

Australia's Future Health Workforce – Nurses Overview Report

August 2014



An Australian Government Initiative

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The Australia's Future Health Workforce – Nurses Overview 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 Overview 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 Overview 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.
2. **Australia's Future Health Workforce – Nurses – Detailed Report.** 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 Report*.

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.

Recommendations

Recommendation 1

Establish a National Nursing and Midwifery Education Advisory Network (NNMEAN) to make recommendations to governments on the planning and coordination of education and employment requirements for Registered Nurses, Enrolled Nurses, Assistants-in-Nursing and Midwives. This includes implementing the key findings of this report, as well as the recommendations contained in the HWA report, *Nursing Workforce Sustainability: Improving Nurse Retention and Productivity*.

Recommendation 2

Once established, the NNMEAN should prioritise implementing the key findings of this report for the mental health nursing sector, which is projected to have the greatest nursing workforce shortfall of the nursing sectors.

Recommendation 3

Unify Australian Health Practitioner Regulation Agency (AHPRA) nursing student registration data with AHPRA nursing registration data to enhance longitudinal tracking of Registered Nurse and Enrolled Nurse graduate employment outcomes, early career retention and movements of nurses across their career through different sectors and locations.

Recommendation 4

Establish a method for collecting and calculating Enrolled Nurse education attrition data, and making this data available to inform future workforce planning.

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 mortality¹. 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.

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.

¹ Standing Council on Health (2013) National Primary Health Care Strategic Framework

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.

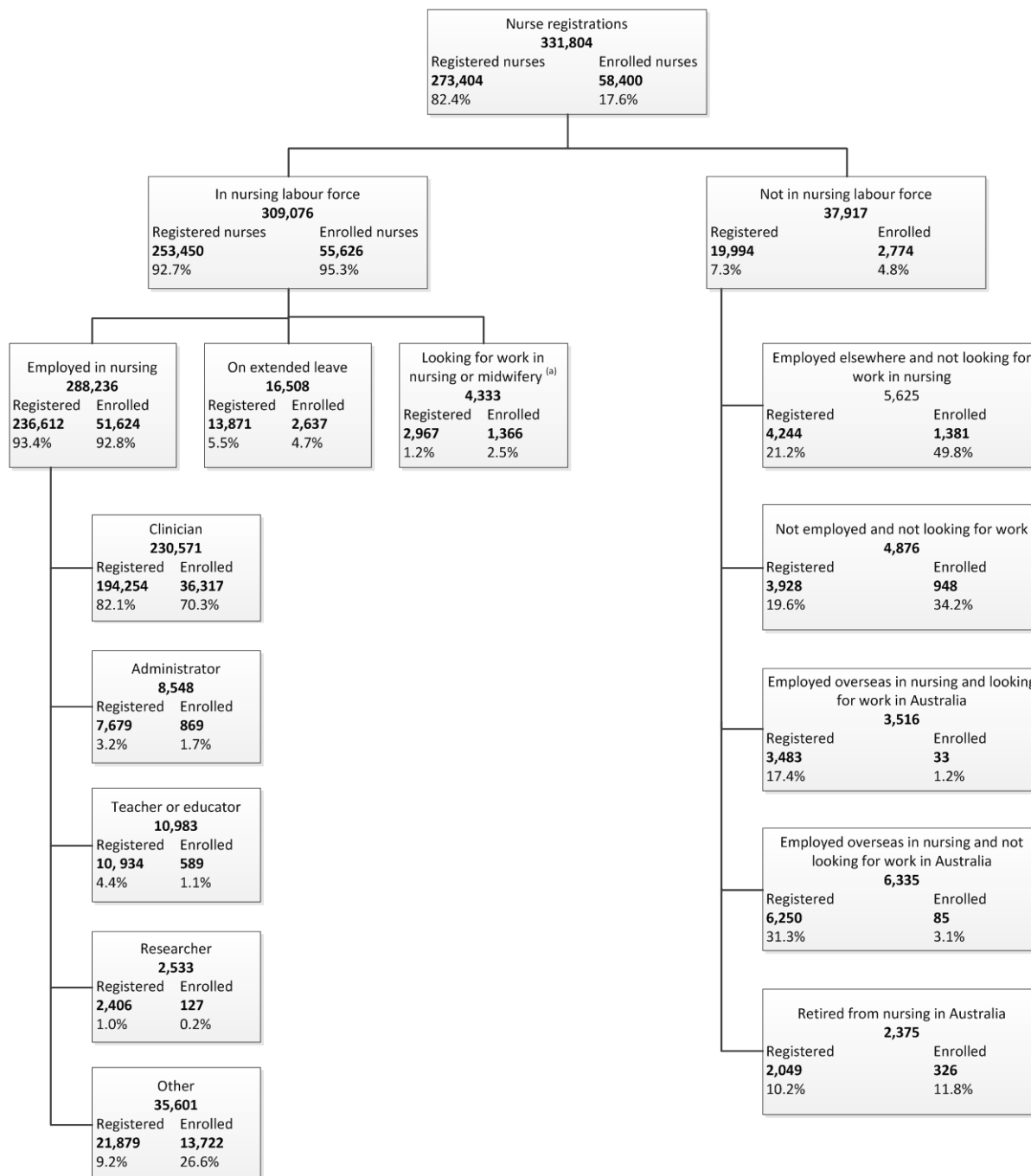
An EN usually works with RNs to provide patients with basic nursing care, doing less complex procedures than RNs. ENs must complete a Certificate IV (only available until 30 June 2014) or a Diploma of Nursing from a vocational education training provider, and are also registered with the NMBA.

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 nurses 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.

