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**ANTON BREINL CENTRE FOR PUBLIC HEALTH AND  
TROPICAL MEDICINE  
SCHOOL OF PUBLIC HEALTH, TROPICAL MEDICINE AND  
REHABILITATION SCIENCES  
JAMES COOK UNIVERSITY**

**QUEENSLAND HEALTH, ALLIED HEALTH PRE-ENTRY  
SCHOLARSHIP REVIEW**

**LITERATURE REVIEW**

**Report submitted to:**

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**Julie Hulcombe  
Director Allied Health Workforce Advice and Coordination Unit  
Queensland Health**

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## ***Contributions and Acknowledgements***

This work was coordinated by Sue Devine, Senior Lecturer at the Anton Breinl Centre for Public Health and Tropical Medicine at James Cook University. Any enquiries can be directed to:

Sue Devine  
Anton Breinl Centre  
School of Public Health, Tropical Medicine and Rehabilitation Sciences  
James Cook University  
Townsville, Qld, 4811  
Phone: (07) 47815335  
Fax: (07) 47815254  
Email: [sue.devine@jcu.edu.au](mailto:sue.devine@jcu.edu.au)

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# **1. INTRODUCTION**

In June 2010, the Anton Breinl Centre for Public Health and Tropical Medicine in the School of Public Health, Tropical Medicine and Rehabilitation Sciences at James Cook University was engaged by the Allied Health Workforce Advice and Coordination Unit at Queensland Health to conduct a literature review as part of the overall Queensland Health Allied Health Pre-Entry Scholarship Review.

The literature review addresses the following questions:

1. The association between undergraduate scholarship schemes and enhanced recruitment of rural and remote allied health professionals (AHP) and the retention of early career AHPs
2. The features that influence the success of existing undergraduate scholarship schemes in relation to:
  - Structure e.g. year at entry, duration, support (financial, organisational) during scholarship period
  - Service (bonding) periods and administration of same
  - Components of the scholarship program which support the recipient to gain rural and remote practice skills and positively influence early career retention outcomes
- 3 Other models to enhance allied health rural and remote recruitment and early career retention outcomes
- 4 Evidence (and of what strength) to support these models
- 5 Current and projected rural and remote allied health workforce trends - i.e. how many new graduates currently enter rural and remote practice, are these numbers increasing, decreasing?

The National Rural Health Alliance (NRHA) (2004) in collaboration with Services for Australian Rural and Remote Allied Health Inc (SARRAH) (2005) have defined a clinical and diagnostic AHP as an individual who works with other AHPs and medical and nursing professionals as part of a multidisciplinary team in primary and/or secondary care to achieve best practice outcomes for clients by providing direct treatment or assistance, assessment and client/patient management and education. AHPs practice in multiple disciplines. However, for this literature review, AHPs include the following:

- Physiotherapists
- Occupational therapists
- Speech therapists
- Dietitians/nutritionists
- Podiatrists
- Psychologists
- Pharmacists
- Medical imaging/radiographers
- Social workers.

## **2. METHODOLOGY**

The first set of questions addressed by the literature review (questions 1-4) focus on strategies used to enhance the recruitment of rural and remote allied health professionals and the retention of early career allied health professionals. The review particularly seeks to uncover evidence to support the efficacy of undergraduate scholarship schemes and the factors associated with their success. It also seeks to identify additional strategies that have been employed to address allied health recruitment and retention in rural and remote regions, both in Australia and overseas, and to assess their effectiveness.

At this point it is important to note that while there has been a multiplicity of strategies used to enhance recruitment and retention of health professionals in rural and remote regions, there is a dearth of robust evidence to support the effectiveness of any of these strategies. The absence of rigorous evidence was highlighted by the recent Cochrane review of interventions to increase the proportion of health professionals practicing in rural and other underserviced areas. They identified a number of strategies including educational, financial, regulatory and supportive but concluded that “there are no studies in which bias and confounding are minimised to support any of the interventions that have been implemented to address the inequitable distribution of health care professionals” (Grobler, Marais, Mabunda, Marindi, Reuter & Volmink, 2009, p.2). Additionally, a systematic review by Australian authors of retention incentives for health workers in rural and remote areas also commented on the paucity of evidence and poor quality of what evidence does exist (Buykx, Humphreys, Wakerman & Pashen, 2010). The Australian review concluded that there is little evidence available to support the effectiveness of any specific retention strategy.

Given this paucity of robust evidence of the effectiveness of any rural and remote workforce strategies, it was apparent for the current review that conducting a literature search using rigid inclusion/exclusion criteria would result in few if any instances of rigorous evidence pertaining specifically to scholarships or to components of scholarships, or even to other strategies and thereby be of little value to policy makers trying to weigh up the relative effectiveness of various incentives. Accordingly, the current review adopted a broad search strategy that included both published and grey literature:

- *Published literature:* the *Cochrane Library*, *EBSCOhost (Health)* and *MEDLINE* were searched using the following terms:

- Scholarship, recruitment, retention, rural, remote, allied health, physiotherapist, occupational therapist, speech pathologist, speech therapist, social worker, podiatrist, psychologist, pharmacist, medical imaging, radiologist, dietitian, nutritionist, medical/doctor (medical practitioners were included because the bulk of the literature on recruitment and retention strategies has been conducted on this cohort), undergraduate, graduate, early entry/ early career, base grade
- *Grey literature* was accessed by undertaking a *Google* search using similar terms in addition to searching Australian state health websites and peak body websites
- A snowballing technique was used whereby the reference lists of identified papers were searched for additional material
- Strategies that did not pertain to undergraduate recruitment were excluded
- Strategies that did not pertain to early career retention were excluded
- Strategies from overseas that were not relevant to the Australian context were excluded
- The time period searched was 1990-2010
- Only English language material was included.

The second and subsidiary question addressed by the literature review relates to rural and remote allied health workforce trends in Australia. The search strategy for this component of the review was:

- *Published literature: EBSCOhost (Health) and MEDLINE* were searched using the following terms:
  - Workforce, rural, remote, allied health, physiotherapist, occupational therapist, speech pathologist, speech therapist, social worker, podiatrist, psychologist, pharmacist, medical imaging, radiologist, dietitian, nutritionist, undergraduate, graduate, early entry/ early career, base grade
- *Grey literature* was accessed by undertaking a *Google* search using similar terms in addition to searching Australian state health websites and peak body websites including registration boards and Australian Institute of Health and Welfare
- A snowballing technique was used whereby the reference lists of identified papers were searched for additional material
- The time period searched was 1990-2010.

### **3. CURRENT AND PROJECTED RURAL AND REMOTE ALLIED HEALTH WORKFORCE TRENDS IN AUSTRALIA**

The sustainable provision of health professionals to rural and remote regions of Australian has been an on-going challenge. While the literature on the rural and remote health workforce has focused heavily on the medical profession and to a lesser extent, nurses, there is data to show that recruitment and retention of AHPs is also of significant concern. Although in general the data collected on the allied health workforce is of poor quality (Health Professional Council of Australia [HPCA], 2005), there is a national shortage of AHPs with a maldistribution between metropolitan centres and rural and remote communities such that access to the range of core clinical allied health services reduces significantly with increasing remoteness (Allen, 2005). In 2005, it was estimated that the average number of AHPs in major metropolitan areas was 2.66 per 10,000 population compared to 0.60 per 10,000 population in very remote areas, and 1.81 per 10,000 population in inner regional areas such as Bathurst (SARRAH, 2005). The NRHA (2004) expressed the problem in terms of “just 24% of allied health professionals service the 32% of Australia’s population living in rural and remote regions of Australia” (p.7). More recent data suggests that the ratio of allied health to population may be significantly less than this, at least in some regions of Australia (Smith, Cooper, Brown, Hemmings & Greaves, 2008).

In a climate of allied health workforce shortage, SARRAH (2010) has noted that demand for AHPs is likely to increase with the ageing of the population. This is particularly the case in remote regions of Australia where social isolation, cultural diversity, socioeconomic status, employment status, environmental factors and distance from health services impact negatively on health outcomes. The ageing of the population combined with epidemiological changes in the pattern of disease and disability (e.g., increased chronic disease, increased disability associated with depression) are also likely to force shifts in the nature of health service delivery including greater emphasis on employing multidisciplinary health teams (Battye, Hines, Ingham & Roufeil, 2006).

Section 3 of the this literature review aims to describe the current and projected allied health workforce trends, with specific emphasis on professionals working in rural and remote areas and new graduate employment trends. However, it is important to note that this data is limited, based on estimates only, and varies across allied health disciplines (Lowe, 2007). It is also quickly out of date due to the long time lapse between collection and publication of the data



(Lowe, 2007). This situation may improve in the future as Health Workforce Australia (HWA) has commenced a program of work to collect and store robust data on the Australian health workforce in a single repository system although this data is not yet available<sup>1</sup>. While the HWA aims to provide current data on the allied health sector, its focus is on quantifying workload capacity for specific health care arrangements. Although this will be beneficial in determining the number of staff required in certain health fields, a gap may continue to exist in data collection methods which provide a comprehensive understanding of current workforce trends combined with workload capacity and efficacy of recruitment and retention strategies. For this current literature review, we acknowledge the “age” of the data presented but acknowledge this reflects the current state of allied health workforce data for rural and remote Australia.

### ***3.1 Trends in Australian allied health workforce over time***

The Australian Institute of Health and Welfare (AIHW) (2009) report data from the 2006 census for AHPs, but unfortunately do not present the data according to geographical location. The AIHW does report changes in the overall number of workers per profession from the 2001 to 2006 census with substantial increases reported for all the AHPs of interest to this study (see Table 1). The largest increases were for social workers (36.6%), dietitians (29.6%) and medical imaging specialists – predominantly medical diagnostic radiographers, medical radiation therapists, nuclear medicine technologists and sonographers (28.2%), with the smallest increase for pharmacists (10.2%). However, the situation for pharmacists may have improved since 2006 with the recent growth of university training programs. For example, from 2001 to 2006 there was a growth rate of about 1.8 % per annum in the pharmacy workforce (Human Capital Alliance, 2008). It was expected that the actual pharmacy workforce would grow from about 11,000 in 2000 to between 13,594 and 14,147 in 2010, an annual growth rate of about 2% (Health Care Intelligence, 2003). Despite this apparent growth in the production of pharmacy graduates, there remains considerable doubt as to whether this will translate into an improvement in the distribution of pharmacists in rural and remote regions (Waterman, 2008).

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<sup>1</sup> For further information on the role of HWA in data collection, see <http://hwa.gov.au/programs/research-and-data/national-health-workforce-dataset>

**Table 1: Change in number of allied health professionals between 2001 and 2006**

Allied health profession	Change (increase) between 2001 & 2006 (%)
Dietetics	29.6
Pharmacy (all)	10.2
Medical Imaging (all)	28.2
Occupational Therapy	27.7
Physiotherapy	19.9
Podiatry	18.8
Psychology (clinical psychologists) ^	Not available
Social Work	36.6
Speech Pathology	28.7

Source: AIHW (2009)

^ It was not possible from the AIHW data to ascertain the number of registered psychologists who were *not* clinical psychologists.

