

# NationalHealthWorkforce

Planning and Research Collaboration

## Workload Measures for Allied Health Professionals

Final Report

October 2010

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A collaboration of:



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# Preface

In 2006 the Council of Australian Governments (COAG) agreed to a significant national health workforce reform package to enable the health workforce to better respond to the evolving care needs of the Australian community, while maintaining the quality and safety of health services. The COAG package included the establishment of the National Health Workforce Taskforce (NHWT) to undertake project-based work and advise on and develop workable solutions for workforce innovation and reform. The NHWT ceased operation with the establishment of Health Workforce Australia, which assumed responsibility for the ongoing commitments and work program of the Taskforce in 2010. HWA was established by COAG through its 2008 National Partnership Agreement on Hospital and Health Workforce Reform and tasked with facilitating more effective and integrated clinical training for health professionals, provide effective and accurate information and advice to guide health workforce policy and planning, and promote, support and evaluate health workforce reform.

The National Health Workforce Planning and Research Collaboration ('the Collaboration') was established by the former Taskforce. The Collaboration is a tri-partite partnership between the Australian Health Workforce Institute, PricewaterhouseCoopers (PwC) and the NHWT (now HWA), and was created to undertake a significant body of national health workforce research over a three-year period, including advice and development on future supply and demand models for the health workforce.

The 'Workload Measures for Allied Health Professionals' project was undertaken by the Collaboration to explore current data sources on workload measures for allied health professions. These data are an important part of national workforce planning exercises for allied health professions. The objectives are to map and summarise existing data sources, and recommend priorities for future data collection. The views in this report are those of the authors and do not necessarily represent those of NHWT or HWA.

## Acknowledgements

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## Executive summary

The aim of this project is to examine current data sources on workload measures for allied health professions, ie the number of services provided per FTE. These data are an important part of national workforce planning exercises for allied health professions. The objectives are to map and summarise existing data sources, and recommend priorities for future data collection.

## Recommendations

- The new national registration scheme provides a landmark opportunity to remedy current failures in national data collection for allied health professionals. For those allied health professions covered by the new national registration scheme:
  - Registration should include compulsory questions on hours worked across clinical and non-clinical activities, and hours worked in the private and public sectors. In the absence of comprehensive national administrative data on utilisation and workload, especially in the private sector, a question on the number of patients seen per week in each sector would provide an important national source of data on utilisation and changes in utilisation over time.
  - If compulsory questions are not possible, the registration database should be used as the sample frame to conduct regular surveys of the allied health workforce. These have been conducted in the past by AIHW, and should be repeated regularly for each profession alongside registration.
  - Data collected from registrants (both compulsory data items collected as part of registration, as well as targeted workforce surveys) should be routinely linked over time to create a longitudinal dataset that can accurately track changes in an individual's hours worked, participation, changes in the allocation time across activities, and changes in the number of patients seen. This would provide a powerful source of data to track careers and evaluate policy change.
- For allied health professions not currently covered by the registration scheme, nationally co-ordinated and regular workforce surveys should be conducted that include similar questions.

## Key findings

- It is not currently known with any precision how many allied health professionals are working in Australia, the volume of activities they perform, or how these are changing over time. Comprehensive and accurate information on the numbers and workload of the allied health workforce is urgently required for national workforce planning. If such data are not improved, then it will continue to be impossible to conduct national workforce planning for these groups in Australia.

- Data on the utilisation of allied health professions is available by combining data from the National Health Survey (non-hospital allied health utilisation) with data from the National Hospital Morbidity database (public and private hospital utilisation). However, this can only be done for a limited number of allied health professions, and will be an underestimate of total utilisation. Data from Medicare and claims from private health insurance do not cover all out of hospital services and should not be used to estimate national utilisation or predict trends in utilisation/demand. For some allied health professions, a large part of allied health utilisation is paid for entirely out of pocket and so is not included in claims or administrative data, but will be captured by the National Health Survey.
- Workforce surveys are not undertaken in every state and territory and only cover a handful of allied health professions. These workforce surveys in most cases are relatively outdated although there have been surveys that are either concluded recently or are in progress but these are mostly focused on rural allied health workers. Given that most workforce surveys are conducted in conjunction with the registration of allied health practitioners and typically not compulsory, the surveys sometimes suffer from high rates of non-response. This creates a problem as the information based on the sample of practitioners that responded often cannot be generalised to the population.
- Previous workforce surveys conducted by registration bodies, jurisdictions and AIHW do not routinely ask questions about workload, such as the number of patients seen per week, or the allocation of time between clinical and non-clinical duties. These questions would be an important addition to future surveys for workforce planning purposes.
- Data on the total number of allied health professionals from the census is very different compared to headcount data presented in registration-based and jurisdictional workforce surveys. For physiotherapy in NSW, registration-based workforce surveys included 18% more physiotherapists than the census, and 67% more psychologists. It is not apparent why this is the case, but suggests that census data, although national in coverage, should be treated with caution.
- A methodology is presented that combines existing data sources to calculate national estimates of workload per FTE for some allied health professions. However, reliable national estimates cannot be calculated given serious biases in the data.

# 1 Introduction

## Aims

The aim of this project is to examine current data and knowledge on workload measures for allied health professions. *The main purpose is to obtain high-level measures for future national workforce planning exercises* from those allied health professions perceived to be in shortage. The objectives are to map and summarise existing data sources, identify and summarise major gaps in the data, and recommend priorities for future data collection.

Ideally, these data sources would measure service utilisation per FTE allied health worker. This requires good quality national data on both the supply of allied health professionals (hours worked, FTEs) and data on the activities they undertake (visits, utilisation). Differences between the public and private sectors, and between hospital and community allied health workload will be highlighted if the data allows.

There is no clear and consistent agreement on which professions comprise the allied health workforce in Australia (AMWAC, 2006; Ridoutt et al, 2006). Definitional issues were discussed extensively in the AMWAC report and in Ridoutt (2006). The AMWAC report listed a number of definitions of allied health professions from a number of different perspectives (eg ABS/AIHW, Health Professions Council of Australia, Medicare-funded professions). The AMWAC report included *Audiology, Dietetics and Nutrition, Occupational Therapy, Physiotherapy, Podiatry, Psychology, Radiography, Speech Pathology*. We use these selected professions to illustrate the issues. Examination of other allied health professions are beyond the scope of this report, and would need to be examined in further research.

## Approach

Workload measures can be derived by comparing aggregate service utilisation to workforce supply data (e.g. services per FTE), or by identifying any specific workload or longitudinal studies held by professional organisations, universities and others. Two approaches are used to identify potential data sources and identify gaps in these data:

- a review of the published and grey literature;
- consultation with key stakeholders.

The list of key stakeholders are shown in Appendix A.

The third part of this project is, where the data allow, to obtain data and calculate workload measures. Given the focus on national/aggregate measures of workload for national workforce planning, we take a 'top down' approach to the calculation of workload measures. This involves using aggregate (ie national or state level data) measures of both utilisation and workforce supply estimates. These are then validated against 'bottom up' sources of data and feedback from key stakeholders. 'Bottom up' sources of data may include specific hospital-level studies or surveys of allied health workload. Although these are not representative and so cannot be used to calculate national workload measures, they are important in helping to validate and assess the face validity of measures calculated at the national level.

## 2 Review of literature and existing data sources

The literature review and consultations identified a number of key reports, datasets and pieces of work that have examined allied health workload. Methods of the literature review are shown in Appendix B. The following sections discuss the data sets that are available in Australia that can be employed to estimate aggregate measures of allied health workload using a 'top down' approach.