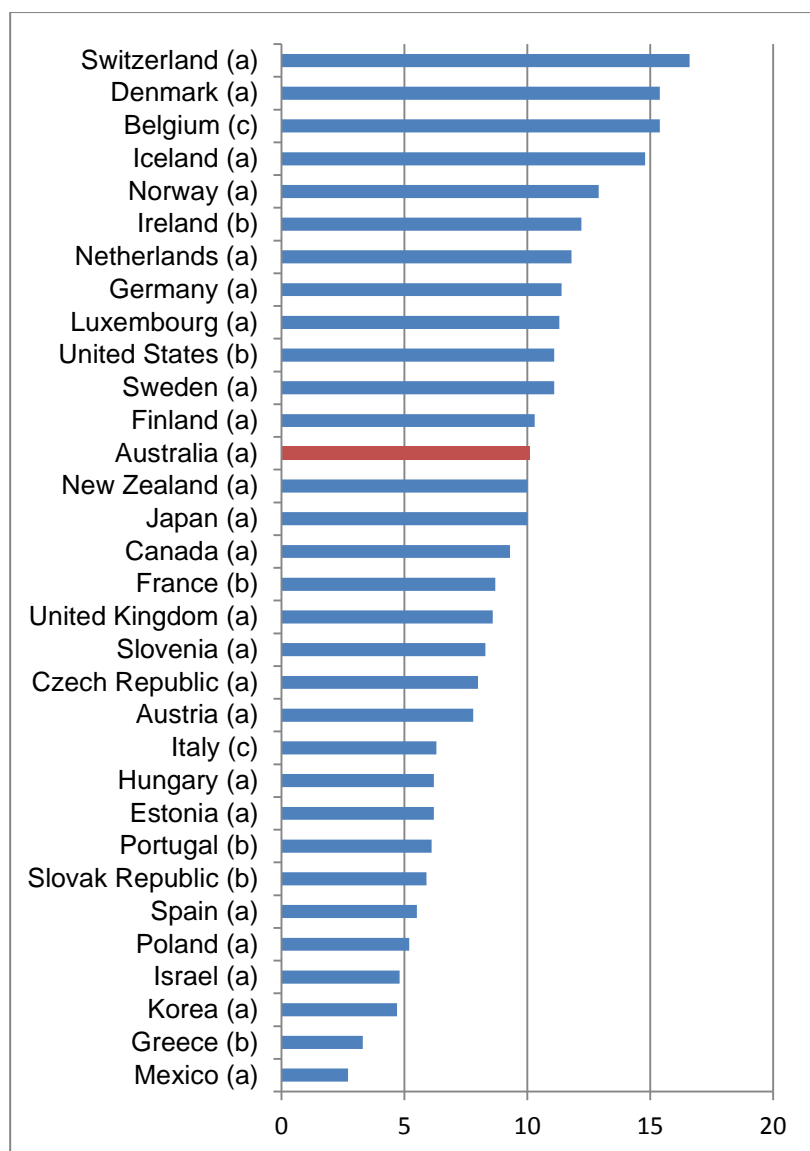
Note: Nursing role is based on main nursing job.

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: Nurses, density per 1,000 population (headcount), OECD countries, 2011 (or nearest year)



(a) Practising nurses, those providing care directly to patients in the following countries include: Switzerland, Denmark, Iceland, Norway, the Netherlands, Germany, Luxembourg, Sweden, Finland, Australia, New Zealand, Japan, Canada, the United Kingdom, Slovenia, Czech Republic, Austria, Hungary, Estonia, Spain, Poland, Israel, Korea and Mexico

(b) Professionally active nurses, which includes practising nurses plus other nurses working in the health sector as managers, educators, researchers, etc, in the following countries: Ireland, the United States, France, Portugal, Slovak Republic and Greece.

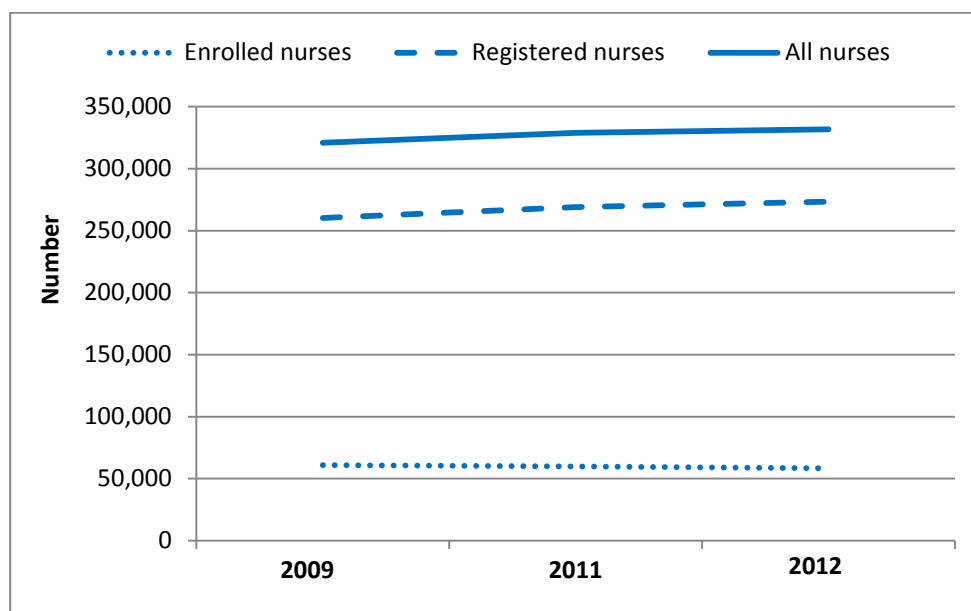
(c) All nurses who are licensed to practice and includes the following countries: Belgium and Italy.

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: Registered nurses and enrolled nurses, 2009 to 2012



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)	Percent aged 55 and over	Average age (years)	Percent aged 55 and over
Registered nurses	44.2	19.9	44.3	22.5
Enrolled nurses	44.9	19.3	46	25.9
All nurses	44.3	19.8	44.6	23.1

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
All nurses	37.3	32	32.6	37.1	31	31.6

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 by sector (public/private) 2009 and 2012

Sector	2009		2012	
	Number	Percentage	Number(a)	Percentage
Public sector	154,376	69%	155,770	66%
Private sector	70,664	31%	80,438	34%

(a) Excludes 404 registered nurses who did not state their sector of employment.
Source: AIHW Nursing and Midwifery Labour Force Survey 2009 and NHWDS: nurses and midwives 2012.

Table 4a: Employed enrolled nurses by sector (public/private) 2009 and 2012

	2009		2012	
Sector	Number	Percentage	Number(a)	Percentage
Public sector	31,818	62%	28,247	55%
Private sector	19,893	38%	23,353	45%

(a) Excludes 24 enrolled nurses who did not state their sector of employment.

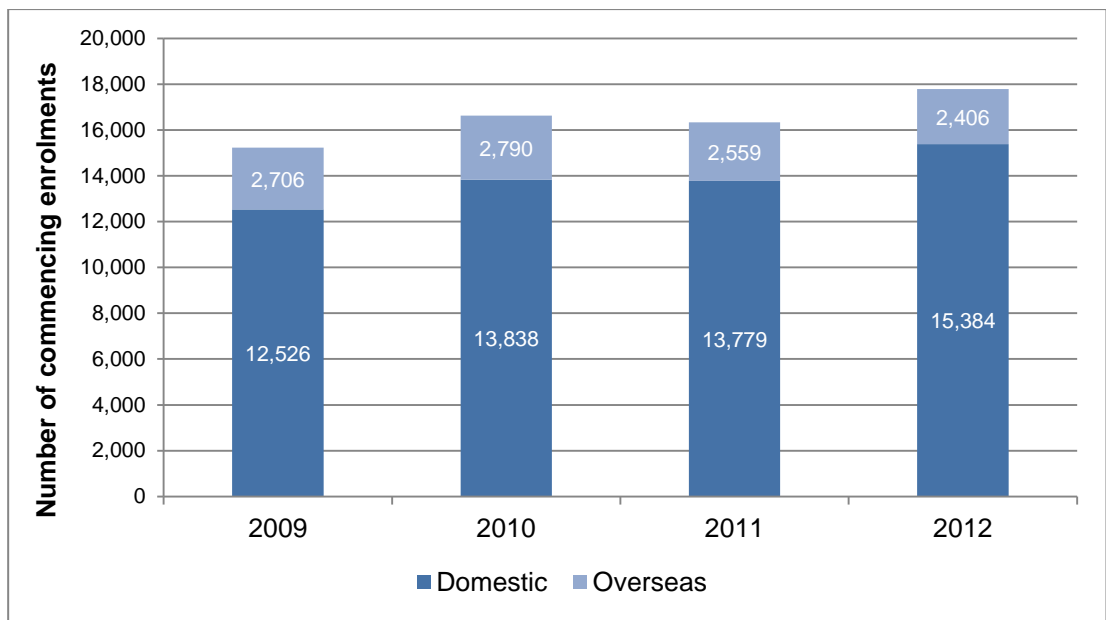
Source: AIHW Nursing and Midwifery Labour Force Survey 2009 and NHWDS: nurses and midwives 2012.