The AIHW (2010) reports somewhat different trends over time for the allied health workforce based on workforce data for 2003 and 2008 (see Table 2). This data shows the biggest rise in the physiotherapy workforce (49%) and the smallest rise in the psychology workforce (13%). The AIHW included data on the percentage of the workforce over 55 to provide an indicator of likely workforce loss due to retirement. Based on this data, the pharmacy profession may be at greatest risk. To further understand potential workforce trends, the AIHW reported the number of completions of allied health courses in 2002 and again in 2007 (see Table 3). This data showed an overall increase of 26% in all people completing health-related courses, with the highest growth in nutrition/dietetics (94%) and podiatry (64%), and the lowest growth for occupational therapists (8%).

**Table 2: Allied health professions employed in 2003 and 2008**

Occupation	2003		2008		% increase 2003-2008
	Number	% over 55 years	Number	% over 55 years	
Medical imaging	10,500	8**	13,300	13	27
Pharmacy	15,700	22*	19,200	23	22
Physiotherapy	11,000	5**	16,400	16*	49
Psychology	13,100	8*	29,200	16*	13
Social work	12,600	9*	17,000	14*	35

Source: AIHW (2010), p.448

\*ABS advises use of this data with caution. \*\* ABS advises data is unreliable.

**Table 3: Completions of selected higher education allied health courses by Australian citizens and permanent residents 2002 and 2007**

Field	Number in 2002	Number in 2007	% change 2002-2007
Pharmacy	754	1,181	56.6
Radiography	609	781	28.2
Physiotherapy	739	971	31.4
Occupational therapy	698	756	8.3
Speech pathology	436	543	24.5
Podiatry	113	185	63.7
Nutrition/dietetics	302	586	94.0

Source: AIHW (2010), p.450

### ***3.2 Census data for allied health professionals by geographical location***

The most extensive report containing allied health workforce records was published in 2004 by Lowe and O’Kane using 2001 Australian Bureau of Statistics (ABS) data. Although this report provides an in depth view on allied health data, it is now outdated and it does not incorporate data on allied health graduates entering rural and remote practice as this type of data has never

been collected. Lowe and O’Kane (2004) highlight the under representation of allied health professionals in 2001 in rural and remote locations across all states (not applicable to NT, ACT or Tasmania), relative to the percentage of population living in rural and remote regions. For example, in NSW 29% of the population lived in rural and remote locations, however, only 21% of AHPs worked in rural and remote locations (see Table 4). In Queensland, 48% of the population lived in rural and remote locations however only 33.7% of AHPs worked in rural and remote locations.

**Table 4: Difference in ratio between population and allied health workforce by rural and remote regions across states 2001**

State	Number of Allied Health Professionals	% of Allied Health Professionals in rural and remote	% of population living in rural and remote
New South Wales	16,869	21	29
Victoria	14,223	19	26.4
Queensland	8,404	33.7	48
South Australia	4,579	15.5	28
Western Australia	5,592	17.5	30
Tasmania*	1,193	100	100
Northern Territory*	443	100	100
ACT**	1,024	-	-
Australia	52,327	24	32

Source: Lowe & O’Kane, 2004

\*All of this state/territory is classified as rural and remote

\*\*All of this territory is classified as a city

Table 5 provides individual figures for specific AHPs and the percentage working in rural and remote localities in 2001. Using an average figure that 32 percent of Australians live in rural and remote areas, all AHPs are underrepresented in rural and remote Australia with hospital pharmacists least represented (20.2%) and speech pathologists with the highest rural and remote representation (27.9%).

**Table 5: Distribution of allied health professions in 2001**

Allied Health Profession	Number	Major Capital	Rural and remote
			(% of number)
Audiologist	797	639	158 (19.8)
Dietitian	1996	1508	488 (24.4)
Hospital Pharmacist	1713	1367	346 (20.2)
Medical Imaging	8322	6321	2001 (24)
Occupational Therapist	5339	3989	1350 (25.3)
Orthoptist	434	382	52 (12)
Orthotists /Prosthetist	356	288	68 (19.1)
Physiotherapist	10249	7679	2570 (25.1)
Podiatrist	1750	1323	427 (24.4)
Psychologist	9318	7406	1912 (20.5)
Social Worker	9108	6823	2285 (25.1)
Speech Pathologist	3006	2166	840 (27.9)
<b>Total:</b>	<b>52388</b>	<b>39882</b>	<b>12497 (23.9)</b>

Source: Lowe & O’Kane (2004)

Shaded professions are those which are relevant to this literature review

Lowe and O’Kane (2004) also present ABS 2001 data on the number of allied health professionals within specific age groups working in rural and remote regions. Examining the data for the under 25 age group provides some way of understanding of the number of newly qualified allied health professionals entering the rural and remote workforce. This age group would contain many (though not all) AHPs who have graduated within the past 5 years. Caution is needed however, with this assumption, as there is a significant level of mature age entry into some disciplines. Table 6 identifies 20.8% of people aged 24 and under within specific AHPs working in rural and remote locations in 2001. Similar data from the 2006 census is not available from the ABS website. There is thus no way of comparing 2001 and 2006 figures to ascertain trends.

**Table 6: Comparative age distribution across the ASGC Remoteness Structure Regions for allied health professional workforce disciplines – expressed as a percentage**

Allied Health Profession	0-24 years		25-34 years		35-44 years		45-54 years		55+	
	MC	R&R	MC	R&R	MC	R&R	MC	R&R	MC	R&R
Audiology	88	12	77	23	80	20	82	18	93	7
Dietetics	70	30	77	23	73	27	79	21	71	29
Hospital Pharmacy	87	13	85	15	79	21	77	23	72	28
Medical Imaging	79	21	79	21	74	26	73	27	73	27
Occupational Therapy	74	26	79	21	70	30	72	28	76	24
Orthoptics	90	10	91	9	87	13	83	17	77	23
Orthotics	91	9	87	13	77	23	74	26	80	20
Physiotherapy	76	24	79	21	73	27	71	29	74	26
Podiatry	71	29	76	24	74	26	85	15	71	29
Psychology	81	19	82	18	80	20	77	23	78	22
Social Work	80	20	79	21	74	26	71	29	74	26
Speech Pathology	64	36	74	26	73	27	75	25	68	32
<b>Average:</b>	<b>79.3</b>	<b>20.8</b>	<b>80.4</b>	<b>19.6</b>	<b>76.2</b>	<b>23.8</b>	<b>76.8</b>	<b>23.4</b>	<b>75.7</b>	<b>24.4</b>

Source: Lowe & O’Kane (2004)

Shaded professions are those which are relevant to this literature review. MC=metropolitan / city. R&R = rural and remote.

### **3.3 Other sources of allied health workforce data**

In addition to census data, other sources of data on the allied health workforce are registration board surveys, AIHW surveys, state health department and other peak body surveys. The problem with this data is the inconsistent collection/reporting of the data, inadequate categorisation of geographical location, and reliance on survey formats with limited response rates. For example, NSW Health undertakes regular surveys of physiotherapists on the Registered Physiotherapists Board of NSW. However, the last survey was completed in 2005 (prior to the 2006 census) and of the 6,568 physiotherapists in 2005, only 82.4% responded (NSW Health, 2008). Other survey-based approaches such as that employed by the Tasmanian

Allied and Oral Health Workforce Study (Lowe, Keane & Smith, 2009) struggle to quantify the rural workforce. In the remainder of this section we report the findings from various surveys of this kind although we recommend the findings be treated with caution.

A national survey undertaken with occupational therapists in 2002-2003 found that 91.1% of the 3,107 respondents who were employed as occupational therapists worked in metropolitan areas while only 8.9% worked in rural and remote areas (AIHW, 2006a). This data, however, is difficult to interpret as the study was unable to provide a survey response rate as the national occupational therapist figures were unknown.

A survey of the rural pharmacy workforce for the Pharmacy Guild conducted in 2009 indicated that the rural pharmacy workforce itself was poorly distributed with 47.2% in inner regional areas, 29.8% in outer regional areas, 4.0% in remote regions, and 1.5% in very remote regions (based on the Australian Standard Geographical Classification) (RhED Consulting, 2010). Of additional concern was the very high proportion of pharmacists over the age of 55 in remote and very remote regions. However, once again this data is based on a low response rate of 25.1%.

An online survey of psychologists distributed by the various psychology registration boards in Australia (Mathews, Stokes, Crea & Grenyer, 2010) received a response rate of 48% and reported that a much larger proportion of psychologists were providing services to rural, regional and remote regions than previously reported by the AIHW (2006b). One quarter of respondents to this survey were providing services to non-metropolitan regions.

The Department of Education, Employment and Workplace Relations (DEEWR) undertakes extensive skill shortage research on an on-going basis based in job advertisements and other data. Their most recent data is for the first half of 2010 and is summarised in Table 7. While there are limitations to this data because of the collection method, it showed shortages across most states, especially for medical imaging practitioners, speech pathologists, and podiatrists, and in some states, for psychologists and physiotherapists.

**Table 7: Skill shortages for allied health professions by state**

Profession	Qld	NSW	SA	NT	WA	Tas	Vic
Dietetics	No shortage – data assessed at national level						
Pharmacy (hospital and retail)	No shortage – data assessed at national level						
Medical Imaging • Medical diagnostic radiographer	S	S+	NS	S	S	S	R, M-D
• Medical radiation therapist	Shortage – data assessed at national level						
• Sonographer	S	S	S	S	S	Not reported	S
Occupational Therapy	S	RD	NS	D	D	S	Not reported
Physiotherapy	S	RD	NS	S	S	S	Not reported
Podiatry	Shortage – data assessed at national level						
Psychology (clinical psychologist)				Not reported	S	S	PubS
Social Work				Not reported	S		Not reported
Speech Pathology	Shortage – data assessed at national level						

Sources: DEEWR, 2010a,b,c,d

S = shortage; + = shortage is particularly evident in regional areas; R = regional area shortage; NS = no shortage; D = recruitment difficulty; RD=recruitment difficulty in regional areas; M-D = recruitment difficulties in metropolitan areas; PubS = public sector experiences significant difficulty recruiting

### **3.4 Conclusions**

The total number of graduating and employed AHPs in Australia seems to be increasing in all of the AHPs under investigation in this study although this is based on limited and poor quality data. The published literature also does not unpack the data sufficiently to understand what this apparent increase translates to in the workforce. For example, it is unclear if the apparent increase equates to true full-time equivalent positions. This may be a particularly relevant issue given the feminisation of many of the allied health professions and the lifestyle choices preferred by many young professionals today.



The breakdown of the workforce data by geographical location is also non-existent or at best weak. It fails to drill down to understand outreach delivery of services, and to distinguish adequately between where an AHP lives and where they provide services (which may be multiple places). In summary, the evidence suggests that despite training more AHPs the shortage of these health professionals appears to continue, particularly in rural regions, and particularly for some professions (i.e., podiatry, speech pathology, medical imaging professionals, and in some states psychologists and physiotherapists).

