68).

Published case studies also suggest that specialists providing outreach services independently, whether based in the public or private sector, commonly plan and manage their own outreach services. Examples exist of specialists self-regulating their clinical service offering to fit the context (up and down scale as needed) (35), shaping services around cost efficiency principles (61) and undertaking quality improvement (6).

## **2.11 Conclusion**

Chapter 2 outlines a review of the literature. It notes there have been a number of descriptive local-level studies describing rural outreach by different specialist doctors in different contexts over the last ten to fifteen years. These findings are mainly based in Australia and predominantly relate to remote settings. Available information about the prevalence of outreach suggests such work could be relatively common and vary by specialty and context. There is some indication that a range of specialists participate in rural outreach work and outreach services are initiated for different reasons, structured and funded in different ways. Most of the available literature provides positive accounts of longer-term, successful services. However available studies are

generally limited to a single service type (visiting one or more locations). There are no state/territory or national level studies in Australia or overseas which systematically explore the extent of rural outreach work, types of specialists participating, patterns of service in rural and more remote locations, service stability and funding.

There is also limited reporting of outreach service planning across Australia. A range of policy and planning initiatives occur in isolation at a national, state/territory and health service or practitioner level. These tend to focus on specific regions or areas of care. Some of the common challenges noted in the literature include managing services funded in different ways, judging service need, coordinating service delivery and promoting outreach and local service integration. Although a recent Parliamentary Inquiry called for outreach services to be acknowledged as part of the rural service platform and planned accordingly, there is a lack of systematic evidence to inform this. As a starting point, more detailed information is needed about the national rural outreach policy for specialist doctors. Chapter 3 describes the evolution of a formal outreach policy by the Australian Government, including a description of its structure and aims, so as to inform the thesis inquiry.

Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
Turner et al (2011) (63)  Cross-sectional case study	Multiple	Ophthalmology		Multiple locations including the Pilbara and East Kimberley, South Western Australia, Central Australia, Top End and both northern and central Queensland.	Multiple models	Multiple models	Commonly costs shared by state, the Australian Government and other (non-government, corporate sponsorships, private funding and patient fees). Specialists paid by fee-for-service or sessional rates. Option of a baseline salary or top up for remote work. One location received state-based rebates set at 50% more than Medicare.	Fee-for-service significantly increased clinical activity (2.5 times) (based on clinical records in several outreach sites) compared with salaried payment. It also reduced waiting times and resulted in lower per cost attendance. However the funding model has potential to influence distribution. Covering base costs is a significant burden particularly for individual practitioners.
Tibby et al (2010) (26)  Case study of regionalised model	Queensland	Cardiology	Director of cardiology initiated to provide direct access to specialty services to overcome Indigenous disadvantage	From Prince of Wales public hospital in Brisbane to 18 sites across rural and remote Queensland	Clinical service delivered since 2007, visiting each site every two to three months	Visiting cardiologists, sonographer and Indigenous coordinator worked with local Indigenous health workers (IHW) using a community engagement framework targeting capacity building, self-management and direct referral.	Medical Specialist Outreach Assistance Program (MSOAP) and Queensland State Cardiac Network funds	Clinical attendance - 98%, 80-85% clients, Indigenous, 64% clients had rheumatic heart disease, 23% ischaemic heart disease and 13% congenital heart disease.
McDermott et al (2003) (69)	Queensland	Cardiology	By specialists following a 1996 community diabetes summit in the Torres	From Cairns Diabetes Centre (Queensland Health) in Cairns to several	Not mentioned	Support for local IHW to manage a register, recall, reminder system for chronic disease	A project grant from National Health and Medical	Significantly better controlled diabetes, hypertension and reduced admissions to hospital for diabetes-related

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Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
RCT – both sites received specialists outreach			Strait called for more health services	remote Indigenous communities in the Torres Strait Islands		management. Specialist cardiologist visited control and intervention sites.	Research Council (NHMRC) allowed a cluster randomised controlled trial.	conditions between control and intervention sites.
<b>Thomas et al (2008) (7)</b>  Case study with comparison group	Queensland	Respiratory	Not stated	From Royal Children's Hospital Brisbane to seven regional sites including Cairns, Townsville, Mackay, Rockhampton, Hervey Bay, Toowoomba and Gold Coast. Distance: 1,700km.	Twice a year since 2000	Visiting team of respiratory physician, physiotherapist, dietician and nurse. Local health workers invited to attend the clinics. Children managed by their general practitioner (GP) and paediatrician. Post clinic multi-disciplinary meetings.	Publicly employed specialists.	Pulmonary function tests (FEV1), sputum tests, and nutritional status and hospital admissions comparable with metropolitan clinic.
<b>Hoy et al (2005) (58)</b>  Case study with before and after data	Queensland	Renal	Initiated by doctors at the Central Queensland Clinical School who wanted to improve awareness and management of renal disease in remote areas	From Brisbane to three remote Aboriginal communities in the Northern Territory and two community controlled health services in Western Australia	Not stated	Systematised care guidelines: regular screening, follow-up, treatment, catch-up, team meetings. Specialist and nurse expected to provide back up for complex cases across the region.	Office of Aboriginal and Torres Strait Islander Health, Kidney Health Australia and Rio Tinto, Janssen-Cilag of Australia	Improved local access to services – treatment for diabetes initiated for 63% of patients, blood pressure control. Lack of local workforce capacity/absenteeism.
<b>Rothstein et al (2007) (25) and Agostino et al (2012) (70)</b>  Case study	Queensland	General physician + Paediatrics – (via a general practitioner (GP))	Staff at Cairns Base Hospital initiated due to lack of specialist support for isolated primary care workers managing children. Built paediatric service on existing physician outreach for adult chronic diseases.	From Cairns Base Hospital to 17 public community health clinics in Far North Queensland. Area: 269,224km <sup>2</sup> .	Approximately weekly travel to visit various communities, by light plane since 1994.	Visiting GP registrar, GP with interest in paediatrics and an occupational therapist working within community health clinics and receiving referrals from these. Take all equipment. Record keeping centralised. Poor staff retention at outreach site so Royal Flying Doctor's Service (RFDS) provide primary	Not stated	Saw 56% children from Aboriginal communities. High rate of preventable conditions: Otitis media rate of 14.7; global recommendation were 4% or lower; 2% hearing loss; 8% failure to thrive and 1.5% foetal alcohol syndrome; 1.2% congenital heart disease.



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Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
						health care support which has been sustained.		
<b>Gadiel et al (2004)</b> (35)  Case study	Queensland	Surgery – General, Vascular, Bone, Breast, Endocrine and Gastro – working as generalists in outreach setting. Cairns Base Hospital runs other outreach: Physician, Orthopaedic Surgery, mental health, Obstetrics and Gynaecology, Paediatrics and Anaesthetics	In 1994 the health region ear-marked a discretionary budget for surgical outreach, which has been maintained and allocated growth.	From Cairns Base Hospital to 13 sites (smaller rural hospitals and multi-purpose centres) across various local health districts. Six relate to surgery.	Weekly visiting by four surgeons, by car (4 sites) and plane (2 sites) since 1994. Return day trip, 6 hours split between surgery and consulting. Arrangements differ for each specialty.	Works with GPs for anaesthetic support. Keeps operating facilities at smaller hospitals open. Medical students and three accredited advanced trainees in general surgery also attend. Clinical correspondence in writing with GPs. Added high risk foot clinic to the model in 1995.	Surgery has a discretionary budget (commenced at \$194,000) but other specialties mainly bulk-billed and assigned to the CBH to supplement hospital funds, (few supported by MSOAP/Rural Health Outreach Fund (RHOF)). Equipment supplied by CBH or hospitals supply their own if outside the Cairns District.	Surgery done in accordance with available infrastructure. Only 1% referred back to Cairns Base Hospital. Effectiveness hinges on local coordination (recall and reminders to patients etc.) Sterilisation standards have cost implications. Patients and local GPs report being happy. Surgeons see more complex morbidity than in main practice. De-centralisation of care increases access but hospital budget was exhausted. Continued because outreach satisfied the doctors and kept the small rural hospitals open.
<b>Medlin et al (2014)</b> (59)  Case study of regionalised model	Queensland	Respiratory	Initiated through state government funding to address Closing the Gap targets	<u>Paediatric team</u> from Royal Children's Hospital Brisbane to 10 locations in 5 health and hospital districts. <u>Adult team</u> from multiple hospitals including Gold Coast, Cairns, Mount Isa, Rockhampton, Prince Charles and two private	1-4 days per clinic, visiting approximately quarterly since 2011	Framework for site identification. Visiting physicians, scientists, nurses and Indigenous project officers with participation by registrars, students and other staff including infectious diseases physician. Work with local IHW. Target engagement, capacity building and service delivery.	In 2011, the Queensland State Government funded the program for two years to address closing the Gap priorities. The Torres Strait Islands and north west are supported by Medical	In first 18 months, 45 paediatric clinics (601 patients) and 39 adult clinics (333 patients). Average cost per clinic was about \$18232 for adult clinics and \$25511 for paediatric clinics. Positively received by community. Minimal staff turnover.

Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
				practices to 11 locations in six health and hospital districts. Population base: 42653 people			Specialist Outreach Assistance Program – Indigenous Chronic Diseases (MSOAP-ICD).	
<b>Nguyen et al (2015) (62)</b>  Case study with cost-effectiveness of adding telehealth screening to outreach	Queensland	Otolaryngology (ENT)	Deadly Ears Program – initiated by the Queensland Government via Closing the Gap	From Brisbane tertiary hospital to the Greater South Burnett area (Cherbourg Community Health Service), Distance: 255km	Bi-annually, for four days, since 2008 + ENT support by telehealth from Brisbane	Routine screening by dedicated local IHW plus ad hoc screening in schools. Children failing assessment referred to outreach ENT. Visiting ENT team brings equipment and staff, and any surgery occurs either onsite, in nearest hospital or in Brisbane as required. Added in a mobile telemedicine screening van to visit schools and childcare, (run by a hearing specialist IHW). Online screening checked by ENT team in Brisbane. Surgery referred to Deadly Ears Outreach Program.	Stated start-up funding provided by the Children’s Hospital Foundation Queensland, by corporate and community sponsors and the Darling Downs Hospital and Health Service (Queensland Department of Health).	An estimated 35% screened when just outreach via Deadly Ears which increased to about 70-90% when added mobile van.
<b>Carson (2009) (71)</b>  Narrative	Northern Territory	Surgery	Not mentioned	From Royal Darwin Hospital in the Northern Territory to remote communities in the Northern Territory	Stated “regular”	Work with community-based GPs and regionally based district medical officers along with Indigenous health workers.	Not mentioned	Description of model, centred on primary care
<b>Gruen et al (2006) (4)</b>  Longitudinal study with comparison of communities of	Northern Territory	Surgery, Ophthalmology, Otolaryngology (ENT), Obstetrics and gynaecology	Specialists working in Royal Darwin hospital advocated outreach and gained support of the	From Royal Darwin Hospital in the Northern Territory to three remote communities in the	Up to four times a year	Work closely with nurses, Indigenous health workers and resident GPs in two communities	The Australian Government (Office of Aboriginal and Torres Strait	Timely and opportunistic access and completion of referrals by urgency for those seen at outreach clinic. No indication of over-referral by

Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
different levels of intervention  <b>Gadiel et al (2004) (35)</b>			hospital, specialist colleges, the Territory and Australian Governments.	Northern Territory Distance: 260-500km.			Islander Health) supported seed funding for initial purchase of equipment, transport and staff. The Northern Territory Government assumed full funding.	primary healthcare practitioners. Hospitalisation rate lower if access outreach service.
<b>O'Sullivan et al (2004) (15)</b>  Narrative	Northern Territory	Renal / community physician	Complex care demands in public hospital stimulated chronic disease outreach to improve early intervention	From Darwin to six remote communities in central Australia. MSOAP funding eventually, which enabled full-time physician outreach from Alice Springs Base Hospital to over 25 remote communities.	At least weekly since 2001	Model based around local community-based primary healthcare teams, upskilling and support to ensure appropriate management of kidney disease. Formal written plan for each patient, with support by specialist between visits.	Previously hospital funded but gained MSOAP funding which improved the regularity of an organised and sustained outreach program from the public hospital.	A sustainable model centred on primary care.
<b>Gadiel et al (2004) (35)</b>  Case study	Northern Territory	Endocrinology	Physician recognised a need, had no specific funding, but started outreach. The Royal Darwin Hospital conceded it would work because it was cost neutral. Eventually it became part of the expectation of hospital employment. Specialists aware of	From Royal Darwin Hospital in the Northern Territory to six remote communities in the Darwin and Katherine Region. Distance: 300 to 650 km.	Quarterly travel to various communities, according to a pre-organised schedule, by plane or drive depending on the community. Since early 1990's.	Outreach is centred on implementing the Chronic Disease Strategy for renal disease, hypertension, chronic airways disease and diabetes. High primary health staff turnover including GPs, made it difficult to up-skill.	No specific budget allocation. Hospital employs 0.5-0.7 staff specialists, and the specialist is rebated via Medicare. Outreach travel paid by patient assisted travel scheme budget	The outreach model reduced pressure on the Northern Territory Health system to support full-time positions in smaller towns like Katherine. Noted the need for specialists participating to have wide scope of practice but avoid duplication e.g. renal physician sees diabetic patient, then endocrinologist doesn't need to. Regional coordinators have potential to increase efficiency of clinics.

Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
			this when recruited as staff specialist. They value outreach work – feel making a difference.				at the hospital because cost-effective to transport physicians rather than multiple patients.	
<b>Cord-Udy (2003; 2004, 2006)</b> (56) (72) (27)  Case study/ narrative	South Australia	Psychiatry	A private specialist who had contemplated rural work, but had been deterred by pressure it would place on the main practice. MSOAP (government policy funding) facilitated the decision to start outreach work.	From a private practice in Adelaide to Coober Pedy (840km) and other remote towns including Marla/Mintabi, Anangu Pitjantjatjara and Oodnadatta. Distance: 2,800km	Visiting 2-4 times per year, by small plane and car on rough, unsealed roads. Since 2001.	Detailed psychiatric assessment to allow local services (GP and mental health workers) to manage patient plus regular follow-up through outreach. Teleconference between visits initially, but limited over time due to workload at normal practice.	Australian Government MSOAP Policy and Medicare billing by private specialist.	Description of service implementation and development over 3 years.
<b>Gadiel et al (2004)</b> (35)  Case study	South Australia	Paediatrics plus further visiting sub-specialists (child psychiatrists, gastroenterologist, geneticist, respiratory physician and endocrinologist) for undifferentiated caseload	Commenced as a pilot project of Women and Children's hospital Adelaide and Port Augusta Hospital and Regional Health Services. The paediatrician was the only resident staff specialist at Port Augusta at the time but the specialist capacity at Port Augusta increased over time.	From Port Augusta Hospital to 13 towns covering around 80% of South Australia's land mass. Distance: 500-600km.	Monthly circuit by light plane, since 1993 (RFDS or SA-health chartered planes).	RFDS provides logistical support. Paediatricians concentrate on second tier care, leaving minor problems to GPs. Takes own allied health workers. Works via local IHW. Regular back up and educational support for GPs including between visits by teleconference.	Port Augusta hospital pays for the visiting sub-specialists to support resident paediatricians. Fixed budget for the service \$360,000 (as of 2004) covering paediatrician's non-clinical time, vehicle costs, and teaching. Specialists bill Medicare.	Ad hoc reporting that the severity and number of sick children needing hospitalisation reduced since service started, greater earlier intervention. Relies on resident specialist in Port Augusta, provides interesting career opportunity.
<b>Whitehead et al (2006)</b> (73)	South Australia	Geriatrics	Interested specialists initiated to help bridge the	Adelaide to Fleurieu region South Australia,	Monthly visits by geriatrician and extended	Visiting specialist practice nurse and geriatrician visit and work with local	Main author from Flinders University and	Clinical data from first 115 people assessed, time to see specialist and failure to attend

Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
Case study with comparison group			gap between metropolitan and rural options for geriatric specialist care and meet the needs of the rural community.	catchment of around 13 rural towns. Area: 2800 km <sup>2</sup> .	practice nurse since around 2001.	GPs and allied health. All referrals from GP, with whom co-located. Extended practice nurse identifies cases needing specialist review. Specialist writes to GP with advice. GP manages medications, as well as referring to local allied health. Education programs. Multi-disciplinary team meetings.	Repatriation General hospital. Funding source not stated.	comparable with metropolitan clinic.
<b>Simm et al (2014) (74)</b>  Case study with comparison group	Victoria	Paediatrics + endocrinology	Not stated. Service aimed to increase access to specialised diabetes clinical care in region with no or limited local paediatricians.	From the Royal Children's Hospital in Melbourne to western Victoria: Horsham, Hamilton and Portland. Distance: 300-400km.	Three-monthly, since 2001.	Same consultant works with local diabetes nurse educators and allied health team and children's GP or local paediatrician using shared protocols based on metropolitan-best practice. The local team do all follow-up care. Sustaining service by same specialist strengthened relationships, so contact between visits occurred for complex patients.	Publicly employed specialists.	Comparable outcomes as per tertiary metropolitan centre, with no difference in mean HbA1c (8.3%/67 mmol/mol for both groups). Number of visits per year was higher in the rural group (3.3 per year rural compared with 2.7 urban, $P < 0.001$ ).
<b>Goss et al (2010) (6)</b>  Case study with comparison group	Victoria	Paediatrics	Instigated by a private group of paediatricians to improve access to effective multi-disciplinary diabetic care for children in rural areas. The	From Sale to both Sale (three clinics) and Bairnsdale (one). Distance: 75km.	Four times a year, by car, since 2007.	Paediatrician works onsite and collaborates with a locally based core team of general paediatrician, diabetes educator, and mental health nurse, reviewing serious cases. Regular	Medicare rebated consultations, community fund raising for equipment, pharmaceutical industry grant	Comparable outcome to metropolitan units. Average HbA1c fell from mean $9.6\% \pm 1.81$ (median $9.7\%$ ) in 2006 to mean $8.1\% \pm 1.25$ (median $7.9\%$ ) in 2009 ( $p < 0.001$ ). Excellent patient and professional satisfaction.

Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
			control of diabetes was considered poor under existing arrangements (complex cases previously reviewed by single private consultant).			team case meetings at end of clinic to discuss ongoing care priorities, 24-hour phone contact for all patients.	for commencement and evaluation of service. The paediatricians funded the service counsellor.	
<b>Chittleborough et al (2013)</b> (8)	Victoria	Surgery	Team of two surgeons initiated (outreach work is professionally and interesting and builds the practice, supporting viability of permanent rural practice)	From Wangaratta in Victoria to Beechworth, Benalla, Bright and Mansfield. Distance: 36-100km.	Weekly travel by car, involving half day consulting/half day operating sessions (shared by two surgeons)	Services provided in local GP rooms or hospital-provided rooms. GP proceduralists support anaesthetics and post-operative care. Up-skilling so the GPs and local nursing staff can manage complex patients. Support by phone between visits.	Specialist-funded (private model) with Medicare billing, plus or minus patient fees.	Outreach clinics increased referral base for rural surgeons. Surgeons travelled 2,958km in 3 months, saving 315 patients travelling a total of 38,634km for the same specialist contact in the regional centre. 15% of 18,029 procedures over 5 years performed in smaller hospitals as outreach service.
<b>Campbell et al (2012)</b> (75)  Case study								
<b>Gadiel et al (2004)</b> (35)  Case study	Victoria	Obstetrics	Specialist had been the resident obstetrician and gynaecologist in Hamilton prior to relocating to Warrnambool. Once set up privately in Warrnambool, outreach was initiated to ensure enough work to sustain a practice partnership, maintain access for people in his original town and increase convenience. Income not the main driver, but	From the Wentworth Women's Clinic, Warrnambool (private practice) in Victoria to Hamilton, Terang & Cobden, Victoria. Travel time: 30-35 mins each way.	Every two weeks one of three specialists visits each town via their own car since 1985. Services normally for two days per visit.	Terang/Cobden service co-located in GP rooms to increase referrals. Depends on GP obstetricians to ensure the demands of outreach work are not too onerous on the specialist, but this is affected by a decline in GP obstetricians in the local area over time.	Surgery and consultation in Hamilton are in the public hospital, discounted room hire of \$20; patients are billed privately. Consultations in GP room billed to Medicare.	Untapped need in two new services to Terang/Cobden. Has adapted scope of outreach service based on available substitute labour (general practitioners and GP obstetricians).

Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
			important that service is viable.					
<b>Gadiel et al (2004)</b> (35)  Case study	Victoria	Physicians (internal medicine)	In 1981, the specialist took locum position in a private practice in Wangaratta. The practice owner did not return. So he stayed on and started outreach in 1983. Two other specialists commenced as principals and started outreach as well. Aims to reduce patient travel and reduce fragmented care.	From Wangaratta (private) Cardiology and Respiratory Centre, to Myrtleford, Yarrowonga, Rutherglen, Benalla, Beechworth, Bright, Mansfield. Travel time: 45 mins-1.25 hours each way.	Weekly visits by three independent practitioners to various towns, since 1983, via their own car. Day trip.	Mainly non-procedural, consultative (40% of caseload is wider scope of practice). Seeks to complement locally available specialists. Opportunity for informal and regular meetings between GP and specialist/s. Use local allied health services to support patients. Provided in hospital or GP rooms. Restricted time (GP and specialist) to participate in education sessions, but intention is there. Telephone support between visits.	Private practice – three separate practitioners sharing rooms. Billing is private including Medicare rebate and patient pays the gap. Some funding from regional or state health authority as well. Some concessions on room hire and equipment.	Patients reported service was high quality and GPs generally appreciate it. Waiting times up to 3 months and patients on pension report hard to pay the fee. Administrative arrangements for outreach services are complex and have potential to impact succession outcomes.
<b>Broadbent and McKenzie (2006)</b> (57)  Case study	New South Wales	Palliative medicine	Individual initiated to increase access to specialist palliative care	From Sacred Heart Palliative Care Service (St Vincent's Hospital) in Sydney to several rural sites including Wagga Wagga and surrounds. Distance: 450km.	Fortnightly visits for one day, since 2002	Visiting specialist worked with local service providers: radiation oncologist, medical oncologist, GPs and nurses. Referrals from hospitals, GPs, nurses, aged care and community. Phone support for staff during and between visits.	NSW State Government via a Health Department grant.	111 consultations in first year of service. 43% reviewed at home. 76% were considered appropriate referrals: mainly for cancer-related pain. Additionally, 16% involved complex decision-making.
<b>Foy and Tierney (2014)</b> (61)  Case study	New South Wales	General physician (since 2006) + cardiology and endocrinology (since 2008)	A Mungindi GP contacted a specialist for help because had limited referral options for patients with	From Calvary Mater Hospital in Newcastle to community clinics in Moree and	Six times a year (increased to eight times based on demand)	At service initiation, GPs were notified about the clinic starting. Clinics were held in general practice, Aboriginal medical service and a	MSOAP and the specialists work in public hospital. Local allied health practitioner	Frequency of trips increased due to demand. Indigenous patients over-represented. Small communities accounted for more than 25% of the clinical load due to high health

Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
			hepatitis C. Outreach service designed for wider scope to ensure cost-effectiveness in relation to distance travelled. Aimed to improve service access; support local GPs and provide rural registrar training.	Mungindi. Distance: 495km and 620km.	involving a five day circuitous car trip, since 2006.	local district health clinic. Predominantly a consultation liaison model, supporting complex cases; GPs retained responsibility for patient care. Education sessions, but limited time (balancing demands of patient care and travel).	funded by MSOAP-ICD. NSW Ministry of Health air service for two specialists who joined the service in 2008.	burden. Six advanced trainees involved in service. Increasing number of referrals each year.
<b>Tchan and Cass (Oct 2012)</b> (60)  Case study with before and after data	New South Wales	Cardiology, renal and endocrinology	Instigated by the remote Aboriginal Health Corporation's Board of Directors, (Maari Maa) to improve the prevention and management of chronic diseases.	From Royal Prince Alfred Hospital in Sydney to Broken Hill, Menindee and Wilcannia. Distance: 1,150km.	Four times a year via plane, since 2009.	Integrated through onsite coordinators. Maari Maa established agreement to access specialists via a single tertiary hub in the city to improve ability to sustain specialist visits. Multi-disciplinary endocrinology team visits. GPs and allied health co-consultation/face to face handover. Videoconference in between for complex case management. Service evaluation and quality improvement activities.	MSOAP and the Scully fund in partnership with the Maari Maa Health service	72% clients Aboriginal. Improved access to testing and clinical management, previously not available onsite. Support for GPs. Improved rate of controlled diabetes, cardiovascular disease according to evidence-based guidelines.
<b>Bowman et al (2008)</b> (5)  Case study with comparison group	New South Wales	Rehabilitation	Not mentioned	From St Vincent's public hospital in Sydney to Griffith Base Hospital, NSW. Distance: 600km.	Weekly visiting since 1999, via commercial aircraft	Visiting specialist and physiotherapist work closely with local services (local physician, nursing and allied health)	Not mentioned, probably public funding	Outreach achieved comparable functional improvement and length of stay to city-based clinic.
<b>Gadiel et al (2004)</b> (35)  Case study	New South Wales	Dermatology	Single dermatologist operating from private group practice in Sydney. Previously the	From a private practice in Chatswood to Port Macquarie and	Weekly visiting to alternating towns for 2-3 days, by commercial	Co-consultation with GPs to enable skill development. Financial pressure makes the schedule tight and hard to	Privately funded. Increased financial return by buying rooms at Port	Travel time and commercial transport reliability considered the main influence on sustainability. The flight schedule changed four times



Table 2.1: Australian research: rural outreach by specialist doctors, presented by state/territory of origin of the outreach service

Ref – study type	State/ territory	Area of care	How started	Locations	Delivery	Integration	Funding	Findings
			resident GP in Taree before specialising. Committed to return. However, family reluctant to relocate. Outreach to keep his commitment and build the main practice, (succeeded an existing dermatologist providing the service). Enjoys professional variety and managing greater morbidity.	Taree. Travel time: 2-3 hours.	flight since 1998 (service succeeds that by another dermatologist since 1985).	fit in up-skilling. Seminars on skin cancer and evening talks. Takes registrars for College Dermatology and medical students from the University of New South Wales (UNSW).	Macquarie (with in-built accommodation) and investing in clinical infrastructure. Patient throughput (and size of catchment) essential to viability. Air travel (earliest flight) critical to efficiency.	since 1998, causing a reliance on car travel to Taree for a year. 1800 new referrals by 230 GPs in two years indicating high demand. Specialist reported altruism important but financial reward also critical to sustain the work.
<b>Rankin et al (2001) (68)</b>  <b>Gadiel et al (2004) (35)</b>  Cross-sectional survey of patient perceptions/modelling costs	Western Australia	Surgery	Professor House, from the Department of Surgery University of Western Australia and Sir Charles Gardiner Hospital, initiated the Rural Surgical Service (RSS) to increase access to services areas in small rural towns with no resident surgeon. Prof House grew up in a remote area. Affinity with needs of isolated communities.	From Sir Charles Gardiner Hospital in Perth Western Australia to five small rural and remote towns in regional Wheat belt/ Goldfields and Pilbara. Distance: 300km.	Weekly travel to various towns, by chartered airplane or commercial flight and car travel, since 1996.	Uses a funded medical coordinator, to ensure model efficiencies. Works with local GPs who manage post-operative care.	The Australian Government, via an initial grant of the Department of Health, then the Western Australia Department of Health took over, but funding continues to be under threat. Funding supports one full-time specialist salary, apportioned across three surgeons.	88% patients preferred local service over travelling. 10% would not have sought surgical care if no local service. There were shorter waiting lists in visiting services. An estimated patient saving of AU\$1,077 per specialist outreach consultation compared with travelling for services.



# Chapter 3: Australia's national outreach policy

## 3.1 Introduction

As noted in Chapters 1 and 2, as an example of a specific policy intervention, the Australian Government has had a national policy supporting rural outreach by specialist doctors, since 2000. However, there is limited published analysis as to the evolution, structure and aims of the policy, which is now called the Australian Government Rural Health Outreach Fund (RHOF). This Chapter aims to answer the first research question: *what is the nature of the current national policy to support specialist medical outreach in rural Australia?*

## 3.2 National outreach policy

The literature that forms the basis of Chapter 3 is in the form of a manuscript that was published in the Bulletin of the World Health Organization in 2014.

O'Sullivan BG, Joyce CM, McGrail MR. Adoption, implementation and prioritization of specialist outreach policy in Australia: a national perspective. Bulletin of the World Health Organization 2014 Jul 2014;92:512-9. © Copyright 2014 The Bulletin of the World Health Organization. Reprinted with Permission.

## Declaration for Thesis Chapter 3

### Declaration by candidate

In the case of Chapter 3, the nature and extent of my contribution to the work on the manuscript: "Adoption, implementation and prioritization of specialist outreach policy in Australia: a national perspective" was the following:

Nature of contribution	Extent of contribution (%)
Conception, identification and collation of literature and drafting of manuscript	85%

The following co-authors contributed to the work.

Name	Nature of contribution
A/Prof Catherine Joyce	Provided critical advice about concept, design, writing and analysis
Dr Matthew McGrail	Provided critical advice about concept, design, writing and analysis

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work.

Candidate's Signature		Date 11/12/15
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Main Supervisor's Signature		Date 11/12/15
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## Policy & practice

### Adoption, implementation and prioritization of specialist outreach policy in Australia: a national perspective

Belinda G O'Sullivan,<sup>a</sup> Catherine M Joyce<sup>b</sup> & Matthew R McGrail<sup>c</sup>

**Abstract** The World Health Organization has endorsed the use of outreach to promote: efficient redeployment of the health-care workforce; continuity of care at the local level; and professional support for local, rural, health-care workers. Australia is the only country that has had, since 2000, a sustained national policy on outreach for subsidizing medical specialist outreach to rural areas. This paper describes the adoption, implementation and prioritization of a national specialist outreach policy in Australia. Adoption of the national policy followed a long history of successful outreach, largely driven by the professional interest and personal commitment of the workforce. Initially the policy supported only new outreach services but concerns about the sustainability of existing services resulted in eligibility for funding being extended to all specialist services. The costs of travel, travel time, accommodation, professional support, staff relief at specialists' primary practices and equipment hire were subsidized. Over time, a national political commitment to the equitable treatment of indigenous people resulted in more targeted support for outreach in remote areas. Current priorities are: (i) establishing team-based outreach services; (ii) improving local staff's skills; (iii) achieving local coordination; and (iv) conducting a nationally consistent needs assessment. The absence of subsidies for specialists' clinical work can discourage private specialists from providing services in remote areas where clinical throughput is low. To be successful, outreach policy must harmonize with the interests of the workforce and support professional autonomy. Internationally, the development of outreach policy must take account of the local pay and practice conditions of health workers.

Abstracts in **عربي**, **中文**, **Français**, **Русский** and **Español** at the end of each article.

#### Introduction

The World Health Organization (WHO) recognizes the need for policies designed to overcome the chronic undersupply of health workers in rural areas in both developed and developing countries.<sup>1</sup> In February 2009, following international calls for action, WHO launched a programme that aimed to increase access to health workers in rural and remote areas by improving staff retention.<sup>2</sup> The programme involved an evidence-based appraisal of policies that could influence retention through education, regulation, financial incentives or professional support.<sup>3</sup> Outreach was endorsed as an effective strategy because it enables: efficient redeployment of the workforce; continuity of care at the local level; and professional support and education for local workers, which could improve retention.<sup>1</sup> WHO defines outreach as, "any type of health service that mobilizes health workers to provide services to the population or to other health workers away from the location where they usually work and live".<sup>1</sup> In Australia, outreach involves planned, regular visits to each community.<sup>4</sup>

Australia is the only country that has had, since 2000, a sustained, national policy on outreach that subsidizes medical specialist outreach to rural areas. The country has a low population density, vast stretches of uninhabited land and several urban centres distributed sparsely along the coastal fringe.<sup>5</sup> Inequalities in the social determinants of health between metropolitan and rural populations influence the need for health care.<sup>4,6</sup> Although it is a developed country, Australia continues to have problems addressing the high rate of preventable disease, particularly in remote communities where the proportion of indigenous people is high and where geographical distances are extremely large.<sup>4</sup> For example, the rates of trachoma,<sup>7</sup> otitis

media<sup>8</sup> and rheumatic heart disease<sup>9</sup> in these communities remain high relative to global expectations.

