Modelling Gippsland’s Future Health and Community Services Workforce

Summary Report

April 2019

# About this report

This Summary Report was commissioned by the Latrobe Valley Authority of the Victorian Government. Funding was provided by the Latrobe Valley Authority, Latrobe City Council, Latrobe Regional Hospital, and the Department of Health and Human Services. The full, longer version of this report can be obtained from the Latrobe Valley Authority.

The full Swinburne University of Technology research team is listed below.

Malcolm Abbott – Project Manager

Alexis Esposto – Senior Researcher

Aron Perény – Researcher

Juan Felix Agudelo - Researcher

The analysis presented in this document is that of the authors and may not reflect the views of the Latrobe Valley Authority, the other funding bodies or those interviewed.

****

The project team thanks those stakeholders that participated in the survey and those who agreed to be interviewed. The latter include:

|  |  |
| --- | --- |
| Andrew Waller | Latrobe Valley Authority |
| Holly Perriam | Latrobe Valley Authority |
| Jenni Hardy | Latrobe Valley Authority |
| Kate Kerslake | Latrobe City Council |
| Helen Taylor | Latrobe City Council |
| Don McRae | Latrobe Regional Hospital |
| Anita Raymond | Latrobe Regional Hospital |
| Debbie Knight | Interchange Gippsland |
| Annette Jackson | Berry Street |
| Paul Hill | Gippsland Physiotherapy Group |
| Rowena Cann | Health and Human Services |
| Nigel Brand | Health and Human Services |
| Gary Au | Health and Human Services |
| Robyn Hayles | Bairnsdale Regional Health Service |
| Bernadette Brown | Bairnsdale Regional Health Service |
| Linda Daniel | Bairnsdale Regional Health Service |
| Valentine Agugo | Bairnsdale Regional Health Service |
| Sandra Holland | Bairnsdale Regional Health Service |
| Sangeeta Alex | Education and Training |
| Audra Fenton | West Gippsland Healthcare Group |
| Sheree Wells | West Gippsland Healthcare Group |
| Belinda Ogden | Gippsland Southern Health Service |
| Dara Twomey | Federation University |
| Geraldine Jones | Federation University |
| Wendy Cross | Federation University |
| Andrew Evans | Federation University |
| Linda Austin | TAFE Gippsland |
| Christine Harrison | Partners in Learning |
| Corey Harrison | VACCA |

Contents

[About this report 1](#_Toc26267690)

[Executive summary 4](#_Toc26267691)

[Introduction 3](#_Toc26267692)

[Regional profile 5](#_Toc26267693)

[Healthcare and social services workforce 10](#_Toc26267694)

[Global and national technological and policy changes 20](#_Toc26267695)

[Skills composition of occupations 22](#_Toc26267696)

[Knowledge intensity of occupations in full-time employment 36](#_Toc26267697)

[Occupational forecasts 42](#_Toc26267698)

[Conclusion & recommendations 62](#_Toc26267699)

[References 65](#_Toc26267700)

# Executive summary

**General demographics of the region**

* Growth in employment in the sectors is driven by the ageing of the population. The median age in Gippsland rose from 32 in 1986 to 45 by 2016. The median age is expected to continue to rise to 47 by 2036.
* The population will rise at a rate below that of the national average, but in the two western Local Government Areas (LGAs) (Bass Coast and Baw Baw) at a rate above that of the national average. In five of the six LGAs it is expected that the number of births will rise.

**Employment in the healthcare and social assistance sectors**

* The healthcare and social assistance sectors in Gippsland employ around 14,000 people, seven per cent of the workforce and produce nine per cent of the region’s value added. Over the past few decades growth in employment in the sector has been at an annual rate of between five and seven per cent and this rate is expected to slow to three per cent for the next ten years and then two per cent in the decade after. These reduced rates are still higher than the growth of the economy and workforce overall.
* As well as the 14,000 employed directly in healthcare and social assistance an additional approximate figure of 2,000 people are employed in related administration and clerical duties in the industry and a similar figure in hotel and allied duties.
* In the healthcare and social assistance sectors nurses and aged and disability carers are the occupations with the largest numbers. Other occupations with substantial numbers include social workers, and allied health workers such as physiotherapists, pharmacists, paramedics, doctors and dentists.
* Gippsland has health related professionals, that compared to the rest of the country, are fewer in number compared to the population (with the exception of nurses), disproportionately recruited from overseas and are ageing.
* It is expected that the number of people employed in the two sectors (healthcare and social assistance) will rise over the next twenty years, from approximately 14,000 in 2016 to nearly 19,000 by 2036. Growth will not be uniform across the six LGAs or across all occupations but will be significant in all cases.

**Education and training**

* Gippsland historically has had a lower level of pass on of young people from secondary to tertiary level education, than in the rest of Victoria. There is some evidence that the gap is narrowing.

**Skill and knowledge sets**

* The skill intensity of work in the region has grown, but less so than in other parts of Victoria. On the whole, the aggregate skills growth has tended to be in lower skilled jobs and in addition the knowledge intensity of work has grown.
* The skills growing in importance include: monitoring, troubleshooting, quality control analysis, management of financial resources, and learning strategies. In addition, growth in social skills are important and include such things as: social perceptiveness, coordination, persuasion, negotiation, instructing and service orientation. These changes are common across all occupations, but to differing degrees.
* In nearly all occupations there has been a growth in the need for communication skills, IT skills, teamwork, critical thinking, problem solving and decision making. Also, the technical complexity of many jobs has changed, which means that there is an increased need for people to engage in lifelong learning as the nature of their jobs change.

**The way forward**

* The changes in skills means that there is a need for the creation and upgrading of formal courses that include and highlight skills such as: critical thinking, active learning, learning strategies, social perceptiveness, negotiation, service orientation, instructing, judgement and decision making and generic management skills. Local educational providers should be encouraged to include the above ‘skill requirements’ of occupations into the curriculum. Employers and educators, should together, develop education programs and workforce plans in order to minimise skill gaps, mismatches and shortages using the skill forecasts provided in this report;
* For the healthcare and social assistance sectors to develop there will need to be a concerted effort on the part of all stakeholders to promote education and training in the region. That means there needs to be a creation and expansion of partnerships between employers, employer representative groups, educational institutions and the community to explore career pathways that will help boost job retention in Gippsland. In addition, there should be a creation and expansion of partnerships that work towards encouraging professionals to come to work in Gippsland through marketing campaigns that highlight the benefits of living and working in Gippsland;
* The continued use of regional skills audits in the sectors in Gippsland should occur, designed to attract and retain employees in the region. In addition, the casualization of employment practices be reduced in order to attract and retain employees in the healthcare and social assistance sectors.
* School age children should be made aware of the employment opportunities that are available in the healthcare and social assistance sectors. Career counsellors should be provided with ongoing professional development specific to career opportunities available in the healthcare and social assistance sector in Gippsland;
* Key programs that are already in place should be maintained (especially important in the case of nursing and aged and disabled care). Training organisations should take measures to provide and promote appropriate healthcare and social assistance-based training packages designed to meet the needs of an expanding healthcare and social assistance sectors;
* The possibility of the delivery of programs in social work and allied health (physiotherapy, occupational therapy, pharmacy, and para-medicine) should be examined, supported and provided with pathways from Certificate and Diploma programs.
* A review of management and administration courses relevant to working in the healthcare and social assistance sectors should also be undertaken.

# Introduction

In recent years there has been a great deal of interest and concern about the nature of the development of the healthcare and social assistance workforce. Not only is there a growing demand for the services of these two sectors – and related employees - but also there are concerns about the types of education and training that people entering the sector are receiving as preparation for work. These concerns are especially heightened in those parts of the country where the process of the ageing of the population has already occurred the most, and consequently in recent years the demand for healthcare and social assistance services has risen most sharply. Planning for future growth in demand in these services is critical if living standards are to be maintained and enhanced. The purpose of this report, therefore, is to provide information and guidance on the manner in which the healthcare and social assistance demands can be best accommodated.

This report has been commissioned by the Latrobe Valley Authority along with the Latrobe City Council, Latrobe Regional Hospital and Victorian Government’s Department of Health and Human Services. It was commissioned as part of the former’s development of a smart specialisation strategy aimed at promoting the social and economic development of the broader Gippsland region in the State of Victoria. This report will be of use not only to the sponsoring organisations, but also to other healthcare and social assistance providers, education and training providers, policy makers and researchers.