## **4. RECRUITMENT AND RETENTION**

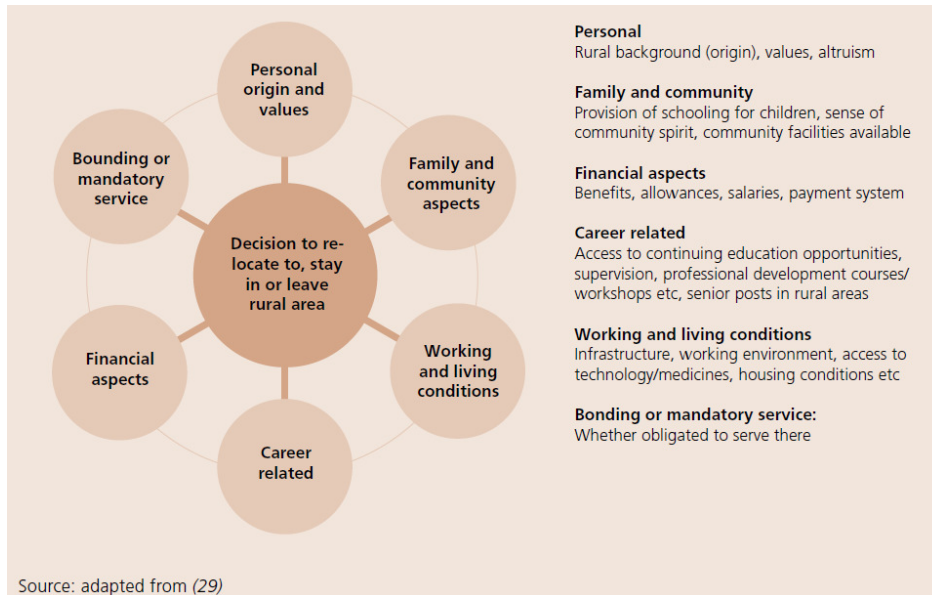
Workforce retention refers to “the length of time between commencement and termination of employment” (Humphreys, Wakerman, Pashen & Byykh, 2009, p.7). Recruitment is related to retention but also distinct from it. Recruitment involves “the attraction and selection of staff to a particular organisation or role and is a pre-requisite for retention” (Humphrey et al, 2009, p.8). Section 4 begins with an overview of the factors that have been identified as associated with the decision to work in a rural region and the factors associated with the retention of health professionals to rural regions. These factors are discussed here because they have been used, either singularly or in combination, to inform the development of recruitment and retention strategies. Following this review, a summary of recruitment and retention strategies (both national and international) is provided with an analysis of the evidence base for these interventions.

### **4.1 Factors associated with recruitment and retention of allied health professionals**

A considerable body of literature has accumulated that investigates the factors associated with recruitment and retention of health professionals. The WHO (2010) has recently reviewed this literature and described the factors associated with recruitment and retention to remote and rural practice as falling in to five categories (see Figure 1):

- Personal origins and values
- Working and living conditions
- Career related
- Financial aspects
- Bonding and mandatory service.

**Figure 1: Factors related to decisions to relocate to, stay in or leave rural and remote areas**



Source: WHO 2010 (p.14)

Australian research has identified very similar recruitment and retention factors. These can be categorised in terms of the nature of the work, personal needs, and the context of the work including managerial factors. While not the major focus of this literature review, a broad synthesis of the Australian literature<sup>2</sup> indicates that the main factors associated with recruitment and retention are:

(i) Factors associated with the context of the work:

- Not enough time for networking and professional development
- Poor staffing levels
- Workloads in general
- Lack of leave relief via locum or agency staff

<sup>2</sup> This summary is based on the findings reported in the following literature: Alexander & Fraser, 2004; Denham & Shaddock, 2004; Firth, 2005; Gillham & Risteovski, 2007; Hoeth, 2004; Human Capital Alliance, 2005; Huntley, 1991; McAuliffe & Barnett, 2009; Mills & Millstead, 2002; Millstead, 2001; O’Kane & Curry, 2003; O’Toole, Schoo & Hernan, 2010; Pearson & Andres, 2010; Playford, Larson & Wheatland, 2006; SARRAH, 2000; Schofield, Fletcher, Fuller, Birden & Page, 2009; Schoo, Stagnitti, Mercer & Dunbar, 2005; Struber 2004; Struber 2005; Suarez & Shanklin, 2004; Summers, Blau & Ward-Cook, 2000; Taylor, Blue & Misan, 2001; Tran, McGillis Hall, Davis, Landry, Burnett, Berg & Jaglal, 2008.

- Funding issues around fractional appointments
- Inappropriate and/or ineffective management and supervisory structures for AHPs (e.g., not having another AHP as immediate supervisor), a problem magnified in smaller communities
- Poor access to education and training
- Limited opportunity for career advancement; flat career structures
- Inadequate attention by employing agencies to the occupational health and safety of AHPs engaged in outreach services
- Distance to be travelled for outreach workers and clients
- Lack of communication amongst agencies
- Poor management support
- Inadequate electronic information management and communication systems to support integrated practice
- Rapidly changing health service delivery structures
- Unevenly distributed and limited resources
- Lack of resource sharing
- Personal safety fears; violence, commonly in the form of verbal abuse or threatening behaviour, towards staff by patients or patients' relatives

(ii) Factors associated with the work itself (many of the factors listed above could also be placed in this category):

- Lack of opportunity to use special skills
- Professional isolation (especially for sole therapists)
- Lack of access to professional mentoring and debriefing sessions
- Pressure of waiting lists on overstretched services in every allied health discipline

(iii) Personal factors:

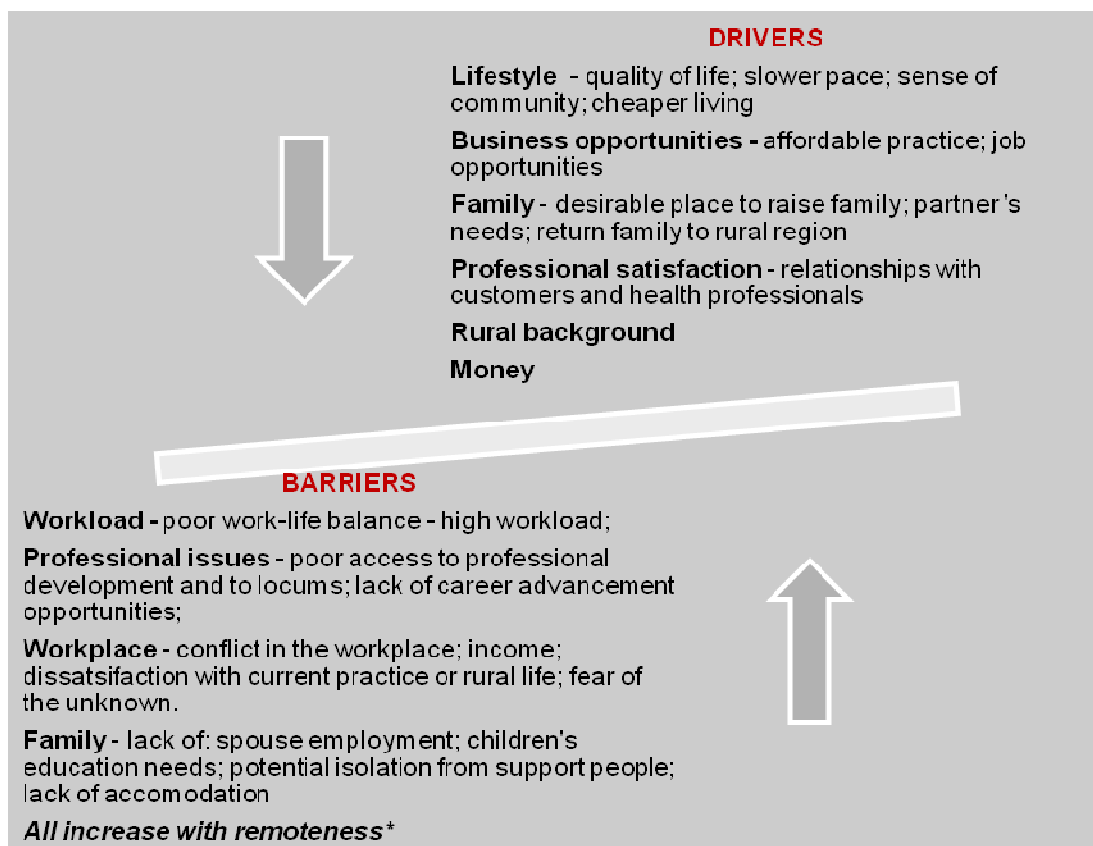
- Rural background
- Lack of educational and employment opportunities for family members
- Economic security
- Lack of financial incentives

- Negative perceptions of rural/remote living and professional practice (may be at least partially overcome by rural student placements)
- Social isolation
- Characteristics of the particular location or community.

It is generally accepted that the factors associated with recruitment (drivers and barriers) to rural and remote regions are different from those that affect retention because the decision to practise rurally is generally made from outside a rural context, whereas the decision to leave or stay is made from within a rural context. However, some recruitment and retention factors clearly overlap, and many exert their impact at different stages of the life course.

Balance models are often employed to explain decision making with regard to moving to rural areas and leaving rural practice. The premise is that an imbalance exists between incentives and disincentives (Mills & Millsteed, 2002). One such recruitment model described the drivers and barriers to rural practice for pharmacists, highlighting the mix of work-related and professional factors operating for this profession (RhED Consulting, 2010).

**Figure 2: Drivers and barriers to rural pharmacy practice**



Source: RhED Consulting, 2010 (p.96)

Mills and Millsted (2002) proposed a model of retention equilibrium for occupational therapists that also reflects an interplay of work-related and professional factors.

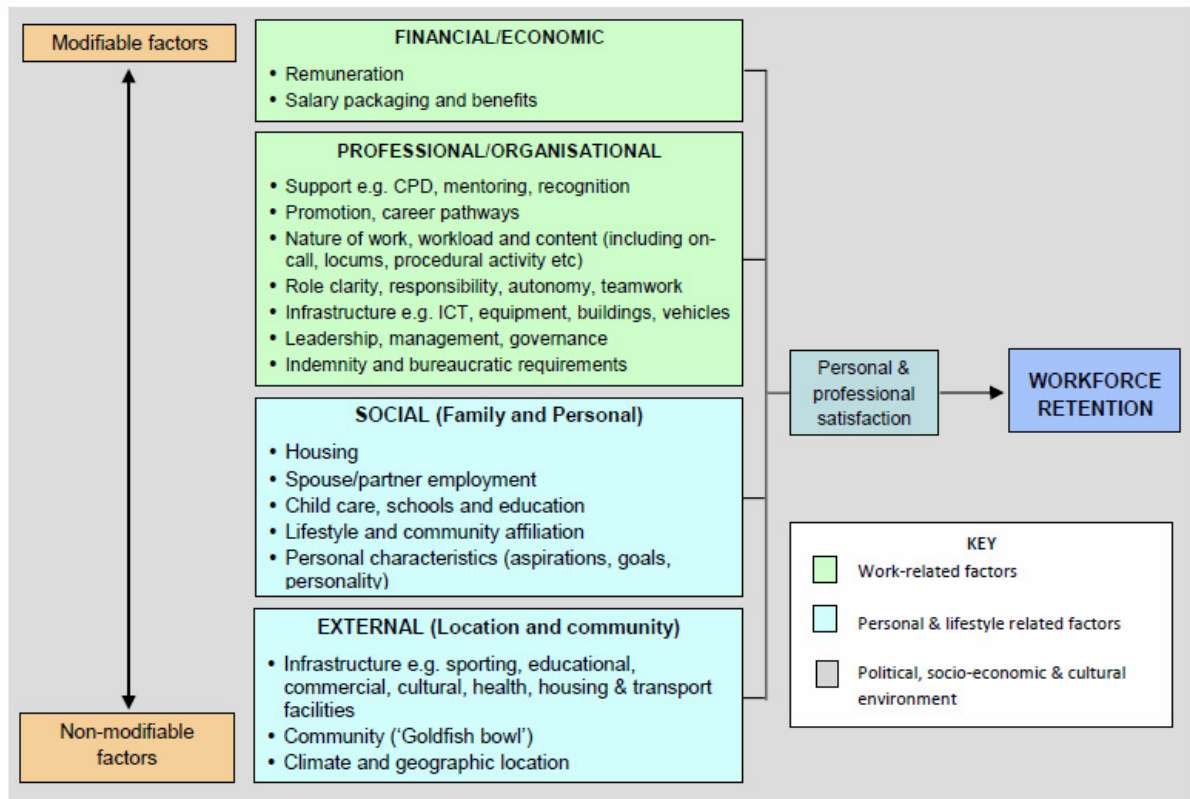
**Table 8: Model of retention equilibrium for occupational therapists**

	Incentives to leave	Incentives to remain
Professional factors	Lack of professional development Little professional support or recognition Pay and conditions	Development of professional skills Autonomy and independent Good working conditions
Personal factors	Family-related factors Homesickness	Friendships Lifestyle

Source: Mills & Millsted, 2002 (p.177)

Humphreys and colleagues (2009) have also posited a model of retention factors that identifies those factors that are modifiable and those that are not (see Figure 3).