In rural and remote communities, a lack of local services and low utilization of hospitals results in higher mortality than is found in large cities.<sup>10</sup> The medical evacuation of patients who require specialist care in a large hospital is important for these communities but a substantial number need to be retrieved and the cost is high.<sup>5,11</sup> Thus, more efficient and effective community-based approaches are needed. Access to comprehensive primary health care involving specialists is considered ideal for the early and ongoing management of illness in rural areas.<sup>12</sup> However, only 15% of Australian specialists have their main practice outside metropolitan areas, whereas 30% of Australians reside in nonmetropolitan areas.<sup>13</sup> Rural specialist outreach services could help overcome complex barriers to service access,<sup>4,6</sup> which are mainly due to language and cultural differences,<sup>5,14</sup> and help avoid the cost and effort of seeking care away from home.<sup>15</sup> Visiting specialists can meet many of the health service needs of rural areas<sup>16</sup> and, since they are less exposed to some of the negative effects of full-time rural specialist practice, it may be easier to recruit them.<sup>17,18</sup> In addition, visiting specialists can also provide periodic procedural support for rural generalists, thereby increasing their confidence clinically and reducing their professional isolation.<sup>19,20</sup>

All medical specialists in Australia must complete advanced medical training and become fellows of a specialist college. Specialist care is normally accessed by referral from a general practitioner and is partly or wholly subsidized by a universal health insurance scheme – the Medicare Benefits Schedule<sup>21</sup> – which is funded by the Commonwealth of Australia (i.e. the national or federal government). Self-employed

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and hospital specialists with a right to private practice, who together account for 73% of all Australian specialists,<sup>21</sup> have the discretion to set their fees at or above the Medicare funding level, which has an effect on the level of co-payment, if any, required from patients. Overall, 47% of specialists work in mixed public and private practice, 33% work in public practice only and 20% work in private practice only.<sup>22</sup> Furthermore, 49% of those working only in public practice have a right to a private practice.<sup>22</sup>

Globally there is a lack of information on outreach strategies that can help guide policy.<sup>1</sup> The aim of this paper, therefore, was to describe the adoption, implementation and prioritization of a national specialist outreach policy in Australia to provide a reference for other countries.

### Specialist outreach

The early history of specialist outreach in Australia includes many examples of individual "champions" who, despite various barriers and logistical challenges, pioneered outreach services at a local and national level.<sup>23–25</sup> There are numerous examples of specialists whose practice was adapted to complement local health services, which highlights the importance of professional autonomy and local design.<sup>9,14,26</sup> The provision of specialist outreach through a "bottom-up" approach has continued to result in accessible, safe and relatively sustained (i.e. for more than 5 years) services in different parts of the nation and across a range of specialties.<sup>6,8,27</sup> Evaluations have shown that specialist outreach in remote settings improves early interventions and the coordination of care and reduces the hospitalization rate.<sup>6</sup> Moreover, integrated services have a higher clinic throughput and lower costs.<sup>28</sup> However, such services require time and patience to develop and must be based on local relationships and respect for local culture.<sup>9,14</sup> In Australia, specialist outreach has been fostered by the interest and investment of state and territory governments.<sup>4,27</sup>

The funding arrangements for locally initiated outreach services tend to be patchy: funding has often developed relatively opportunistically and its distribution may be inequitable. Some specialists do not receive subsidies for travel associated with outreach,<sup>27</sup> whereas others are subsidized by mixed

funding – for example, by short-term Commonwealth funding coupled to longer-term state funding – or directly through the health services. Nevertheless, inequitable funding does not necessarily deter professionals from being interested in or having a commitment to outreach. However, with "self-funded" services, in which specialists independently fund their own transport and accommodation, outreach is likely to be restricted to easily reached locations and the time dedicated to professional support is likely to be limited.<sup>27</sup>

Although the proportion of specialists providing outreach services to rural areas in Australia is unknown, it appears to be substantial and is increasing. Surveys carried out in the late 1990s indicated that 29% of otolaryngologists and 41% of dermatologists based in metropolitan areas provided outreach to rural communities.<sup>29,30</sup> The factors that motivated specialists to participate in outreach were the variety of the work professionally, the needs of the rural community and loyalty to rural staff.<sup>29,30</sup> Although specialists were willing to provide outreach services for a smaller financial reward than they would receive in metropolitan areas,<sup>31</sup> adequate remuneration for clinical services (at least at the level provided by Medicare) was considered important for sustainability.<sup>27</sup> Bridging the gap in remuneration between specialists' main practices and their outreach work is vital, particularly for outreach to remote areas.<sup>32</sup>

### A national outreach policy

In 1998, following the establishment of national structures for providing policy advice on medical workforce planning three years earlier,<sup>33</sup> a discussion paper on sustainable specialist services in Australia was submitted to the Australian Health Minister's Advisory Council.<sup>34</sup> It advocated outreach as the only means through which many rural communities could obtain access to regular specialist care. The estimated size of the catchment area population that was large enough to ensure that outreach work was viable varied from 14 000 to 30 000 people, smaller than that necessary for residential practice (i.e. 20 000 to over 80 000). Moreover, the desirable population size was similar for different specialties. The main barriers to outreach identified were: (i) the specialist's travel and accommodation costs and the time

needed; (ii) the local clinical infrastructure; and (iii) the availability of staff.<sup>34</sup>

In May 2000, the Medical Specialist Outreach Assistance Program (MSOAP-*Core*), a national initiative of the Commonwealth Government, commenced with an allocated annual budget of approximately 20 million Australian dollars (Aus\$), which was equivalent to 12 million United States dollars (US\$) at the exchange rate on 3 July 2000. The initial aim was to promote the supply of new rural outreach services by subsidizing costs.<sup>31</sup> Initially, services that were operating before 2000 – including those that were already receiving funding from, for example, individual specialists or state or territory governments – were not eligible for funding. In practice, MSOAP-*Core* complemented other Commonwealth Government programmes. For example, it helped ensure that ophthalmologists were available for the new Eye Health Program.<sup>35</sup> In addition, MSOAP-*Core* provided systematic support for travel, the travel time needed by non-salaried specialists, accommodation and the hire of equipment and facilities. It was well received by specialists contemplating rural service.<sup>36</sup> Proposals for new outreach services usually originated at the local level and MSOAP-*Core* ensured that service delivery was flexible. Table 1 gives a broad outline of the administrative steps involved in implementing national specialist outreach policy. Subsidies were also provided for meals, cultural training for specialists, back-filling for the specialist's primary practice (i.e. short-term staff relief for salaried specialists) and improvement of skills (i.e. sharing knowledge with or providing educational support for local staff).<sup>37</sup> However, clinical services were not subsidized, which provided an incentive for specialists to achieve a reasonable clinical load. Specialists had the discretion to set charges for services.

After the first four years of MSOAP-*Core*, the Commonwealth Government commissioned an evaluation of the sustainability of outreach services that were not eligible for MSOAP-*Core* funding in 2000. Despite the lack of Commonwealth Government funding, outreach services had been operating for more than five years in six of eight case studies, principally because of personal investment by specialists and the clear willingness of the community to pay.<sup>27</sup> To ensure that these services would be sustainable, the Commonwealth



Table 1. Administration of national specialist outreach policy, Australia, 2000–present<sup>37,38</sup>

Administrative step	Associated action
A specialist or a rural health organization submits a proposal to the fund holder (i.e. the operational agency in the state or territory government responsible for national specialist outreach policy).	The specialist or rural health organization: <ul style="list-style-type: none"> <li>• proposes a location and commencement date for the service;</li> <li>• describes how the proposed service meets needs;</li> <li>• estimates the size of the visiting team, including students;</li> <li>• describes the proposed clinical services and the actions that will be taken to improve skills;</li> <li>• describes how cultural awareness training will be carried out;</li> <li>• confirms worker registration and indemnity insurance have been arranged; and</li> <li>• proposes a billing method and reports funding from other sources.</li> </ul>
The fund holder reviews the submission in the context of a regional needs assessment and the regional service plan.	The fund holder: <ul style="list-style-type: none"> <li>• verifies there is a substantial need in the community for the care provided by the specialist;</li> <li>• ensures the proposal is consistent with national policy priorities;</li> <li>• ensures the local workforce and facilities can support and integrate with the proposed service; and</li> <li>• verifies that the proposed service provides value for money.</li> </ul>
The State or Territory Advisory Forum, which is an impartial representative of the state or territory government, endorses the proposal.	The State or Territory Advisory Forum holds regular meetings with the fund holder.
The Commonwealth Government approves the proposal and contracts a specialist provider via the fund holder.	• A deed of agreement is signed by the Commonwealth Government and the specialist or rural health organization.
The fund holder pays the specialist on submission of a bimonthly service report.	The specialist reports: <ul style="list-style-type: none"> <li>• the number of specialist visits completed;</li> <li>• the number of patients seen;</li> <li>• the proportion of patients from indigenous communities; and</li> <li>• the skills improved and the personnel involved.</li> </ul>
The fund holder reports annually to the Commonwealth Government.	The fund holder: <ul style="list-style-type: none"> <li>• submits an annual report; and</li> <li>• renews contracts for services that were performed well.</li> </ul>

Government expanded eligibility for MSOAP-Core funding to existing services in May 2004 with the hope that state and territory governments would continue their current levels of investment in outreach services.<sup>31</sup>

In 2008, after an incoming government renewed its commitment to improve the health of indigenous people as a political commitment to equity, a National Partnership Agreement on Closing the Gap in Indigenous Health Outcomes was signed between the Commonwealth Government and State and Territory Governments. As part of this Agreement, the Commonwealth Government provided an additional stream of funding for outreach in 2009 and 2010 through the MSOAP Indigenous Chronic Disease (MSOAP-ICD) programme. This programme had the same annual budget as MSOAP-Core (i.e. US\$ 16 million at the Aus\$ exchange rate on 1 July 2009) and targeted remote communities or communities with a high proportion of Aboriginal people, who have high rates of diabetes, cardiovascular disease, chronic respiratory

disease, chronic renal disease and cancer. It funded outreach services based on multidisciplinary teams that included specialists, general practitioners and allied health workers;<sup>39</sup> placed a greater emphasis on collaborative and sustained care; supported the local workforce and encouraged improvements in their skills; and encouraged self-management by patients. Subsequently, two further streams of MSOAP funding were introduced: one for ophthalmology in 2011 (MSOAP-Ophthalmology) and one for maternity services in 2012 (MSOAP-Maternity).

In 2011, an independent national evaluation of all streams of MSOAP funding was commissioned because it was not possible to judge the value of the programme using only self-reported data submitted in bimonthly specialist service reports (Table 1). The evaluation showed that MSOAP was strongly supported by policy-makers, fund-holders, service providers and local staff. In addition, the evaluation identified the need for improvements in: (i) the national framework for assessing the local need

for specialists; (ii) the systematic provision of local outreach coordinators; and (iii) national monitoring of specialist outreach.<sup>31</sup> Although improving local staff's skills was also considered important, it may not have occurred in practice because of competing demands on specialists' time during short visits.<sup>31</sup>

The relative effect of MSOAP on improving access to specialist services was assessed using Medicare data and estimates of billing practices in remote areas based on consultations with stakeholders. It was estimated that MSOAP contributed 0.7% to 3.0% of specialist services in inner and outer regional areas, 4.2% in remote areas and 28.7% in very remote areas.<sup>31</sup> Geographical areas were defined according to the Australian Standard Geographical Classification Remoteness Structure as either metropolitan, inner regional, outer regional, remote or very remote.<sup>40</sup> Case studies in seven local areas showed that, whereas most visiting specialist services in remote areas were provided through MSOAP, a large number in regional areas operated independently.<sup>41</sup> This



highlighted the need for strong local coordination of outreach services supported by MSOAP and of those operating independently of national policy, principally in regional centres.

The evaluation of MSOAP included a provider survey of 233 specialists. It showed that 59% intended to provide outreach for an additional five years or more. Moreover, 57% of specialists involved in MSOAP normally worked in the private sector: 42% had mixed public and private practices and 15% had private practices only. In addition, 41% were from public hospitals and had a right to private practice in 67% of the cases.<sup>42</sup>

The estimated annual cost of administration in 2010 and 2011 for state and territory governments was US\$ 1.8 million (at the Aus\$ exchange rate valid on 1 July 2010) for MSOAP-Core and US\$ 1.3 million (at the Aus\$ exchange rate valid on 1 July 2010) for MSOAP-ICD. The total annual cost to the Commonwealth Government was around US\$ 0.84 million (at the Aus\$ exchange rate valid on 1 July 2010).<sup>31</sup> Most costs were staff costs.

In July 2012, as a result of the MSOAP evaluation, a streamlined Rural Health Outreach Fund was created to consolidate the funding for outreach provided by MSOAP-Core, MSOAP-Ophthalmology and MSOAP-Maternity. The fund had a value of US\$ 28 million per year (at the Aus\$ exchange rate valid on 2 January 2014) and funding was separate from that for MSOAP-ICD. However, as with MSOAP-ICD, the priorities of the Rural Health Outreach Fund were aligned with other health-care priorities (e.g. on chronic disease, maternal and paediatric health, mental health and ophthalmology) and a team-based approach to outreach, which included a service coordinator, was adopted.<sup>38</sup> The principles underlying the administration of the Rural Health Outreach Fund are similar to those listed in Table 1 but place greater emphasis on performing nationally consistent assessments of needs via fund holders.

In 2012 and 2013, in response to the growth of fly-in-fly-out work practices in the mining industry in Australia, a national parliamentary inquiry was conducted into the fly-in-fly-out workforce.<sup>43</sup> The findings confirmed that outreach services were important for rural health care in Australia, particularly as a complement to residential services in

primary health care. The inquiry concluded that a comprehensive national public health policy on outreach was required to tackle the need for: (i) infrastructure, such as staff accommodation and clinical facilities; (ii) streamlined and supported local coordination; (iii) realistic funding that takes into account the true cost of service provision; and (iv) explicit regional planning that incorporates the outreach workforce.

## Discussion

The two broad aims of national specialist outreach policy in Australia are to support the provision of outreach and to ensure its sustainability. The specific policy aims are: (i) to counter strong market forces that reinforce the centralization of specialists; (ii) to ensure that remote areas are equitably served by outreach; (iii) to sustain outreach practice by ensuring its financial viability; and (iv) to influence practice by providing incentives that support the integration of specialist outreach services with local health services and the provision of professional assistance for local workers. The policy affects specialists who would otherwise fund outreach themselves and who would encounter financial disincentives to providing outreach in remote areas and to improving the skills of local workers. Back-filling support for salaried specialists also fosters outreach by hospital-based specialists.

The extent to which specialist outreach services can be provided independently of national policy – for example, by specialists or rural health organizations – has not been explored systematically. Consequently, the influence of national policy on the distribution and practice of outreach has not been evaluated in comparative studies. It is likely that the professional autonomy and personal investment of specialists will remain important for initiating and ensuring the continuity of outreach services.

Current national policy, by default, encourages the supply of outreach to areas where there is a legitimate clinical demand because it does not subsidise payment for clinical services. However, although fee-for-service billing arrangements improve the efficiency of outreach services, providing specialists with a regular salary or a fixed payment for clinical services in remote and sparsely populated areas might help counterbal-

ance any loss of income due to poor attendance or low throughput at clinics in these areas.<sup>28</sup> Funding for outreach services is based on proposals from specialists or health organizations and a strong assessment framework is needed to ensure that these proposals address legitimate needs. The establishment of a national outreach service register might help identify where there is an oversupply or undersupply of services. Local outreach service coordinators can help reduce costs and improve the efficiency of services by organizing what can be a complex array of interrelated outreach services.<sup>28</sup> In addition, coordinators can act as cultural intermediaries who ensure that outreach services are accessed according to need.<sup>44</sup>

Outreach has been described as a low-cost, health-care option for resource-constrained countries<sup>45</sup> but has also been seen as essential for ensuring universal access to health care.<sup>44</sup> International attempts to replicate Australia's experience with adaptable and regular outreach have highlighted the need to take into account local patterns of illness, the characteristics of the local community and the capacity of the local workforce.<sup>46</sup> In addition, national policy must consider: political stability; the structure and funding of the health system; the size of the health-care workforce; remuneration patterns; local transportation and options for retrieving patients; and the level of poverty in the local community. The structure and funding of the health services in a country will influence the autonomy of the workforce and hence the ability of workforce members to participate in outreach and their payment for participating. Dual-practice health-care systems, like Australia's, are common internationally.<sup>47</sup> However, the cost of the outreach policy in Australia is small relative to the national health budget and outreach is made possible by the existence of Medicare.<sup>48</sup> In countries with high levels of poverty and high health-care needs that lack universal health insurance, outreach policy may be based on salaried or volunteer workers, a low level of subsidy or mandatory participation. Moreover, the implementation of outreach in resource-constrained nations may require the support of partner nations for technical knowledge and help with equipment, training and mentorship, monitoring and funding.<sup>45</sup> International alliances can work well if



they address programmes at a systemic level, engage with local staff and are responsive to local circumstances.<sup>49</sup> For example, the Fred Hollows Foundation in Australia, a not-for-profit agency, has promoted outreach internationally by offering leadership, providing strong collaboration and focusing on capacity building.<sup>50</sup> Globally, such alliances often benefit outreach workers, many of

whom practice under extremely difficult conditions.<sup>45</sup>

In Australia, national policy supports the supply of specialist outreach services and helps ensure their sustainability while making sure that they are aligned with national health-care priorities. The policy's success is underpinned by interested specialists who, given the right support, may initiate and sustain

outreach. It is essential that outreach policy be coupled to the systematic assessment of local health-care needs, take into account local health-care organization and funding, and be implemented in accordance with the interests of the workforce. ■

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## ملخص

### اعتماد سياسة تواصل الأخصائيين في أستراليا وتنفيذها وتحديد أولوياتها: منظور وطني

والدعم المهني وراحة العاملين في عيادات الأخصائيين الأولية واستئجار المعدات. وبمرور الوقت، نتج عن الالتزام السياسي الوطني بتحري الإنصاف في علاج السكان الأصليين زيادة الدعم المستهدف للتواصل في المناطق النائية. وتتمثل الأولويات الراهنة فيما يلي: (1) إنشاء خدمات التواصل المستندة على الفرق؛ (2) تحسين مهارات الفريق المحلي؛ (3) تحقيق التنسيق المحلي؛ (4) إجراء تقييم للاحتياجات على نحو متسق وطنياً. ومن الممكن أن يؤدي غياب الإعانات المقدمة للعمل السريري الذي يقوم به الأخصائيون إلى إثناء الأخصائيين في القطاع الخاص عن تقديم الخدمات في المناطق النائية التي ينخفض فيها إجمالي الإنفاق السريري. ولضمان نجاحها، يجب أن تتسق سياسة التواصل مع اهتمامات القوى العاملة ودعم الاستقلال المهني. وعلى الصعيد الدولي، يجب أن يأخذ وضع سياسة التواصل في الحسبان الرواتب المحلية للعاملين الصحيين وظروف الممارسة.

اعتمدت منظمة الصحة العالمية استخدام التواصل لتعزيز ما يلي: إعادة نشر القوى العاملة في مجال الرعاية الصحية بكفاءة؛ واستمرارية الرعاية على الصعيد المحلي؛ والدعم المهني للعاملين في مجال الرعاية الصحية على الصعيدين المحلي والريفي. وتعد أستراليا البلد الوحيد الذي توجد لديه، منذ عام 2000، سياسة وطنية مستدامة بشأن التواصل تهدف إلى دعم تواصل الأخصائيين الطبيين مع المناطق الريفية. وتصف هذه الورقة اعتماد سياسة وطنية لتواصل الأخصائيين في أستراليا وتنفيذها وتحديد أولوياتها. وكان اعتماد السياسة الوطنية نتاج تاريخ طويل من التواصل الناجح، الذي نتج بشكل رئيسي عن الاهتمام المهني والالتزام الشخصي للقوى العاملة. وفي البداية، دعمت السياسة خدمات التواصل الجديدة فقط غير أن المخاوف بشأن استدامة الخدمات القائمة نتج عنها توسيع نطاق أهلية التمويل ليشمل جميع خدمات الأخصائيين. وتم دعم تكاليف السفر ووقت السفر والإقامة

## 摘要

### 澳大利亚专科医生外展政策的采用、实施和优先落实：国家视角

世界卫生组织一直都支持使用外展以便推进：医疗劳动力的有效调动；护理在地方层面上的连续性；对地方、农村卫生医护人员的专业支持。澳大利亚是唯一自 2000 年以来一直提供可持续外展政策的国家，该政策为在农村地区开展外展服务的专科医生提供补贴。本文描述澳大利亚国家专科医生外展政策的采用、实施和优先落实。采用国家政策之后，外展取得长期的成功，这在很大程度上是由工作人员的职业兴趣和个人奉献驱动的。最初，政策只支持新的外展服务，但因为考虑到现有服务的可持续性，资助资格扩展至所有专科医生服务。对差旅、差旅时间、住宿、专业支持、

专科医生的主要工作的员工助济和设备租用的费用进行补贴。久而久之，公平对待原住民的全国性政治承诺促进了偏远地区更有针对性的外展支持。当前的优先顺序是：(i) 建立基于团队的外展服务；(ii) 提高当地工作人员技能；(iii) 实现当地协调；(iv) 执行全国一致的需求评估。如果专科医生临床工作无补贴，则会打击私人专科医生在临床产出较低的偏远地区提供服务的积极性。要想取得成功，外展政策必须与工作人员利益相协调，并对专业自主权提供支持。在国际上，外展政策的制定必须考虑卫生工作人员的当地工资和实践条件。

## Résumé

### Adoption, mise en œuvre et priorisation de la politique de proximité spécialisée en Australie: un point de vue national

L'Organisation mondiale de la Santé a approuvé l'utilisation de services de proximité pour promouvoir: le redéploiement efficace du personnel des soins de santé; la continuité des soins au niveau local; et le support professionnel au personnel de santé local et rural. L'Australie est le seul pays qui possède, depuis l'an 2000, une politique nationale soutenue de services de proximité afin de subventionner la présence de médecins spécialistes dans les zones rurales. Cet article décrit l'adoption, la mise en œuvre et la priorisation d'une politique nationale de proximité spécialisée en Australie. L'adoption de cette politique nationale a fait suite à une longue histoire de services de proximité

dont la réussite est largement attribuable à l'intérêt professionnel et à l'engagement personnel des professionnels de santé. À l'origine, cette politique soutenait seulement les nouveaux services de proximité, mais les préoccupations concernant la durabilité des services existants ont abouti à l'extension de l'admissibilité au financement à tous les services spécialisés. Les coûts des déplacements, des temps de déplacement, d'hébergement, du soutien professionnel, de personnel de remplacement dans les cabinets primaires des médecins spécialistes et de la location d'équipement ont été subventionnés. Au fil du temps, l'engagement politique national pour le traitement équitable

des populations autochtones a entraîné un soutien plus ciblé pour acheminer les services de médecine mobile dans les zones reculées. Les priorités actuelles sont: (i) l'établissement de services de proximité en équipe; (ii) l'amélioration des compétences des professionnels locaux; (iii) la réalisation de la coordination locale; et (iv) la conduite d'une évaluation cohérente des besoins à l'échelle nationale. L'absence de subventions pour le travail clinique des médecins spécialistes peut

décourager les médecins spécialistes privés de venir soigner dans les zones éloignées où le rendement clinique est faible. Pour qu'elle réussisse, la politique de proximité doit s'harmoniser avec les intérêts des professionnels de santé et soutenir l'autonomie professionnelle. À l'échelle internationale, le développement de politiques de proximité doit tenir compte du salaire local et des conditions d'exercice des professionnels de la santé.

## Резюме

### Принятие, осуществление и определение приоритетов политики выездного обслуживания специалистами в Австралии: национальная перспектива

Всемирная организация здравоохранения одобрила использование выездного обслуживания для способствования эффективному перераспределению медицинских кадров, преимущественности оказания медицинской помощи на местном уровне, а также для профессиональной поддержки местных и сельских медицинских работников. Австралия — это единственная страна, в которой с 2000 года проводится национальная политика выездного обслуживания с целью субсидирования выездного обслуживания медицинскими специалистами сельских районов. В данной статье описывается принятие, осуществление и определение приоритетов в национальной политике выездного обслуживания специалистами в Австралии. Национальная политика была принята после длительного периода осуществления выездного обслуживания, успех которого в значительной степени был обусловлен профессиональным интересом и личной приверженностью работников. Изначально в рамках политики поддержка оказывалась только новым видам выездного обслуживания, но опасения относительно развития существующих услуг привело к распространению права на финансирование всех видов услуг специалистов. Осуществлялось субсидирование затрат на проезд,

время в пути, проживание, профессиональное обслуживание, высвобождение персонала в первичных учреждениях практикующих врачей-специалистов и аренду оборудования. Со временем национальная политическая приверженность принципу равного отношения к коренным народам привела к более адресной поддержке выездного обслуживания в отдаленных районах. В настоящее время приоритетами являются: (i) введение услуг выездного обслуживания коллективом специалистов; (ii) повышение квалификации местного персонала; (iii) осуществление координации на местном уровне и (iv) проведение последовательной оценки потребностей на национальном уровне. Отсутствие субсидий для поддержки клинической работы специалистов может препятствовать предоставлению услуг частными специалистами в отдаленных районах с низкой клинической пропускной способностью. Для обеспечения успешности политики выездного обслуживания она должна согласовываться с интересами работников и поддерживать профессиональную автономию. На международном уровне при развитии политики выездного обслуживания необходимо учитывать уровень оплаты труда на местах и условия практической работы медицинского персонала.

## Resumen

### La adopción, implementación y prioridad de una política de difusión de especialistas en Australia: una perspectiva nacional

La Organización Mundial de la Salud ha aprobado el uso de la difusión con el objetivo de promover la reasignación eficiente del personal sanitario, la continuidad de la atención a nivel local y el apoyo profesional para el personal sanitario a nivel local y rural. Australia es el único país que ha mantenido, desde el año 2000, una política nacional continuada en materia de subvención de la difusión de especialistas médicos en las zonas rurales. Este artículo describe la adopción, implementación y prioridad de la política de difusión de especialistas en dicho país. La adopción de la política nacional obedeció a un largo historial de difusión con buenos resultados, impulsado en gran parte por el interés profesional y el compromiso personal de los trabajadores. En un principio, la política apoyaba únicamente los servicios de difusión nuevos, pero la preocupación acerca de la sostenibilidad de los servicios existentes auspició una ampliación de la financiación a la totalidad de los servicios especializados. Se subvencionaron los costes y el tiempo de

viaje, el alojamiento, el apoyo profesional, la asistencia al personal en los consultorios principales de los especialistas y el alquiler de equipos. Con el tiempo, el compromiso político nacional respecto al trato equitativo de los pueblos indígenas se tradujo en un apoyo más específico para la difusión en las áreas más alejadas. Las prioridades actuales son: (i) establecer servicios periféricos por equipos, (ii) mejorar las capacidades del personal local, (iii) lograr la coordinación local y (iv) llevar a cabo una evaluación cohesiva de las necesidades a nivel nacional. La ausencia de subsidios para el trabajo clínico de los especialistas puede disuadir a los especialistas privados de prestar servicios en zonas remotas, en las que el rendimiento clínico es bajo. Para resultar satisfactoria, la política de difusión debe armonizar los intereses del personal y apoyar la autonomía profesional. A nivel internacional, el desarrollo de una política de divulgación debe tener en cuenta los salarios y las condiciones locales de los miembros del personal sanitario.

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## Policy &amp; practice

## Specialist outreach policy in Australia

Belinda G O'Sullivan et al.

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Belinda G O'Sullivan et al.

Policy & practice  
Specialist outreach policy in Australia

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### **3.3 Conclusion**

The manuscript in Chapter 3 substantially addresses the first research question, providing a thorough account of the background, development and intent of the Australian Government's rural outreach policy. The impetus for the Australian Government to invest in outreach was based on a strong history of specialists already undertaking and enjoying rural outreach work and in response to the findings of a survey of specialist colleges which suggested a range of specialist services were financially viable in smaller populations, if provided on a visiting basis.

The policy in its current form, called the Australian Government Rural Health Outreach Fund (RHOF), aims to subsidise team-based outreach in outer regional and remote locations, in priority areas of care. The eligibility of both new and existing services for subsidies is intended to extend and support existing local-level activity, including outreach funded by the states and territories.

Although the RHOF has successfully been sustained, it lacks a clear evidence base. It depends on interested specialists self-nominating to provide services, however there is no national information about the extent of specialist participation in rural outreach work, nor patterns of practice. This makes it difficult to judge whether the RHOF accommodates the varied opportunity costs of specialists working in different practice sectors and travelling from different locations. The effect of the RHOF on service distribution has only been tested based on modelling of service billing (of in situ and outreach specialists services, 2009-2010) by location. However the billing practices used in the model were subjective, based on stakeholder consultation in particular locations. More research is needed to determine the extent of all Australian outreach supported by the RHOF, and its influence on service patterns compared with services operating independently, or with other forms of subsidies.

Informed by the literature review in Chapter 2 and the policy analysis in Chapter 3, Chapter 4 outlines the research design used in the remainder of this thesis to address its research questions.



# **Chapter 4: Research design**

## **4.1 Introduction**

Chapter 1 outlined the background to the need for specialists in rural and remote Australia and the potential value of outreach as a strategy. Chapter 2 then reviewed the evidence about specialist outreach, highlighting there are no state or national level studies systematically exploring the extent of rural outreach work, types of specialists participating and patterns of service. It also noted that a range of strategic planning occurs at a national, state/territory and health service level but this is relatively fragmented and lacks an evidence base. Chapter 3 then addressed the first research question, by describing the background, aims and structure of the Australia's unique specialist outreach policy, which targets the supply and sustainability of priority rural outreach services into more remote locations. It noted the poor basis of information to determine how well the policy is targeted and whether it works.

In this Chapter, the research design underpinning the thesis aims and remaining research questions is outlined. This includes describing the structure of the parent study in which the thesis is nested. It describes the research methods, the use of existing data and collection of new data as well as data cleaning and analysis.

## **4.2 A sub-study of MABEL**

The thesis method is nested within the Medicine in Australia: Balancing Employment and Life (MABEL) Longitudinal survey of Australian Doctors. The MABEL survey began in 2008 to investigate the labour supply decisions of Australian doctors including their patterns of service delivery. Annually, it collects information about the doctor's job satisfaction, attitudes toward work, work setting, workload, finances, geographic location, demographics and family circumstances.

The MABEL survey has four research themes, one of which is rural workforce supply and distribution. Under this theme, the MABEL survey, since its inception in 2008, has included

questions for medical specialists about whether they travel to provide services or clinics in other geographic locations. This is the first known national data about rural outreach work. Being embedded in the MABEL survey presented the opportunity to explore the influence of a range of characteristics of the specialist doctor and their practice arrangements on rural outreach work. In addition to these data, MABEL has the provision to add new questions to upcoming MABEL surveys, to research special topics, which provided a unique basis for this thesis research.

## **4.3 MABEL study design**

The studies related to this thesis adhered to the MABEL methods for sampling, recruitment, questionnaire design and ethical review. The MABEL methods have been published elsewhere (76, 77, 78) but are summarised here.

### **4.3.1 Sampling frame and response management**

The MABEL sampling frame is based on the Australasian Medical Publishing Company directory (AMPCo Direct) (79). The MABEL survey commenced in 2008, prior to the introduction of national medical registration in Australia. At this time, the AMPCo Medical directory was considered to be the most comprehensive and accurate national database of doctors. It receives around 58,000 updates to contact details through bi-annual surveys and updates from the Medical Board of Australia among other sources.

At baseline (2008), the MABEL survey was sent to all doctors in Australia working clinically, who were contactable and able to be assigned to one of four doctor types (GP and GP registrars, specialists, doctors enrolled in specialist training and hospital doctors not enrolled in a specialist training program). Of 54,746 doctors sent the surveyed between June and November, 10,498 doctors (19.4%) self-selected into the study by responding, including 22.3% (n=4,596) specialists (76).



Each year, over the same period, the respondents to previous waves are re-surveyed as well as new doctors (new graduates, doctors returning to clinical work or emigrating from other countries) who are added to the survey to maintain responses from around 10,000 doctors across all doctor types. This thesis uses MABEL survey data of specialists only, from waves 1 to 4 (2008-2011) and wave 7 (2014).

The MABEL survey is mailed in hard copy with a link to an online version (doctors are able to login with unique identifiers). Three personalised hard-copy reminder letters are posted to all doctors who do not respond to the initial mail out at 4-6 week intervals. The letters include a link to the survey online and a fax sheet is provided, enabling doctors to request a different version of the survey if they have changed doctor type since the previous survey.

Remote doctors, including medical specialists, were provided with an unconditional \$100 cheque for participating, in order to encourage their participation between waves 1-3 (new and continuing survey respondents). After wave 3, the cheque was only provided to remote GPs. The aim of the incentive was to encourage over-sampling of remote doctors in order to ensure adequate number of respondents to research rural medical supply and distribution patterns.

### **4.3.2 The questionnaire**

Prior to the baseline MABEL survey in 2008, four surveys, one for each doctor type, were developed specific to the MABEL research themes. Where possible, questions were adapted from existing survey tools. The initial surveys were piloted with respective doctor types to ensure questions were clear and concise to answer and sensitive to topics of interest (76). Since wave 2, to accommodate doctors entering the survey for the first time, eight questionnaire types were used, including new and continuing versions for each doctor type.

Each version of the MABEL survey includes a set of core questions as well as specific ones to investigate topical issues or areas specific to a type of doctor. Questions such as age, gender

and medical school of graduation are included in the questionnaire for new participants but excluded for continuing doctors. Most items are repeated to enable longitudinal data analysis.

### **4.3.3 Data management and storage**

Data collection and storage conventions for the MABEL survey are well published (76, 77). Briefly, data from hard-copy questionnaires are entered into an electronic database by a commercial data entry company. Double entry verification is carried out for all variables. Electronic data from online versions of the questionnaire are automatically downloaded as a record in the same database. The two databases are merged into a single Stata (80) database.

