

# AUSTRALIA'S FUTURE HEALTH WORKFORCE – Nurses

Detailed Report

August 2014



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The Australia's Future Health Workforce – Nurses Detailed report was developed by Health Workforce Australia with the input of key stakeholders for the consideration of Commonwealth, State and Territory Health Ministers.

Health Workforce Australia was abolished on 8 October 2014.

The Australia's Future Health Workforce – Nurses Detailed report was approved for publication by the Commonwealth and all State and Territory Health Ministers on 10 October 2014.

The recommendations contained in the Australia's Future Health Workforce – Nurses Detailed report will be the subject of further consideration.

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# Preface

## Australia's Future Health Workforce – Nurses

The nursing profession is the largest single health profession in Australia. Workforce planning is critical to ensure alignment of nursing supply with demand required by the health system, to create a sustainable nursing workforce for Australia.

*Australia's Future Health Workforce – Nurses* (AFHW – Nurses) provides the results of nursing workforce planning projections conducted by Health Workforce Australia (HWA). It is presented in two publications:

1. **Australia's Future Health Workforce – Nurses – Overview.** This publication presents an overview of Australia's current nursing workforce's demographics and characteristics, along with HWA's workforce planning projections for the total nursing workforce.

The workforce planning projections in this publication show that in the medium to long-term, Australia's demand for nurses will significantly exceed supply (with a projected shortfall of approximately 85,000 nurses by 2025, or 123,000 nurses by 2030 under current settings). It shows that no single policy scenario is capable of closing the gap between nursing workforce supply and demand. However, a combined scenario, which models improved retention of nursing students within education, improved employment rates following graduation, and increased early career retention; as well as assuming that slower future economic growth will slow provision of health services and consequently demand for nurses, demonstrates that the initial shortfall can be significantly reduced (to approximately 39,000 by 2025 or 45,000 by 2030).

2. **Australia's Future Health Workforce – Nurses – Detailed.** This publication supports the overview, and provides information on the demographics and characteristics, and workforce planning projections for the following nursing sectors:
  - Acute care
  - Aged care
  - Critical care and emergency
  - Mental health
  - Other nursing.

Additionally, information on the number and characteristics of primary health care nurses, nurses working in academic settings and nurses who identified as Aboriginal or Torres Strait Islander is also provided in *Australia's Future Health Workforce – Nurses – Detailed*.

These reports build on the work conducted in HWA's previous publication *Health Workforce 2025 – Doctors, Nurses and Midwives* (HW2025). In HW2025, the importance of workforce planning being conducted as an iterative process was highlighted, to allow for refinements as updated data becomes available. AFHW – Nurses provides this first update since the release of HW2025.

# Acknowledgements

HWA wishes to acknowledge and thank the many stakeholders involved with the *Australia's Future Health Workforce: Nurses* project, for their assistance to date.

Oversight of the project was provided by a Project Advisory Group (PAG) comprising representatives from academia, government, the health sector and peak representative organisations for nurses.

HWA benefited greatly from the experience and knowledge of the PAG members and wishes to thank them for their input and time. HWA also wishes to acknowledge that the content of this final report represents the findings of HWA, and is not to be viewed as being endorsed by the organisations represented by PAG members – their role was in an advisory capacity as experts in their field.

A list of the PAG members is provided in Appendix A.

# Executive summary

In 2012, there were over a quarter of a million (273,404) Registered Nurses and almost 60,000 Enrolled Nurses registered in Australia. This represents a significant investment to the Australian economy – in terms of the cost of employing nurses and the embedded cost of education, both of which are substantially borne by the taxpayer. Coordinated planning and deployment of this workforce is therefore essential – not only in providing substantial health gains to the community, but also in providing financial gains from a well-utilised resource.

Such planning was envisioned when, in 2012, Health Workforce Australia (HWA) published *Health Workforce 2025 – Doctors, Nurses and Midwives (HW2025)*, the first major, long-term, national projections for the future of these three key professions. For nurses, this report concluded that population health trends, combined with an ageing nursing workforce and poor retention rates, will lead to an imminent and acute nursing shortfall.

To address this significant issue, health ministers and policymakers need to have the most up-to-date analysis and workforce planning projections for the nursing workforce to develop effective policies. *Australia's Future Health Workforce – Nurses (AFHW – Nurses)* provides information on the characteristics of the existing nursing workforce, and updates the workforce planning projections that were initially published in 2012. It uses the best available planning data to project Australia's future nursing workforce requirements from 2012 to 2030.

Workforce planning projections for the nursing workforce show that in the medium to long-term Australia's demand for nurses will significantly exceed supply, with a projected shortfall of approximately 85,000 nurses by 2025, and 123,000 nurses by 2030 under current settings. The projected shortfall in 2025 is lower than the workforce planning projections published in HW2025 (which projected a shortfall of approximately 109,000 nurses in 2025 under current settings). This change was the result of changes in the behaviours of nurses and employers, which is reflected in the most recent data used in generating the workforce planning projections, specifically:

Lower exit rates in *AFHW – Nurses* than those used in the HW2025 workforce planning projections, from more nurses remaining in the workforce than expected.

Lower demand rates for nurses working in acute care in *AFHW – Nurses* (2.6 percent) compared with those used in HW2025 (2.2 percent), reflecting lower labour demand than projected, particularly in the public sector.

These changes reflect economic conditions, changes in policy in public sector health systems and other external impacts.

No single policy change is capable of closing the gap between nursing workforce supply and demand. However, scenario modelling demonstrates the shortfall can be significantly counteracted by a coordinated approach across governments, employers, the profession and the tertiary education sector. This is demonstrated in a combined scenario, which

models improved retention of nursing students within education, improved employment rates of domestic graduates, and increased early career retention; as well as assuming that slower future economic growth will slow provision of health services and consequently demand for nurses. The result of this combined scenario demonstrates the initial nursing shortfall can be significantly reduced (to approximately 39,000 by 2025 or 45,000 by 2030). While achieving this outcome will require significant and coordinated action, HWA believes the combined scenario provides the best basis for future planning.

Even the combined scenario projects a significant shortfall in the total nursing workforce by 2030. One approach that could further increase nursing workforce supply within a fixed budget would be to change the skill mix in some sectors. Workforce planning projections were also conducted for a range of skill mixes in the acute and aged care nursing sectors. This was to demonstrate the workforce impact of changes to the existing skill mix across the national workforce. The acute and aged care sectors were selected for this exercise as they already have a diverse skill mix, and have the largest numbers of employed nurses. The alternate skill mixes included were chosen as examples only, to demonstrate the impact of change. HWA does not endorse any specific skill mix. The skill mix scenarios demonstrate that skill mix changes could result in Registered Nurses and Enrolled Nurses being available to be deployed into other nursing sectors into the future.

The workforce planning projection results clearly demonstrate that there will be insufficient nurses to maintain existing utilisation patterns into the future, and that there is no single measure to address this. Therefore different models that combine a variety of responses need to be considered, including strong and effective primary health care, which can achieve better health outcomes at a lower cost than health systems that are focused on acute and specialist care.

# Introduction

## Australia's Future Health Workforce

The Australia's Future Health Workforce (AFHW) reports provide medium to long-term national workforce planning projections for different professions and sectors. Workforce planning projections identify potential gaps between the future supply of, and demand for, the workforce in scope under a range of scenarios. A scenario represents a particular vision of future health care delivery, and in the health workforce context, scenarios are often developed to reflect potential government policy decisions, higher education/training sector activities, employer practices, trends within the existing health workforce and trends within service demand.

The identification of potential workforce gaps through workforce planning projections provides government, professional bodies, employers, regulatory bodies, and higher education and training providers the opportunity to develop and implement plans to minimise such gaps. Such plans can involve workforce reform, changes to training intakes or pathways, changes to immigration levels, or a combination of all factors. It is this step that is essential in the delivery of a sustainable health workforce. Consequently, as well as providing the workforce planning projections, AFHW also makes recommendations relevant to the findings to support policy considerations to ensure Australia's health workforce meets the community's needs.

AFHW focuses on workforce planning at the national level. It is at this level that questions of aggregate supply and demand can be separated from issues of allocation and distribution – the principal aim being to ensure an appropriate pool of professionals is available to meet aggregate demand in Australia.

## Why plan the future nursing workforce?

In common with other developed countries' health systems, Australia faces a major challenge in sustaining a health workforce that will meet the rapidly rising demand for health care. Demand is being driven by an ageing population living longer with more complex problems, combined with rising costs of technology and treatment, and increasing consumer expectations. Health expenditure accounts for an increasing proportion of Australia's gross domestic product (GDP) and is rising at a level that is unsustainable in the long-term. The health workforce is the single largest component of the health budget, and the nursing profession is the largest health profession in Australia.

In 2012, there were over a quarter of a million (273,404) Registered Nurses (RNs) and almost 60,000 Enrolled Nurses (ENs) registered in Australia. This represents a significant investment to the Australian economy – in terms of the cost of employing nurses and the embedded cost of education, both of which are substantially borne by the taxpayer. Coordinated planning and deployment of this workforce is therefore essential – not only in providing substantial health gains to the community, but also in providing financial gains from a well-utilised resource.

There is wide acknowledgement of the imminent retirement of older nurses, and the consequent impact this will have on the workforce. The impact of this will be exacerbated if the following trends continue: high student attrition in courses leading to RN registration, lower than historical rates of RN and EN graduate employment and low retention of early career RNs and ENs more generally.

The lack of coordinated decision making between tertiary education institutions, governments, employers and the profession, combined with lag-times in implementing changes and broader economic impacts affecting decisions by these bodies, has resulted in a “boom and bust” cycle in nursing education and the resulting number of nursing graduates. This has been particularly evident in recent years, where a significant proportion of new domestic nursing graduates have been unable to secure suitable employment, whilst experienced nurses continue to be recruited from overseas. These issues are not confined to Australia. Coordinated national planning is therefore critical to ensure Australia maintains steady education capacity growth and strong employment opportunities for newly graduating nurses to meet future health needs.

Workforce planning must also be considered in the context of the wider economy. In 2011-12, the estimated total spend in Australia on healthcare was over \$140.0 billion, which equated to 9.5 percent of GDP. The Australian Institute of Health and Welfare estimates the average real growth in health spending over the period 1999-2000 to 2009-10 was five percent per annum compared with a three percent increase in GDP per annum over the same period. This growth is unsustainable in the long-term, as health will consume an ever increasing proportion of total government expenditure.

This is exacerbated by a predicted fall in the ratio of working to non-working age people. In 1970 there were 7.5 working aged people for each Australian aged 65 years and over. Today, that number has dropped to five, and by 2050 it is estimated to almost halve to 2.7 (AG 2010). This will impact the supply of workers to the labour market, with flow on effects to the economy – reducing the available financial resources for governments to allocate to health and social services (OECD 2013). Additionally, if no changes are made to the current system, there are unlikely to be enough working aged people to meet the future demand for nurses.

The nature of health care in Australia is also changing. Our burden of disease is shifting with significant increases in chronic disease and multi-morbidities. Emerging health and information technologies are releasing the constraints on the way care is delivered, who can deliver that care, and where the care is delivered. If our workforce education and planning continues to be based on the current system, existing models of care will be perpetuated, including the focus on acute hospital-based care. Evidence demonstrates that those health systems with strong primary health care are more efficient, have lower rates of hospitalisation, fewer health inequalities and better health outcomes including lower mortality<sup>1</sup>. Nursing (and the wider healthcare system) in Australia must evolve, adapt and innovate in order to continue to provide effective patient care amidst ever increasing demand, emerging technologies and limited resources.

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<sup>1</sup> Standing Council on Health (2013) National Primary Health Care Strategic Framework

All these reasons reinforce the need to plan over a medium-term time horizon, with enough time to effect and implement change to address the projected future nursing shortfall. It is essential that decisions by tertiary education institutions, governments, employers and the profession are aligned to what the nation needs from nurses in the future.

### How we use the information from the workforce reports

The first workforce reports produced by HWA were for doctors, nurses and midwives. These publications, which provided the first, long-term national workforce projections for these professions, were titled *Health Workforce 2025 – Doctors, Nurses and Midwives* (HW2025) and were released in 2012.

Nursing is the largest profession in the health workforce. For nurses, HW2025 concluded that population health trends, combined with an ageing nursing workforce and poor retention rates, will lead to an imminent and acute nursing shortfall. This would then impact on the community's ability to access the health services they need, when they need them.

HW2025 also found that no single policy solution could address this projected shortfall, and that an integrated approach is required to tackle this critical issue.

In response to HW2025, Health Ministers agreed in November 2012 to focus on the following key policies to address the projected nursing shortfall:

- Retention and productivity.
- Innovation and reform.
- Training capacity and efficiency.

HWA is undertaking a range of projects in these areas, including the following.

### The Nursing Retention and Productivity project

This project launched in direct response to the HW2025 finding that improving the retention and productivity of nurses has a substantial impact on reducing the projected nursing workforce shortfall, and consequently is vital in ensuring communities get the level of care they need. This report recommends changes to support the spread of innovation in the workplace, recognising that there are often many paths to achieving an outcome at local level. It identifies strategic actions for adoption at national level that are designed to add value to what is already underway.

Recommendations focus on change in three major areas:

- Building nurse leadership capacity.
- Improving nurse retention through early career preparation, support and provision of opportunities.
- Improving nurse productivity by enabling and encouraging innovation.

## The Clinical Training Funding (CTF) program

This program was allocated \$425 million for the three year period 2011-13 to subsidise growth in clinical placement activity and to expand clinical training infrastructure by increasing clinical training facilities and student accommodation. At an aggregate level, in courses funded through the CTF Program in 2012, there was a 50 percent growth of Clinical Training Placement Days (CTPDs) over the 2010 baseline. This has meant an increase to 3.3 million CTPDs in 2012 compared with the 2010 baseline of 2.2 million CTPDs. Of this funding, \$52.4 million was allocated to nursing over the three year period, which supported growth in 2012 of 317,000 CTPDs above the 2010 baseline (a 38 percent increase).

In 2014, the CTF program has provided \$76.5 million to support the continuation of the growth achieved in clinical training activity in the 2011-13 period. This is based on an estimated growth of 1.1 million CTPDs in 2013. This funding will support in 2014 the growth of 18,600 equivalent full-time student load (EFTSL) achieved in the 2011-13 funding period. Of this funding, \$21 million has been allocated to nursing to support the growth of 6,750 EFTSL achieved in 2011-13. Total nurse funding has increased as a percentage of the total CTF pool, from 12 percent in 2011-13 to 27 percent in 2014.

## The Rural Health Professionals program

This program is providing a range of support services to attract and retain nurses and allied health professionals to work in country communities. The program's overall aim is to increase access to primary healthcare services in rural and remote Australia. Since the program's launch in January 2012, 130 nurses have started working in rural and remote Australia (as at February 2014).

## The Expanded Scope of Practice program

This program is broadening the role of RNs working in emergency and endoscopy settings to enhance consumers' timely access to health services and appropriate, coordinated care. HWA funded 13 projects across Australia over a two year period, which saw emergency and endoscopy nurses in a range of settings trained to expand their scope of practice. The projects are now being evaluated to assess their suitability for national roll out on a larger scale

Health Ministers agreed to the need for improved mechanisms to better align training and workforce need for health professionals and requested this project be led by HWA, with support from higher education and training sector, jurisdictions, employers, health professional and higher education sector regulators. For nursing, HWA has proposed to convene a National Nursing and Midwifery Education Advisory Network (NNMEAN) as an advisory mechanism to develop a national education alignment plan, providing advice on nursing and midwifery tertiary education targets, employment and immigration requirements. HWA proposes to convene this network within existing HWA governance structures, and using existing HWA means of providing advice to Health Ministers on progress with training and workforce alignment.

## Updating planning projections

Additionally, HWA is committed to regularly updating the nursing workforce planning projections. This is in recognition of the fact that in any workforce modelling, projections become less accurate as the period of time over which they apply increases, due to factors including changes in service delivery (for example technological change) that impact on the relationship between the type and number of services provided, and changes in data and assumptions used in the projections.

*AFHW – Nurses* is the first update to the nursing workforce projections initially released in HW2025. It incorporates new and improved planning data provided by the AHPRA, the Australian Government Department of Education, the National Centre for Vocational Education Research (NCVER), the Australian Government Department of Immigration and Border Protection and others (for a full list of data sources, see Appendix B) to project Australia's future nursing workforce requirements from 2012 to 2030. Additionally, new scenarios have been developed to better reflect potential policy options to address the projected nursing workforce shortfall. Due to the changes in the data used and the scenarios modelled, caution should be used when comparing the results in this publication with those presented in HW2025.

# Australia's current nursing workforce

In health workforce planning, understanding the number and characteristics of the existing health workforce is the essential first step. This section describes the characteristics of the existing nursing workforce in Australia using the latest available information. Please note, the 2012 nursing numbers presented in this section will not exactly match to the 2012 workforce numbers presented with the workforce planning projection results. This is because those nurses that reported working in a non-clinical role, but also reported as working in a clinical setting, have been included in the base workforce for the workforce planning projections.

## Structure of the nursing workforce

There are two levels of regulated nurses in Australia – RNs and ENs. A RN is a person who has completed as a minimum, a three-year bachelor degree and is registered with the Nursing and Midwifery Board of Australia (NMBA). RNs practise independently and interdependently, assuming accountability and responsibility for their own actions and delegation of care to ENs and other healthcare workers.

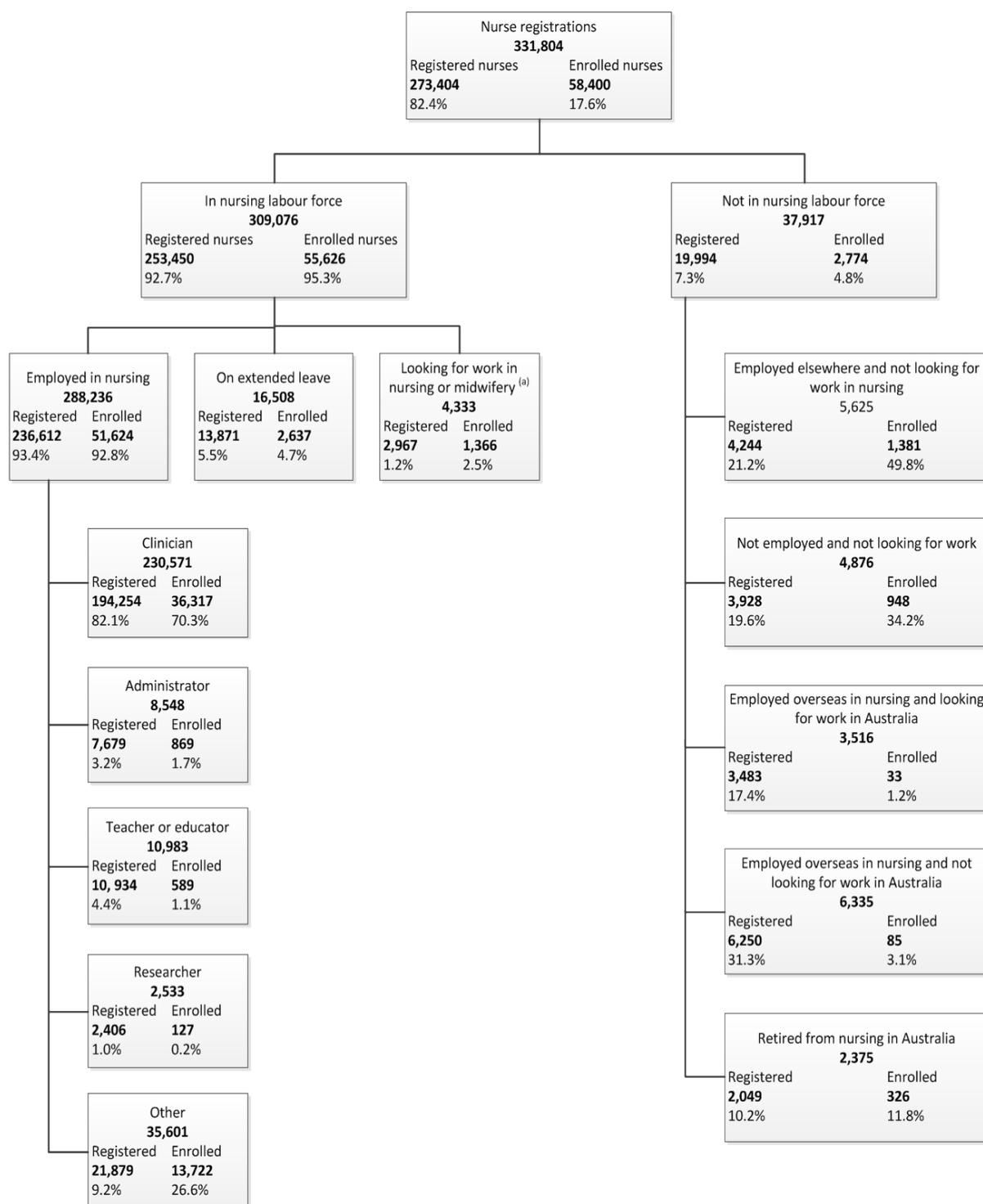
An EN usually works with RNs to provide patients with basic nursing care, doing less complex procedures than RNs. ENs must complete a Certificate IV (only available until 30 June 2014) or a Diploma of Nursing from a vocational education training provider, and are also registered with the NMBA.

## How many nurses?

In 2012 the total number of RNs and ENs was 331,804. Under the National Registration and Accreditation Scheme, appropriately qualified people can register as nurses, midwives or both. Nurses who were also registered as midwives (dual-registered nurses and midwives) are included in nurse registration totals in this publication. Those registered as midwives only, of whom there were 2,274 in 2012, are not included in 2012 totals in this publication.

Of the 331,804 nurses registered in Australia, the majority were registered as RNs (82 percent or 273,404), while those registered as ENs accounted for 18 percent (or 58,400) of total nurse registrations. Most RNs (93 percent) and ENs (95 percent) were in the labour force. Of those in the labour force, most were employed in nursing (93 percent of RNs and ENs), with small percentages on extended leave or looking for work (Figure 1).

Figure 1: Registered and enrolled nurses by labour force status, 2012



(a) Includes 294 dual-registered nurses and midwives who may be looking for work in midwifery. It is not possible to identify which area people are looking for work in, therefore the 294 dual-registered nurses and midwives looking for work are included in both the nursing and midwifery labour force. This does not affect the workforce projections as only employed nurses are used in the modelling.

Note: Nursing role is based on main nursing job.

Source: National Health Workforce Dataset (NHWDS): Nurses and Midwives 2012.

## How Australia compares internationally

International comparisons provide a useful means for examining performance against the experience of other countries. In 2011 there were 10.1 nurses per 1,000 population in Australia. This rate was higher than the Organisation for Economic Co-operation and Development (OECD) average (8.7). Different allocation of tasks between nurses and other health professionals may contribute to variations in rates across OECD countries.

**Figure 2: Nurse density per 1,000 population (headcount) OECD countries 2011**



(a) Practising nurses, those providing care directly to patients.

(b) Professionally active nurses, which includes practising nurses plus other nurses working in the health sector as managers, educators, researchers, etc.

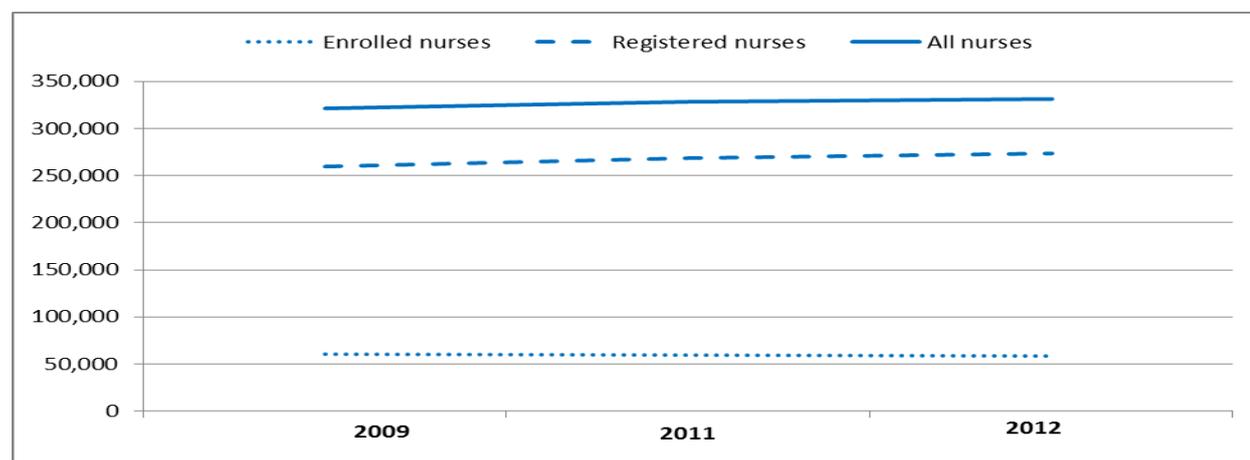
(c) All nurses who are licensed to practice.