### 2.1 Key findings from published literature

The published literature related to allied health workload can be categorised into four broad themes. For much of the literature, these themes are interrelated and often overlap. Although some literature dealt with the methods to measure allied health workload, little of this literature identified specific datasets or quoted summary data on allied health workloads. Grey literature and reports were the main source of information on datasets and surveys. These were identified primarily through the consultations

#### Theme One. Methods

The first theme focuses on the methodological approaches to measuring the workload of allied health professionals. This has been extensively reviewed in a report by Ridoutt *et al.* (2006) which was prepared for the Department of Human Services Victoria. Schoo *et al.* (2008) also examine the issues of defining and classifying allied health service activities. Methods range from the simple *ratio-based approach* (e.g. beds or activity to staff ratio) to *diagnostic or casemix based* approach where workload measures are categorised by diagnostic sub-groups. Workload measurement and management is also examined in two reports for the case of Scotland National Health Service (Scottish Executive 2005, 2006).

#### Theme Two. Staffing ratios

The second theme is concerned with the establishment of guidelines and recommendations on workload/caseload sizes and staffing requirements. Examples include Adams (2004) for recommendations on physiotherapy staffing levels in rural areas of Australia; Richardson (2006) on staffing guidelines for allied health workers in NSW metropolitan hospitals; Allied Health in Rehabilitation Consultative Committee (2007) on guidelines for allied health resources required for rehabilitation services in Australia; and Christie (1999) on caseload guidelines for physiotherapists in Canada. Clarke (2008) summarised the recommended staffing ratios for eight allied health professions by acute and rehabilitation settings (Table 1). The figures refer to the number of staff per 10 beds.

Two secondary topics that follow under this theme include the examination of the variations in *actual* staffing levels (e.g. van der Gaag *et al.*, 1999) across different health care

institutions and the extent to which the actual staffing guidelines that were implemented deviates from the recommended levels (e.g. Erlendson *et al.* 2003).

**Table 1. Recommended staff to bed ratios in acute and rehabilitation settings**

	Physiotherapy	Occupational Therapy	Clinical Psychology	Dieticians	Podiatry
Christie(2006) <sup>#</sup> Acute Rehab.	0.3-1.0 1.2	0.1-1.0 1.0			
AFM(2005) <sup>#</sup> Acute Rehab	1.25-2.0 0.75-2.0	0.8-2.0 0.5-2.0	0.2-0.7 0.025-1.0	- 0.4-0.5	- 0.025-0.1
Gill et al. (2007) Acute			1:500 pts		1:180-120 pts 1:50-75 pts
Burton et al. 2005) <sup>#</sup> Rehab			0.15-0.3	0.05-0.5	

Source: Clark (2008).

### Theme Three. Factors influencing workload

The third theme examined the factors that influence the intensity of service utilisation by patients which has a direct effect on the workload of allied health professionals. Some factors include the level of patients' medical needs (e.g. number & severity of conditions), the presence of conditions that facilitate or hinder the use of health services (e.g. ability to communicate and comprehend) and the effect of personal characteristics (e.g. age, gender and cognitive status) (e.g. Dunal *et al.* 2006).

### Theme Four. Stress and burnout

The fourth theme investigates the prevalence and effects of stress and burnouts among allied health workers where poor workload management is likely to be contributing factors. Examples include Lloyd and King (2004) who examined these issues for mental health occupational therapists and social workers in Australia and Lindsay *et al.* (2008) for physiotherapists in regional public hospitals in Australia.

### Theme Five. Data and surveys

A number of reports were identified from the consultations and literature review reporting the results of surveys and datasets. Two types of data are reviewed: data sources on allied health utilisation and data on allied health workforce supply. These are summarised in the following sections.

## 2.2 Utilisation measures for allied health

Measures of the utilisation of allied health services in Australia are available from a variety of sources. The measures differ by: (i) the setting at which the services are provided (hospital, clinic, day centre, home), (ii) provider type (e.g. public, private) and (iii) unit of measurement (e.g. hospital separations, number of services, insurance claims, time). The following describes the data sources and discusses how the data may be used for estimating allied health utilisation.

The data is also categorised by sector, delivery settings and unit of measure. A summary table is presented in Table 2 below. The issue is whether these disparate datasets can be combined to provide national estimates for Australia. Table 2 shows that there is substantial overlap and duplication.

**Table 2. Summary of data sources for allied health utilisation**

Data Source/Field	NHMD	Non Admit	NHS	PHIAC	HACC	MAHS	Medicare
<b>Sector</b>							
Public	X	X			X	X	X
Private	X			X			
<b>Delivery Setting</b>							
Hospitals	X	X				X	
Community health centres/Day centres		X	X		X	X	
Private consultation rooms			X	X			X
Residential homes					X		
<b>Measurement Unit</b>							
Occasion of service	X	X	X			X	X
Expenditure/Claims				X		X	
Time					X		

NHMD = National Hospital Morbidity Data (AIHW)  
 Non Admit= Non-Admitted Patient Data Collections  
 NHS=National Health Survey  
 PHIAC= Private Health Insurance Administration Council  
 HACC=Home and Community Care Minimum Dataset  
 MAHS=More Allied Health Services

## National Hospital Morbidity Data (NHMD)

[Type (Public & private); Setting (Inpatient); Measurement Unit (Number of procedures/separations)]

### Description

The NHMD<sup>1</sup> is maintained by the Australian Institute of Health and Welfare (AIHW) collects data on a number of allied health services provided in Australian public and private hospitals. Utilisation measures of allied health services in the database include the *total number of allied health procedures performed* and the *number of hospital separations* where at least one allied health services are provided. Data are available from 2000/01 to 2006/2007 for between 12-14 allied health professions. Details on the coverage of allied health specialties such as procedural block, item numbers and years in which data is available are shown in Table 3.

### Data Usage

Data from the NHMD can be used to derive measures of the volume of inpatient allied health activity in public and private hospitals in Australia. These data do not include hospital staffing, and so cannot be used by themselves to calculate allied health workload.

**Table 3. National Hospital Morbidity Database, Australian Institute of Health and Welfare**

Specialty	Procedural Block	Procedural Number	Years Available
Audiology	1916	95550-06	2000/01 to 2006/07
Dietetics and Nutrition	1916	95550-00	
Occupational Therapy	1916	95550-02	
Orthoptics*	1916	95550-07	
Orthotics & Prosthetics*	1916	95550-08	
Hospital Pharmacy*	1916	95550-09	
Physiotherapy	1916	95550-03	
Podiatry (Chiropodist)	1916	95550-04	
Psychology	1916	95550-10	
Speech Pathology	1916	95550-05	
Radiography	B 1967-1986		

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<sup>1</sup> [http://www.aihw.gov.au/hospitals/nhm\\_database.cfm](http://www.aihw.gov.au/hospitals/nhm_database.cfm). Last accessed 8 October 2009.

## Non-Admitted Patient Data Collections

[Type (Public); Setting (Outpatient); Measurement Unit (Number of services)]

### Description

Administrative data collected by state/territory governments on non-admitted patients contain information on allied health activity delivered in publicly funded outpatient settings such as outpatient clinics and community rehabilitation centres. Examples include the Victorian Integrated Non-admitted Health Minimum Dataset (VINAH MDS). Databases<sup>2</sup> covering sub-acute care such as the Sub-Acute and Non-Acute Patient (SNAP) in NSW also includes data on the delivery of allied health services.

### Data Usage

These data measure utilisation and do not include hospital staffing, and so cannot be used by themselves to calculate measures of allied health workload. Outpatient allied health activity in publicly funded health care institutions could be combined with utilisation data from the NHMD to derive measures of the total allied health services provided by state & territories governments. Thereafter, aggregate measures of workload can be estimated that can be used for state & territory-level allied health workforce planning. In combining measures of inpatient and outpatient allied health activity, careful identification of the setting of delivery is important to avoid duplications or double counting.