**Background and purpose**

As part of the wider economy and society, the healthcare and social assistance sectors play an important role in fostering the social and economic development of Australia. The Latrobe Valley Authority, in turn, has identified these two sectors as ones that can help to promote the Gippsland region’s economic and social development. The two sectors, however, face a number of challenges including the need to attract and retain qualified staff in the region.

In term of this report, the challenge will be to:

1. identify what healthcare and social assistance employment growth there will be expected to take place in the future in the Gippsland region (both generalist support, such as HR, IT and financial and health-related such as acute, community or allied health);
2. determine the degree to which current skills levels in the region can contribute to this growth;
3. evaluate what the skills gap will be between existing skills (both enterprise and technical skills) and future skill and upskilling demands; and
4. formulate an education and training strategy designed to close that gap.

Through a mix of analysis of publicly available data and information sources, targeted consultations with healthcare and social assistance managers, surveyed and interviewed sector workers, education and training providers and government officials this report provides a comprehensive map of the present and future demand for people, as well as their skills and knowledge in Gippsland.

In order to meet the challenges of our project and to obtain a thorough and more accurate understanding of labour market change in Gippsland we apply an innovative methodology by combining two large datasets. We do this by aligning employment data from Australia’s national the Census of Population and Housing obtained for the years 1986, 1991, 1997, 2001, 2007, 2011 to 2016 for the six LGAs that make up the Gippsland region. This data is then aligned with employment data obtained from the Occupational Information Network (O\*NET). Combining these two large datasets gives us very accurate and detailed information about the region’s available jobs.

The O\*NET is a free online database that contains hundreds of occupational definitions to help labour market analysts, students, job seekers, businesses and workforce development professionals to understand today's world of work. The O\*NET system is a digital database which offers flexible employment related information, allowing users to reconfigure data to meet their employment requirements and needs. This is in contrast to the more ‘fixed format’ of the Australian and New Zealand Standard Classification of Occupations (ANZSCO). Furthermore, its information meets the employment needs of an information society, rather than an industrial one, which makes it especially useful at looking at the healthcare and social assistance sectors.

The O\*NET describes occupations in terms of the skills and ‘knowledges’ required to undertake them. It also provides detailed information and data on how the work is performed, and the type of work settings in which employees are required to perform their daily job requirements. The O\*NET information helps support the creation of industry-based competency models, in this particular case, the healthcare and social assistance sectors. For each job, the O\*NET provides the following information:

* personal requirements: the skills and knowledge required to perform a specific job;
* personal characteristics: the abilities, interests and values needed to perform work tasks and requirements;
* experience requirements: the training and level of licensing and experience needed to be able to do a job competently;
* job requirements: the work activities and context, including the physical, social, and organizational factors involved; and
* labour market: the occupational outlook and the pay scale for different occupations.

The specific application of the O\*NET in this report is to analyse labour market changes in Gippsland and to give specific attention to changes in the employment composition that relates to changing healthcare and social assistance sectors. Using the detailed data in O\*NET and combining it with Australian Census data, we are able to conduct highly detailed skills and knowledge forecasts within occupations in the healthcare and social assistance sectors, thus allowing regional educators, policy makers, the community and other stakeholders to produce detailed work information related to changes to work practices and the future demand for skill needed to perform job tasks effectively.

# Regional profile

**Gippsland**

Gippsland is in the south-eastern portion of [Victoria](https://en.wikipedia.org/wiki/Victoria_(Australia)) and covers an area of 41,556 square kilometres. Overall the region extends from outskirts of the greater metropolitan area of the city of Melbourne, to Cape Howe, the most easterly point of Victoria. Although it covers a large area it has a fairly limited population. In early 2019 Gippsland had an estimated population of 279,350 (Table below), with the principal population centres of the region, in descending order of population, being [Traralgon](https://en.wikipedia.org/wiki/Traralgon,_Victoria) (25,485), [Moe](https://en.wikipedia.org/wiki/Moe,_Victoria) (15,509), [Warragul](https://en.wikipedia.org/wiki/Warragul,_Victoria) (14,276), [Morwell](https://en.wikipedia.org/wiki/Morwell,_Victoria) (13,540), [Sale](https://en.wikipedia.org/wiki/Sale,_Victoria) (13,511), [Bairnsdale](https://en.wikipedia.org/wiki/Bairnsdale,_Victoria) (12,952), [Drouin](https://en.wikipedia.org/wiki/Drouin,_Victoria) (11,887), and [Leongatha](https://en.wikipedia.org/wiki/Leongatha,_Victoria) (5,119) (Australian Bureau of Statistics 2016).

The region of Gippsland is comprised of six geographically, economically and socially diverse local government areas (LGAs); the Bass Coast Shire, Baw Baw Shire, East Gippsland Shire, Latrobe City Council, the South Gippsland Shire, and the Wellington Shire. The major concentration of population of Gippsland is centred in the Latrobe Valley sub-region in the central part of Gippsland.

**The Gippsland economy**

Gippsland’s economy is mainly based around natural resources and commodities, with key industry sectors including horticulture, forestry (timber, pulp and paper), dairy, pastoral, fishing, coal mining, electricity generation, and oil and gas extraction/treatment. In addition, tourist destinations, for example, [Phillip Island](https://en.wikipedia.org/wiki/Phillip_Island_(Victoria)), [Wilsons Promontory](https://en.wikipedia.org/wiki/Wilsons_Promontory), the [Gippsland Lakes](https://en.wikipedia.org/wiki/Gippsland_Lakes), and the [Baw Baw Plateau](https://en.wikipedia.org/wiki/Mount_Baw_Baw), also generate income for the region. The region’s economy is highly connected with the rest of the country and overseas markets through the strong state, national and international demand for horticulture, dairy, livestock, forestry products and energy. One indicator of the link between Gippsland and the rest of the world is that the region generates exports worth about $10 billion annually, with food processing (mainly dairy and horticulture), pulp, paper etc., oil and gas, electricity, aerospace, and tourism being the most important. The flow of income and expenditure from these sectors creates demand for services including transport, construction, retail, wholesale trade and healthcare and social services.

The Gippsland economy is currently diversifying its base with a focus on food production, innovation in clean energy, healthcare services, education and tourism. Some of this growth is based on the region’s Australia wide and international reputation as a producer and processor of high quality food products. Despite the positive developments the region, however, faces a number of important challenges, as a result of industry

and social changes. Of particular impact is the closure of the Hazelwood Power Station, which has required its former employees to acquire a new set of skills and knowledge in order to participate in the new jobs being created in the region. There are also questions about the future of the remaining coal based, power stations located in the Latrobe Valley, which face the prospect of being eventually replaced by renewable energy source.

|  |  |
| --- | --- |
|  |  |

Source: Australian Bureau of Statistics, 2016, cat. No. 6330.0. Latrobe City Council, 2019. Wellington Shire Council, 2019. Baw Baw Shire Council, 2019.

**Employment**

Linked to these economic changes is the ageing of the population in the region (which has led, and will further lead in the future, to an increase in demand for healthcare-related services). An ageing population, (historically) high levels of youth unemployment and disengagement, increasing income inequalities all lead to a need to train and retrain the workforce as well as attract skilled people and investment to ensure sustainable economic and social development. Overall the Gippsland region has a higher median age than that of Victoria and Australia (45 in 2016, compared to 37 in Victoria and 38 for Australia; see previous Figure). In terms of employment although the energy sector is a significant employer of people in the region (7.8 per cent), agriculture, forestry and fisheries contribute 8.6 per cent of the value added of the broader Gippsland region along with 9.5 per cent of employment (see Figures below). The health, transport and education sectors have also been important employers in recent years.

In recent times, compared to the Victorian economy, Gippsland has experienced slower (and sometimes contracting) economic growth, a slower rate of population growth, lower levels of average income, and an ageing population. In addition, a smaller proportion of the labour force in Gippsland has higher education level qualifications compared to the rest of Victoria. Instead, the workforce of Gippsland possesses a significant proportion of the labour force having diploma and certificate qualifications (see figure below). At the same time, unemployment levels have historically been higher and the participation rate lower than the state overall.

|  |  |
| --- | --- |
| **Gippsland regional value added, 2016** | **Gippsland regional workforce size, 2016** |
|  |  |

Source: Australian Bureau of Statistics, 2016.

Source: Australian Bureau of Statistics, 2016, cat. No. 6330.0.