Source: OECD Health Data 2013

## Changes in Australia's nursing workforce numbers

From 2009 to 2012 the total number of RN and EN registrations increased by three percent, from 320,982 to 331,804. However the composition of nursing registrations is changing – with the overall increase resulting from increased RN registrations (of five percent from 260,121 in 2009 to 273,404 in 2012), offset by a fall in EN registrations (down 2,461, from 60,861 in 2009 to 58,400 in 2012).

Figure 3: Total registered, Registered Nurses and enrolled nurses, 2009 to 2012(a)



Sources: Australian Institute of Health and Welfare (AIHW) Nursing and Midwifery Labour Force Survey 2009 and NHWDS: nurses and midwives 2011 and 2012.

## The nursing workforce is ageing

There is wide acknowledgement of the imminent retirement of older nurses, and the consequent impact this will have on the workforce. Table 1 shows the age profile of employed nurses in 2009 and 2012. The ageing workforce is reflected in both the increasing average age of nurses (from 44.3 years in 2009 to 44.6 years in 2012) and the increasing percentage of those aged 55 years and over (from 19.8 percent in 2009 to 23.1 percent in 2012). The ageing of the nursing workforce is expected to continue into the future.

Table 1: Employed registered nurses and enrolled nurses, age profile, 2009 and 2012

Type of nurse	2009		2012	
	Average age (years)	Per cent aged 55 and over	Average age (years)	Per cent aged 55 and over
Registered nurses	44.2	19.9	44.3	22.5
Enrolled nurses	44.9	19.3	46	25.9
<b>All nurses</b>	<b>44.3</b>	<b>19.8</b>	<b>44.6</b>	<b>23.1</b>

Source: AIHW Nursing and Midwifery Labour Force Survey 2009 and NHWDS: nurses and midwives 2012.

## The nursing workforce works part-time

Table 2 shows average weekly hours worked by employed nurses in 2009 and 2012. Historically, RN working hours have exceeded EN working hours. However this has changed substantially over time, with RNs only working less than an hour more on average than ENs in 2012. This was a result of RN average weekly working hours falling by 1.7 hours from 2009 to 2012, compared with almost no change in EN average weekly hours worked over the same period.

In both years, male RNs and ENs worked substantially longer hours on average than females.

**Table 2: Average weekly hours, employed registered nurses and enrolled nurses, 2009 and 2012**

Type of nurse	2009			2012		
	Male	Female	Persons	Male	Female	Persons
Registered nurses	38.8	33	33.6	37.6	31	31.7
Enrolled nurses	34.1	30.5	30.8	34.5	30.9	31.2
<b>All nurses</b>	<b>37.3</b>	<b>32</b>	<b>32.6</b>	<b>37.1</b>	<b>31</b>	<b>31.6</b>

Source: AIHW Nursing and Midwifery Labour Force Survey 2009 and NHWDS: nurses and midwives 2012.

## Nurses are moving from the public to private sector

The Australian health system is a mix of public and private sector service providers. The number of RNs working in both the public and private sectors increased from 2009 to 2012, with the number working in the private sector increasing at a greater rate than those in the public sector. This resulted in the percentage of all RNs employed in the public sector falling by three percentage points from 2009 (69 percent) to 2012 (66 percent), with the percentage of RNs employed in the private sector increasing three percentage points.

Overall, the total number of employed ENs fell slightly from 2009 to 2012 (by approximately 100 ENs). While over half of all ENs were employed in the public sector in 2012, the move from employment in the public to private sectors was more pronounced in the EN workforce – with the percentage of ENs in the public sector falling from 62 percent to 55 percent, and a corresponding increase in private sector employment (from 38 percent to 45 percent).

**Table 3: Employed registered nurses and enrolled nurses by sector (public/private) 2009 and 2012**

Sector	2009		2012	
	Number	Percentage	Number <sup>(a)</sup>	Percentage
Registered nurses – public sector	154,376	69%	155,770	66%
Registered nurses – private sector	70,664	31%	80,438	34%
Enrolled nurses – public sector	31,818	62%	28,247	55%
Enrolled nurses – private sector	19,893	38%	23,353	45%

Excludes 404 registered nurses and 24 enrolled nurses who did not state their sector of employment.

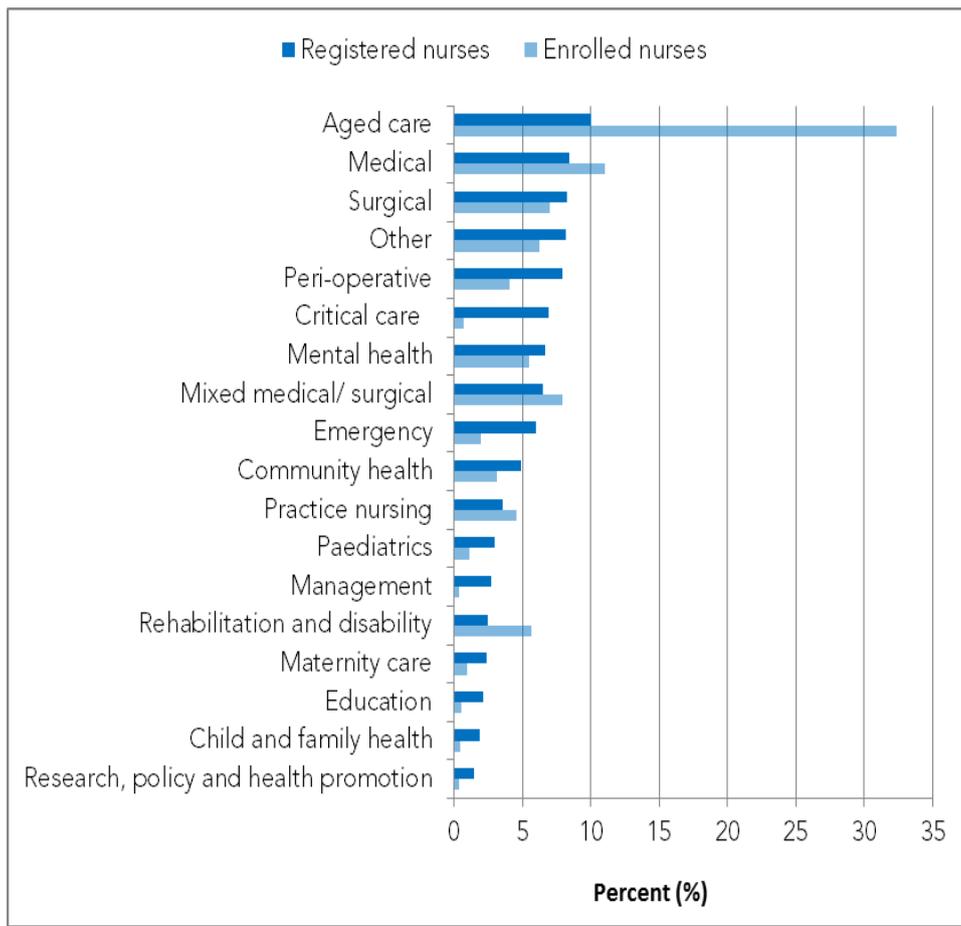
Source: AIHW Nursing and Midwifery Labour Force Survey 2009 and NHWDS: nurses and midwives 2012.

### Clinical nurses' principal area of main job

The highest percentage of clinical RNs (10 per cent or approximately 25,100) worked in aged care in 2012. Approximately one-quarter (23 per cent or approximately 58,000) of clinical RNs worked in the combined medical, surgical and mixed medical/surgical areas (Figure 4).

Almost one-third of clinical ENs worked in aged care (32 per cent or approximately 17,550). This was almost triple the number of clinical ENs' second most popular principal area of main job – medical – with approximately 6,000 ENs.

Figure 4: Employed clinical registered and enrolled nurses, by principal area of main job, 2012

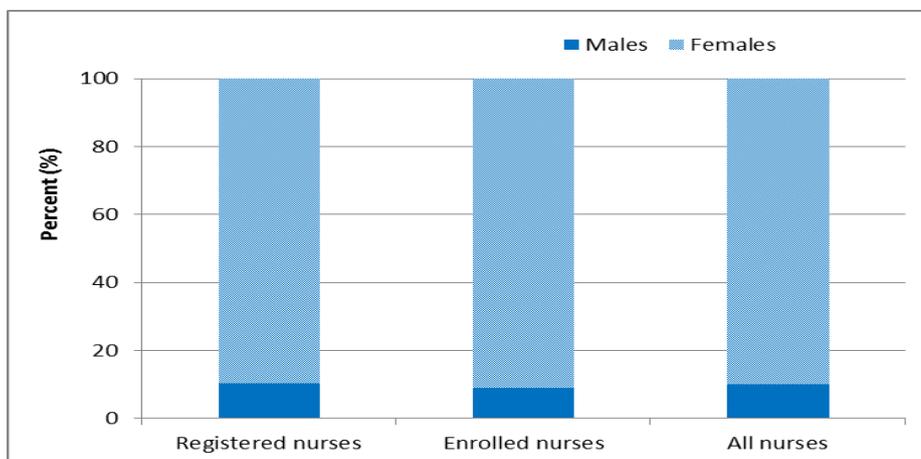


Source: NHWDS: nurses and midwives 2012

### Almost all nurses are female

Historically, the vast majority of nurses has been, and continues to be, women. In 2012, males comprised approximately one-tenth (10 per cent or 29,612) of employed nurses (figure 5). This trend is likely to continue, with females accounting for almost 90 per cent of all graduates in programs of study required for initial registration as a RN in recent years.

Figure 5: Employed registered and enrolled nurses by gender, 2012

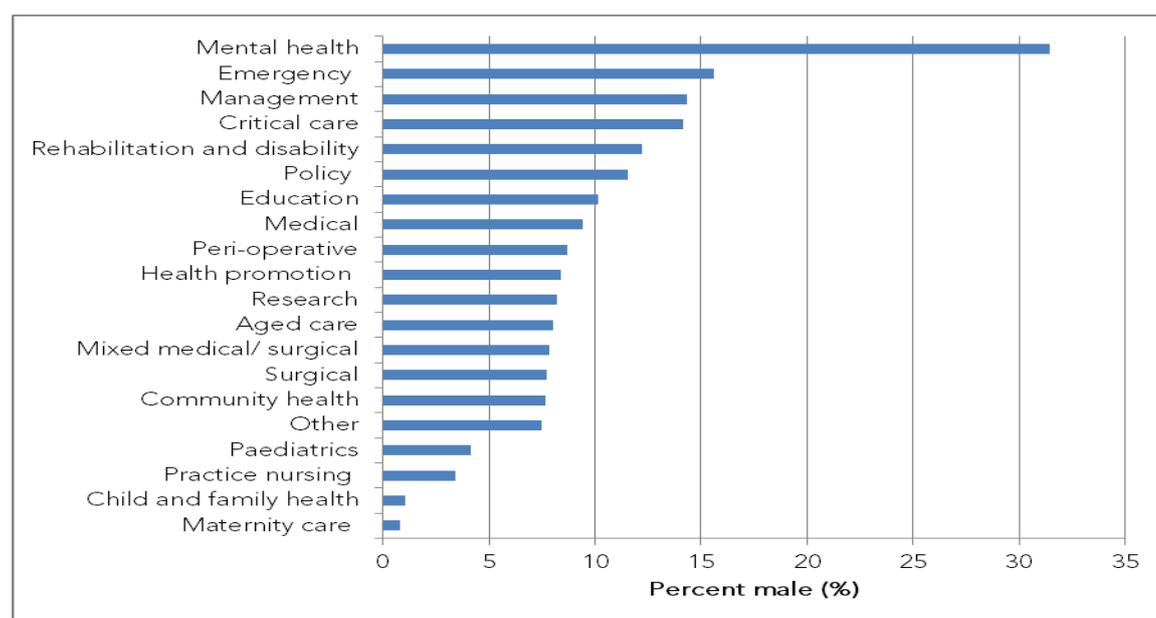


Source: NHWDS: nurses and midwives 2012.

The nursing profession is facing increasing competition for its future workforce supply. Australia's population is ageing, which will result in fewer people being available to enter the labour force. In addition, female workforce participation is increasing across a range of professions. Strategies suggested to help ease supply issues have included increasing migration, changing skill mix or nurses' roles and redesigning work. Another potential supply pool for the nursing workforce is to increase the number of males working in the profession.

While overall males only account for approximately 10 per cent of employed nurses (Figure 6), some areas of practice do have higher percentages of male nurses. In 2012, almost one-third (5,992) of all nurses (both RNs and ENs) working in the mental health clinical area were male. The clinical areas of emergency (with 16 per cent or 2,372 male nurses) and critical care (with 14 per cent or 2,365 male nurses) also had higher percentages of males than the overall nursing population. Of the non-clinical areas, management (with 14 per cent or 988 male nurses) and policy (with 12 per cent or 56 male nurses) had higher percentages of males than the overall nursing population (Figure 6).

**Figure 6: Percentage of employed male nurses by principal area of main job, 2012**



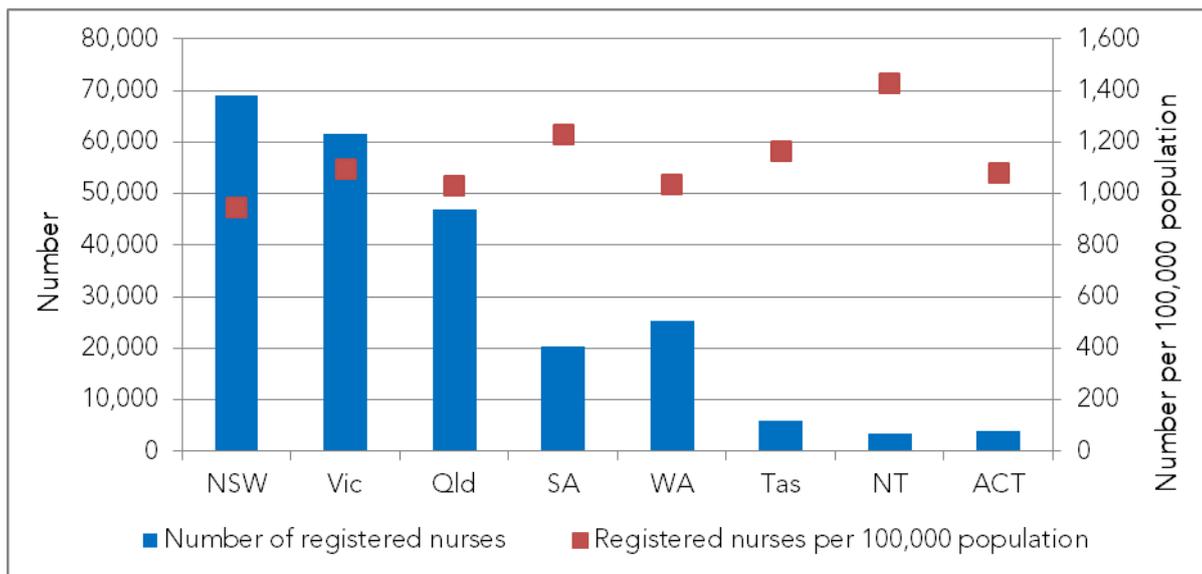
Source: NHWDS: nurses and midwives 2012.

## Geographic distribution of nurses

### State and territory distribution 2012

In 2012, over one-quarter of RNs (29 per cent or 69,113) worked in New South Wales, approximately another quarter (26 per cent or 61,618) worked in Victoria, and a further 20 per cent or 46,893, worked in Queensland (Figure 7).

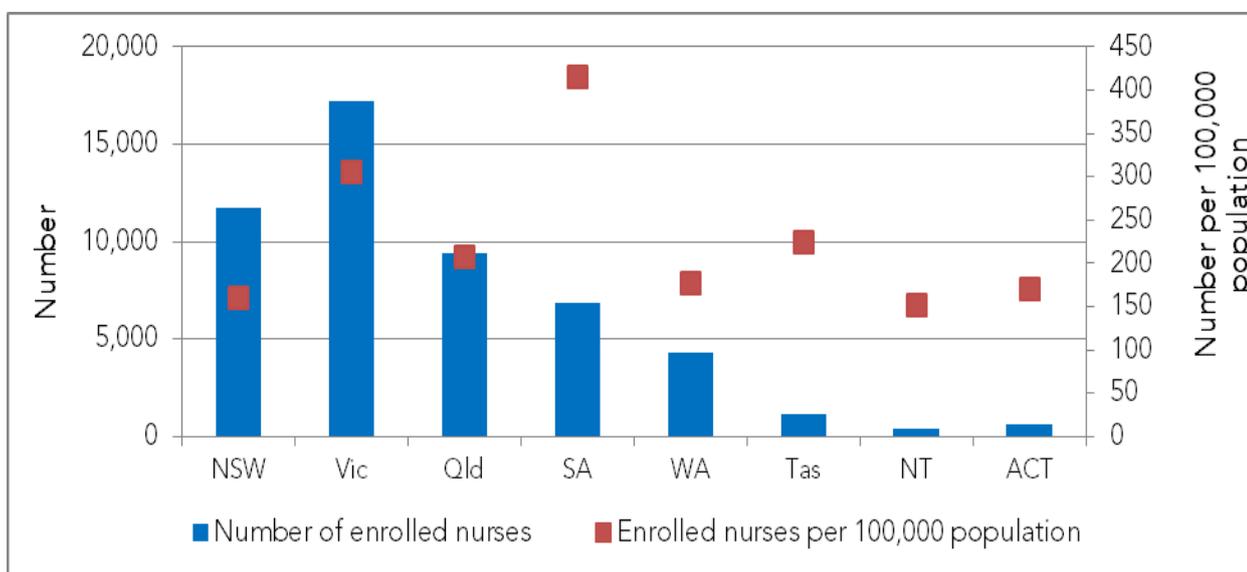
**Figure 7: Employed registered nurses, number and number per 100,000 population, states and territories, 2012**



Source: NHWDS: nurses and midwives 2012.

For ENs, one-third (17,197) worked in Victoria, with approximately one-quarter (23 per cent or 11,705) working in New South Wales. On a per 100,000 population basis, South Australia had significantly more ENs than other states and territories (Figure 8).

**Figure 8: Employed enrolled nurses, number and number per 100,000 population, states and territories, 2012**



Source: NHWDS: nurses and midwives 2012.

While characteristics of RNs and ENs are generally similar across states and territories (Table 4), points to note include:

- the Northern Territory has the highest number of employed RNs per 100,000 population (1,428.4)

- South Australia has significantly more ENs per 100,000 population than other jurisdictions (415.2)
- the Northern Territory has the highest percentage of male ENs and RNs (15.7 per cent and 14.4 per cent)
- Tasmania has the oldest nursing population of both ENs (46.1 years) and RNs (48.1 years)
- Nurses in New South Wales worked the longest hours, with ENs averaging 32.9 hours per week, and RNs averaging 32.8 hours per week.

**Table 4: Employed registered and enrolled nurses, selected characteristics by states and territories, 2012**

Characteristic	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
Number of employed nurses – registered nurses	69,113	61,618	46,893	20,382	25,213	5,975	3,354	4,048	236,612
Number of employed nurses – enrolled nurses	11,705	17,197	9,421	6,870	4,292	1,145	356	638	51,624
Number of employed nurses per 100,000 population – registered nurses	948	1,096	1,028	1,232	1,037	1,167	1,428	1,080	1,043
Number of employed nurses per 100,000 population – enrolled nurses	161	306	207	415	177	224	152	170	228
Percent male – registered nurses	11.3	9.8	10.5	10.9	9.3	11.6	14.4	9.8	10.5
Percent male – enrolled nurses	10.9	9	9.1	8.6	6	8.1	15.7	8.5	9.1
Average age (years) – registered nurses	45.1	43.4	44.1	44.9	44	46.1	42.6	43.9	44.3

Characteristic	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia
Average age (years) – enrolled nurses	46.2	45.5	46.2	45.8	46.4	48.1	44.1	45.2	46
Average weekly hours worked – registered nurses	32.8	30.4	32.1	31.2	31.4	30.5	30.4	31.4	31.7
Average weekly hours worked – enrolled nurses	32.9	30	32.1	30.1	31	30.9	30	31	31.2

Source: NHWDS: nurses and midwives 2012.

## Regional distribution 2012

One measure used to determine workforce availability is the ratio between the number of health professionals and an area's population.

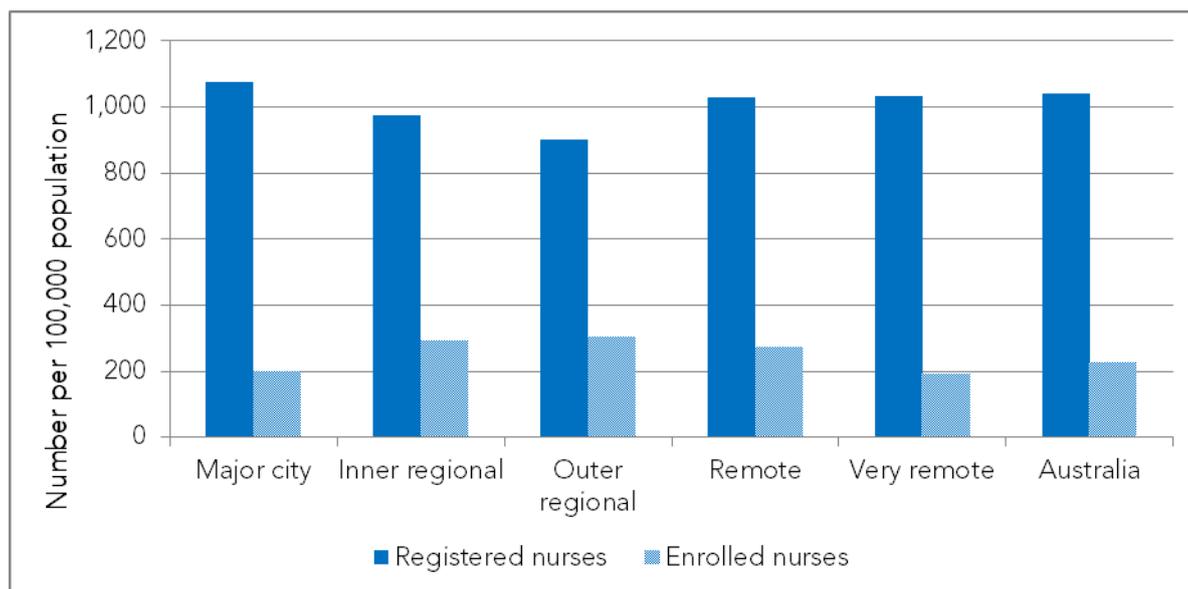
The Remoteness Area Structure within the Australian Standard Geographical Classification (ABS Catalogue No. 1216.0), produced by the Australian Bureau of Statistics, is used to present regional data for nurses. This structure is based on the Accessibility/Remoteness Index of Australia, where the remoteness index value of a point is based on the physical road distance to the nearest town or service in each of population size classes based on the 2006 Census of Population and Housing.

These classes are:

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

In 2012, the ratio of RNs to population was highest in major cities (1,077 RNs per 100,000 population) followed by very remote areas (1,035). Outer regional areas had the lowest ratio of RNs to population (902). The opposite was observed with ENs. The highest number of ENs per 100,000 population was in outer regional areas (306 ENs per 100,000 population) and the lowest in very remote (191) areas, followed by major cities (199).

**Figure 9: Employed registered nurses and enrolled nurses, number per 100,000 population by Remoteness Area, 2012**



Source: NHWDS: nurses and midwives 2012.