## National Health Survey (NHS)

[Type (Combined Public & Private); Setting (Non-hospital); Measurement Unit (Number of visits)]

### Description

The NHS, administered by the Australian Bureau of Statistics (ABS), collects information on utilisation of non-hospital allied health services from a sample of the population. From 2001, the ABS conducted the NHS every 3 years, with the most recent being the 2007/08 survey. Survey respondents were asked to indicate the number of visits they make to allied health professionals in the two weeks preceding the survey. The visits refer to consultations with allied health professions that occur in a non-hospital and outpatient setting.<sup>3</sup> This is the only data source that includes all non-hospital allied health utilisation.

### Data Usage

Fortnightly utilisation rates by age & sex may be scaled up to a yearly measure and applied to the demographic composition of the population in Australia to calculate an annualised measure of allied health activity for the non-hospital setting. This is likely to include both

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<sup>2</sup> Under the National Health Partnership Agreements, state and territories health authorities committed to implement quality data collection and standards for sub-acute health care services, which include non-admitted health care.

<sup>3</sup> Survey respondents were asked to exclude visits to allied health professionals that occurred during a stay in hospital, a visit to a casualty/emergency department or outpatients unit, or day clinic (ABS, 2006)

public (such as community health centres) and private health care facilities (practitioners' private practice), and services funded by different sources (Medicare, Health insurance). An estimate of the total number of visits to *private* allied health practitioners could be derived by subtracting from the total the number of services provided through publicly funded non-admitted (outpatient) data collections, but careful attention is required in defining the latter to avoid under- or over-estimating private activity. Thereafter, workload measures corresponding to that of private allied health practitioners working in the non-hospital settings can be derived using workforce survey data in where information on sector (public or private) and work settings are collected. This will be discussed in greater detail in the next section which discusses allied health labour force data.

Note that the NHS does not collect information on all allied health professions and in some instances the utilisation measure can be non-specific and contain other closely related specialties. Coverage of NT/Indigenous is limited. The availability of data varies by the survey year and data versions. Information on the availability of data is summarised in Table 4.

**Table 4. National Health Survey**

	Description of Allied Health Visit		
	2001	2004/05	2007/08
<b>Audiology</b>	Audiologist/ Audiometrist	Audiologists*	- Not Asked -
<b>Dietetics and Nutrition</b>	Dietician/Nutritionists	Dietician/Nutritionists	Dietician/Nutritionists
<b>Occupational Therapy</b>	Occupational Therapist	Occupational Therapist*	Occupational Therapist
<b>Optometry*</b>	Optician/Optometrists	Optician/Optometrists	Optician/Optometrists
<b>Orthotics &amp; Prosthetics*</b>	- Not Available -	- Not Available -	- Not Asked -
<b>Hospital Pharmacy*</b>	- Not Available -	- Not Available -	- Not Asked -
<b>Physiotherapy</b>	Physiotherapist/ Hydrotherapist	Physiotherapist/ Hydrotherapist	Physiotherapist/ Hydrotherapist
<b>Podiatry (Chiropodist)</b>	Chiropodist/Podiatrist	Chiropodist/Podiatrist	Chiropodist/Podiatrist
<b>Psychology</b>	Psychologist	Psychologist	Psychologist
<b>Speech Pathology</b>	Speech therapists/ Speech pathologist	Speech therapists/ Speech pathologist^	Speech therapists/ Speech pathologist^
<b>Radiography</b>	- Not Available -	- Not Available -	- Not Asked -

\*Included in the Others category in both BASIC and EX-CURF

^Available as a separate item in the EX-CURF but included in the 'Others' category for in the Basic CURF

## Private Health Insurance Administration Council (PHIAC).

[Type (Private); Setting (Outpatient); Measurement Unit (Number of services, claim benefits)]

### Description

PHIAC publishes statistics on number of services and benefits paid by private health insurers on a quarterly basis<sup>4</sup>, with the latest being June 2009. The measures of allied health utilisation published in the statistics are derived from data on the benefits paid by private health insurers. The utilisation measures of allied health services include the *number of services* and the *monetary value of the insurance benefit*. A breakdown of the measures by allied health service type are available only for benefits on general treatment which implies that these utilisation measures pertain to services provided in an outpatient setting. It should be noted that not all allied health specialties that are of interest in this study are published and in some instances, the service type can be non-specific and contain other closely related specialties. Information on the availability of data is summarised in Table 5.

**Table 5. Allied health professions covered in Private Health Insurance Administration Council data**

Specialty	Description of Services/ Benefit Item
Audiology	Hearing Aids and Audiology
Dietetics and Nutrition	Dietetics
Occupational Therapy	Occupational Therapy
Orthoptics*	Orthoptics (Eye Therapy)
Orthotics & Prosthetics*	Prostheses, Aids and Appliances
Hospital Pharmacy*	Pharmacy
Physiotherapy	Physiotherapy
Podiatry (Chiropodist)	Podiatry (Chiropody)
Psychology	Psychology/ Group Therapy
Speech Pathology	Speech Therapy
Radiography	- Not Available -

### Data Usage

Compared with the various data sources discussed above, the scope in the use of PHIAC data for the purpose of workforce planning is limited as it measures only the utilisation of allied health services by individuals who use private health insurance. However, one could

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<sup>4</sup> <http://www.phiac.gov.au/for-industry/industry-statistics/quarterly-statistics/>. Last accessed 8 October 2009.

use the allied health utilisation rates contained in the NHS combined with information on private health insurance to estimate similar measures to that captured in the PHIAC data for non-insured individuals.

## Home and Community Care (HACC) Minimum Data Set<sup>5</sup>

[Type (Public); Setting (Home and day care centres); Measurement Unit (Time)]

### Description

HACC is a joint Commonwealth and State/Territory program that provides a comprehensive range of home & community-based maintenance and support services. These services can include domestic assistance (such as house cleaning and clothes washing), nursing and allied health care, and/or personal care (assistance with eating, bathing). The HACC data set records the total amount of allied health services clients received at home or at a day centre over 3-month period. This is measured in terms of time rather than the number of visits- that is the total hours and minutes of allied health services received. The allied health care provided through the HACC includes podiatry, occupational therapy, physiotherapy, social services and the scope of services can be expected to vary across different HACC agencies depending on the clients' demand.

### Data Usage

HACC data use a time-based measure of workload which is not comparable to other data sources using patient visits.

## Commonwealth Funded Allied Health Initiatives

The following are examples of commonwealth funded program that involve the delivery of allied health services:

### More Allied Health Services Program (MAHS)

[Type (Public); Setting (Outpatient, Inpatient; Rural); Measurement Unit (Occasion/Type of service, Expenditure)]

The More Allied Health Services (MAHS), through Divisions of General Practice, funds the delivery of allied health services in rural communities. Allied health services funded through MAHS include dieticians, physiotherapists, podiatrists, social workers, psychologists, Aboriginal mental health workers, Aboriginal health workers, diabetes educators, dieticians

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<sup>5</sup> <http://www.health.gov.au/internet/main/Publishing.nsf/Content/hacc-mds.htm>. Last accessed 8 October 2009.

and other primary health care providers. Divisions routinely report the number of MAHS services provided and the number of allied health service providers by provider type and FTE.

## Data Usage

Workload measures under the MAHS program can be estimated by combining MAHS activity data with the supply of allied health labour under the program. The data only include services in rural areas, and only those services funded through MAHS.