One result of the past reliance on the energy, agricultural and tourism sectors for employment is a relatively low number of people with higher education qualifications compared to the state and national averages. Future growth in employment dictates that this tendency should change to closer to the situation elsewhere in Australia. Looking forward, the average annual employment growth in the Gippsland regon is expected to be 1.4 per cent per annum compared to 1.5 per cent for the state as a whole (Deloitte Access Economics, 2016, ix). The strongest growth of employment in Gippsland is expected to come in accommodation and hospitality, rental and real estate, construction, administration and support services and healthcare and social assistance. These trends are consistent with Victorian and Australia wide trends.

It should be noted that while Gippsland will experience a solid growth in demand for healthcare services because of the ageing of the population, a great deal of this trend has already occurred in the region. For instance, the median age in the Gippsland region was 36 at the 1996 Census and climbed steadily to reach 45 in 2016. In the short, to medium term the population is expected to age further, but this ageing should taper off at some point, before this occurs elsewhere in Australia.

**Gippsland Region, and LGAs population in 2018, and forecasts up until 2036**

|  | 2018 | 2021 | 2026 | 2031 | 2036 |
| --- | --- | --- | --- | --- | --- |
| Bass Coast Shire | 34,496 | 36,990 | 40,952 | 44,798 | 48,737 |
| Baw Baw Shire | 50,065 | 54,318 | 61,296 | 67,743 | 74,427 |
| East Gippsland Shire | 45,448 | 47,118 | 49,647 | 52,150 | 54,810 |
| Latrobe City | 74,021 | 75,038 | 77,775 | 81,222 | 84,944 |
| South Gippsland Shire | 27,976 | 28,478 | 29,611 | 30,677 | 31,766 |
| Wellington Shire | 42,011 | 42,687 | 43,921 | 45,153 | 46,293 |
| Gippsland Region | 274,017 | 284,628 | 303,202 | 321,742 | 341,516 |

Source: Victoria, Department of Environment, Land, Water and Planning, 2016.

A number of demographic changes are expected to occur in the future that will largely drive the demand for healthcare and social assistance. These are as follows.

* First of all, it is expected that the population of the entire region will continue to grow, as will the population of each of the six LGAs (see Table above for Victorian Government forecasts of the population). Population growth, however, will be strongest in the two western LGAs (Bass Coast and Baw Baw) a product of the growth of the outer suburbs of Melbourne.
* The second change will be the further ageing of the population (see the population distribution in the Figure below). This is a process that is occurring across all of Australia, but in the case of Gippsland is largely complete. In 1986, for instance, the median age of people living in Gippsland was 32. This rose to 36 by 1996 and by the 2016 Census this figure had risen quite substantially to 45. It is forecast that this median age will stabilise at around 47 and will continue, though at approximately this level until 2036. That said, the median age will rise in some areas of Gippsland, such as in the Latrobe Valley, while staying lower in areas such as the Baw Baw Shire.
* The third change is the maintenance of the number of births in the region. It is expected that the number of births will rise in line with population growth (see numbers of young people between the ages of 1 and 4 years old), although this will not be uniform across the region. Growth in the number of births will be strongest in the western parts of Gippsland and will decline marginally in Latrobe City.

These social economic and demographic changes will all lead to a growth in demand for healthcare and social assistances services, which will mean that there will be a tendency for employment in these sectors to grow. The exisiting workforce in these sectors is currently quite substantial, although it is noteable that there are currently gaps in the employment of trained and skilled personal in some fields.

Source: Victoria, Department of Environment, Land, Water and Planning, 2016.

# Healthcare and social services workforce

In Australia, it is expected that the healthcare and social services workforce will grow faster than that of the economy and workforce more generally (in Australia growth of this workforce is expected to average 2.5 per cent in future years compared to 1.5 per cent per annum (Deloitte Access Economics, 2018). In the case of the Gippsland, although it is expected that the demand for healthcare and social assistance will grow, and in turn this will lead to a growth in the number of people employed in these sectors, to a large degree this process has already occurred in Gippsland. The data in the following Figure show the extent of the growth in the workforce. From 9,314 at the time of the 2001 Census numbers have grown to 14,259 by 2016. This growth was considerably higher than that of the workforce as a whole, which has meant that the proportion of the workforce has risen from 10.3 per cent to 14.3 per cent by 2016.

As well as health related staff there are also other types of staff as well employed in the sector. These include administration and clerical staff as well as hotel and allied staff. The former is made up of staff such as administrative assistants, receptionists, accountants, payroll officers, supply managers etc. The latter is made up of cooks, security officers, maintenance workers, housekeepers, cleaners, etc. In the case of the Latrobe Regional Hospital, for instance, around 15 per cent of staff are in administration and clerical fields and 18 per cent in hotel and allied. The data provided in the annual reports of other public hospitals in the Gippsland region indicate similar percentages. If these rates, therefore, are considered typical of the healthcare and social assistance sectors more generally then there would be an additional 2,000 administrative and clerical employees in the sectors in 2016 and a similar figure for hotel and allied. The Table that follows the one below provides information on the level of skills in the healthcare and social assistance sectors over the period 1986 to 2016 for the Gippsland region. As can be seen from the data there has been a considerable build-up of hours worked, and skills developed by people working in this sector

Source: Australian Bureau of Statistics, 2016. Victoria, Department of Environment , Land, Water and Planning 2016. Authors’ estimates

**The state of health**

The basic reason for the rise in demand for healthcare services as the population ages is because there is a rise in the prevalence of chronic diseases. In addition, the labour intensive nature of the industry means that demand for labour rises. The ageing population, the transition to the National Disability Insurance Scheme will all help to increase demand for aged care, disability support and mental health services and represent the largest drivers of growth for the sector in the next few years. The link between the age of Australians and demand for healthcare is well established.

The Australian Health Survey shows that among older Australians the common long-term health conditions (excluding short and long sightedness), arthritis (affecting 49 per cent of those aged 65 and over), hypertensive disease (38 per cent) and hearing loss (complete or partial). Just over one in five older people reported having heart, stroke and vascular diseases, 15 per cent had diabetes, and 7 per cent had cancer. Age related vision problems that are likely to be disabling include cataracts (affecting 10 per cent of those aged 65 and over), glaucoma (36 per cent), macular degeneration (5 per cent) and blindness (2 per cent) (Australian Institute of Health and Welfare, 2014)