While the ratio between the number of nurses and an area's population is a useful measure, it should be noted there is no nationally agreed workforce to population ratio. It also does not account for a number of issues, including:

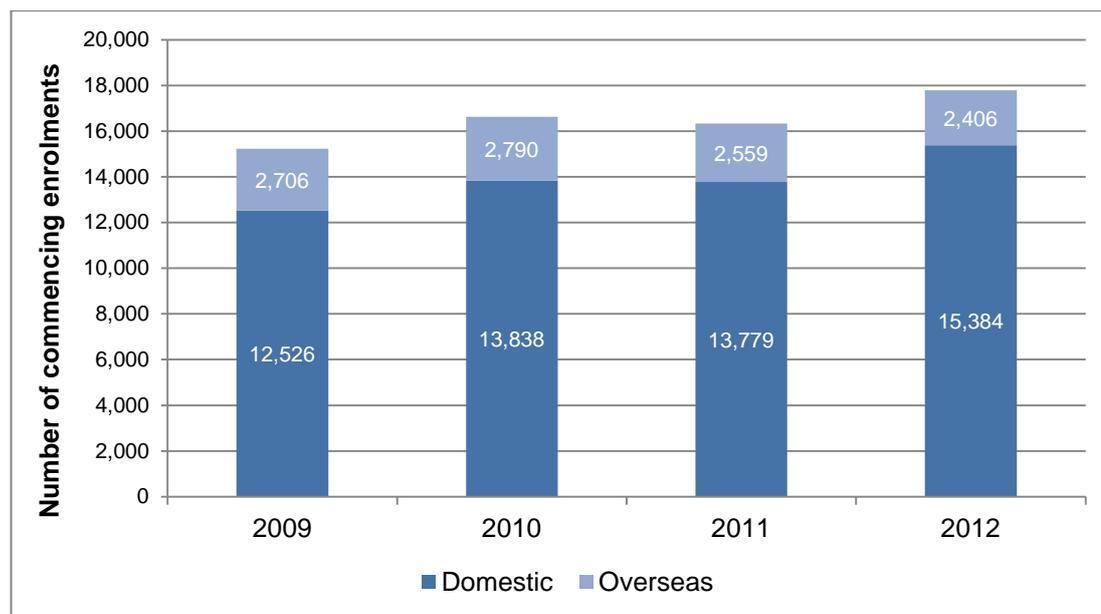
- The role of the nursing workforce varies with increasing remoteness. In the most remote communities, nurses can often be the only health professional providing regular face-to-face health services within the community. The distribution in this publication does not take this differing role into account.
- The average age of the nursing workforce is older outside of major cities. This indicates that while the current distribution is relatively even, the ageing of the nursing workforce may lead to a mal-distributed workforce in the future.

## **Nursing student commencements and completions are increasing**

### **Registered nurse students**

Overall, commencing student enrolments in programs of study required for initial registration as a RN increased 17 percent from 2009 to 2012 (Figure 10). This comprised a rise in domestic commencing enrolments of 23 percent, and a fall in overseas student commencing enrolments of 11 percent over the same period.

**Figure 10: Commencing enrolments, students undertaking programs of study required for initial registration, 2009 to 2012**



Source: Department of Education

It is expected that the nursing profession will continue to be a female-dominated profession, with females accounting for almost 90 percent of commencing enrolments from 2009 to 2012 (Table 5).

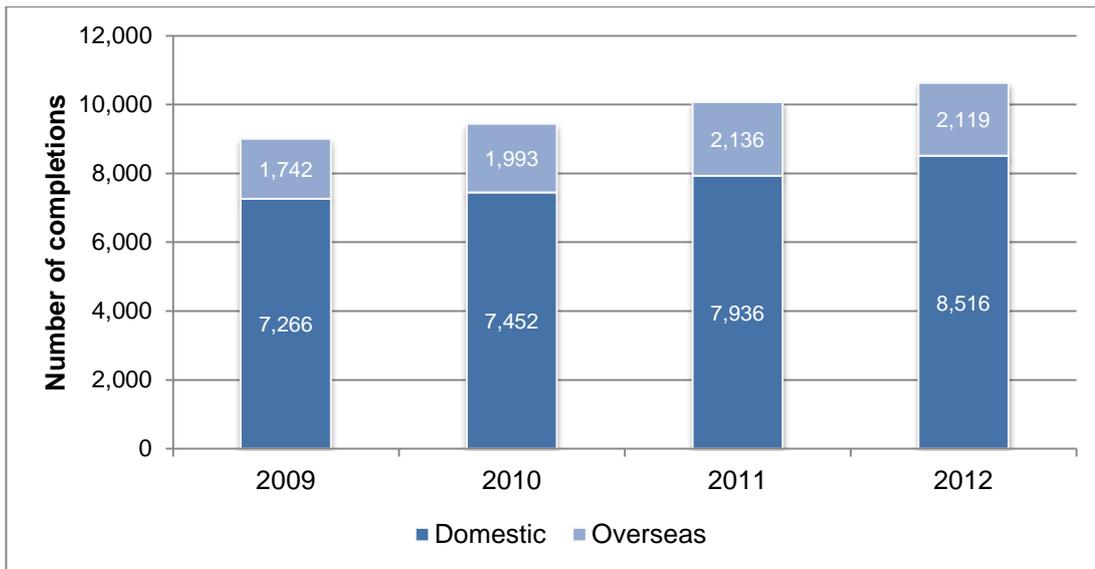
**Table 5: Commencing enrolments, students undertaking programs of study required for initial registration as a RN, by gender, 2009 to 2012**

	2009	2010	2011	2012
Commencing enrolments (number)	15,232	16,628	16,338	17,790
% Female	86.7	86.0	86.4	86.2
% Male	13.3	14.0	13.6	13.8

Source: Department of Education

Consistent with the increase in commencing enrolments, the number of course completions for initial registration as a RN has also increased, from 9,008 in 2009 to 10,635 in 2012 (up 18 percent). Within this, domestic completions rose 17 percent, from 7,266 to 8,516, and overseas completions rose 22 percent, from 1,742 to 2,119 (Figure 11).

Figure 11: Students completing general nursing (RN) courses required for initial registration, 2009 to 2012

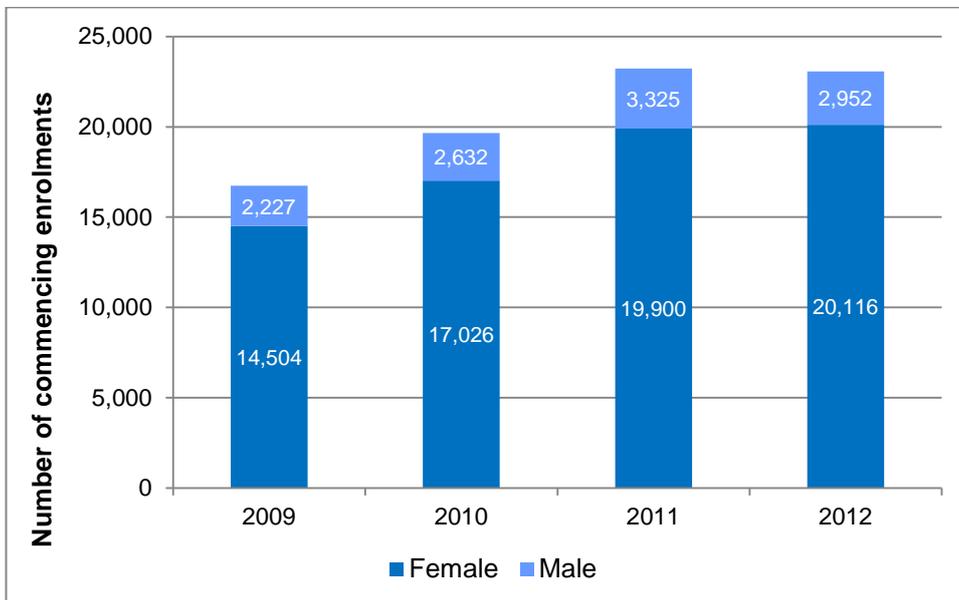


Source: Department of Education

### Enrolled nurse students

EN commencing enrolments have increased by over one-third (38 percent) over the period 2009 to 2012 (Figure 12).

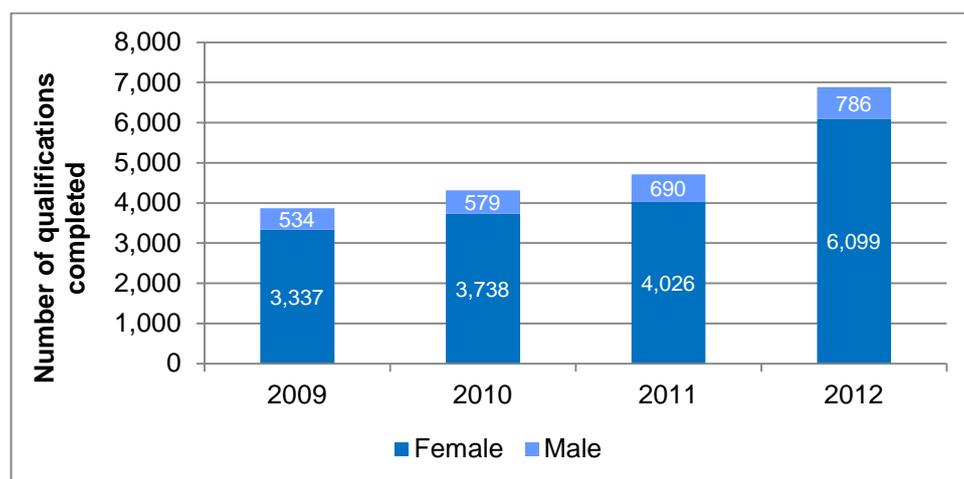
Figure 12: Enrolled nurse commencing enrolments, 2009 to 2012



Source: NCVET VET provider collection

Figure 13 shows the number of EN qualifications completed, with a substantial increase in qualifications completed in 2012 compared with the previous selected years.

Figure 13: Enrolled nurse course completions, 2009 to 2012



Source: NCVET VET provider collection

### How many nurses are from overseas?

A range of temporary and permanent visa options exist for nurses wishing to work in Australia. Table 6 shows the number of temporary and permanent visas granted to RNs from 2006 to 2012. The number of RNs granted a permanent visa appears to have substantially declined since 2006; however a contributing factor to this is likely to be recent changes in the reporting methodology used by the Australian Government Department of Immigration and Border Protection, which minimises the likelihood of double counting permanent migrants who may have already held a temporary working visa.

Table 6: Number of temporary and permanent visas granted to registered nurses, 2006 to 2012

Visa type	2006	2007	2008	2009	2010	2011	2012
Temporary	2,782	3,272	3,762	3,456	2,319	2,747	3,124
Permanent	1,863	1,103	1,054	1,213	926	708	612
<b>Total</b>	<b>4,645</b>	<b>4,375</b>	<b>4,816</b>	<b>4,669</b>	<b>3,245</b>	<b>3,455</b>	<b>3,736</b>

Source: Department of Immigration and Border Protection

Table 7 shows that while few permanent and temporary visas were granted to ENs over the selected years, the highest numbers were granted in 2012. This is likely a reflection of ENs being added to the skilled occupation list from 2012.

**Table 7: Number of temporary and permanent visas granted to enrolled nurses, 2006 to 2012**

Visa type	2006	2007	2008	2009	2010	2011	2012
Temporary	33	26	36	41	40	41	67
Permanent	0	3	3	1	7	9	21
<b>Total</b>	<b>33</b>	<b>29</b>	<b>39</b>	<b>42</b>	<b>47</b>	<b>50</b>	<b>88</b>

Source: Source: Department of Immigration and Border Protection

# Australia's future nursing workforce

AFHW – Nurses – Overview provided the workforce planning projections for the total nursing workforce.

In this publication, the following sections present workforce demographics and projections for the nursing workforce by sector. The method for allocating nurses to sectors were informed by the Project Advisory Group, and a description of this is contained Appendix C. The nursing sectors that had workforce projections conducted are:

- Acute care
- Aged care
- Critical care and emergency
- Mental health
- Other nursing

Additionally, workforce profiles are provided for the following groups:

- Primary health care nurses
- Nurses working in academic settings
- Nurses who identified as Aboriginal Torres Strait Islanders.

## Workforce planning methodology

Workforce projections require two components – estimating future workforce supply and estimating future demand for the workforce. Summary information on the methodology is presented below, with detailed information contained in Appendix C.

### Projecting workforce supply

AFHW – Nurses uses a dynamic stock and flow model to estimate future workforce supply. It takes the conditions in 2012 and projects them into the future without change using a process where people entering and exiting the workforce (flows) periodically adjust the initial number in the workforce (stock). The workforce is broken down into age and gender cohorts and different flow rates are applied to each cohort. The model then takes these different flow rates into account by progressive ageing of the workforce through iteration of the stock and flow process.

### Projecting workforce demand

The demand projections use the utilisation approach. This means that while expected change in population size and composition is accounted for over the projection period, there is an assumption that the current patterns of service use remain unchanged.

In projecting 2012 conditions into the future the modelling takes into account factors including:

- Known patterns in graduation rates of nursing students and their subsequent movement into employment.

- The ageing of the current workforce and demographics of new entrants into the workforce.
- Current hours of work broken down into age and gender cohorts to capture the known changes in hours.
- Migration is held constant throughout.

## Scenario modelling

The workforce projections developed using the methods described above are based on the assumption of existing workforce supply trends and service use continuing into the future. However changes in supply streams and service use are likely. Therefore scenario planning is used to present alternative futures that represent particular visions of future health care delivery, and in the health workforce context, scenarios are often developed to demonstrate potential government policy decisions on future workforce supply and demand, higher education/training sector activities, employer practices, trends within the existing health workforce and trends within service demand. Changes that a scenario may seek to quantify include constrained economic circumstances, changing models of care, changing scopes of practice, technology changes, improved preventative health measures, changes to education and workforce retention levels or changed workforce inflows through training or immigration.

The scenarios presented in this publication are:

- **Constrained labour demand** which limits demand for nursing services to predicted economic growth.
- **Combined scenario** which demonstrates the combined effects of the constrained labour demand scenario, along with reduced nursing course attrition rates, increased employment rates for newly graduated nurses and improvements in retention of early career RNs and all ENs under 60 years of age. Details of each of the components of the combined scenario are described in Appendix C.
- **Changes to the existing skill mix** in selected settings and the consequent national workforce impact. Three skill mix scenarios are presented each for the acute and aged care nursing sectors:
  - Comparison scenario – which simply projects the existing workforce percentages of RNs, ENs and AINs/PCAs into the future without change.
  - Skill mix change based on limitations in training capacity – this scenario moves towards the illustrative skill mix in 2030, however achievement of this is constrained by the application of limits on what change is achievable, for example what is achievable with the changes required in training output.
  - Private example skill mix – represents the illustrative skill mix in 2030.
- **Productivity scenario.** This presents the impact on workforce supply and demand projections of a five per cent productivity gain over the projection period. In this scenario, the productivity gain is not attributed to any particular measure, but could include gains achieved through workforce reforms such as changing models of care, adjustments to skill mix, health professionals working to their full scope of practice and technology changes.
- **Medium self-sufficiency scenario.** This presents the results of moving towards a 50 per cent reduction in net international migration (both temporary and permanent),

and a 50 per cent reduction in the number of international students graduating Australian nursing programs by 2030 (starting from the number of migrants and international graduates in the base year, 2012).

- **65+ scenario.** The nursing workforce is ageing and recent trends show nurses are retiring later in life. This scenario shows the impact of all nurses in the workforce retiring at age 65.
- **Intention to retire scenario.** Recent trends show nurses have been retiring later in life. This is likely due to the economic climate. If the economic climate improves, nurses may return to an earlier retirement age. This scenario considers those in the nursing workforce who are approaching retirement age (50-75 years) and shows the effect of a gradual return to historic exit rates, and a 20 per cent increase in exit rates for 55 + age from 2015.

It is important to note the scenarios are not predictions of what will happen over the period to 2030 - each provides an estimate of likely outcomes given the set of conditions upon which it is based.

### Nursing student attrition

The method used to calculate RN student attrition rates is outlined here given its importance in determining RN nurse supply.

In the workforce planning projections, new graduates are one workforce supply stream. Therefore an estimate of graduate numbers needs to be calculated for this input. To do this, HWA uses historical trends in student commencements to project an estimated number of future student commencements (up to a maximum of three years in the future). A student attrition rate is then applied to the projected student commencements to determine the number of graduates to include as the supply stream in the workforce planning projection.

For RNs, HWA used higher education statistics from the Australian Government Department of Education on student commencements and completions (definitions of these terms are contained in Appendix C).

The attrition rate for RNs was calculated using the following formula:

$$([\text{Commencements in Year X}] - [\text{Completions in Year X+2}]) / [\text{Commencements in Year X}]$$

Rates were calculated for four periods (commencing years 2007 to 2010 and completion years 2009 to 2012). The average of the rates for each of the four periods was then calculated, and applied to the projected student commencements to obtain the estimated graduate numbers. Please note, the method HWA uses for calculating attrition for workforce planning purposes may differ to methods tertiary institutions use for their own planning and evaluation purposes.

For RN students, the historical attrition rate (2000 to 2006) has been 21 percent. The current overall attrition rate (using the commencing years 2007 to 2010 and completion years 2009 to 2012) was calculated to be 34 percent (noting that attrition rates varied across educational institutions, from a low of 18 percent to a high of 54 percent).

For ENs, an attrition rate could not be calculated. This is because of difficulties in identifying EN course commencements, as people often enrol in an EN course to only complete a specific module, rather than to qualify as an EN. Therefore for ENs, graduate inflows into the workforce planning projections were the 2012 EN course completions, which was then held constant across the projection period.

### Data developments since HW2025

Recent developments such as national health professional regulation and the HWA National Statistical Resource have significantly improved data quality and consistency, resulting in a more robust basis for future workforce planning. These changes, in addition to increased sophistication in the workforce planning projection methodology, improve the accuracy of the workforce projections. In particular, national registration of selected health professions through AHPRA, and the workforce survey administered at the time of registration renewal, now allows for:

- Longitudinal tracking of individual practitioners.
- The ability to distinguish between dual registrant RNs, midwives and RNs working in midwifery (for increased accuracy of the attribution of working hours).

The workforce projections presented in AFHW – Nurses incorporate these recent data developments, reflected by:

- Basing the opening workforce data on labour force surveys undertaken by AHPRA with a 2012 start year rather than the Australian Institute of Health and Welfare labour force survey with a 2009 start year.
- Producing workforce projections out to 2030 rather than 2025.
- Updating demand, migration and new graduates inputs to the latest available information.

### Workforce planning projection results

Reflecting the inherent uncertainty involved in workforce projections, the results presented graphically make use of a variation band. This means the results for both supply and demand projections are displayed with a +/- two percent 'variation' allowance through to the end of the projection period. Areas of intersection within these variation bands suggest a workforce projected to be in relative balance from the initial starting point.

### Summary of overall nursing modelling results

Table 8 shows a summary of the modelling results for the total nursing workforce (presented in AFHW – Nurses – Overview in more detail). The results indicate that the combined scenario reduces the shortfall of nurses from 45 per cent of the total supply, to 12 per cent. This highlights the significant workforce impact of coordinating small improvements across several policy areas.

**Table 8: Summary of all nursing projection results**

Scenario	2025			2030		
	Supply	Demand	Balance	Supply	Demand	Balance
Comparison	273,522	358,879	-85,357	271,657	394,503	-122,846
Constrained labour demand	273,522	339,492	-65,970	271,657	365,557	-93,900
Combined	300,398	339,492	-39,094	320,722	365,557	-44,835
Medium self sufficiency	263,370	358,879	-95,509	251,744	394,503	-142,759
Productivity	273,522	352,400	-78,878	271,657	384,640	-112,983
Intention to retire	267,693	358,124	-90,431	266,041	393,640	-127,599
Retirement at 65	263,836	356,683	-92,847	262,579	392,108	-129,529

# Profiles and projections by nursing sector

This section describes the characteristics of specific nursing sectors which are used in the workforce modelling and provides the workforce projection results for each nursing sector.

The nursing sectors are:

- Acute care
- Aged care
- Critical care and emergency
- Mental health
- Other nursing

Nurses were categorised into each of the above sectors based on the principal area of practice they selected when completing the AHPRA workforce survey, combined with their work setting and job role. The 'other' sector includes nurses who self-selected as 'other' and the remainder of the nursing workforce not categorised into one of the four discrete nursing sectors. For more information on how these sectors were mapped, see Appendix C.

Information provided for each nursing sector includes:

- A detailed table showing the relationship between work role, area of practice and job setting by sector
- The total number of nurses employed in the sector by registration type and gender
- A graphical representation of the sector age profile, by registration type and gender
- The average weekly hours worked in the sector, by registration type and gender
- Workforce modelling results

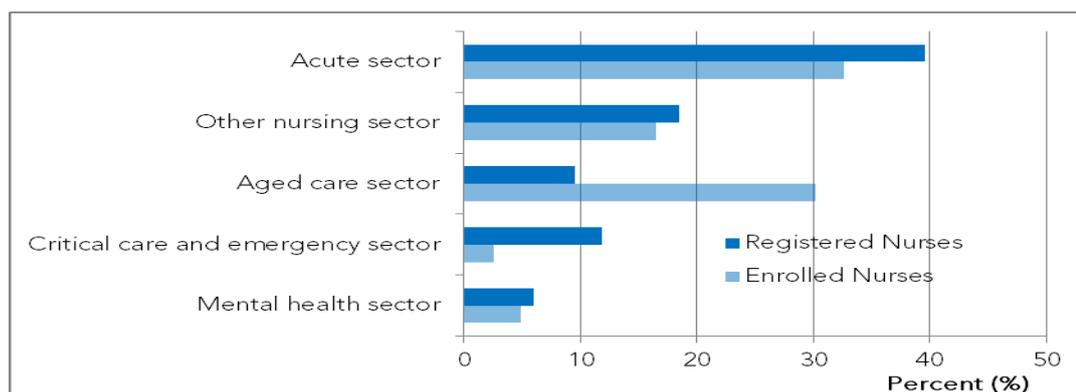
During consultation, HWA was also requested to provide information on the following groups:

- Primary health care sector nurses
- Academics
- Aboriginal and Torres Strait Islander nurses

Information on the number and characteristics of nurses in these three groups is provided in this publication. However workforce projections have not been conducted for these groups because they are already included within the original five nursing sectors.

Figure 14 shows the percentage of RNs and ENs employed in each sector. The highest percentages of RNs (46 per cent) and ENs (38 per cent) work in the acute sector. The second highest percentage of RNs (22 per cent) worked in other nursing, while for ENs, the second highest percentage worked in aged care.

Figure 14: Percentage of employed registered and enrolled nurses by sector, 2012



Source: NHWDS: nurses and midwives 2012.

### Acute care sector

Acute care nurses provide care to people with conditions such as infections, metabolic disorders and degenerative conditions who need medical intervention in a range of health, aged care and community settings, as well as providing care to patients with injuries and illness that need surgical intervention. They also assess patients' conditions, plan nursing care for surgical intervention, maintain a safe and comfortable environment, assist surgeons and anaesthetists during surgery, and monitor patients' recovery from anaesthetic.

Table 9 shows nurses working in the acute sector by their principal role, principal area of practice and job setting. Most nurses working in the acute sector (85 per cent) indicated their principal role was a clinician or clinical manager, with a further 11 per cent indicating a principal role of 'other' (and have been included in acute care as their stated work setting a hospital or outpatients setting in medical areas).

Table 9: Acute sector, relationship between work role, area of practice and job setting

Principal role	Principal Area of Practice	Setting of job	Number of nurses
Clinician/ clinical manager	<ul style="list-style-type: none"> <li>Mixed medical/surgical</li> <li>Medical</li> <li>Surgical</li> <li>Perioperative</li> <li>Other nursing sector</li> </ul>	<ul style="list-style-type: none"> <li>All</li> </ul>	99,738
Administrator	<ul style="list-style-type: none"> <li>Mixed medical/surgical</li> <li>Medical</li> <li>Surgical</li> <li>Perioperative</li> <li>Education</li> <li>Management</li> <li>Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>Hospital</li> <li>Outpatient services</li> </ul>	3,056

Principal role	Principal Area of Practice	Setting of job	Number of nurses
Teacher/educator	<ul style="list-style-type: none"> <li>Mixed medical/surgical</li> <li>Medical</li> <li>Surgical</li> <li>Perioperative</li> <li>Education</li> <li>Management</li> <li>Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>Hospital</li> <li>Outpatient services</li> </ul>	3,227
Other	<ul style="list-style-type: none"> <li>Mixed medical/surgical</li> <li>Medical</li> <li>Surgical</li> <li>Perioperative</li> <li>Education</li> <li>Management</li> <li>Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>Hospital</li> <li>Outpatient services</li> </ul>	11,831
<b>All acute nurses</b>	–	–	<b>117,852</b>

Note: Other nursing sector refers to Clinicians/clinical managers recording Hospital and Outpatient services as their Setting of job only.