## Medicare

[Type (Private); Setting (Private: Primary care); Measurement Unit (Number of services)]

Medicare Australia publishes data on the total number of Medicare claims for a range of allied health services such as consultations with chiropractors, dieticians and psychologists. The following allied health services for people with chronic conditions and complex care needs are covered under Medicare

**Table 6: Allied health services under Medicare**

Professions	Item Number
Aboriginal Health Worker	10950
Diabetes Educator	10951
Audiologist	10952
Exercise Physiologists	10953
Dietician	10954
Mental Health Worker	10956
Occupational Therapists	10958
Physiotherapist	10960
Podiatrist	10962
Chiropractor	10964
Osteopath	10966
Psychologist	10968
Speech Pathologist	10970

## Data Usage

.The number of Medicare claims for allied health services can be used to measure allied health utilisation. A limitation of using Medicare data is that limits are imposed (currently the maximum of 5 services per patients for each calendar year) on the number of allied health services that individuals are entitled to claim the Medicare rebate and the possibility of out-of-pocket payments implies that Medicare statistics are likely to be significantly under-representing the allied health needs of the population.

## 2.3 Allied health workforce supply data

### 2.3.1 Introduction

The data that are available on allied health workforce supply was discussed extensively in AMWAC (2006). The main sources of data include periodic AIHW allied health labour force surveys, the Australian Bureau of Statistics (ABS) Census of Population and Housing, and workforce surveys conducted by allied health professional associations or registration bodies.

The discussion in this section on data on allied health workforce supply has four objectives:

- as an update to the discussion in AMWAC (2006), to highlight the allied health workforce surveys that have either been completed or are currently in progress since the AMWAC report was published;
- to calculate estimates of allied health labour supply for the eight allied health specialties that are of primary interest in this report using data from the 2006 Census of Population and Housing. Supply measures are broken down by sector (public or private) and state/territories;
- to examine the comparability of the estimates produced using the census data with that from the allied health workforce surveys, and;
- to critically examine the usefulness of these data for calculating allied health workload measures.

### 2.3.2 Allied Health Workforce Surveys: From 2002 to Present

Table 7 provides an overview of allied health workforce surveys that were conducted from 2002 to the present. Data collection at this level is not comprehensive over time or professional group. These data cannot be used to obtain a consistent national picture of the numbers of allied health professionals in Australia. Although registration data is often used as the sampling frame and so can be used to obtain headcounts in each state/jurisdiction, data on number of hours worked, sector and setting of work can only be obtained through surveys which have varying response rates, and so are subject to response bias.

The AIHW published a series of reports on allied health workforce surveys conducted in 2002 to 2003 for Occupational Therapy, Physiotherapy, Podiatry and Psychology. These represented 4 out of only 6 surveys that were national in scope and so used a consistent methodology. The other two national surveys included a report projecting the Podiatry workforce from 2008 to 2017 published by the Australasian Podiatry Council. In addition, a survey of the audiological workforce in Australia has also been completed recently (Goulios and Patuzzi). Jurisdictional workforce surveys were carried out in New South Wales for Physiotherapy (2005), Podiatry (2007) and Psychology (2007); in Victoria for Speech Pathology (2006); in Queensland for Occupational Therapy (2005) and Speech Pathology (2006); and in Western Australia for Occupational Therapy (2007) and Podiatry. Rural allied health workforce surveys are currently being conducted in South Australia and the Northern Territories and have been completed for the New South Wales and Tasmania.

**Table 7. Allied health workforce surveys by specialty and state/territories (2002 – Present)**

Specialty / StateTerritories	NSW	VIC	QLD	SA	WA	TAS	ACT	NT	Across State/Territories
<b>Audiologist</b>									Goulios and Patuzzi
<b>Dietetics and Nutrition</b>									
<b>Occupational Therapy</b>			QLD Health (2008a) [Sect, Set]		CHP Office (2008) [Sect, Set]				AIHW (2006a)
<b>Physiotherapy</b>	NSW Health (2008a) [Sect, Set]		QLD Health (2008b) [Sect, Set]						AIHW (2006b)
<b>Podiatry</b>	NSW Health (2008c) [Sect, Set]		QLD Health (2008d) [Sect, Set]		CHP Office (2007) [Sect, Set]				AIHW(2006c) APod (2008)
<b>Psychology</b>	NSW Health (2008c) [Sect, Set]		QLD Health (2008c) [Sect, Set]						AIHW (2006d)
<b>Speech Pathology</b>		DHS (2006) [Sect]	QLD Health (2008e) [Sect, Set]						
<b>Radiography</b>									
<b>Cross-Specialty</b>	Keane et al. (2009) [Sect, Set & Task]			RAHWS (On-going)		Lowe et al. (2009) [Sect, Set & Task]		(On-going)	

[Sect] : Includes data on sector of work (public/private)

[Set] : Includes data on setting of work (eg. hospital, private practice)

[Task] : Includes data on percentage of time allocated to different activities (eg. patient care, administration)

## AIHW National Allied Health Labour Force Surveys

The strengths and limitations of the AIHW allied health labour force surveys are highlighted below. These have also been briefly discussed in AHWAC (2006).

a) The AIHW allied health data collection is comprehensive in the data that is collected but is limited in coverage of only a handful of professions: Occupational Therapy, Physiotherapy, Podiatry and Psychology. The workforce surveys are now relatively outdated and not conducted regularly - the most recent surveys were conducted in 2003. Given that the surveys are conducted in conjunction with the registration of allied health practitioners and are typically not compulsory, they may suffer from high rates of non-response. This creates a problem as the information based on the sample of practitioners that responded often cannot be generalised to the population. It is also difficult to assess the potential magnitude of the problem posed by non-response as there is no reliable data available on the total number and characteristics of the professionals across the different occupations nationally. National registration will greatly facilitate this.

b) The surveys contain questions on the number of weekly hours worked; work setting of main job (e.g. hospital, nursing home, private practice); work sector (public or private); and the field of respondents' main job - whether professionals are engaged in clinical practice (e.g. diagnosis, care and treatment of patients) or non-clinical work (e.g. administration/management, training/education, research, other). This information was collected in separate questions and hence does not allow for disaggregated analysis. Data on the distribution of weekly hours worked by work setting, sector or clinical activity provides useful and more detailed information on labour supply. This will be especially informative if a significant number of respondents work in multiple settings, sectors and have both clinical and non-clinical responsibilities.

c) The surveys do not collect data on workload such as the number of patients seen per week. This information, combined with the number of weekly hours worked, can be used to produce estimates of workload measures for workforce planning purposes.

## Jurisdictional Allied Health Workforce Surveys

Allied health workforce surveys were conducted in New South Wales, Queensland Victoria and Western Australia for a selection of allied health occupations. The strengths and limitations of these surveys are highlighted below.

a) Compared with the AIHW national allied health data collection, the jurisdictional labour force surveys are relatively more recent. The coverage of occupations is similar to the AIHW collection except for Speech Pathology that was collected in Victoria and Queensland. Given that the surveys were conducted in conjunction with the registration of allied health practitioners and are typically not compulsory, they suffer from high rates of non-response. For

instance, only 43% of registered occupational therapist in Western Australia responded to the 2007 Occupational Therapy Labour Force survey (CHP Office, 2008). This creates a problem as the information based on the sample of practitioners that responded often cannot be generalised to the population.

b) Except for the Occupational Therapy and Podiatry surveys in Western Australia and the Speech Pathology survey in Victoria, the remaining jurisdictional workforce surveys collected information on hours worked, work setting/sector and clinical role in separate questions and hence does not allow for disaggregate analysis.

c) All jurisdictional surveys do not collect data on workload measures such as the number of patients seen per week.