**Figure 3: Factors affecting retention**



Source: Humphreys et al, 2009 (p.9)

## 4.2 Types of interventions to enhance recruitment and retention

Given the multiplicity of factors associated with recruitment and retention to rural and remote practice, a range of strategies at personal level, service level and the system level have been adopted, sometimes singularly or in combination. The World Health Organisation (WHO, 2010) has identified four broad categories of recruitment and retention interventions (see Table 9):

- (i) Education interventions
- (ii) Regulatory interventions
- (iii) Financial incentives
- (iv) Professional and personal support

**Table 9: Categories and types of recruitment and retention interventions and proposed reason for effectiveness**

<b>Category</b>	<b>Examples of types of interventions</b>	<b>Hypothesis</b>
Education	Students from rural background Health professional schools outside major cities Clinical rotation in rural areas during studies Curriculum that reflect rural health issues Continuous professional development for rural health workers	Select the 'right' students who is likely to work in a rural area and expose them to rural issues and practice; provide access to on-going education for rural health workers despite isolation to encourage them to stay in rural areas
Regulatory	Enhances scope of practice Different types of health workers Compulsory service Subsidised education for return of service	This encompasses a range of government-imposed legislation and policy to enforce or encourage rural practice
Financial	Appropriate financial incentives	Provision of additional financial or in-kind benefits for rural practice to entice health workers to regions and/or encourage them to stay
Professional and personal support	Better living conditions Safe & supportive work environment Outreach support Career development program Professional networks Public recognitions measures	Addressing the work-related or social/family related isolation that accompanies rural practice may entice health workers to regions and/or encourage them to stay

Source: Adapted from WHO, 2010 (p.17)

In Australia, governments and health services, sometimes in collaboration with university allied health departments and/or allied health organisations, have developed a raft of strategies to address the maldistribution of allied health professionals in rural and remote regions. Since the early 1990s, Australian governments have implemented a range of recruitment strategies and retention incentives initially targeting medical practitioners to rural and remote regions, and



more recently a broader range of health professionals including AHPs. The types of incentives used in Australia largely reflect the categories described by the WHO.

### **4.3 Impact of interventions on recruitment and retention: The evidence**

#### **Limitations of the evidence: Caution is warranted**

There is a paucity of robustly designed studies to assess the impact of recruitment and retention interventions on the rural and remote allied health workforce. What evidence is available offers only weak support for the strategies examined because of issues with the research design such as small sample size, failure to control for extraneous variables, difficulty establishing a baseline against which to assess results, significant drop out rates in longitudinal studies, and inability to identify causal relationships between interventions and workforce outcomes. Ascertaining evidence of a causal relationship is challenging because it is generally not ethically feasible to use randomized controlled trials to assess the effectiveness of various strategies. It is also costly, difficult and time-consuming to conduct longitudinal studies to track recipients over time<sup>3</sup>, especially when a range of factors such as rural background (itself a strong predictor of rural practice) need to be controlled to provide a robust test of the intervention. Given these obstacles, it is not surprising that so much of this body of literature has relied on assessing *intention* to take up rural practice as the outcome measure. While these studies provide some information to policy makers, it is essential researchers begin to adopt more sophisticated research designs and statistical procedures to provide stronger evidence to inform government responses.

A further challenge when evaluating rural workforce interventions is understanding the importance of the social, political and economic context in which the intervention took place (Huicho, Dieleman, Campbell, Codijia, Balabanova, Dussault & Dolea, 2010). Assessing an

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<sup>3</sup> Some universities attempt to monitor students after graduation but this is an expensive and difficult exercise. The only uniform longitudinal data collection system for health professionals currently in operation in Australia is the Medical Schools Outcomes Database (MSOD) and the Longitudinal Tracking Project. Data from this project has been used to predict medical students' *intention* to take up rural practice after graduation (Jones, Humphreys, & Prideaux, 2009). The statistically significant predictors included rural background and being on a scholarship or being bonded.

intervention in complex real world settings requires multimethod and multidisciplinary efforts that are time consuming and expensive. The WHO has stated that current efforts to assess the impact of workforce interventions in rural regions are rarely informed by best practice evaluation techniques and have accordingly developed a conceptual framework to encourage researchers in the health sector to improve the robustness of their evaluations and to address the difficulties in conducting evaluation studies in this complex area (Huicho et al, 2010).

One final caution is required before reviewing the evidence. In terms of recruitment and retention efficacy studies, the bulk of the literature has focused on medical practitioners as opposed to AHPs. This is perhaps not surprising since this is also where the bulk of government investment has been directed in terms of interventions. As an example of the dominance of medical practitioners in the literature, Buykx and colleagues (2010) recent systematic review of the literature on retention incentives for health workers found that of the 14 papers that met criteria, 6 were solely about medical practitioners and a further 5 were predominantly about doctors. The generalisability of findings on doctors to AHPs is unclear. For example, while some of the factors that have been shown to influence recruitment and retention for medical practitioners have also been found with AHPs (e.g, rural background, rurally-based training schools and rural clinical placements, see Dolea, Stormont & Braichet, 2010; Worley, Martin, Prideaux, Woodman, Worley & Lowe, 2008; Kent Guion, Mishoe, Taft & Campbell, 2006) there are likely to be important differences between the nature of the work carried out by the professions. For example, medical practitioners in rural and remote regions are much more likely to have to provide extensive on-call coverage and be unable to leave the community without locum coverage than most AHP disciplines. How the differences in the nature of the work conducted by health professionals impacts on recruitment and retention and hence on incentives, remains unclear.

The paucity of robust evidence of the efficacy (and relative efficacy) of strategies to address rural recruitment and retention impacts on policy makers who are challenged with identifying and implementing cost effective solutions to the rural workforce situation. Given this absence of evidence, one jurisdiction in Canada conducted a literature review of recruitment and retention strategies for health rehabilitation professionals (physiotherapists, occupational therapists, speech pathologists) and then used an expert panel to identify strategies that they *thought* would be the most important and most feasible to implement for this cohort (Tran et al, 2008). Such an approach to policy making reflects the current realities of the limited evidence-base in the management of rural workforce recruitment and retention issues. However, it does highlight

one of the basic principles described by the WHO, that is, the need to cautiously assess possible strategies for their likely efficacy in terms of both health professional and population needs and expectations (Dayrit, Dolea, & Braichet 2010).

## **The evidence**

The WHO has responded to the worldwide shortage of health professionals in rural and remote regions by establishing a program of work to improve access to health professionals in these areas through enhanced recruitment and retention. In particular, the WHO is focusing on building the evidence, developing policy recommendations based on the evidence, and supporting implementation (Dayrit et al, 2010). As part of this work, the WHO (2010) has published a review of the literature on recruitment and retention interventions and rated each of the broad strategies on the quality and strength of supporting evidence<sup>4</sup>. Table 10 outlines their findings and shows that Education had a mix of low and very low quality of evidence and strong and conditional strength of evidence, with exception to ‘students from rural backgrounds’ with moderate quality of evidence and strong strength of evidence; Regulatory and Financial categories had low quality of evidence and conditional strength of evidence; while Professional and Personal Support has low quality of evidence with strong strength of evidence.

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<sup>4</sup> Evidence refers to strategies to improve attraction, recruitment and retention in rural and remote areas. Quality of evidence is measured using the GRADE (Grading of recommendations, assessment, development and evaluation) criteria as well as other factors, including benefits and harm, the variability in values and preferences, the resources needed and technical feasibility in different contexts. The GRADE criteria provided an indication of the strength of evidence. Generally, a “strong” recommendation is related to “moderate” or “low” quality of evidence, while “conditional recommendation is linked with “very low” or “low” quality evidence.

**Table 10. Quality and strength of evidence for recruitment and retention interventions**

Category	Examples of types of interventions	Quality of evidence	Strength of evidence
Education	Students from rural background	Medium	Strong
	Health professional schools outside major cities	Low	Conditional
	Clinical rotation in rural areas during studies	Very Low	Conditional
	Curriculum that reflect rural health issues	Low	Strong
	Continuous professional development for rural health workers	Low	Conditional
Regulatory	Enhances scope of practice	Low	Conditional
	Different types of health workers	Low	Conditional
	Compulsory service	Low	Conditional
	Subsidised education for return of service	Low	Conditional
Financial	Appropriate financial incentives	Low	Strong
Professional and personal support	Better living conditions	Low	Strong
	Safe & supportive work environment	Low	Strong
	Outreach support	Low	Strong
	Career development program	Low	Strong
	Professional networks	Low	Strong
	Public recognition measures	Low	Strong

Adapted from WHO (2010)

One of the strongest lines of evidence found in the literature is for incentives that form what has been called the ‘rural pipeline’, referring to recruiting students from rural backgrounds, delivering regional training, exposing students during this training to rural curriculum and placements, and then building regional postgraduate training pathways. The evidence for the rural pipeline is strongest for the medical profession (e.g., Dunbabin & Levitt, 2003; Henry, Edwards & Crotty, 2009; Hsueh, Wilkinson, & Bills, 2004; Stagg, Greenhill, & Worley, 2009), but is beginning to slowly emerge for allied health professionals (e.g., Playford, Larson & Wheatland, 2006).

It is also important to note that the bulk of the programs designed by government to support allied health in rural Australia have focused on the public sector with minimal attention to AHPs

in the private sector (O'Toole & Schoo, 2010). This is despite some evidence that private sector AHPs remain longer in rural areas than those working in the public sector (O'Toole, Schoo, Stagnitti & Cuss, 2008; Stagnitti, Schoo, Reid, & Dunbar, 2005). The research by O'Toole and Schoo (2010) in Victoria suggests that one strategy that remains to be adequately implemented and evaluated in rural Australia is the expansion of the AHP workforce through partnerships with private providers. While some partnerships of this nature do exist, as a workforce strategy public-private AHP partnerships are not widespread and poorly evaluated despite the evidence that the private sector may see considerable advantage to them in such arrangements (O'Toole & Schoo, 2010).