Source: NHWDS: nurses and midwives 2012.

Table 10 shows that the acute sector nursing workforce is predominantly made up of RNs (85 per cent). Males comprise eight per cent of the acute sector workforce for both RNs and ENs.

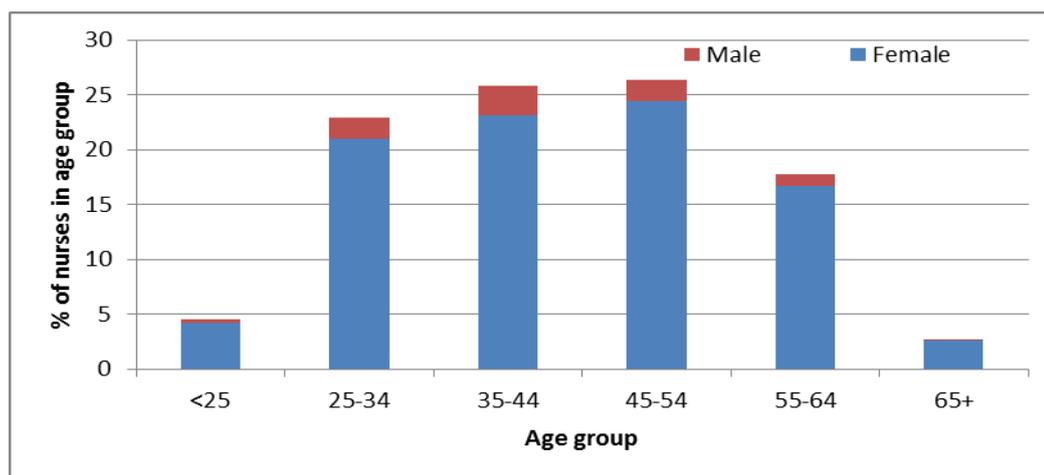
**Table 10: Acute sector, employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	8,024	92,104	100,128
Enrolled nurses	1,461	16,263	17,724
<b>All nurses</b>	<b>9,485</b>	<b>10,8367</b>	<b>117,852</b>

Source: NHWDS: nurses and midwives 2012.

Figure 15 shows that similar percentages of the acute sector nursing workforce were aged 45-54 years (27 per cent), 35-44 years (26 per cent), and 25-30 years (23 per cent). Smaller percentages occurred in the remaining age groups. The highest percentages of male acute nurses were aged 35-44 years (10 per cent).

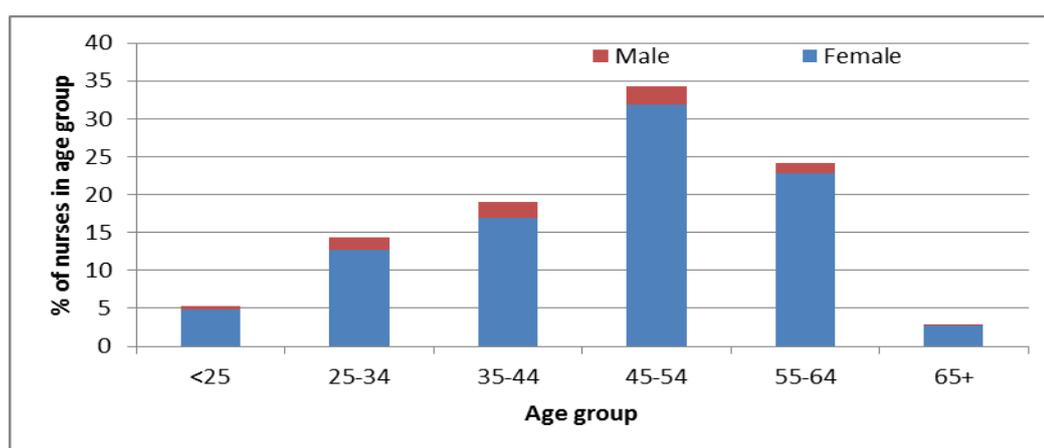
Figure 15: Employed registered nurses, acute sector, by age group, 2012



Source: NHWDS: nurses and midwives 2012.

The age profile of ENs in the acute nursing workforce differs substantially to that of RNs, with over one-third aged 45-54 years, and almost one-quarter aged 55-64 years (Figure 16). The highest percentages of male acute ENs were aged 25-34 years (24 per cent).

Figure 16: Employed enrolled nurses, acute sector, by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Table 11 shows that the average weekly hours for RNs in the acute nursing sector is 31.4 hours, compared with 32.1 hours for ENs. Male RNs work an extra 4.4 hours per week than females, and male ENs work an extra 6.2 hours per week.

Table 11: Average weekly hours, employed registered and enrolled nurses, acute sector, 2012

Type of nurse	Male	Female	Persons
Registered nurses	35.4	31.0	31.4
Enrolled nurses	37.8	31.6	32.1
<b>All nurses</b>	<b>37.4</b>	<b>31.5</b>	<b>32.0</b>

Source: NHWDS: nurses and midwives 2012.

## Modelling results

The comparison scenario shows a small oversupply in the acute nursing sector until 2015, after which demand exceeds supply, with the acute sector having a projected undersupply of approximately 41,000 in 2030. The major contributing factor to this result is that workforce exits exceed new entrants from 2016 onwards.

**Figure 17: Comparison scenario, registered and enrolled nurses, acute sector, 2012 to 2030**

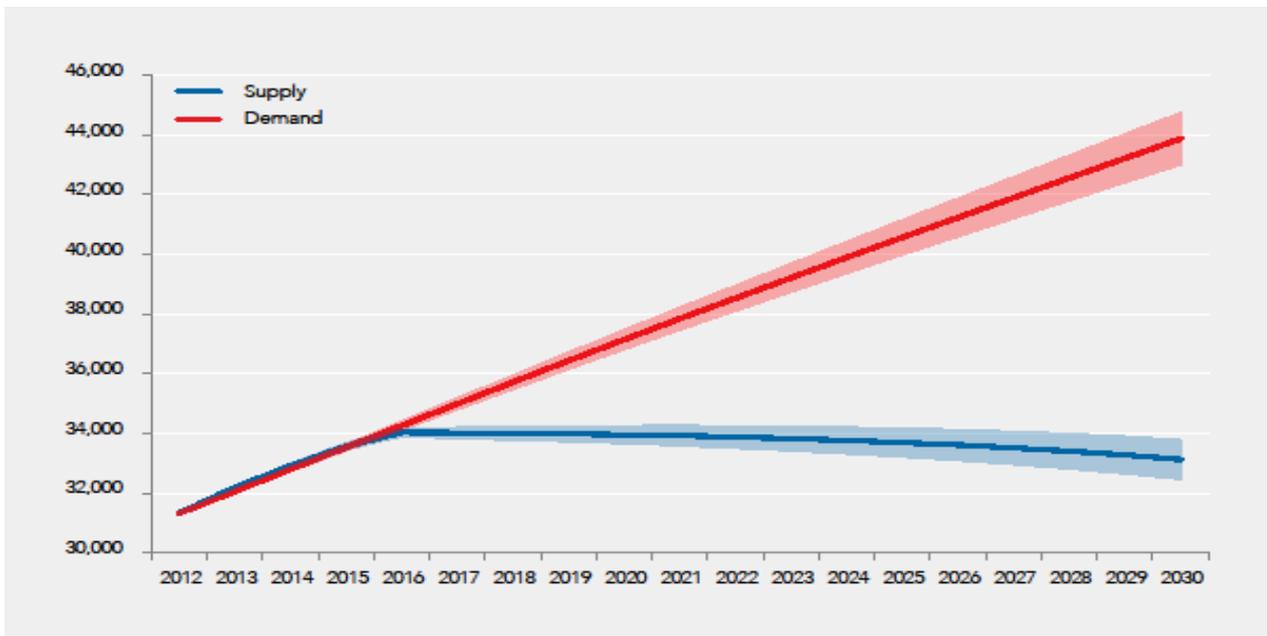


Figure 18 shows the results of the combined scenario and the constrained labour force demand scenario for the acute nursing sector. Using these two scenarios as the basis to examine the relationship between workforce supply and demand, it shows that within five years of the starting point, demand for the acute care nursing workforce exceeds supply, to reach a relatively small workforce gap of approximately 6,400 by 2030.

**Figure 18: Combined scenario and constrained labour demand scenario, registered and enrolled nurses, acute sector, 2012 to 2030**

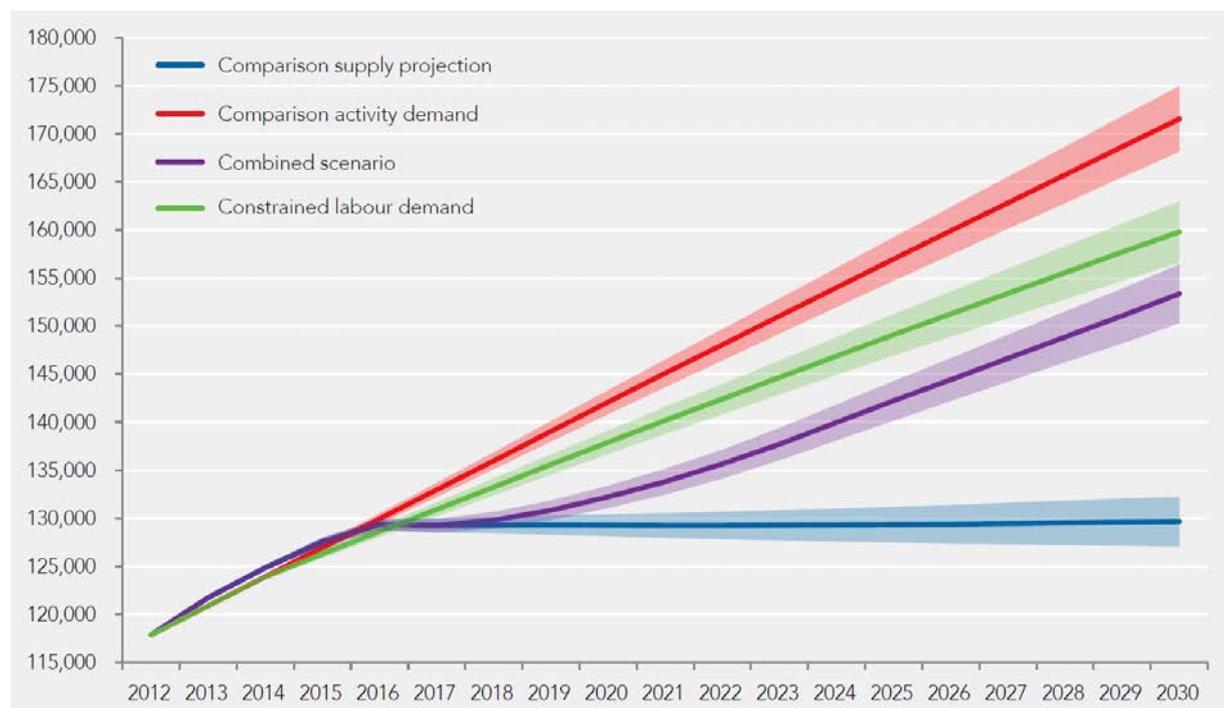


Figure 19 depicts the skill mix differences achieved by the acute sector skill mix scenario, for the acute sector, the scenario used was a skill mix of 70 percent RNs, 25 percent ENs and 5 percent AINs/PCAs in 2030. Results of the skill mix scenarios for the acute sector are shown in Figure 19 and Table 12.

Under the comparison scenario (using the combined scenario parameters), the total acute nursing workforce increases from 121,852 in 2012 to a projected total of 158,578 in 2030.

Under the skill mix change scenario based on limitations in training capacity:

- The total acute nursing workforce in 2030 is greater than that under the comparison scenario (178,280 compared with 158,578).
- Absolute numbers of the RN, EN and AIN/PCA workforces all increase across the projection period (Table 12)
- The percentage that each workforce accounts for of the overall total changes from 2012 to 2030 – with the RN percentage reducing (from 82 percent to 71 percent), the EN percentage increasing (from 15 percent to 24 percent) and the AIN/PCA percentage increasing (from three percent to five percent).

In this scenario, the illustrative workforce percentages are not reached in 2030 due to the constraints applied in the modelling (around what change is achievable). This highlights that the projected acute nursing workforce in 2030 would include 'excess' RNs (of approximately 10,000) to those needed under the illustrative skill mix. These RNs are assumed to be available to other nursing areas of practice.

Figure 19: Acute sector skill mix scenario

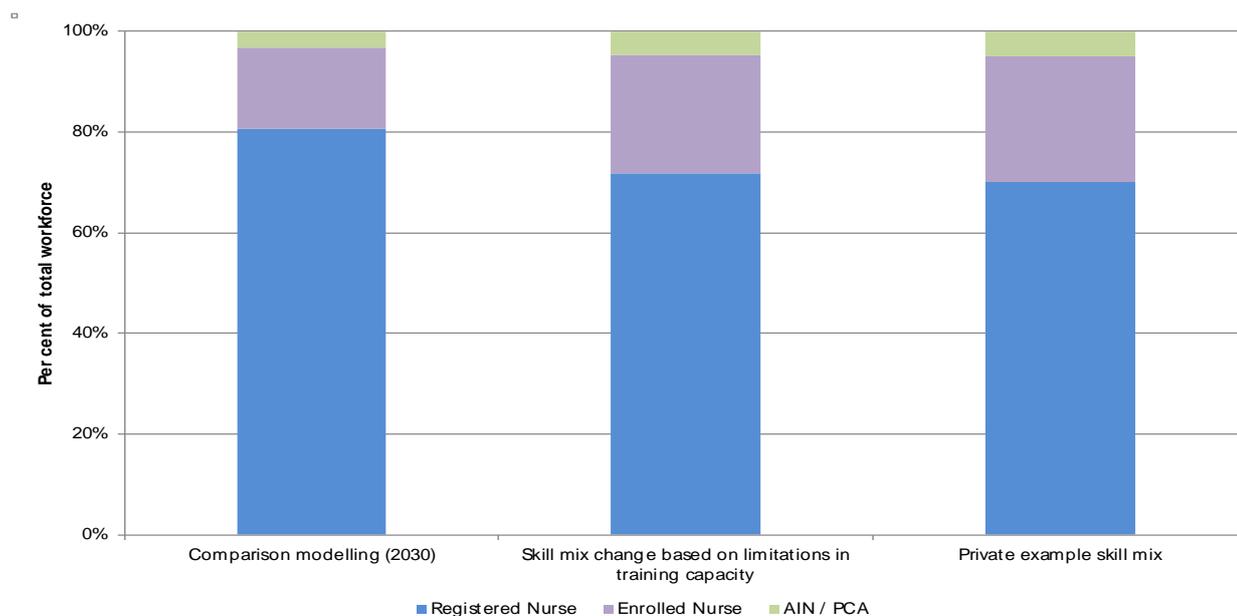


Table 12: Acute sector skill mix scenario results

Type of nurse	Comparison 2012	Comparison 2030	Skill mix change 2030	Extra from Comparison	Private example 2030	Extra from Comparison
RN	100,128	127,762	127,762		117,736	-10,026
EN	17,724	25,616	42,108	16,492	42,049	16,433
AIN/PCA	4,000	5,200	8,410	3,210	8,410	3,210
<b>Total</b>	<b>121,852</b>	<b>158,578</b>	<b>178,280</b>	<b>19,702</b>	<b>168,195</b>	<b>9,617</b>

Table 13 provides a summary of all the scenario results for the acute nursing workforce sector. Of all the scenarios, the combined scenario has the greatest impact, reducing the workforce gap from 32 per cent (of workforce supply) in the comparison scenario, to three per cent in the combined scenario.

**Table 13: Summary of acute sector registered and enrolled nurses, projection results**

Scenario	2025			2030		
	Supply	Demand	Balance	Supply	Demand	Balance
Comparison	129,324	156,989	-27,665	129,642	171,568	-41,926
Combined	142,222	149,091	-6,869	153,377	159,806	-6,429
Productivity	129,324	154,154	-24,830	129,642	167,279	-37,637
Intention to retire	126,909	156,731	-29,822	127,195	171,271	-44,076
Retirement at 65	125,794	156,352	-30,558	126,052	170,852	-44,800

### Aged care sector

Aged care nurses provide nursing care to the elderly in community settings, residential aged care facilities, retirement villages and health care facilities. The aged care sector has a significantly higher proportion of ENs (compared with RNs) to any other nursing sector.

Table 14 identifies the relationship between work role, area of practice and job setting in the aged care sector. It also shows that three-quarters of nurses work as a clinician or clinical manager, with a further 19 per cent indicating their principal role as 'other', but reported as working in residential and community aged care services.

**Table 14: Aged Care sector, relationship between work role, area of practice and job setting**

Principal role	Principal Area of Practice	Setting of job	Number of nurses
Clinician/ clinical manager	<ul style="list-style-type: none"> <li>Aged care</li> <li>Other nursing sector</li> </ul>	<ul style="list-style-type: none"> <li>All</li> </ul>	30,429
Administrator	<ul style="list-style-type: none"> <li>Aged care</li> <li>Education</li> <li>Management</li> <li>Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>Residential aged care facility</li> <li>Community aged care service</li> </ul>	1,651
Teacher/educator	<ul style="list-style-type: none"> <li>Aged care</li> <li>Education</li> <li>Management</li> <li>Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>Residential aged care facility</li> <li>Community aged care service</li> </ul>	602
Other	<ul style="list-style-type: none"> <li>Aged care</li> <li>Education</li> <li>Management</li> <li>Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>Residential aged care facility</li> <li>Community aged care service</li> </ul>	7,839

Principal role	Principal Area of Practice	Setting of job	Number of nurses
All aged care nurses	–	–	40,521

Note: Clinician/clinical managers, whose principal area of practice 'other nursing sector' recorded the setting of job to be either a residential aged care facility and/or a community aged care service.

Source: NHWDS: nurses and midwives 2012

Table 15 shows that of the 40,521 nurses working in aged care, over half (59 per cent) are RNs, with 41 per cent being ENs. Males account for eight per cent of the total aged care workforce – accounting for nine per cent of RNs working in the aged care workforce and seven per cent of ENs working in the aged care workforce.

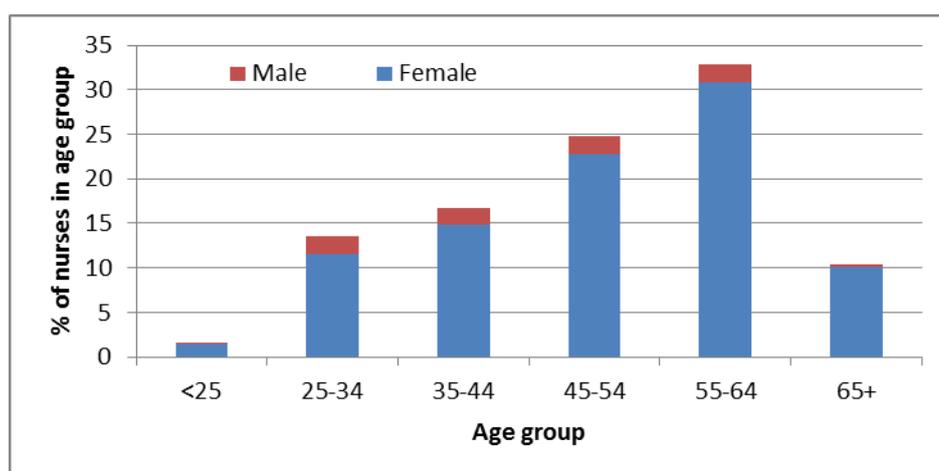
**Table 15: Aged care sector, employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	2,058	22,022	24,080
Enrolled nurses	1,232	15,209	16,441
<b>All nurses</b>	<b>3,290</b>	<b>37,231</b>	<b>40,521</b>

Source: NHWDS: nurses and midwives 2012.

Figure 20 shows the highest percentage of RNs working in aged care (33 per cent) were aged 55-64 years, with the next highest percentage being those aged 45-54 years (25 per cent). This highlights an ageing workforce is of particular concern for the aged care sector.

**Figure 20: Employed, registered nurses, aged care sector, by age group, 2012**

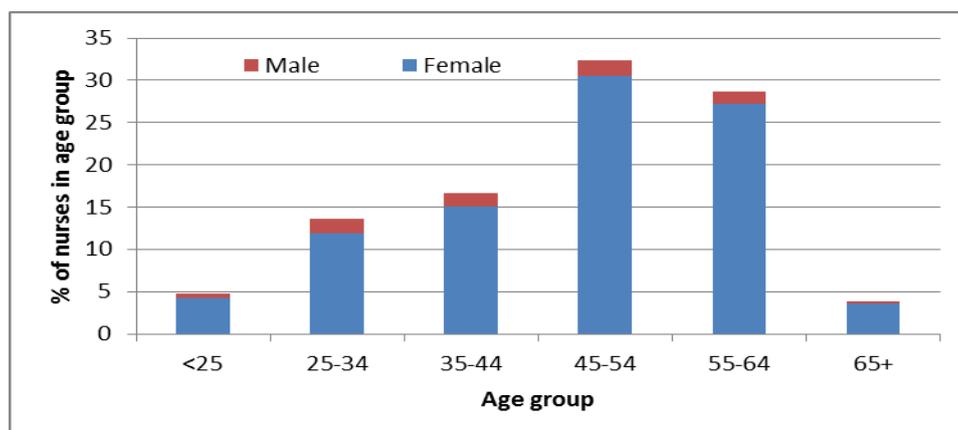


Source: NHWDS: nurses and midwives 2012.

Figure 21 shows the age profile of the EN aged care workforce. The highest percentage of ENs working in aged care are aged 45-54 years (32 per cent), followed by those aged 55-

64 years ( 29 per cent). Again, this highlights an ageing workforce is of concern for this sector.

Figure 21: Employed enrolled nurses, aged care sector, by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Table 16 shows that RNs work on average 33.3 hours per week in aged care, higher than ENs, who worked 30.3 hours per week on average. Male RNs and ENs worked longer average weekly hours than female RNs and ENs in the aged care sector (4.2 hours and 1.7 hours per week respectively).

Table 16: Average weekly hours, employed registered and enrolled nurses, aged care sector, 2012

Type of nurse	Male	Female	Persons
Registered nurses	37.1	32.9	33.3
Enrolled nurses	31.9	30.2	30.3
<b>All nurses</b>	<b>35.1</b>	<b>31.8</b>	<b>32.1</b>

Source: NHWDS: nurses and midwives 2012.

## Modelling results

Figure 22 shows the comparison scenario for nurses working in aged care. From 2014, demand begins to exceed supply, with the workforce gap extending across the projection period to be approximately 13,000 nurses in 2030 (a 26 per cent gap). The major contributing factors to this result is the ageing workforce and low entry numbers.