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 4). 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 4: Commencing enrolments, students undertaking programs of study required for initial registration as a RN, 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).

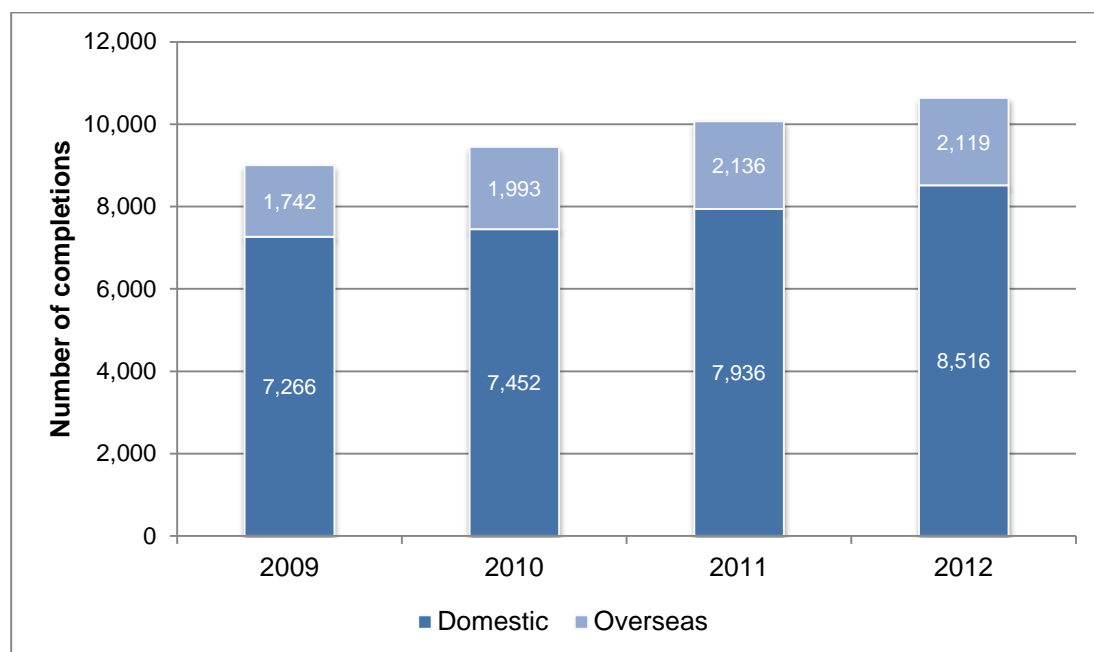
Table 5: Commencing enrolments, students undertaking programs of study required for initial registration as a RN, by gender, 2009 to 2012

	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 5).

Figure 5: Students completing programs of study required for initial registration as a registered nurse, 2009 to 2012

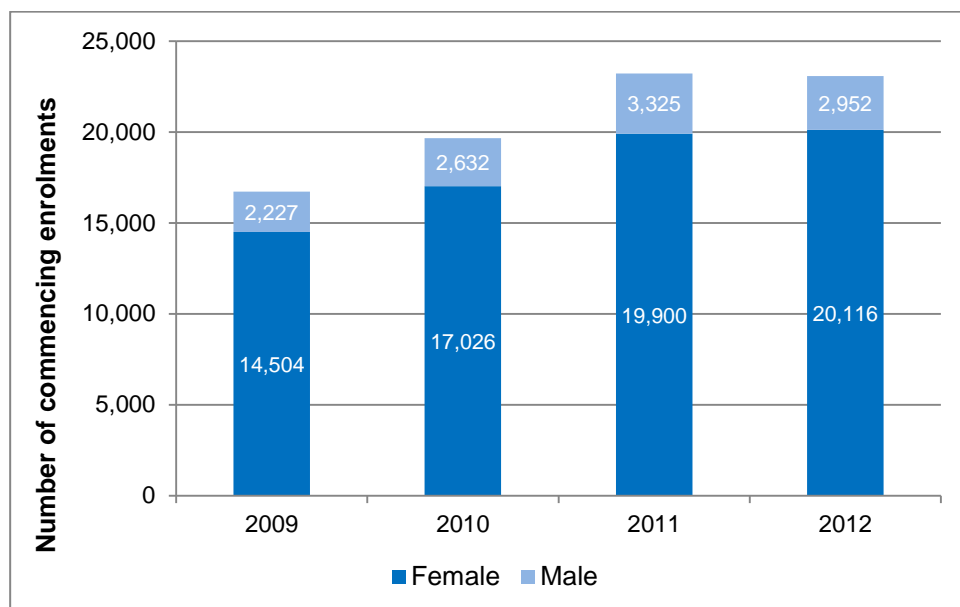


Source: Department of Education

Enrolled nurse students

EN commencing enrolments have increased by over one-third (38 percent) over the period 2009 to 2012 (Figure 6).

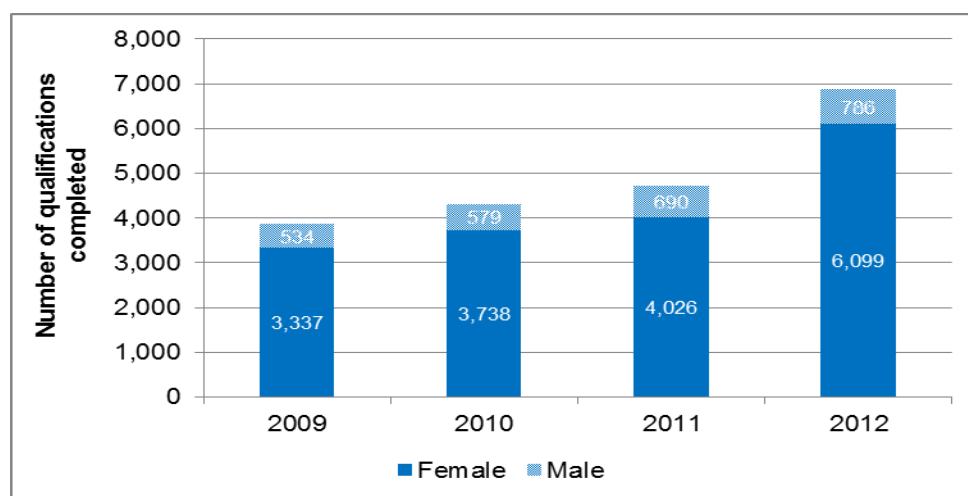
Figure 6: Enrolled nurse commencing enrolments, 2009 to 2012



Source: NCVER VET provider collection

Figure 7 shows the number of EN qualifications completed, with a substantial increase in qualifications completed in 2012 compared with the previous selected years.