### Rural Allied Health Workforce Surveys

In response to the national shortage of allied health professionals, and particularly in rural areas, workforce surveys focusing on allied health professionals working in rural areas were recently conducted in New South Wales and Tasmania. Similar surveys are currently in progress in South Australia and the Northern Territory.

a) The coverage of occupations in the rural allied health workforce surveys is more comprehensive compared with the national and jurisdictional surveys. For example, the NSW rural survey includes occupations such as Audiologist, Dietician and Radiographer which are not covered in the national and jurisdictional surveys. Like the other national and jurisdictional surveys, these surveys are conducted in cooperation with registration and licensing bodies and are not compulsory and hence they potentially suffer from high rates of non-response bias. For example, the approximate response rate for the NSW survey is on average 31% across the different occupations.

b) In addition to data on weekly hours worked, the rural surveys collect the proportion of time professionals work in multiple sectors (public, private, federal program etc.) as well as the time spent in various organisation roles (e.g. individual patient clinical care, work related travel, teaching and training etc.)

c) As with the national and jurisdictional surveys, the rural surveys do not collect data on workload measures such as the number of patients seen per week.

### 2.3.3 Calculating Allied Health Labour Supply Measures Using Census 2006

Measures of allied health labour supply can be constructed using data from the 2006 ABS Census of Population and Housing. The census is the only national measure of the size of composition of the allied health workforce. In the census

data, occupation is self-reported and allied health professionals are identified using the ANZSCO occupational codes.<sup>6</sup> Headcounts of allied health professionals can be generated by sector of work (public and private)<sup>7</sup>, by the number of hours worked (1-99) and state/territories. Using these data, one can multiply the headcounts with the work hours to calculate estimates of labour supply measures such as the total number of work hours, hours per worker and the number of full-time equivalents (FTE) by sector and state/territories.

Table 8-15 present the workforce profiles and labour supply estimates for eight allied health specialties. Three broad characteristics of the allied health workforce can be observed.

- The distribution of allied health workers (headcount) by sector of work varies significantly across the different specialties. Nationally podiatrists and physiotherapists work predominantly in the private sector compared with dieticians and occupational therapists which are distributed roughly equally between the public and private sectors.
- The average numbers of hours that allied health professionals worked in the public and private sectors vary across specialties. For instance, the average number of hours worked by podiatrists in the private sector (36.1 hours) is higher than that of podiatrists in the public sector (32.8 hours). On the contrary, the reverse is the case for psychologists where the average hours worked in the public and private sectors are 36.2 and 33.1 hours respectively.
- The average number of hours and the corresponding FTE ratios (where 1 FTE=35 worker-hours)<sup>8</sup> varies across sectors, specialties and jurisdictions. In WA, podiatrists in the public sector have an average FTE ratio of 0.66 which is significantly lower than the national average of 0.94 as well as 0.95 for private sector podiatrists. On average, public and private sector psychologists in the NT have a FTE ratio of between 1.13 and 1.14 which is higher than the national averages of 1.03 and 0.95 for public and private respectively)

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<sup>6</sup> The ANZSCO code for the 8 allied health specialties examined in this report are Audiologists (252711), Dieticians (2511), Occupational Therapists (2524), Physiotherapists (2525), Podiatrists (2526), Psychologist (2723), Speech Pathologists (252712) and Radiographer (251211). Note that some specialties are coded with a 4-digit ANZSCO code while others have a 6-digit code. The CDATA facility maintained by the ABS allows for access to the census data. However, CDATA releases occupational information only up to a 4-digit ANZSCO code so specialties such as audiologists, speech pathologists and radiographers are categorised together with other relevant specialty groups. Disaggregated data at the 6-digit ANZSCO can be requested by contacting the ABS.

<sup>7</sup> Derived from the Government/Non-government Employer Indicator (GNGP) variable. Public sector allied health workers are employed by Commonwealth, State/Territories and Local Governments.

<sup>8</sup> The Australian Bureau of Statistics define full time workers as employed persons who usually worked 35 hours or more a week (ABS, 2010)

**Table 8. Estimates of Audiologist workforce (2006 Census)**

<b>Audiologist</b>						
	Public			Private		
	Headcount (HC)	Hours (HR)	Number of FTEs (35h)	Headcount (HC)	Hours (HR)	Number of FTEs (35h)
NSW	146	4766	136.2	168	5556	158.7
VIC	152	4726	135.0	172	5690	162.6
QLD	112	3477	99.3	103	3729	106.5
SA	28	1000	28.6	51	1854	53.0
WA	34	1286	36.7	64	2174	62.1
TAS	4	88	2.5	9	405	11.6
NT	6	240	6.9	3	30	0.9
ACT	6	108	3.1	12	384	11.0
<b>Total</b>	<b>488</b>	<b>15691</b>	<b>448.3</b>	<b>582</b>	<b>19822</b>	<b>566.3</b>
<b>Total HC = 1,070</b>						
<b>Total Hours = 35,513</b>						
<b>Public HC as a % of Total HC = 45.6%</b>						
<b>Public Hours as a % of Total Hours = 44.2%</b>						

**Table 9. Estimates of Dietician workforce (2006 Census)**

<b>Dieticians</b>						
	Public			Private		
	Headcount (HC)	Hours (HR)	Number of FTEs (35h)	Headcount (HC)	Hours (HR)	Number of FTEs (35h)
NSW	370	12,413	354.7	474	14,430	412.3
VIC	334	10,804	308.7	304	10,257	293.0
QLD	209	7,597	217.1	263	8,812	251.8
SA	99	3,232	92.3	74	2,387	68.2
WA	88	2,737	78.2	98	2,811	80.3
TAS	22	743	21.2	12	408	11.7
NT	23	785	22.4	6	288	8.2
ACT	55	1,846	52.7	18	582	16.6
<b>Total</b>	<b>1,200</b>	<b>40,157</b>	<b>1,147.4</b>	<b>1,249</b>	<b>39,974</b>	<b>1,142.1</b>
<b>Total HC = 2,449</b>						
<b>Total Hours = 80,132</b>						
<b>Public HC as a % of Total HC = 49.0%</b>						
<b>Public Hours as a % of Total Hours = 50.1%</b>						

**Table 10. Estimates of Occupational Therapist workforce (2006 Census)**

<b>Occupational Therapist</b>						
	Public			Private		
	Headcount (HC)	Hours (HR)	Number of FTEs (35h)	Headcount (HC)	Hours (HR)	Number of FTEs (35h)
NSW	849	28,953	827.2	1,120	36,915	1,054.7
VIC	848	29,696	848.5	802	25,192	719.8
QLD	548	19,486	556.7	628	20,101	574.3
SA	225	7,012	200.3	272	8,851	252.9
WA	318	11,599	331.4	511	16,042	458.3
TAS	63	1,925	55.0	69	2,126	60.7
NT	29	973	27.8	22	778	22.2
ACT	48	1,460	41.7	62	2,063	58.9
<b>Total</b>	<b>2,928</b>	<b>101,104</b>	<b>2,888.7</b>	<b>3,486</b>	<b>112,067</b>	<b>3,201.9</b>
<b>Total HC = 6,414</b>						
<b>Total Hours = 213,171</b>						
<b>Public HC as a % of Total HC = 45.7%</b>						
<b>Public Hours as a % of Total Hours = 47.4%</b>						