Each annual wave of data on around 10,000 Australian doctors is released for internal or external use in de-identified format. Geographic variables, such as the location of the main hospital of work, other places of work, residence and the rural area lived in up to leaving school, are only available to internal users to prevent identification of individual medical practitioners. An accompanying MABEL User Manual, from the University of Melbourne, Melbourne Institute of Applied Economic and Social Research is co-released annually, outlining the survey methods, data management and variable naming and coding, encompassing any changes from one wave of the survey to another (78).

The recorded values for each variable reflect the scaling and scoring of the original variables. Data are checked by the MABEL team for accuracy (range and consistency checks). Minimal imputation is performed to enable flexibility for data users. Locations (postcode and town names) are geo-coded according to the Australian standardised remoteness area categorisation (ASGC-RA or ASGS-RA), relevant to the period of data collection.

### **4.3.4 Ethics**

The MABEL survey was ethically approved by the University of Melbourne, Faculty of Business and Economics Human Ethics Advisory Group (Ref. 0709559) and the Monash University Standing Committee on Ethics in Research Involving Humans (Ref. CF07/1102 - 2007000291)

Understanding Workforce Dynamics. Annually, ethical approval is gained for any amendments to the survey and investigators. An amendment to ethics was endorsed on 27 February 2014 for the inclusion of new questions related to this thesis in the wave 7 survey and to add Belinda O’Sullivan as a student researcher with full access to the internal dataset (MUHREC Amendment CF07/1102 -2007000291).

## **4.4 Research method for outreach study**

The thesis research is an exploratory, descriptive study of self-reported rural outreach work by medical specialist doctors in Australia. It was conducted in two stages. The first involved using existing data from waves 1 to 4 of the MABEL survey (2008-2011) and the second involved collecting new information in the wave 7 MABEL survey in 2014.

### **4.4.1 Using existing data**

As briefly described in section 4.2, the MABEL survey, since its inception, has asked specialist doctors (in new and continuing surveys) whether they travel to provide clinics/ services to other geographic locations, which is answered yes or no. If “yes”, specialists are asked to report: “Where are you providing these services or clinics?” and to list the town name and postcode for up to three locations. Each town/postcode location is geo-coded rural or metropolitan so as to determine the cohort providing rural outreach services.

The existing question in the MABEL survey did not ask about whether the travel to provide services in other geographic locations was regular. Further the question about outreach in the MABEL survey was limited to physical outreach, rather than virtual, although it is acknowledged that outreach services in practice have the potential to take on a range of other forms, including incorporating telehealth or as virtual telehealth services only.

The town names reported by specialists could be checked to exclude those who did not indicate a specific town they visited, or who commented that the service was telehealth or retrieval. The main work and outreach suburb/town names were also reviewed to determine

specialists were visiting a town away from the location of their main work, for example a main work location of Bendigo and outreach location of Swan Hill.

Since the MABEL survey is broad in focus, there was a range of existing information about doctors and their normal practice to explore the influence on rural and remote outreach work. These included variables characterising specialists: their age as at 31 December the previous year; sex; state or territory of contact address and; geo-coded remoteness category for location data and childhood years of rural background. Further variables characterising the specialist's main practice included: specialist type; average weekly hours worked and; setting of work (public hospital, private hospital, private consulting rooms, other).

Chapters 5, 6 and 7 describe the results of two cross-sectional and one longitudinal studies which used existing data from waves 1 to 4 of the MABEL survey.

#### **4.4.2 Collecting new data**

MABEL generally focuses its questions on characteristics of the doctors' main practice. As such, to answer research questions as to the characteristics of the outreach service, the reasons specialist doctors participate in rural outreach work and the influence of the national rural outreach policy, a range of additional questions were developed for inclusion in the wave 7 MABEL survey, collected in June to November, 2014. New questions were developed in two phases: Deciding what to measure and; Designing and testing questions.

##### ***Deciding what to measure***

A planned process was used to decide the main topics, and within them, what to measure. This involved mapping hypotheses concerning specialist outreach workforce dynamics (under each of the research questions) to new variables of interest in the relevant categories of interest e.g. policy. Concurrently, information that could already be deducted from existing questions in the MABEL survey was determined.

To develop hypotheses, an iterative process ensued including appraising the published evidence, developing case scenarios of practice patterns, checking emerging theories through informal meetings with stakeholders (fund holders, different government stakeholders, rural hospital managers and specialist doctors) and liaising with the MABEL research team to discuss research themes. Over time, the key concepts under study were decided and the planned sub-group analyses, dependent and independent measures were documented.

### ***Designing and testing questions***

The second stage involved developing questions to collect data on the proposed set of variables. Questions from other survey instruments (81, 82) were appraised and determined not to be fit-for-purpose. As such, new questions were developed.

The new questions were designed to validly and reliably measure the concept under study, as well as being easy both to understand and to answer. Questions were also designed with consideration as to how to optimise response rates within the self-administered MABEL survey, ensuring questions were consistent with others in the MABEL survey and that they fitted the space available (suggested by Chief Investigators to be half a page). Closed-end questions were selected wherever possible on the basis of improving survey response time and minimising data cleaning.

As already noted, every year, the MABEL survey has asked specialist doctors “Do you travel to provide services/clinics in other geographic areas?” However in the wave 5 survey, the follow-up question: “Where are you providing these services or clinics?” was not included. Prompted by the outreach study, this question was reinserted into wave 7. Without the follow-up question about where services are provided, outreach work in rural versus metropolitan locations could not be demarcated. Allowing specialists to list up to three locations was considered important to collect data about remote outreach work because when responses to the location question were analysed, there was some indication that specialists were more likely to report travel to remote locations last, of three possible locations.

With the aim of exploring rural outreach work, new questions were developed to ensure the specialists identified a rural outreach service within their list of up to three locations: “Do you provide at least one of these services in a non-metropolitan location on a regular, periodic basis (an outreach service)?” The use of “regular, periodic” and specific inclusion of the term “outreach” were intended to restrict reporting of other types of mobile services, such as locum work. The term “non-metropolitan” was considered open to interpretation, however, geo-coding locations was considered an objective way to determine rural or metropolitan areas.

Given that more than one of the services could be a rural outreach service, a further filtering question was included: “At which non-metropolitan location do you spend the most time?” Selecting the location where the specialist spent the most time aimed to minimise bias against nominating remote outreach services. Reports of outreach summarised in Table 2.1 of Chapter 2 indicated that remote outreach potentially involves less frequent visiting, but time spent providing the service was likely to approximate outreach to larger rural towns, especially accommodating longer travel requirements. This was consistent with the identification of the main outreach service, included in the 2012 Australian Health Professional Registration Authority workforce survey (81). To increase data quality and aid survey completion time, specialists responded by ticking a box which linked to the town name and postcode already specified.

A question was then developed asking: “On average, how often did you visit this location in the last year?” The rate of visiting the nominated location was considered important to help delineate outreach from one-off locum services, adding to the methods such as excluding specialist doctors who did not nominate a specific town they travelled to. Service regularity was also expected to help determine whether the outreach visits were likely to be related to the specialist’s full-time employment. For example specialists travelling to a regional area on a weekly basis where the regional area was also reported as the main place of work, were excluded from outreach, as the travel related to the main rather than a secondary practice.

Further questions about the rural outreach service were based on measuring behaviours and intentions rather than perceptions, where possible. They collected information about number of years the outreach service had been provided, how long the specialist planned to continue providing the outreach service, whether they were required to provide the service as part of their employment conditions at their main place of work, whether they led the establishment of the service, whether the service is subsidised or reimbursed, how the service was billed on average and the reasons for providing the main service. For most questions, a categorical or binary response option was provided to improve data consistency. The response category for reasons specialists provided their main rural outreach service was based on an existing 5-point Likert scale already used in one part of the MABEL survey about “the degree to which you agree or disagree with the following statements”.

For specialists not currently travelling to provide rural outreach services (the majority of respondents), questions were designed to collect information about the level of interest in participating in outreach in the future and whether the specialist used to have subsidisation for the service. The final questionnaire is included in Appendix 1.

### **4.4.3 Piloting new questions**

Informal and formal piloting of new questions was conducted. The informal phase involved circulating the new questions about rural outreach to the MABEL research team, for feedback about lay-out, wording and to establish face validity. Minor incremental changes were made to sequencing, question structure and wording. Then feedback was sought through a face to face meeting with the Rural Workforce Agency Victoria (RWAV), as a fund holder for the national specialist outreach policy. The RWAV confirmed the questions were answerable, relevant to the current policy environment and that specialists would be able to identify whether they had support from the Rural Health Outreach Fund or not.

RWAV enabled contact with ten Victorian specialists providing rural outreach services. Four specialists, of different types and from different locations, responded with written feedback, which suggested the questions were clear and easy to answer. One specialist recommended

a strong reason for participating in rural outreach was to support rural health staff. It was subsequently added to the list of reasons.

The MABEL survey additionally undertakes formal piloting on an annual basis, prior to the distribution of the main wave survey. The new outreach questions were included in the formal wave 7 pilot between January and March 2014. As part of this process, the new questions were incorporated into hard and electronic copies of the wave 7 survey for new and continuing specialist surveys by a MABEL research manager. The MABEL research team checked the wording and survey skips in a draft electronic version in January 2014, prior to the formal pilot. The pilot was sent to a selected sample of 150 specialists, including a mix of n=50 hard copy and n=100 online respondents. Based on the results of the pilot, response categories were refined to improve sensitivity (to minimise skewed response frames). Minimal refinement was made to questions and the final question and response categories was confirmed with the research manager.

The new survey questions were administered in the main MABEL wave 7 survey between June and November 2014. The electronic copy was hosted using *Qualtrics*, which enabled it to be completed by iPad, iPhone or other computer. It included automatic check boxes and typed textual responses.

## **4.5 Data cleaning and analysis**

The relevant waves of the MABEL datasets were obtained with correct permissions from the University of Melbourne. The copied datasets did not include any respondent contact details and were de-identified. They were managed on a password accessible secure server at Monash University.

The existing MABEL data had already been cleaned prior to analysis. The new data from the outreach questions included in wave 7 were initially cleaned by the MABEL research team through standard data checks and cleaning procedures. The raw data was browsed for outliers, cleaned and categorised as described in individual studies from Chapter 5 onwards.



De-stringing functions in Stata (80) converted text to numerical values. Where a respondent provided a range of values, this was replaced with the mean value (for example, 10-12 was replaced with 11).

If basic punctuation symbols such as '?' or '~' were combined with a numeric value, the symbol was dropped and the numerical value was assigned. Missing values were treated as per outlined in the MABEL user manual (78) and missing data were documented in respective studies.

Services to individual towns were described in summary form without reference to individual specialty service origin and destination, or town names.

The thesis only included qualified medical specialists, who responded that they were working clinically because, compared with registrars, they are able to make independent decisions about their employment. Further exclusion and inclusion criteria are identified with respect to individual studies from Chapter 5 onwards. Descriptive univariate and multi-variate analysis was undertaken to research the range of thesis questions. The exact nature of analysis and reporting is outlined in the methods and results sections of the manuscripts presented in Chapter 5, 6, 7, 8 and 9.

### **4.5.1 Managing response bias and attrition**

Preceding this thesis, the MABEL research team had already tested response bias by comparing key characteristics of survey respondents to waves 1 and 2 with national medical labour workforce statistics (76, 77). To summarise the results, the 10,498 doctors responding to the wave 1 MABEL survey had a similar distribution of mean hours worked per week (44.4 vs 45.0) compared with the Australian medical workforce (76). MABEL respondents were minimally over-represented (less than 2%) in all age cohorts up to 60 years, compared with the distribution of Australian specialists; the largest difference was reflected in the 51-60 year age group (24.2% amongst MABEL respondents vs 21.5% nationally). However, MABEL

respondents were more likely to be female and probably due to deliberate over-sampling, to come from non-metropolitan areas (4.3% fewer MABEL respondents lived in metropolitan areas).

In wave 2, 10,304 doctors responded (64.9%) including 3,587 continuing specialists (82.5%), (respondents in wave 1) and 348 (44.1%) specialists new to the survey (77). The methods of inviting new doctors (new graduates, doctors returning to work or entering the medical workforce from overseas) to participate in the survey after the first wave (from 2009 onwards), increased the proportion of younger, female doctors in the wave 2 sample relative to the national medical workforce (23.6% vs 20.7% aged 30-39 years and 11.4% vs 7.7% aged <30 years; and 42.0% vs 34.5% female). With each wave of the MABEL survey, the representativeness of the sample has the potential to follow this trend.

In wave 7, 9,288 doctors responded (47.5%) including 3,517 (57.5%) specialists who had responded to a prior wave and 84 (29.6%) of specialists invited to participate for the first time (83).

Response bias was managed in three main ways, applied in various ways throughout the thesis, depending on the methods and cohort applied to various studies. To account for waves 1 and 2, it was possible to cite previously published studies of the MABEL team, quantifying any survey response bias. Secondly, where available in the MABEL dataset and relevant to the sampling frame, the candidate applied a routine cross-sectional survey weight, available in the MABEL dataset. Finally, to appraise response bias specific to specialist doctors, the candidate compared key characteristics of specialist respondents with the national specialist workforce, including: sex, age group, mean age, main place of work, specialist group and mean weekly hours worked. National specialist workforce data were from the AMPCo medical directory datasets (79) and the Australian Institute of Health and Welfare's labour force data (84, 85).

There is also some attrition between annual waves of the MABEL survey, which is common in longitudinal studies. As assessed between waves 1 and 2, this was lowest for specialists (17.3% compared with 18.8% of GPs) and doctors living in non-metropolitan locations (16.9%

outer regional and 18.4% in inner regional areas compared with 21.0% metropolitan-based), probably due to the honorarium payment of \$100 (77). Attrition has the potential to affect statistical analysis where it is systematically related to outcome variables but not enough is known about rural outreach to evaluate the potential influence. For the one longitudinal study reported in this thesis, attrition bias among specialists was managed by testing key covariates of age and sex, and found to be negligible.

## 4.6 Conclusion

In this Chapter, the research design for the thesis has been outlined including methods which maximise the use of existing data about outreach work existing in the MABEL longitudinal survey of Australian doctors. Such an approach enables analysis of a diverse range of factors about specialist doctors and their normal practice. New data will also be collected to gather information about the outreach service, which is specific to informing a range of thesis questions. This research will provide valuable national level perspectives to guide policy development and planning of rural outreach by specialists, as a health system strategy.

In the following chapters of the thesis, the specific methods and outcomes of analyses pertaining to each research question will be outlined. Firstly, Chapter 5 is a published cross-sectional study about participation in rural and remote outreach. Then Chapter 6 is a published cross-sectional study of the patterns of rural outreach work by specialists based in rural and metropolitan locations. Chapter 7 is a published longitudinal analysis of ongoing outreach. Chapters 8 and 9 are unpublished manuscripts describing the reasons specialists participate in rural outreach work and the influence of financial subsidies on targeted service distribution into more remote locations. Finally in Chapter 10, the results are summarised and discussed as to their implications, including an unpublished manuscript providing a perspective for policy.

# Chapter 5: Participation in rural outreach work

## 5.1 Introduction

Chapter 5 focuses solely on the second research question: *What is the extent of rural outreach, the characteristics that influence participation in rural outreach and service provision in remote areas?* It is the first national-level data analysis about the prevalence of rural outreach work by Australian medical specialists.

The main outcome of the study presented in Chapter 5 is whether specialists participate in rural outreach work or not and secondly, whether they provide remote outreach services compared with outreach to any rural location. In the analysis, outreach providers are defined as specialists working clinically, travelling to provide clinics/services in a specific rural location which was not their main location of work. The range of variables explored in this research was limited to data in the MABEL survey including age, gender, practice type, location and specialty using several weighted logistic regression models.

## 5.2 Prevalence of rural and remote outreach work

The published manuscript that forms the basis of Chapter 5 is a cross-sectional study describing the prevalence of rural and remote outreach work among specialist doctors in Australia, and how these are influenced by the characteristics of the specialist, their location and practice type (consulting rooms or not).

O'Sullivan B, Joyce C, McGrail M. Rural outreach by specialist doctors in Australia: a national cross-sectional study of supply and distribution. *Human Resources for Health* 2014;12:1-10. [Copyright permission rests with the authors].

## Declaration for Thesis Chapter 5

### Declaration by candidate

In the case of Chapter 5, the nature and extent of my contribution to the work on the manuscript: “Rural outreach by specialist doctors in Australia: a national cross-sectional study of supply and distribution” was the following:

Nature of contribution	Extent of contribution (%)
Conception, identification and collation of literature, data analysis and drafting of manuscript	85%

The following co-authors contributed to the work.

Name	Nature of contribution
A/Prof Catherine Joyce	Provided critical advice about concept, design, writing and analysis
Dr Matthew McGrail	Provided critical advice about concept, design, writing and analysis

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate’s and co-authors’ contributions to this work.

Candidate’s  
Signature

	Date 11/12/15
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Main  
Supervisor’s  
Signature

	Date 11/12/15
---	------------------

## RESEARCH

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# Rural outreach by specialist doctors in Australia: a national cross-sectional study of supply and distribution

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## Abstract

**Background:** Outreach has been endorsed as an important global strategy to promote universal access to health care but it depends on health workers who are willing to travel. In Australia, rural outreach is commonly provided by specialist doctors who periodically visit the same community over time. However information about the level of participation and the distribution of these services nationally is limited. This paper outlines the proportion of Australian specialist doctors who participate in rural outreach, describes their characteristics and assesses how these characteristics influence remote outreach provision.

**Methods:** We used data from the Medicine in Australia: Balancing Employment and Life (MABEL) survey, collected between June and November 2008. Weighted logistic regression analyses examined the effect of covariates: sex, age, specialist residential location, rural background, practice arrangements and specialist group on rural outreach. A separate logistic regression analysis studied the effect of covariates on remote outreach compared with other rural outreach.

**Results:** Of 4,596 specialist doctors, 19% (n = 909) provided outreach; of which, 16% (n = 149) provided remote outreach. Most (75%) outreach providers were metropolitan specialists. In multivariate analysis, outreach was associated with being male (OR 1.38, 1.12 to 1.69), having a rural residence (both inner regional: OR 2.07, 1.68 to 2.54; and outer regional/remote: OR 3.40, 2.38 to 4.87) and working in private consulting rooms (OR 1.24, 1.01 to 1.53). Remote outreach was associated with increasing 5-year age (OR 1.17, 1.05 to 1.31) and residing in an outer regional/remote location (OR 10.84, 5.82 to 20.19). Specialists based in inner regional areas were less likely than metropolitan-based specialists to provide remote outreach (OR 0.35, 0.17 to 0.70).

**Conclusion:** There is a healthy level of interest in rural outreach work, but remote outreach is less common. Whilst most providers are metropolitan-based, rural doctors are more likely to provide outreach services. Remote distribution is influenced differently: inner regional specialists are less likely to provide remote services compared with metropolitan specialists. To benefit from outreach services and ensure adequate remote distribution, we need to promote coordinated delivery of services arising from metropolitan and rural locations according to rural and remote health need.

**Keywords:** rural, remote, outreach, visiting, medical, workforce, hub, service planning, policy

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## Background

Outreach is defined as the travel by health workers to provide services away from their normal practice. In 2011, outreach was globally endorsed as an evidence-based strategy to improve universal access to health care in underserved areas [1]. Rural outreach by specialist doctors is supported by Australian policy [2,3] and research [4] to overcome workforce shortages, address priority areas of care and provide professional support and education for permanent rural health staff. However, it depends on health workers who are willing to travel and their distribution to areas of need. Historically, specialist doctors in Australia have shown a strong interest and investment in outreach work [3], but we lack systematic information about the proportion of specialists that participate in outreach at a national level, the factors predicting participation in outreach work and the provision of outreach in remote areas.

Medical specialist services are relatively centralized in Australia due to their dependence on a viable population base, other staff and technical equipment [5]. Only 15% of specialist doctors, in contrast to 31% of the Australian population, lives in nonmetropolitan (rural and remote) areas [6,7]. Of specialist doctors based in rural and remote areas, most base their practice in large regional towns (approximate population 50,000 to 100,000) [6]. Remote and outer regional locations have the smallest proportion of medical specialists (constituting 13% and 22% of all doctors compared with 28% and 38% in inner regional and metropolitan areas, respectively) [6]. Outside of regional centres, nonmetropolitan Australia is a large country with vast stretches of uninhabited land and a large number of small and dispersed communities, which are located up to 1 000 km from service centres. Remote communities tend to have a higher proportion of indigenous people and widespread poverty. Notably, complex comorbid illness is common, but remote communities have restricted, if any, access to local health care [8,4]. Despite greater need, remote outreach is challenging due to extreme distances, rugged terrain, more limited infrastructure and lower clinical throughput [9].

To promote specialist redistribution, the Australian government introduced a national specialist outreach policy in 2000 [3], allocated through a competitive tender process. Specialists can gain subsidization for travel, accommodation, equipment lease, time spent up-skilling and travel time for private specialists (or back-filling for salaried specialists) for providing outreach to rural and remote areas designated to have a service need [3]. Whilst the policy is thought to account for only a small proportion of all outreach services [10] it does signal a sustained national commitment to outreach. Information about the predictors of outreach work and remote

distribution will inform policy decisions about how to best target the workforce.

Most Australian specialist doctors can participate in outreach work, either through private arrangements, rights to private practice for hospital specialists [11] or as part of hospital employment conditions [12]; but there is a lack of information about how the main practice arrangements influence outreach work participation. Private practice is quite common among specialist doctors in Australia: only 33% of specialist doctors work solely in the public sector whereas 19% solely in the private sector, and 48% are in mixed sector practice, of which 58% work mainly privately in hospital or consulting rooms or both [11].

Different types of specialty doctors have the capacity to practice intermittently in small populations [5], but no single analysis has observed how outreach work varies by specialty. Participation by different specialties may be related to rural health need or formal service plans that designate the services needed. Although there is limited information to assess this, core specialty outreach services routinely needed in remote Australian locations have been proposed [13], and rural health strategy in Australia highlights the importance of generalist specialists (for example, general medicine and general surgery) because of their wide scope of practice [14]. Variation by specialty may also be related to labour market conditions. In the Australian context, specialist doctors might be more likely to practice rural outreach work if competition for their specialty services in metropolitan areas is high, for example, when there is an oversupply of a particular specialist type in metropolitan centres. Specialties experiencing workforce shortages, on the other hand, may have less capacity to provide outreach and could experience weaker market influences driving their participation. A number of specialties have been formally assessed at a national level as experiencing current workforce shortages, including psychiatry, medical oncology, general medicine, paediatric surgery and radiation oncology [15].

This paper is the first national study of rural outreach participation by specialist doctors. It aims to outline the proportion of Australian specialist doctors who participate in rural outreach, describe the characteristics of specialists who provide outreach and assess how these characteristics influence remote distribution. Further, it describes the extent of outreach and its remote distribution by specialist type to discuss some of the broad factors influencing participation by specialty.

## Methods

We used data from the Medicine in Australia: Balancing Employment and Life (MABEL) study. It is a large prospective cohort study that conducts annual waves of data collection using a national database of all Australian doctors (<https://mabel.org.au/>). The first wave was a census of



the Australian medical workforce able to be contacted and working clinically ( $n = 54,750$ ) between June and November 2008 [16]. Contact details were obtained from the Australian Medical Publishing Company, considered the most comprehensive and accurate listing of all national medical practitioners at the time. Doctors (general practitioners, specialists, specialists in training and hospital non-specialists) were sent an invitation and study information, a paper copy of the survey and were given the opportunity to complete the survey online through a secure website. Three reminders were issued. The survey collected information about job satisfaction, attitudes toward work, work setting, workload, finances, geographic location, demographics and family circumstances [17]. The section on geographic location included questions about the main place of work, main place of residence, and years and location of any childhood rural background. Specialist doctors were also asked whether they travel to provide services/clinics in other geographic areas and were able to list up to three locations (town name and postcode without designating metropolitan or nonmetropolitan locations). A total of 10,498 doctors responded (overall response rate was 19%). Response bias for the wave 1 sample was reported in a previous study using key covariates of age, sex, geographic location, doctor type and hours worked [16]. It was found to be negligible with the potential to adjust minor bias through weighted analysis.

The primary outcome of this paper, outreach participation, was defined as medical specialist doctors travelling to provide clinics/services in at least one nonmetropolitan location. The secondary outcome, remote outreach participation, was defined as a subset of outreach, where services were provided in at least one remote location. Specialist residential and outreach locations were coded using the 5-level Australian Standard Geographical Classification - Remoteness Area scale [18], which is based on the average road distance to nearby larger service centres. The geographic properties of this scale are outlined in Table 1. Nonmetropolitan locations included those categorized as inner regional, outer regional, remote or very remote (an index  $>1$ ), and remote locations included those categorized as remote or very remote (an index 4 to 5). Specialists who did not report the specific rural town/s they travelled to (for example, reported a broad geographic catchment) were

excluded from all analyses because we considered this practice aligned with locum rather than outreach work, which comparatively involves a strong awareness of revisiting specific communities over time.

Specialist residential location was re-categorized to three levels: metropolitan (index = 1), inner regional (index = 2) and outer regional/remote (index 3 to 5).

Specialist doctors were those who had completed advanced training in a technical area of care to gain accreditation with a Specialist Medical College. Main specialty was self-reported from a list of 48 accredited specialties that belonged to one of four main specialist groups (Table 2) [17]. Specialists working in a specialty that was not accredited at the time were able to self-report 'other specialty - not specified above'.

Age quintiles followed a linear distribution with outreach; thus, age was included as a continuous variable grouped in 5-year increments to aid interpretation.

Rural background was defined as the number of childhood years residing in a rural area up until school-leaving age (0 to 18 years) and was categorized into three groups: 0, 1 to 10 and 11 to 18 years.

Private practice was self-reported with three response options: no private practice work (public only), private practice work in a hospital only or private practice in hospital and private consulting rooms.

Cross-sectional sampling weights were applied to all analyses. To determine the predictors of the primary outcome, outreach, bivariate associations of seven covariates (sex, age, location of residence, years of childhood rural background, practice arrangements and specialist group) were tested using logistic regression, odds ratios (OR) and 95% confidence intervals. In this analysis, four specialist groups were used, comprising individual specialist types as outlined in Table 2. Interactions were tested in adjusted models using the Wald test. A single multiple logistic regression model included all these covariates.

To determine the predictors of the secondary outcome, remote outreach, separate logistic regression analysis was done, which included the same covariates as for the primary outcome. This analysis compared specialists who provided remote outreach with those who provided outreach to other rural areas.

**Table 1 Geographic properties of the Australian Standard Geographical Classification - Remoteness Area scale (ASGC-RA) [7,18]**

ASGC-RA index	Label	Australia's population (%)	Australia's area %	Density (persons per km <sup>2</sup> )
1	Major city	68.6%	0.3%	780
2	Inner regional	19.7%	3.8%	16.2
3	Outer regional	9.4%	12.5%	2.4
4	Remote	1.5%	14.6%	0.3
5	Very remote	0.8%	68.7%	0.04



**Table 2 Self-reported specialist doctor groups and specialty type, Medicine in Australia: Balancing Employment and Life (MABEL) survey**

Specialist group	Specialist type
Internal medicine	Cardiology, clinical genetics, clinical haematology, clinical immunology (including allergy), clinical pharmacology, endocrinology, gastroenterology, general medicine, geriatrics, infectious diseases, intensive care-internal medicine, medical oncology, neurology, nuclear medicine, paediatric medicine, renal medicine, rheumatology and thoracic medicine
Pathology	General pathology, anatomical pathology, clinical chemistry, cytopathology, forensic pathology, haematology, immunology and microbiology
Surgery	General surgery, cardiothoracic surgery, orthopaedic surgery, otolaryngology, paediatric surgery, plastic/reconstructive surgery, urology, neurosurgery and vascular surgery
Other	Anaesthesia (non ICU), dermatology, diagnostic radiology, emergency medicine, intensive care - anaesthesia, medical administration, obstetrics and gynaecology, occupational medicine, ophthalmology, psychiatry, public health medicine, radiation oncology and rehabilitation medicine

Source: MABEL Wave 1 questionnaire [17].

The t-test was used to compare mean age between specialists providing outreach or not and to compare those providing remote versus other rural outreach.

Further, separate univariate logistic regression analysis was undertaken to test the association between specialist types and the primary and secondary outcomes. Twelve specialties consisting of all eight pathology specialties (Table 2) and four internal medicine specialties (clinical genetics, clinical haematology, clinical immunology and clinical pharmacology) were grouped together as 'laboratory-based' because of their strong links with work in that setting. They were used as the reference group because laboratories tend to be centralized. Medical administration and public health specialties were combined into one group, as were cardiothoracic surgery and neurosurgery, due to small cell sizes. For analysis of remote outreach, the same laboratory-based specialty group was used as the reference group. Specialty types individually analysed were general medicine, paediatric medicine, general surgery, orthopaedic surgery, otolaryngology, anaesthesia (non-ICU), dermatology, diagnostic radiology, obstetrics and gynaecology, ophthalmology, psychiatry and other specialties not specified. Remaining specialist types were combined and included as one group due to small cell sizes.

The study was approved by the University of Melbourne, Faculty of Business and Economics Human Ethics Advisory Group (Ref. 0709559) and the Monash University Standing Committee on Ethics in Research Involving Humans (Ref. CF07/1102 - 2007000291).

## Results

Responses were received in Wave 1 from 4,596 specialists (22% of all specialist doctors). Of these,  $n = 35$  were excluded as they did not list the specific rural location/s they visited. In total,  $n = 909$  (19%) provided rural outreach, of which  $n = 149$  (16%) provided remote outreach. Of rural outreach providers,  $n = 715$  (83%) were male,  $n = 623$  (74%) were metropolitan-based,  $n = 618$  had no years of childhood rural background (70%) and  $n = 525$  (61%) worked in private consulting rooms. Of those providing remote outreach,  $n = 112$  (80%) were male,  $n = 82$  (66%) were metropolitan-based,  $n = 103$  (75%) had no years of childhood rural background and  $n = 72$  (54%) worked in private consulting rooms.

Table 3 shows the characteristics associated with outreach provision.

In the fully adjusted multivariate model, outreach was associated with being male (OR 1.38, 1.12 to 1.69), residing in a rural area (inner regional: OR 2.07, 1.68 to 2.54; outer regional/remote: OR 3.40, 2.38 to 4.87) and working in private consulting rooms (OR 1.24, 1.01 to 1.53). No significant associations were found for age, specialist group or rural background. No effect modification was evident.

Table 4 shows participation in outreach by specialist type. Compared with laboratory-related specialties, general medicine (OR 1.82, 1.06 to 3.11), renal medicine (OR 3.26, 1.74 to 6.12), otolaryngology (OR 2.21, 1.13 to 4.34), urology (OR 3.63, 1.72 to 7.67), ophthalmology (OR 1.92, 1.17 to 3.14) and radiation oncology (OR 2.68, 1.34 to 5.33) specialties were more likely to provide outreach. Anaesthetists were less likely than laboratory-based specialties to provide outreach (OR 0.56, 0.37 to 0.84).

Table 5 shows the characteristics influencing remote outreach, compared with other rural outreach. Increasing age (OR 1.17, 1.05 to 1.31) and residing in an outer regional/remote area (OR 10.84, 5.82 to 20.19) were significantly associated with providing outreach in remote locations. Specialists in inner regional areas were less likely to provide remote outreach (OR 0.35, 0.17 to 0.70). Specialists working in private consulting rooms tended to be less likely to provide remote outreach, but this was not significant. Sex, rural background and specialist group were not associated with remote provision. No effect modification was evident.

Specialists in general medicine (OR 4.45, 1.30 to 15.15,  $P = 0.017$ ), general surgery (OR 3.89, 1.25 to 12.07,  $P = 0.02$ ), otolaryngology (OR 6.25, 1.57 to 8.26,  $P = 0.009$ ) and dermatology (OR 6.62, 1.53 to 28.68,  $P = 0.012$ ) were more likely to provide remote outreach than laboratory-based specialties. Remote outreach by ophthalmology approached significance (OR 2.99, 0.89 to 10.05,  $P = 0.08$ ).