Figure 7: Enrolled nurse course completions, 2009 to 2012



Source: NCVER 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	2782	3272	3762	3456	2319	2747	3124
Permanent	1863	1103	1054	1213	926	708	612
Total	4645	4375	4816	4669	3245	3455	3736

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
Total	33	29	39	42	47	50	88

Source: Department of Immigration and Border Protection

Australia's future nursing workforce

This section provides the results of HWA's updated workforce planning projections for the nursing workforce. Firstly, summary information on the projection methodology is presented, followed by the workforce planning projection results. Due to changes in the scenarios modelled, caution should be used when comparing the results in this publication with those presented in HW2025.

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.
- **Changes to the existing skill mix** in selected settings and the consequent national workforce impact.

Additional scenarios replicating those presented in HW2025 are available in the publication *AFHW – Nurses – Detailed Report*.

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.

Comparison scenario

This section provides an update of the forecast outputs for the nursing workforce as the comparison (or baseline) scenario, constructed using the methodology outlined earlier in the publication. The result of this workforce modelling is not a prediction of the future, rather it provides a comparison scenario that allows us to see a "do nothing" outcome and compare the effects of taking action.

The comparison scenario demonstrates that relative to the starting point, demand for the nursing workforce immediately exceeds supply, with the gap gradually increasing over the projection period (with demand projected to exceed supply by approximately 85,000 in 2025 and 123,000 in 2030, see Figure 8 and Table 8).

The result for 2025 is lower than the original nursing 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.

Figure 8: Comparison scenario, registered nurses and enrolled nurses, 2012 to 2030

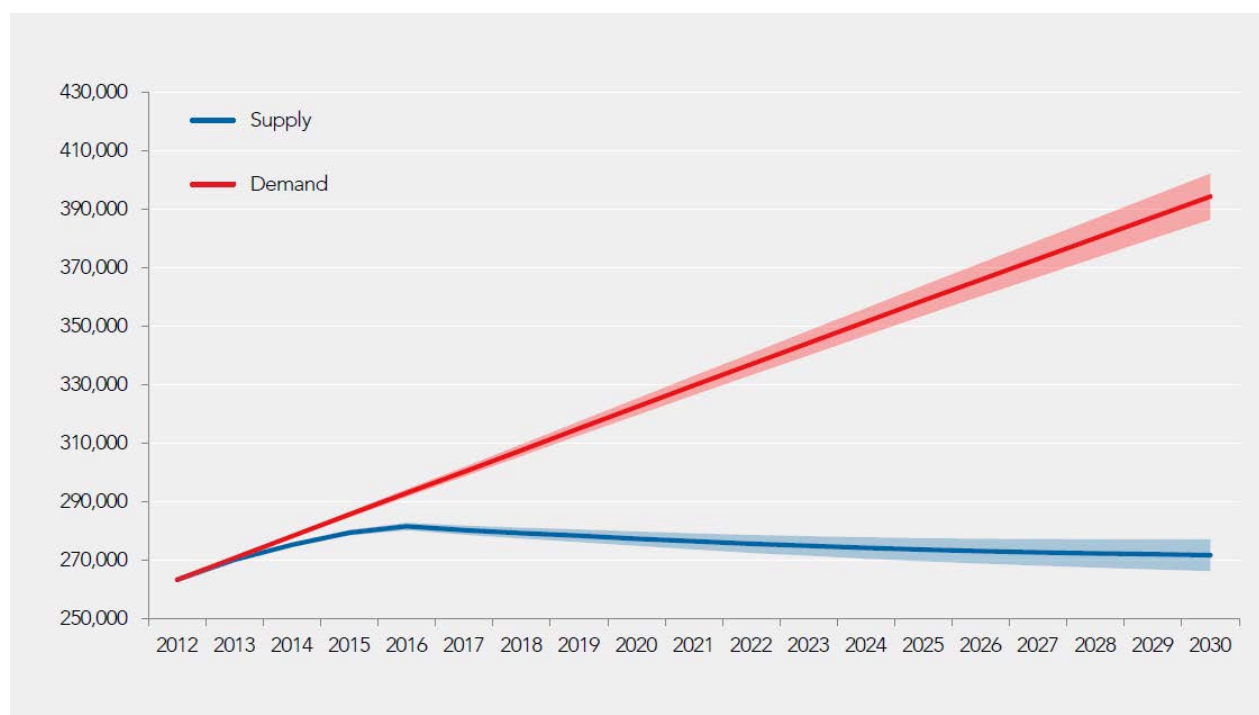


Table 8: Comparison scenario, registered nurses and enrolled nurses, selected years

	2012	2016	2018	2025	2030
Supply	263,212	281,491	279,206	273,522	271,657
Demand	263,212	292,942	307,625	358,879	394,503
Excess/Shortfall	0	-11,451	-28,419	-85,357	-122,846

Constrained labour demand scenario

The comparison scenario is constructed on the assumption that existing workforce supply and service use trends continue into the future. However changes in supply streams, service use and other factors such as funding are likely to affect future nursing workforce supply and demand.

A major factor affecting future workforce supply and demand is the economic environment. Health service provision relies substantially upon government funding,

governments are a major employer of nurses and additionally service demand may be affected by people's ability to access services. Beyond government revenue, overall economic conditions will also affect the resources available to individuals and families to support their health care needs.

Commonwealth Treasury's projections for the future show a lower long-run economic growth rate in the decades ahead (2.7 percent per annum) versus the long-run historical growth rate (3.3 percent per annum). A slowing economy will impact government revenues and private wealth, which will affect capacity to pay for health services, and is likely to have a consequent impact on labour demand across the health workforce, including for nurses.

Therefore the constrained labour demand scenario is used to demonstrate the effect of slower economic growth into the future and the potential impact this would have on the affordability of existing utilisation patterns of nursing services, and consequently, the rate of growth in nursing workforce demand.

Figure 9 and Table 9 provide the results of the constrained labour demand scenario. It shows that the projected workforce gap in 2030 reduces relative to the comparison scenario. However, it is still projected that demand for nurses would substantially exceed supply in 2030 (by approximately 94,000 nurses).