### **Scholarships and other financial incentives**

A major focus of this literature review was the impact of financial incentives (particularly in the form of scholarships) on recruitment to rural practice. Like other incentives, there is a paucity of robustly designed efficacy studies to test the impact of financial incentives on workforce outcomes. The bulk of the literature that does exist has focused on the medical profession and is included here with the reminder that the generalisability of these findings to allied health professionals is questionable.

A multifaceted recruitment and retention program for doctors in rural Chile is worthy of inclusion in this review because of its financial incentives and methodological strengths including the inclusion of longitudinal data from 2001 to 2008, although there is still no control group (Peña, Ramirez, Beccerra, Carabantes & Arteaga, 2010). The program includes salary benefits and bonuses, some re-location and housing subsidies, payment of fees to enable the applicant to complete specialized post-graduate training, supported professional development opportunities, and additional leave entitlements. The program aims to recruit new doctors and retain them for a minimum of 3 years. There are more applicants to the program than places although there is considerable non-take up of places, particularly among the best applicants. Very few doctors leave the program under three years and if they do, it is early in the program. While the majority of doctors manage 3 years, only 58% stay for 6 years. In drawing their conclusions, the authors note that the program is promising and surmise that it is the *package* of targeted incentives (both financial and non-financial) that appears to be the key factor.

In Australia, a retrospective case control study supported the utility of the Rural Australian Medical Undergraduate Scholarship (RAMUS) rural background criteria as a likely predictor of rural place of employment (Laven, Wilkinson, Beilby, & McElroy, 2005). RAMUS provides \$10,000 per year to selected medical students with a rural background to study medicine at university. This financial support assists scholarship holders to overcome the financial barriers to studying medicine at university, particularly the costs of moving and living away from their family support structures. Recipients are expected to have a rural mentor and to take part in rural health club activities. The scholarships are not bonded. It provides weak to moderate support for financially supporting rural medical students through their university training.

Bärnighausen and Bloom (2009) undertook a systematic review of published studies (till February 2009) on the impact of financial incentives on recruitment and retention to rural practice<sup>5</sup>. The review included incentives for AHPs as well as nursing and medical students. The types of financial incentives included were:

- Student incentives: service requiring scholarships, educational loans with service requirements; service-option educational loans
- Post-training incentives: loan repayment programs; direct financial incentives.

The review found some weak evidence for the effectiveness of financial incentives but did not identify a causal relationship<sup>6</sup>. Importantly, most programs had substantial drop out rates before the start of the service obligation. That is, on average, 3 in 10 participants did not fulfill their commitment but the drop-out rate was highest among students who committed to service (e.g., service-requiring scholarships and educational loans with service requirements) compared to qualified health workers who committed to service *after* their training (e.g., financial incentive, loan repayment scheme). There was evidence (albeit very weak) that drop outs may occur at the same rate irrespective of conditions of the program (i.e., whether or not the program contained a buy-out clause).

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<sup>5</sup> There has been one other systematic review of financial-incentive programs. That study reviewed literature published between 1996 and 2002 but only included physicians (Sempowski, 2004). It was therefore not included in the current literature review. However, it is worth noting that the Sempowski study concluded, albeit on the basis of weak evidence, that financial incentives can enhance recruitment in the short term but have less impact on long-term retention of physicians, particularly to the same area.

<sup>6</sup> The studies in this review were all observational studies; there was minimal control for selection effects; of the 43 studies identified 34 were in the USA and none in Australia thus the generalisability of the findings is questionable.

A recent American study examined the influence of loan repayment programs on the recruitment and retention of rural health professionals (Renner, Westfall, Wilroy & Ginde, 2010). The majority of recipients of these incentives were physicians or nurses although one of the programs included AHPs. The three programs addressed in this retrospective cohort study all provided substantial educational loan repayments and two of the three programs (including the one that incorporated AHPs) had a compulsory service commitment. It emerged that the majority of incentives were awarded to health professionals who would have been likely to practice in a rural community regardless of the existence of the incentive program. The authors argued that loan repayments probably had limited influence on the decision of health professionals to practice rurally, although it did seem to influence their decision to work in that particular community. In other words, rural communities who can offer loan repayment programs may do better than those who do not offer these programs. Interestingly, the programs seemed to have a greater impact on retention than recruitment, with the majority of recipients staying beyond the time of the program (albeit in the short term). While these findings potentially offer promising news for policy makers the findings must be treated with caution. The retrospective nature of the study renders the data susceptible to response bias (i.e., participants were asked to recall why they made decisions after the event), and the small sample size, confounding of multiple variables (e.g., rural upbringing, location and provider type), and absence of control group reduce the robustness of the findings.

Given the inability of researchers to ethically implement the gold standard in program evaluation research designs (i.e., randomized controlled trials), the next best option may be to utilize statistical modeling to control for selection biases (Bärnighausen & Bloom, 2009). Such techniques can enable researchers to be more confident that their findings reflect the impact of the financial incentive and not just pre-existing differences between the program recipients and non-recipients. Even with this level of evidence some researchers have warned that this will still be insufficient to inform practical policy decisions (Blaauw, Erasmus, Pagaiya, Tangcharoensathein, Mullei, Mudhune et al., 2010). They argue that financial incentives will generally have some positive impact on recruitment and retention; what is the more important question, however, is “how much money is required to achieve a certain impact and how do financial strategies compare to other policy options, either individually or in combination” (Blaauw et al., 2010, p. 350). The authors go on to conclude that “what policy makers actually need is information on the relative impact and cost-effectiveness of different packages of human resource interventions in a variety of contexts” (p.350). In an effort to address this concern,

Blaauw and colleagues (2010) conducted a discrete choice experiment (DCE) in Kenya, South Africa and Thailand to model the relative effectiveness of financial and non-financial strategies on attracting health professionals to rural areas. While the study employed nursing students, it is worth reporting the findings in this literature review because it is possibly the only published study that has tried to untangle the relative effectiveness of a range of incentives on recruitment. This technique uses statistical modeling to predict the *probable outcome* of various incentives to rural practice. The incentives tested in the research were:

- A rural allowance
- Provision of better housing
- Preferential opportunities for specialist training
- Faster rank promotion
- A benefits package
- A change in workplace culture from hierarchical to relational management.

Financial incentives emerged as strong attractors to rural practice but only if the incentive was sufficiently high – a 10% salary increase was insufficient to attract staff. Non-financial strategies were also important. The most powerful non-financial incentives were access to training and career development opportunities with improved housing and accelerated promotion of moderate importance. DCE studies do have limitations (see Lagarde & Blaauw, 2009), but they may be the most effective and efficient route through which policy makers can obtain the information they need on the relative impact and cost-effectiveness of a range of recruitment and retention strategies.

There appear to be no well controlled studies of the impact of undergraduate scholarships on recruitment to rural practice for AHPs. The only study (RhED, 2010) that was identified for this review was an evaluation of the Rural and Remote Pharmacy Scholarship Scheme that is managed by the Pharmacy Guild of Australia on behalf of the Department of Health and Ageing. The Scholarship commenced in 2004 and provides \$10,000 per annum in financial assistance to successful applicants. Applicants must be of rural origin and be undertaking their entry level pharmacy training. The study (RhED, 2010) involved a self-report survey of current recipients of the Scholarship with a 70.2% response rate. Of the respondents, 77% stated they would be interested in rural practice but only 47% said they planned to undertake rural practice. A total of 63% reported that the Scholarship had raised their interest in rural practice. While these findings



are promising, they are less so when the fact that all recipients were of rural origin is taken into consideration. That is, rural background is itself the strongest predictor of rural practice.

In summary, there is a paucity of evidence to assess the efficacy of financially-based scholarships on recruitment to rural practice. It appears that financial and in-kind incentives of sufficient amount are likely to have some impact but how much incentive is required to achieve an effect on the workforce remains unclear and for scholarship-type incentives, some degree of drop-out appears unavoidable. Drop-outs may occur whether or not there is a buy-out clause. Moreover, it would seem that financial incentives need to be part of a broader package of incentives to maximize the chance of a positive impact. As Humphreys and colleagues (2009) warn, the evidence for financial incentives is not strong enough to warrant it being the most important or initial strategy of choice. From their review, Humphreys and colleagues (2009) report that the strongest evidence exists for strategies involving some form of obligation. These types of approaches are reviewed in the next section.

### **Compulsory service programs**

Another focus of this literature review was the impact of conditional scholarships on recruitment to rural areas. Conditional scholarships are classified in the literature as a type of compulsory service program along with bonding, mandated or obligatory service and coercive programs (Frehywot, Mullan, Payne & Ross, 2010). These compulsory service interventions have a long history and have been particularly popular across the world since the 1970s, including in Australia (Frehywot et al, 2010; Wilkinson, 2003).

Essentially, these programs require the health professional to work in a rural or remote area for a specified number of years, either with or without additional incentives. Incentives include:

- Education (completion of rural placement required to receive qualification, rural service is required as a prerequisite into specialist training, rural placement is required after graduation)
- Employment (rural practice is required to obtain license to practice or as a pre-requisite to career advancement)

- Living provisions (housing, lower car loans, children's scholarships as incentives to stay after the period of compulsory service) (Frehywot et al, 2010).

Many of the programs that use incentives also include the potential for the recipient to "buy out" some or all of the period of compulsory service. Of the thirty programs with incentives identified by Frehywot and colleagues (2010), eight stated they allowed buy out, seven refused it, and the remainder were not specified.

In Australia, bonded scholarships were widely available in areas such as education, health and defence (Wilkinson, 2003). This approach remains popular, especially for the medical profession. The NSW Rural Resident Medical Officer Cadet Program (Cadetship Program) is funded by NSW Health and managed by the NSW Rural Doctors Network<sup>7</sup>. It offers bonded scholarships in the form of financial support (\$15,000 per annum for the final years of their degree) for students who completed their Higher School Certificate in NSW and are studying medicine. In return, cadets are contracted to complete two of their first three postgraduate years in the NSW rural hospital network. An evaluation of the Cadetship Program provides weak evidence of the impact of the program with 43% of former cadets (pre-1999) working in rural locations in 2004 compared to 20.5% of all medical practitioners nationally; the limitation of the study being that 46% of the sample came from a rural background, a factor also known to influence choice of practice location (Dunbabin, McEwin & Cameron, 2006).

The Medical Rural Bonded Scholarship (MRBS) Scheme provides an annual stipend to selected students for each year it takes to complete their medical degree<sup>8</sup>. Students agree to practice in rural or remote areas of Australia for six continuous years upon completion of basic medical and vocational training as a specialist (including general practice). The scholarship is formalised in a contract between successful applicants and the Commonwealth. There are penalties for breaking the contract. No data has been found which documents the efficacy of this scheme in relation to contracts being fulfilled and medical professionals continuing their employment in rural and remote regions of Australia.

Frehywot and colleagues (2010) extensive review of the international literature on compulsory service programs found that the overwhelming majority of incentives targeted doctors and

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<sup>7</sup> For an overview of the Cadetship Program see [http://www.nswrdn.com.au/client\\_images/919185.pdf](http://www.nswrdn.com.au/client_images/919185.pdf)

<sup>8</sup> For an overview of the MRBS see <http://www.health.gov.au/internet/main/publishing.nsf/Content/work-st-mrb-summe>

occasionally nurses or dentists. Very few programs included allied health professionals. We could not find any published evaluations of compulsory service programs for AHPs in Australia though it is noteworthy that the evaluation of the Rural and Remote Pharmacy Scholarship Scheme for the Pharmacy Guild of Australia noted that many of the recipients of the Scholarship who were interviewed stated they would have been happy to accept the Scholarship if it was bonded (RhED, 2010), however the scholarship holders come from rural areas.