**Table 3 Strength of association between characteristics of Australian specialist doctors and providing rural outreach services**

Covariates of interest	Providing outreach		Univariate odds ratio (95% confidence interval) <sup>a</sup>	P value	Multivariate odds ratio (95% confidence interval) <sup>a,c</sup>	P value
	Yes (n)	% yes <sup>a</sup>				
<b>Total</b>	909	19				
<b>Sex</b>						
Female	194	15	Reference		Reference	
Male	715	20	1.47 (1.22 to 1.76)	<0.0001	1.38 (1.12 to 1.69)	0.002
<b>Age (grouped by 5 years)</b>	909	Mean 50.9 SD 9.68	1.00 (0.97 to 1.04)	0.06	0.98 (0.94 to 1.01)	0.28
<b>Location of residence<sup>b</sup></b>						
Metro	616	17	Reference		Reference	
Inner regional	208	33	2.28 (1.88 to 2.77)	<0.0001	2.07 (1.68 to 2.54)	<0.0001
Outer regional/remote	78	43	3.55 (2.54 to 4.96)	<0.0001	3.40 (2.38 to 4.87)	<0.0001
<b>Years of Rural background<sup>b</sup></b>						
Nil	618	19	Reference		Reference	
1 to 10	103	22	1.23 (0.96 to 1.58)	0.10	1.21 (0.93 to 1.56)	0.16
11+	174	25	1.39 (1.14 to 1.70)	0.001	1.24 (1.00 to 1.55)	0.06
<b>Practice arrangements<sup>b</sup></b>						
Public only	198	18	Reference		Reference	
Private to hospital and consulting rooms	525	22	1.29 (1.06 to 1.56)	0.01	1.24 (1.01 to 1.53)	0.04
Private to hospital only	135	15	0.78 (0.60 to 1.00)	0.05	0.78 (0.60 to 1.02)	0.07
<b>Specialist group<sup>b</sup></b>						
Pathologist	33	16	Reference		Reference	
Surgeon	146	24	1.58 (1.03 to 2.44)	0.04	1.34 (0.82 to 2.19)	0.24
Internal physician	301	24	1.57 (1.04 to 2.37)	0.03	1.57 (0.99 to 2.49)	0.06
Other specialist	425	18	1.13 (0.75 to 1.68)	0.50	1.14 (0.73 to 1.80)	0.56

<sup>a</sup>analysis includes cross-sectional sampling weight.<sup>b</sup>location of residence missing for n = 7 specialists providing outreach and n = 307 not providing outreach.

years rural background missing n = 14 specialists providing outreach and n = 359 not providing outreach.

practice arrangements missing n = 51 specialists providing outreach and n = 311 not providing outreach.

specialist group missing n = 4 specialists providing outreach and n = 357 not providing outreach. Specialist group included specialist types as outlined in Table 1.

<sup>c</sup>Total missing from multivariate model n = 725.

## Discussion

This study provides the first national perspective of the extent and characteristics of rural outreach by the specialist doctors. Providing rural outreach services is relatively common, suggesting there are both unmet needs/demands for services and a healthy level of workforce interest. A smaller proportion of specialist doctors provide outreach in remote areas and this is influenced differently. Factors influencing outreach participation, and then remote distribution, are discussed.

Outreach participation was more common among male specialists; 83% of providers were male. Whilst most Australian specialists (77%) are male, an increasing proportion of qualified specialists and particularly specialists-in-training are female [19]. Female specialists-in-training increased 4.6% between 2008 and 2012 [6]. The gender-

related influences on the uptake of outreach work will be important to explore, as will the potential to influence uptake by exposure to outreach work during medical training.

Around three-quarters of outreach providers are metropolitan-based, largely because 85% of Australian specialists reside in metropolitan areas. However, residing in a rural area was strongly related to providing rural outreach. In rural locations, providing services in nearby towns may be relatively convenient, undertaken as part of employment or organizational expectations [12] (under hub-and-spoke regional health models) or provided to increase the viability of regional specialist practice [20]. Furthermore specialists residing in rural locations may be more aware of regional health needs in neighbouring towns [21].



**Table 4 Strength of association between different types of specialty doctors and providing rural outreach services in Australia**

Specialist type	Providing outreach		Univariate odds ratio (95% confidence interval) <sup>b</sup>	P value
	Yes (n) <sup>a</sup>	% yes <sup>b</sup>		
Lab-based specialties	51	18	Reference	
Anaesthesia (non-ICU)	68	11	0.56 (0.37 to 0.84)	0.006
Cardiology	20	26	1.63 (0.87 to 3.03)	0.13
Cardiothoracic surgery/neurosurgery	5	12	0.60 (0.22 to 1.63)	0.32
Dermatology	14	24	1.43 (0.70 to 2.92)	0.33
Diagnostic radiology	56	25	1.55 (0.99 to 2.42)	0.06
Emergency medicine	24	13	0.67 (0.38 to 1.15)	0.15
Endocrinology	11	14	0.74 (0.36 to 1.54)	0.42
Gastroenterology	14	17	0.92 (0.47 to 1.80)	0.81
General medicine	32	28	1.82 (1.06 to 3.11)	0.03
General surgery	51	23	1.33 (0.84 to 2.10)	0.22
Geriatrics	24	28	1.82 (1.00 to 3.27)	0.05
Infectious diseases	7	20	1.13 (0.44 to 2.89)	0.8
Intensive care	9	13	0.69 (0.31 to 1.53)	0.37
Intensive care – anaesthesia	4	13	0.69 (0.23 to 2.09)	0.51
Medical oncology	16	30	1.97 (1.00 to 3.86)	0.05
Neurology	15	28	1.75 (0.87 to 3.53)	0.12
Nuclear medicine	5	15	0.82 (0.30 to 2.27)	0.71
Obstetrics and gynaecology	51	19	1.06 (0.68 to 1.67)	0.79
Occupational medicine	14	27	1.72 (0.84 to 3.51)	0.14
Ophthalmology	41	29	1.92 (1.17 to 3.14)	0.01
Orthopaedic surgery	36	23	1.33 (0.81 to 2.19)	0.26
Other specialty	46	23	1.40 (0.87 to 2.23)	0.16
Otolaryngology	17	33	2.21 (1.13 to 4.34)	0.02
Paediatric medicine	68	25	1.56 (1.00 to 2.39)	0.05
Paediatric surgery	5	24	1.44 (0.48 to 4.32)	0.51
Plastic/reconstructive surgery	5	13	0.66 (0.24 to 1.80)	0.42
Psychiatry	82	19	1.04 (0.70 to 1.57)	0.84
Public health medicine/medical administration	6	22	1.32 (0.47 to 3.69)	0.6
Radiation oncology	17	37	2.68 (1.34 to 5.33)	0.005
Rehabilitation medicine	13	23	1.41 (0.69 to 2.86)	0.35
Renal medicine	26	42	3.26 (1.74 to 6.12)	<0.0001
Rheumatology	11	23	1.34 (0.63 to 2.85)	0.45
Thoracic medicine	12	16	0.88 (0.43 to 1.80)	0.73
Urology	15	44	3.63 (1.72 to 7.67)	0.001
Vascular surgery	11	31	2.01 (0.89 to 4.54)	0.09

<sup>a</sup>specialist type missing for n = 7.<sup>b</sup>analysis includes cross-sectional sampling weight.

Specialists working in private consulting rooms are more likely to provide outreach, possibly due to higher practice autonomy. With more control over work choice, individual motivations can play out [12] such as a desire to respond to identified health needs, to expand and diversify the main

practice base [12], or provide complex health care in challenging situations [22]. Of the 19% of specialist doctors who work in private only practices, 71% have private consulting rooms and of the 48% who work in mixed public/private practice, 36% work mainly in private consulting rooms [11].

**Table 5 Strength of association between characteristics of Australian specialist doctors and providing remote outreach services, compared with any rural outreach**

Covariates of interest	Providing remote outreach		Univariate odds ratio (95% confidence interval) <sup>a</sup>	P value	Multivariate odds ratio (95% confidence interval) <sup>ac</sup>	P value
	Yes (n)	% yes <sup>a</sup>				
<b>Total</b>	149	16				
<b>Sex</b>						
Female	37	18	Reference		Reference	
Male	112	15	0.79 (0.52, 1.19)	0.26	0.75 (0.45 to 1.25)	0.27
<b>Age (grouped by 5 years)</b>	149	Mean 51.8 SD 10.13	1.06 (0.97 to 1.16)	0.18	1.17 (1.05 to 1.31)	0.006
<b>Location of residence<sup>b</sup></b>						
Metro	82	14	Reference		Reference	
Inner regional	11	5	0.36 (0.19 to 0.70)	0.002	0.35 (0.17 to 0.70)	0.003
Outer regional/remote	54	62	14.65 (8.59 to 25.00)	<0.0001	10.84 (5.82 to 20.19)	<0.0001
<b>Years of Rural background<sup>b</sup></b>						
Nil	103	17	Reference		Reference	
1 to 10	16	13	0.92 (0.52 to 1.63)	0.77	0.83 (0.42 to 1.65)	0.59
11+	25	12	0.84 (0.52 to 1.35)	0.47	0.68 (0.37 to 1.25)	0.22
<b>Practice arrangements<sup>b</sup></b>						
Public only	48	21	Reference		Reference	
Private - hospital and consulting rooms	72	14	0.50 (0.33 to 0.75)	0.001	0.64 (0.39 to 1.06)	0.08
Private - hospital only	24	15	0.68 (0.39 to 1.17)	0.16	0.65 (0.33 to 1.28)	0.21
<b>Specialist group<sup>b</sup></b>						
Pathologist	5	15	Reference		Reference	
Surgeon	45	20	1.38 (0.49 to 3.90)	0.54	1.86 (0.58 to 5.95)	0.30
Internal physician	29	13	0.98 (0.36 to 2.68)	0.98	1.05 (0.34 to 3.18)	0.94
Other specialist	70	16	1.10 (0.41 to 2.96)	0.84	1.46 (0.49 to 4.37)	0.50

<sup>a</sup>analysis includes cross-sectional sampling weight.<sup>b</sup>location of residence missing n = 2 for specialists providing remote outreach and n = 5 for those providing other rural outreach.

years rural background missing n = 5 for specialists providing remote outreach and n = 9 for those providing other rural outreach.

practice arrangements missing n = 5 for specialists providing remote outreach and n = 46 for those providing other rural outreach.

specialist group missing n = 0 for specialists providing remote outreach and n = 4 for those providing other rural outreach. Specialist group included specialist types as outlined in Table 1.

<sup>c</sup>Total missing from multivariate model n = 69.

Despite evidence that rural upbringing can influence the attraction and retention of rural specialist medical staff [23], having a rural background is not significantly associated with outreach. Specialists with a metropolitan upbringing, may value the professional diversity and challenge of intermittent rural practice [22]. It is likely that the dynamics influencing outreach work vary from those influencing permanent rural appointment.

Our study has additionally highlighted key factors influencing the provision of outreach in remote areas. Whilst only 16% of outreach services were provided in remote areas, only 7% of Australia's nonmetropolitan population resides in remote locations [7]. Nevertheless, remote service provision is still likely to be under-represented because remote communities are spread across 83.3% of Australia's land mass, remote health needs are greater

than those in rural areas and local specialist services are more commonly not available. Further, the frequency of outreach visiting in remote areas is potentially much lower than in rural areas [4].

Remote outreach is associated with increasing age, suggesting that as professional stability and financial security increases, specialists may be more likely to participate.

Inner regional specialists are the least likely to provide remote outreach, possibly related to the high demand for health care coupled with staff shortages in regional settings [21]. Key logistical barriers may be the time requirements for remote travel [12] and limited efficient travel options to transport them to remote areas (that is, reliance on car travel or the need to travel via major cities to access remote-area flights). Further, they may be more likely to identify, within the region, communities



that are in need, precluding the need to travel long-distances to fulfil motivations to support underserved populations [12].

Remote outreach tends to be provided by specialists residing either close to or in remote areas or by metropolitan specialists (two-thirds of all remote providers). This suggests that flexible models of service delivery (rather than integrated hub-and-spoke models) currently underpin remote outreach provision [12]. Flexible models may help capitalize on the specialists willing to travel and enable remote areas to tap into metropolitan supply networks. However, where services arise from varied origins, strong local planning processes are paramount to ensure they complement each other, are well integrated with local community-based services and align with local needs and priorities.

Whilst not statistically significant, specialists with private consulting rooms tend to be less likely to provide remote outreach compared with public-only specialists. Private specialists, remunerated through fee-for-service arrangements, may be deterred by lower clinical throughput [9] and loss of income incurred for the longer travel [12] associated with remote outreach practice. Current Australian outreach policy aims to overcome disincentives for private specialists to travel and up-skill local staff, but not all specialist types are eligible for policy support and the funding is limited [3]. Further, the policy does not permit private specialists to nominate to receive a sessional or salaried payment for clinical services rendered during outreach, except in exceptional circumstances [2].

It is common for different specialist types to provide outreach services, some well above the average participation rate of 19%. However the extent of outreach and its distribution to remote areas varies by specialty. There were some discernable patterns in participation according to needs or service plans in the Australian setting. Consistent with rural health strategy [14], generalist specialists are more likely to provide both rural and remote outreach. Additionally, three of seven core outreach services considered needed in remote areas [13] are associated with remote outreach (general medicine, general surgery and otolaryngology), two with rural rather than remote provision, (paediatrics and ophthalmology) and two had no association with rural or remote outreach (cardiology and obstetrics and gynaecology). This suggests health service planning is potentially important to mobilizing specific specialty types. Ideally, this planning is based on systematic assessment of rural and remote health need and existing workforce capacity, at a regional level.

Workforce shortages in some specialties are unrelated to participation in outreach work. For example, general medicine, radiation oncology and psychiatry are considered to be in current workforce shortage [15], but only psychiatrists are less likely to provide

outreach services. Addressing the greater relative health need in rural and remote areas could potentially be a stronger driver than market forces. Motivations that affect different types of specialists require further exploration, but evidence to date shows outreach work is not necessarily a profitable undertaking [3].

In addition to, or instead of, outreach services, rural and remote populations may access specialist medical care through a range of other service models and arrangements. These include: 1) role-substitution with general practitioner proceduralists (for example, anaesthetics); 2) telemedicine (for example, psychiatry); 3) aero-medical retrieval (for example, emergency medicine); 4) patient assisted transport or 5) travel (at patient's own expense) to regional or metropolitan centres. Decisions about how to deliver services might be influenced by the preferences of local rural staff and patients, the complexity of care with respect to local infrastructure and rural workforce capacity, how practical and affordable it is for patients to travel and the cost and availability of patient and specialist transport and accommodation. Compared with the alternatives, outreach has the potential to provide up-skilling on site, support complex case management [24], enable simple procedures [20], improve continuity of care [4] and reach populations who are unlikely to otherwise seek care [4], but it may not be timely enough in urgent situations, nor have the capacity to reach all communities in need. The way outreach services are billed is yet to be determined systematically, but economies of scale are expressed where the specialist travels to a group of patients, rather than individual patients to the specialist [20].

This paper reflects patterns of outreach in a nation where specialist doctors have a strong history of self-initiating rural outreach work, supported by a universal health insurance system and since 2000, a national outreach policy which helps subsidize travel and accommodation for selected specialists [3]. Also, among Australian doctors, specialists are the highest income earners [25], possibly enabling them to provide outreach services in situations of no or limited financial benefit [3]. Depending on the state of the population's health and locally available workforce and infrastructure in underserved areas, other nations may decide to mobilize primary, preventative or specialty workforces. Factors influencing the participation by other health workers are likely to vary. But for the workforce of interest, it is important to consider the history of outreach practice, public/private work sector balance, workforce size and current distribution, remuneration arrangements, geographical distances and the availability of expedient travel options. In many countries, distances to rural and remote areas may be smaller than in Australia but



limited infrastructure, and safety issues may affect mobilisation of the workforce and their travel to remote locations.

Some limitations are acknowledged. This paper was not able to explore the full extent of rural outreach work because the MABEL survey did not collect information about how frequently outreach services were provided to different communities, nor the exact functions the specialist doctors performed at the rural locations they visited. This has potential implications for the type of rural health service capacity achieved by workforce mobilization patterns studied in this paper. The rate of visiting to remote areas is expected to be considerably lower than that to regional areas, but this has not been systematically studied. The MABEL survey is currently collecting information about the frequency of visiting, remuneration arrangements and workforce motivations to address information gaps.

As another limitation, this paper has only examined outreach by specialist doctors, assuming they are visiting in isolation. However, it is possible that participation in outreach is influenced by the ability to visit as part of a complementary health-care team, which helps overcome barriers such as local staff shortages. Whilst we have not analysed outreach with respect to local-level service capacity, we recognize that sustainable outreach is conditional on stable primary health care [26]. Policies to support recruitment and retention of primary health staff (medical, nursing, allied health, indigenous health workers and community volunteers) are likely to improve the distribution of specialist outreach workers, particularly to remote areas. Apart from excluding 35 specialists who did not report the specific locations they visited, this study was not able to further delineate locum from outreach workers due to a lack of information about regularity and length of rural visiting. We tested the effect of excluding specialists who work as hospital locums for more than 15 hours per week in their normal practice ( $n = 34$  providing any rural outreach), which did not affect the results. We used cross-sectional data, such that associations, rather than causal relationships could be examined. A cross-sectional snapshot can be informative because evidence shows outreach tends to be sustained for at least five years [12].

We acknowledge that our findings are based on 2008 data, and we are aware that the policy environment has changed somewhat since that time [3]. We expect that many of the predictive factors studied (age, location, specialist type and practice arrangements) have remained relatively stable over time. Our paper provides the first national study of participation in outreach, providing a baseline from which to examine trends over time. We are pursuing further research on longitudinal trends in the context of changes in policy since 2008.

Whilst we used survey weights to control for selection bias, unobserved response bias that cannot be corrected by the use of weights may exist.

## Conclusions

Outreach is relatively common among Australian specialist doctors suggesting there is a need or demand for services and a healthy level of workforce interest. Whilst rural specialists are more likely to provide outreach, metropolitan areas form an important hub, being the main locations where specialists reside. Despite greater need, remote outreach is less prevalent and depends on harnessing specialists based proximally as well as those from metropolitan areas. Whilst having private consulting rooms may influence outreach work, private specialists may be less inclined to provide remote outreach. Coordinated planning to promote outreach by specific specialties, and integrate services arising from different locations, is important to harnessing the benefit of outreach, specific to community need.

## Abbreviations

MABEL: Medicine in Australia: Balancing Employment and Life; OR: odds ratio.

## Competing interests

We declare there are no conflicts of interest in producing this work. The lead author is supported by an Australian Postgraduate Award. This research otherwise received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

## Author's contributions

CJ and MM were involved in collecting the information as part of the MABEL longitudinal survey of doctors. BOS conceived the study, analyzed data, interpreted findings and drafted the manuscript. MM and CJ critically reviewed the study design, analyses and manuscript. All authors read and approved the final manuscript.

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## **5.3 Conclusion**

The manuscript in Chapter 5 is based on cross-sectional analysis of existing MABEL data collected in 2008. The outreach cohort were defined using existing data and were limited to specialists visiting a specific location which was rural and away from the normal practice. The cross-sectional analysis measured prevalence in the year of the survey and was restricted to reporting associations rather than causality. Participation in outreach work was counted per specialist, regardless as to the number of rural locations services were provided.

The results suggest around one in five specialists participate in rural outreach work and of all participants, around 16% undertake remote outreach work. Participation in rural outreach work is influenced by the characteristics of specialists: specialist type and working in private consulting rooms; and most strongly, by where they reside. Rural specialists are most likely to participate but metropolitan-based specialists provided the majority of all services.

Remote outreach work is influenced differently to any rural outreach work, and increased with specialist age (suggesting experience and career stability may be important). Service provision to remote locations is particularly supported by metropolitan-based specialists as well as specialists living in outer regional or remote locations. Those living in inner regional areas are less likely to provide services in remote locations.

These results highlight the need for further research to establish the practice patterns of specialists in metropolitan versus rural locations. This forms the basis of the research presented in Chapter 6.



# Chapter 6: Patterns of rural outreach work

## 6.1 Introduction

Chapter 6 focuses solely on the third research question: *What are the main patterns and models of rural outreach service distribution and what influences these patterns?* Building on the evidence from Chapter 5, which found specialist location influences participation in rural and remote outreach work, Chapter 6 analyses the patterns of rural outreach service provision by specialists living in metropolitan or rural locations. Understanding service patterns by metropolitan-based outreach providers is important given such specialists provide around three-quarters of all rural outreach services. The manuscript in Chapter 6 also includes more detailed analysis of the specialist's main work given that Chapter 5 highlighted specialists in private consulting rooms tended to be less likely to participate in remote outreach work. In this Chapter, specialists are categorised as working publicly only, in mixed practice - mainly privately or mainly publicly and privately only (based on hours worked in different settings). Services are categorised as distributed in an inner regional location or an outer-regional or remote location.

To explore the distance travelled as an outcome, rather than just the remoteness of locations, straight-line travel distance was calculated between the residential town/postcode location and the outreach location/s in kilometres and merged with the MABEL dataset based on the specialist's ID number. Locations were approximated using town centroids, and distances were calculated using a spherical trigonometry formula of the shortest distance between two points, accounting for the earth's curvature. Straight-line distance was chosen over road distance to accommodate the fact that most roads from metropolitan areas are relatively direct to major regional centres and to conservatively estimate remote-travel where direct air transport is commonly used.

Apart from where services are distributed, the research in Chapter 6 also attempts to define models of service distribution and how they differ by rural and metropolitan-based providers. Specifically, the extent to which specialists provide outreach services as fly-in fly-out, drive-in drive-out or as a pre-arranged hub-and-spoke service models. As noted in Chapter 1, terms like fly-in fly-out or hub-and-spoke have the tendency to be used inter-changeably with the term outreach in the literature. However, it is useful to delineate these models as they have different configurations, with inherently different planning implications. This study was restricted to differentiating these models based on existing variables in the MABEL dataset, namely the number of locations visited, the distance travelled and sector of the doctor (an indicator of public-sector arranged).

Finally, this Chapter aims to establish how the regional context influences patterns of outreach service distribution by metropolitan or rural-based specialists. Contextual factors considered include the size of the regional hospital, whether the regional town serves a remote catchment or more densely populated area.

## **6.2 Service distribution and models of outreach**

The published manuscript that forms the basis of Chapter 6 is a cross-sectional study of the service distribution and models of rural outreach by specialist doctors living in metropolitan or rural locations, in Australia.

O'Sullivan B, McGrail M, Joyce C, Stoelwinder J. Service distribution and models of rural outreach by specialist doctors in Australia: a national cross-sectional study. Australian Health Review 2015. Permission to reproduce for the thesis is provided as part of the Licence to Publish.

## Declaration for Thesis Chapter 6

### Declaration by candidate

In the case of Chapter 6, the nature and extent of my contribution to the work on the manuscript:

“Service distribution and models of rural outreach by specialist doctors in Australia: a national cross-sectional study” was the following:

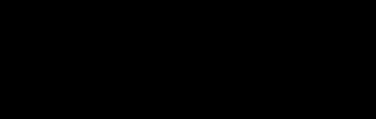
Nature of contribution	Extent of contribution (%)
Conception, identification and collation of literature, data analysis and drafting of manuscript	85%

The following co-authors contributed to the work.

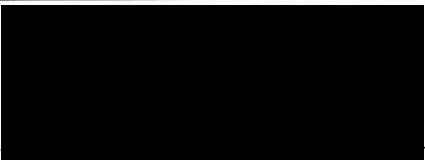
Name	Nature of contribution
Dr Matthew McGrail	Provided critical advice about concept, design, writing and analysis
Prof Just Stoelwinder	Provided critical advice about concept, design, writing and analysis
Adj A/Prof Catherine Joyce	Provided critical advice about concept, design, writing and analysis

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work.

Candidate's  
Signature

	Date 1/12/15
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Main  
Supervisor's  
Signature

	Date 1/12/15.
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## Service distribution and models of rural outreach by specialist doctors in Australia: a national cross-sectional study

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### Abstract

**Objective.** This paper describes the service distribution and models of rural outreach by specialist doctors living in metropolitan or rural locations.

**Methods.** The present study was a national cross-sectional study of 902 specialist doctors providing 1401 rural outreach services in the Medicine in Australia: Balancing Employment and Life study, 2008. Five mutually exclusive models of rural outreach were studied.

**Results.** Nearly half of the outreach services (585/1401; 42%) were provided to outer regional or remote locations, most (58%) by metropolitan specialists. The most common model of outreach was drive-in, drive-out (379/902; 42%). In comparison, metropolitan-based specialists were less likely to provide hub-and-spoke models of service (odd ratio (OR) 0.31; 95% confidence interval (CI) 0.21–0.46) and more likely to provide fly-in, fly-out models of service (OR 4.15; 95% CI 2.32–7.42). The distance travelled by metropolitan specialists was not affected by working in the public or private sector. However, rural-based specialists were more likely to provide services to nearby towns if they worked privately.

**Conclusions.** Service distribution and models of outreach vary according to where specialists live as well as the practice sector of rural specialists. Multilevel policy and planning is needed to manage the risks and benefits of different service patterns by metropolitan and rural specialists so as to promote integrated and accessible services.

**What is known about this topic?** There are numerous case studies describing outreach by specialist doctors. However, there is no systematic evidence describing the distribution of rural outreach services and models of outreach by specialists living in different locations and the broad-level factors that affect this.

**What does this paper add?** The present study provides the first description of outreach service distribution and models of rural outreach by specialist doctors living in rural versus metropolitan areas. It shows that metropolitan and rural-based specialists have different levels of service reach and provide outreach through different models. Further, the paper highlights that practice sector has no effect on metropolitan specialists, but private rural specialists limit their travel distance.

**What are the implications for practitioners?** The complexity of these patterns highlights the need for multilevel policy and planning approaches to promote integrated and accessible outreach in rural and remote Australia.

**Additional keywords:** fly-in fly-out, hub-and-spoke, medical specialist.

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### Introduction

Rural outreach service delivery is a key strategy to help rural and remote populations overcome geographic, cost and cultural

barriers to accessing specialist services. Outreach clinics support resident primary health workers to manage complex illness, reducing hospitalisation rates.<sup>1</sup> Moreover, they can achieve



equivalent health outcomes to metropolitan-based clinics.<sup>2,3</sup> Around one in five Australian specialists participates in rural outreach work, with research indicating that service distribution differs according to where specialists live.<sup>4</sup> However, we lack national-scale evidence to more explicitly describe the spatial distribution of services and service models underpinning rural outreach by specialists from different locations. Identifying these patterns and the drivers at play will inform the development of strategies to promote integrated and accessible outreach services.

Only 15% of specialists, but 30% of the population, live in rural and remote areas, which span 99.8% of Australia's land mass.<sup>5,6</sup> Metropolitan areas have a greater range of specialists<sup>7</sup> and account for approximately three-quarters (68%) of outreach providers.<sup>4</sup> However, there is no information about where their services, compared with those of rural-based specialists, are provided.

Apart from where services are provided, models by which metropolitan- and rural-based specialists deliver these outreach services raise different planning implications. Several outreach models have been loosely described, including hub-and-spoke, fly-in, fly-out (FIFO) and drive-in, drive-out (DIDO),<sup>8,9</sup> but they remain to be defined and quantified, including whether their prevalence varies by location. Conceptually, they relate to different structural configurations of services delivered within or beyond regional boundaries, via different modes of transport.

The hub-and-spoke model is typically organisationally driven and intends to promote integrated care because workers in the hub know the context at spoke sites, acting as a referral site for higher-level services, to manage care within a geographic boundary. It is a formal policy of the Queensland government,<sup>10</sup> but the capacity for such models in the public sector could be limited because 33% of all medical specialists work solely in the public sector and 48% in mixed public and private practice, in both metropolitan or rural areas.<sup>11</sup> Restricted case studies exemplify specialists within hub-and-spoke models visiting towns within a 300-km boundary.<sup>2,3,9</sup>

The FIFO model commonly refers to the flexible deployment of individual staff over long distances, usually to a key site, on a rostered basis.<sup>12</sup> Limited case studies exemplify specialists flying to provide outreach services to a key town more than 300 km away,<sup>13,14</sup> but its viability depends on the specialist's access to long-distance transport and capacity to absorb transport costs. A variant on this model involves flying to more than one distant location.<sup>9</sup> Both variants risk poor regional integration.

The DIDO model is poorly defined in the literature. A parliamentary inquiry into FIFO practices in regional Australia suggested DIDO involves shorter distance commuting by car.<sup>12</sup> Delivering services nearby could be an organisational initiative and occur within a regional boundary similar to the hub-and-spoke model, but targeting only one nearby town, as somewhat a model of convenience.

Whether the specialist normally works in public or private practice also has the potential to affect the distribution of outreach services because of responsibility for the costs incurred. Those working in mixed or private practice can incur direct costs for outreach travel and opportunity costs for travel time. They may require adequate clinical throughput to enable sufficient financial reimbursement via a fee-for-service

payment system. Conversely, salaried public-employed specialists have their time covered and are reimbursed for travel expenses.

Patterns of outreach service distribution by metropolitan and rural-based specialists are also likely to vary at a local level with regard to different regional contexts, such as the size and location of regional towns, how remote the catchment is and whether major regional towns have any formal plan for specialist outreach services.

The aims of the present paper are to describe service distribution and models of rural outreach by specialist doctors living in metropolitan or rural locations, how service distribution varies by working in public or private practice and to use case studies to explore the role of regional context.

## Methods

Data come from the Medicine in Australia: Balancing Employment and Life (MABEL) longitudinal survey of doctors (<https://mabel.org.au/>, accessed 5 August 2015). Between June and November 2008, all doctors undertaking clinical work in Australia were invited to participate in the study.<sup>15</sup> Overall, 4596 or 22% of all Australian specialist doctors who had completed advanced training to gain accreditation with a specialist medical college participated by completing either a paper or online survey. Selection bias was tested by the MABEL research team, showing respondents were broadly representative based on key covariates, age, sex, hours worked and location.<sup>15</sup> As indicated in Table 1, the characteristics of specialists in the cohort were similar to those of the national specialist workforce.

Specialists were asked whether they 'travel to provide services/clinics in other geographic locations' and could report up to three locations they visited. The present cohort included specialists who travelled to provide clinics or services to at least one identifiable rural location. Thirty-five specialists who reported visiting 'various locations' were not considered rural outreach providers, but rather locum workers or retrieval services. Locations were geo-coded and categorised according to the five-level Australian Standard Geographical Classification Remoteness Area scale.<sup>16</sup> Rural locations included inner regional, outer regional, remote and very remote.

The study was approved by The University of Melbourne, Faculty of Business and Economics Human Ethics Advisory Group (Ref. 0709559) and the Monash University Standing Committee on Ethics in Research Involving Humans (Ref. CF07/1102-2007000291).

## Predictors

The specialist's residential location was used to define the base location as either metropolitan (major city) or rural (four categories, as defined above). Seven specialists not indicating a residential location were excluded because the distance they travelled could not be measured.

Practice sector was defined using information about weekly hours worked in public hospitals, private hospitals, private consulting rooms or 'other' (e.g. aged care facilities, tertiary education; Table 2).

**Table 1. Characteristics of specialist doctors in the 2008 Medicine in Australia: Balancing Employment and Life (MABEL) sample ( $n = 4596$ )<sup>A</sup>**

Unless indicated otherwise, data are given as the number of subjects in each group with percentages in parentheses

	Males		Females	
	MABEL	Population <sup>B</sup>	MABEL	Population
Mean age (years)	52.4	50.6	46.5	45.2
Age group (years)				
<45	938 (20%)	6284 (26%)	637 (14%)	3334 (14%)
45–64	1937 (42%)	9596 (40%)	580 (13%)	2569 (11%)
65+	422 (9%)	2252 (9%)	43 (1%)	255 (1%)
Mean total clinical hours worked	47.2	47.0	38.2	37.8
Location of main place of work				
Metropolitan	2457 (53%)	13 340 (68%)	1042 (23%)	3646 (19%)
Rural	625 (14%)	2203 (11%)	158 (3%)	389 (2%)
Specialist type				
Other specialists	1575 (34%)	8159 (34%)	691 (15%)	3484 (14%)
Internal	862 (19%)	4968 (21%)	374 (8%)	1743 (7%)
Pathology	117 (3%)	707 (3%)	58 (1%)	430 (2%)
Surgery	498 (11%)	4298 (18%)	60 (1%)	500 (2%)
Total	3318 (72%)	18 132 (75%)	1278 (28%)	6158 (25%)

<sup>A</sup>Overall, 21 male and 18 female respondents to the MABEL survey were missing observations about age, 207 male and 55 female respondents were missing observations about total hours worked, 236 male and 78 female respondents were missing observations about the location of the main place of work and 266 male and 85 female respondents were missing observations about specialist type.

<sup>B</sup>Data on the Australian specialist workforce population were obtained from the Australian Medical Labour Force Survey data 2009 ( $n = 24\ 290$ ) (Australian Institute of Health and Welfare (AIHW). Medical Labour Force Survey. Canberra: AIHW, 2009. Available at: <http://www.aihw.gov.au/publication-detail/?id=10737419680&tab=3> [verified 5 August 2015]), except for data on location of main place of work, which were obtained from the 2008 Australian medical directory dataset ( $n = 19\ 578$ ) (Australasian Medical Publishing Company Direct (AMPCo). Australian Medical Directory Dataset Sydney: AMPCo Direct; 2008).

**Table 2. Normal sector of practice, used in the analysis**

Sector	Usual weekly hours worked
Public	All hours worked in public hospital only
Private	Hours worked in private consultation rooms and/or private hospital, not public hospital
Mixed, mainly public	Hours worked in public and private sectors but spends more than median total hours in public hospital ( $\geq 33\%$ )
Mixed, mainly private	Hours worked in public and private sectors but spends less than median total hours in public hospital ( $< 33\%$ )

### Outcome measures

#### Spatial distribution of services

Four mutually exclusive patterns of outreach service distribution were defined based on specialist residential and outreach locations: (1) metropolitan to inner regional; (2) metropolitan to outer regional or remote; (3) rural to inner regional; and (4) rural to outer regional or remote.<sup>16</sup>

#### Models of outreach

Five mutually exclusive models of outreach service delivery were defined to enable standardised comparison between metropolitan and rural-based specialists and to draw out different planning implications. Four models were based on the typical configurations of distance travelled, number of communities visited and transport mode, as described in published case studies<sup>2,3,9,12–14</sup> (see Table 3). A mixed model was also defined to account for the small proportion of remaining specialists.