Figure 9: Constrained labour demand, registered and enrolled nurses, 2012 to 2030

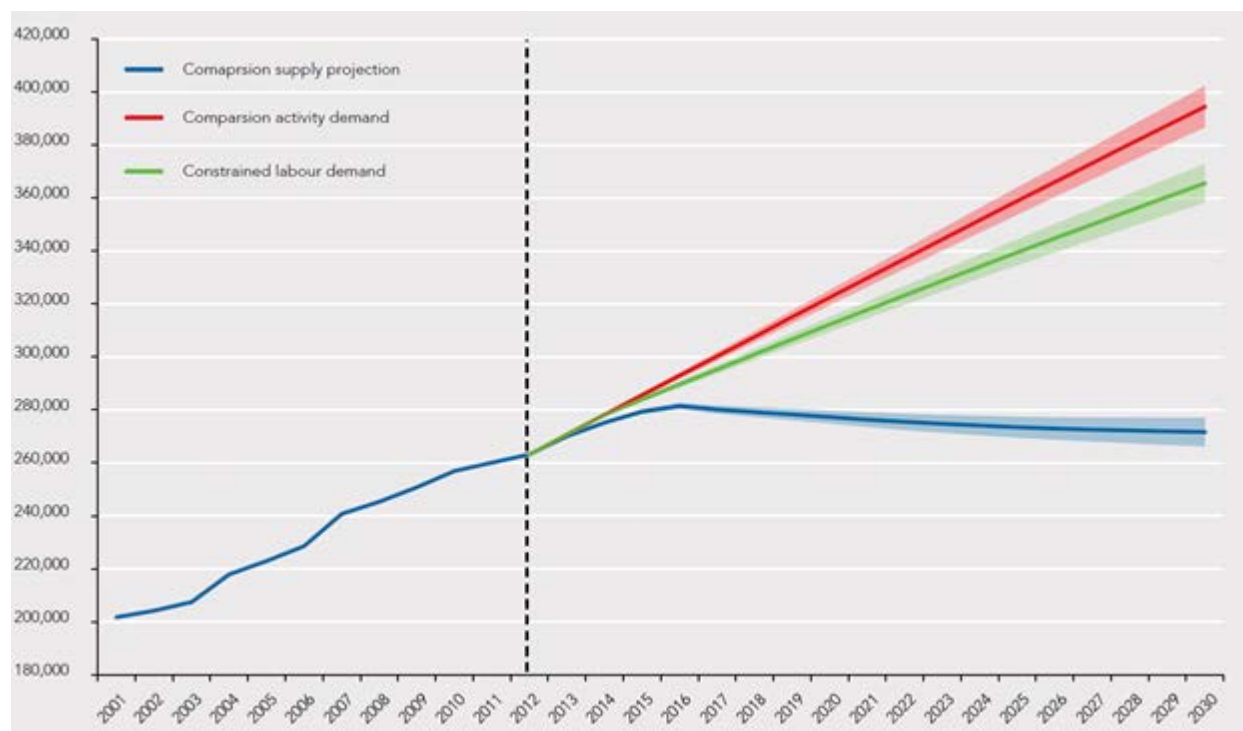


Table 9: Constrained labour demand scenario, registered nurses and enrolled nurses, selected years

	2012	2016	2020	2025	2030
Comparison supply	263,212	281,491	277,304	273,522	271,657
Comparison demand	263,212	292,942	322,448	358,879	394,503
Comparison projected excess/shortfall	0	-11,451	-45,144	-85,357	-122,846
Constrained labour demand	263,212	289,660	312,237	339,492	365,557
Constrained labour demand excess/shortfall^(a)	0	-8,169	-34,933	-65,970	-93,900

(a) Calculated as the comparison supply less the constrained labour demand.

Combined scenario

The constrained labour demand scenario demonstrates that even with the rate of nursing demand constrained by a slower economic environment, demand is still projected to substantially exceed future workforce supply. That scenario also only altered a single parameter in the model to generate an alternative future workforce scenario. While individual scenario modelling is important for understanding the effect of individual policy changes, in reality, multiple policy interventions can be made simultaneously to achieve an improved, coordinated outcome.

HWA developed a combined scenario for the nursing workforce, which 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 results, 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 and ENs aged under 60 years

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).

Figure 10 and Table 10 present the results of the combined scenario. This shows a substantial reduction in the projected nursing workforce shortfall relative to the comparison scenario. As a percentage of supply, the combined scenario reduces the shortfall of nurses from 45 percent (in the comparison scenario) to 14 percent. This highlights the substantial impact that coordinated small improvements across several policy areas can have.

Key findings from the combined scenario

Actions to address Findings 1 and 2 would increase future nursing supply.

1. Reduced student attrition in courses required for initial registration as a Registered Nurse.
2. Improved rates of Registered Nurse and Enrolled Nurse graduates entering employment.

Actions to address Findings 3 and 4 would also increase nursing supply through improved retention of nurses.

3. A reduced exit rate for early career RNs.
4. A reduced exit rate for Enrolled Nurses aged under 60 years of age.

Figure 10: Combined scenario results, registered nurses and enrolled nurses, 2012 to 2030