The international review noted the strong objection to compulsory service programs from health professionals with a range of reasons cited including cost, poor rural facilities and resourcing, lack of transport and basic services, and difficulty in implementing the skills learned in their training (see Frehywot et al, 2010). The authors also concluded that the high turnover associated with many compulsory service programs needs to be seen as the reality of rural practice rather than as a weakness of the program. To maximize the effectiveness of compulsory service programs Frehywot and colleagues (2010) recommended the following:

- The success of these types of programs largely depends upon potentially fragile personal commitment and relationships. *Prospective and proactive planning* is required to manage the myriad of problems associated with assignment, placement and fulfillment of the requirements. The costs associated with such planning need to be factored to the overall program costs
- Programs must be transparent in terms of what is required of the health professional and the rules consistently enforced
- Programs should be supplemented by appropriate support systems and incentives such as housing subsidies, continuing education and clinical support.

Despite identifying factors that can improve the likelihood of success of compulsory service programs, the literature review concluded that these types of programs are not a permanent solution to rural workforce issues but if well planned and supported by additional incentives can improve the maldistribution of health professionals (Frehywot et al, 2010). This conclusion supports that of an earlier review of incentives by Wilson, Couper, De Vries, Reid, Fish and Marais (2009) who also concluded that coercive strategies show promise but their long-term impact remains unclear.

## **Recruitment and retention incentives specific to allied health professionals**

Table 11 lists a range of incentives specific to AHPs that were identified by this literature review. Where information was available, we have included evidence of the efficacy of the strategy in terms of impact on the rural and remote workforce, with comment on the strength of this evidence. The lack of any evidence for the majority of the incentives is noteworthy. Where evidence was available, it was generally observational in nature and methodologically flawed. Incentives are listed following the WHO's (2010) categories of recruitment and retention interventions: education, regulatory, financial, professional and personal support<sup>9</sup>.

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<sup>9</sup> It is important to note that many incentives fit multiple categories, however, we have placed them in the one incentive which it was most suited to.

**Table 11: Incentives to recruit and retain Australian allied health professional to rural and remote practice and evidence to support the incentive**

Strategy	Who administers initiative	Type of initiative	Overview of initiative	Evidence of impact on workforce and strength of evidence
<b>EDUCATION</b>				
The Rural Allied Health Undergraduate Scholarship Scheme	Australian Government administered by SARRAH	Scholarship with financial incentive + support and encouragement for rural practice	Assists selected students from a <i>rural background</i> commencing an allied health course with <i>annual grants</i> of \$10,000 per person Although there are no contracts to work within rural and remote communities on graduation, the <i>students engage in a rural mentorship scheme</i> and become members of their University rural health club to reinforce ties with rural and remote communities Eligible allied health disciplines includes: AHW, audiology, chiropractic, dental & oral health, dietetics & nutrition, exercise physiology, genetic counselling (postgraduate), medical radiation science, occupational therapy, optometry, orthoptics, osteopathy, physiotherapy, podiatry, prosthetics and orthotics, psychology (postgraduate), social work, speech pathology, and sonography. <a href="http://www.sarrah.org.au/site/index.cfm?display=74992">http://www.sarrah.org.au/site/index.cfm?display=74992</a>	None found
Rural Pharmacy Scholarship Scheme	Pharmacy Guild on behalf of the Australian Government	Scholarship with financial incentive + support and encouragement for rural practice	Assists selected students from a <i>rural background</i> commencing an allied health course with <i>annual grants</i> of \$10,000 per person Although there are no contracts to work within rural and remote communities on graduation, the <i>students engage in a rural mentorship scheme</i> and become members of their University rural health club to reinforce ties with rural and remote communities <a href="http://www.guild.org.au/rural">http://www.guild.org.au/rural</a>	Survey of recipients showed 47% intended to work in rural areas (RhED Consulting, 2010; weak evidence: observational data, small response rate)
University Departments of Rural Health (UDRH)	Australian Government	A network of rural academics with multi-disciplinary focus to support health professionals	Supports <i>clinical placements</i> in rural and remote regions and those currently practising in these areas. <a href="http://www.health.gov.au/internet/main/publishing.nsf/Content/work-st-udrh">http://www.health.gov.au/internet/main/publishing.nsf/Content/work-st-udrh</a>	Universities Centre for Rural Health (CUCRH), (WA) has undertaken review of 2-week placement for AHPs and nurse students supported by Centre during 2009 (Buykx, 2009). Placement increased number of students who said they would

Strategy	Who administers initiative	Type of initiative	Overview of initiative	Evidence of impact on workforce and strength of evidence
				consider employment in a rural area from 23% to 47%. Weak evidence (observational study; prospective design measuring intention to practice; no control for selection effects)
National Rural Health Network (NRHN)	Australian Government	National body representing university student Rural Health Clubs across Australia	<i>Promotion of rural practice</i> to medical, nursing and allied health students <a href="http://www.nrhn.org.au/site/index.cfm?display=40529">http://www.nrhn.org.au/site/index.cfm?display=40529</a>	None found
Allied Health student training	NT Government	Training in NT Urban centres	Enables Speech Pathology, Audiology and Nutrition & Dietetics to undertake <i>placement</i> in Darwin, Katherine, Alice Springs and Nhulunbuy with support of academic staff. No financial incentives are provided. It is important to note that the NT only has allied health undergraduate degrees in pharmacy and social work <a href="http://www.health.nt.gov.au/For_Professionals/NT_Clinical_School/index.aspx">http://www.health.nt.gov.au/For_Professionals/NT_Clinical_School/index.aspx</a>	None found
<b>FINANCIAL</b>				
The Allied Health Scholarship and Support Scheme: Allied Health Clinical Placement Grant	Australian government administered by SARRAH	Clinical placement grant	Provides a <i>one off grant</i> to allied health (and oral health) students to undertake a clinical placement in a rural or remote Australian community. Students in their final year/s of study have higher priority. Funding is for a maximum of 6 weeks while on clinical placement. Approximately 150 scholarships are offered per year <a href="http://www.sarrah.org.au/site/index.cfm?display=74996">http://www.sarrah.org.au/site/index.cfm?display=74996</a>	None found
NSW Rural Allied Health Clinical Placement Grants	NSW	Clinical placement grant	Provides a <i>one off grant</i> to allied health students to undertake a clinical placement in rural or remote NSW. The student must be enrolled full time in a NSW university allied health course. Grants are offered biannually of up to \$750 (or \$1,000 for placements at Broken Hill) <a href="http://www.health.nsw.gov.au/rural/alliedhealth/rural_grants.asp">http://www.health.nsw.gov.au/rural/alliedhealth/rural_grants.asp</a>	None found
Allied Health Clinical	Queensland	Clinical placement grant	Provides a <i>one off grant</i> to allied health students to undertake a clinical placement in Queensland away from	None found

Strategy	Who administers initiative	Type of initiative	Overview of initiative	Evidence of impact on workforce and strength of evidence
Placement Subsidy Scheme			the region they are studying Although it is not a rural and remote only grant, priority is given to placements in rural and remote regions, in particular where that particular discipline is limited <a href="http://www.health.qld.gov.au/orh/scholarships/clinical/clinical.asp">http://www.health.qld.gov.au/orh/scholarships/clinical/clinical.asp</a>	
The Queensland Health Rural Scholarship Scheme (QHRSS)  NB: Nursing and medicine included, not psychology or medical imaging.	Queensland	University scholarship program, contracting students to work in rural and remote communities on graduation	<i>A long term support program</i> for allied health, nursing and medicine full time students (psychology and medical imaging not included) <i>Scholarships</i> are offered for the duration of the students study (this time frame can vary slightly depending on study discipline) Students are required to undertake a <i>Rural Experience Week</i> every year in a different community Once graduated, scholarship holders are contracted out to a rural or remote health care facility <i>Scholarship holders are required to work in rural communities for a period equal to the period of financial assistance provided as a student</i> <a href="http://www.health.qld.gov.au/orh/scholarships/qhrss/docs/info_kit.pdf">http://www.health.qld.gov.au/orh/scholarships/qhrss/docs/info_kit.pdf</a>	None found
Rural Pharmacy Placement Allowance Scheme	Pharmacy Guild on behalf of the Australian Government	Financial support for rural placement	<i>Financial support</i> for rural placements through pharmacy schools <a href="http://www.guild.org.au/rural">http://www.guild.org.au/rural</a>	Survey of recipients showed 51% planning to work in rural areas (RhED Consulting, 2010; weak evidence: observational data, small response rate)
Rural Pharmacy Pre-Registration Incentive Allowance	Pharmacy Guild on behalf of the Australian Government	Financial support to pharmacy owner	<i>Financial assistance</i> to rural pharmacy owner to recruit intern pharmacist <a href="http://www.guild.org.au/rural">http://www.guild.org.au/rural</a>	Survey of recipients showed 65.7% reported that Incentive had at least some impact on their decision to take an intern (RhED Consulting, 2010; weak evidence: observational data, small response rate)
Allied Health Student Support Program	UTAS University Department of Rural Health	Financial and accommodation	The following <i>accommodation and financial support</i> may be provided when placement is undertaken in rural regions: accommodation at one of the UDRH rural health teaching sites; computer and internet access at the RHTS;	None found

Strategy	Who administers initiative	Type of initiative	Overview of initiative	Evidence of impact on workforce and strength of evidence
			assistance with locating a placement; and travel/accommodation allowance of up to \$200.00 <a href="http://www.ruralhealth.utas.edu.au/students/allied-health.php">http://www.ruralhealth.utas.edu.au/students/allied-health.php</a>	
<b>PROFESSIONAL &amp; PERSONAL SUPPORT</b>				
Continuing Professional Development for Rural Allied Health Practitioners Subsidy Program	Victoria	Professional development grant	Provides subsidies for allied health professionals employed in publicly funded health services in rural Victoria for professional development e.g., conferences Funding does not assist in tertiary level or VET qualifications <a href="http://www.vha.org.au/uploads/CPD%20Guidelines%202009_10.pdf">http://www.vha.org.au/uploads/CPD%20Guidelines%202009_10.pdf</a>	None found
Regional Allied Health Works (previously Regions of Choice)	Victorian Government	Assistance in recruitment and retention	Supports allied health workers, employees and publicly funded health and community services in the recruitment and retention of allied health workers in regional Victoria. It does not support dietitians/nutritionists or psychologists. <a href="http://www.health.vic.gov.au/workforce/healthcareers/roc">http://www.health.vic.gov.au/workforce/healthcareers/roc</a>	None found
Mentoring Works	Victorian Government	Provides training and support for mentoring	Supports the implementation and effectiveness of mentoring in rural and remote Victoria in public health and community services to improve the recruitment and retention of allied health professionals in these regions. Mentoring Works undertakes various training with health professionals and reviews and evaluates the mentoring project in several ways, including the efficacy of the project on recruitment and retention rates. <a href="http://www.mentoringworks.com.au/files/FINAL%20REPORT%20Evaluation%20of%20Victorian%20Allied%20Health%20Workforce%20Recruitment%20and%20Retention%20Projects%20-%2021%20May%202009%20.pdf">http://www.mentoringworks.com.au/files/FINAL%20REPORT%20Evaluation%20of%20Victorian%20Allied%20Health%20Workforce%20Recruitment%20and%20Retention%20Projects%20-%2021%20May%202009%20.pdf</a>	Quarterly reviews are undertaken in Mentoring Works. AHPs commented whether the project has contributed to their likelihood of staying in rural health (12% very high), however recruitment and retention figures were not found. See website (PDF) for further details
Statewide Allied Health Workforce Education Program	Victorian Government	Provides training and support for mentoring	Supports continuous professional development to improve recruitment and retention in rural and remote locations. Support was provided on line and face to face. <a href="http://www.mentoringworks.com.au/files/FINAL%20REPORT%20Evaluation%20of%20Victorian%20Allied%20Health%20Workforce%20Recruitment%20and%20Retention%20Pr">http://www.mentoringworks.com.au/files/FINAL%20REPORT%20Evaluation%20of%20Victorian%20Allied%20Health%20Workforce%20Recruitment%20and%20Retention%20Pr</a>	Biannual reports evaluated the implementation and effectiveness of the project. AHPs commented whether the project has contributed to their likelihood of staying in rural health (25% very