Figure 22: Comparison scenario registered and enrolled nurses, aged care sector, 2012 to 2030

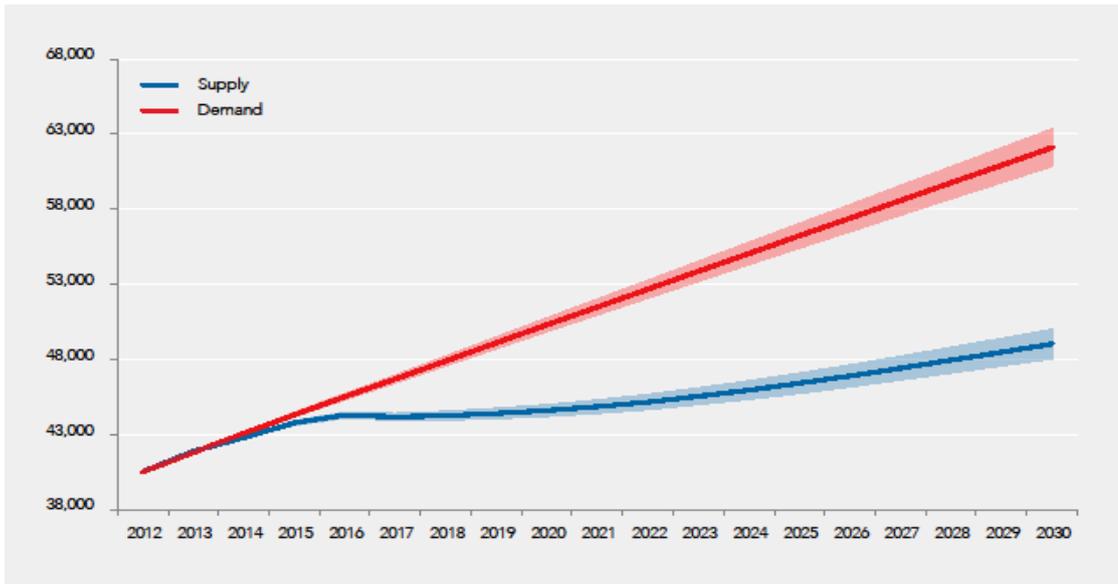


Figure 23 shows the results of the combined scenario and the constrained labour force demand scenario for the aged care sector. This shows after a period of workforce supply (under the combined scenario) being less than workforce demand (under the constrained activity demand scenario), from 2025 onwards workforce supply is projected to exceed workforce demand.

Relative to the comparison scenario demand, the combined scenario in aged care leads to a workforce approximately in balance in 2030.

Figure 23: Combined scenario and constrained labour demand scenario, registered and enrolled nurses, aged care sector, 2012 to 2030

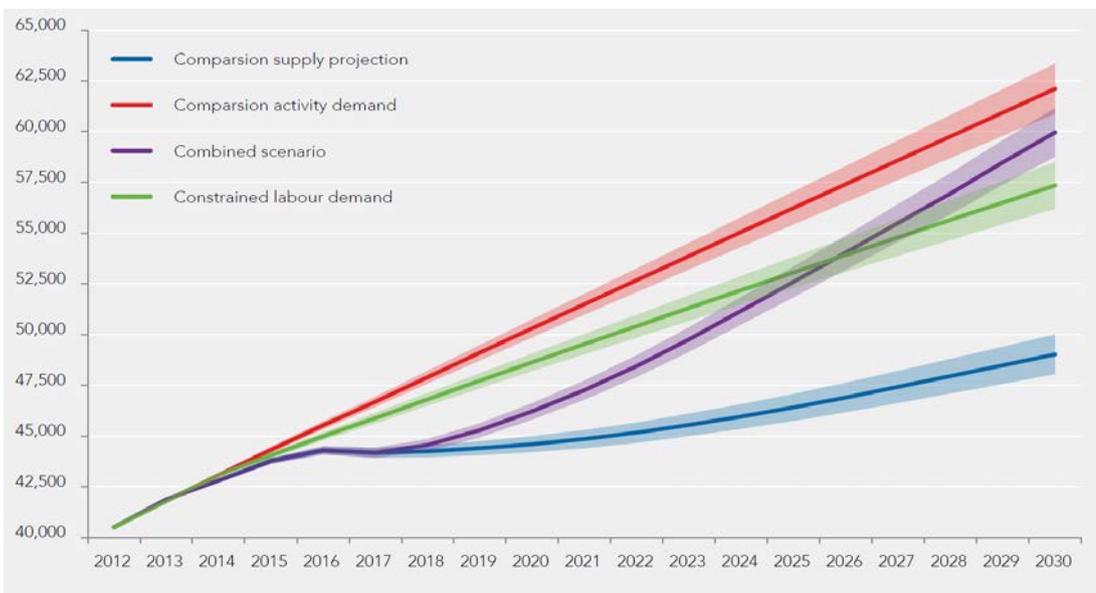


Figure 24 shows the aged care sector the scenario used a skill mix of 15 percent RNs, 15 percent ENs and 70 percent AINs/PCAs in 2030. Results of the skill mix scenarios for the aged care sector are shown in Figure 24 and Table 17.

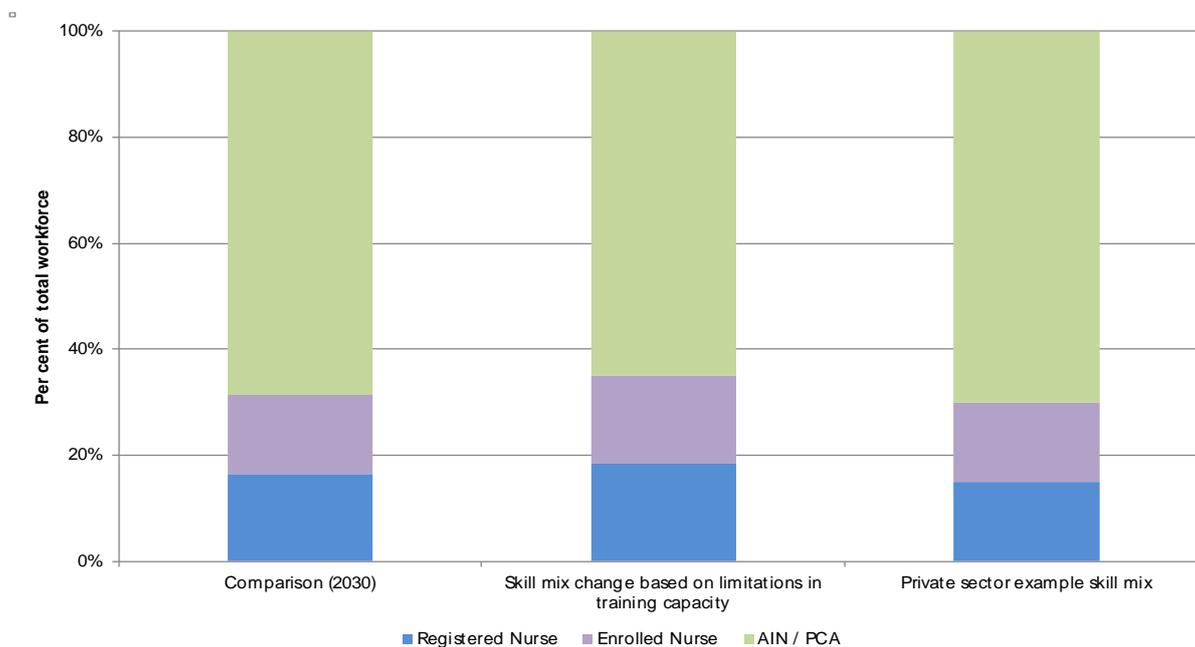
Under the comparison scenario (using the combined scenario parameters), the total aged care nursing workforce increases from 140,833 in 2012 to a projected total of 190,362 in 2030.

Under the skill mix change scenario based on limitations in training capacity:

- The total aged care nursing workforce increases from 140,833 in 2012 to 170,315 in 2030.
- The percentage share of RNs in the aged care nursing workforce is maintained (at approximately 18 percent) while their absolute number increases from 2012 (24,080) to 2030 (31,386).
- The percentage share of ENs in the aged care nursing workforce increases from 12 percent in 2012 to 17 percent in 2030, also with an increase in absolute numbers (from 16,441 in 2012 to 28,570 in 2030).
- The percentage share of AINs/PCAs in the aged care nursing workforce reduces from 2012 (71 percent) to 2030 (65 percent), however the absolute number of AINs/PCAs increases over the same period (from 100,312 to 110,359).

In this scenario, the illustrative workforce percentages are not reached in 2030 due to the constraints applied in the modelling (around what change is achievable). This highlights that the projected aged care nursing workforce in 2030 would include ‘excess’ RNs (approximately 7,800) and ENs (approximately 5,000) to those needed under the illustrative skill mix. These are assumed to be available to other nursing areas of practice.

**Figure 24: Aged care sector skill mix scenario**



**Table 17: Aged care sector skill mix scenario results**

Type of nurse	Comparison 2012	Comparison 2030	Skill mix change 2030	Extra from Comparison	Private example 2030	Extra from Comparison
RN	24,080	31,386	31,386	0	23,648	-7,738
EN	16,441	28,570	28,570	0	23,648	-4,922
AIN/PCA	100,312	130,406	110,359	-20,046	110,359	-20,046
<b>Total</b>	<b>140,833</b>	<b>190,362</b>	<b>170,315</b>	<b>-20,046</b>	<b>157,656</b>	<b>-32,706</b>

Table 18 show the result of all the scenarios for the aged care nursing sector, with the combined scenario resulting in a move from a 26 per cent shortfall (of workforce supply) in the comparison scenario to a four per cent oversupply.

**Table 18: Summary of aged care sector registered and enrolled nurses, results**

Scenario	2025			2030		
	Supply	Demand	Balance	Supply	Demand	Balance
Comparison	46,421	56,240	-9,819	49,034	62,102	-13,068
Combined	52,602	53,068	-466	59,956	57,345	2,611
Productivity	46,421	55,224	-8,803	49,034	60,549	-11,515
Intention to retire	45,456	56,129	-10,673	48,227	62,013	-13,786
Retirement at 65	45,062	55,908	-10,846	48,097	61,861	-13,764

## Critical care and emergency

Critical care and emergency nurses provide nursing care to critically ill patients and patients with unstable health following injury, surgery or during the acute phase of diseases, integrating new technological equipment into care in settings such as high dependency units, intensive care units, emergency departments or retrieval services.

Table 19 shows there were 31,327 nurses in the critical care and emergency sector in 2012. Of these, 91 per cent of nurses indicated that they were working as a clinician or clinical manager, with six per cent indicating they worked in hospitals (with a principal role of 'other').

**Table 19: Critical care and emergency sector, relationship between work role, area of practice and job setting**

Principal role	Principal Area of Practice	Setting of job	Number of nurses
Clinician/clinical manager	<ul style="list-style-type: none"> <li>Critical care</li> <li>Emergency</li> </ul>	All	28,539
Administrator	Critical care	Hospital	133
Teacher/educator	<ul style="list-style-type: none"> <li>Critical care</li> <li>Emergency</li> </ul>	Hospital	732
Other	<ul style="list-style-type: none"> <li>Critical care</li> <li>Emergency</li> </ul>	Hospital	1,923
<b>Total</b>	–	–	<b>31,327</b>

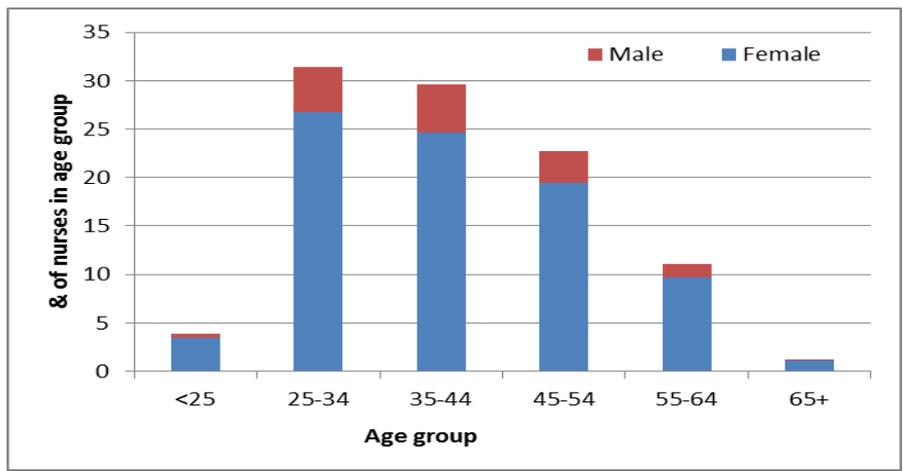
Table 20 provides the split between RNs and ENs in the critical care and emergency nursing workforce. Almost all (96 per cent) nurses were RNs. Overall, males comprised approximately 15 per cent of the total critical care and emergency nursing workforce.

**Table 20: Critical care and emergency sector, employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	4,435	25,531	29,966
Enrolled nurses	224	1,137	1,361
<b>All nurses</b>	<b>4,659</b>	<b>26,668</b>	<b>31,327</b>

Figure 25 presents RN critical care and emergency workforce age profile. This is a younger workforce compared with other nursing sectors, with the highest percentage aged 25-34 years (31 per cent), followed by those aged 35-44 years (30 per cent). For males the highest percentage were aged 35-44 years.

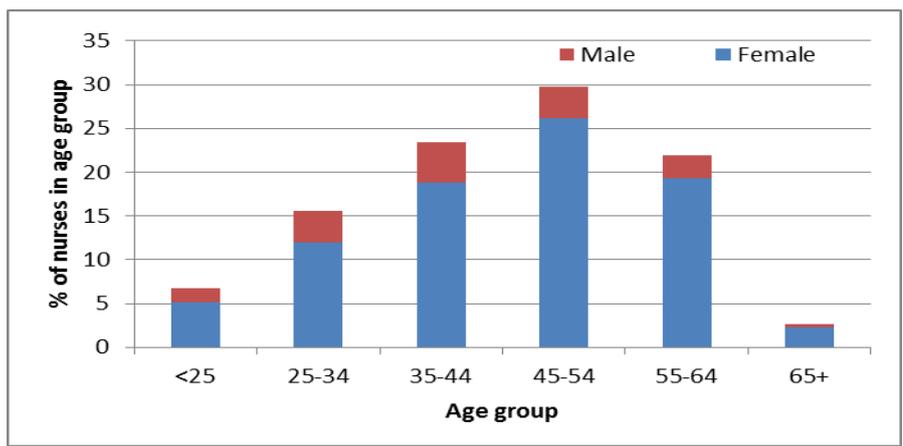
Figure 25: Employed registered nurses, critical care and emergency sector, by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Figure 26 shows ENs working in the critical care and emergency sector have a substantially different age profile compared with RNs in the same sector. The highest percentage of ENs in this sector was 45-55 years (30 per cent).

Figure 26: Employed enrolled nurses, critical care and emergency sector, by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Table 21 shows that the average hours worked per week for critical care and emergency nurses. Average weekly hours worked for RNs and ENs were similar. Male critical care and emergency nurses worked approximately four hours more than females. This is consistent for both RNs and ENs.

**Table 21: Average weekly hours, employed registered and enrolled nurses, critical care and emergency sector, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	37.7	33.3	33.9
Enrolled nurses	37.9	33.0	33.8
<b>All nurses</b>	<b>37.7</b>	<b>33.2</b>	<b>33.9</b>

Source: NHWDS: nurses and midwives 2012.

## Modelling results

Figure 27 shows the comparison scenario results for critical care and emergency nurses. In the early years (till 2016) a small oversupply is projected, with the critical care and emergency care nursing sector projected to be in undersupply by approximately 10,500 in 2030 (a 32 per cent gap). The major contributing factor to this is that exits exceed new entrants from 2016 onwards.

**Figure 27: Comparison scenario, registered and enrolled nurses, critical care and emergency sectors, 2012 to 2030**

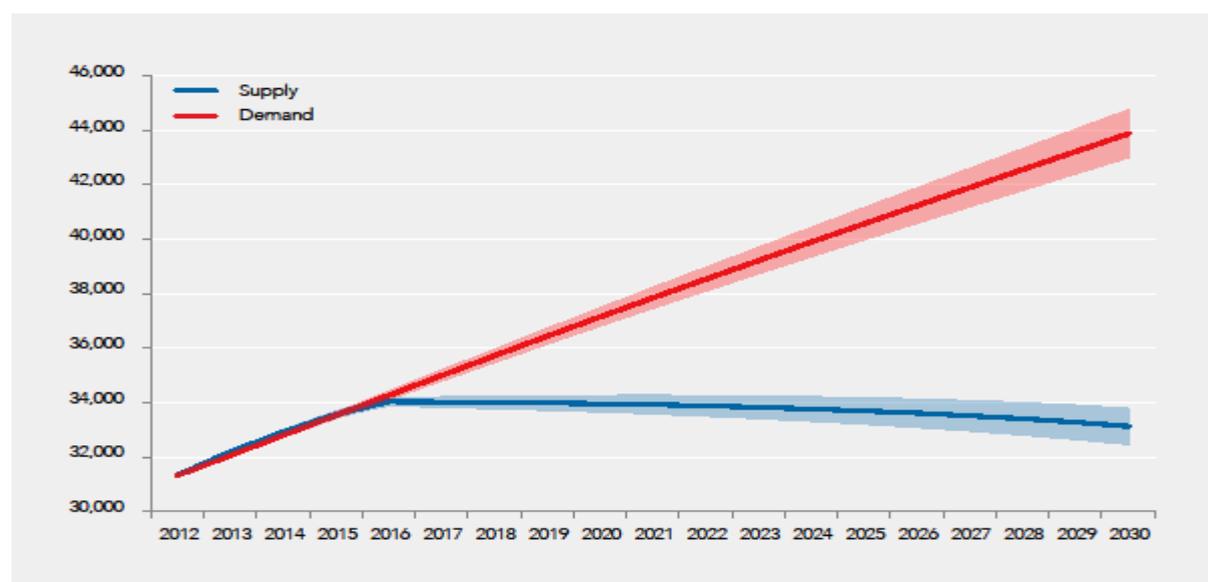


Figure 28 indicates that within the critical care and emergency care sectors, the combined scenario demonstrates that relative to the starting point, the nursing workforce would immediately move into a small oversupply. Within five years this reverses to a small undersupply, and the gap between supply and demand gradually increases over the projection period. Relative to the comparison supply, the combined scenario significantly reduces the shortfall of nurses down to eight per cent (of workforce supply) within the critical care and emergency care sector to 2030.

**Figure 28: Combined scenario and constrained labour demand scenario, registered and enrolled nurses, critical care and emergency sectors, 2012 to 2030**

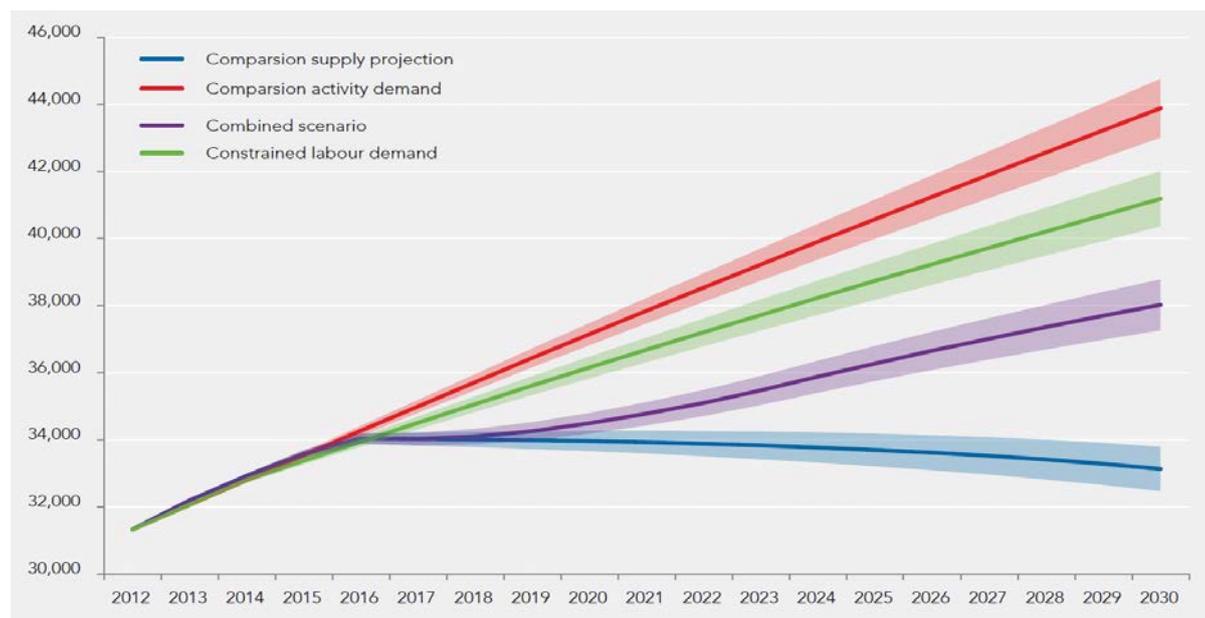


Table 22 shows the summary of the scenarios modelled for the critical care and emergency care nursing sector. The combined scenario has the largest impact in reducing the projected workforce gap in 2030, followed by the productivity scenario.

**Table 22: Summary of critical care and emergency care sector registered and enrolled nurses, results**

Scenario	2025			2030		
	Supply	Demand	Balance	Supply	Demand	Balance
Comparison	33,698	40,575	-6,877	33,129	43,882	-10,753
Combined	36,273	38,734	-2,461	38,021	41,180	-3,159
Productivity	33,698	39,842	-6,144	33,129	42,785	-9,656
Intention to retire	33,203	40,542	-7,339	32,541	43,835	-11,294
Retirement at 65	32,950	40,498	-7,548	32,286	43,780	-11,494

### Mental health sector

Mental health nurses provide care to patients with mental illness and disorders. They offer a range of clinical interventions aimed at promoting the individual's wellbeing, aiding them in recovery from illness, and enhancing their capacity to participate in community life. Mental health nurses work in hospitals, community mental health services, residential mental healthcare services, welfare and aged care facilities, correctional services and the community.

Table 23 shows that of the 17,860 nurses that work in mental health, almost all (97 per cent) indicated their principal role was as a clinician or clinical manager. A further two per cent indicated their principal role as 'other' but work in either community or residential mental health services.

**Table 23: Mental health sector, relationship between work role, area of practice and job setting**

Principal role	Principal Area of Practice	Setting of job	number
Clinician/ clinical manager	<ul style="list-style-type: none"> <li>• Mental health</li> <li>• Other nursing sector</li> </ul>	All	17,279
Administrator	<ul style="list-style-type: none"> <li>• Mental health</li> <li>• Education</li> <li>• Management</li> <li>• Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>• Community mental health service</li> <li>• Residential mental health care service</li> </ul>	128
Teacher/educator	<ul style="list-style-type: none"> <li>• Mental health</li> <li>• Education</li> <li>• Management</li> <li>• Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>• Community mental health service</li> <li>• Residential mental health care service</li> </ul>	94
Other	<ul style="list-style-type: none"> <li>• Mental health</li> <li>• Education</li> <li>• Management</li> <li>• Other, not stated</li> </ul>	<ul style="list-style-type: none"> <li>• Community mental health service</li> <li>• Residential mental health care service</li> </ul>	359
<b>Total</b>	–	–	<b>17,860</b>

Note: \*Clinician/clinical managers, whose principal area of practice 'other nursing sector' recorded the setting of job to be either a residential aged care facility and/or a community aged care service.

Table 24 shows that 85 per cent of the mental health sector nursing workforce are RNs, with 15 per cent ENs. Mental health has the highest proportion of male nurses, with 33 per cent working as RNs and 26 per cent working as ENs.

**Table 24: Mental health sector, employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	4,998	10,241	15,239
Enrolled nurses	686	1,935	2,621

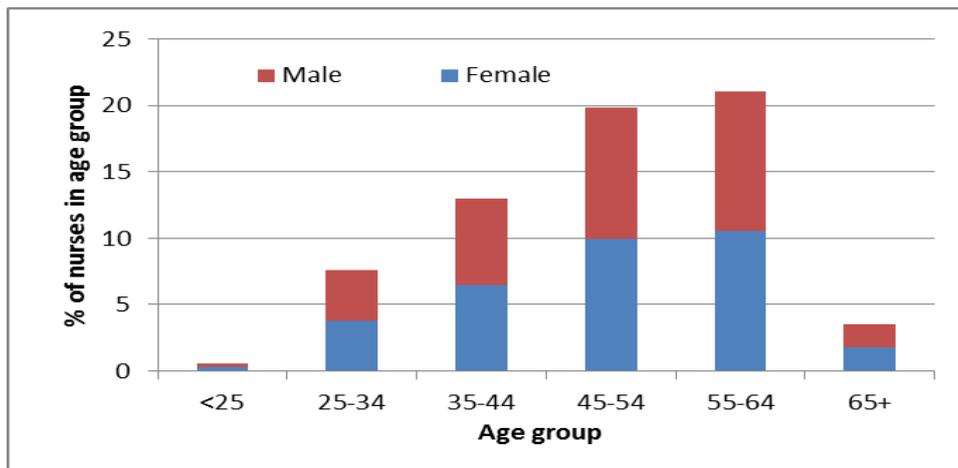
Type of nurse	Male	Female	Persons
All nurses	5,684	12,176	17,860

Source: NHWDS: nurses and midwives 2012.