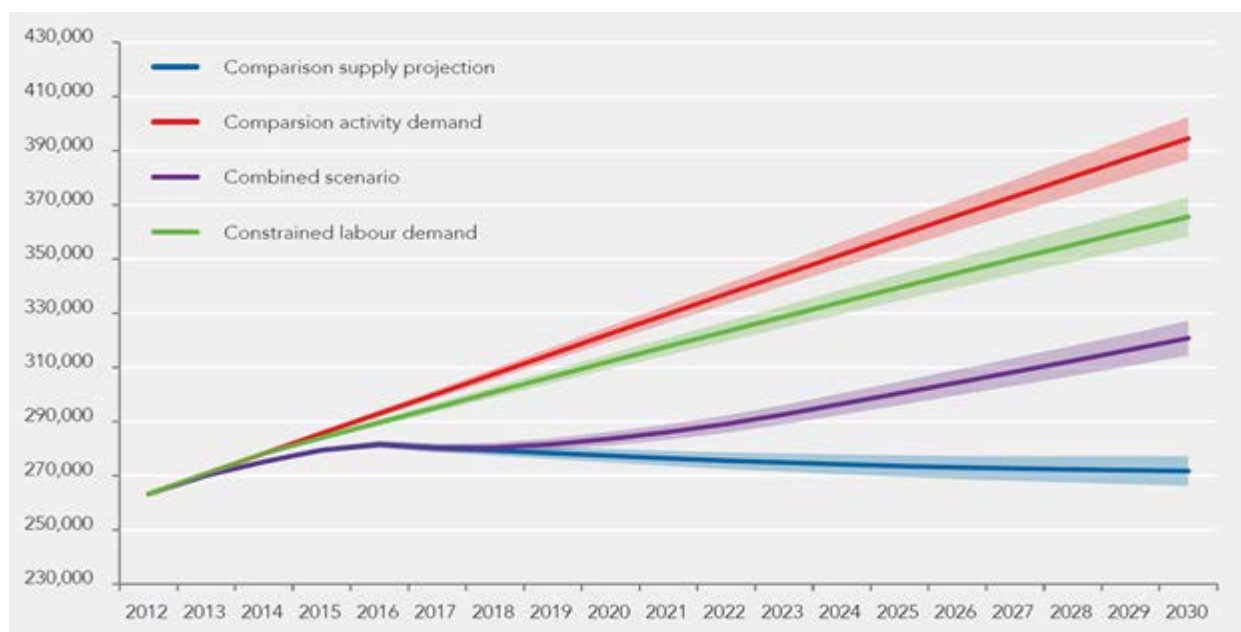


Table 10: Combined scenario, registered and enrolled nurses, selected years

	2012	2016	2020	2025	2030
Comparison supply	263,212	281,491	277,304	273,522	271,657
Comparison demand	263,212	292,942	322,448	358,879	394,503
Comparison projected excess/shortfall	0	-11,451	-45,144	-85,357	-122,846
Combined scenario supply	263,212	281,491	283,623	300,398	320,722
Constrained labour demand	263,212	289,660	312,237	339,492	365,557
Excess/shortfall ^(a)	0	-8,169	-28,614	-39,094	-44,835

(a) Calculated as the combined scenario supply less the constrained labour demand.

Table 11 shows the actual annual change in workforce supply headcount that results from each of the parameter changes incorporated in the combined scenario. The reduced exit rate has the greatest impact on increasing workforce supply across the projection period. This is consistent with HW2025 findings, which demonstrated nursing retention had the greatest impact on reducing the projected workforce gap.

Table 11: Combined scenario, annual change in workforce supply headcount, 2017 to 2030

Type of change	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Student Attrition	331	643	937	1,066	1,178	1,292	1,394	1,327	1,265	1,208	1,156	1,108	1,063	1,020
Graduate employment	271	530	788	1,028	1,238	1,459	1,662	1,587	1,518	1,457	1,403	1,354	1,311	1,271
Decrease exit rate	543	992	1,164	1,193	1,209	1,222	1,233	1,251	1,278	1,303	1,330	1,435	1,512	1,621
Total	1,145	2,165	2,889	3,287	3,625	3,973	4,289	4,165	4,061	3,968	3,889	3,897	3,886	3,912

Skill mix scenarios

The scenarios above are based on the assumption that current nursing configurations remain the same into the future. Arguments exist that there is scope to change the skill mix in the nursing workforce whilst maintaining safe, quality patient care.^{2,3} Drivers for such change include freeing up of RN and EN resources to be employed across the nursing sectors in more complex practice activities, cost savings delivered by a changed skill mix, as well as increased job satisfaction for highly-trained professionals performing the role they were trained for, with likely consequent effects on workforce retention.

HWA has therefore generated two skill mix scenarios to demonstrate the potential effect across the national workforce of changes to the existing skill mix. These scenarios have been generated for the acute and aged care nursing sectors as they already have a diverse skill mix, and have the largest numbers of employed nurses. The alternate skill mixes that have been modelled are illustrative examples only. HWA does not endorse any specific skill mix.

Construction of the skill mix scenarios

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.

Acute sector

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 11 and Table 12.

² Aiken L, Clarke S, Sloane D, Sochalski J, Silber J, 2002, 'Hospital nurse staffing and patient mortality, nurse burnout and job dissatisfaction. *The Journal of the American Medical Association*, 288(16), pp.1987-1993.

³ Duckett, S., Breadon, P. and Farmer, J. 2014, *Unlocking skills in hospitals: better jobs, more care*, Grattan Institute.

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 11: Acute sector skill mix scenario

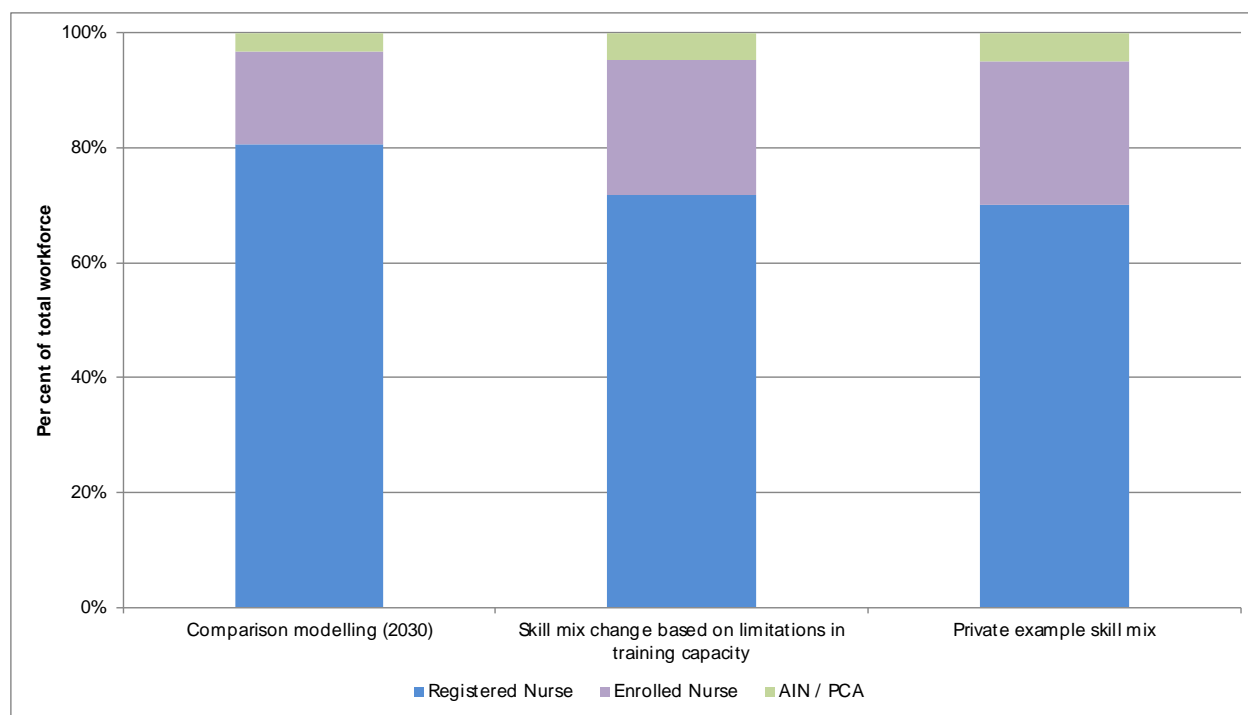


Table 12: Acute sector skill mix scenario results

Nursing type	Comparison 2012	Comparison 2030	Skill mix change 2030	Extra from Comparison	Private example 2030	Extra from Comparison
RN	100,128	127,762	127,762	0	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
Total	121,852	158,578	178,280	19,702	168,195	9,617

Aged care sector

For 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 12 and Table 12.