Strategy	Who administers initiative	Type of initiative	Overview of initiative	Evidence of impact on workforce and strength of evidence
			<a href="#">jects%20-%2021%20May%202009%20.pdf</a>	high), however recruitment and retention figures were not found. See website (PDF) for further details
Rural and Remote Allied Health Competencies: Professional	WA Country Health Service and Combined University Centres for Rural Health	Framework for professional development and support	Provides a framework outlining the competencies of an entry level allied health professional (HSU level 4-6) Used as a tool for facilitating continuing learning and development  <a href="http://www.wacountry.health.wa.gov.au/uploaddocs/rrahc%20professional%20final%20report.pdf">http://www.wacountry.health.wa.gov.au/uploaddocs/rrahc%20professional%20final%20report.pdf</a>	None found. It is important to note that the quality of the framework has been evaluated however, its efficacy on workforce recruitment and retention has not been evaluated

## **Basic principles for devising and implementing recruitment and retention strategies**

Based on their extensive review of the evidence, the WHO has devised a number of principles to guide policy makers in addressing the shortage of rural health professionals (Dayrit et al, 2010). These principles are a starting point to understanding the approach that needs to be undertaken by policy makers with regard to both recruitment and retention incentives:

- “There is no single-bullet solution” (p.322)
- Interventions need to be applied in “mutually reinforcing combinations or bundles” (p.322)
- Strategies must not just focus on the needs and expectations of the health professional but also on the needs of the population
- Monitoring and evaluation of strategies should not be an afterthought but rather built in when the intervention is implemented
- When conducting evaluations, it is important to note that interventions can take many years to yield results. As Chen (2010, p.323) argues, achieving a sustainable rural health workforce will take “sustained investment and capacity building, beyond electoral cycles and immediate political gains”.

SARRAH (2010, p.15) has also developed a best practice model specific to the *recruitment* of AHPs to remote areas that includes the following strategies:

- Adopt a broad approach to advertising for registered health professionals in remote locations rather than focusing on the media only. Different targeted promotional strategies may work for different professions and locations.
- Promote positive factors of remote communities including ongoing commitment by health care providers and funding authorities, new and exciting opportunities for families and lifestyle changes
- Promote the experience of remote practice through positive clinical placement experiences and consider an exchange program with metropolitan and remote AHPs
- Promote the professional development opportunities, funding and support (including clinical supervision/support) available to remote AHPs
- Discuss and address the negative perceptions of remote practice including lack of career opportunities, social isolation, lack of staff, locums

- Present the position aspects of remote practice including rewarding and fulfilling personal and professional environments including job diversity
- Develop a community orientation program including an overview of the culture of the employing agency.

Additionally, SARRAH (2010, p.16) has developed a best practice model for *retaining* AHPs to remote areas that includes the following strategies:

- Provide an environment for job satisfaction including: careers progression and pathways; achievement and recognition; retention payments/bonuses; responsibility; flexible working conditions; clear management structures; and support/mentoring by peers, teams, and/or managers
- Provide professional development opportunities consistently and equitably across the AHPs disciplines
- Provide united and consistent resources and support structures from management including access to locums and relief staff
- Provide multidisciplinary practice and learning opportunities supported by appropriate electronic information, management and communication systems
- Provide networking opportunities and access to distance learning and technologies to prevent professional isolation
- Provide an opportunity for personal growth, long term social support for the AHP and family and work/family life balance opportunities
- Provide job and economic security through the provision of retention bonuses, additional long service leave and/or annual leave.

## **5. CONCLUSIONS**

This literature review has been written for a particular audience, namely policy makers within the government sector who have the task of deciding how to get maximum impact for their investments. It is important to note that the review has focused on the efficacy of recruitment and retention strategies in terms of what Huicho and colleagues (2010) describe as outputs (recruitment and retention), as opposed to outcomes (e.g., access to services, responsiveness of services) or impact (improved health status). As previously indicated, the bulk of recruitment and retention incentives implemented by the Australian Government have focused on doctors and to a lesser extent, nurses, with very few interventions targeting AHPs (Auditor-General, 2009). Throughout the review, we have noted the paucity of evidence and the low quality of what evidence is available to support the various strategies.

There is limited data in the literature regarding allied health workforce trends in Australia and in rural and remote practice, and what is available is not current. There is also a lack of data for allied health graduate rates, as well as a lack of studies that follow allied health graduates across their career path to determine where they take up employment (geography, discipline and organisation) and what has influenced their decision.

The literature review highlights the lack of robust evidence to determine the efficacy of undergraduate and graduate scholarships and other incentive schemes. However, some conclusion can be drawn from the literature review.

The 'rural pipeline' is one of the strongest lines of evidence found in the literature, referring to recruiting students from rural backgrounds, delivering regional training, exposing students during this training to rural curriculum and placements, and then building regional postgraduate training pathways. Although evidence is strongest for medical professions (e.g., Dunbabin & Levitt, 2003; Henry, et al., 2009; Hsueh, et al., 2004; Stagg, et al, 2009), it is beginning to emerge for allied health professionals as well (e.g., Playford et al, 2006).

The particular focus of this study, however, was financial incentives, specifically scholarships. While the evidence was limited and rarely specific to allied health professionals, it appears that financial and in-kind incentives of sufficient amount are likely to have some impact but how much incentive is required to achieve a positive impact on the workforce remains unclear and drop-outs appear unavoidable. There is also limited evidence for strategies involving some form

of obligation. Some authors also note that the high turnover associated with many compulsory service programs needs to be seen as the reality of rural practice rather than as a weakness of the program (Frehywot et al, 2010).

It would seem that the most effective approach to address the maldistribution of AHPs is bundled packages of incentives targeted to a particular audience (i.e., location and type of allied health professional), also taking into consideration the needs of the population. Until the evidence base becomes more expansive and reliable, the most effective combination is likely to be a mix of financial and non-financial incentives.

## **REFERENCES**

- Alexander, C. & Fraser, J. (2004). Occupational violence in an Australian healthcare setting: Implications for managers. *Journal of Healthcare Management*, 49(6):377-390.
- Allen, O. (2005). SARRAH: In a nutshell. *Australian Journal of Rural Health*, 13:60.
- Auditor-General (2009). *Rural and Remote Workforce Capacity – The Contribution made by Programs Administered by the Department of Health and Ageing*. Canberra: National Audit office.
- Australian Institute of Health and Welfare (2006a). *Occupational Therapy Labour Force 2002-2003*. National Health Labour Force Series Number 34. Canberra: AIHW.
- Australian Institute of Health and Welfare (2006b). *Psychology Labour Force 2003*. National Health Labour Force Series Number 33. Canberra: AIHW.
- Australian Institute of Health and Welfare (2009). *Health and Community Services Labour Force*. National Health Labour Force Series Number 42. Cat. no. HWL43. Canberra: AIHW.
- Australian Institute of Health and Welfare (2010). *Australia's Health 2010*. Australia's health series no 12. Cat. no. AUS122. Canberra: AIHW.
- Battye, K., Hines, J., Ingham, C & Roufeil, L. (June, 2006). *The NSW Central West Allied Health Service Network: A model to increase access to public and private allied health services*. Bathurst: NSW Central West Division of General Practice. A report prepared for the Commonwealth Dept of Health and Ageing.
- Bärnighausen, T. & Bloom, D.E. (2009). Financial incentives for return of service in underserved areas: A systematic review. *BMC Health Services Research*, 9:86.
- Blaauw, D., Erasmus, E., Pagaiya, N., Tangcharoensathein, V., Mullei, K., Mudhune, S., Goodman, C., English, M., & Lagarde, M. (2010). Policy interventions that attract nurses to rural areas: A multicountry discrete choice experiment. *Bulletin of the World Health Organisation*, 88:350-356.

- Buykx, H. (2009) *2009 Report on Rural Student Placements*. Geraldton, WA: Combined Universities Centre for Rural Health.
- Buykx, P., Humphreys, J., Wakerman, J., & Pashen, P. (2010). Systematic review of effective retention incentives for health workers in rural and remote areas: Towards evidence-based policy. *Australian Journal of Rural Health, 18*: 102-109.
- Chen, L.C. (2010). Striking the right balance: Health workforce retention in remote and rural areas. *Bulletin of the World Health Organisation, 88*:323.
- Dayrit, M.M., Dolea, C., & Braichet, J-M. (2010). One piece of the puzzle to solve the human resources for health crisis. *Bulletin of the World Health Organisation, 88*: 322.
- Denham, L.A. & Shaddock, A.J. (2004). Recruitment and retention of rural allied health professionals in developmental disability services in New South Wales. *Australian Journal of Rural Health, 12*(1):28-29.
- Department of Education, Employment and Workplace Relations (June 2010a). *Skill Shortage Lists*. Accessed 20/10/2010 from <http://www.deewr.gov.au/Employment/LMI/SkillShortage/Pages/StateTerritorySkillShortage.spx>
- Department of Education, Employment and Workplace Relations (2010b) *Skill Shortage NSW June 2010*. Canberra: Commonwealth of Australia.
- Department of Education, Employment and Workplace Relations (2010c). *Skill Shortage South Australia June 2010*. Canberra: Commonwealth of Australia.
- Department of Education, Employment and Workplace Relations (2010d). *Skill Shortage Tasmania June 2010*. Canberra: Commonwealth of Australia.
- Dolea, C., Stormont, L., & Braichet, J. (2010). Evaluated strategies to increase attraction and retention of health workers in remote and rural areas. *Bulletin of the World Health Organisation, 88*:379-385.
- Dunbabin, J.S. & Levitt, L. (2003). Rural origin and rural medical exposure: Their impact on the rural and remote medical workforce in Australia. *Rural Remote Health, 3*:212.