**Growth in total hours worked by O\*NET Skills for 42 healthcare and social assistance occupations, periods 1986 to 2016 and 2001 to 2016**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Gippsland | | Melb. Inner | | Victoria | | Australia | |
|  | 1986-2016 | 2001-2016 | 1986-2016 | 2001-2016 | 1986-2016 | 2001-2016 | 1986-2016 | 2001-2016 |
| **Content** | **5.9** | **5.5** | **7.9** | **3.8** | **5.8** | **5.2** | **6.2** | **5.3** |
| Reading Comprehension | 6.0 | 5.5 | 8.2 | 3.9 | 5.9 | 5.2 | 6.3 | 5.3 |
| Active Listening | 6.6 | 5.5 | 8.5 | 3.9 | 6.3 | 5.2 | 6.8 | 5.3 |
| Writing | 5.3 | 5.5 | 7.0 | 3.8 | 5.2 | 5.3 | 5.6 | 5.3 |
| Speaking | 6.1 | 5.7 | 7.7 | 4.0 | 5.9 | 5.4 | 6.4 | 5.4 |
| Mathematics | 6.0 | 5.8 | 7.5 | 4.0 | 5.8 | 5.1 | 6.2 | 5.2 |
| Science | 4.9 | 4.4 | 8.9 | 3.3 | 5.4 | 4.4 | 5.6 | 4.6 |
| **Process** | **6.1** | **5.8** | **7.8** | **3.9** | **6.0** | **5.5** | **6.4** | **5.5** |
| Critical Thinking | 6.0 | 5.5 | 7.8 | 3.8 | 5.9 | 5.2 | 6.3 | 5.3 |
| Active Learning | 5.2 | 5.7 | 7.1 | 3.9 | 5.3 | 5.5 | 5.6 | 5.6 |
| Learning Strategies | 6.4 | 5.8 | 8.0 | 4.1 | 6.1 | 5.6 | 6.6 | 5.6 |
| Monitoring | 7.0 | 6.3 | 8.3 | 3.9 | 6.7 | 5.7 | 7.1 | 5.7 |
| **Social Skills** | **6.3** | **5.8** | **7.6** | **4.1** | **6.1** | **5.5** | **6.6** | **5.5** |
| Social Perceptiveness | 7.4 | 5.6 | 9.1 | 4.2 | 7.1 | 5.3 | 7.6 | 5.4 |
| Coordination | 6.1 | 5.6 | 6.9 | 4.3 | 5.9 | 5.3 | 6.3 | 5.3 |
| Persuasion | 4.6 | 5.5 | 6.2 | 3.9 | 4.8 | 5.4 | 5.3 | 5.4 |
| Negotiation | 4.5 | 5.4 | 5.5 | 3.9 | 4.6 | 5.3 | 5.0 | 5.3 |
| Instructing | 5.9 | 6.0 | 7.4 | 4.1 | 5.7 | 5.6 | 6.1 | 5.7 |
| Service Orientation | 8.3 | 6.4 | 9.3 | 4.3 | 7.7 | 5.9 | 8.3 | 5.8 |
| **Complex Problem Solving** | **5.6** | **5.4** | **7.6** | **3.7** | **5.6** | **5.3** | **6.0** | **5.3** |
| Complex Problem Solving | 5.6 | 5.4 | 7.6 | 3.7 | 5.6 | 5.3 | 6.0 | 5.3 |
| **Technical Skills** | **7.0** | **5.7** | **7.7** | **3.5** | **6.1** | **4.8** | **6.6** | **4.9** |
| Operations Analysis | 0.8 | 3.7 | 1.6 | 3.1 | 1.3 | 4.2 | 1.4 | 4.4 |
| Technology Design | 4.8 | 5.8 | 5.5 | 4.1 | 4.4 | 5.8 | 4.7 | 5.8 |
| Equipment Selection | 10.5 | 5.0 | 10.4 | 3.7 | 7.2 | 4.6 | 8.0 | 4.7 |
| Installation | 6.8 | 5.3 | -0.9 | 3.2 | 2.0 | 6.0 | 2.5 | 6.3 |
| Programming | 3.2 | 4.7 | 5.4 | 4.0 | 3.3 | 5.2 | 3.7 | 5.5 |
| Operation Monitoring | 11.7 | 6.7 | 11.4 | 3.3 | 9.5 | 4.9 | 10.4 | 5.0 |
| Operation and Control | 13.4 | 5.9 | 13.7 | 3.2 | 10.1 | 4.1 | 11.1 | 4.2 |
| Equipment Maintenance | 5.1 | 4.9 | 4.8 | 2.3 | 3.1 | 5.1 | 3.5 | 5.2 |
| Troubleshooting | 12.2 | 6.7 | 11.4 | 2.9 | 9.0 | 5.5 | 10.0 | 5.4 |
| Repairing | 5.7 | 5.1 | 4.8 | 2.4 | 3.2 | 5.3 | 3.6 | 5.5 |
| Quality Control Analysis | 16.6 | 6.5 | 16.5 | 4.5 | 13.3 | 5.1 | 14.6 | 5.2 |
| **System Skills** | **4.7** | **5.4** | **6.3** | **3.9** | **4.7** | **5.2** | **5.1** | **5.3** |
| Judgment and Decision Making | 5.7 | 5.6 | 7.3 | 3.9 | 5.6 | 5.2 | 6.0 | 5.3 |
| Systems Analysis | 4.0 | 5.8 | 5.7 | 4.0 | 4.2 | 5.4 | 4.5 | 5.5 |
| Systems Evaluation | 3.9 | 4.9 | 5.4 | 3.8 | 4.0 | 4.9 | 4.4 | 5.0 |
| Resource Management | 2.7 | 5.8 | 2.8 | 3.7 | 2.8 | 5.3 | 3.0 | 5.4 |
| **Time Management** | **4.4** | **6.2** | **5.0** | **3.6** | **4.4** | **5.7** | **4.7** | **5.7** |
| Management of Financial Resources | -0.3 | 6.4 | -1.5 | 3.7 | -0.1 | 5.5 | 0.0 | 5.9 |
| Management of Material Resources | 1.1 | 6.0 | 0.3 | 4.1 | 1.2 | 5.2 | 1.4 | 5.4 |
| Management of Personnel Resources | 3.2 | 5.0 | 4.1 | 3.7 | 3.4 | 4.8 | 3.7 | 5.0 |

Source: Australian Bureau of Statistics, Census, O\*NET database and author calculations.

The healthcare and social assistance workforce comprise a combination of health professionals, careers and support workers. Health professionals include registered nurses, general practitioners, surgeons, dentists and midwives. They are supported by allied health workers, enrolled nurses, personal care workers and related health and welfare support carers who work in broader aged-care, residential, community and in-home settings. Allied health professionals include such people as dental hygienists, diagnostic medical sonographers, dietitians, medical technologists, occupational therapists, physical therapists, radiographers, respiratory therapists, and speech language pathologists. The sector also includes a variety of early years educators and child carers for young families. Finally, the workforce also includes in hospitals and aged care facilities cooks, kitchenhands, commercial cleaners, receptionists and other support staff.

In the case of Gippsland today healthcare and social assistance represents one of the largest workforces in the region by. Organisationally the sectors are made up by a great diversity of organisations in nature and scale, including very large hospitals (in the case of the Latrobe Regional Hospital employing over 1,500 full-time equivalent staff) to much smaller organisations, including individual professionals. In the case of the hospitals Gippsland is serviced by the Latrobe Regional Hospital, the major regional hospital, four sub-regional hospitals at Warragul, Bairnsdale, Sale/Maffra and Wonthaggi. Local health services are also located at Leongatha/Korumburra, Foster, Omeo, Yarram, and Orbost. With the Baw and Bass Coast shires being amongst the fastest growing LGAs in Victoria, there is a further need to develop a range of Gippsland’s hospitals, including the Latrobe Regional Hospital and West Gippsland Hospital to meet an increasing demand.

Although age is the key driver to demand growth in the region an additional aspect is that of the lifestyle choices of the people living in the region. There is some evidence that the general health of the population of Gippsland is slightly worse than that of the rest of Australia. This would be partially due to the older average population of Gippsland but would also be due to lifestyle choices such as a greater incidence of drinking and smoking. Growth in the size of the healthcare and social assistance workforce, and its composition will be influenced by these factors.

**Occupations**

Bearing these aspects in mind it is possible to look more specifically at the types of occupations that exist in the sector. At present there are around 14,000 people employed in the sectors. Of those employed the occupations listed in the following Figure contains some of the main ones. As can be seen nursing, nursing support, personal care and aged and disability workers comprise substantial proportions of the numbers employed. It is for this reason that a great deal of effort at training and education by providers in Gippsland have focused on these two areas. Of those engaged as carers around 600 are estimated to be in disability (Victoria, Department of Health and Human Services, 2019).

In addition to these two areas, however, there are a range of others that employ numbers in the two to three hundred range. These include such things as general practitioners, dentists, paramedics, physiotherapists, pharmacists, midwives, dental assistants, social workers etc. In these professions people are educated outside of the region, the relatively small numbers to date not being seen as justifying the maintenance of these qualifications.

Source: Australian Bureau of Statistics, 2016. Australia, Department of Health, National Health Workforce Data Set 2018. \*Disability carers have been estimated to number around 600 by the Victorian Department of Health and Human Services

The following Tables provide data on the number of professionals per population in Gippsland and the percentage of these that were educated overseas. Comparisons can be made to the equivalent figures for Australia.

First all as can be seen from the data, in most cases the number of professionals per population in Gippsland’s is lower than the national average, indicating that Gippsland is under serviced by professionals. The main exception to this is the case of nurses and midwifes where the figure is 1,426, compared to a national average of 1,347. Some recent studies have suggested that there is a current long-term shortage of nurses, with further shortfalls being foreseen (Health Workforce

Australia 2014; Deloitte Access Economics, 2018), although in Gippsland the problem to date has not been as acute as it might have been.

Secondly in some cases (nurses, pharmacists, and psychologists) the number of professionals in Gippsland over 55 years of age is higher than that of the national average. This means that in the future the difficulties associated with recruiting into some professionals made be made more acute by an ageing of the workforce.

Finally, the numbers of professionals educated overseas in some cases (pharmacists, dentists) is higher in Gippsland than in Australia more generally. This might be a reflection of the difficulties there has been in attracting qualified Australians to the region.