Figure 29 shows RNs working in mental health have a relatively old age profile, with the highest percentages in the 55-64 and 45-54 age groups. A concern for this sector is not only the older age profile, but that the 20-34 year age group is one of the smallest across the sectors.

The highest proportion of male RNs in mental health are aged 55-64 years.

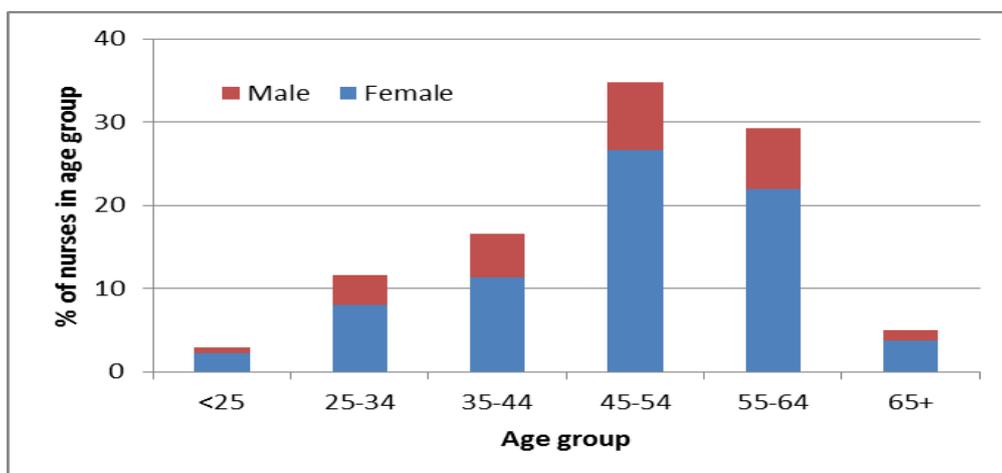
Figure 29: Employed registered nurses, mental health sector, by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Similar to RNs, ENs working in mental health have an older age profile, with the highest percentages aged 45-54 years (35 per cent) followed by those aged 55-64 years (29 per cent).

Figure 30: Employed enrolled nurses, mental health sector, by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Nurses in the mental health sector work the longest average hours per week of the nursing sectors (Table 25).

**Table 25: Average weekly hours, employed registered and enrolled nurses, mental health sector, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	38.2	35.5	36.4
Enrolled nurses	36.3	34.5	35.0
<b>All nurses</b>	<b>38</b>	<b>35.4</b>	<b>36.2</b>

Source: NHWDS: nurses and midwives 2012.

### Modelling results

Figure 31 shows that in the comparison scenario, the mental health nursing workforce moves to the largest undersupply of all sectors (of approximately 18,500) in 2030. A numbers of factors contribute to this result, including the ageing of the workforce, high exit rates and low new entrants into the workforce in the younger age groups.

**Figure 31: Comparison scenario registered and enrolled nurses, mental health sector, 2012 to 2030**

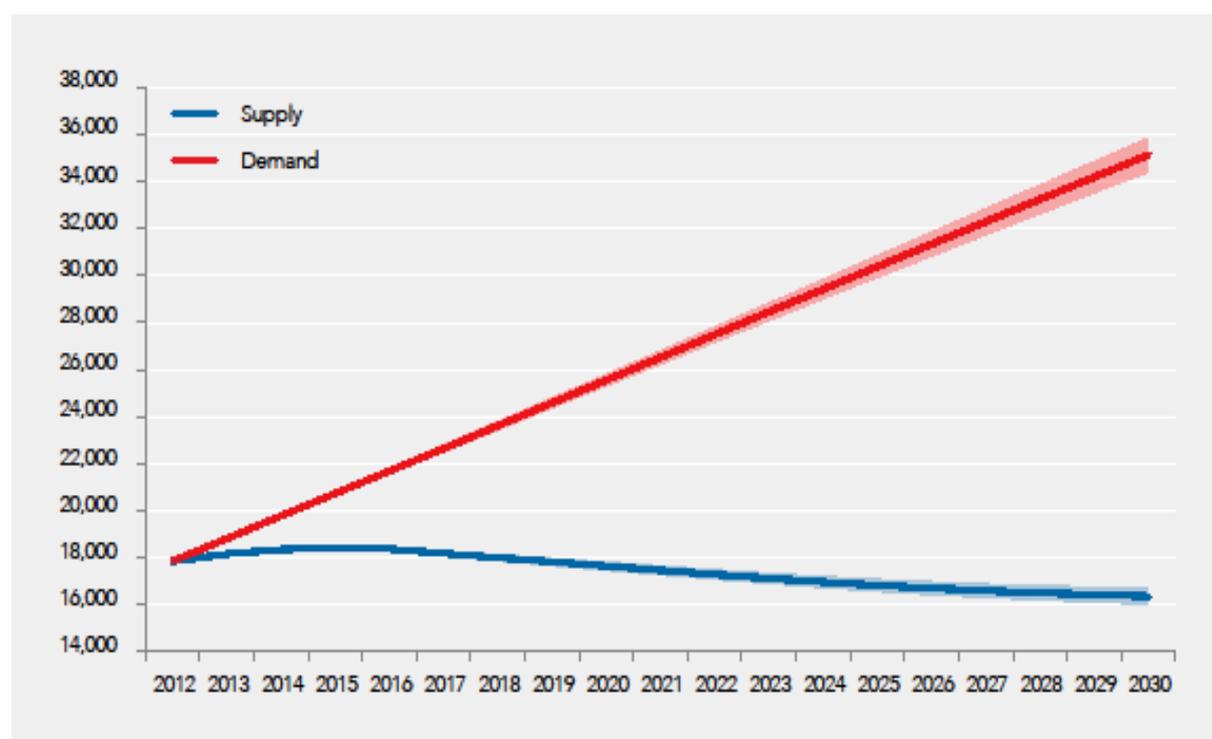


Figure 32 shows that regardless of scenario, a substantial workforce gap is still projected for the mental health nursing sector across the projection period. The combined scenario reduces the shortfall of nurses within the mental health sector in 2030 to approximately 11,500 – a 61 per cent gap (of workforce supply) which is the largest percentage gap of all sectors.

Figure 32: Combined scenario and constrained labour demand scenario, registered and enrolled nurses, mental health sector, 2012 to 2030

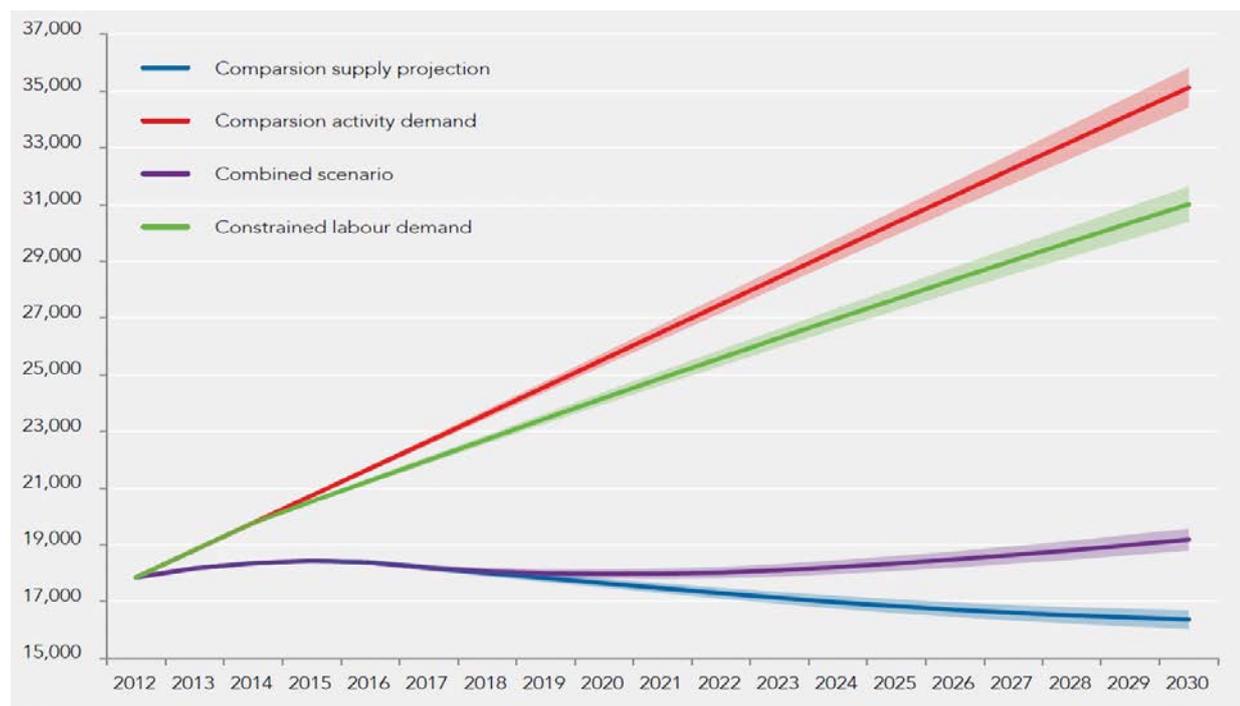


Table 26 shows the summary scenario results for the mental health nursing sector. While the combined scenario has the greatest impact on reducing the workforce gap in 2030, a number of different factors would need to be considered, with an emphasis on increasing new entrants to this sector.

Table 26: Summary of mental health sector registered and enrolled nurses, results

Scenario	2025			2030		
	Supply	Demand	Balance	Supply	Demand	Balance
Comparison	16,838	30,374	-13,536	16,369	35,120	-18,751
Combined	18,347	27,680	-9,333	19,187	31,010	-11,823
Productivity	16,838	29,825	-12,987	16,369	34,242	-17,873
Intention to retire	16,380	30,298	-13,918	15,966	35,035	-19,069
Retirement at 65	15,793	30,109	-14,316	15,487	34,847	-19,360

## Other Nursing

Other nursing includes all other areas not covered by the acute, aged care, critical care and emergency and mental health nursing sectors. This includes nurses:

- providing care, health counselling, screening and education to individuals, families and groups in the wider community with a focus on patient independence and health promotion
- assisting and facilitating patients with disabilities to adapt to their disabilities, achieve their greatest potential, and work toward productive, independent lives
- who design, plan, implement, evaluate and deliver nursing education and staff development programs, and management of educational resources
- providing advice regarding internal diseases and disorders in children from birth up to, and including, adolescence
- providing care and advice to women during pregnancy, labour and childbirth, and postnatal care for women and babies in a range of settings such as the home, community, hospitals, clinics and health units
- who manage a health service unit or sub-unit of a hospital, aged care or community healthcare facility, supervision of nursing staff and financial resources to enable the provision of safe, cost effective nursing care within a specified field or for a particular unit, and monitoring of quality, clinical standards and professional development of nurses
- developing policy, working in industrial relations, regulation and other areas.

Table 27 shows there were a total of 55,652 nurses working across these areas in 2012. Of these, 87 per cent indicated they work as a nurse with their principal role as a clinician or clinical manager.

**Table 27: Other nursing sector, relationship between work role and area of practice**

Principal role	Principal Area of Practice	Number of nurses
Clinician/clinical manager	<ul style="list-style-type: none"> <li>• Community health</li> <li>• Child and family health</li> <li>• Practice nursing</li> <li>• Rehabilitation and disability</li> <li>• Health Promotion</li> <li>• Education</li> <li>• Management</li> <li>• Paediatrics</li> <li>• Maternity care</li> <li>• Other, not stated</li> <li>• Policy</li> </ul>	48,163
Administrator	<ul style="list-style-type: none"> <li>• Community health</li> <li>• Child and family health</li> <li>• Practice nursing</li> <li>• Rehabilitation and disability</li> <li>• Health promotion</li> <li>• Education</li> <li>• Management</li> </ul>	1,377
Teacher/educator	<ul style="list-style-type: none"> <li>• Community health</li> <li>• Child and family health</li> <li>• Practice nursing</li> <li>• Rehabilitation and disability</li> <li>• Health promotion</li> <li>• Education</li> <li>• Management</li> </ul>	3,308

Principal role	Principal Area of Practice	Number of nurses
Other	<ul style="list-style-type: none"> <li>• Community health</li> <li>• Child and family health</li> <li>• Practice nursing</li> <li>• Rehabilitation and disability</li> <li>• Health promotion</li> <li>• Education</li> <li>• Management</li> </ul>	2,804
<b>Total</b>	–	<b>55,652</b>

\* Other nursing sector refers to the principal area of practice for Education, Management, Paediatrics, Maternity, Policy and Other, not stated

Table 28 shows that of those other nurses, 84 per cent were RNs and 16 per cent were ENs. Males comprise eight per cent of the RN workforce, and nine per cent of the EN workforce.

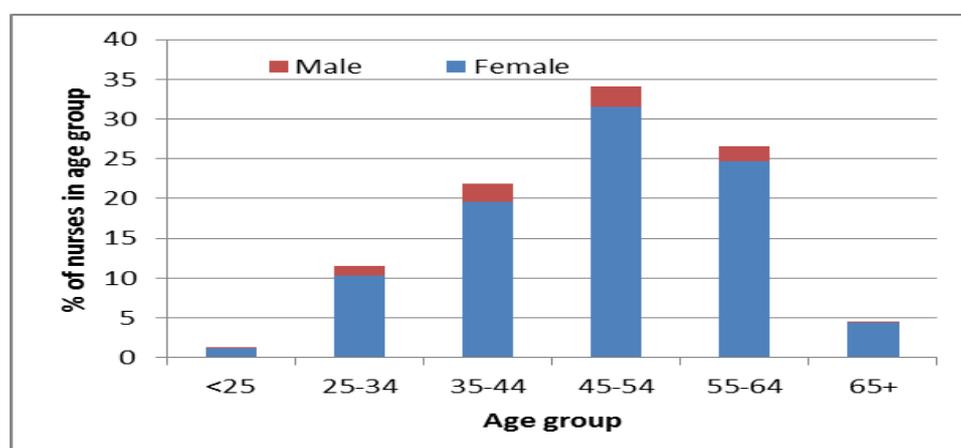
**Table 28: Other nursing sector, employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	3,822	42,867	46,689
Enrolled nurses	767	8,196	8,963
<b>All nurses</b>	<b>4,589</b>	<b>5,1063</b>	<b>55,652</b>

Source: NHWDS: nurses and midwives 2012.

Figure 33 shows that approximately one-third (34 per cent) of RNs in the other nursing sector are aged 45-54 years, with approximately one-quarter (27 per cent) aged 55-64 years. The highest proportion of males were aged 45-54 years.

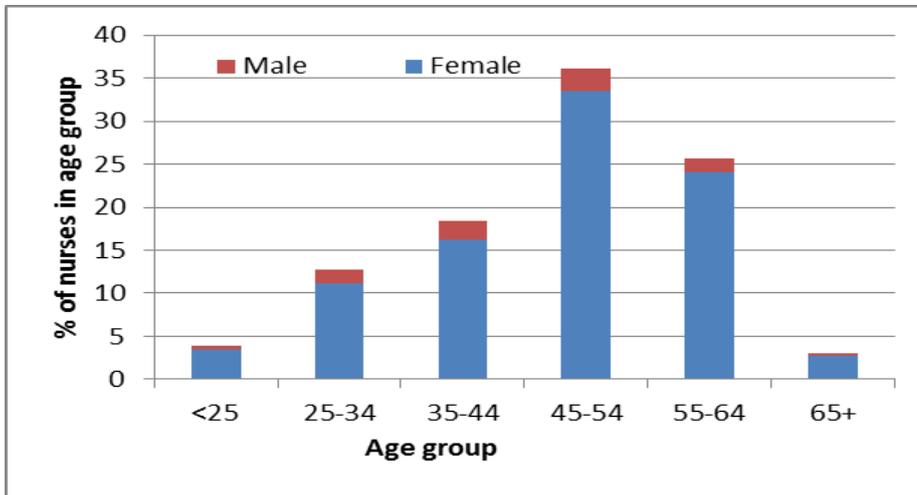
**Figure 33: Employed registered nurses, other nurse sector, by age group, 2012**



Source: NHWDS: nurses and midwives 2012.

Figure 34 shows that of ENs in the other nursing sector, over one-third (36 per cent) are in the 45-54 age group, with 26 per cent aged 55-64, with a total of 29 per cent aged 55 years or over.

**Figure 34: Employed enrolled nurses, other nurse sector, by age group, 2012**



Source: NHWDS: nurses and midwives 2012.

Average weekly hours worked for RNs and ENs in the other nursing workforce sector were similar (Table 29). Males in this sector worked substantially higher average weekly hours than females.

**Table 29: Average weekly hours, employed registered and enrolled nurses, other nurse sector, 2012**

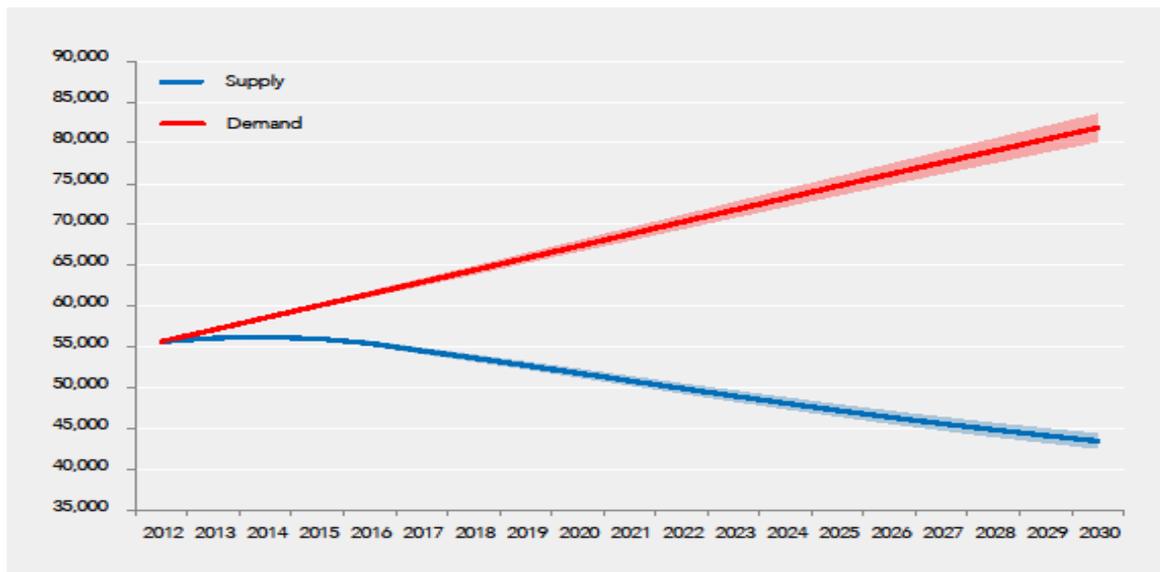
Type of nurse	Male	Female	Persons
Registered nurses	37.1	30.5	31.0
Enrolled nurses	34.3	30.5	30.8
<b>All nurses</b>	<b>36.7</b>	<b>30.5</b>	<b>31.0</b>

Source: NHWDS: nurses and midwives 2012.

## Modelling results

Figure 35 shows the comparison scenario results for the other nursing sector. A workforce undersupply is projected across the projection period, reaching an undersupply of approximately 38,000 in 2030 (an 88 per cent gap). Factors contributing to this are high exit rates and low numbers of workforce entrants.

Figure 35: Comparison scenario, registered and enrolled nurses, other nursing sector, 2012 to 2030



Regardless of scenario, workforce projections show a substantial projected workforce gap for the other nursing sector in 2030 (Figure 36). Relative to the comparison supply, the combined scenario reduces the shortfall of nurses within the other nursing sector to approximately 26,000 by 2030. This sector is projected to experience the largest shortfall of nurses in 2030 (25,897).

Figure 36: Combined scenario and constrained labour demand scenario, registered and enrolled nurses, other nursing sector, 2012 to 2030

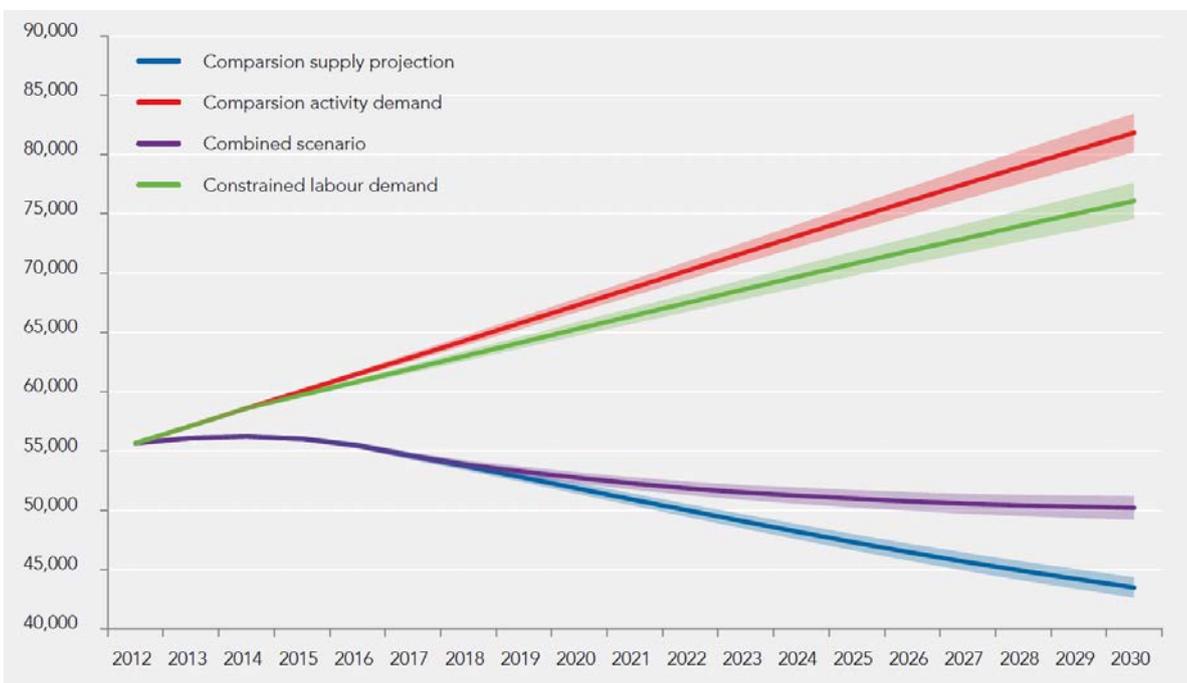


Table 30 shows a summary of the workforce projection scenario results for the other nursing sector. The combined scenario has the greatest impact in reducing the projected workforce gap relative to the comparison scenario, however the gap is still substantial. Emphasis also needs to focus on increasing new entrants to the sector.

**Table 30: Summary of other nursing sector registered and enrolled nurses, results**

Scenario	2025			2030		
	Supply	Demand	Balance	Supply	Demand	Balance
Comparison	47,240	74,702	-27,462	43,483	81,831	-38,348
Combined	50,954	70,847	-19,893	50,181	76,078	-25,897
Productivity	47,240	73,353	-26,113	43,483	79,785	-36,302
Intention to retire	45,745	74,423	-28,678	42,112	81,486	-39,374
Retirement at 65	44,236	73,815	-29,579	40,656	80,768	-40,112

### Primary health care sector profile

The nature of health care in Australia is changing. Our burden of disease is shifting with significant increases in chronic disease and multi-morbidities. Emerging health and information technologies are releasing the constraints on the way we deliver care, who can deliver that care and where the care is delivered. If we continue to conduct our workforce education and planning based on the current system, we will propagate existing models of care including the focus on acute hospital-based care. Evidence demonstrates that those health systems with strong primary health care are more efficient, have lower rates of hospitalisation, fewer health inequalities and better health outcomes including lower mortality. Now is our opportunity to prepare our future nursing workforce for the future work.

Primary health care is the first level of contact that individuals, families and communities have with the health care system. Nurses working in primary health care work in a variety of roles providing health care for the community across the lifespan. This includes health promotion and education, treatment and prevention of illness, and community development. They work in a range of settings, including general practice, community health services, Aboriginal health services, and drug and alcohol services.