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 12: Aged care sector skill mix scenario

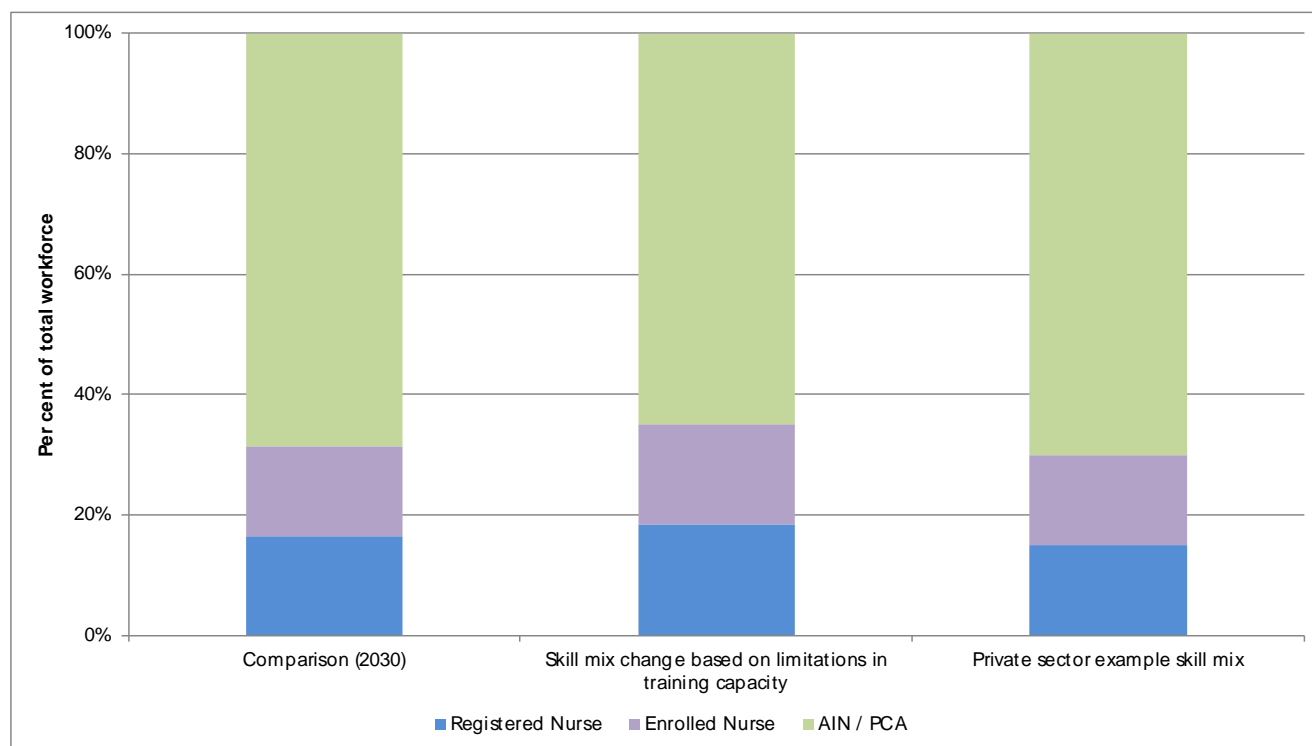


Table 13: Aged care sector skill mix scenario results

Nursing type	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
Total	140,833	190,362	170,315	-20,046	157,656	-32,706

Cost implication of the skill mix scenarios

HWA also conducted a cost analysis of the impact of the skill mix scenarios. This compared the differential cost of meeting projected future demand between the combined scenario (that is, retention strategies are in place and constrained labour demand is also in place) with the change in skill mix built upon this base.

The costing was based on the following parameters:

- The assumption that there is no change in skill mix configuration until 2015 onwards, so there is no cost difference between 2012 to 2014 under the two approaches
- All analysis is in real terms, and costs of wages and education costs are included

The focus of the costing analysis should be on the differences achieved in savings, rather than the absolute costings themselves. In net present cost terms, the total saving over the period 2015 to 2030 is estimated to be \$7.2b. This is an average of \$450m per year, with

the savings being strongly weighted to the later part of the projection period as the adjustment to the skill mix becomes more apparent.

Most of this saving (approximately 93 percent) is attributable to wage differences in a nurse mix that has a lower percentage of RNs than current levels (noting that the absolute number of RNs and ENs in 2030 is greater than in 2012). Reduced education costs form the seven percent balance of savings.

Approximately 53 percent (or around \$3.8b) of this total cost saving over the period 2015 to 2030 is attributable directly to the change in the skill mix within the nursing workforce (that is, a change in the relative proportions of nurse types employed across the workforce) in the direction of the private sector examples described above.

The balance of savings (\$3.4b) reflects the cost savings associated with meeting the projected labour demand gaps associated with the changed structure of the workforce following the implementation of the skill mix change. A key benefit of the skill mix scenarios is the effective 'freeing up' of RNs (in both skill mix scenarios) and ENs (in the aged care sector) to work in other nursing sectors where there are significant shortfalls in workforce projected. Given the relative expense involved in training and employing RNs versus other types of nurse and assistants, this contributes significantly to the projected cost savings.

Key finding of the skill mix scenarios

Actions to address Finding 5 would increase nursing productivity.

5. Maximise the full potential of the available workforce including assistant and support workers as an integral part of the nursing team by aligning skill mix for patient requirements.

Conclusion

This report represents a further advance on HWAs HW2025 reports. For the first time it presents a combined scenario demonstrating the effects of small improvements across multiple policy levers, which presents a more realistic future vision than what has been modelled previously.

The scenario results in AFHW – Nurses are consistent with the results of HW2025, and continue to show demand for nurses will exceed supply in the future. However this publication shows that the shortfall can be significantly counteracted by a coordinated approach across governments, employers, the profession and the tertiary education sector. This is demonstrated in the 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 constrains workforce demand.

The recommendations and key findings of this publication are primarily derived from the findings of this combined scenario. The establishment of a National Nursing and Midwifery Education Advisory Network (NNMEAN) is recommended to implement the key findings, which are demonstrated to have a substantial impact on reducing the projected nursing workforce shortfall.

While many of the issues raised by this report are not new, Australia is better placed than ever to respond constructively to the challenges ahead by bringing together all the key players and decision makers through a NNMEAN, with a focus on the nursing workforce as a collective national asset.

Glossary

Capped working hours – The capped hours scenario was created by reducing the working hours of any individual who reported working in excess of 50 hours per week to 50. The working hours of individuals who reported working 50 hours or less per week were left unchanged. As this approach does not directly impact headcount (which the model results are reported on) the effective reduction in headcount based on changes to the full-time equivalent induced by this change is reported.