**Gippsland Region and Australian medical professionals, 2016**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Gippsland  Total | Gippsland Professionals per 100,000 population | Australia  Professionals  per 100,000 population |
| Chiropractors | 58 | 22 | 20 |
| Chinese Medicine Practitioners | 13 | 5 | 17 |
| Dental Practitioners | 152 | 57 | 83 |
| Medical Practitioners | 692 | 258 | 390 |
| Medical Radiation Practitioners | 116 | 43 | 56 |
| Nurses and Midwives | 3,825 | 1,426 | 1,347 |
| Occupational Therapists | 148 | 55 | 68 |
| Optometrists | 44 | 16 | 20 |
| Osteopaths | 19 | 7 | 8 |
| Pharmacists | 235 | 88 | 102 |
| Physiotherapists | 167 | 62 | 104 |
| Podiatrists | 46 | 17 | 18 |
| Psychologists | 160 | 60 | 108 |
| Social Workers | 244 | 91 | 90 |

Source: Australia, Department of Health, National Health Workforce Data Set, 2018. Social workers from the Australian Bureau of Statistics, Census.

**Gippsland Region and Australian medical professionals, 2016**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Gippsland  Overseas  % | Australia  Overseas  % | Gippsland  55+ % | Australia  55+ % |
| Chiropractors | 5 | 13 | 16 | 17 |
| Chinese Medicine Practitioners | 23 | 29 | 0 | 33 |
| Dental Practitioners | 35 | 23 | 22 | 22 |
| Medical Practitioners | 47 | 32 | 30 | 27 |
| Medical Radiation Practitioners | 14 | 14 | 17 | 15 |
| Nurses and Midwives | na | na | 31 | 25 |
| Occupational Therapists | 7 | 8 | 12 | 9 |
| Optometrists | 14 | 15 | 23 | 20 |
| Osteopaths | 16 | 10 | 0 | 13 |
| Pharmacists | 21 | 12 | 24 | 15 |
| Physiotherapists | 22 | 12 | 14 | 13 |
| Podiatrists | 26 | 11 | 7 | 10 |
| Psychologists | 7 | 8 | 47 | 28 |

Source: Australia, Department of Health, National Health Workforce Data Set, 2018.

**Education and training levels in Gippsland**

Despite the growth in the numbers of people being trained for entry into the healthcare and social assistance sectors in Gippsland, there are still some areas of concern. The proportion of people in Gippsland who have completed high school (29 per cent) is lower than that of the state and national averages (44 and 42 per cent). In addition the proportion of people that have university level education (9.9 per cent) is lower than that of the state and national averages (19.9 and 17.9 per cent). Finally the proportion of the population with certificate and diploma level education qualifications is higher in Gippsland

(26.6 per cent) compared to the state and national averages.

There is some evidence that this situation is changing. The following provides information on the destination of Year 12 leavers from the various LGAs of Gippsland compared to that of Victoria as a whole. Although in each case the proportion from each Gippsland LGA going onto university is lower than that of the state average, the gap in some cases today is not that great (Bass Coast, Baw, and Wellington shires). Even in the case of the South Gippsland Shire and Latrobe City the gap is not as great as it was some twenty years ago.

Source: Victoria, Ontrack 2018 Survey Results

**Education and training institutions in Gippsland**

To provide healthcare and social assistance education and training in Gippsland there are a number of institutions involved.

*Federation University***:** At the university level the most important provider is Federation University, which has its Gippsland campus at Churchill in the Latrobe City, along with other main campuses at Berwick and Ballarat. Study areas at the campus include Arts (Media, Humanities, Communication and Social Science); Business; Education; Information Technology; Nursing; Midwifery; Sport, Outdoor and Physical Education; Psychology; Science; Engineering and Visual Arts. Federation University is the provider of degree level nursing programs in Gippsland, and as such has made a major contribution to the development of the healthcare sector in Gippsland. In 2018 there were 657 students enrolled in undergraduate nursing programs (418 full time and 239 part time), with a number of these being students that have followed pathways from the Diploma of Nursing programs delivered by the local TAFE and private providers.

Source: Provided by Federation University

The Gippsland campus of Federation University attracts a fair proportion of students in the Gippsland region. The figures in the following Table indicate that Federation University attracts the most students of any university from students in the six LGAs, whether to the Churchill or Berwick campuses.

**Institution of year 12 or equivalent completers, 2017**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Bass Coast  Shire | Baw  Shire | Latrobe  City | Wellington  Shire | South Gippsland  Shire | East Gippsland  Shire |
| Federation University | na | 16.7 | 35.2 | 14.9 | 20.0 | 20.7 |
| Monash University | 18.4 | 26.8 | 12.0 | 27.7 | 16.4 | na |
| Deakin University | 22.4 | 13.0 | 10.4 | 17.0 | 18.2 | na |
| Melbourne University | 14.3 | 4.3 | na | Na | na | na |
| RMIT University | na | 10.1 | na | 10.6 | 12.7 | na |
| Other universities | 10.2 | 17.3 | 9.6 | Na | na | na |

Source: Victoria, Ontrack 2018 Survey Results.

*Monash University***:** In 2008, the Monash Gippsland Medical School was opened. When Monash left the campus in 2014 it continued delivering the first year of the four-year [graduate entry medical program](http://www.med.monash.edu.au/medical/gippsland/) at Churchill.  Monash also has teaching sites for its rural health course across Gippsland. Monash’s Rural Health Unit at Churchill was reported to have 75 students in 2019.

*TAFE Gippsland*: TAFE Gippsland is a key institution providing a range of courses in the aged care, disability, enrolled nurses and other social assistance areas. The following Table provides data on the range of healthcare and social assistance courses it delivers, as well as student numbers. As can be seen the bulk of the Certificate and Diploma level enrolments in healthcare and social assistance courses in Gippsland are conducted by TAFE Gippsland.

*Chisholm Institute;* The other main government TAFE that operates in Gippsland is the Chisholm Institute which operates a campus at Wonthaggi in the Bass Coast Shire. As well as the Wonthaggi campus it operates campuses in Dandenong, Frankston, Berwick, Cranbourne, and Rosebud. The Wonthaggi campus has approximately 700 enrolments.

*Private institutions:*In Gippsland there are also private institutions that provide training courses in healthcare and social assistance courses. These include *Partners in Training* in Sale,*Community College Gippsland* with campuses at Leongatha and Warragul and *Gippsland Employment Skills Training* in Moe.

**Case study: Educational and training pathways**

One important aspect of education is the degree to which people can transition from one qualification to another. Given the generally low average educational attainments of people in Gippsland it is important that they are able to upgrade their skills through their adult life. It is also important in the recruitment of qualified employees that providers are able to encourage this process. Although in Australia most education providers, including those in Gippsland, provide for the ability of people to transition from Certificate III, to Certificate IV and then Diploma qualifications the next step to Degree level courses can be problematic given the historical division between TAFEs and universities. This division is overcome in Australia either by TAFE institutes and universities negotiating pathway agreements between them from Diploma to Degree programs or for the providers to be multi-level institutions (providing both Diploma and Degree level courses). The Table below provides examples. Swinburne University of Technology and Victoria University have Higher Education and TAFE divisions and so for a number of their Diploma qualifications there are distinct pathways into Degrees. At Victoria University, one can undertake the Diploma of Nursing, Diploma of Community Services and Diploma of Community Development and then gain credit for up to one’s year’s work in the Bachelor of Nursing, Bachelor of Social Work and Bachelor of Community Development respectively. Swinburne has similar arrangements for its Diploma of Nursing and Diploma of Community Services. Chisholm and Box Hill have pathways agreements with universities, i.e. Chisholm’s Diploma of Nursing pathways into Latrobe University’s Degree of Nursing, while Box Hill’s pathways into the Nursing degrees of Latrobe University, Deakin University and the Australian Catholic University. These providers also have their own degrees, which act as a pathway for Diploma students. Chisholm’s Diploma of Alcohol and Other Drugs, Diploma of Community Development and Diploma of Mental Health students can pathway into Chisolm’s Bachelor of Community Mental Health, Alcohol and Other Drugs. Box Hill has a Bachlor of Community Services Degree.

**Pathways from Diploma to Degree level courses**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Course Name | Chisholm Institute | Swinburne University | Victoria University | Box Hill  Institute |
| Diploma of Nursing | B.Nursing (Latrobe) | B.Nursing | B.Nursing | B.Nursing (Latrobe, Deakin, ACU) |
| Diploma of Community Services | - | B.Arts  B.Communication | B.Social Work | B.Community Services  B.Social Work (Deakin) |
| Diploma of Alcohol and Other Drugs | BCMHA&OD  B.Community Services (Latrobe) | No pathway | - | - |
| Diploma of Community Development | BCMHA&OD  B.Community Services (Latrobe) | - | B.Social Work  B.Community Development | - |
| Diploma of Mental Health | BCMHA&OD  B.Community Services (Latrobe) | - | - | - |

BCMHA&OD- Bachelor of Community Mental health, Alcohol and Other Drugs

Source: Websites of Chisholm Institute, Swinburne University of Technology, Victoria University, Box Hill Instit

# Global and national technological and policy changes

**Introduction**

A number of global and national changes are occurring that impact on the development of the healthcare and social assistance sectors (OECD, 2016). These changes will have an impact on employment growth and skills development.