**Table 11. Estimates of Physiotherapist workforce (2006 Census)**

<b>Physiotherapist</b>						
	Public			Private		
	Headcount (HC)	Hours (HR)	Number of FTEs (35h)	Headcount (HC)	Hours (HR)	Number of FTEs (35h)
NSW	1,020	34,637	989.6	2,753	93,078	2,659.4
VIC	947	32,923	940.7	1,982	69,546	1,987.0
QLD	601	21,053	601.5	1,525	53,917	1,540.5
SA	260	8,850	252.9	840	28,270	807.7
WA	365	11,840	338.3	904	30,049	858.5
TAS	106	3,313	94.7	153	5,055	144.4
NT	28	1,079	30.8	55	1,936	55.3
ACT	78	2,625	75.0	143	5,398	154.2
<b>Total</b>	<b>3,405</b>	<b>116,320</b>	<b>3,323.4</b>	<b>8,355</b>	<b>287,250</b>	<b>8,207.1</b>
<b>Total HC = 11,760</b>						
<b>Total Hours = 403,570</b>						
<b>Public HC as a % of Total HC = 29.0%</b>						
<b>Public Hours as a % of Total Hours = 28.8%</b>						

**Table 12. Estimates of Podiatrist workforce (2006 Census)**

<b>Podiatrist</b>						
	Public			Private		
	Headcount (HC)	Hours (HR)	Number of FTEs (35h)	Headcount (HC)	Hours (HR)	Number of FTEs (35h)
NSW	45	1,365	39.0	505	18,955	541.6
VIC	115	3,839	109.7	464	16,572	473.5
QLD	23	947	27.1	321	11,831	338.0
SA	41	1,297	37.1	184	6,379	182.3
WA	21	487	13.9	218	7,234	206.7
TAS	18	669	19.1	42	1,569	44.8
NT	0	0	0.0	3	195	5.6
ACT	4	160	4.6	24	827	23.6
<b>Total</b>	<b>267</b>	<b>8,764</b>	<b>250.4</b>	<b>1,761</b>	<b>63,563</b>	<b>1,816.1</b>
<b>Total HC = 2,028</b>						
<b>Total Hours = 72,326</b>						
<b>Public HC as a % of Total HC = 13.2%</b>						
<b>Public Hours as a % of Total Hours = 12.1%</b>						

**Table 13. Estimates of Psychologist workforce (2006 Census)**

<b>Psychologist</b>						
	Public			Private		
	Headcount (HC)	Hours (HR)	Number of FTEs (35h)	Headcount (HC)	Hours (HR)	Number of FTEs (35h)
NSW	1,299	46,882	1,339.5	2,812	91,277	2,607.9
VIC	1,121	39,328	1,123.6	2,454	81,300	2,322.9
QLD	875	32,743	935.5	1,454	49,562	1,416.1
SA	247	9,005	257.3	450	15,541	444.0
WA	424	14,813	423.2	959	31,722	906.3
TAS	96	3,421	97.7	143	4,266	121.9
NT	36	1,465	41.9	61	2,402	68.6
ACT	163	6,480	185.1	182	6,116	174.7
<b>Total</b>	<b>4,261</b>	<b>154,136</b>	<b>4,403.9</b>	<b>8,515</b>	<b>282,186</b>	<b>8,062.5</b>
<b>Total HC = 12,776</b>						
<b>Total Hours = 436,322</b>						
<b>Public HC as a % of Total HC = 33.4%</b>						
<b>Public Hours as a % of Total Hours = 35.3%</b>						

**Table 14. Estimates of Radiographer workforce (2006 Census)**

<b>Radiographer</b>						
	Public			Private		
	Headcount (HC)	Hours (HR)	Number of FTEs (35h)	Headcount (HC)	Hours (HR)	Number of FTEs (35h)
NSW	599	20948.87	598.5	1463	48038.5	1372.5
VIC	519	19532	558.1	857	29447.6	841.4
QLD	431	14944.72	427.0	707	23935.3	683.9
SA	227	7652	218.6	296	9049.7	258.6
WA	206	7572.276	216.4	378	12360.0	353.1
TAS	49	1504.087	43.0	89	2906.0	83.0
NT	24	730	20.9	19	686.0	19.6
ACT	35	1290	36.9	59	1772.0	50.6
<b>Total</b>	<b>2090</b>	<b>74173.95</b>	<b>2119.3</b>	<b>3868</b>	<b>128195.1</b>	<b>3662.7</b>
<b>Total HC = 5,958</b>						
<b>Total Hours = 202,369</b>						
<b>Public HC as a % of Total HC = 35.1%</b>						
<b>Public Hours as a % of Total Hours = 36.7%</b>						

**Table 15. Estimates of Speech Pathologist workforce (2006 Census)**

<b>Speech Pathologist</b>						
	Public			Private		
	Headcount (HC)	Hours (HR)	Number of FTEs (35h)	Headcount (HC)	Hours (HR)	Number of FTEs (35h)
NSW	417	13164	376.1	694	20322	580.6
VIC	472	15202.84	434.4	598	18280	522.3
QLD	285	9375.376	267.9	466	14331	409.5
SA	158	4912	140.3	177	5560	158.9
WA	124	3734	106.7	298	8798	251.4
TAS	60	1530	43.7	39	1134	32.4
NT	21	558	15.9	6	150	4.3
ACT	39	1002	28.6	10	324	9.3
<b>Total</b>	<b>1576</b>	<b>49478.21</b>	<b>1413.7</b>	<b>2288</b>	<b>68900</b>	<b>1968.6</b>
<b>Total HC = 3,864</b>						
<b>Total Hours = 118,378</b>						
<b>Public HC as a % of Total HC = 40.8%</b>						
<b>Public Hours as a % of Total Hours = 41.8%</b>						

### 2.3.4 Comparability of Workforce Profiles between Workforce Surveys and Census Data

The allied health workforce profiles from the census data and the workforce surveys were examined to assess the extent to which they are comparable (Table 16).

**Table 16. Comparability of the workforce surveys and the Census data**

	Workforce surveys		Census 2006	
	Headcount	% in Public Sector	Headcount	% in Public Sector
<b>Physiotherapy (NSW)<sup>1</sup></b>	4,452	59.1	3,773	27.0
<b>Psychology (NSW)<sup>2</sup></b>	6,933	58.5	4,111	31.6

<sup>1</sup>NSW Physiotherapist workforce in 2005 (NSW Health 2008a)

<sup>2</sup>NSW Psychologist workforce in 2007 (NSW Health 2008b)

The expected number of allied health professionals working in NSW after adjustments were made for non response to the workforce surveys. See page 4 of NSW Health (2008a) and page 3 in NSW Health (2008b).

The estimates of the physiotherapy workforce are based on the 2005 survey published in NSW Health (2008a) and the psychologist workforce on the 2007 survey in NSW Health (2008b). These include those working, and exclude those not working but registered, and those working in other states. These surveys were chosen for the comparison as the sample sizes are relatively large and the years the surveys were conducted closely corresponds to when the census was conducted.

There are large differences between the datasets.

- The size of the physiotherapist workforce in NSW (4,452) is 18% higher than recorded in 2006 census (3,773). In both data sources, more physiotherapists work in the private sector as compared to the public sector. However, the estimated proportion of public sector physiotherapists in the Census (27%) is much lower as compared with the 2005 workforce survey (59.1%).
- For psychologists, the workforce survey estimated that there were 6,933 psychologists working in the NSW in 2007 compared with 4,111 recorded in the Census data a year earlier, a difference of almost 69%. The workforce survey suggests that there was a higher percentage of psychologists working in the public sector (58.5%) as compared with the private sector, while the Census indicates the opposite (31.6%).

There are a number of possible explanations for the differences in the workforce characteristics in the surveys as compared with the census data.

- The surveys were conducted in different years (2005 & 2007) compared with the Census (2006) although adjustments can be made to the survey data to incorporate expected changes in the size of the workforce over time. This was not attempted here. Nevertheless, it is unlikely that the change in the workforce from year to year is as large as presented in the tables.
- How the workforce is defined in the surveys is likely to have an effect on the size of the allied health workforce in NSW.