Review of the data and consultation with stakeholders has enabled HWA to identify primary health care nurses, separate from the rest of the nursing workforce. However there are still data limitations, mainly in the domain of determining a demand rate for primary health care. For this reason, modelling of this sector was not conducted in this nursing update (primary health care is included in the 'other' sector for the purposes of modelling). Further investigation for these potential variables will continue.

Table 31 presents the number of nurses identified as working in primary health care. In total, there were 39,314 nurses working in primary health care in 2012. Of these, 91 per cent reported their principal role as a clinician or clinical manager.

**Table 31: Primary health care, relationship between work role, area of practice and job setting**

Principal role	Principal Area of Practice	Setting of job	Number of nurses
Clinician/clinical manager	<ul style="list-style-type: none"> <li>• Community health</li> <li>• Child and family health</li> <li>• Practice nursing</li> <li>• Rehabilitation and disability</li> <li>• Health promotion</li> <li>• Other nursing sector*</li> </ul>	All	35,917
Administrator	<ul style="list-style-type: none"> <li>• Community health</li> <li>• Child and family health</li> <li>• Practice nursing</li> <li>• Rehabilitation and disability</li> <li>• Health promotion</li> <li>• Education</li> <li>• Management</li> </ul>	<ul style="list-style-type: none"> <li>• Locum private practice</li> <li>• General practitioner (GP) practice</li> <li>• Other private practice</li> <li>• Aboriginal health service</li> <li>• Drug and alcohol service</li> <li>• Other community health care service</li> </ul>	782
Teacher/educator	<ul style="list-style-type: none"> <li>• Community health</li> <li>• Child and family health</li> <li>• Practice nursing</li> <li>• Rehabilitation and disability</li> <li>• Health promotion</li> <li>• Education</li> <li>• Management</li> </ul>	..	704
Other	<ul style="list-style-type: none"> <li>• Community health</li> <li>• Child and family health</li> <li>• Practice nursing</li> <li>• Rehabilitation and disability</li> <li>• Health promotion</li> <li>• Education</li> <li>• Management</li> </ul>	..	1911
Total	-	-	<b>39,314</b>

.. - not applicable

\*Other nursing sector refers to job settings of locum private practice, general practitioner (GP) practice, other private practice, Aboriginal health service, drug and alcohol service and other community health service.

Table 32 shows that of the nurses who identified as primary health care nurses, 84 per cent were RNs and 16 per cent were ENs. Males comprised seven per cent of both RN and EN primary health care nurses.

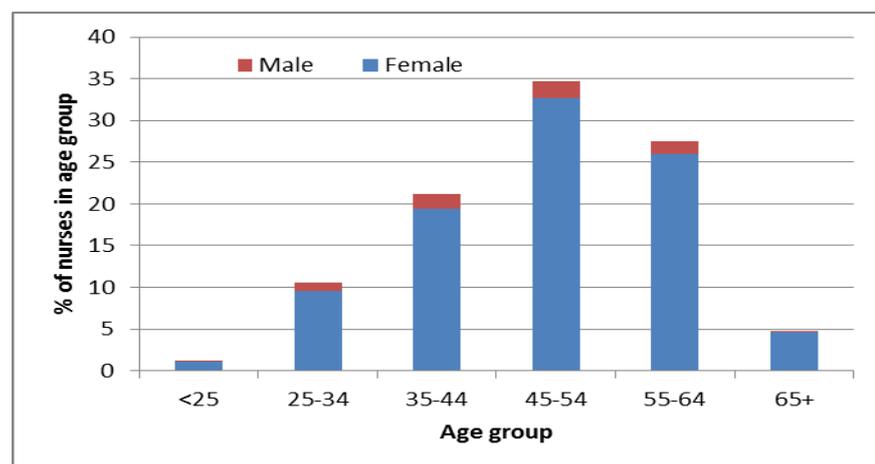
**Table 32: Primary health care sector, employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	2,182	30,697	32,879
Enrolled nurses	471	5964	6,435
<b>All nurses</b>	<b>2,653</b>	<b>3,6661</b>	<b>39,314</b>

Source: NHWDS: nurses and midwives 2012.

Figure 37 shows that of the RNs who indicated they worked in primary care, 35 per cent were aged 45-54 years, 28 per cent were aged 55-64 years and 25 per cent were aged 35-44 years. The highest percentage of males occurred in the 45-54 aged group.

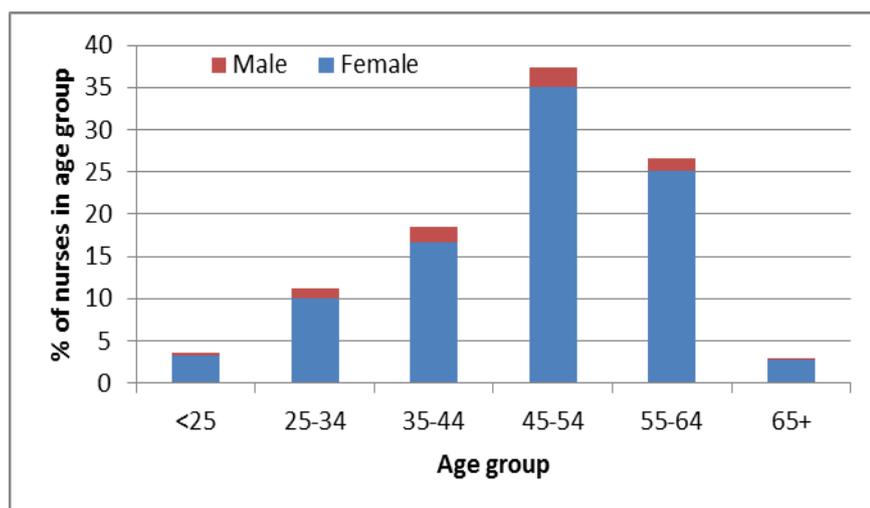
**Figure 37: Employed registered nurses, primary health care sector, by age group, 2012**



Source: NHWDS: nurses and midwives 2012.

Figure 38 shows that ENs working in primary health had a similar age profile to RNs, with 37 per cent aged 45-54 years and 27 per cent aged 55-64 years.

Figure 38: Employed enrolled nurses, primary health care sector, by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Table 33 shows that RNs and ENs worked on average 30.3 hours per week. Male RNs and ENs worked longer hours than females – by an extra 7.5 hours per week and 4.1 hours per week respectively.

Table 33: Average weekly hours, employed registered and enrolled nurses, primary health care sector, 2012

Type of nurse	Male	Female	Persons
Registered nurses	37.3	29.8	30.3
Enrolled nurses	34.1	30.0	30.3
<b>All nurses</b>	<b>36.7</b>	<b>29.8</b>	<b>30.3</b>

Source: NHWDS: nurses and midwives 2012.

### Academic sector profile

Nurses working in the academic sector design, conduct and evaluate nursing and interdisciplinary research projects, and promote the implementation of research findings into clinical nursing practice. They also design, plan, implement, evaluate and deliver nursing education programs in the tertiary sector, and manage educational resources.

Table 34 shows that 83 per cent of the 2,675 nurses who identified as academics reported their principal role as a teacher/educator in a tertiary education institution, with a further 17 per cent reporting as a researcher in a tertiary education institution.

**Table 34: Academic workforce, relationship between work role, area of practice and job setting**

Principal role	Principal Area of Practice	Setting of job	Number
Researcher	All	Tertiary education institution	462
Teacher/educator	All	Tertiary education institution	2,213
<b>Total</b>	–	–	<b>2,675</b>

Table 35 shows that of the employed academic workforce, almost all (97 per cent) are RNs. Males account for a higher proportion of academics relative to some other nursing sectors – with 12 per cent of academic RNs being males and 15 per cent of ENs.

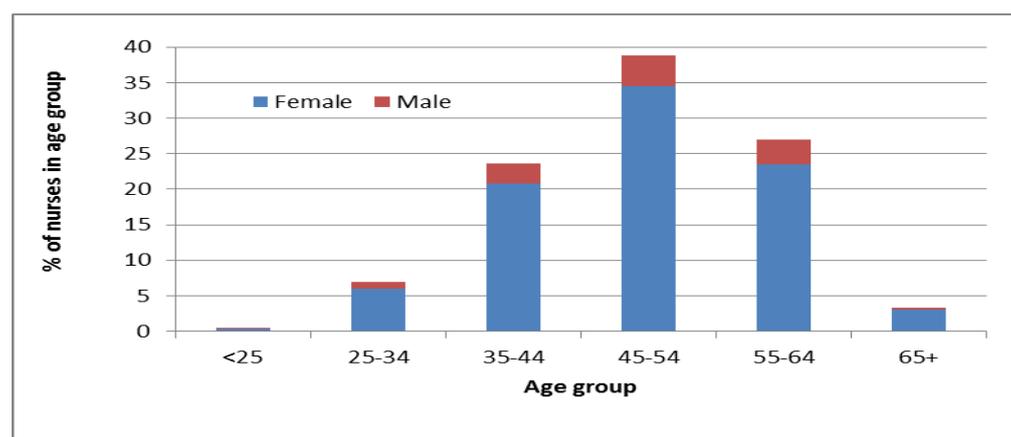
**Table 35: Academic workforce, employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	307	2,283	2,590
Enrolled nurses	11	74	85
<b>All nurses</b>	<b>318</b>	<b>2,357</b>	<b>2,675</b>

Source: NHWDS: nurses and midwives 2012.

Figure 39 show that over one-third (39 per cent) of RNs in the academic sector are aged 45-54 years, with a further 27 per cent aged 55-64 years and 24 per cent aged 35-44 years. For males, the highest proportion is in the 45-54 age group.

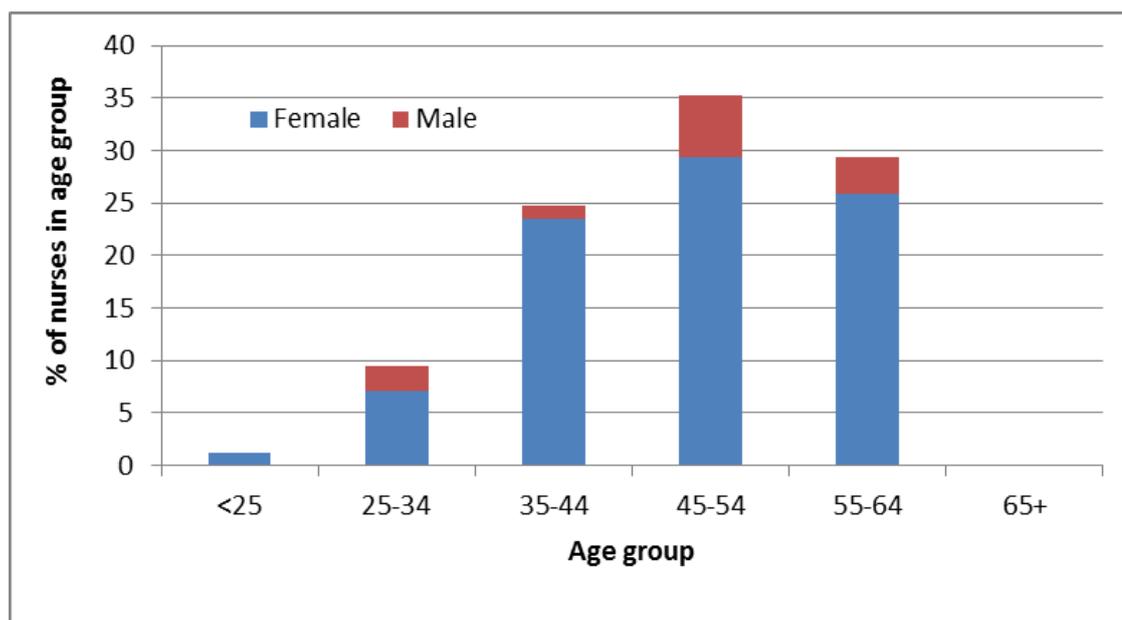
**Figure 39: Employed registered nurses, academic sector by age group, 2012**



Source: NHWDS: nurses and midwives 2012.

Figure 40 shows that ENs in the academic workforce have a similar age profile than RNs.

Figure 40: Employed enrolled nurses, academic sector by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Table 36 show the average weekly hours worked for nurses working in the academic sector. RNs worked greater average weekly hours than ENs (33.6 compared with 32.2). Male nurses also worked greater average weekly hours than female nurses (both RNs and ENs, see Table 36).

Table 36: Average weekly hours, employed registered and enrolled nurses, academic sector, 2012

Type of nurse	Male	Female	Persons
Registered nurses	38.5	33	33.6
Enrolled nurses	37.5	31.4	32.2
<b>All nurses</b>	<b>38.5</b>	<b>32.9</b>	<b>33.6</b>

Source: NHWDS: nurses and midwives 2012.

The academic workforce is not included in the modelling on the basis that researchers do not actively work in clinical settings.

### Aboriginal and Torres Strait Islander nurses profile

Aboriginal and Torres Strait Islander nurses work across all areas of practice and job settings. Aboriginal and Torres Strait Islander people are under-represented in the nursing workforce. Factors which adversely impact on the ability of Aboriginal and Torres Strait Islander nurses to succeed in the health workforce include racism, perceptions that Aboriginal people can only be Aboriginal Health Workers and negative perceptions of nurses because of their previous role in the stolen generation. These issues start in the education system where Aboriginal and Torres Strait Islander students have lower levels of commencements, and lower rates of completion.

Table 37 shows that 2,140 nurses reported as being Aboriginal and Torres Strait Islander in 2012. Of these, approximately three-quarters (77 per cent) indicated that their principal role was as a clinician or clinical manager, with 15 per cent reporting a role of 'other', four per cent a role of teacher or educator and three per cent a role of administrator.

**Table 37: Aboriginal and Torres Strait Islander workforce, relationship between work role, area of practice and job setting, 2012**

Principal role	Principal Area of Practice	Setting of job	Number of nurses
Clinician/clinical manager	All	All	1,646
Administrator	All	All	56
Teacher/educator	All	All	81
Researcher	All	All	15
Other	All	All	314
Not employed, not applicable	NA	NA	28
<b>Total</b>	<b>-</b>	<b>-</b>	<b>2,140</b>

Source: NHWDS: nurses and midwives 2012.

Table 38 shows that 64 per cent of nurses who reported as Aboriginal and Torres Strait Islander are RNs, and 36 per cent are ENs. Males comprised 12 per cent of Aboriginal and Torres Strait Islander RNs and 13 per cent of Aboriginal and Torres Strait Islander ENs.

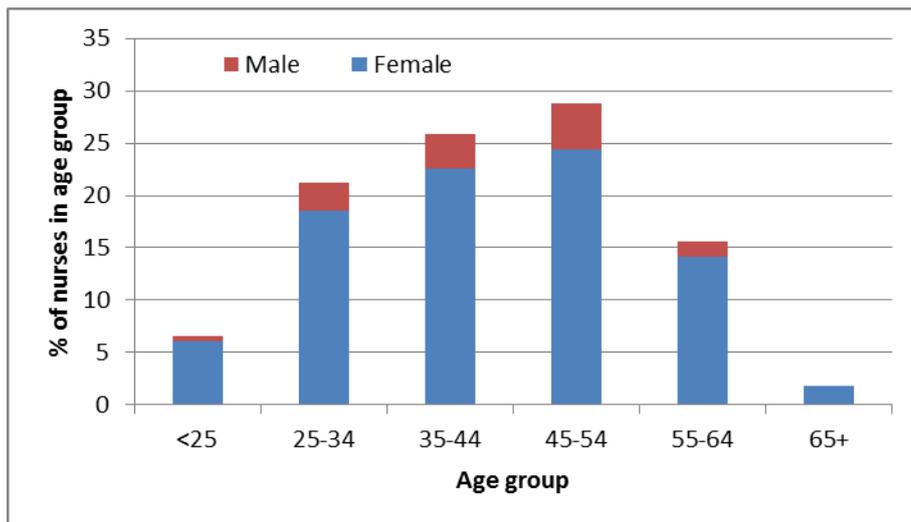
**Table 38: Aboriginal and Torres Strait Islander employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	171	1,206	1,377
Enrolled nurses	100	663	763
<b>All nurses</b>	<b>271</b>	<b>1,869</b>	<b>2,140</b>

Source: NHWDS: nurses and midwives 2012.

Figure 41 shows the age profile of Aboriginal and Torres Strait Islander RNs in 2012. The highest percentage (29 per cent) were aged 45-54 years, with 26 per cent aged 35-44 years, and 21 per cent aged 25-34 years. The highest proportion of males was in the 45-54 year age group.

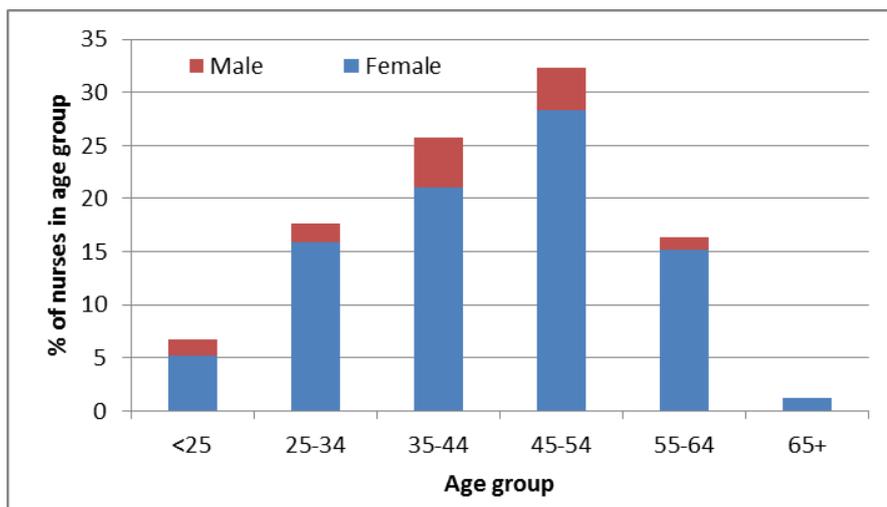
Figure 41: Employed Aboriginal and Torres Strait Islander registered nurses by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Figure 42 show that of the EN workforce, 32 per cent were aged 45-54 years, 26 per cent were aged 35-44 years, and 18 per cent were aged 25-34 years. The highest proportion of male Aboriginal and Torres Strait Islander ENs were aged 35-44 years.

Figure 42: Employed Aboriginal and Torres Strait Islander enrolled nurses by age group, 2012



Source: NHWDS: nurses and midwives 2012.

Table 39 shows average weekly hours worked for Aboriginal and Torres Strait Islander RNs and ENs is similar (33.7 hours and 33.3 hours respectively). Male Aboriginal and Torres Strait Islander RNs worked almost five hours more on average than females, and male Aboriginal and Torres Strait Islander ENs worked approximately two hours more per week on average than females.

**Table 39: Average weekly hours, Aboriginal and Torres Strait Islander employed registered and enrolled nurses, 2012**

Type of nurse	Male	Female	Persons
Registered nurses	38.0	33.1	33.7
Enrolled nurses	35.4	33.0	33.3
<b>All nurses</b>	<b>37.0</b>	<b>33.1</b>	<b>33.6</b>

Source: NHWDS: nurses and midwives 2012.

# Appendix A: Project Advisory Group members

Member	Affiliation
Chair	Executive Director, Information Analysis and Planning, Health Workforce Australia
Ms Heather Witham	Aged and Community Services Australia
Associate Professor Kim Ryan	Australian College of Mental Health Nurses
Professor Deb Thoms	Australian College of Nursing
Ms Alison McMillan	Australian and New Zealand Council of Chief Nurses
Ms Amanda Adrian	Australian Nursing and Midwifery Accreditation Council
Ms Julianne Bryce	Australian Nursing and Midwifery Federation
Ms Kathy Bell	Australian Primary Health Care Nurses Association
Ms Liz Spaul	Australian Private Hospitals Association
Ms Liz Callaghan	Catholic Health Australia
Ms Janine Mohamed	Congress of Aboriginal and Torres Strait Islander Nurses and Midwives
Professor Di Twigg	Council of Deans of Nursing and Midwifery (Australia and New Zealand)
Ms Geri Malone	CRANaplus
Ms Shirley Browne	Department of Social Services – Ageing and Aged Care Division
Ms Penny Shakespeare	Department of Health – Health Workforce Division
Dr Rosemary Bryant	Department of Health – Chief Nurse and Midwifery Officer
Ms Robyn Burley	Health Workforce Principal Committee
Mr David Stewart	Health Workforce Principal Committee
Ms Kay Richards	Leading Age Services Australia
Dr Lynette Cusack	Nursing and Midwifery Board of Australia

# Appendix B: Workforce planning data sources

## Demand data sources

Nursing specialty	Data items to be included	Method
Acute	Hardes forecasting method	Utilisation - Bed days by population,
Critical care , high dependency and emergency	<ul style="list-style-type: none"> <li>• Hardes forecasting method</li> <li>• Australia New Zealand Intensive Care data</li> <li>• AIHW</li> </ul>	<ul style="list-style-type: none"> <li>• DRGs; separations for emergency</li> <li>• Beds and staffing</li> <li>• Emergency presentations</li> </ul>
Aged care	<ul style="list-style-type: none"> <li>• Hardes forecasting method</li> <li>• HACC</li> <li>• NILS</li> <li>• AIHW</li> </ul>	<ul style="list-style-type: none"> <li>• Residential aged care: high and low care bed days</li> <li>• Proportions of the workforce within nursing i.e. AINs and PSAs</li> <li>• Population based demand – ageing profiles and workforce mix</li> </ul>
Mental health	<ul style="list-style-type: none"> <li>• National Health Survey Data</li> <li>• AIHW</li> </ul>	<ul style="list-style-type: none"> <li>• Need data on increasing demand and trend data</li> <li>• Labour force survey</li> <li>• Inpatient and community data is required for this category</li> <li>• Establishments of data</li> </ul>
Other registered nurses	<ul style="list-style-type: none"> <li>• Hardes forecasting method</li> <li>• Community care data collections</li> <li>• Primary health care data</li> <li>• Medicare data</li> </ul>	DRGs by bed days for registered nurses

## Supply data items

Supply data sources and datasets	Application of Data	Data Limitations	Data/Methodology Assumptions	Datasets
AHPRA	<ul style="list-style-type: none"> <li>A combination of AHPRA registration and workforce data will be used to determine the baseline numbers.</li> <li>Survey data will also be used to model exits and re-entries</li> </ul>	As with any large, self-reporting survey, there are issues of data quality. Respondents do not answer every question and can interpret each question differently.	Generally accepted conventions have been applied. These include the exclusion of data which is obviously in error (for example, individual who claims to be > 100 years old or working 200 hours per week) and the apportionment of non-responses in proportion to valid responses.	AHPRA registration and labour force surveys data
AIHW	AIHW labour force data will be used for historical workforce data.	Same issues as those identified in the AHPRA dataset.	Same methodology employed as those described in the AHPRA dataset.	AIHW labour force surveys data
Innovation (DIICCS RTE)	A primary source for registered nurses course commencements and completions	Data does not distinguish between study year	Entries into the workforce are measured as total students divided by length of course in years. Individual courses and University will be modelled to generate graduate pipeline	DEEWR student data for nurses and midwives workforce entrants
DIAC	Enrolled nursing immigration data	Data may not reflect those that have necessarily entered the workforce in a given year	Data acts as only a proxy for employment	DIAC immigration and arrivals data
NCVER	Compile dataset of Enrolled Nurses, Midwifery students/graduates for graduate pipeline	Data does not distinguish between study year (an issue for accurate pipelining)	Entries into the workforce are measured as total students divided by length of course in years. Individual courses will be modelled to generate graduate pipeline	NCVER student data for nursing/ mid-wife workforce entrants

# Appendix C: Workforce planning methodology

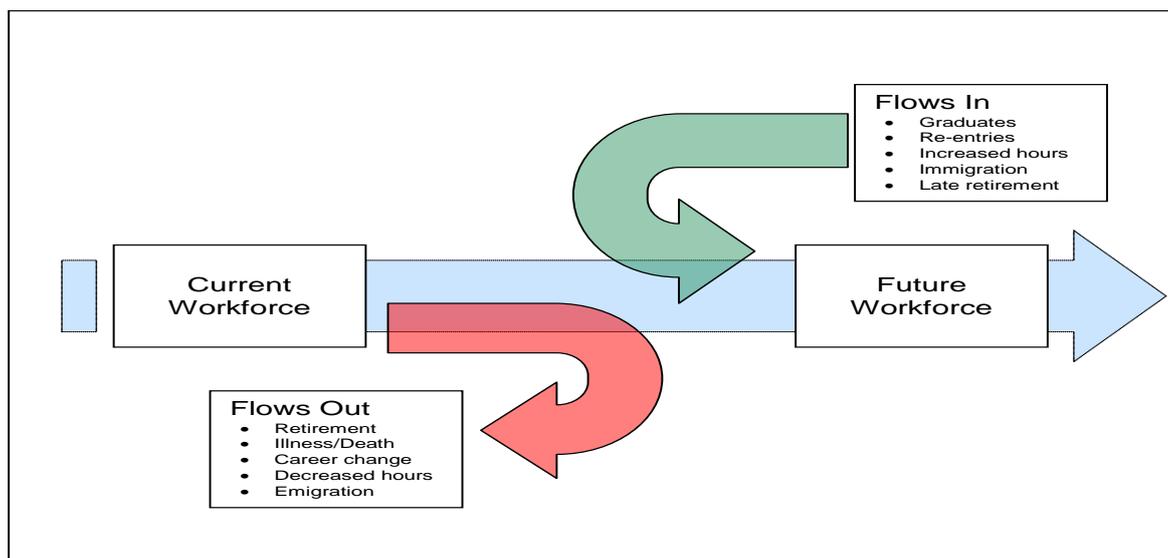
## Supply methodology

The principal method used to develop the nursing workforce projections is mathematical simulation modelling, using the National Health Workforce Tool. The simulation model employed to generate the workforce supply projections is a dynamic stock and flow model.