**Global and technological trends.**

Many of the changes occurring in the healthcare and social assistance areas in Gippsland and Australia are mirrored by changes occurring both in other parts of Australia and globally. These changes are often technological in nature, but also in many cases involve changes in the organisational structure of healthcare and social assistance providers. In addition, changes have been, and will occur, to the mobility of workers across nations. This latter phenomenon has become an important aspect of both the Australian sectors and those of most Western countries (Global Health Workforce Alliance and World Health Organisation 2015; OECD 2015). These changes may have an impact on the growth of employment in these two sectors and will certainly impact on the nature of the skills required by people working in the two sectors.

Globally employment in the industry is rising, driven by growth in population and an ageing of the population. Growth in demand and employment means that expenditure is rising. Healthcare expenditure is expected to grow at around 5.4 per cent per annum in the years up until 2022, well above that of population and economic growth (Economist Intelligence Unit 2019). The life expectancy of people is also expected to rise, although this will be more marked in developing countries rather than in developed countries such as Australia.

Changes in demand will lead to substantial growth in employment internationally, even with the development of labour-saving technology. The healthcare and social assistance sectors are characterised as being both labour intensive and conversely users of many forms of advanced technology. It is, therefore, possible that the two sectors will grow in size, employ greater numbers of people and at the same time develop using more advanced forms of technology.

The growth in expenditure will mean that in many countries there will be increasing pressure on providers to reduce cost expansion and improve efficiency. Government budgets in particular will be put under stress and around the world governments will be keen to find ways to rein in growth of public expenditure on healthcare and social assistance. This will mean that there will be increasing pressures for hospitals to reorganise or to merge to retain scale and drive efficiencies. The need to rein in costs will also drive the desire to achieve other changes. An increasing focus on prevention and early intervention, organizational redesign, and new revenue streams are all possible types of change. A shift in focus will occur from curing disease in the short-term towards preventing and managing disease and promotion overall wellbeing in the long-term. New business and care delivery models may be introduced, aided by digital technologies to help solve these problems. New business models will emerge that blur the boundaries between institutions, the resulting clusters of public-private providers will in turn drive future innovation. Personalised medicine, exponential technologies, new competing and expanded delivery sites

A lot of the new innovations that are being introduced involve data collection, management and use. For instance, measures to review, store and share medical information, including laboratory results, allergy lists, and more are being developed. Artificial intelligence to tackle disease, including the monitoring, detection and life style management are also being developed (Deloitte 2019, p. 9). Robotic process automation to improve claims times without extra staff are growing in use. The nature of work, therefore, is becoming more digital and automated. Many administrative functions such as documentation, insurance processing, and scheduling as well as logistic tasks, for instance delivering linen, meals and medical supplies have been introduced. Using digital technologies to augment and in some cases replace human workers will free up healthcare professionals from repetitive mundane tasks and enable them to focus on their core competencies (Safavi & Dare 2018). Although it is possible that these global trends will moderate the growth in employment in the two sectors it is more likely that substantial growth will still occur, but in addition staff will be required to be more computer literate and use an expanding diversity of digital applications. This will add, therefore, to staff needing to develop broader skills in terms of communication, IT skills, team work and problem solving.

**National changes**

One aspect that will alter the manner in which the two sectors operate is the nature of government policy. Of particular importance in Victoria, is the impact of the introduction of the National Disability Insurance Scheme in 2013-2016, the impact of the Victorian Government’s Royal Commission into Family Violence (reported March 2016), the Australian Government’s Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability (established April 2019), and the Victorian Government’s Royal Commission into Victoria’s Mental Health System (established February 2019).

In the case of the National Disability Insurance Scheme in 2010, the Australian Government asked the Productivity Commission to carry out a public inquiry into a long-term disability care and support scheme. The Prime Minister released the Productivity Commission's report on 10 August 2011. In 2011 the Council of Australian Governments (agreed to the need for a reform to disability services through a National Disability Insurance Scheme (NDIS). In March 2013 the NDIS legislation was passed and the National Disability Insurance Agency (NDIA) created. The NDIS began on 1 July 2013, with trial sites, the trial period finishing in July 2016. The [NDIS](https://myplace.ndis.gov.au/ndisstorefront/about-us/what-ndis.html) provides support to people with disability, their families and carers. It is jointly governed and funded by the Commonwealth and participating states and territories. Participants meet with the [NDIA](https://myplace.ndis.gov.au/ndisstorefront/about-us.1.html) to identify a set of supports agreed as ‘reasonable and necessary’ to meet their goals. They are provided with funding for these supports and can choose how their needs are met. The cost of the scheme is expected to be around $22 billion by 2019, representing an increase in spending to around 1.1 per cent of GDP. It is important to note, however, that the Commonwealth will only be responsible for half of the annual cost of the scheme. The [NDIA annual report](https://myplace.ndis.gov.au/ndisstorefront/news/ndia-2015-15-annual-report-released.html)s project that expenditure will increase gradually to 1.3 per cent of GDP in 2044–45, reflecting the increased cost of supports as NDIS participants age over time (Dale & Buckmaster 2015National Disability Insurance Agency 2017). The introduction of the NDIS means increased funding and expanded employment, however, a number of the interviewed providers in Gippsland have reported difficulties in recruiting a sufficient number of staff to meet growing demand.

The other main changes that are occurring in the social assistance sector are being driven by the Royal Commissions that are being conducted. Only one to date (April 2019) has reported that being the Victorian Government’s Royal Commission into Family Violence. One of the recommendations of this report was that the Victorian Government introduce mandatory qualifications for specialist family violence practitioners, so that no later than 31 December 2020 all funded services must require family violence practitioners to hold a social work or equivalent degree (Victoria, Royal Commission into Family Violence 2016, p.102). It is expected that the other two Royal Commissions on Violence, Abuse, Neglect and Exploitation of people with Disability and on Victoria’s Mental Health System when they report will advocate a raising of qualifications to degree level (amongst other things) (Australia, Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability, 2019; Victoria, Royal Commission into Victoria’s Mental Health System, 2019).

Although the number of degreed social workers in Gippsland is growing, there is a shortage of qualified people of this sort in the region, and a number of social assistance providers expressed a difficulty in attracting social workers. Although it is desired that more highly qualified people work in the social assistance fields in Gippsland, there will be some challenges for a number of providers in achieving this.

**Conclusion**

Much of these changes have already to begin to occur globally, internationally and in Gippsland itself. Greater uses of information technology are being used and skills requirements across all occupational groups are being affected by it.

# Skills composition of occupations

**The O\*NET: A suggested approach to defining and measuring skill**

One way of achieving an understanding of the skill needs of a changing labour market is through the use of the Occupational Information Network (O\*NET). This is an extensive and comprehensive database that describes the attributes and characteristics of occupations and workers. Its first version was launched in 1998 and is known as O\*NET 98 and was developed by the United States Government’s Department of Labor. An advantage of the O\*NET is that it offers statistical information that can be applied to the Australian context. For the purpose of this analysis, we have employed its latest version, O\*NET 23.The Content Model is the conceptual foundation of the O\*NET. It was developed by Mumford and Peterson (1995), using research on job and organisational analysis, and embodies a framework that reflects the character of occupations (i.e. using job-oriented descriptors) and people (i.e. using worker-oriented descriptors). The Content Model also allows occupational information to be applied across jobs, industry sectors and within occupations The Content Model is organised into six major domains; Worker Characteristics, Worker Requirements, Experience Requirements, Occupation Requirements, Occupation Characteristics and Occupation Specific Information.

The O\*NET is a large and complex occupational information system and contains a vast amount of information on 1,000 occupations with detailed elements and descriptors of job requirements and performance. In applying the system, it is possible to use three components of its data to understand labour market change and skill and knowledge requirements of occupations.

As well a survey was undertaken of healthcare and social assistance staff in Gippsland to determine the applicability of the O\*NET approach and classifications to staff there. The survey found that the O\*NET classifications are broadly applicable to job classifications, skills and knowledge in Gippsland (details of the survey can be found in the Appendix of the long version of this Report). The survey undertaken confirmed the applicability of the O\*NET approach to analysing the nature of the Gippsland workforce.