Travel distance was calculated by the straight-line distance in kilometres between each residential location and corresponding

outreach location(s) as a conservative estimate. Straight-line distance approximates the flight path to distant locations and accommodates the fact that most major highways are relatively direct to regional areas. A cut-off of  $< 300$  km or  $\geq 300$  km was applied because this was consistent with the distance travelled in published case studies of different models in practice (Table 3). Personal Communication by the main author (BOS) with rural service delivery stakeholders confirmed that 300 km reasonably approximated regional boundaries.

To analyse practice sector, specialist residential location was stratified as metropolitan or rural. To account for cell sizes, specialists were categorised as providing outreach to local ( $< 300$  km) or distant towns ( $\geq 300$  km) according to the most distant service provided.

#### Statistical analyses

Fisher's Chi-squared test was used to examine the association between metropolitan or rural-based specialists and the remoteness of outreach service distribution. The mean distance specialists travelled was also calculated.



**Table 3. Five mutually exclusive models of outreach used in the analysis**  
DIDO, drive-in, drive-out; FIFO, fly-in, fly-out

Model	References	No. locations <sup>A</sup>	Distance from base location <sup>A</sup> (km)	Description and implications
DIDO	12	1	<300	Outreach services to towns within a regional boundary, convenient for the specialist to provide, normally by car; potentially fragmented
Hub-and-spoke	2, 3, 9	2–3	<300	Outreach services to multiple towns within a regional boundary <sup>B</sup> and integrated at an organisational level with a hub
FIFO	13, 14	1	≥300	Outreach services to a key location normally by flight, which bypasses regional boundaries; potentially fragmented and costly to provide
Multiple distant	9	2–3	≥300	A variant of FIFO, but services are to multiple key locations, normally by flight, bypassing regional boundaries; potentially fragmented and more costly to provide than FIFO services to one location
Mixed		2–3	<300 and ≥300	A mixture of services to towns in the region or bypassing regional boundaries

<sup>A</sup>The cut-off point of 300 km was based on published case studies exemplifying the number of locations and distance travelled by medical specialists working under different models.

<sup>B</sup>The regional boundary could be the major regional centres of the state they live in for metropolitan specialists, or towns within the health region they work in for rural specialists.

The association between metropolitan or rural-based specialists and the model of outreach was measured using univariate logistic regression as odds ratios (OR) and 95% confidence intervals (CI).

Separate univariate logistic regression tested the association between practice sector and local or distant distribution of outreach. Specialists who reported most of their work hours in the 'other' setting and who worked <10 h in public or private settings or both public and private (for the mixed sector group) were excluded from this analysis.

Cross-sectional sampling weights were applied to all calculations of proportions and statistical analyses of models of outreach and doctor's practice sector.

#### *Regional context: case studies*

Eight regional towns were purposefully selected as key rural hubs to study the effect of regional context. They reflected different populations (20 000–250 000), hospital sizes (<100 or ≥100 beds), locations (with remote vs regional catchments, proximity to metropolitan areas, inland or coastal) and six states and territories, one of which had a formal plan for specialist outreach. Between one and three nearby towns within the vicinity of the regional town (hub) were chosen based on having a viable population to support an outreach service (>5000 people)<sup>17</sup> and being less than 3-h drive away or easily reached in <2 h by flight according to Google Maps (<http://maps.google.com>, accessed 5 August 2015). The range of service patterns by metropolitan and rural-based specialists were examined by the authors to determine typical patterns specific to Australia's rural and remote population dispersion and geography.

#### **Results**

Of 4596 specialists who responded, weighted analysis showed 909 (19%) provided rural outreach services; seven were excluded because they had no residential address. The final cohort of 902 specialists provided 1401 rural outreach services. Most (79%) were male, their mean age was 50.8 years, they worked an average of 46.6 clinical hours per week and 33% were internal

physicians, 47% were other specialists, 16% were surgeons and 4% were pathologists. Specialist types in the cohort have been described previously.<sup>4</sup>

#### *Spatial distribution of services*

Forty-two per cent (585/1401) of outreach services were provided to outer regional or remote rather than to inner regional locations, and most of these ( $n = 338$ ; 58%) were provided by metropolitan-based specialists. Outer regional or remote outreach services were significantly associated with rural specialists ( $n = 247$ ; 48% of all rural services vs 38% of all metropolitan services;  $P < 0.0001$ ).

Metropolitan-based specialists travelled a mean distance of 262 km to inner regional and 954 km to outer regional or remote locations. Rural-based specialists travelled an average of 106 km to inner regional and 318 km to outer regional or remote locations.

#### *Models of rural outreach*

The most common outreach model based on weighted analysis was DIDO ( $n = 379/902$ ; 42%), with 74% provided by metropolitan-based specialists. Other common models were the hub-and-spoke ( $n = 183$ ; 19%) and FIFO ( $n = 168$ ; 20%). Metropolitan specialists were significantly less likely to provide outreach services via a hub-and-spoke model compared with DIDO (OR 0.31; 95% CI 0.21–0.46), but significantly more likely to provide outreach via FIFO (OR 4.15; 95% CI 2.32–7.42) or multiple distant models (OR 3.60; 95% CI 1.79–7.24; Table 4).

#### *Practice sector*

There were no significant associations between practice sector and providing local or distant outreach services by metropolitan-based specialists (Table 5). Public sector specialists in rural and metropolitan areas provided similar rates of local outreach services (60% and 55%, respectively). However, within the rural specialist group, compared with public sector specialists, local outreach service models were significantly associated with private only (OR 3.16; 95% CI 1.01–9.94) and mixed practice,

whether mainly private (OR 7.13; 95% CI 2.74–18.60) or mainly public (OR 2.83; 95% CI 1.35–5.93).

### Regional context

There were three typical patterns by which regional context tended to affect outreach service distribution, two which applied to isolated regional towns with remote catchments and one to regional towns in areas of higher population concentration (Table 6). Outreach services were more likely to be provided from isolated regional towns serving remote catchments, which also had larger regional hospitals and a formal outreach service plan. If the regional hospital was smaller and direct commercial air transport was available to the nearby remote sites,

metropolitan-based specialists provided most services. In regional towns in areas of higher population concentration, a disorganised mix of rural and metropolitan-based specialists provided outreach services.

### Discussion

This paper demonstrates that nearly half of all rural outreach services are provided to outer regional or remote, rather than inner regional, locations. Many intersecting factors affected service distribution and models of rural outreach, including where specialists live, the practice sector of rural specialists and the regional context.

### Where specialists live

Rural-based specialists provided a higher rate of outreach services to outer regional or remote locations compared with metropolitan specialists. However, metropolitan-based specialists boosted the overall number of outer regional or remote services. Metropolitan-based specialists more commonly provided FIFO or multiple distant models of outreach service. Furthermore, although they were less prone to provide outreach services through hub-and-spoke models, they provided the majority of all DIDO services.

The policy implications with regard to using metropolitan-based outreach services are twofold. First, they involve managing a high rate of service delivery that bypasses regional boundaries and, second, being aware of the large number of services targeting one nearby town through the DIDO model. The FIFO model allows some flexibility to reach more distant communities and adapt services to changing needs.<sup>9</sup> To mitigate the risk of disconnected care, these services need to communicate a regular, predictable visiting schedule,<sup>18</sup> spend sufficient time

**Table 4. Association between metropolitan-based<sup>A</sup> specialist doctors and model of outreach<sup>B</sup>**

Unless indicated otherwise, data are given as the number of subjects in each group with percentages in parentheses. DIDO, drive-in, drive-out; FIFO, fly-in, fly-out; OR, odds ratio; CI, confidence interval

Model of outreach	Metropolitan based	Rural based	Univariate OR (95% CI)	P-value
DIDO	264 (74%)	115 (26%)	Reference 1.0	
Hub-and-spoke	77 (47%)	106 (53%)	0.31 (0.21–0.46)	<0.0001
FIFO	151 (92%)	17 (8%)	4.15 (2.32–7.42)	<0.0001
Multiple distant	66 (91%)	12 (9%)	3.60 (1.79–7.24)	<0.0001
Mixed	58 (69%)	36 (31%)	0.78 (0.48–1.27)	0.31
Total	616	286	–	–

<sup>A</sup>Base location coded according to the specialist's residential location, using Australian Standard Geographical Classification Remoteness Area (ASGC-RA) scale.<sup>16</sup>

<sup>B</sup>Analysis includes 902 specialist doctors who provided outreach services and cross-sectional sampling weight. Models are defined in Table 3.

**Table 5. Association between practice sector at main practice and outreach to local towns<sup>A</sup> stratified by base location<sup>B</sup> of the specialist doctor<sup>C</sup>**

Unless indicated otherwise, data are given as the number of subjects in each group with percentages in parentheses. OR, odds ratio; CI, confidence interval

	Local towns	Distant towns	Univariate OR (95% CI)	P-value
Outreach by metropolitan-based specialist	<i>n</i> = 323	<i>n</i> = 255		
Practice arrangement				
Public only	94 (55%)	76 (45%)	Reference 1.0	
Private only	46 (46%)	48 (54%)	0.72 (0.43–1.21)	0.22
Mixed-mainly private	95 (59%)	65 (41%)	1.20 (0.76–1.87)	0.44
Mixed-mainly public	88 (57%)	66 (43%)	1.10 (0.70–1.74)	0.68
Outreach by rural-based specialist	<i>n</i> = 213	<i>n</i> = 61		
Practice arrangement				
Public only	38 (60%)	30 (40%)	Reference 1.0	
Private only	26 (83%)	5 (17%)	3.16 (1.01–9.94)	0.049
Mixed-mainly private	76 (92%)	7 (8%)	7.13 (2.74–18.60)	<0.0001
Mixed-mainly public	73 (81%)	19 (19%)	2.83 (1.35–5.93)	0.006

<sup>A</sup>Local towns included specialist doctors travelling to one or more towns <300 km from their residential location. Distant towns included travelling to at least one town ≥300 km away.

<sup>B</sup>Base location coded according to the specialist's residential location, using Australian Standard Geographical Classification Remoteness Area (ASGC-RA) scale.<sup>16</sup>

<sup>C</sup>Analysis includes 852 specialist doctors who provided outreach services. Nine specialists (eight metropolitan, one rural) were missing observations about hours worked in different settings, so their practice sector could not be coded, and 41 specialists (30 metropolitan, 11 rural) predominantly worked in 'other' settings. Analysis includes cross-sectional sampling weight.



**Table 6. Regional-level characteristics affecting outreach service distribution by metropolitan and rural doctors**

Pattern	Characteristics of the hub and nearby towns	Mix of outreach services <sup>A</sup>
1	Isolated regional town with nearby remote communities with large hospital ( $\geq 100$ beds) and formal plan for outreach from the regional town to remote towns nearby	Specialists living in the regional town provide most of the outreach to remote sites
2	Isolated regional town with small hospital ( $<100$ beds); direct flights available to remote towns in catchment from metropolitan area	Remote towns supplied by metropolitan specialists also visiting the regional town
3	Regional town of various size in area of higher population concentration	Few specialists deployed from regional town; metropolitan specialists provide services to the regional or rural towns in the region, not both

<sup>A</sup>Outreach to the regional town was provided primarily by metropolitan-based specialists in all cases.

on the ground to engage with local staff,<sup>19</sup> work in a culturally sensitive way, use local referral networks, provide high-quality team-based handovers to conclude each visit<sup>20</sup> and allow for local staff to contact them between visits.<sup>2</sup> Given that 20% of Australia's rural population resides in 1500 communities of fewer than 5000 people,<sup>8</sup> deciding about where to provide FIFO services also needs to be sensitive to sustainability, efficiency and equity principles.

The large number of DIDO services provided by metropolitan specialists is likely to be related to delivering services to larger regional centres near major cities. This is potentially related to the specific equipment or staff needs of subspecialists and proceduralist specialists. Nearby regional towns may also offer higher financial return than more remote locations because of the size of regional communities and their potential willingness to pay to offset the costs of regularly seeking care in metropolitan areas. However, it is also possible that outreach is overused in regional areas when permanent services are viable.<sup>12</sup> A key policy challenge is to ensure that outreach services to regional areas focus on specialties that best complement, and do not detract from, existing rural-based services, and that they are not concentrated in one regional town without considering the needs of other rural communities.

Rural specialists provided a smaller proportion of DIDO services and a higher proportion of hub-and-spoke services compared with metropolitan specialists, but rural services overall are not as far-reaching.

#### Practice sector

The sector of practice made no difference to how far specialists travelled from metropolitan locations, probably because of the better access to expedient transport by flight, which limits the loss of income related to travel time. Conversely, rural specialists working in mixed or private practice are likely to travel nearby, perhaps to ensure the practice is financially sustainable. Outreach services by private rural specialists could enhance in-referral and limit the pressure on the public sector, where fewer specialists work overall. However, it is important that they are coordinated and targeted to reach communities most in need of care, not just those able to pay. Informal as well as formal links between rural specialists in the same region are likely to increase the chance that specialists in different sectors know who is going where and when. Implementing more deliberate strategies, such as clinical networks,

could also be important to promote coordinated regional service delivery between the public and private sector.<sup>21</sup>

#### Regional context

The characteristics of regions including how isolated they are, the population concentration, the size of regional hospital, whether outreach is formally planned and the availability of air transport has the potential to affect the distribution of regionally-based outreach services. This means that the supply of specialists will vary by regional context. In the Northern Territory, specialist outreach services are formally planned and other proposed outreach services are expected to communicate with planned services.<sup>22</sup> This is likely to reinforce regionally-based outreach, but is not pragmatic for regional areas with smaller hospitals and fewer local specialists.

The disorganised mix of rural and metropolitan-based specialists apparent across more densely populated regions, suggests they are likely to benefit from developing: (1) a clear position about the role of outreach to and from the regional centre and the services the public sector will deploy; (2) systems to remain abreast of local outreach activity; and (3) methods to develop partnerships that promote integrated service delivery and services that match regional need.

#### Limitations

The present study was limited to the spatial dimension of accessibility (locations visited), not the frequency of visits or the nature or quality of the outreach work. We were restricted to using MABEL covariates to describe the models, so we could not measure more than three locations per specialist, the transport mode or exact regional boundaries. The 300 km cut-off for the local travel model is reasonable for more populated states, but may not sensitively reflect the size of regional boundaries in areas of low population density. However, straight-line distance calculations underestimate the distance travelled by road, potentially overestimating the proportion of specialists providing services  $<300$  km away.

Despite weighting the analysis, there is some potential for bias from other unweighted covariates, namely childhood years of rural background, practice management and overall work satisfaction.

Data from 2008 were used to show the complexity of outreach systems. These findings are relevant to current policy and planning challenges.

## Conclusion

The spatial distribution of services and models of rural outreach by specialist doctors are inherently complex and vary according to where specialists live, the practice sector of rural specialists and the regional context. The variation in service patterns highlights the capacity to better use outreach services by specialists living in different locations, as well as the risks that need to be mitigated to promote integrated and accessible services. Given specialists commonly visit a single location, considerable effort is needed to ensure services are appropriately targeted and that services from metropolitan and rural areas are coordinated. Rather than one simple policy solution, the complexity of service patterns highlights the need for multilevel policy and planning to promote integrated and accessible outreach in rural and remote Australia.

## Competing interests

None declared.

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## **6.3 Conclusion**

The research in Chapter 6 provides the first description of how outreach services are distributed in Australia, by specialists living in different locations.

The findings suggest that many intersecting factors have the potential to influence service distribution and models of rural outreach including where specialists live, the practice sector of rural specialists and the regional context (such as the degree of population dispersion, size of regional hospitals and air transport options).

Particularly, metropolitan and rural-based specialists have different levels of service reach and models of service provision, with inherently different risks and benefits. The complexity of outreach service patterns, by different types of specialists, travelling from different locations and working in different practice sectors, suggests the need for multilevel policy and planning to promote integrated and accessible services. Coordinated and integrated services are likely to be particularly challenging in more densely populated regions where metropolitan and rural-based specialist services are more likely to overlap.

To build on information about the extent of rural outreach work in Chapter 5, and where outreach services are distributed in Chapter 6, Chapter 7 explores whether rural outreach services are sustained. This includes determining whether such services continue to visit the same community over time and the factors influencing this such as the distance travelled and town size.

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# Chapter 7: Sustaining rural outreach

## 7.1 Introduction

Chapter 7 focuses solely on the fourth research question: *How sustained are rural outreach services and what factors influence service stability?* The results of Chapter 5 suggested around one in five specialists participate in rural outreach work, and Chapter 6 described the patterns of such work, however, the rate at which rural outreach services are sustained and the factors influencing the stability of such services are yet to be systematically studied. Sustaining rural outreach by specialist doctors is a goal of the Australian Government Rural Health Outreach Fund, as described in Chapter 3.

Chapter 1 defined a key component of sustained rural outreach services is that they are continued to a specific town over time. There are multiple case reports of specialists providing ongoing rural outreach services (Table 2.1 of Chapter 2), however such reports are likely to be positively biased.

This Chapter uses longitudinal data to observe whether specialists providing rural outreach services at entry to the MABEL survey (2008 and 2009) (as per the definition used in Chapters 5 and 6), continued to travel to provide services in the same town over time (up to 2011). Variables studied include the specialist's sex, career stage, practice sector, location, distance travelled and town characteristics.

## 7.2 The stability of rural outreach services

The published manuscript that forms the main basis of Chapter 7 describes a longitudinal study of the stability of rural outreach services by specialist doctors in Australia.

O'Sullivan, B.G., Stoelwinder, J., McGrail, M.R. The stability of rural outreach services: a national longitudinal study of specialist doctors. *Medical Journal of Australia* 2015;03(7):297.e1-297.e6. doi: 10.5694/mja15.00369 © Copyright 2015 The Medical Journal of Australia. Reproduced with permission.



## Declaration for Thesis Chapter 7

### Declaration by candidate

In the case of Chapter 7, the nature and extent of my contribution to the work on the manuscript: "The stability of rural outreach services: A national longitudinal study of specialist doctors" was the following:

Nature of contribution	Extent of contribution (%)
Conception, identification and collation of literature, data analysis and drafting of manuscript	85%

The following co-authors contributed to the work.

Name	Nature of contribution
Dr Matthew McGrail	Provided critical advice about concept, design, writing and analysis
Prof Just Stoelwinder	Provided critical advice about concept, design, writing and analysis

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work.

Candidate's Signature		Date 1/12/15

Main Supervisor's Signature		Date 1/12/15

# The stability of rural outreach services: a national longitudinal study of specialist doctors

**O**utreach health care services by medical specialists, involving travel away from their normal practice to underserved areas, is a key strategy to promoting access to such services in rural Australia. Evidence shows that rural outreach clinics can improve access to specialist services, reducing hospitalisations<sup>1</sup> and achieving similar clinical outcomes to metropolitan-based clinics.<sup>2,3</sup> The degree to which specialists continue to visit the same town over time is important to sustaining access and supporting follow-up care. About one in five Australian specialists provides rural outreach services,<sup>4</sup> but we do not know how stable these services are.

The available evidence about the continuity of rural outreach services is scant, localised to individual services, and descriptive in nature. One small-scale qualitative evaluation has shown how service structure and design can influence outreach sustainability, but it was restricted to a remote setting.<sup>5</sup> Case studies of successful ongoing outreach services by a selected range of specialist types in both rural and regional settings have been reported.<sup>1,6,7</sup>

A parliamentary enquiry that appraised outreach services in regional Australia suggested that outreach health care might better balance the social and professional needs of practitioners than their being permanently located in a rural area.<sup>8</sup> In one survey, visiting specialists reported less negative effects of rural practice than did resident specialists.<sup>9</sup> However, an evaluation of several demonstration outreach services of at least 5 years' duration indicated that diverse challenges can threaten ongoing service provision. In particular, the leadership of individual specialists was considered to play a strong part in sustaining outreach service delivery.<sup>6</sup>

Since 2000, the Australian government has provided subsidies for the

## Abstract

**Objective:** To explore the characteristics of specialists who provide ongoing rural outreach services and whether the nature of their service patterns contributes to ongoing outreach.

**Design, participants and setting:** Specialist doctors providing rural outreach in a large longitudinal survey of Australian doctors in 2008, together with new entrants to the survey in 2009, were followed up to 2011.

**Main outcome measures:** Providing outreach services to the same rural town for at least 3 years.

**Results:** Of 953 specialists who initially provided rural outreach services, follow-up data were available for 848. Overall, 440 specialists (51.9%) provided ongoing outreach services. Multivariate analysis found that participation was associated with being male (odds ratio [OR], 1.82; 95% CI, 1.28–2.60), in mid-career (45–64 years old; OR, 1.44; 95% CI, 1.04–1.99), and working in mixed, mainly private practice (OR, 1.73; 95% CI, 1.18–2.53). Specialists working only privately were less likely to provide ongoing outreach (OR 0.51; 95% CI, 0.32–0.82), whereas metropolitan and rural-based specialists were equally likely to do so. Separate univariate analysis showed travelling further to remote towns had no effect on ongoing service provision. Outreach to smaller towns was associated with improved stability.

**Conclusions:** Around half of specialists providing rural outreach services continue to visit the same town on an ongoing basis. More targeted outreach service strategies should account for career stage and practice conditions to help sustain access. Financial incentives may increase ongoing service provision by specialists only working privately. There is some indication that outreach services delivered to smaller communities are more stable.

costs of rural outreach work, most recently through the Rural Health Outreach Fund (RHOF).<sup>10</sup> However, to effectively target the RHOF, more information is needed about the determinants of ongoing practice.

The factors influencing ongoing outreach service provision by specialists are yet to be established. The aim of this study was to explore the characteristics of specialists who provide ongoing outreach services, and to determine whether the nature of their service patterns contributed to ongoing service delivery.

## Methods

Our study was based on a large national longitudinal survey of Australian doctors, the Medicine in Australia: Balancing Employment and Life (MABEL) study (mabel.org.au). The MABEL study commenced in 2008 by inviting all Australian

doctors listed on the Australasian Medical Publishing Company directory (AMPCo Direct), the most comprehensive listing of medical practitioners in Australia at the time, to complete a print or online copy of a survey between June and November 2008. Doctors who responded were re-surveyed on an annual basis, between June and November each year, and doctors who were new to the AMPCo database (returning to the workforce or new graduates) were also surveyed. The participants were broadly representative of Australian doctors in general.<sup>11,12</sup>

## Study cohort

We included specialist doctors who had completed advanced training to gain accreditation from a specialist medical college, who were working clinically, and who, when they first completed the survey in 2008 or 2009, had indicated that they had travelled to provide services in other

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## Research

geographic locations and had reported at least one rural location to which they had travelled (up to three could be listed). Locations were geocoded using the Australian Standard Geographical Classification — Remoteness Areas categories.<sup>13</sup> Specialists not reporting a residential location (12 doctors) or a specific location that they had visited (35 doctors) were excluded from the study.

### Outcomes

The series of annual surveys allowed us to observe whether specialists continued to travel to provide services to rural locations. Ongoing outreach was defined as providing outreach service to the same rural or remote town for at least a 3-year period (from 2008 or 2009, up to 2011). Ongoing outreach service delivery was assumed when data were missing if the specialist had provided outreach to the same town over at least two time points spanning at least a 3-year period, and in the interim year, (1) they did not respond to the survey, or (2) they continued to work clinically, with no indication that they had ceased travelling or had travelled to different communities.

The alternative outcome, ad hoc outreach, included specialists who responded to the survey over at least two time points, but who provided rural outreach service to the same community for less than 3 years, or ongoing outreach service was interrupted by a year of non-clinical work, not travelling, or visiting other towns.

### Variables

Predictive variables were assessed when the specialist first completed the survey (2008 or 2009).

Age was categorised to reflect career stages: early career, < 45 years; mid-career, 45–64 years; and near-retirement, ≥ 65 years.

The definition of practice sector was based on weekly hours worked in public hospitals, private hospitals, private consulting rooms, or “other” (aged care, education and other). Three categories were applied: “public sector” (public hospital only),

“private sector” (private consultation rooms and/or private hospital, not public hospitals) and “mixed sector” (both public sector and “private sector”). “Mixed sector” was further disaggregated to “mainly public” if the specialist spent more than the median hours (equivalent to more than 31% of their total work time) in a public hospital, or “mainly private”. Specialists who reported most of their work hours in the “other” setting and less than 10 hours’ work in public or private sectors or both public/private (if a mixed sector specialist) were excluded from this study.

The main specialty was self-selected from a list of 48 accredited specialties.

Four service patterns were defined according to the specialist’s residential location (metropolitan or rural) and service destination (inner regional or outer regional/remote). The most remote service pattern was used if more than one rural location was visited.

Locations were approximated using town centroids, and straight-line distances (in kilometres) were calculated between the residential and outreach location. Distance was categorised as “local” (< 300 km) or “distant” (≥ 300 km), reflecting the probability that the specialist drove to the location. The most distant service was used if more than one rural location was visited.

Town size was categorised into four groups that were relatively homogeneous according to professional and non-professional indicators: < 5,000; 5,000–15,000; 15,001–50,000; > 50,000 people.<sup>14</sup> The most remote town visited was applied if more than one rural town was visited.

The number of rural locations visited was re-coded as 1 or 2–3.

### Analysis

Data were analysed using Stata version 11.2 (StataCorp). First, bivariate associations of four covariates (age, sex, residential location and practice sector) were tested by logistic regression, odds ratios (ORs) and 95% confidence intervals (CIs) to explore the characteristics of specialists who provided ongoing outreach.

Interactions were tested in the adjusted model using the Wald test. A single multiple logistic regression model included all these covariates.

A second, separate logistic regression tested the association between specialist type and ongoing outreach, expressed as ORs and 95% CIs. Deviation contrasts compared each category of specialist type with the grand mean.

Finally, the association between the specialist’s service patterns and ongoing outreach was tested by bivariate associations (ORs and 95% CIs) for the remoteness of outreach service provision from metropolitan or rural locations, distance travelled, town size and number of rural locations visited.

The study was part of a research program with ethics approval from the University of Melbourne (Ref. 0709559) and Monash University (Ref. CF07/1102 – 2007000291).

### Results

A total of 4596 specialists (22.3% of those invited) completed the MABEL survey in 2008, and 348 specialists new to AMPCo (44.1%) responded in 2009. After exclusions, the cohort providing rural outreach services included 953 specialists (893 in 2008, 60 in 2009). Of these, 105 (92 in 2008, 13 in 2009) did not respond to subsequent surveys or were not working clinically after entry to the survey. No attrition bias based on age ( $P = 0.30$ ) or sex ( $P = 0.08$ ) was detected.

We compared the characteristics of the final cohort of 848 specialists with those of the medical specialist workforce in Australia, and found that they were similar with respect to age, hours worked and specialist group (Box 1). The exception was that the proportion of older and rural doctors in the study cohort was approximately double that for the national specialist workforce; rural-based male specialists are more likely to participate in outreach work.<sup>4</sup>

### Specialist characteristics

A total of 440 of 848 specialists (51.9%) provided regular outreach to

**1 Characteristics of medical specialists providing rural outreach services, compared with those of the general Australian medical specialist workforce**

	Specialist doctors providing rural outreach (n = 848)		Australian specialist workforce (n = 24 290)*	
	Male	Female	Male	Female
<b>Number (% of group)</b>	656 (77.4%)	192 (22.6%)	18 132 (74.6%)	6158 (23.4%)
<b>Age</b>				
< 45 years	171 (20.2%)	76 (9.0%)	6284 (25.9%)	3334 (13.7%)
45–64 years	331 (39.0%)	103 (12.1%)	9596 (39.5%)	2569 (10.6%)
≥ 65 years	154 (18.2%)	13 (1.5%)	2252 (9.3%)	255 (1.0%)
Mean age, years	51.4	46.8	50.6	45.2
<b>Location (main place of work)</b>				
Metropolitan	423 (49.9%)	141 (16.6%)	13 340 (68.1%)	3646 (18.6%)
Rural	231 (27.2%)	49 (5.8%)	2203 (11.3%)	389 (2.0%)
<b>Specialist group</b>				
Internal medicine	218 (25.7%)	68 (8.0%)	4968 (20.5%)	1743 (7.2%)
Pathology	20 (2.4%)	8 (0.9%)	707 (2.9%)	430 (1.8%)
Surgery	116 (13.7%)	13 (1.5%)	4298 (17.7%)	500 (2.1%)
Other specialists	299 (35.3%)	102 (12.0%)	8159 (33.6%)	3484 (14.3%)
<b>Mean hours worked per week</b>	48.5	42.2	45.9	37.3

There were four missing observations for specialist group and location (main place of work) for the outreach group, and one was missing for the Australian specialist workforce specialist group. \* Data on the Australian specialist workforce were obtained from the Australian Medical Labour Force Survey, 2009,<sup>19</sup> except the data on location (main place of work), which were obtained from the 2008 Australian Medical Directory dataset (n = 19 578). ♦

the same community. The data in Box 2 show that ongoing outreach was associated with being male, mid-career and working in mixed but mainly private practice. Working in private-only practice was associated with lower levels of regular outreach service. Metropolitan and rural-based specialists were equally likely to provide ongoing outreach service. There was no evidence of interaction in the multivariate analysis.

### Specialist type

General surgeons (30/40, 75.0%;  $P = 0.005$ ) and otolaryngologists (14/18, 77.8%;  $P = 0.035$ ) were more likely to provide regular outreach service, whereas laboratory specialists (15/45, 33.3%;  $P = 0.01$ ), anaesthetists (22/65, 33.9%;  $P = 0.003$ ) and emergency physicians (6/25, 24.0%,  $P = 0.005$ ) were less likely. A range of other specialist types also provided a higher than average rate of ongoing outreach service, such as cardiologists (14/19, 73.7%), general physicians (18/29, 62.1%) and paediatricians (37/66, 56.1%), but

these was not significantly different from the overall mean.

### Service patterns

Box 3 shows that visiting more towns and visiting smaller towns (< 5000 people) was associated with ongoing outreach service, but travel distance and visiting remote locations had no effect.

A sensitivity analysis confirmed that the assumptions for missing data were reasonable. Restricting the ongoing group to specialists for whom no assumption was made ( $n = 364$ ) did not affect the results.

### Discussion

Around half of all medical specialists providing rural outreach service in our study provided it to the same town on an ongoing basis. This suggests that the stability of rural outreach services could be improved. The characteristics of specialists, including their career stage, practice conditions, specialty type and aspects of their service patterns,

influence the ongoing provision of outreach services.

### Career stability

Male specialists at a more stable career stage were more likely to provide ongoing rural outreach services. Early career specialists could be restricted by the amount of time needed to develop their main practice or to fulfil hospital-based roles. One way to address their lower rate of regular outreach provision may be to structure outreach services to complement their commitments at their main practice. Team-based rotational arrangements require less time commitment by individuals, and including telehealth in the service platform can also reduce the number of visits needed. The attitude of employers to the participation of staff in outreach work also needs further investigation.

Specialists nearing retirement may not consider rural outreach work as part of their retirement work plan. However, it is possible that succession planning could provide a



## Research

**2 Univariate and multivariate analysis of association between specialist characteristics and ongoing rural outreach services (*n* = 848)**

Covariates	Number reporting continuity of outreach*	Univariate analysis		Multivariate analysis	
		OR (95% CI)	<i>P</i>	OR (95% CI)	<i>P</i>
<b>Total</b>	440 (51.9%)				
<b>Sex</b>					
Female	79 (41.2%)	1		1	
Male	361 (55.0%)	1.75 (1.26–2.43)	0.001	1.82 (1.28–2.60)	0.001
<b>Age</b>					
< 45 years	115 (46.8%)	1		1	
45–64 years	288 (55.0%)	1.39 (1.02–1.88)	0.03	1.44 (1.04–1.99)	0.029
≥ 65 years	36 (46.8%)	1.00 (0.60–1.67)	0.99	0.99 (0.57–1.74)	0.99
<b>Location of residence</b>					
Metropolitan	300 (52.5%)	1		1	
Rural	140 (50.7%)	0.94 (0.70–1.25)	0.65	0.81 (0.60–1.11)	0.19
<b>Practice sector</b>					
Public only	120 (49.2%)	1		1	
Mixed, mainly public	114 (50.7%)	1.06 (0.74–1.52)	0.75	0.95 (0.66–1.38)	0.80
Mixed, mainly private	145 (64.7%)	1.90 (1.31–2.75)	0.001	1.73 (1.18–2.53)	0.005
Private only	42 (36.5%)	0.58 (0.37–0.92)	0.02	0.51 (0.32–0.82)	0.006

OR = odds ratio. The number of respondents included in the final model was reduced to 807: there was one missing observation for age, and 40 observations for weekly hours worked in different settings either missing or involving work in "other" sectors. \* Percentages are based on corresponding figures for specialist doctors providing rural outreach in Box 1. ♦

structure for late career specialists to maintain some involvement with a reduced workload.

Previous research found that women were less likely to participate in rural outreach work,<sup>4</sup> and our study found that they are also less likely to provide ongoing outreach services. The influence of sex on outreach workforce dynamics requires specific investigation.

#### Conditions at the main practice

Specialists working in the public and mixed, mainly public sectors in their normal practice provided similar rates of ongoing rural outreach services. Despite the potential security of salaried remuneration for outreach work, the workload of public sector employment and the financial constraints of the public system may restrict regular participation in outreach services.