A stock and flow model involves identifying the size and activity of the current workforce (stock) and sources of inflows and outflows from the stock (people entering and exiting the workforce), as well as looking at trends or influences on the stock and flows. To project future supply, the initial stock is moved forward based on expected inflows and outflows, allowing for the impact of trends and influences in the stock. The workforce is broken down into age and gender cohorts, and different flow rates are calculated by cohort and year for each of the input and output factors.

The nursing workforce projections used a dynamic version of the stock and flow approach. This means the stock of the workforce is affected by inflows and outflows to adjacent age cohorts within the stock, as well as external inflows and outflows. That is, each age and gender cohort receives inflows not just from graduates and migration (external flows), but also from people ageing within the model that move from one age cohort into the next. For example, someone moves from the 30 to 34 cohort into the 35 to 39 cohort. Similarly, each age and gender cohort has exits applied – exits as people leave the workforce altogether, and exits as a person moves into the next age cohort. This is an iterative calculation in each year over the projection period, and provides for a more realistic representation of labour dynamics. This provides for a more realistic representation of labour force dynamics. This process is represented in Figure 43.

Figure 43: Stock and flow process



## Key inputs in the stock and flow model

There are four key inputs in the dynamic stock and flow model:

- Workforce stock
- New graduates
- Migration (permanent and temporary)
- Exits, which includes all permanent and temporary flows out of the workforce.

### Workforce stock

Calculation of the workforce 'stock' in the base year (2012) used the National Health Workforce Dataset (NHWDS): AHPRA Labour Force data. The NHWDS combines data from the annual registration process for registered and ENs, together with data from a workforce survey that is voluntarily completed at the time of registration.

The workforce stock is categorised into five-year age and gender cohorts.

### New graduates

Data from the Australian Government Department of Education, and the NCVER was used to estimate the anticipated number of new and completing graduates, based on recent trends in the number of graduating students and their expected years of completion.

Table 40 shows the number of domestic and international graduates (current and projected) for RNs and ENs to 2014. From 2014, graduate numbers are held constant in the model. Enrolled nurse numbers were held constant from 2012 numbers.

**Table 40: Projected Graduates 2012 to 2014**

Year	Registered nurse		Enrolled nurse	
	Domestic	International	Domestic	International
2012	7,238	700	3,436	646
2013	7,614	593	3,436	646
2014	8,928	558	3,436	646

### Migration

Table 41 shows temporary and permanent migration numbers in 2012 which are held constant to 2030 in the model. To avoid double counting, the number of permanent migrants who had not previously held a working visa was used as the input into the workforce projections. These numbers are calculated at 85 percent for registered and 55 percent for ENs.

**Table 41: Temporary and Permanent migrants, 2012**

Type of nurse	Permanent migration	Temporary migration
Registered nurses	522	2,650
Enrolled nurses	17	32
<b>Total</b>	<b>539</b>	<b>2,682</b>

Source: Department of Immigration and Border Protection

## Exits

Estimates of exits are based on the number of permanent departures (retirements, resignations, deaths and migration) and semi-permanent departures (absences from the workforce on a medium to long-term basis, including leave without pay and maternity leave) from national registrations.

To work out the exit rates for the nursing workforce, the current exit rates are held constant until 2015 after which the rate unwinds to the average from 2006 to 2011 and is then held constant throughout the projection period to 2030. For those aged 85+, the exits have been set at 100 percent based on the assumption that no one is likely to be working after this age.

## Demand methodology

Demand projections employed the utilisation method – which measures expressed demand, and are based on service utilisation patterns as they currently exist for five-year age and gender cohorts. The utilisation approach makes no assumptions about potential demand.

Demand for the nursing workforce is calculated:

- For the acute care nursing workforce, using hospital utilisation data length of stay and (number of bed days)
- For aged care, using residential beds (high and low care), community care packages and HACC data
- For critical care, using a national intensive care database (ANZICS) and hospital utilisation data
- For emergency care, using emergency care hospital utilisation data (number of attendances at emergency departments)
- For mental health, using a subset of the national Mental Health Dataset and community care data and Home and Community Care data.

Once calculated, this utilisation was matched against age and gender cohorts, and projected against future demographic structures.

## Training pipeline methodology

Pipelining provides a projection of the number of students needed to establish a balance between projected supply and demand in a given year. The process moves beyond unrealistic lockstep assumptions about the passage of students through the education system. That is, it does not assume that, for example, a nurse entering a three year education program will complete their training in that timeframe. Instead the methodology uses specialised flow analysis taking into account:

- Typical transition rates within courses
- Recent changes in student intakes
- Historical rates of flow through, that is, known number of beginning students and actual outputs (graduates).

## Nursing graduate pipeline

The basis for conducting the training pipeline analysis was the supply and demand workforce projections, which calculate the projected imbalance in the nursing workforce in 2030. Once that imbalance was known, the process to determine the estimated number of graduates required annually to fill the gap was to:

- Determine the period over which it is possible to fill the gap calculated by the workforce supply and demand projections (14 year period from 2017 to 2030). This was based on the first additional inflow of students occurring from 2014, with the first additional (registered nurse) graduates being produced in 2017.
- Calculate the number of graduates required annually over the 14 year period to fill the gap in 2030.
- Determine the number of additional students required in the education system to produce the additional required number of graduates annually. This was calculated by working backwards from the number of graduates required, applying a transition rate (i.e., a proportion representing the number of students that do not finish their education) to calculate the number of additional students required in the education system, to produce the additional required number of graduates annually.

## Scenarios

Scenario modelling is used to demonstrate the impact of potential policy options on future workforce supply and demand. These 'alternative futures' are modelled and measured by varying input parameters. The general method used is to present a comparison scenario, where current trends are assumed to continue into the future, and use this to compare with a range of alternative scenarios. The alternative scenarios are generated by altering parameters in the model, with the flow through effect to the future workforce measured through the impact relative to the comparison scenario.

The impact of these scenarios is measured by comparing their workforce projection results with the comparison scenario – a technical construct where current trends are assumed to continue into the future. The comparison scenario is not a prediction of the future; it should be interpreted as a 'do nothing' scenario, which assumes known policy settings are held

constant as their future levels cannot be predicted. This allows an assessment of the effects of other changes, which may impact the workforce.

These scenarios reflect the potential policy options for government, industry and education sectors to influence health workforce outcomes, as well as possible external shocks to the nursing workforce.

**Constrained demand** - This scenario presents an indicative affordability measure based on an assumption that the broad system outcomes observed historically will in some way be influenced by the (projected) decline in economic growth rates in the decades ahead. The model considers a long run growth rate of real GDP (2.7 percent p.a.) from 2015 onwards and runs through to 2030.

**Skill mix scenario** - examines the effect of alternate skill mixes in the acute and aged care sectors. These sectors were selected as they already have a diverse skill mix, and have the largest numbers of employed nurses. The skill mix scenarios work by setting demand based on fixed percentages of RNs, ENs and AIN/PCAs. Three skill mix scenarios are presented each for the acute and aged care nursing sectors:

1. Comparison scenario – which simply projects the existing workforce percentages of RNs, ENs and AINs/PCAs into the future without change. For RNs and ENs, 2012 NHWDS data was used to establish the relevant percentages. For AINs/PCAs, Australian Bureau of Statistics Labour Force Survey data was used to establish the existing percentage in the workforce.
2. Skill mix change based on limitations in training capacity – this scenario moves towards the illustrative skill mix in 2030, however achievement of this is constrained by the application of limits on what change is achievable, for example what is achievable with the changes required in training output.
3. Private example skill mix – represents the illustrative skill mix in 2030.

The scenarios also use the parameters of the combined scenario, that is, constrained labour demand, improved graduate employment rates and reduced exit rates. Where nurse inflows are projected to be above those necessary to meet this demand, they are not reduced or removed from the model. Therefore the actual percentages shown in the scenario results by nurse type and AIN/PCA in 2030 are not the exact illustrative percentage. Where additional nurses or AIN/PCAs are required to meet the illustrative percentage, these are modelled in to allow labour demand to be met.

**Combined scenario** - the combined scenario alters multiple parameters to provide a more realistic representation of what may be achieved in a real-world environment. The assumptions adopted in the combined scenario have been informed by an expert Project Advisory Group. The combined scenario is comprised of the following components.

- **Constrained labour demand** – as outlined in the previous scenario, Treasury projects reduced future economic growth. Therefore HWA is using the constrained labour demand scenario in this combined scenario, to reflect a more realistic measure of the future nursing workforce demand rate.

- **A gradual annual reduction in the RN student attrition rate.** The attrition rate of students enrolled in programs of study required for initial registration as an RN is very high (calculated to be an average of 34 percent over the past four years). Many factors contribute to this (both positively and negatively), including prior academic achievement, whether the course is the first preference of students, course fit (how well the course meets students' aspirations), quality of teaching and other factors such as language and social-economic status. However as nursing students represent the major supply source for the future nursing workforce, improvements in this rate is essential. **The combined scenario reduces attrition to 21 percent.** This is achieved by a two percent reduction per annum from 2017 until 2023, with the rate held constant (at 21 percent) thereafter.
- **An increase in the employment rate of domestic graduate RNs and ENs.** Analysis of the NHWDS showed that currently only 85 percent of RN graduates and 55 percent of EN graduates are immediately entering employment as a nurse. Contributing factors to these rates include some RN graduates being unable to find suitable graduate employment opportunities, graduates using their qualification to transition into other education opportunities, graduates choosing to enter alternate professions, and the effect of employer decisions on workforce size. **In the combined scenario, the rate of RN and EN domestic graduates entering employment is improved by ten percent respectively (to 95 percent for RN graduates and 65 percent for EN graduates).** This is achieved by a two percentage point increase per annum from 2017 until 2019, followed by a one percentage point increase per annum until 2023, with the rates held constant thereafter.
- **A small improvement in the retention of early career RNs (those aged 20 to 29 years) and all ENs aged under 60 years of age.** The early exit of nurses from the workforce gives rise to a loss of investment from training, a loss in productivity given the future years the nurse would otherwise have provided into the nursing workforce, and the significant cost of staff turnover. HWA analysis of the RN and EN workforces showed the rates at which nurses leave the profession vary by age, and that for RNs, exit rates are relatively high in early working years (even allowing for usual early career mobility), while EN exit rates are relatively high across all age cohorts. HW2025 demonstrated that retention of nurses has a major effect the projected nursing shortfall, and that if measures can be implemented to retain nurses in the workforce, the projected nursing shortfall will substantially reduce. **In the combined scenario, the exit rate for RNs aged 20 to 29 years is reduced by three percentage points, from 7.2 percent to 4.2 percent (achieved by a 0.025 annual percentage point drop from 2017 to 2028 and held constant thereafter); and the exit rate for RNs aged less than 60 years is reduced by one percentage point each year from 2017 (to no lower than the 2012 exit rate).**

**Medium self-sufficiency** - This scenario presents the results of moving towards a 50 percent reduction in net international migration (both temporary and permanent), and a 50 percent reduction in the number of international students graduating Australian nursing programs, by 2030 (starting from the number of migrants and international graduates in the base year, 2012).

**Productivity** - This scenario presents the impact on workforce supply and demand projections of a five percent productivity gain over the projection period. In this scenario, the productivity gain is not attributed to any particular measure, but could include gains achieved through workforce reforms such as changing models of care, adjustments to skill mix, health professionals working to their full scope of practice and technology changes.

**65+** - The nursing workforce is ageing and recent trends show nurses are retiring later in life. This scenario shows the impact of all nurses in the workforce retiring at age 65.

**Intention to retire** – Recent trends show nurses have been retiring later in life. This is likely due to the economic climate. If the economic climate improves, nurses may return to an earlier retirement age. This scenario considers those in the nursing workforce who are approaching retirement age (50-75 years) and shows the effect of a gradual return to historic exit rates and a 20 percent increase in exit rates for 55+ age groups from 2015.

## Assumptions

The simulation modelling techniques used to produce the projections rely on two key inputs:

- The set of assumptions about future conditions; and
- The data from which the model's parameters inputs and starting position are derived.

The assumptions are important as they affect the interpretation of workforce projection results. The projections provide likely outcomes given the assumptions on which they are based, so if any of the assumptions are not applicable or cease to reflect real world situations, the projections will not provide an accurate indication of future outcomes. For the input data, any inaccuracies that may exist will directly impact on the accuracy of the modelled results.

Major assumptions and data treatments underlying the scenarios are outlined in the following sections. These are critical to understand as the interpretation of the modelled outputs needs to be done in the context of the underpinning assumptions.

## Supply assumptions

- The base nursing workforce is set at 2012 levels.
- Workforce entrants enter the model as graduates or as internationally-trained nurses through either temporary or permanent migration streams.
- Registered nursing graduates entering the workforce are grown through to 2014 based on Department of Education data and held constant thereafter. Enrolled nurse graduates and held constant from 2012 NCVET data.
- The inflow of nursing professionals via migration is obtained from the Department of Immigration and Border Protection. The model holds constant 2012 levels of international migration. The permanent migration numbers are based on 'first-time' visa grantees i.e. only those who have not previously held a working visa.
- The proportion of graduating international students entering the workforce is calculated at 70 percent for both registered and enrolled nurses.

- Hours worked are calculated and applied separately for each age/sex cohort for both registered and enrolled nurses within each nursing sector (acute, aged care, critical care and emergency, mental health and other nursing). The data from which hours worked is calculated is taken from the National Health Workforce Dataset for 2012.
- Exit rates are calculated separately both registered and enrolled nurses within each nursing sector (acute, aged care, critical care and emergency, mental health and other nursing). They are calculated for each five year age/sex cohort.
- Exit rates are a composite measure including all forms of removal from the workforce, permanent or temporary.
- Registered nurse and enrolled nurse graduates are apportioned into each area of practice based on that area's percentage share of the workforce within each specialty i.e. registered and enrolled
- The proportion of graduating domestic students and international migrants entering the workforce is calculated at 85 percent for registered and 55 percent for enrolled nurses.
- All graduating nurses professionals are assumed to remain in the workforce, even in situations of workforce supply exceeding demand. That is, exit rates are not adjusted to take account of possible movements away from a profession in an oversupply situation
- Each nurse is treated as a full contributor to the workforce, regardless of whether they occupy training positions, such as graduate programs, or other roles with a partial training component.

### Demand assumptions

- Demand is calculated based on the growth in activity over the three year period from 2009-2012. Separate demand rates are calculated for each nursing sector, based on hospital separations, Medicare item numbers and ANZICS data. A constant, linear growth rate is then applied to the various age/sex cohorts. This provides for variation in demand as a result of different sizes of age/sex cohorts over time, but not due to different demand patterns within an age/sex cohort.
- The sizes of age/sex cohorts in the service population are calculated from ABS population projections Series B (ABS Cat No. 3222.0, Population Projections, Australia, 2012 (base) to 2101).
- Demand and supply start from an 'in balance' position. This is for the purposes of modelling only and should not be taken to imply that the workforces are (or are not) currently in balance.

### Assumptions specific to the self-sufficiency scenario

- The principle behind modelling this scenario is to progressively reduce the inflow of overseas entrants into the workforce (international graduates, and permanent and temporary migrants) to 50 percent or of their respective base levels in 2030.
- Immigration numbers are based on 'first-time' visa grantees to avoid double-counting the people who are already in the workforce or entering through the graduate stream, i.e. the initial stock includes all health workers here on a temporary visa and graduate inflows includes international students.

- Temporary migrants are modelled as a constant pool in the workforce, whereby the inflows that replenish this pool are progressively reduced under self-sufficiency scenarios.
- New permanent migrants are added each year to the workforce and inherit the general characteristics of the workforce by nursing area of practice, e.g. hours worked, likelihood of exit in a given year.
- The migration flow pattern used in the base year is held constant through to 2030.

### Updated concordance mapping

In the previous modelling of HW2025 Volume 1 and 2, only those who identified themselves in their principal role as a 'clinician' were included in the projections. However improved data quality combined with the ability to further analyse the data, indicates that there are a number of nurses who have identified their principal role as other than 'clinician' and at the same time indicated a job setting that is of a clinical nature.

For example principal roles of 'administrator' or 'other' were not included in the previous modelling on the basis that those nurses were not working in a clinical setting. Again the data indicates that the majority of these nurses state they are employed in a hospital setting, 45 percent (7,226 administrator) and 48 percent (14,123 other) respectively. These individuals are likely to be NUMs and DONs providing a sound rationale for them being included in the 'clinical' workforce being modelled.

Based on the example above, those nurses that identified themselves in the non-clinical roles, and are working in job settings of a clinical nature will be included in the modelling.

It is important to reiterate that this change in methodology will result in different projections. These cannot necessarily be compared to the previous set of nursing projections in HW2025 volume 1 and 2, but are more likely to accurately reflect the actual workforce size working within a clinical setting.

### Principal areas of practice mapping procedure

The nursing sectors included in AFHW – Nurses – Detailed Report are primarily based on the principal areas of practice in the AHPRA workforce survey data. The tables within the main body of the report outline the relationship between areas of practice and workforce characteristics. Job setting was also considered in allocating nurses to acute care, aged care and mental health where they reported 'other', or did not state their principal area of practice.

During consultation in the development of HW2025, HWA was asked to include primary health care nursing as an area of practice. Review of the data and further consultation in the update for nursing has now enabled HWA to provide a method for identifying primary health care nurses, separate from the rest of the nursing workforce. However there are still data limitations, mainly in the domain of determining a demand rate for primary health care that inhibit modelling to be undertaken in this nursing update. Further investigation for these potential variables will continue.

## Attrition method, definitions and rates

### Method

The method used to calculate RN student attrition rates is outlined here given its importance in determining RN nurse supply.

In the workforce planning projections, new graduates are one workforce supply stream. Therefore an estimate of graduate numbers needs to be calculated for this input. To do this, HWA uses historical trends in student commencements to project an estimated number of future student commencements (up to a maximum of 3 years in the future). A student attrition rate is then applied to the projected student commencements to determine the number of graduates to include as the supply stream in the workforce planning projection.

For RNs, HWA used higher education statistics from the Australian Government Department of Education on student commencements and completions (definitions of these terms are contained in this Appendix).

The attrition rate for RNs was calculated using the following formula:

$$([\text{Commencements in Year X}] - [\text{Completions in Year X+2}]) / [\text{Commencements in Year X}]$$

Rates were calculated for four periods (commencing years 2007 to 2010 and completion years 2009 to 2012). The average of the rates for each of the four periods was then calculated, and applied to the projected student commencements to obtain the estimated graduate numbers. Please note, the method HWA uses for calculating attrition for workforce planning purposes may differ to methods tertiary institutions use for their own planning and evaluation purposes.

For RN students, the historical attrition rate (2000 to 2006) has been 21 percent. The current overall attrition rate (using the commencing years 2007 to 2010 and completion years 2009 to 2012) was calculated to be 34 percent (noting that attrition rates varied across educational institutions, from a low of 18 percent to a high of 54 percent).

For ENs, an attrition rate could not be calculated. This is because of difficulties in identifying EN course commencements, as people often enrol in an EN course to only complete a specific module, rather than to qualify as an EN. Therefore for ENs, graduate inflows into the workforce planning projections were the 2012 EN course completions, which was then held constant across the projection period.

**Table 42: Registered Nurse attrition rates**

	Domestic Attrition Rate	International Attrition Rate	Male Attrition Rate	Female Attrition Rate
2007 commencements to 2009 completions	33.50%	25.59%	43.53%	31.19%
2008 commencements to 2010 completions	32.64%	19.80%	32.55%	30.25%
2009 commencements to 2011 completions	36.64%	21.06%	42.57%	32.54%
2010 commencements to 2012 completions	38.46%	24.05%	41.23%	35.20%
Attrition used	35.00%	22.00%		
Actual Average	34.24%	22.63%	39.97%	32.29%

This calculation assumes that all courses are three years in length but that is not the reality. This is more of an issue when looking at the data by University and for Universities that have large changes in numbers from year to year. Students may move from one University or course to another. This is not tracking students through courses - just total numbers.

## Definitions

### Commencing Students<sup>2</sup>

A student is a commencing student if she/he has enrolled in the course for the first time at the higher education provider or an antecedent higher education provider between 1 January of the collection year and 31 December of the collection year. An antecedent higher education provider means a higher education provider which has merged with the higher education provider at which the student's enrolment continues. Students of the following types are not to be classified as commencing students:

- students who are starting a specialised program of studies after completing, at the institution or an antecedent institution, a common initial year or years of a general program;
- students who, having completed an initial year of study at the institution or an antecedent institution then exercise a standard option of continuing their studies but at a lower level (i.e. their studies would then lead to an award at a level lower than that which pertains to the program of studies undertaken in the first year);
- students who move from course to course within a course of study;
- students who are admitted to, or transfer to a bachelor's honours course of study having previously been enrolled at the higher education provider or an antecedent higher education provider, in the related bachelor's pass course of study;

<sup>2</sup> Source: [Department of Education /uCube Higher Education Statistics](#)

- students who are admitted to, or transfer to a master's honours course of study having previously been enrolled at the higher education provider or an antecedent higher education provider, in the related master's pass course;
- students who are enrolled in a course of study at the higher education provider or an antecedent higher education provider which is upgraded in level or renamed;
- students who are resuming the same course at the higher education provider or an antecedent higher education provider after an absence;
- students continuing from the first component of a combined course to the second or later components;
- students resuming a combined course which normally leads to a single award after having been conceded an award for another course of study;
- students who have completed part of the requirements of a combined course of study at the institution and then change their enrolment to one of the components of that combined course of study;
- students who have completed part of the requirements of a unitary course of study at the institution and then change their enrolment to a related combined course of study which leads to an award or awards that subsume the award applicable to the unitary course of study; or
- students who transfer within the higher education provider from one course strain to another course strain, where the course leads to the same award (e.g. a student who changes from a BSc (Chemistry) to a BSc (Physics)).

### Completions<sup>3</sup>

The successful completion of all the academic requirements of a course which includes any required attendance, assignments, examinations, assessments, dissertations, practical experience and work experience in industry. The conferring of the award for a course is not synonymous with and should not be substituted for 'course completion' as some students may have completed all the academic requirements of the course but not have received the award.

A course completion occurs in those cases where a student is conceded an award after ceasing studies which would have led to a single award for a combined course (e.g. BA/LLb). In such cases, the course completion is for the course for which the completed units of study are counted as meeting its requirements. However, if a student is granted an award after partial completion of a combined course which normally leads to a single award, and then resumes studies of the combined course in the next year, a course completion does not occur.

Where a combined course automatically leads to two separate awards, a course completion only occurs when the requirements of both awards have been satisfied. The completion, therefore, would be for the combined course only (and not two separate completions for two awards).

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<sup>3</sup> Source: [Department of Education /uCube Higher Education Statistics](#)