The two O\*NET indicators that are used in this report to investigate changes in the content of occupations in Gippsland are those of skill and knowledge. Firstly, skills are innately linked to knowledge, learning, practice, education and experience. For example, a person cannot acquire or apply skills without learning, practising, being exposed to education, experiencing or acquiring knowledge. Secondly, skills can be seen as general procedures that are necessary for the performance of multiple tasks. These tasks, however, must form part of a given domain of skills such as social skills, basic skills or problem-solving skills. Finally, skills are not constant attributes of individuals that remain unchanged over time. They can be acquired (sometimes they can be lost) and developed as a result of new learning, experience or newly acquired knowledge. The taxonomy of skill is divided into two broad categories. The first is referred to as basic skills. These are defined as the developed capacities that facilitate learning or the attainment of new knowledge. Basic skills are subdivided into two further categories described as content and process skills. These are made up of six and four skill variables respectively, out of a total of 35 skills that comprise the complete O\*NET skill taxonomy. Content skills can be broadly defined in terms of those capabilities that allow people to acquire information and convey it to others. They represent the structures required to work with and acquire other skills. This category includes skills such as reading, writing, listening, speaking, mathematics and science. Process skills, on the other hand, are seen as those that facilitate the acquisition of content across domains. The ability to think critically is thus part and parcel of process skills. This is closely related to a second kind of general learning skill, referred to as active learning. Another process-oriented skill takes the form of learning strategy. This uses a variety of approaches when learning new things.

The O\*NET defines knowledge as a collection of discrete, but related facts, information and principles about a particular area of work. Knowledge is acquired through formal education and/or training or can be built upon a collection of a variety of experiences. Knowledge is acquired incrementally and can be used to acquire further knowledge and to develop skills. It is closely related to skills because it can assist in the development of skills, while, at the same time, skills can aid the process of knowledge acquisition. In the O\*NET taxonomy, the 33 knowledges can be regarded as belonging to general categories and are regarded as being essential elements in the successful performance of occupational tasks. Others are narrower and can only be applied to a fine range of occupational groups, while others can be seen as occupation specific.

The skill taxonomic structure of the O\*NET is hierarchically organised and is very detailed. Each descriptor defines a skill, such as critical thinking, active listening, judgement and decision making and reading comprehension. For a given occupation, each of these areas of skill is ranked on a scale of 0 to 100, for both its importance to the occupation and for the level in that area required in that occupation. With a rank of zero in the importance scale, the descriptor of skill shows that the given skill is of no consequence to that occupation, while at a ranking of 100, the descriptor is considered to be extremely important in performing that particular job. Thus the ‘importance’ indicator for a particular skill refers to how important it is to the performance of the job in question. Similarly, the ‘level’ indicator for a particular area of skill refers to the degree or quality which that skill requires in the occupation under investigation. Thus, in the following Table for the occupation ‘Family and General Practitioners’ the importance of the skill descriptor ‘critical thinking’ has a score of 85, and the level of ‘critical thinking’ required has a score of 63. For ‘librarian’ the same skill is not as important (score 63 in importance) and the level required is even less demanding (score 54 in level). Thus, in relative terms, skill required for critical thinking is higher for doctors, lower for librarians and less so for brickmasons.

**Skill indicators, importance and level, three occupations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Skill indicator score | Family and general practitioners  ANZSCO 2531  O\*NET 29-1062 | | Librarians  ANZSCO 2531  O\*NET 25-4021 | | Brickmasons and blockmasons  ANZSCO 3311  O\*NET 47-2021 | |
| *Importance* | *Level* | *Importance* | *Level* | *Importance* | *Level* |
| Critical Thinking | 85 | 63 | 63 | 54 | 53 | 43 |
| Active Listening | 81 | 68 | 75 | 57 | 50 | 45 |
| Judgment and Decision Making | 81 | 66 | 56 | 46 | 47 | 39 |
| Reading Comprehension | 78 | 68 | 78 | 57 | 44 | 36 |
| Writing | 78 | 61 | 68 | 57 | 31 | 41 |
| Speaking | 75 | 61 | 72 | 57 | 50 | 36 |
| Science | 75 | 61 | 16 | 9 | 20 | 18 |
| Complex Problem Solving | 75 | 59 | 53 | 45 | 47 | 32 |
| Monitoring | 72 | 57 | 60 | 52 | 50 | 41 |
| Social Perceptiveness | 72 | 61 | 53 | 50 | 44 | 39 |
| Service Orientation | 72 | 54 | 53 | 52 | 31 | 30 |
| Active Learning | 69 | 57 | 53 | 46 | 47 | 30 |
| Average skill score | 76 | 61 | 58 | 48 | 43 | 36 |
| Average skill cross product score | 47 |  | 30 |  | 16 |  |

Source: United States, Department of Labor (1998) and Authors’ calculations.

Similar to the previous Table the following Table shows the O\*NET skill importance and level for three non-clinical occupations commonly found in the healthcare and social assistance sectors. This Table allows us to compare the skill requirements of each of the three jobs between clinical healthcare and social assistance occupations and non-clinical for accountants, receptionists and office managers. These occupations are of particular interest because they are central to the operation of not just large organisations such as hospitals, but also small to medium sized organisations responsible for the delivery of health services.

Of particular interest is the level and importance at which skills such as problem solving, monitoring, social perceptiveness, service orientation and active learning, are becoming in the healthcare and social assistance sectors. It is our view, that these types of skills are becoming far more important than previously recognised. It is for this reason that these types of skills should be included in the curricula of educational programs designed for the healthcare sector.

**Skill indicators, importance and level, for three non-clinical occupations.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Skill Indicator Score | ANZSCO 2211 | | ANZSCO 5421 | | ANZSCO 5121 | |
| O\*NET 13-2011.01  Accountant | | O\*NET 43-4171.00  Receptionist | | Office Managers  43-9061.00 | |
|  | *Importance* | *Level* | *Importance* | *Level* | *Importance* | *Level* |
| Critical Thinking | 78 | 54 | 65 | 45 | 60 | 43 |
| Active Listening | 78 | 57 | 72 | 48 | 75 | 43 |
| Judgment and Decision Making | 70 | 50 | 48 | 30 | 55 | 32 |
| Reading Comprehension | 78 | 55 | 65 | 46 | 75 | 50 |
| Writing | 72 | 46 | 65 | 45 | 62 | 45 |
| Speaking | 75 | 54 | 72 | 43 | 72 | 52 |
| Science | 38 | 23 | 20 | 0 | 20 | 0 |
| Complex Problem Solving | 65 | 45 | 50 | 39 | 52 | 36 |
| Monitoring | 68 | 48 | 55 | 36 | 58 | 41 |
| Social Perceptiveness | 60 | 43 | 62 | 55 | 60 | 43 |
| Service Orientation | 60 | 43 | 70 | 45 | 60 | 41 |
| Active Learning | 78 | 57 | 60 | 34 | 75 | 54 |
| Average skill score | 68 | 48 | 59 | 39 | 60 | 40 |
| Average skill cross product score | 34 |  | 24 |  | 26 |  |

Source: Occupational Information Network, skill variables, United States, Department of Labour.

To analyse changes in the knowledge, and skill component of occupations employment data were linked to the O\*NET occupational data. In assigning the ‘most appropriate’ O\*NET occupation code to an ANZSCO occupation code, it was assumed that there was a similarity in the description of United States and Australian occupations, as the great bulk tend to have similar or close definitions and descriptions. The end result is two sets of data containing information on the knowledge and skill occupation scores for over 358 Australian occupations for the census years 1986, 1991, 1996, 2001, 2006, 2011 and 2016 together with employment data (disaggregated by males and females, and by full-time and part-time work) for each year. The following Table reveals that the nature of employment has changed considerably over the period. The picture that emerges demonstrates a twofold shift characterised by slower growth in full-time employment and a massive increase in part-time employment that is far higher than the national average.