Specialists working in mixed practice with a higher component of private work may have a greater sense of ownership and enthusiasm, considered important for ongoing outreach

service delivery.<sup>6</sup> However, there appears to be a tipping point: working in a fully private model reduced the likelihood of ongoing outreach services. We speculate that private-only specialists are hindered by the costs and the demands that ongoing outreach work can place on their normal practice.<sup>7</sup> Financial subsidies for the costs of travel and travel time may help facilitate ongoing rural outreach by specialists working privately. Australia's RHOF policy plays an important role supporting this. However, only some specialist types and a restricted number of doctors can gain subsidies through this fund, and other long-term financial incentives may be required to encourage ongoing outreach practice by private-only specialists.

#### Specialist type

To some extent, generalist specialists were more likely to provide ongoing outreach services. But at the other end of the spectrum, otolaryngologists, who are procedurally based and have high equipment demands, were also likely to provide ongoing

service. This might be driven by the demographic and disease profiles of different rural communities. Further, it could be enabled by specialists widening their normal scope of practice during outreach work.<sup>15</sup> Meanwhile, the RHOF, which targets sustained outreach in chronic diseases, and in maternal and child, ear and eye, and mental health,<sup>16,17</sup> may need to be reinforced by other approaches targeting specialists working in priority areas of care, including intersite staff sharing, and hub-and-spoke models from major public hospitals.

#### Location and nature of service patterns

The specialist's location did not influence the rate of ongoing outreach services. Mobilising specialists from metropolitan areas, where 85% of specialists live, could contribute to sustained service access in rural and remote locations. Although the distance the specialist travelled made no difference, it is still possible that the time spent travelling, which more closely determines any loss of

### 3 Univariate analysis of association between patterns of service and ongoing rural outreach services (*n* = 848)

Covariates	Number reporting continuity of outreach	Univariate analysis: OR (95% CI)	<i>P</i>
<b>Remoteness of service</b>			
Metropolitan to inner regional	172 (50.7%)	1	
Rural to inner regional	60 (43.8%)	0.76 (0.51–1.13)	0.17
Metropolitan to outer regional/remote	128 (54.9%)	1.18 (0.85–1.65)	0.32
Rural to outer regional/remote	80 (57.6%)	1.32 (0.88–1.96)	0.18
<b>Distance travelled</b>			
Local (< 300 km)	282 (52.8%)	1	
Distant (≥ 300 km)	158 (50.3%)	0.91 (0.68–1.20)	0.48
<b>Size of town</b>			
> 50 000	55 (46.2%)	1	
15 001–50 000	167 (48.1%)	1.08 (0.71–1.64)	0.72
5000–15 000	97 (51.9%)	1.25 (0.79–1.99)	0.34
< 5000	121 (62.1%)	1.90 (1.20–3.02)	0.006
<b>Number of rural locations visited</b>			
1	247 (48.1%)	1	
2–3	193 (57.8%)	1.48 (1.12–1.95)	0.006

OR = odds ratio. ♦

income, may influence choices about ongoing outreach services.

Outreach services delivered to smaller towns are likely to be structured differently and driven by different personal motivations to outreach services to larger towns, but this remains to be investigated. Smaller towns are less likely to have any resident specialist services. We propose that the nature of planning for outreach services in larger towns is worth exploring, to identify factors that could increase service stability.

This research did not study other parameters of sustainable outreach,

such as the regularity of visiting, the quality, relevance and responsiveness of clinical and professional support, and the availability of a succession plan. Further, a range of factors with the potential to affect service maintenance, such as short-term contracting<sup>6,7</sup> and inadequate or inflexible funding,<sup>6,18</sup> remain to be investigated.

Ongoing outreach was defined in our study on a conservative basis, being limited doctors to visiting the same town, whereas some specialists visited more than one rural location on a regular basis, while others visited

different nearby towns. Rotational or team-rostered outreach was also not considered. Self-administered survey methods mean there is some potential for under-reporting of participation. There was also a small degree of survey dropout and movement in and out of the annual survey. Finally, we were limited to analysing 4 years' data.

A small proportion of specialists in our cohort moved from a metropolitan to a rural location or vice versa during the study. However, moving location should not, theoretically, alter the ability to continue visiting a town. Further, we did not account for changes to practice sector, because the hours worked in different settings are very sensitive to change over time; we could not be sure whether any change reflected a definite change in practice.

In summary, a range of strategies is needed to promote more stable rural outreach services, taking into account the individual specialist's career stage, practice conditions and specialty. Financial incentives are likely to increase ongoing outreach services only by specialists working privately. Our research indicates that outreach services to smaller communities are more stable.

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## 7.3 Conclusion

Chapter 7 results suggest that around half of all rural outreach services by specialists continue to the same community over time. The study is based on a conservative measure which does not account for specialists that move the location of the outreach service to another nearby town, whilst maintaining the same regional catchment, rotational outreach and undercounts specialists maintaining visits to more than one town.

Outreach service stability was increased in mid-career stages, in mixed practice conditions where specialists had more autonomy and for certain specialist types. Specialists only working privately were less likely to continue visiting the same town over time. Further, the poor participation and lower rate of sustained outreach by female specialists is important to research further in light of the increased feminisation of the specialist workforce in Australia.

The characteristics of services (how far, how remote) did not influence outreach service stability. Metropolitan-based specialists sustained services at an equal rate to rural specialists. However, there was some indication that specialist outreach services delivered to smaller communities (<5,000 population) were more stable, with signs of an inverse dose response relationship with the least stable services provided to the largest regional centres (>50,000 population).

The manuscript concluded specific strategies are needed to promote outreach service stability including structured and systematic planning, which targets at-risk groups.

The research presented in Chapters 5 to 7 demonstrated that various characteristics of the specialists, their practice sector and geographic characteristics influence participation in rural outreach and patterns of work. However, the role of personal reasons, as individual-level drivers has not yet been explored. Chapter 8 investigates the reasons why specialists participate in rural outreach work.



# Chapter 8: Why specialists participate in rural outreach work

## 8.1 Introduction

Chapter 8 focuses solely on the fifth research question: *Why do specialists participate in rural outreach work and do their reasons influence service patterns?* There is very little systematic evidence about the reasons specialists participate in rural outreach. As described in Chapter 2, the main evidence consists of a single American survey of specialists visiting 11 rural hospitals in Massachusetts, which identified they were motivated to supplement their patient base and income and support underserved patients (48). A range of Australian case reports also identify various reasons underpinning specialist participation in outreach work, but there are no state/territory or national studies which systematically explore this topic.

The findings of Chapters 5, 6 and 7 identified that the specialist's practice sector influences outreach patterns, but it is not known as to whether the reasons for participating in rural outreach work also differ by the specialist's main work. In Australia, about 33% of all specialists are full-time employed in public hospitals, paid by salary from their employer (16). Such specialists can be required to provide rural outreach services as part of employment arrangements. The prevalence of organisationally-mandated outreach work is unknown. However, one Australian case study suggested specialists were aware that the employing hospital expected them to provide outreach services when they were recruited (35). As such the reasons for participating in rural outreach work are likely to be linked to the specialist's choice of position.

This Chapter aims to explore the reasons that specialists provide their main rural outreach service, and whether these reasons differ according to the doctor's main type of work and have any influence on service initiation, distribution and longevity. It is presented in an unpublished form.

## **8.2 Methods**

This is the first Chapter using new data which was collected in the wave 7 MABEL survey. The methods with respect to the wave 7 survey were outlined in section 4.4.2. A range of questions were drafted asking specialists the reasons they provided their main rural outreach service. They were broadly based on the range of reasons that were noted in various case reports summarised in Table 2.1 at the end of Chapter 2. The questions were piloted in two stages with outreach providers between August 2013 and March 2014. Minimal refinement was needed. The questions were then included in the final MABEL survey, administered between June and November 2014 (survey included as Appendix 1). All questions were closed-ended to fit with other questions in the MABEL survey and ensure consistency via self-reported methods.

The questions asked specialist to report their agreement on a five point scale with each of five reasons for providing their main outreach service (where they spent the most time): “I provide this service in order to: grow my practice, provide healthcare to disadvantaged people, maintain a personal connection to a region, provide complex healthcare in challenging situations and provide support for rural health staff”. Responses were categorised: Agree (“strongly agree/agree”) or Disagree (“neutral/disagree/strongly disagree”).

Specialist location was categorised into two groups: “metropolitan” or “rural” based on the ASGS-RA categories of the specialist’s residence (86).

To clarify the extent of mandatory rural outreach work and check for association with the reasons for participating in rural outreach, specialists were asked: “Are you required to provide outreach services as part of your employment conditions at your main place of work?” to which they answered either yes or no.

To explore relationships with the nature of their main work, the specialist’s main practice (public only or at least some private work) was defined based on the average weekly hours worked in public hospital, private hospital, private consulting rooms or other settings.

Service initiation was measured by specialists reporting whether they led the establishment of the main outreach service.

Remoteness of the main outreach service was measured using the ASGS-RA corresponding to the main outreach service location and categorised: “outer regional/remote” or “inner regional” (86). Specialists reported the travel time to reach the location of their main outreach service from their place of residence: “<1 hour”; “1-3”; or “4+ hours”. Frequency of visiting the main outreach location was reported as a continuous measure and categorised “less than monthly” or “monthly+”.

The longevity of service was measured by the calendar year the main outreach service commenced, converted to a number based on 2014 being equal to 1 and categorised into two groups higher or lower than the median as: “<6 years” or “6 years+”.

The association between agreement with the reasons for participating, employment context and service patterns were tested using chi-squared. For the analysis of main practice, 37 specialists were excluded because they mainly or only worked in other settings (e.g. tertiary education). No cross-sectional weight was available to apply to this analyses so the characteristics of the cohort were described to clarify response bias.

## 8.3 Cohort

A total of 9,288 doctors responded to the wave 7 survey between May and November 2014, including 3,517 specialists who had responded to a previous wave (57.5%) and 84 specialists new to the survey (29.6%). The cohort were comparable with the national specialist workforce but had 7.6% more females, a lower mean age (44.5 vs 50.2) and around 4.8% fewer surgeons (Table 8.1).

Table 8.1- Characteristics of respondents to the Medicine in Australia: Balancing Employment and Life survey, 2014, compared with the Australian specialist workforce

	Specialist respondents (n=3505)	Australian specialist workforce (n=27,279) <sup>c</sup>
	n (%)	n (%)
<b>Sex</b>		
Male	2260 (65)	19,681 (72)
Female	1243 (36)	7598 (28)
<b>Age <sup>a</sup></b>		
Mean age	45	50
<b>Location main work</b>		
Metro	2,899 (83)	21,808 (86)
Rural	606 (17)	3,601 (14)
<b>Specialist group <sup>b</sup></b>		
Internal medicine	762 (22)	5,706 (21)
Pathology	127 (4)	1119 (4)
Surgery	380 (11)	4,250 (16)
Other specialists	1986 (57)	15,306 (56)
Missing	0	898 (3)
Mean hours worked /week	42	44

<sup>a</sup> The number of sample respondents to *age* was reduced to 3441 due to 64 missing values; *sex* reduced to 3503 due to 2 missing values; *mean hours worked* reduced to 3239 due to 266 missing values and *specialist group* reduced to 3255 due to 250 missing values.

<sup>b</sup> Internal medicine: cardiology, endocrinology, gastroenterology & hepatology, general medicine, geriatric medicine, haematology, medical oncology, nephrology, respiratory & sleep medicine, rheumatology, other physician

Pathology: anatomical and general pathology

Surgery: general surgery, otolaryngology, plastic, urology, other surgery

Other specialists: diagnostic radiology, other radiology, obstetrics & gynaecology, paediatrics, anaesthesia, psychiatry, emergency medicine, ophthalmology, dermatology, ICU medicine, rehabilitation medicine, radiation oncology, other specialists not grouped

<sup>c</sup> Data on the Australian specialist workforce were obtained from the National Health Workforce Dataset (NHWDS), 2014 (85), except data on *Location main place of work*, which was obtained from the 2014 Australian Medical Directory dataset (n=25,409). The NHWDS included n=166 specialists whose specialty was general practice under "other specialists", which is not included as a specialty in the MABEL survey.

Of 3,517 respondents, 645 provided rural outreach (18%). Of these, 45 were excluded (chiefly because their main outreach services was indeterminate) as were 25 missing information about motivations and 8 who reported neutral to all motivations also excluded, leaving 567 in the final cohort. No exclusion bias was detected by age ( $p=0.28$ ) or sex ( $p=0.07$ ).

## 8.4 What are the reasons?

Of the 567 specialists in the cohort, most (54%) specialists reported participating in the main outreach service to grow the practice; 26% to maintain a personal connection to a region and; 18% to provide complex healthcare in challenging situations (Table 3). Less commonly reported reasons included providing healthcare to disadvantaged people (12%) and supporting rural health staff (6%).

Metropolitan specialists were more likely than rural specialists, to provide the main outreach service to maintain a connection to a region (29% vs 18%,  $p<0.05$ ).

Around a quarter of specialists were required to provide the main outreach service as part of their normal work (26%), related to working in the public sector (40%) compared to those working at least some hours privately (14%,  $p<0.0001$ ). However, public specialists more commonly reported providing the main outreach service to grow the practice compared with specialists working privately (65% vs 48%,  $p<0.01$ ). Growing the practice was also related to providing the main outreach service into a more remote location and travelling for longer. Specialists working privately more commonly provided the main outreach service to undertake complex healthcare in challenging situations (22% vs 14%,  $p<0.05$ ), which was also associated with providing the main service to an inner regional location and travelling less time.

None of the reasons studied related to initiating the main outreach service or the longevity of such a service.

Table 8.2: Association between reasons specialists participate in rural outreach work, practice characteristics and outreach service patterns n=567

		Reasons				
		Grow my practice	Maintain personal connection to region	Complex healthcare in challenging situations	Provide healthcare for disadvantaged people	Provide support rural staff
	Agree n (%)	304 (54%)	145 (26%)	104 (18%)	70 (12%)	35 (6%)
Covariates	Specialists (n)	n (%) yes	n (%) yes	n (%) yes	n (%) yes	n (%) yes
<b>Where reside</b>						
Metro	385	206 (54)	112 (29)	68 (18)	50 (13)	27 (7)
Rural	180	97 (54)	32* (18)	35 (19)	19 (11)	8 (4)
<b>Main practice</b>						
Public only	196	127 (65)	56 (29)	27 (14)	28 (14)	7 (4)
At least some private work	332	158** (48)	80 (24)	72* (22)	35 (11)	25 (8)
<b>Initiated the service</b>						
No	366	200 (55)	101 (28)	73 (20)	45 (12)	27 (7)
Yes	198	102 (52)	42 (21)	29 (15)	23 (12)	8 (4)
<b>Remoteness of outreach</b>						
Inner regional	340	163 (48)	96 (23)	73 (22)	53 (16)	27 (8)
Outer regional/remote	227	141* (62)	49 (22)	31* (14)	17* (8)	8* (4)
<b>Time travelled</b>						
< 1 hour	86	39 (45)	18 (21)	24 (28)	14 (16)	9 (11)
From 1-3 hours	342	178 (52)	92 (27)	60 (18)	41 (1)	17 (5)
4+ hours	137	86* (63)	34 (25)	19* (14)	14 (10)	9 (7)
<b>Service longevity</b>						
< 6 years	253	128 (56)	76 (30)	45 (18)	31 (12)	15 (6)
6 + years	308	174 (57)	67* (22)	58 (19)	39 (13)	20 (7)
Missing		14 (3)	11 (2)	7 (1)	7 (1)	5 (1)

\*sig at p= 0.05; \*\* sig at p&lt;0.01

## 8.5 Discussion

This Chapter reports a unique national cross-sectional study of the reasons why specialist doctors participate in providing the main rural outreach service, including whether reasons influence patterns of rural outreach work. The findings mainly suggest that specialists have different reasons for participating in rural outreach work, associated with the nature of their normal practice, whether public or private.

Growing the practice was reported by around one in two specialists but was more strongly associated with specialists working only in the public system. It was the only reason significantly associated with outer regional/remote service provision and travelling further. Growing the practice is easier to describe as a motivator of private sector work, where revenue from service throughput is directly paid to the specialist. It is somewhat more complex to explain for specialists employed in the public system, whose income is commonly set. It could reflect public sector goals of improving access to hospital-based services for culturally diverse or disadvantaged groups in the community based on the longer travel to more remote locations by specialists reporting this reason. It may also reflect a complex array of professional and system-level competition. Professionally, rural outreach work could facilitate relationships, partnerships and different caseload, important to specialists wanting to transition to some private work or to support public specialists wanting to achieve career advancement as a staff specialist. At a system level, public hospitals typically limit the number of procedures/clinics available to employed specialists due to budget restrictions, however public specialists may travel to carry out such work in smaller under-utilised hospitals, to aid throughput.

Providing complex healthcare in challenging situations, associated with specialists working privately, is likely to be related to goals for professional diversity. This reason was related to a lower rate of outer regional/remote outreach services and shorter travel time. For private specialists, practice diversity could be achievable without travelling far from the main practice. Also, interests in providing complex healthcare probably need to be balanced with the financial viability of the service. Notably, whilst growing the practice was associated with specialists working publicly, it was also the main reason reported among private specialists.



The scope of technical practice is likely to be wider in inner regional towns where facilities and supporting staff are more readily available and larger populations are likely to enable higher clinical throughput, for financial return.

Importantly the finding that metropolitan-based specialists participated to maintain a personal connection to a region suggests rural exposure during training or work could be important to increase their participation. Research in Chapter 5 noted that childhood rural background did not influence participation in rural outreach, however, it is possible that other childhood exposures, such as visiting rural relatives or rural holidays could be relevant.

The reasons studied did not relate to either service initiation or longevity of rural outreach service provision. This was surprising given demonstration case studies suggest enthusiastic specialists initiate and sustain outreach services (35). However, other system-level factors are likely to play a role or combine with personal reasons to influence service initiation. The findings of Chapter 7 suggested that the specialist's practice arrangements, influenced outreach service continuity.

### *Limitations*

The study was limited in scope. It only explored five reasons using closed-end questions. The list of reasons was not exhaustive; 51 specialists participating in rural outreach disagreed to all the reasons under study or were neutral to all reasons listed. There is limited information about how specialists in different practice sectors might interpret reasons, including how public specialists interpret "growing the practice". A qualitative study would have been useful to supplement this however this was beyond the scope of the thesis timelines. The reasons were asked only in relation to the main rural outreach service provided, whereas the reasons for providing outreach services to different towns could vary.

## **8.6 A sub-finding: length of service**

A sub-finding of using new MABEL data within Chapter 8 was the finding that specialists reported a median length of time of providing the main outreach service, was 6 years. This

contrasts with the findings of Chapter 7, that rural outreach services were continued to the same town for at least three years around half the time. It is unlikely this difference in service longevity is related to reporting bias by specialists responding to the wave 7 survey, since they clearly reported the year the service commenced, considered a relatively easy fact to recall, as a major life event. It is likely to reflect the conservative measurement of outreach service continuity applied in Chapter 7, according to at least one of the same town names being reported by specialists, each year they provided outreach for at least three years. Although visiting for at least three years was the benchmark, most were visiting for at least four years. Further, compared with Chapter 7 which measured continuity to any rural town, Chapter 8 also specifically studied the specialist's main outreach service (where they spent the most time).

## **8.7 Conclusion**

The findings of Chapter 8 suggest specialists provide the main outreach service for varied reasons which differ according to the specialist's main employment. The reasons studied mainly influence service distribution, rather than service initiation or longevity. Structuring rural outreach services to complement the specialist's reasons for undertaking such work could improve service distribution. Private specialists may be more interested in the complex and challenging medicine often found in smaller remote towns, but they are likely to require the right financial support to put this interest into practice.

As one form of intervention, Chapter 9 explores whether financial subsidies for rural outreach work, particularly those from the Australian Government Rural Health Outreach Fund (RHOF), relate to the provision of specialist outreach services into more remote locations.



# Chapter 9: Financial subsidies for rural outreach

## 9.1 Introduction

Chapter 9 focuses on the fifth research question: *Are subsidies for the cost of rural outreach work, and particularly subsidies via the Australian Government Rural Health Outreach Fund (RHOF), related to the provision of outreach services into more remote locations?* It was noted in Chapter 2 that the financial aspects of rural outreach work are complex. The main costs related to travel and travel time need to be balanced against clinical remuneration. Case reports (Table 2.1 of Chapter 2) suggest the financial viability of rural outreach work is a particular concern for non-salaried specialists, self-funding their outreach service. Research in Chapter 8 suggested that despite private specialists being interested in rural outreach to increase practice diversity, they are more likely to work in inner regional areas, with reduced travel time. The findings of Chapter 5 highlighted that specialists in private consulting rooms were less inclined to undertake remote outreach work, and Chapter 6, private rural specialists, restricted their travel distance. The findings in Chapter 7 noted that specialists only working privately, considered the most financially exposed group, had lower service stability. With the combined findings suggesting that the financial costs of rural outreach work have the potential to influence patterns of service delivery, it is important to establish whether subsidising specialists the main costs of rural outreach work has the potential to increase service provision into more remote locations and support sustained rural outreach services.

Chapter 3 described the structure and aims of the Australian Government Rural Health Outreach Fund (RHOF) policy, which subsidises specialists for the costs of outreach work, including travel and travel time (non-salaried) and back-filling (salaried). However, the extent of specialists supported by the RHOF or other types of subsidies, and the degree to which subsidies correlate with more remote service provision and sustained practice by various

specialist types has not previously been described using comparison groups. The unpublished manuscript in section 9.2, is a cross-sectional study exploring this topic.

## **9.2 Subsidies and patterns of service**

The unpublished manuscript which forms the main basis of Chapter 9 is a cross-sectional study describing subsidises for rural outreach work and whether subsidies, and specifically RHOF subsidies, target outreach services into more remote locations. The manuscript is presented as submitted to the journal *Australian Health Review*.

O'Sullivan B, McGrail M, Stoelwinder J. Subsidies to target specialist outreach services into more remote locations: a national cross-sectional study [submitted to *Australian Health Review* 4 February 2016].

## Declaration for Thesis Chapter 9

### Declaration by candidate

In the case of Chapter 9, the nature and extent of my contribution to the work on the manuscript: "The influence of subsidies on targeted specialist outreach services into more remote locations in Australia" was the following:

Nature of contribution	Extent of contribution (%)
Conception, identification and collation of literature, data analysis and drafting of manuscript	85%

The following co-authors contributed to the work.

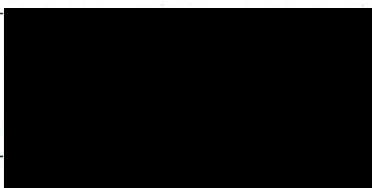
Name	Nature of contribution
Dr Just Stoelwinder	Provided critical advice about concept, design, writing and analysis
Dr Matthew McGrail	Provided critical advice about concept, design, writing and analysis

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work.

Candidate's  
Signature

	Date 1/12/15
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Main  
Supervisor's  
Signature

	Date 1/12/15.
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# **Subsidies to target specialist outreach services into more remote locations: a national cross-sectional study**

**Main text words:** 2780

**Abstract words:** 185

## **Abstract**

Targeting rural outreach services to areas of highest relative need is challenging due to the higher costs it imposes on health workers to travel longer distances. The potential for subsidies to support the provision of specialist outreach services into more remote locations was studied using national data about medical specialist outreach providers as part of the wave 7 Medicine in Australia: Balancing Employment and Life (MABEL) Survey, in 2014. Nearly half received subsidies: 19% (n=110) from a formal policy - The Australian Government Rural Health Outreach Fund (RHOF) and 27% (n=154) from other sources. Subsidised specialists travelled for longer and visited more remote locations, relative to the non-subsidised group. Additionally, compared with non-subsidised specialists, RHOF-subsidised specialists worked in priority areas and provided equally regular services they intended to continue, despite visiting more remote locations. This suggests the RHOF, whilst limited to one in five specialist outreach providers, is important increase targeted and stable outreach services in areas of highest relative need. Other subsidies also play a role in facilitating remote service



distribution, but may need to be more structured to promote regular, sustained outreach practice.

**What is known about this topic?**

There are no studies describing subsidies for specialist doctors to undertake rural outreach work, and whether subsidies, including formal and structured subsidies via the Australian Government Rural Health Outreach Fund (RHOF), support targeted outreach services, compared with no financial support.

**What does this paper add?**

We describe subsidisation among specialist outreach providers and whether specialists subsidised via the RHOF or another source are more likely to provide remote outreach services, using national data from Australia.

**What are the implications for practitioners?**

Subsidised specialist outreach providers are more likely to provide remote outreach services. The RHOF, as formally structured comprehensive subsidy, additionally targets the provision of priority services into such locations on a regular, ongoing basis.

**Key words:** subsidy, outreach, policy, specialist, remote services

## Introduction

Outreach healthcare services, involving health workers travelling away from their normal practice location to provide services in underserved areas are widely endorsed to distribute health care to where it is needed (1). In Australia, outreach is a key strategy to improve access to medical specialist services in rural areas (2). However, ensuring the right mix of services where they are most needed is a significant challenge. Australia is a vast country with many small and isolated towns lacking local services, despite higher disease burden. Most Australian specialists base their main practice in metropolitan cities (85%) or inner regional towns (11%), with generally larger populations (>50,000) and within two hours travel of the city (3). Rural outreach work is undertaken by around one in five specialists in Australia, but only 16% of those specialists participating provide services to remote locations (4).

The provision of ongoing, regular outreach services into more remote areas typically involves more direct costs to specialist doctors for longer travel and time away from their normal practice. In Australia, specialists have the potential to receive subsidies for these costs: either comprehensive subsidies from a structured national rural outreach policy called the Australian Government Rural Health Outreach Fund (RHOF), directed at priority areas of care, or subsidies from other sources. However, the proportion of specialists working with these subsidies and their effect is unknown. This study aims to describe the proportion of specialist outreach providers subsidised by the RHOF or other subsidies, and whether subsidies, and specifically RHOF subsidies target specialist outreach services into more remote locations.

The Australian Government established a structured national outreach policy in 2000, to promote rural outreach work by medical specialists. The policy, called the RHOF since 2012, has been sustained and developed over time (2). It currently allocates \$Aus124.1 million over four-years (apportioned to multi-disciplinary teams), providing capped funding to state and territory fund holders to directly contract specialist doctors who self-nominate to participate (5). It is administered on a state and territory basis, via a competitive tender process overseen by state/territory-based independent advisory groups, who prioritise services in outer regional and remote locations, which address specific national priority areas: chronic diseases; maternal and child; mental health; and eye health. Fees for clinical services are not

reimbursed as part of the RHOF, but via Medicare, the Australian Government's health financing scheme, which guarantees a minimum fee-for-service payment to the specialist, regardless of the patient's capacity to pay.

Specialists successfully tendered by the RHOF are able to gain reimbursement for the cost of outreach work for three years (reviewed annually), covering the cost of travel and accommodation, loss of income for being absent from the normal practice (non-salaried) or funding to back-fill (salaried). By subsidising these costs via a tender process centred on specific healthcare priorities, the government intends to increase the regular, ongoing provision of targeted outreach services to smaller, outer regional and remote towns which can demand up to a whole day of travel (6).

The characteristics of services provided by RHOF-subsidised specialists has not been explored using comparison groups. One part of an evaluation of an earlier version of the policy used modelling which found that policy-subsidised services accounted for a higher proportion of total (including in situ) specialist services in remote (4.2%) and very remote areas (28.7%) compared with regional areas (0.7-3.0%), but parameters in the model were subjective, based on stakeholder consultation about the types of billing practices in specific towns (7).

The range and quality of subsidies from other sources is poorly documented. Examples include subsidisation from one-off grants from different national government sources, state/territory government or public hospital funds or private industry (8-10). These subsidies are likely to support public sector specialists employed on a salary who incur fewer out of pocket costs for travel. Subsidies from other sources are less likely to be comprehensive, and more likely to be short-term and to target more diverse priorities driven by local/regional or organisational objectives.

Specialists receiving no subsidies for the costs of rural outreach work, self-fund their services for diverse reasons. Examples include to improve access and referral to their services and increase patient convenience (6, 11). However, without financial support, these specialists are likely to minimise travel costs.

## Materials and Methods

This paper uses data from a large national longitudinal panel survey of Australian doctors, the Medicine in Australia: Balancing Employment and Life (MABEL) study. The primary aim of the MABEL study is to investigate labour supply decisions and their determinants among Australian doctors. The study protocol has been reported elsewhere (12) but briefly, in 2008 between June and November, all Australian doctors (n=54,750), working clinically were invited to participate (wave 1). Every subsequent year, all respondents to the previous waves are re-surveyed along with new doctors, returning to active clinical practice or new graduates.

This paper reports results for specialist doctors surveyed as part of wave 7 of the MABEL survey, conducted between May and November 2014 (n=3505). Wave 7 questionnaires included questions about funding arrangements for outreach work and can be accessed from the study's website (see <https://mabel.org.au/>). Analysis of non-response bias specific to the first two waves of the survey has been reported elsewhere, showing the survey respondents were broadly representative (12, 13). Further, Table 2.1 describes the characteristics of wave 7 respondents compared to all Australian specialists.

The MABEL study has ethical approval from the University of Melbourne (Ref. 0709559) and Monash University (Ref. CF07/1102 - 2007000291).

### Cohort

This study includes specialist doctors who had completed advanced training to gain accreditation with a specialist medical college; working clinically; and who travelled to provide outreach services in at least one rural location (1-3 locations could be listed). All locations were geocoded using the Australian Statistical Geography Standard (ASGS-RA) Remoteness Area categories (14), based on road distance to nearby larger service centres. Rural locations included all categories other than "Major Cities". The specialist indicated the location of their main outreach service, where they spent the most time in the last year, about which they were asked additional questions.

During data cleaning, the main outreach service was imputed for a small number of records missing this information, based on travel time to the outreach location, or as the first rural location visited where travel time was missing.

Specialists who reported the service was telehealth/retrieval (n=3), visited zero times in the last year (n=4) or forty or more times and the outreach location was the same town as the main place of work (n=10) and whose main outreach service could not be determined (n=28) were excluded.

## **Outcome**

Specialists were asked “Do you currently receive any reimbursement or subsidy for your services to this location (e.g. for travel costs)?” Three groups were compared: “Yes, from the Commonwealth, e.g. Rural Health Outreach Fund”; “Yes, from another source”; or “No”.

## **Variables**

### *Characteristics of services*

The time spent travelling from the residential to the outreach location was reported <1, 1 to 3 or 4+ hours.

The remoteness of the outreach location was categorised into two groups based on the ASGS-RA categories: “inner regional”; or “outer regional/remote/very remote” (14).

Service regularity was measured by the number of times the location was visited in the last year and categorised <12; 12+, to reflect a minimum monthly or more regular service.

Ongoing service was indicated by the specialist’s intention to continue providing the outreach service for <5; or 5+ years.

Specialists reported the year they started providing their main outreach service, which was converted to a continuous measure of years, with 2014 counted as 1.

### *Characteristics of specialists*

Age was categorised to reflect career stages of early to mid-career <45 and mid to late career 45+.

Residential location was categorised as “metropolitan” or “rural” based on the ASGS-RA categories.

Main specialty was self-reported from a list of 50 accredited specialties. An indicator group of specialists working in priority areas of care targeted by the RHOF included: general (internal) medicine, ophthalmology, psychiatry, obstetrics and gynaecology, paediatrics, renal medicine, endocrinology, cardiology, respiratory medicine and oncology (5). All other specialist types were combined as a reference category, except laboratory-based specialties that were excluded from the analysis of specialist type because they commonly provide centralised services (all pathology specialties and clinical genetics, clinical haematology, clinical immunology, clinical pharmacology).

Practice type was defined based on weekly hours worked in public hospitals, private hospitals, private consulting rooms or “other” (aged care, education and other). Two categories were applied: “public-only” (all hours in public hospital); or “at least some private work” (one or more hours working in private consultation rooms and/or private hospital). Specialists who reported all or most of their work hours in the “other” setting and less than 10 hours work in public or private settings were excluded.

## **Analysis**

Univariate multinomial regression models compared the associations between various characteristics and receiving subsidies from the RHOF, another source or none, reporting relative risk ratios and 95% confidence intervals. First, service characteristics (time spent travelling, remoteness of the location visited, service regularity and intention to continue providing the outreach service) were explored. Second, specialist characteristics (age, sex, residential location, practice type and specialist type) were tested. Separate multivariate models tested associations between service characteristics and subsidies, accounting for practice sector, as a known influence on outreach service distribution (15).

## Results

Table 2.1 shows the 3,505 respondents were broadly comparable to the Australian specialist workforce but included 8% more females, had a lower mean age (45 vs 50) and around 5% fewer surgeons. Of 3,505 respondents, 645 provided rural outreach services (18%). Of these, 45 were excluded, mainly because the main outreach service was indeterminate. A further 25 were missing information about subsidies, leaving 575 specialists in the final analysis. No exclusion bias was detected by age ( $P=0.28$ ) or sex ( $P=0.07$ ). Of the study cohort, 73% were male, had a mean age of 45 years, 34% worked in a rural area and worked a mean of 44 hours per week.

Nearly half received some subsidies: 110 (19%) from the RHOF; 154 (27%) from another source; and 311 (54%) no subsidies.