Direct Entry Midwife – A direct entry midwife is educated in the discipline of midwifery in a program or path that does not require prior education as a nurse and which leads to registration under the National Law with Australian Health Practitioner Regulation Agency (AHPRA).

Enrolled Nurse (EN) – An EN is a nurse who provides nursing care, working under the direction and supervision of a RN. The supervision may be direct or indirect according to the nature of the work delegated. ENs are registered under the National Law administered by the AHPRA.

Full-time equivalent (FTE) – The model calculates FTE on a per specialty/area of practice basis based on the initial headcount in those groups multiplied by their reported clinical hours worked (based on an average calculated on a per gender and per age group basis). This is then divided by a standardised assumption about what constitutes a single FTE across the workforce modelled (38 hours per week for the nursing workforce) to generate the FTE quantity.

Graduate nurse – A student who has completed a Diploma or Bachelor of Nursing.

Headcount – The initial headcount in the model is based on actual AHPRA 2012 Labour Force Survey numbers, grouped according to the relevant nursing area of practice being modelled. Each individual record contains a area of practice, gender, age and hours worked data item.

Midwife – A midwife is a person with appropriate educational preparation and competence to practise, who is registered under the National Law administered by AHPRA to practise midwifery in Australia. Most midwives are also licensed RNs who have additional midwifery qualifications. Their licence records that they are a RN with a midwifery endorsement.

Registered Nurse (RN) – A RN is a person with appropriate educational preparation and competence to practise, who is registered under the National Law administered by the AHPRA to practise as a RN in Australia.

Productivity – Productivity is the output obtained from a given level of inputs. The modelling scenario that increases productivity represents this as an effective decrease in demand because the ability to produce more with less requires fewer persons to deliver a given quantum of services.

Self-sufficiency – In the context of the modelling, self-sufficiency scenarios represent a reduction in the temporary and permanent migration input into the health workforce as well as a reduction in the internationally trained nurses in the nursing workforce.

Skill mix (nursing) – the combination of different categories of staff providing nursing care within a setting.

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

Member	Affiliation
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"> • Hardes forecasting method • Australia New Zealand Intensive Care data • AIHW 	<ul style="list-style-type: none"> • DRGs; separations for emergency • Beds and staffing • Emergency presentations
Aged care	<ul style="list-style-type: none"> • Hardes forecasting method • HACC • NILS • AIHW 	<ul style="list-style-type: none"> • Residential aged care: high and low care bed days • Proportions of the workforce within nursing i.e. AINs and PSAs • Population based demand – ageing profiles and workforce mix
Mental health	<ul style="list-style-type: none"> • National Health Survey Data • AIHW 	<ul style="list-style-type: none"> • Need data on increasing demand and trend data • Labour force survey • Inpatient and community data is required for this category • Establishments of data
Other registered nurses	<ul style="list-style-type: none"> • Hardes forecasting method • Community care data collections • Primary health care data • Medicare data 	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"> A combination of AHPRA registration and workforce data will be used to determine the baseline numbers. Survey data will also be used to model exits and re-entries 	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 (DICCSRTE)	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

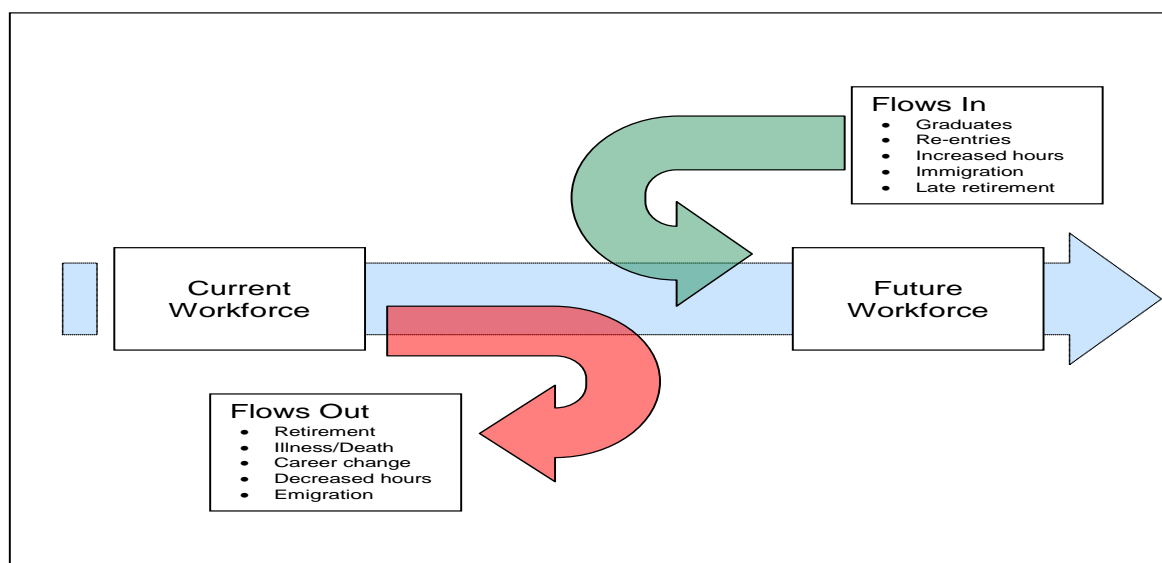
Supply methodology

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 13.

Figure 13: 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 14 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 14: Projected Graduates 2012 to 2014

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

Migration

Table 15 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 15: Temporary and Permanent migrants, 2012

Nursing type	Permanent migration	Temporary migration
Registered nurses	522	2,650
Enrolled nurses	17	32
Total	539	2,682

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

Combined scenario – assesses the impact of improvements across multiple settings. This scenario is modelled based on the following assumptions:

- Attrition rate has been dropped from 34 percent in education to 21 percent based on a 2 percent p.a. drop from 2017 to 2023 and holding it constant thereafter.
- The proportion of domestic graduate students entering the workforce has been increased from 85 percent to 95 percent for registered and 55 percent to 65 percent for enrolled nursing based on a 2 percent p.a. increase from 2017 to 2021 and holding it constant thereafter.
- Exit rate for age groups 20 to 29 in the area of registered nursing has been dropped by a total of four percentage points based on a 0.5 percentage point drop each year from 2017 to 2023 and held constant thereafter.
- Exit rates for age groups 15 to 59 in the area of enrolled nursing has been dropped by one percentage point each year from 2017 but 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 NCVER 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 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:

$$([Commencements\ in\ Year\ X] - [Completions\ in\ Year\ X+2])/[Commencements\ in\ Year\ x]$$

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 21percent. 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 16: Registered Nurse attrition rates

Category	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 Students⁴

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

⁴ Source: Department of Education [uCube Higher Education Statistics](#)

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;
- 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)).

Completions⁵

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

⁵ Source: Department of Education [uCube Higher Education Statistics](#)

completion, therefore, would be for the combined course only (and not two separate completions for two awards).