- There may be non-response bias given the response rate of 82.4% in the Physiotherapist survey and 72.7% in the Psychologist survey, which have more of an impact on the reporting of hours worked and sector, than total numbers working. Furthermore, of those who did complete the survey, not everyone answered the work hours and sector question, resulting in item non-response bias. Those working in the public sector simply may have been more likely to respond to the survey, and more likely to answer the hours and sector questions, leading to an overestimate of the percentage working in the public sector. On the other hand there is likely to be very little non-response bias in the census to sector question. The census data may be more accurate in terms of hours worked and sector of employment
- The workforce survey numbers are ‘estimated’ and scaled up to account for non-respondents.
- Discrepancies between the workforce size derived from the census and the workforce surveys are unlikely to be due to differences in the definition of working location. The workforce survey number includes those undertaking some work in NSW. The Census data includes those resident in NSW, and so may slightly overestimate the number working in NSW, if some live in NSW but work entirely in another state.
- The Census data are self-reported, and for psychologists may include counsellors and therapists in addition to psychologists. People may have also reported their occupation if on maternity or other long-term leave.

## Summary

The Census data is the only data source that provides national estimates of supply. The accuracy of the measurement of hours worked in the census may be limited since it does not account for people with multiple jobs. The accuracy of these data from the workforce surveys are influenced by non-response and item-non response bias. The total headcounts from the Census are very different from those estimated from the workload surveys. It not possible to reconcile the data two data sources, and so the Census data should be treated with some caution.

The advent of national registration for some allied health professions should provide more accurate national estimates of workforce supply, but only if the survey is compulsory. Data on hours of work and sector of employment should be compulsory elements of the registration process to avoid non-response bias from survey data.

## 3 A method for calculating aggregate workload measures for allied health professions

### 3.1 Method

The aim of this section is to set out a proposed method for calculating national estimates of allied health workload. This section describes the approaches to calculating aggregate national workload measures for the eight allied health professions that are examined in this project. The method that is proposed is a 'top-down' aggregate approach which involves deriving a measure of the number of allied health services that is produced by per full-time equivalent allied health worker in a given time period.

The estimated workload for each allied health specialty  $J$  is given by the following formula:

$$Workload_J = \frac{(\text{Total Expected Number of Non-hospital and Hospital Services in } J)}{(\text{Total Allied Health Labour Supply in } J)} \quad (1)$$

The numerator in equation (1) consists of two parts. The first part is the total expected number of visits to allied health professionals that occur in a non-hospital setting. This is a measure of demand estimated using the 2004-05 National Health Survey (NHS). The NHS data provide the most comprehensive national estimate across all different types of non-hospital setting. They should include those services funded by Medicare and the Commonwealth (EPC, MAHS and HACC data) and by private health insurance (PHIAC data), in addition to that proportion of allied health visits that are paid for entirely out of pocket and therefore not captured in existing administrative data, or those services funded by other agencies (e.g. DVA, Workcover).

The NHS collects information on the frequency of visits to allied health professionals. The visits refer to consultations that occurred in a non-hospital and outpatient setting. Using the Basic and Expanded Confidentialised Unit Record Files (CURF) of the 2004-5 National Health Surveys, national utilisation rates by age (5-year age bands) and gender were calculated for 5 allied health professions (*Dietician, Speech Pathology, Physiotherapy, Podiatry, Psychology*) that were collected in the survey. The utilisation rates were thereafter applied to data on the population size in each of the equivalent age-band and gender groupings in Australia using the 2006 census. Appendix C shows the method used to predict allied health utilisation for each age-gender group from NHS data.

The second part of the numerator is the total number of allied health services provided in both public and private hospitals. This data is based on the National Hospital Morbidity Database and obtained through a request from the Australian Institute of Health and Welfare. These data are presented in Section 4.2.1. The frequency of non-hospital visits are added to the data on the number of allied health procedures performed in public and private hospitals in 2006 to obtain estimates of the total number of allied health services provided in Australia.

The denominator in equation (1) is the total allied health labour supply which is measured in terms of the number of FTEs derived from data from the 2006 Census which is presented in Tables 8-15.

### 3.2 Problems with this approach

- Although the NHS is comprehensive in its coverage of the non-hospital sector, it does not collect data on audiology, radiography, and occupational therapy. Data on the number of Medicare claims plus services claimed through private health insurance for audiology, radiography and occupational therapy services could be used.<sup>9</sup> However, these datasets are likely to seriously underestimate utilisation for these groups as they does not include services where the patient, private health insurer or other agency (e.g. DVA or Workcover) pays fully for the service. Data from the DVA or Workcover could be used, but the picture would still be incomplete and produce erroneous results.
- The NHS asks for self-reported visits in the past two weeks. Using this assumes that the incidence and predicted probability of visiting in a two week period is the same as in a year. This may be a reasonable assumption, as NHS interviews were conducted over a reference period of 11 months.
- The NHS data may under-represent the actual frequency of visits to allied health professionals for individuals who visited multiple allied health professionals in the two week reference period of the question. Respondents to the NHS were asked to provide information on recent visits to only two types of other health professionals, and not all health professionals, and no information is therefore recorded for individuals consulting a wide range of allied health professionals.
- Data from the National Hospital Morbidity Database does not cover all public and private hospitals in Australia, and so would underestimate hospital-based utilisation of allied health services.
- Inaccuracies with the census data (see Table 16) would create significant bias in the calculation of workload in equation 1. Underestimates of workforce size would artificially inflate workload, and overestimates would artificially deflate workload.

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<sup>9</sup> The Medicare item numbers for these services are: *Audiology* (11309, 11312, 11315, 11318 and 11321); *Radiography* (58500, 58503, 58506) and *Occupational Therapy* (10958, 80145, 81330, 82010, 82025).

- Allied health professionals spend a proportion of their time in non-direct patient care, including travelling and administration, and this is not accounted for in the data in data using numbers of visits. Relatively low number of visits can therefore be explained by a high proportion of time spent in non-direct patient care. Clinical care ratio (CCRs) reflect the proportion of time allied health devote to clinical care<sup>10</sup> as opposed other activities such as management, teaching & training and research. Data on CCRs for four allied health professions (Nutrition & Dietetics, Occupational Therapy, Physiotherapy and Speech Pathology) are collected using staff activity data collected by members of the National Allied Health Benchmarking Consortium (NAHBC) in 9 acute teaching hospitals around Australia and New Zealand. A total of 2200 staff records over 3 years (2006 – 2008) were analysed by the Consortium. Clinical care ratios are available by allied health profession and staffing levels/tiers. These cover public hospitals only.

### 3.3 Conclusion

Given the serious biases with using the above approach, estimates of workload have not been presented in this report.

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<sup>10</sup> Clinical care activities are categorised as either Individual Patient Attributable (IPA) or Non-Individual Patient Attributable (NIPA) on the basis of whether clinical care activities can or cannot be assigned to an individual patient (NAHCC 2001).

## 4 Conclusions

Comprehensive and accurate information on work characteristics and workload of allied health professionals is required for national workforce planning. In Australia, measures of allied health service activity are well documented for services provided in public and private hospitals but there is however a lack of comprehensive and accurate data on allied health activity that occurs in a non-hospital environment. In terms of information on allied health workforce, existing sources of information on allied health work characteristics are not collected on a regular basis, are limited in the coverage of professions and are usually not available for all states and territories. This report recommends that workforce and workload data be collected annually in conjunction with the national registration exercise.

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# Appendices

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## Appendix A Consultations

National Allied Health Advisory Committee.

Jurisdictional Workforce Planners Group.