Table 2 shows that specialists subsidised in any way were nearly twice as likely to travel four or more hours, and up to four times more commonly, to visit more remote locations, relative to those with no subsidies. RHOF-subsidies supported specialists from both metropolitan and rural areas, whereas subsidies from another source mainly supported metropolitan-based specialists.

RHOF-subsidised specialists provided outreach services with similar frequency, (40% monthly or more) relative to non-subsidised specialists (47%) despite providing services into more remote locations and travelling for longer. In contrast, specialists subsidised from another source, were significantly less likely to provide at least a monthly service (27%; RRR 0.40, 0.26-0.61).

Nearly two-thirds (62%) RHOF-subsidised specialists intended to continue visiting for five or more years, comparable to non-subsidised specialists (61%). Comparatively, those subsidised from another source reported less intention to continue the outreach service, which approached significance (51%; RRR 0.67, 0.46-1.0). The mean length of outreach service



provision was highest for RHOF-subsidised specialists at 11 years, compared with 8 for specialists with other subsidies and 9 for those with no subsidies.

Table 3 indicates RHOF-subsidies supported specialists who were significantly more likely to working in priority areas of care (as established by the RHOF), relative to non-subsidised specialists (57% vs 43%) (RRR 1.73, 1.11-2.70). They also more commonly undertook at least some private work (74% vs 59%) (RRR 1.77, 1.07-2.93).

Specialists with subsidies from another source more commonly worked in the public sector relative to non-subsidised specialists (44% vs 33%). They were also nearly four times more likely to receive a salaried or fixed payment for their outreach service relative to those with no subsidies (72% vs 43%) (RRR 3.50, 2.29-5.31), mainly related to the higher proportion of public specialists in this group (82% of whom were paid a salaried or fixed payment).

Accounting for potential confounding by practice sector, did not change the results.

## **Discussion**

This study provides the first national level description of subsidies for specialists to undertake rural outreach work and how they relate to service characteristics. Nearly half (46%) of the specialists in our study received subsidies for the costs of outreach service provision, relatively evenly split between subsidies from the Australian Government Rural Health Outreach Fund (RHOF) and subsidies from another source.

Receiving subsidies of any type was associated with specialist doctors travelling for longer and providing more remote services. Additionally, RHOF subsidies were correlated with specialists working in priority areas, who provided equally regular services they intended to continue relative to non-subsidised specialists, despite visiting more remote locations. This suggests the competitive tender process centred on national priorities is working well. Further, the signs that outreach services by RHOF-subsidised specialists are likely to be more stable could be related to the comprehensive nature of these subsidies, including provisions for back-

filling, team support and re-contracting after three years. However, the capacity to influence remote health priorities depends on continued government funding in the same priority areas as well as consistent service provision to the same population catchments.

The RHOF appears well-targeted at private specialists, based in both metropolitan and rural areas. Previous research has shown that specialists based in inner regional locations are less likely to provide remote outreach services (4), private rural specialists restrict their travel distance likely due to poorer access to expedient transport (15) and private specialists overall are less likely to sustain rural outreach services (16).

Specialists with non-RHOF subsidies were likely to be public-sector employed, incurring fewer out-of-pocket costs for outreach work, regardless of clinical throughput. Whilst increasing remote service provision, the finding of irregular service provision is potentially related to a pre-determined service schedule by public hospitals, restricted funding or difficulty back-filling the normal role to cover the hospital workload. Regardless of a lower intention for ongoing practice, the group receiving subsidies from other sources still had a reasonable mean 8 years of providing rural outreach service.

Commonly (57%) specialists providing rural outreach services without any subsidies were also not paid a salaried or fixed payment for services at the outreach location, relying on fee-for-service reimbursement. Perhaps driven by a financial imperative to balance the direct costs of outreach work against the potential revenue available via a fee-for-service payment for clinical services, this group tended to provide outreach service to nearby inner regional locations. The policy benefit is that through necessity, the group with no subsidies is likely to practice outreach in a self-sustaining way, with intent to continue rural outreach services similar to the RHOF-subsidised group (61% vs 62%).

The RHOF is a unique policy intervention aiming to mobilise specialists to areas of need (2). Compared with financial incentives to promote permanent recruitment and retention in rural and remote areas, the RHOF represents modest expenditure, which is flexible to adjust workforce redistribution according to specific priorities. This paper's findings are applicable to other developed nations grappling with the mobilisation of a highly centralised and

privatised workforce into geographically-dispersed rural communities with specific health needs.

We postulate that the capacity for policies subsidising health workers to make a difference to rural and remote health outcomes depends on the level workforce interest, the autonomy of health workers who choose to participate, the amount of funding and proportion of rural outreach services the funding can support. In Australia, where population densities are small and distances can be extreme, travel is expensive and time-consuming. Other more densely-populated countries may spend less to achieve improved access in under-served areas.

### *Limitations*

Our study was limited to reporting about subsidies for the main outreach service only, rather than secondary outreach services the specialists may provide. Basing the research on the location where the specialist spent the most time may have biased our study to larger towns, such that an under-estimation of remote outreach work is likely. This study was unable to determine the exact qualities and size of subsidies provided from the RHOF or other sources, as these can be packaged up differently according to individual needs and local-level factors. Whilst the study was limited to exploring associations rather than causal relationships, it provides the first national level evidence describing subsidisation for rural outreach.

## **Conclusion**

Specialists subsidised for rural outreach work were more likely to travel for longer and provide services into more remote locations than non-subsidised specialists. Additionally, compared with specialists with no subsidies, RHOF-subsidised specialists worked in priority areas and provided equally regular services they intended to continue, despite visiting more remote locations. This suggests the RHOF, whilst limited to one in five specialist outreach providers, is important increase targeted and stable outreach services in areas of highest relative need. Subsidies from other sources also play a role in facilitating remote service provision but they may need to be better structured to promote regular and sustained practice.

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**Table 1-** Characteristics of medical specialists who responded to the wave 7 Medicine in Australia Balancing Employment and Life (MABEL) survey, 2014, compared with the Australian specialist workforce

	<b>Specialist respondents (n=3505)</b>	<b>Australian specialist workforce (n=27,279) <sup>c</sup></b>
	<b>n (%)</b>	<b>n (%)</b>
<b>Sex</b>		
Male	2260 (65)	19,681 (72)
Female	1243 (36)	7598 (28)
<b>Mean age <sup>a</sup></b>	45 years	50 years
<b>Location main place of work</b>		
Metro	2,899 (83)	21,808 (86)
Rural	606 (17)	3,601 (14)
<b>Specialist group <sup>b</sup></b>		
Internal medicine	762 (22)	5,706 (21)
Pathology	127 (4)	1119 (4)
Surgery	380 (11)	4,250 (16)
Other specialists	1986 (57)	15,306 (56)
Missing	0	898 (3)
<b>Mean hours worked /week</b>	42 hours	44 hours

<sup>a</sup> The number of respondents to *age* was reduced to 3441 due to 64 missing values; *sex* reduced to 3503 due to 2 missing values; *mean hours worked* reduced to 3239 due to 266 missing values and *specialist group* reduced to 3255 due to 250 missing values.

<sup>b</sup> *Internal medicine*: cardiology, endocrinology, gastroenterology & hepatology, general medicine, geriatric medicine, haematology, medical oncology, nephrology, respiratory & sleep medicine, rheumatology, other physician

*Pathology*: anatomical and general pathology

*Surgery*: general surgery, otolaryngology, plastic, urology, other surgery

*Other specialists*: diagnostic radiology, other radiology, obstetrics & gynaecology, paediatrics, anaesthesia, psychiatry, emergency medicine, ophthalmology, dermatology, ICU medicine, rehabilitation medicine, radiation oncology, other specialists not grouped

<sup>c</sup> Data on the Australian specialist workforce were obtained from the National Health Workforce Dataset (NHWDS) 2014 (3) except data on *Location main place of work*, which was obtained from the 2014 Australian Medical Directory dataset (n=25,409) (17). The NHWDS included n=166 specialists whose specialty was general practice under “other specialists”, which is not included as a specialty in the MABEL survey.

**Table 2:** Univariate associations between subsidies for rural outreach work and service characteristics of specialist doctors using multinomial logistic regression, n=575

	No n=311		Yes, subsidy from another source n=154				Yes, RHOF subsidy n=110			
	n	%	n	%	RRR (CI)	P	n	%	RRR (CI)	P
<b>Travel time <sup>a</sup></b>										
1-3 hours	193	62	92	60	1.0		65	59	1.0	
<1 hour	62	20	12	8	0.41 (0.21-0.79)	0.008	11	10	0.53 (0.26-1.06)	0.07
4+ hours	56	18	48	31	1.80 (1.14-2.84)	0.012	34	31	1.80 (1.08-3.00)	0.024
<b>Pattern of travel <sup>b</sup></b>										
Metro or rural to inner regional	217	70	81	53	1.0		46	42	1.0	
Metropolitan to outer regional /remote	47	15	55	36	3.14 (1.97-4.99)	<0.0001	44	40	4.42 (2.63-7.43)	<0.0001
Rural to outer regional/remote	45	15	18	12	1.07 (0.59-1.96)	0.82	20	18	2.10 (1.13-3.88)	0.018
<b>Frequency of visiting <sup>c</sup></b>										
Less than monthly	152	49	110	71	1.0		64	58	1.0	
Monthly or more	146	47	42	27	0.40 (0.26-0.61)	<0.0001	44	40	0.72 (0.46-1.12)	0.14
<b>Intention to continue 5+ years <sup>d</sup></b>										
No	121	39	75	49	1.0		42	38	1.0	
Yes	189	61	79	51	0.67 (0.46-1.0)	0.048	68	62	1.04 (0.66-1.62)	0.88

<sup>a</sup> the number of observations for *travel time* was reduced to 573 because 2 values were missing from specialists with a subsidy from another source

<sup>b</sup> the number of observations for *patterns of travel* was reduced to 573 because 2 values were missing from specialists with no subsidy

<sup>c</sup> the number of observations for *frequency of visiting* was reduced to 558 because 17 values were missing (13 for specialists with no subsidy, 2 with another and 2 with RHOF subsidy)

<sup>d</sup> the number of observations for *intention to continue 5+ years* was reduced to 574 because 1 value was missing from specialists with no subsidy.



**Table 3:** Univariate associations between subsidies for rural outreach work and specialist doctors' characteristics using multinomial logistic regression, n=575

	No n=311		Yes, subsidy from another source n=154				Yes, RHOF subsidy n=110			
Age <sup>a</sup>	(n)	%	(n)	%	RRR (CI)	P	(n)	%	RRR (CI)	P
<44 years	153	49	69	45	1.0		54	49	1.0	
45+ years	153	49	83	54	1.20 (0.81-1.78)	0.35	55	50	1.02 (0.66-1.58)	0.93
<b>Sex</b>										
Female	77	25	44	29	1.0		33	30	1.0	
Male	234	75	110	71	0.82 (0.53-1.27)	0.38	77	70	0.77 (0.47-1.24)	0.28
<b>Practice type<sup>b</sup></b>										
Public only	104	33	68	44	1.0		26	24	1.0	
At least some private work	183	59	72	47	0.60 (0.40-0.91)	0.02	81	74	1.77 (1.07-2.93)	0.03
<b>Salaried/fixed payment for outreach services<sup>c</sup></b>										
No	177	57	42	27	1.0		64	58	1.0	
Yes	134	43	111	72	3.50 (2.29-5.31)	<0.0001	46	42	0.95 (0.61-1.47)	0.82
<b>Targeted specialist type<sup>d</sup></b>										
No	163	52	78	51	1.0		44	40	1.0	
Yes	135	43	63	41	1.04 (0.70-1.54)	0.86	63	57	1.73 (1.11-2.70)	0.02

<sup>a</sup> the number of observations included in the analysis of *age* was reduced to 567 because 8 values were missing (5 for specialists with no subsidy, 2 with subsidy from another source and 1 with RHOF subsidy)

<sup>b</sup> the number of observations included in the analysis of *practice type* was reduced to 534 because 39 specialists working only or mostly in "other" settings (22 for specialists with no subsidy, 14 with subsidy from another source and 3 with RHOF subsidy) and 2 with no subsidy missing hours worked, were excluded

<sup>c</sup> the number of observations about *salaried/fixed payment for services* was reduced to 574 because 1 value was missing for specialists with a subsidy from another source.

<sup>d</sup> the number of observations included in the analysis of *specialist type* was reduced to 553 because 22 laboratory-based specialist types were excluded (11 for specialists with no subsidy, 8 subsidy from another source and 3 with RHOF subsidy: working in haematology/immunology) and 3 were missing specialist type, 2 from no subsidy and 1 from another source. Targeted specialist types included *general medicine, ophthalmology, psychiatry, obstetrics and gynaecology and paediatrics, cardiology, renal physician, endocrinology, oncology and respiratory physicians*.

## 9.3 Conclusion

The study which forms the basis of Chapter 9 is the first to explore the relationship between financial support and characteristics of rural outreach service provision, at a national level. The evidence suggests that financially supporting specialists for the costs of rural outreach work relates to longer travel time and increased provision of outreach services into more

remote locations. The RHOF, as a formal structured form of subsidy, potentially has additional benefits of ensuring such services are aligned with priority areas, and supporting regular and ongoing services in areas of highest relative need.

Having outlined the findings from all six research questions in Chapters 3, 5, 6, 7, 8 and 9, Chapter 10 summarises and synthesises the key results and discusses the implications for policy development and planning of rural outreach by specialist doctors in Australia. Further it includes a perspective for rural outreach healthcare strategy, in the form of a manuscript submitted to the Bulletin of the World Health Organization.

# Chapter 10: Summary and implications

## 10.1 Introduction

The aim of the thesis was to systematically describe rural outreach work by specialist doctors in Australia. This included describing the extent of rural outreach work, characteristics of the participating specialist doctors and exploring the factors related to participation and patterns of rural outreach service provision.

To address the aim and research questions, the thesis includes multiple studies of rural outreach, as reported by medical specialists participating in the MABEL national longitudinal survey of Australian doctors. This included all types of specialists, providing such services in both rural and remote contexts, in all states and territories. This is the only known systematic analysis of rural outreach work and service patterns by the specialist doctors and represents a substantial improvement in evidence to inform policy development and planning.

In this Chapter the research findings are summarised by Chapter, and then synthesised according to the key factors associated with participation, geographic distribution and sustainability of rural outreach services. The implications of the consolidated findings for policy and planning are then discussed, including an unpublished manuscript, submitted to the Bulletin of the World Health Organization, which provides a perspective for outreach policy. Finally, the general limitations of the research and conclusion to the thesis are outlined.

## 10.2 Summary of findings

The results of each Chapter investigating the six thesis research questions are summarised in Table 10.1. The findings describe the extent of rural outreach work and the range of factors influencing participation and patterns of work in Australia. Rural outreach work was found to

be relatively common, and participation was reported by a range of specialist types. The distribution and sustainability of services was also described. A range of common factors such as location of specialist residence, their normal practice and financial support emerged in the various studies to influence different aspects of outreach work. The next section consolidates the findings according to the main thesis outcomes.

**Table 10.1: Summary of findings by Chapter**

Ch	Question	Method	Findings
3	What is the nature of the current national policy to support specialist medical outreach in rural Australia?	Review of the national policy	Australia's policy (now called the Rural Health Outreach Fund – RHOF), aims to increase the supply and sustainability of rural outreach services and target these services at remote locations in priority areas of care. The policy was implemented without systematic evidence about rural outreach work. Improved evidence is needed to understand its influence. The thesis contributes evidence to address this.
5	What is the extent of rural outreach, the characteristics that influence participation in rural outreach and service provision in remote areas?	Cross-sectional study using logistic regression analyses to determine factors associated with participating in rural outreach work or not and remote versus any rural outreach work.	Outreach work is relatively common by Australian specialists (one in five) but of those participating, only 16% undertake outreach work in remote locations. Specialists living in rural locations are more likely to participate but metropolitan specialists constitute around three quarters of outreach providers. Inner regional specialists are less likely to provide remote outreach services. Remote outreach work was associated with metropolitan specialists or those living nearby remote towns.
6	What are the main patterns and models of rural outreach service delivery and what influences these patterns?	Cross-sectional study using logistic regression analyses to describe service patterns and models of outreach by specialists living in metropolitan or rural locations.	Rural outreach services are roughly equally distributed between inner regional and outer regional/remote locations. Patterns of rural outreach service delivery differ according to where specialists live (e.g. FIFO more common among metropolitan specialists), the practice sector of rural specialists and the regional context.
7	How sustained is rural outreach and what factors influence service stability?	Longitudinal study of specialists, using logistic regression analyses to test factors associated with ongoing outreach services.	Rural outreach services are sustained to the same town around half the time and influenced by the career stage and specialist's sector of practice, as well as the size of the town.
8	Why specialists participate in rural outreach work and whether their reasons influence service patterns?	Cross-sectional study using bivariate tests of association between outreach service characteristics and the reasons for providing outreach services.	Reasons for participating in rural outreach vary. Two reasons, 'growing the practice' and providing 'complex healthcare in challenging situations' are related to the specialist's main work sector and also how remotely services are distributed. There is no link between the reasons studied and initiation or longevity of service.
9	Are subsidies for the cost of rural outreach work, and specifically, the Rural Health	Cross-sectional study using multinomial logistic regression analyses to test the association between	Around half of all specialist outreach providers are subsidised. Subsidies related to travelling longer and providing rural outreach services into more remote

Outreach Fund, related to the provision of outreach services into more remote locations?	outreach characteristics of subsidised and non-subsidised specialists.	service locations. RHOF-subsidies additionally support regular, ongoing service provision in priority areas of care.
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## 10.3 Synthesis by key thesis outcomes

In this section the main factors driving outreach, as shown in individual chapters, are consolidated according to their influence on three key thesis outcomes: participation, the distribution of services into more remote locations and; sustained services. In Table 10.2, the prevalence of each outcome is described. Then the significant factors influencing these outcomes are noted. Drawing these results together shows that rural outreach participation and patterns of work are variably affected by the characteristics of the specialist, their location of residence, the characteristics of their main work, characteristics of the town they visit and financial support for the cost of outreach work. Each of these factors is discussed in the next section.

### 10.3.1 Prevalence of rural outreach

Approximately one in five Australian specialists participated in rural outreach work, mainly to grow their practice (Chapter 8). Nearly half travelled to only one nearby town (<300km away) and half were non-subsidised for their participation (Chapter 9). A limited proportion undertook remote outreach work (approximately 16% of all providers). However, as a proportion of all outreach services, nearly half were provided in outer regional or remote locations (Chapter 6). The longitudinal study in Chapter 7 found that around half of all specialists provided outreach services to the same town for at least three years. A longer period providing the main outreach service, of 6 years, was found in the cross-sectional study in Chapter 8.

Table 10.2: Summary of rural outreach by specialist doctors and factors significantly associated with participation and patterns of service provision

Outreach	Participation in rural outreach	Outreach services into more remote locations	Sustained outreach services
<b>Prevalence</b>	<ul style="list-style-type: none"> <li>• 1 in 5 specialists (19%)</li> <li>• Drive-in, drive-out most common model (42%)</li> <li>• Main reasons for participating:               <ul style="list-style-type: none"> <li>- Grow practice (54%)</li> <li>- Maintain connection to region (26%)</li> <li>- Provide complex healthcare in challenging situations (18%)</li> </ul> </li> <li>• 54% non-subsidised</li> <li>• 26% part of normal job</li> </ul>	<ul style="list-style-type: none"> <li>• 16% all outreach providers work in remote locations</li> <li>• 42% of all services provided in outer regional or remote towns</li> </ul>	<ul style="list-style-type: none"> <li>• 52% continue visiting same town (3+ years)</li> <li>• Main outreach service provided for median of 6 years</li> </ul>
<b>Specialist characteristics</b>	<ul style="list-style-type: none"> <li>• Male (OR 1.38, 1.12 - 1.69)</li> <li>• Specialist type <sup>a</sup>:               <ul style="list-style-type: none"> <li>- General medicine (OR 1.82, 1.06-3.11)</li> <li>- Renal medicine (OR 2.21, 1.13-4.34)</li> <li>- Otolaryngology (OR 2.21, 1.13-4.34)</li> <li>- Ophthalmology (OR 1.92, 1.17-3.14)</li> <li>- Urology (OR 3.63, 1.72-7.67)</li> <li>- Renal (OR 3.26, 1.74-6.12)</li> <li>- Radiation oncology (OR 2.68, 1.34-5.33)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Age / experience <sup>d</sup> (OR 1.17, 1.05-1.31)</li> <li>• Specialist type <sup>a</sup>:               <ul style="list-style-type: none"> <li>- General medicine (OR 4.45, 1.30-15.15)</li> <li>- General surgery (OR 3.89, 1.25-12.07)</li> <li>- Otolaryngology (OR 6.25, 1.57-8.26)</li> <li>- Dermatology (OR 6.62, 1.53-28.68)</li> <li>- Ophthalmology (OR 2.99, 0.89-10.05) (not sig)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Male (OR 1.82; 1.28-2.60)</li> <li>• Mid-career <sup>h</sup> (OR 1.44, 1.04-1.99)</li> <li>• Specialist type <sup>i</sup>:               <ul style="list-style-type: none"> <li>- General surgeon (75%, p=0.005)</li> <li>- Otolaryngology (78%, p=0.035)</li> </ul> </li> </ul>
<b>Where reside</b>	<ul style="list-style-type: none"> <li>• Inner regional <sup>b</sup> (OR 2.07, 1.68-2.54)</li> <li>• Outer regional/remote <sup>b</sup> (OR 3.40, 2.38-4.87)</li> <li>• Metropolitan (74% of all providers)               <ul style="list-style-type: none"> <li>- Maintain personal connection to region (p&lt;0.05)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Outer regional/remote <sup>b</sup> (OR 10.84, 5.82-20.19)</li> <li>• Reduced if inner regional <sup>b</sup> (OR 0.35, 0.17-0.70)</li> <li>• Metropolitan-based:               <ul style="list-style-type: none"> <li>- Fly-in, fly-out (OR 4.15, 2.32-7.42) <sup>e</sup></li> <li>- Travel &gt;300km regardless of public or private work.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No effect</li> </ul>
<b>Characteristics of main work</b>	<ul style="list-style-type: none"> <li>• Work privately in consulting rooms <sup>c</sup> (OR 1.24, 1.01-1.53)</li> <li>• Work privately <sup>c</sup>:               <ul style="list-style-type: none"> <li>- Provide complex healthcare in challenging situations (p&lt;0.05)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Reduced if work privately in consulting rooms <sup>c</sup> (not sig) (OR 0.64, 0.39 to 1.06)</li> <li>• Private rural specialists restrict travel to &lt;300km <sup>c</sup></li> <li>• Work publicly <sup>f</sup> <ul style="list-style-type: none"> <li>- Grow practice (p&lt;0.01)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Work in mixed mainly private practice <sup>c</sup> (OR 1.73, 1.18-2.53)</li> <li>• Reduced if only work privately <sup>c</sup> (OR 0.51, 0.32-0.82)</li> </ul>
<b>Characteristics of town visited</b>	n/a	n/a	<ul style="list-style-type: none"> <li>• Small town &lt;5000 <sup>j</sup> (OR 1.90, 1.20-3.02)</li> </ul>
<b>Financial support</b>	n/a	<ul style="list-style-type: none"> <li>• Financial subsidies for costs <sup>g</sup> <ul style="list-style-type: none"> <li>- RHOF for metropolitan specialists (RRR 4.42, 2.63-7.43)</li> <li>- RHOF for rural specialists (RRR 2.10, 1.13-3.88)</li> <li>- Other subsidies for metropolitan specialists (RRR 3.14, 1.97-4.99)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• RHOF subsidies <sup>g</sup>:               <ul style="list-style-type: none"> <li>- RHOF (RRR 1.04, 0.66-1.62) (similar intention to continue relative to non-subsidised group despite more remote services)</li> <li>- Other subsidies (RRR 0.67, 0.46-1.0)</li> </ul> </li> </ul>

<sup>a</sup> Compared with laboratory-based specialists (OR 1.0); Chapter 5<sup>b</sup> Compared with metropolitan-based (OR 1.0), Chapter 5<sup>c</sup> Compared with specialists working publicly only (OR 1.0); Chapters 5, 6, 7<sup>d</sup> Age as a continuous measure, grouped in 5-year increments; Chapter 5<sup>e</sup> Compared with drive-in, drive-out (defined as one location <300km away) (OR 1.0); Chapter 6<sup>f</sup> Compared with at least some private work (chi squared); Chapter 8<sup>g</sup> Compared with non-subsidised (defined as intention to continue) (RRR 1.0); Chapter 9<sup>h</sup> Compared with early career (defined as <45 years) (OR 1.0); Chapter 7<sup>i</sup> Compared with the grand mean for all specialties using a deviation contrast; Chapter 7<sup>j</sup> Compared with towns of >50,000 people (OR 1.0); Chapter 7

### **10.3.2 Specialist characteristics**

The characteristics of specialists influenced participation and patterns of rural outreach work in various ways. Firstly, as shown in Chapter 5, male specialists were more likely to participate in rural outreach and in Chapter 7, to sustain services, however, female specialists were just as likely to undertake remote outreach work.

Increasing age, as a marker of specialists with more experience and career stability, did not influence participation but was correlated with remote outreach work. Additionally, as shown in Chapter 7, mid-career specialists, aged 45-64 years, were more likely to continue rural outreach services, as opposed to those in early career (<45 years) or nearing retirement (65+).

A range of specialist types participated in rural outreach work, with rates as high as 40% for specialists in areas such as renal medicine and urology (Chapters 5 and 7). One area of commonality was that generalists and otolaryngologists were more likely to participate, provide services into more remote locations and sustain such services.

Rural background was not related to rural nor remote outreach participation (Chapter 5).

### **10.3.3 Where the specialist resides**

Participation in rural outreach and the distribution of services into more remote locations was strongly influenced by specialist's residential location (Table 10.2). As shown in Chapter 5, rural-based specialists were more likely to undertake rural outreach work, however about three quarters of all outreach providers were from metropolitan locations. Metropolitan-based specialists were more likely to participate to maintain a personal connection to a region (Chapter 8).

Remote outreach work was associated with specialists living in metropolitan locations or living closer to remote towns, and significantly negatively associated with living in an inner regional area. Chapter 6 added that rural-based specialists were more likely to provide outer

regional or remote services, however, metropolitan-based specialists provided the majority of services to such locations, using long distance models, like fly-in, fly-out.

Despite the strong influence of location on participation and service distribution, the longitudinal study in Chapter 7 suggested that metropolitan and rural specialists were equally likely to sustain rural outreach services.

### **10.3.4 Characteristics of main work**

The results of Chapters 5 suggested that specialists working in private consulting rooms increased participation in rural outreach work. The findings of Chapter 7 also showed those working in mixed mainly private practice were more likely to sustain outreach services. However, specialists working in private consulting rooms (as shown in Chapter 5) tended to have a lower rate of participation in remote outreach work. Practice sector did not influence service distribution by metropolitan specialists but rural-based private specialists were more likely to restrict their travel distance to less than 300km. Private-only specialists also had reduced service stability (Chapter 7).

The reasons specialists reported participating in rural outreach were also associated with public or private work, as found in Chapter 8. Specialists working privately, were more likely to participate to provide complex healthcare in challenging situations, associated with outreach services provided in inner regional locations, whereas public specialists more commonly participated to grow the practice, associated with outreach services in more remote locations.

### **10.3.5 Characteristics of town visited**

Specialists visiting towns with smaller populations (<5000 people) had improved continuity of outreach service provision compared with those visiting towns of >50,000 people. The stability of outreach services was not affected by the remoteness of the town or distance from the specialist's residence. The size of the town was not investigated in relation to its influence



on participation nor the distribution of outreach services into more remote locations since in Chapters 5 and 6, the remoteness and distance to the outreach location were used as predictive variables.

### **10.3.6 Financial support of rural outreach work**

The findings of Chapter 9 suggest that subsidising specialists for the costs of rural outreach work is likely to increase their travel time and rate of service provision into more remote locations relative to non-subsidised specialists. RHOF-subsidies additionally targeted specialists working in priority areas (chronic diseases; maternal and child; mental health; and eye health), who had regular, ongoing services they intended to continue despite visiting more remote locations. Specialists subsidised via another source had significantly less regular service, lower intention to continue the service and covered a wider range of specialty areas relative to non-subsidised specialists.

## **10.4 Implications of findings**

This thesis includes a broad discussion of the implications of the thesis findings, followed by an unpublished policy perspective, submitted to the Bulletin of the World Health Organization, which focuses on how the evidence in this thesis answers the key policy questions in relation to outreach healthcare.” Broadly, the findings highlight that such work is relatively common, practised by a wide range of specialist types, mainly travelling from metropolitan locations, based in different practice sectors and conducting outreach via different service models. Such services are relatively evenly distributed between inner regional and more remote locations suggesting they have the potential to support access to specialist healthcare in a range of settings. However, based on the findings, two main implications are notable.

Firstly, given a complex range of factors differentially influence participation and patterns of outreach work, supporting outreach is likely to depend on multilevel policy and planning. Secondly, based on the extent and range of services provided via different models in both

regional and more remote locations, systems are needed to target priority services to population need; and ensure outreach services are integrated and coordinated. These challenges are discussed separately in section 10.4.1 and 10.4.2.

### 10.4.1 Complex drivers

A complex array of factors differentially influence participation in rural outreach work, outreach service distribution and sustained outreach service provision (Table 10.2). The characteristics of the town (associated with sustained services) is separately discussed as an implication in 10.4.2. The range of factors and differences in the way they influence aspects of outreach work suggests that enabling outreach participation, improving the distribution of services into more remote locations and sustaining service provision are not amenable to one simple solution. Rather, outreach work is likely to require multilevel policy and planning.

The drivers influencing outreach broadly fit into three levels: individual, organisational and economic. The thesis has already speculated a range of strategies at each of these levels, to enable participation and influence patterns of work, however, they largely remain to be tested. An expanded discussion of these and other postulated strategies is outlined in the next section.

At an ***individual level***, the nature and distribution of the specialist workforce nationally is likely to impact outreach participation and patterns of work. The current trend towards sub-specialisation among the Australian specialist workforce could reduce the availability of generalists, which might diminish outreach participation, remote service distribution and the sustainability of services (20). Specialist outreach participation may benefit from education programs, similar to the agenda to broaden the scope of practice of rural GPs through the Australian College of Rural and Remote Medicine training pathway. Further, with more female doctors choosing to specialise, it was suggested in Chapter 5 that increased exposure to outreach during medical training could improve outreach participation by women. However, more research is needed to determine the context influencing reduced participation and decreased stability of outreach services by female specialists. One option is to consider

whether flexible service models incorporating telehealth, or use of visiting teams, have the potential to diminish travel requirements by women in primary care-giver roles.

Providing services into more remote locations was related to older specialists possibly because it is likely to require individuals with the skills and confidence to work relatively independently of other specialists, in resource-limited settings. Such skills are likely to develop through supervised practice, specific to these settings. A range of outreach providers take medical students on their outreach visits (see Table 2.1 in Chapter 2) but the participation of students may not be funded. Additionally, the ability to access portable equipment, travel with adjunct staff and gain support via telehealth and aero-medical retrieval could be important to improve remote service provision among less experienced specialists. There is some potential that older specialists are also more financially stable and able to absorb the cost of outreach work to more distant locations.

Chapter 8 briefly noted that increasing opportunities for metropolitan-based specialists to develop a connection to a region could increase their participation in rural outreach. A connection to a region may be broader than having a childhood rural background, as rural background was found in Chapter 5, not to relate to outreach participation. It is possible that a regional connection could develop during the specialists' training and work life, including as a result of outreach work.

Metropolitan-based specialists, whether public or private, provide important outreach service capacity to outer regional and remote locations, likely due to their better access to air transport. Their services are equally sustained as those by rural specialists, who, on a private basis, restricted their travel to nearby towns. Developing the rural specialist workforce is likely to increase outreach participation, as well as reducing the need for regional-outreach by metropolitan-based specialists. However, as discussed in Chapter 6, apart from providing more far-reaching services, metropolitan-based specialists potentially offer a wide range of services and sub-specialties to complement those by rural specialists. Achieving these goals is subject to issues discussed in 10.4.2.

At an **organisational level**, the increased participation by specialists in private consulting rooms suggests that flexible employment conditions are important. Improving participation by specialists working in the public sector may also depend on support to back-fill or cover their normal workload. Back-filling is also potentially more important to increase the travel by regionally-based specialists to more remote locations, which with restricted air transport options, may take longer.

Structuring outreach around the range and type of work at the main practice including the specialist's professional needs or the objectives of their employer, likewise has the potential to enable participation and improve the distribution of services into more remote locations by different sub-groups.

Finally, organisational strategies are also potentially needed to sustain outreach services. Some suggestions mentioned in Chapter 7 include reducing the employment constraints to ongoing participation by early career specialists, fostering a pool of doctors who can support the workload and actively plan the succession of services provided by older specialists.