- Dunbabin, J.S., McEwin, K. & Cameron, I. (2006). Postgraduate medical placements in rural areas: Their impact on the rural medical workforce. *Rural and Remote Health*, 6: 481.
- Firth, A. (2005). *Factors influencing the retention of speech pathologists and dietitians in Greater Western Area Health Service*. Orange: GWAHS RHTDU.
- Frehywot, S., Mullan, F., Payne, P.W., & Ross, H. (2010). Compulsory service programs for recruiting health workers in remote and rural areas: Do they work? *Bulletin of the World Health Organisation*, 88: 364-370.
- Gillham, S. & Ristevski, E. (2007). Where do I go from here: We've got enough seniors? *Australian Journal of Rural Health*, 15: 313-320.
- Grobler, L., Marais, B.J., Mabunda, S.A., Marindi, P.N., Reuter, H., & Volmink, J. (2009). Interventions for increasing the proportion of health professionals practicing in rural and other underserved areas. *Cochrane Database of Systematic Reviews*, Issue 1. Art. No.:CD005314. DOI:10.1002/14651858.CD005314.pub2
- Health Care Intelligence (HCI) (2003) *A Study of the Demand and Supply of Pharmacists, 2000 - 2010*. Sydney: HCI.
- Health Professions Council of Australia (HPCA) (July, 2005). *The Allied Health Professional Workforce in Australia: Challenges and opportunities. Submission to the Productivity Commission of Australia*. Melbourne: HPCA.
- Henry, J.A., Edwards, B.J. & Crotty, B. (2009). Why do medical graduates choose rural careers? *Rural and Remote Health*, 9:1083.
- Hoeth, R. (2004). Practitioner application. *Journal of Healthcare Management*, 49(6):391-392.
- Hsueh, W., Wilkinson, T. & Bills, J. (2004). What evidence-based undergraduate interventions promote rural health? *New Zealand Medical Journal*, 117:U1117.
- Huicho, L., Dieleman, M. Campbell, J., Codijia, L., Balabanova, D., Dussalut, G., & Dolea, C. (2010). Increasing access to health workers in underserved areas: A conceptual framework for measuring results. *Bulletin of the World Health Organisation*, 88:357-363.



- Human Capital Alliance (2005). *Recruitment and retention of allied health professionals in Victoria – a literature review*. Report prepared for the Department of Human Services.
- Human Capital Alliance (2008). *Analysis of secondary data to understand pharmacy workforce supply - Initial supply report*. Melbourne: HCA.
- Humphreys, J., Wakerman, J., Pashen, D. & Buykx, P. (2009). *Retention strategies and incentives for rural and remote areas: What works?* Canberra: APHCRI.
- Jones, M., Humphreys, J., & Prideaux, D. (2009). Predicting medical students' intentions to take up rural practice after graduation. *Medical Education*, 43: 1001-1009.
- Kent Guion, W., Mishoe, S.C., Taft, A.A., & Campbell, C.A. (2006). Connecting allied health students to rural communities. *The Journal of Rural Health*, 22: 260-263.
- Lagarde, M. & Blaauw, D. (2009). A review of the application and contribution of discrete choice experiments to inform human resources policy interventions. *Human Resources in Health*, 7:62.
- Laven, G.A., Wilkinson, D., Beilby, J.J., & McElroy, H.J. (2005). Empirical validation of the Rural Australian Medical Undergraduate Scholarship 'rural background' criterion. *Australian Journal of Rural Health*, 13:137-141.
- Lowe, S. (2007). *Allied Health Workforce Data Issues Paper*. Services for Australian Rural and Remote Allied Health (SARRAH). Accessed 1/10/ 2010 from <http://www.sarrah.org.au/site/index.cfm?display=65820>
- Lowe, S., Keane, S. & Smith T. (2009). *The Tasmanian Allied Health and Oral Health Workforce Study*. A collaboration of the University Departments of Rural Health: Tasmania, Northern Rivers and Tamworth.
- Lowe, S. & O'Kane, A. (June, 2004). *National Allied Health Workforce Report*. Accessed 1/10/2010 from [http://www.sarrah.org.au/site/index.cfm?leca=283&module=FILEMANAGER&did=85710984&page\\_category\\_code=1843&page\\_id=84779](http://www.sarrah.org.au/site/index.cfm?leca=283&module=FILEMANAGER&did=85710984&page_category_code=1843&page_id=84779)

- Mathews, R., Stokes, D., Crea, K. & Grenyer, B.S. (2010). The Australian Psychology Workforce 1: A national profile of psychologists in practice. *Australian Psychologist*, 45, 154-167.
- McAulliffe, T. & Barnett, F. (2009). Factors influencing occupational therapy students' perceptions of rural and remote practice. *Rural and Remote Health*, 9:1078.
- Mills, A. & Millsteed, J. (2002). Retention: An unresolved workforce issue affecting rural occupational therapy services. *Australian Occupational Therapy Journal*, 49: 170-181.
- Millsteed, J. (2001). Factors affecting the retention of occupational therapists in rural settings. *Occupational Therapy in Health Care*, 14:55-72.
- National Rural Health Alliance (NRHA) (2004). *Under pressure and under-valued: Allied health professionals in rural and remote areas*. NRHA. Accessed 7/10/2010 from <http://www.ruralhealth.org.au/nrhpublic/Index.cfm?Category=PositionPapers>
- NSW Health (2008). *Summary of the Physiotherapy Workforce in NSW 2005*. Sydney: NSW Department of Health.
- O'Kane, A. & Curry, R. (2003). Unveiling the secrets of the allied health workforce. 7<sup>th</sup> National Rural Health Conference. Hobart, 1-4 March.  
<http://www.ruralhealth.org.au/nrhpublic/publicdocs/conferences/7thNRHC/Papers.htm>  
Accessed 22/03/06.
- O'Toole, K.O. & Schoo, A.N. (2010). Retention policies for allied health professionals in rural areas; A survey of private practitioners. *Rural and Remote Health*, 10: 1331 (Online). Available from <http://www.rrh.org.au>
- O'Toole, K., Schoo, A., & Hernan, A. (2010). Why did they leave and what can they tell us? Allied health professionals leaving rural settings. *Australian Health Review*, 34: 66-72.
- O'Toole, K., Schoo, A, Stagnitti, K & Cuss, K. (2008). Rethinking policies for the retention of allied health professionals in rural areas: A social relations approach. *Health Policy*, 87: 326-332.

- Pearson, M.L. & Andres, L.A. (2010). Job location decisions of pharmacy graduates in British Columbia. *American Journal of Pharmaceutical Education*, 74: 74.
- Playford, D., Larson A., & Wheatland, B. (2006). Going country: Rural student placement factors associated with future rural employment in nursing and allied health. *Australian Journal of Rural Health*, 14: 14-19.
- Peña, S., Ramirez, J., Beccera, C., Carabantes, J., & Arteaga, O. (2010). The Chilean Rural Practitioner Programme: A multidimensional strategy to attract and retain doctors in rural areas. *Bulletin of the World Health Organisation*, 88: 371-378.
- Renner, D.M., Westfall, J. M., Wilroy, L.A., & Ginde, A.A. (2010). The influence of loan repayment on rural healthcare provider recruitment and retention in Colorado. *Rural and Remote Health*, 10:1605.
- RhED Consulting (2010). *Research to track the rural pharmacy workforce and identify the role that rural programs have on retention of the rural pharmacy workforce*. Available from [http://www.guild.org.au/uploadedfiles/Rural\\_Pharmacy/Grants\\_and\\_Scholarships/FINAL+REPORT+RHED.pdf](http://www.guild.org.au/uploadedfiles/Rural_Pharmacy/Grants_and_Scholarships/FINAL+REPORT+RHED.pdf) Accessed 1/11/2010
- Schofield, D., Fletcher, S., Fuller, J., Birden, H. & Page, S. (2009). Where do students in the health professions want to work? *Human Resources for Health*, 7: 74.
- Schoo, A.M., Stagnitti, K.E., Mercer, C. & Dunbar, J. (2005). A conceptual model for recruitment and retention: Allied health workforce enhancement in Western Victoria, Australia. *Rural and Remote Health* 5 (online), 2005: 477. Available from: <http://rrh.deakin.edu.au> Accessed 10/10/2010.
- Sempowski, I.P (2004). Effectiveness of financial incentives in exchange for rural and underserved area return-of-service commitments: Systematic review of the literature. *Canadian Journal of Rural Medicine*, 9: 82-88.
- Services for Australian Rural and Remote Allied Health (SARRAH) (2000). *A study of allied health professionals in rural and remote Australia*. Canberra: SARRAH.

- Services for Australian Rural and Remote Allied Health (SARRAH) (2005). *Submission to the Health Workforce Productivity Commission Issues Paper*. Canberra: SARRAH.
- Services for Australian Rural and Remote Allied Health (SARRAH) (2010). *Principles of recruitment and retention of allied health professionals servicing remote Australian communities. Position Paper*. Canberra: SARRAH.
- Smith, T., Cooper, R., Brown, L., Hemmings, R. & Greaves, J. (2008). Profile of the rural allied health workforce in Northern NSW and comparison with previous studies. *Australian Journal of Rural Health, 16*: 156-163.
- Stagg, P., Greenhill, J. & Worley, P.S. (2009). A new model to understand carer choice and practice location of medical graduates. *Rural and Remote Health, 9*:1245.
- Stagnitti, K., Schoo, A., Reid, C., & Dunbar, J. (2005). Retention of allied health professionals in the south-west of Victoria. *Australian Journal of Rural Health, 13*:364-365.
- Struber, J.C. (2004). Recruiting and retaining Allied Health Professionals in rural Australia: why is it so difficult? *Internet Journal of Allied Health Sciences & Practice, 2*:1-13.
- Struber, J.C. (2005). Why don't allied health professionals want to work in the bush? Powerpoint presentation. 6<sup>th</sup> National Allied Health Conference. Melbourne, 23-25 February.
- Summers, S.H., Blau, G. & Ward-Cook, K. (2000). Professional development activities of medical technologists: management implications for allied health. *Journal of Allied Health, 29*:214-219.
- Suarez, VV. & Shanklin, C.W. (2004). Evaluating career values of dietetic students: A model for other allied health professions. *Journal of Allied Health, 33*:51-54.
- Taylor, J. Blue, I. & Misan, G. (2001). Approach to sustainable primary health care service delivery for rural and remote South Australia. *Australian Journal of Rural Health, 9*:304-310.
- Tran, D., McGillis Hall, L., Davis, A., Landry, M., Burnett, D., Berg, K, & Jaglal, S. (2008). Identification of recruitment and retention strategies for rehabilitation professionals in Ontario, Canada: Results from experts. *BMC Health Services Research, 8*:249.

- Waterman, P. (2008). Feast of famine – predicting the pharmacy workforce of the future. *Australian Pharmacist*, 29: 651-652,654.
- Wilkinson, D. (2003). Bonded training places: Evidence-based policy or a stab in the dark? *Australian Journal of Rural Health*, 11: 213-214.
- Wilson, N., Couper, I., DeVries, E., Reid, S., Fish, T., & Marais, B. (2009). A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. *Rural and Remote Health*, 9:1060.
- World Health Organisation (2010). *Increasing Access to Health Workers in Remote and Rural Locations through Improved Retention: Global Policy Recommendation*. Geneva: WHO.
- Worley, P., Martin, A., Prideaux, D, Woodman, R., Worley, E., & Lowe, M. (2008). Vocational career paths of graduate entry medical students at Flinders University: A comparison of rural, remote and tertiary tracks. *Medical Journal of Australia*, 188: 177-178.