National Allied Health Benchmarking Consortium (Health Roundtable)

National Allied Health Classification Committee

Dieticians Association of Australia

Australian Psychological Society

Audiology Society of Australia

Association of Occupational Therapy

Australian Physiotherapy Association

Rosalie Boyce, Queensland University of Technology

Ian Woodruff, RMIT

Australian Institute of Radiography

Speech Pathology Australia

# Appendix B Methods of literature review

The search terms that were utilised in the review are described in Table A1.

**Table B1. Search terms used in literature review**

Allied health professions of interest	Issues of interest
Audiolog*	- Workload/caseload
Dietet*	
Occupational therap*	
Physiotherap*	
Podiatr*	
Psychology	
Radiograph*	
Speech patholog*	

The databases through which the review was conducted were the Cinahl, Cochrane and PubMed. PubMed and Cinahl (5226 records) produced the largest number of references based on the search terms in Table 1. Across the databases, the number of search results that emerged differed across allied health specialties with Psychology (4976 records), Occupational Therapy (54) and Radiography (33) generating the highest number of results while Podiatry (8) and Audiology (8) producing the least.

Searches using internet search engines such as Google Scholar and the websites of the State/Federal Government in Australia and the Allied Health Associations of Australia, United Kingdom, Canada and the USA were also conducted. Titles and abstracts were reviewed if the focus of the study measured or discussed allied health

References and materials were also obtained through consultations held with members of the National Allied Health Advisory Committee, heads of the allied health professional organisations, members of the National Allied Health Benchmarking Consortium and representatives and associates from various governmental agencies and universities.

## Appendix C Methodological approach to calculating the expected utilisation of allied health services using data from the NHS and Census.

The NHS recorded the number of times individuals consulted other health professionals (OHP) in the two weeks preceding the date the interview was conducted. Individuals were asked to state the type OHP and the frequency of visit for the two most recent visits.

Using unit record data from the NHS CURF, the average number of visits to each of the 5 allied health professionals (Dieticians, Physiotherapists, Podiatrists, Psychologists and Speech Therapists) that are within scope in this report are first calculated for each age (5-year bands) and gender combination (see Table C1). Secondly, estimates of the probability of making at least one visit to each of the 5 allied health professionals by age and gender are generated. This is based on the predicted values from five separate probit regression models where the dependent variables are binary indicators of whether individual made a visit to the 5 allied health professionals (see Table C2). The predicted probabilities can then be multiplied by the corresponding population size in each age-gender combination for all states and territories to derive the expected number of individuals in each age-gender cell who makes at least one visit to the allied health professional in a two week period. The former is then multiplied by the average number of visits and divided by two to derive the expected total number of non-hospital visits per week to allied health professionals.

**Table C1. Average number of visits to allied health practitioners by age and sex (NHS 2005)**

Age/Specialty	Dieticians		Physiotherapist		Podiatrist		Psychologist		Speech Therapist	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0-4 years	1.00	0.00	1.00	1.36	0.00	1.00	0.00	1.67	1.30	1.20
5-9 years	0.00	1.00	1.33	0.00	0.00	1.00	1.00	0.00	1.69	1.00
10-14 years	0.00	0.00	1.20	1.56	1.25	1.00	1.00	1.67	1.50	1.50
15-19 years	1.00	1.00	1.61	1.20	1.50	1.29	1.00	1.25	0.00	0.00
20-24 years	1.00	1.50	1.36	1.44	1.00	1.00	1.00	1.00	0.00	1.00
25-29 years	1.33	1.33	1.55	1.33	0.00	0.00	1.00	1.75	0.00	0.00
30-34 years	1.00	1.00	1.68	1.54	0.00	1.00	1.13	1.23	0.00	0.00
35-39 years	1.00	1.75	1.35	1.60	1.50	1.25	1.50	1.60	0.00	0.00
40-44 years	1.00	1.50	1.48	1.45	0.00	1.00	1.00	1.30	0.00	0.00
45-49 years	1.00	1.00	1.52	1.52	1.50	1.14	1.14	1.27	0.00	1.00
50-54 years	1.00	1.00	1.57	1.48	1.00	1.00	1.60	1.00	0.00	0.00
55-59 years	1.00	1.20	1.58	1.40	1.60	1.06	1.00	1.00	0.00	0.00
60-64 years	1.00	1.00	1.50	1.43	1.00	1.00	1.00	1.00	1.00	0.00
65-69 years	1.00	1.25	1.50	1.50	1.00	1.07	0.00	1.00	0.00	0.00
70-74 years	1.00	1.00	1.45	1.31	1.00	1.06	0.00	1.00	1.00	0.00
75-79 years	1.00	1.00	1.50	1.42	1.00	1.00	1.00	0.00	0.00	1.00
80-84 years	0.00	1.00	1.50	1.47	1.00	1.00	1.00	0.00	0.00	1.00
≥ 85 years	0.00	0.00	1.67	1.57	1.00	1.00	0.00	0.00	0.00	0.00

**Table C2. Predicted probability of visiting an allied health practitioner by age and sex (NHS 2005)**

Age/Specialty	Dieticians		Physiotherapist		Podiatrist		Psychologist		Speech Therapist	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0-4 years	0.0014	0.0027	0.0115	0.0125	0.0002	0.0005	0.0065	0.0072	0.0074	0.0049
5-9 years	0.0014	0.0028	0.0124	0.0134	0.0003	0.0007	0.0062	0.0070	0.0058	0.0039
10-14 years	0.0015	0.0029	0.0133	0.0144	0.0005	0.0010	0.0060	0.0067	0.0047	0.0030
15-19 years	0.0016	0.0031	0.0143	0.0155	0.0007	0.0015	0.0058	0.0065	0.0037	0.0024
20-24 years	0.0017	0.0032	0.0154	0.0167	0.0010	0.0021	0.0055	0.0062	0.0029	0.0018
25-29 years	0.0018	0.0034	0.0166	0.0179	0.0015	0.0029	0.0053	0.0060	0.0023	0.0014
30-34 years	0.0018	0.0035	0.0178	0.0192	0.0021	0.0040	0.0051	0.0058	0.0018	0.0011
35-39 years	0.0019	0.0037	0.0191	0.0206	0.0029	0.0055	0.0049	0.0056	0.0014	0.0008
40-44 years	0.0020	0.0039	0.0205	0.0221	0.0040	0.0074	0.0048	0.0053	0.0010	0.0006
45-49 years	0.0021	0.0040	0.0220	0.0237	0.0055	0.0099	0.0046	0.0051	0.0008	0.0005
50-54 years	0.0022	0.0042	0.0235	0.0254	0.0074	0.0130	0.0044	0.0049	0.0006	0.0004
55-59 years	0.0024	0.0044	0.0252	0.0271	0.0099	0.0171	0.0042	0.0048	0.0005	0.0003
60-64 years	0.0025	0.0046	0.0269	0.0290	0.0131	0.0221	0.0041	0.0046	0.0003	0.0002
65-69 years	0.0026	0.0049	0.0288	0.0309	0.0171	0.0284	0.0039	0.0044	0.0003	0.0001
70-74 years	0.0027	0.0051	0.0307	0.0330	0.0222	0.0360	0.0038	0.0042	0.0002	0.0001
75-79 years	0.0029	0.0053	0.0328	0.0352	0.0285	0.0453	0.0036	0.0041	0.0001	0.0001
80-84 years	0.0030	0.0056	0.0350	0.0375	0.0362	0.0565	0.0035	0.0039	0.0010	0.0001
≥ 85 years	0.0031	0.0058	0.0372	0.0399	0.0455	0.0696	0.0033	0.0038	0.0001	0.0000