At an **economic level**, the thesis included research as to the influence of financial subsidies on patterns of rural outreach work in Chapter 9. The findings suggested that around half of all Australian specialists are non-subsidised for outreach work but are likely to sustain rural outreach under market conditions, by mainly focusing on inner regional service provision. However, subsidising specialists the costs of outreach work (e.g. costs of travel), is likely to increase travel time and service provision into more remote locations. Additionally, comprehensive, structured RHOF-subsidies via the Australian Government (supporting around one in five specialist outreach providers in Australia), are likely to specifically support the remote distribution of specialists working in priority areas, providing regular, ongoing services they intend to continue. Further, the RHOF mobilised both metropolitan and rural-based specialists, important to overcome financial barriers to longer travel by private rural specialists, as per the finding of Chapter 6.

The implication is that the government, whether state/territory or the Australian Government, is likely to play an important role in overcoming market failure to address

service delivery into more remote locations. However, there is some potential that the size, structure and sustainability of funding in priority areas of care is also important to mobilise targeted services and improve the stability of remote outreach services. The literature review in Chapter 2 indicated there is poor evidence of state or territory-level outreach policy and planning, except in Queensland and the Northern Territory. Improved policy clarity about outreach as a model of care to address specific state health priorities has the potential to improve the capacity for RHOF-based subsidies of the Australian Government to be complementary. Some considerations include the types of outreach services that are potentially cost-effective to operate via the public hospital system and likely to mitigate other costs (such as those related to emergency presentations and aero-medical retrievals), or specifically generate state or territory revenue.

#### **10.4.2 Targeted, coordinated and integrated services**

Given the number and range of specialist doctors involved in rural outreach work and the findings in 10.4.1 of complex drivers influencing their participation and patterns of work, systems are likely to be needed to target outreach services to population need and; ensure outreach services are integrated and coordinated. A range of strategies have been speculated to address these challenges in the thesis, outlined in Table 10.3, although they remain to be tested. They are discussed below.

Table 10.3: Speculative strategies to address targeted, coordinated and integrated rural outreach services

Issues	Potential strategies to address
Targeted to specific areas of need	<ul style="list-style-type: none"> <li>• Clarity about service gaps: regional, outer regional/ remote</li> <li>• Strategic choice of outreach sites (on basis of service efficiency, sustainability and equity, not just convenience)</li> <li>• Mobilising priority specialties</li> <li>• Reduce clinical pressure on local health staff (support local staff to manage the complex caseload, rather than assuming easiest caseload in order to maximise financial gain)</li> </ul>
Coordinated and integrated with local health services	<ul style="list-style-type: none"> <li>• Support the needs and interests of rural-based specialists</li> <li>• Promote links between public and private and rural and metropolitan-based specialist providers</li> <li>• Manage risks of FIFO services: <ul style="list-style-type: none"> <li>- Communicate the visiting schedule</li> <li>- Promote time on the ground</li> <li>- Support culturally-sensitive practice</li> <li>- Use local referral networks</li> <li>- Provide clear handovers to conclude each visit</li> <li>- Enable contact between specialist and local staff between visits</li> </ul> </li> </ul>

### ***Targeted services***

Appropriately targeting specialist outreach services to areas of need is an important challenge because it was found that the majority of providers visited only one town and a wide range of specialists participate in rural outreach work.

To link outreach providers to specific locations and engage them in addressing clinical priorities, clarity is needed as to regional-level service gaps. Identifying service gaps is potentially more challenging in more densely populated regions, where there are likely to be a larger mix of local specialists and outreach providers (as discussed in Chapters 5 and 6). The market for healthcare somewhat regulates which local and outreach services are likely to be sustained in such areas, but it can leave particular sub-groups under-served, particularly rural residents with complex needs and less capacity to pay. Financial considerations may influence visiting specialists to take on simple cases in convenient locations, leaving the more complex cases for local providers, thus placing these staff under increased strain. Whereas outreach

healthcare specifically targeted at areas of greatest need has the potential to improve population health and reduce pressure on local staff.

To target the RHOF subsidies, the Australian Government uses a systematic needs assessment process managed by state/territory-based fund holders as outlined in Chapter 2 and Chapter 3. However, as noted in Chapter 3, the process is restricted to informing service gaps according to national priority areas of care: chronic diseases, maternal and child, eye and ear and mental health. Regional needs could be more holistically determined, given the findings of Chapter 9 suggested that only about 19% of all rural outreach providers are aligned with RHOF-subsidies. The new Primary Health Network organisations (similar to the former Medicare Locals), could play a role in determining needs more holistically, however, this depends on whether their scope extends to specialty areas of care.

Once service gaps are identified, there is poor evidence of effective strategies to mobilise priority specialties, however, a range of approaches can be deduced as they relate to the workforce drivers outlined in 10.4.1. For example, the proportion of various sub-types of specialists working privately and the age and gender distribution of each specialty workforce is likely to point to particular domains of policy influence. In terms of economic policy, subsidising particular specialists via the RHOF policy has the potential to target priority services to be provided in areas of market failure. Nevertheless, Chapter 7 noted that several specialties which are priorities of the RHOF, such as obstetrician and gynaecologists, psychiatrists, oncologists and ophthalmologists, were not among the groups likely to sustain outreach visits to the same town. It was postulated that beyond the RHOF, other strategies, such as inter-site staff sharing and hub-and-spoke models from major public hospitals may be needed.

### ***Coordinating and integrating services***

Coordinating and integrating outreach services is important to maximise timely access to outreach services at a regional level, accommodating the range of outreach providers, visiting at various times, from different locations, for short periods. Outreach services coordinated with primary care tend to be more efficient (65).

To promote coordinated and integrated outreach services, Chapter 6 noted the importance of managing the risks and benefits of services provided by specialists using different models. With regard to the most common model, drive-in, drive-out, there is a need to coordinate incoming services from metropolitan areas, around those provided by local rural specialists. Rural outreach work potentially supports the viability of rural specialist practice and can improve job satisfaction (8). However, this depends on clarity as to the services coming and going and links between outreach providers and local services, to provide opportunities for co-practice, up-skilling and professional networking. Other systems may be needed to link public and private providers together through some consensus concerning regional priorities. There is limited evidence that deliberate approaches like regional clinical networks can support this (87).

The fly-in, fly-out model was noted to be important for remote service distribution, however, it was also noted in Chapter 5 that specific effort is likely to be needed to reduce the risks of dislocated care and ensure such services provide adequate support for local staff and deliver culturally appropriate care (Table 10.3).

Finally, the finding in Chapter 7 that rural outreach services were more stable if specialists visited smaller towns (<5000 people), irrespective of how remote the town was, nor the distance travelled requires further study as to its cause. As outlined in Chapter 2, larger towns are more likely to have a local specialist base, perhaps reducing the market for new services, unless such services are well-targeted. Outreach healthcare may also be used in such locations to overcome short-term service needs. Another potential explanation is that outreach services provided in smaller towns (<5000 people) are likely to be centred on delivery within primary care settings, potentially reducing their susceptibility to decisions by hospital administrators, and improving the degree of integration and coordination with general practitioners.



### **10.4.3 A perspective for policy**

The unpublished manuscript which adds to Chapter 10 is a policy perspective, submitted to the journal *Bulletin of the World Health Organization*.

O'Sullivan B, Stoelwinder J, McGrail M. Shaping rural outreach healthcare policies: the need for multilevel approaches [Submitted to *Bulletin of the World Health Organization* 10 May 2016].

## Declaration for Thesis Chapter 10

### Declaration by candidate

The nature and extent of my contribution to the work on the manuscript in section 10.4.3: “Shaping rural outreach healthcare policies: the need for multilevel approaches” was the following:

Nature of contribution	Extent of contribution (%)
Conception, identification and collation of literature and drafting of manuscript	85%

The following co-authors contributed to the work.

Name	Nature of contribution
Prof Just Stoelwinder	Provided critical advice about concept, design, writing and analysis
Dr Matthew McGrail	Provided critical advice about concept, design, writing and analysis

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate’s and co-authors’ contributions to this work.

Candidate’s  
Signature

	Date 22 May 2016
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Main  
Supervisor’s  
Signature

	Date 23 May 2016
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## Perspectives

### Shaping rural outreach healthcare policies: the need for multilevel approaches

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Community-based outreach, involving health workers travelling away from their main practice to service areas of need, has been endorsed by the World Health Organization since 2011 as a strategy to enhance access to health workers and improve their retention (1). Outreach service models are particularly relevant to improve access to medical specialist services in rural areas because specialist services are commonly unsustainable in smaller populations on a permanent basis. Regular specialist outreach services are clinically effective (2, 3). Further they facilitate culturally accessible services for marginalised and remote populations (4-6). However, evidence is lacking to support the scalability of rural outreach strategies for specialist services, particularly from a human resource management perspective. It is unknown as to whether specialists are interested and motivated to participate, how far they are willing to travel away from their main practice and whether rural outreach services can be sustained. There is also limited information for structuring policies to promote integrated specialist outreach services that match local needs. Here we inform these policy questions by consolidating the findings of a unique, three-year, systematic research program about medical specialists undertaking rural outreach healthcare.

Our evidence, summarised in Table 1, is based on a large national annual survey, the Medicine in Australia: Balancing Employment and Life study (MABEL: 2008-2014), ([www.mabel.org](http://www.mabel.org)). We defined medical specialists as doctors who had completed advanced training to gain a fellowship of a specialist medical college. Conducting this research in Australia provided the opportunity to reflect on the role of a longstanding national government policy, the Rural Health Outreach Fund (RHOF), which subsidises selected medical specialists for their outreach service costs, aiming to increase the provision of specific clinical services in more remote areas (7). The effect of the RHOF has been poorly evaluated.

Overall, our findings suggest rural outreach healthcare is a scalable strategy to increase access to medical specialist services in rural areas. However, specific challenges include facilitating participation, supporting services in locations of highest relative need and sustaining services. We found around one in five specialists, of various types, undertake rural outreach, mostly without RHOF or other subsidies, mainly to complement the growth and diversity of their main practice (Table 1) (8) (9). Most specialists only visit one rural town and as a proportion

of all outreach services, half are provided in larger regional centres and the other half in smaller towns and remote communities (10). Around half of specialists undertaking rural outreach continue visiting the same town over time (2008-2011) (11), though our 2014 cross-sectional data indicates an average retention of six years to the same location with nearly two-thirds intending to continue providing their outreach service for five or more years (9).

In terms of scaling up specialist outreach healthcare, two key policy implications are noted. Firstly, a wide arrange of factors influence the supply and sustainability of rural outreach by specialists (Table 1). Thus, rather than one simple policy, multi-level, adaptable approaches are likely to be needed for specialist outreach. Secondly, the extent and range of specialists providing rural outreach via different models and working in various practice arrangements (Table 1) raise considerations for the design of service delivery. We discuss both of these issues below.

### **Multi-level, adaptable approaches**

A range of factors are relevant to consider at the *individual level*. The first is to engage specialists living in different locations. Mobilising the larger number of specialists based in larger metropolitan hubs important to increase overall supply, however both rural and metropolitan specialists are important because they have different service patterns.

Specialists living in metropolitan areas have better access to air travel to more remote locations thus reducing financial barriers (such as cost of unproductive travel time) to supplying and sustaining outreach services over longer distances. Their participation is often facilitated by a pre-existing connection to a region (9) (Table 1), potentially fostered during medical training, internships or rural locum work. Strategies to increase their awareness of rural health priorities and inform them of service opportunities that might complement their main practice could improve their participation.

Specialists based in rural areas, although a smaller group, more readily uptake rural outreach healthcare but tend to restrict their outreach services to nearby towns, especially if they work in private practice (8, 10). They are likely to have different opportunity costs to their metropolitan counterparts, including the need for a sustainable business model that reduces strain on a smaller rural practice. Policy strategies to increase the number of rural medical specialists through recruitment and retention may improve the uptake of rural outreach, but will not necessarily meet specialist service needs in more remote areas.

Another consideration at the individual level is to accommodate the varied rate of outreach by different specialist types and their differing sustainability (Table 1) (8). Our evidence suggests that generalists, who are able to address a wide range of community needs and manage undifferentiated caseloads, are suited to outreach work. However, there are exceptions to this. Otolaryngologists, who are procedurally-based and have high equipment demands are similarly viable, possibly because they are well-matched to rural health needs and able to modify their normal practice to suit rural settings. Whilst increasing market competition is driving more medical specialisation, it is important that specialist training provides the opportunity for doctors to maintain general skills and gain practical experience of working in rural and remote settings (12).

The gender balance of the specialist workforce is likewise an important consideration, noting the continuing trends of an increased proportion of females (12). More research is needed to understand the personal and/or professional barriers to the lower supply and sustainability of rural outreach services by female specialists (Table 1). One option to reduce time and travel demands, applicable to both genders, is the use of rotating outreach teams.

At an *organisational level*, the increased participation in rural outreach healthcare by specialists in the private sector (Table 1) indicate flexible employment conditions and back-filling are important to facilitate outreach work. Further, the supply and distribution of outreach services is likely to be enhanced if they are designed to complement the clinical

scope of practice and priorities at the main practice, which differ according to whether specialists are employed in the public (paid salary) or private system (fee-for-service).

We also propose organisational factors affect the capacity to sustain rural outreach services. Particular areas to consider are reducing the employment constraints to ongoing participation by early career specialists, fostering a pool of specialists who can support the workload and planning the succession of services by older specialists (11).

At the *economic level*, subsidies paid directly to specialists for the cost of outreach including travel, increases services provided into more remote locations (9) (Table 1). Subsidies can be provided in a range of forms, including via industry or government grants. However, when provided comprehensively via the RHOF, on a three-year contracted term focused on priority areas (chronic diseases, maternal and child, eye and mental health), relevant specialists provided more regular outreach services in remote locations, which they intend to continue. We suggest that reasonable duration and level of subsidies is important to increase the ongoing supply of outreach services in areas of need. Specialists working without subsidies tend to target their outreach services to larger towns, with less potential for lost income-earning time and increased clinical throughput to ensure outreach work is financially sustainable (9). The hope is that market pressure does not encourage such specialists to cherry-pick profitable caseloads, leaving complex and expensive cases for local staff. Establishing rural healthcare priorities at a state or regional level, to complement national policies like the RHOF, could engender better alignment of such services with specific areas of need.

### **The design of service delivery**

The extent and range of specialists providing rural outreach suggests policies are needed to ensure services are well matched to local need as well as being integrated and coordinated, respecting and reinforcing the capacity of local rural health workers. This is particularly so in more populated rural regions where outreaching and local specialists are most likely to

intersect (10). To reinforce regional workforce growth, it is critical that outreach services complement, and do not compete with local rural health workers.

We see the need for greater clarity as to regional-level service gaps according to priority action areas (national, state and local), through expansion of current coordination efforts, currently limited in Australia to the RHOF-funded programs. Further, local coordinators who can undertake regular scheduling, increase communication between providers and local primary health workers, negotiate facilities and encourage high quality handovers to conclude each visit could enable improved integration of multiple visiting services together on the ground in a way that sustains and buffers the pressure on local workers. Finally, our evidence suggests that subsidies in selected areas of care, can mobilise priority specialist types (9).

Rural outreach is a scalable approach to increase access to specialist medical services. We urge countries to structure specialist outreach policies around multilevel influences, mainly of an individual, organisational and economic nature whilst ensuring such services are targeted and coordinated.



**Table 1:** Summary of systematic evidence about rural outreach healthcare by specialist doctors

Outreach	Participation in rural outreach	Outreach services into more remote locations	Sustained outreach services
<b>Prevalence</b>	<ul style="list-style-type: none"> <li>• 1 in 5 provide outreach healthcare (909/4596, 19%)</li> <li>• 42% visit one town within 300km of where live</li> <li>• Main reasons for participating:               <ul style="list-style-type: none"> <li>- Grow my practice (54%)</li> <li>- Maintain a connection to region (26%)</li> <li>- Provide complex healthcare in challenging situations (18%)</li> </ul> </li> <li>• 54% non-subsidised</li> <li>• 26% provide outreach healthcare as part of their normal job</li> </ul>	<ul style="list-style-type: none"> <li>• 16% of specialists undertaking outreach healthcare provide services in remote locations (where 7% of rural population resides)</li> <li>• 42% of 1401 outreach services provided in smaller rural and remote towns (where 37% of rural population resides)</li> </ul>	<ul style="list-style-type: none"> <li>• 52% provide ongoing outreach healthcare to the same town for three or more years (longitudinal data 2008-2011)</li> <li>• Continuous provision of an outreach healthcare service for a median of six years (cross-sectional data 2014)</li> </ul>
<b>Individual</b>	<ul style="list-style-type: none"> <li>• Male (OR 1.38, 1.12 - 1.69)</li> <li>• Specialist type <sup>a</sup>:               <ul style="list-style-type: none"> <li>- General medicine (OR 1.82, 1.06-3.11)</li> <li>- Renal medicine (OR 2.21, 1.13-4.34)</li> <li>- Otolaryngology (OR 2.21, 1.13-4.34)</li> <li>- Ophthalmology (OR 1.92, 1.17-3.14)</li> <li>- Urology (OR 3.63, 1.72-7.67)</li> <li>- Renal (OR 3.26, 1.74-6.12)</li> <li>- Radiation oncology (OR 2.68, 1.34-5.33)</li> </ul> </li> <li>• Live metropolitan (74% of all providers)               <ul style="list-style-type: none"> <li>- Reasons: maintain personal connection to region (p&lt;0.05)</li> </ul> </li> <li>• Live inner regional <sup>b</sup> (OR 2.07, 1.68-2.54)</li> <li>• Live outer regional/remote <sup>b</sup> (OR 3.40, 2.38-4.87)</li> </ul>	<ul style="list-style-type: none"> <li>• Age / experience <sup>d</sup> (OR 1.17, 1.05-1.31)</li> <li>• Specialist type <sup>a</sup>:               <ul style="list-style-type: none"> <li>- General medicine (OR 4.45, 1.30-15.15)</li> <li>- General surgery (OR 3.89, 1.25-12.07)</li> <li>- Otolaryngology (OR 6.25, 1.57-8.26)</li> <li>- Dermatology (OR 6.62, 1.53-28.68)</li> <li>- Ophthalmology (OR 2.99, 0.89-10.05)</li> </ul> </li> <li>• Live metropolitan:               <ul style="list-style-type: none"> <li>- Outreach to one town more than 300km away (OR 4.15, 2.32-7.42) <sup>e</sup></li> </ul> </li> <li>• Live outer regional/remote <sup>b</sup> (OR 10.84, 5.82-20.19)</li> <li>• Live inner regional <sup>b</sup> (OR 0.35, 0.17-0.70)</li> </ul>	<ul style="list-style-type: none"> <li>• Male (OR 1.82; 1.28-2.60)</li> <li>• Mid-career <sup>h</sup> (OR 1.44, 1.04-1.99)</li> <li>• Specialist type <sup>i</sup>:               <ul style="list-style-type: none"> <li>- General surgeon (75%, p=0.005)</li> <li>- Otolaryngology (78%, p=0.035)</li> </ul> </li> </ul>
<b>Organisational</b>	<ul style="list-style-type: none"> <li>• Work privately in consulting rooms <sup>c</sup> (OR 1.24, 1.01-1.53)</li> <li>• Work privately <sup>c</sup>:</li> </ul>	<ul style="list-style-type: none"> <li>• Work privately <sup>c</sup> (OR 0.64, 0.39 to 1.06)</li> <li>• Private rural specialists travel less than 300km <sup>c</sup> (Mixed practice, mainly private)</li> </ul>	<ul style="list-style-type: none"> <li>• Work in mixed practice, mainly private <sup>c</sup> (OR 1.73, 1.18-2.53)</li> </ul>

	- Reasons: Provide complex healthcare in challenging situations (p<0.027)	OR 7.13, 2.74-18.60) (Mixed practice, mainly public OR 2.83, 1.35-5.93) • Work publicly <sup>f</sup> - Reasons: Grow my practice (<0.0001)	• Work privately only <sup>c</sup> (OR 0.51, 0.32-0.82)
<b>Economic</b>	Not studied	• Subsidies for costs <sup>g</sup> - RHOF for metropolitan specialists (RRR 4.42, 2.63-7.43) - RHOF for rural specialists (RRR 2.10, 1.13-3.88) - Other subsidy type for metropolitan specialists (RRR 3.14, 1.97-4.99)	• RHOF subsidies <sup>g</sup> : - Intend to continue outreach at equivalent rate to non-subsidised specialists (62% vs 61%); whereas specialists with other subsidies had significantly lower intention to continue (51%; RRR 0.67, 0.46-1.0)

OR: Odds ratio; RHOF: Rural Health Outreach Fund; RRR: Relative Risk Ratio

<sup>a</sup> Compared with laboratory-based specialists (OR 1.0) (8)

<sup>b</sup> Compared with metropolitan-based (OR 1.0) (8)

<sup>c</sup> Compared with specialists working publicly only (OR 1.0) (8)

<sup>d</sup> Age as a continuous measure, grouped in 5-year increments (8)

<sup>e</sup> Compared with visiting one town <300km away (OR 1.0) (10)

<sup>f</sup> Compared with at least some private work (chi squared) (9)

<sup>g</sup> Compared with non-subsidised (RRR 1.0) (9)

<sup>h</sup> Compared with early career (defined as <45 years) (OR 1.0) (11)

<sup>i</sup> Compared with the grand mean for all specialties using a deviation contrast (11)

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## 10.5 Further research

The thesis raises a range of areas for further research. These are summarised in Table 10.4 according to the thesis outcomes. The main areas for further research include exploring rural outreach service continuity and effective methods for targeting outreach and enhancing its integration and coordination. Most of the proposed research questions will require a different approach than using data from the MABEL study.

Table 10.4: Areas for further research

Area	Further research needed
<b>Participation</b>	<ul style="list-style-type: none"> <li>• How does gender influence participation in outreach work, including ongoing practice?</li> <li>• What exposures develop a specialist's connection to a region?</li> <li>• Do flexible employment conditions and/or back-filling increase participation in rural outreach?</li> </ul>
<b>More remote outreach services</b>	<ul style="list-style-type: none"> <li>• How is "growing the practice" interpreted by specialists in different practice sectors, particularly those working publicly?</li> <li>• What is the exact nature of other (non-RHOF) subsidies – there is poor evidence in the literature as to what they are?</li> </ul>
<b>Sustained outreach</b>	<ul style="list-style-type: none"> <li>• Why services provided to smaller towns (&lt;5,000 population) are sustained more commonly than those provided to larger towns (&gt;50,000 population)?</li> <li>• Why are specialists in mixed mainly private practice more likely to provide stable outreach whilst those only working privately are less likely?</li> <li>• What is the extent of succession planning of rural outreach services and does it influence ongoing outreach work?</li> <li>• What factors inhibit ongoing participation by early career specialists?</li> <li>• Does outreach participation increase the retention of specialists whose main practice is based in a rural location?</li> </ul>
<b>Policy development and planning</b>	<ul style="list-style-type: none"> <li>• What are effective indicators to differentiate the need for specialist care at a regional level?</li> <li>• What are the rural health population health priorities of state and territory governments? How do they relate to access to various specialty services, if any? What are the perceived benefits and limitations to using rural outreach to address relevant priorities?</li> <li>• Can state or territory-based rural health priority setting and outreach policy increase targeted outreach service provision?</li> <li>• How commonly do public hospitals use outreach as a strategy, and in what context?</li> </ul>

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- What systems effectively promote coordinated and integrated outreach in regional and small rural/remote locations? Are they generalisable or context specific?
  - What systems effectively engage public and private specialists (local and outreach workers) on targeted regional priorities?
  - Would Australia's national outreach policy work in other nations with universal health financing schemes such as Medicare to pay for clinical services?
- 

## 10.6 General limitations

### 10.6.1 Study design and sampling

The thesis research relied on self-reported data from the MABEL longitudinal survey of Australian doctors. The MABEL research team use specific protocols to maximise response rates, maintain the size of the annual cohort at around 10,000 and collect reliable, valid data. The research is based on around 22% of Australian specialists who responded to the initial MABEL survey, of which around 19% participated in rural outreach. Based on the challenges of conducting research on doctors, specifically the time and effort required of doctors to participate, the MABEL response rate is considered reasonably good. Although MABEL is the best available national data on this topic, it can only provide an estimate as to the extent and range of national medical workforce activity. It is however, more suited to support the comparisons undertaken in various chapters of this thesis, including observing longitudinal outcomes and researching medical workforce policy.

Throughout the thesis, non-response and attrition bias was assessed and managed, as summarised in Table 10.5. There is still some potential for bias from other covariates that were not able to be measured, such as practice management and overall work satisfaction.

The self-reported nature of the MABEL survey means there is some potential for reporting error. This was not possible to measure. Specific protocols around designing questions to measure behaviours rather than opinions, as well as piloting processes are expected to reduce this error.

Another limitation is that this thesis did not include a systematic literature review. As such, there is a small potential that some published evidence of outreach services and outreach policy were not found.

**Table 10.5: Summary of how sample and attrition bias were accounted for in various Chapters**

<b>Chapter</b>	<b>Waves of data used in analysis</b>	<b>How managed</b>	<b>Weighting</b>
<b>5</b>	1	Referenced published study protocol which statistically tested sample representativeness (specific to all types of doctors in wave 1)	Applied cross-sectional weights to analyses (proportions and logistic regression models)
<b>6</b>	1	Referenced published study protocol which statistically tested sample representativeness. Compared characteristics of specialists who responded to wave 1 with Australian specialist workforce	Applied cross-sectional weights to analyses (proportions and logistic regression models)
<b>7</b>	1,2,3,4 (cohort included new entrants to the survey in waves 1 and 2)	Referenced published study protocol which statistically tested sample representativeness. Compared characteristics of specialists included in the cohort (drawn from entrants to the survey at wave 1 and 2) with the Australian specialist workforce  Attrition bias tested	No cross-sectional weight available for bi-wave cohort in the study
<b>8</b>	7	Referenced published study protocol which statistically tested sample representativeness. Compared characteristics of specialists who responded to wave 7 with Australian specialist workforce	No cross-sectional weight available
<b>9</b>	7	Referenced published study protocol which statistically tested sample representativeness. Compared characteristics of specialists who responded to wave 7 with Australian specialist workforce	No cross-sectional weight available

### 10.6.2 Questionnaire items

The thesis included the use of existing and new data. The accurate measurement of outreach was improved in all versions of the questionnaire by asking specialists to state the name and postcode of the location where they travelled to provide services, which could be assessed in relation to the location of the main practice. Where specialists indicated non-specific locations

or commented in text that the service was telehealth or retrieval, they were excluded from the cohort of outreach providers.

The new questions added to wave 7, were able to more sensitively measure outreach as opposed to other types of mobile service by asking specialists whether one of the services listed was to a non-metropolitan location on a regular and periodic basis, an “outreach service”. Further validation of outreach was carried out using new data about service regularity, which resulted in excluding specialists providing the service zero times or 40 or more times in the last year, where the outreach location was the same as the location of their main work. The definition of outreach based on existing data resulted in a prevalence of 19%, whereas the more sensitive measure showed a prevalence of 18%. This suggests there was only a slight over-estimation of rural outreach in Chapter 5, 6 and 7. Hence, in Chapter 7, a small proportion of the cohort ceasing outreach could have been locum or retrieval workers.

The range of data including the number of reasons that could be included for specialists providing rural outreach services was restricted based on the overall size of the MABEL survey. It was not possible to include open-text responses.

### **10.6.3 Statistical analyses methods**

Descriptive methods formed the basis of the studies in the thesis. Most studies were cross-sectional, such that associations rather than causality could be determined. The thesis included one longitudinal survey, however, due to specialists missing particular waves of data, methods included an assumption of ongoing practice to the same town. To account for this assumption, sensitivity analysis was done. Several variables such as practice sector are indicative only, based on the average weekly hours worked in different settings. All of the studies included some missing data although the patterns of missing values appeared to be random and non-systematic, suggesting bias in regression analysis would be minimal.



## **10.7 Conclusion**

This thesis has systematically explored rural outreach work by specialist doctors in Australia, including the participation in such work, the distribution of rural outreach services and the degree to which rural outreach services are sustained. The results of the research presented in this thesis provide an important new body of evidence for rural outreach policy development and planning within the Australian context. Specialist outreach service delivery is relatively common and has the potential to improve access to specialist services in both regional and more remote areas. A complex range of factors influences participation and patterns of outreach work in different ways. These factors include the characteristics of specialist doctors, where they reside, the nature of their main practice and financial support. Enabling outreach participation, service provision into more remote locations and sustaining outreach services is likely to depend on multilevel policy development and planning with respect to drivers at an individual, organisational and economic level. Important challenges based on the extent and range of outreach services include targeting priority services to population health need, and promoting coordinated and integrated service delivery. Further research is needed to determine the range of strategies that might address many of the policy and planning challenges raised in the thesis. Specifically within the economic domain, the thesis identified subsidies have the potential to influence the distribution of specialist outreach services into more remote locations and if well-structured and funded, have the potential to target regular, ongoing services in priority areas.



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# Appendix 1: New outreach questions in wave 7 MABEL survey

Questions 53-67 were added to MABEL wave 7 specialist survey to explore rural outreach.

## SPECIALIST

50. Please indicate the reason/s for these restrictions.

☐ I hold a Permanent Resident Visa

☐ I hold a Temporary Resident Visa

☐ I am undertaking a return of service period for a Medical Rural Bonded Scholarship or Bonded Medical Place

☐ Other

☐ Not Applicable

51. Do you travel to provide services/clinics in other geographic areas?

<sup>1</sup> ☐ Yes

<sup>2</sup> ☐ No—Go to question 65

52. Where are you providing these services? Please list up to three locations below.

	Town/Suburb	Postcode
Location 1 . . . . .	<input type="text"/>	<input type="text"/>
Location 2 . . . . .	<input type="text"/>	<input type="text"/>
Location 3 . . . . .	<input type="text"/>	<input type="text"/>

53. Do you provide at least one of these services in a non-metropolitan location on a regular, periodic basis (an 'outreach' service)?

<sup>1</sup> ☐ Yes

<sup>2</sup> ☐ No—Go to question 65

54. At which non-metropolitan outreach location do you spend the most time?

55. On average how often did you visit this location in the last year?

No. of visits . . . . .

56. In what year did you start providing an outreach service to this location? . . . . .

57. How long does it take to travel to this location from your normal place of residence?

<sup>1</sup> ☐ Less than 3 hours

<sup>2</sup> ☐ Between 3 and 6 hours

<sup>3</sup> ☐ 7 or more hours

58. Are you paid a salary/fixd payment for your outreach services to this location?

<sup>1</sup> ☐ Yes

<sup>2</sup> ☐ No

59. What main approach do you take to patient co-payments (gap payments) for your outreach services to this location?

<sup>1</sup> ☐ Mostly I charge patients a gap payment

<sup>2</sup> ☐ Mostly bulk bill patients under Medicare

<sup>3</sup> ☐ Mostly no patient charges are applied and no Medicare claim is made

60. Do you currently receive any reimbursement or subsidy for your outreach service to this location (e.g. for travel costs)?

<sup>1</sup> ☐ Yes, from the Commonwealth, e.g. Rural Health Outreach Fund

<sup>2</sup> ☐ Yes, from another source

<sup>3</sup> ☐ No

61. Did you lead the establishment of the outreach service to this location?

<sup>1</sup> ☐ Yes

<sup>2</sup> ☐ No

62. Are you required to provide outreach services in a non-metropolitan area as part of your employment conditions at your main place of work?

<sup>1</sup> ☐ Yes

<sup>2</sup> ☐ No

## SPECIALIST

63. Please indicate the degree to which you agree or disagree with the following statements.

I provide outreach services in order to:

	Strongly Agree 1	Agree 2	Neither agree nor disagree 3	Disagree 4	Strongly Disagree 5
Grow my practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provide healthcare to disadvantaged people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintain a personal connection to a region	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provide complex healthcare in challenging situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provide support for local health staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

64. For how long do you plan to continue providing outreach services in this location?

- <sup>1</sup> ☐ For less than five years – Go to question 68  
<sup>2</sup> ☐ For five years or more – Go to question 68

65. Are you considering providing outreach services to a non-metropolitan location in the next five years?

- <sup>1</sup> ☐ Yes  
<sup>2</sup> ☐ No

66. Have you previously provided an outreach service to a non-metropolitan location?

- <sup>1</sup> ☐ Yes  
<sup>2</sup> ☐ No – Go to question 68

67. Have you previously received a Commonwealth funding, e.g. through MSOAP, for this outreach service?

- <sup>1</sup> ☐ Yes  
<sup>2</sup> ☐ No

## G About your family circumstances

68. Are you currently living with a partner or spouse?

- <sup>1</sup> ☐ Yes  
<sup>2</sup> ☐ No

69. What is the employment status of your partner/spouse?

- <sup>1</sup> ☐ Not in the labour force (e.g. caring for dependents, studying)  
<sup>2</sup> ☐ Currently seeking work  
<sup>3</sup> ☐ Full-time employment  
<sup>4</sup> ☐ Part-time employment  
<sup>5</sup> ☐ Not Applicable

70. Is your partner/spouse also a medical doctor?

- <sup>1</sup> ☐ Yes  
<sup>2</sup> ☐ No  
<sup>3</sup> ☐ Not Applicable

71. For how many years did your partner/spouse live in a rural area up until the age he/she left secondary school? (If none, write 0)

- Don't know (Tick box) ☐  
 Not Applicable (Tick box) ☐

72. Please indicate the main rural area where your partner/spouse lived up until school leaving age.

- Town   
 State   
 Don't know (Tick box) ☐  
 Not Applicable (Tick box) ☐