**Employment change by region, 1986 to 2016**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Region | Persons employed | | | Annual growth 1986-2016 | Annual growth 1991-2016 |
|  | 1986 | 2001 | 2016 |
| Bass Coast | 5,206 | 7,335 | 10,993 | 3.71 | 3.32 |
| Baw Baw | 12,415 | 14,301 | 19,378 | 1.87 | 2.37 |
| East Gippsland | 11,242 | 12,982 | 15,153 | 1.16 | 1.11 |
| Latrobe | 27,115 | 24,199 | 26,980 | -0.02 | 0.77 |
| South Gippsland | 9,214 | 9,869 | 10,809 | 0.58 | 0.63 |
| Wellington | 14,729 | 14,650 | 16,032 | 0.29 | 0.63 |
| **Gippsland** | **79,921** | **83,336** | **99,345** | **0.81** | **1.28** |
| Melbourne Inner | 166,862 | 199,892 | 301,401 | 2.69 | 3.39 |
| Victoria | 1,626,426 | 1,968,949 | 2,588,698 | 1.97 | 2.10 |
| **Men Full Time** | | | | | |
| Bass Coast | 2,770 | 3,283 | 3,916 | 1.38 | 1.28 |
| Baw Baw | 7,118 | 6,563 | 8,153 | 0.48 | 1.62 |
| East Gippsland | 6,278 | 5,375 | 5,564 | -0.38 | 0.23 |
| Latrobe | 16,361 | 11,012 | 11,004 | -1.09 | 0.00 |
| South Gippsland | 5,185 | 4,519 | 4,295 | -0.57 | -0.33 |
| Wellington | 8,488 | 6,819 | 6,697 | -0.70 | -0.12 |
| **Gippsland** | **46,200** | **37,571** | **39,629** | **-0.47** | **0.37** |
| Melbourne Inner | 81,566 | 81,981 | 116,363 | 1.42 | 2.80 |
| Victoria | 885,038 | 888,772 | 1,052,312 | 0.63 | 1.23 |
| **Men Part-Time** | | | | | |
| Bass Coast | 459 | 843 | 1,659 | 8.72 | 6.46 |
| Baw Baw | 653 | 1,295 | 2,024 | 6.99 | 3.75 |
| East Gippsland | 777 | 1,557 | 2,090 | 5.63 | 2.28 |
| Latrobe | 1,344 | 2,283 | 2,901 | 3.86 | 1.80 |
| South Gippsland | 572 | 957 | 1,324 | 4.39 | 2.56 |
| Wellington | 710 | 1,290 | 1,617 | 4.25 | 1.69 |
| **Gippsland** | **4,515** | **8,225** | **11,615** | **5.24** | **2.75** |
| Melbourne Inner | 10,838 | 20,233 | 34,663 | 7.33 | 4.75 |
| Victoria | 87,204 | 183,736 | 303,334 | 8.26 | 4.34 |
| **Women Full Time** | | | | | |
| Bass Coast | 1,183 | 1,397 | 1,943 | 2.14 | 2.60 |
| Baw Baw | 2,853 | 3,044 | 3,859 | 1.18 | 1.78 |
| East Gippsland | 2,277 | 2,600 | 2,951 | 0.99 | 0.90 |
| Latrobe | 5,328 | 4,794 | 5,321 | 0.00 | 0.73 |
| South Gippsland | 2,090 | 2,105 | 1,983 | -0.17 | -0.39 |
| Wellington | 3,368 | 3,061 | 3,319 | -0.05 | 0.56 |
| **Gippsland** | **17,100** | **17,002** | **19,374** | **0.44** | **0.93** |
| Melbourne Inner | 54,923 | 63,549 | 92,054 | 2.25 | 2.99 |
| Victoria | 417,530 | 477,149 | 606,944 | 1.51 | 1.81 |
| **Women Part-Time** | | | | | |
| Bass Coast | 794 | 1,812 | 3,475 | 11.26 | 6.12 |
| Baw Baw | 1,791 | 3,399 | 5,342 | 6.61 | 3.81 |
| East Gippsland | 1,910 | 3,450 | 4,548 | 4.60 | 2.12 |
| Latrobe | 4,082 | 6,110 | 7,754 | 3.00 | 1.79 |
| South Gippsland | 1,367 | 2,288 | 3,207 | 4.49 | 2.68 |
| Wellington | 2,163 | 3,480 | 4,399 | 3.45 | 1.76 |
| **Total Gippsland** | **12,106** | **20,538** | **28,727** | **4.58** | **2.66** |
| Melbourne Inner | 19,535 | 34,129 | 58,321 | 6.62 | 4.73 |
| Victoria | 236,654 | 419,292 | 626,108 | 5.49 | 3.29 |

**Employability skills and the Occupational Information Network (O\*NET)**

In recent years there has been considerable interest in employability skills, both in Australia and overseas. In 2001, the Australian Chamber of Commerce and Industry and the Business Council of Australia undertook a major research project designed to provide the Department of Education, Science and Training with a detailed understanding of the employability skills needs of industry. More recently in 2013, the Department of Education, Employment and Workplace published the report Core Skills for Work Developmental Framework (CSfW). The CSfW aimed to provide “… a common reference point and language that will assist:

* those who develop standards, curriculum, programs and learning and assessment resources to more clearly articulate the Core Skills for Work required for certain occupations or at particular points in career development.
* trainers, educators and those who work with job seekers to more explicitly address the development of these skills in learners, and to assist those they work with to more clearly articulate the skills they do possess and identify those that they would like to develop” (CSfW, 2013, p. 4).

The CSfW report is a continuation of the same ideas presented initially *Employability Skills for the Future*. In the report, employability skills are defined as “skills required not only to gain employment, but also to progress within an enterprise to achieve one’s potential and contribute successfully to enterprise strategic directions”. The report also identifies an *Employability Skills Framework* which incorporates eight key skill groupings:

* communication skills,
* team work skills,
* problem-solving skills,
* initiative and enterprise skills,
* planning and organising skills,
* self-management skills,
* learning skills, and
* technology skills.

A striking feature of the report is its implicit contention that the employability skills required for the future can be determined in the absence of any detailed view of the industrial and occupational structure of the economy. Thus, the report argues that employability skills should equip the workforce to meet the “challenges facing Australian industry”, especially insofar as those challenges have to do with “globalisation and the knowledge economy”, but no specific connections are made. Further, “the required technical and job-specific skills, being subject to ongoing change, are not readily predictable. What is important, therefore, is the capacity to continually adapt and upgrade with the application of core or generic employability skills that can be transferred across different settings."

The idea is that workers should be provided with a set of generic skills, which will enable them to move from one job to another. But suppose that “technical and job-specific skills” can be associated with the occupations of the Australian and New Zealand Standard Classification of Occupations (ANZSCO). While all eight skills in the Employability Skills Framework may be required to some extent in all ANZSCO occupations, some skills will be more relevant for some occupations than others. For example, *management skills* would seem to be very important for *Health and Welfare Services Managers (ANZSCO 1342),* but not particularly important for *8511 Fast food cooks*. Hence, if it is thought that more *Health and Welfare Services Managers* are required in a particular geographical regionthan *Fast food cooks* will be needed to meet the future challenges facing Australian industry, the training resources devoted to generic skills should be allocated appropriately. Generic employability skills may well be more transferable than job-specific skills, but not (or, at least, not obviously) to the extent that structural change can safely be ignored when determining future requirements. Furthermore, while it is true that future employment by occupation is “not readily predictable”, it is not true that it cannot be predicted at all. Many industrialised countries routinely produce forecasts of employment by industry and occupation.

It is possible to make the link between industry and occupational structure and the skills and knowledge needed. Esposto (2005), for instance, adapted the O\*NET to the Australian labour market and created a means whereby the skill and knowledge requirements of occupations can be utilized to understand labour market change, particularly in the case of regional Australia. One way of understanding labour market change is by combining the data in the O\*NET to that with Australian regional employment census data, which is detailed, accurate and highly valuable.

It is important to note, that the O\*NET was developed with the aim of becoming an information system consisting of a framework made up of a variety of components. Firstly, it possesses occupational information that allows jobs to be described in terms of more general descriptors that reflect the modern labour market. Secondly, the O\*NET is closely linked to labour market data which are updated on a continual basis. Although it was not originally intended for this purpose, an advantage of the O\*NET is that the detailed data collected on worker characteristics and job requirements can be used to examine and analyse changes in the labour market. Data are gathered on over 200 occupations each year, with the aim of totally upgrading the database every five years (O\*NET Consortium, 2004). The O\*NET contains cross-occupation descriptive information that includes the kind of work, conditions under which it is done, and the requirements imposed on the people doing the work.

Making use of the O\*NET and Australian Census data in the next Table the changes in the skill intensity, 1986 to 2016, are provided. For every year, for the total employed population and for men and women, the skill intensity index is higher for Victoria and Melbourne Inner relative to Gippsland. This indicates that the skill occupations in the Victoria and Melbourne Inner require higher skill levels than for Gippsland. The skill intensity results show that for total employment job creation in Melbourne Inner in particular, skilled occupations are favoured. The skill intensity of jobs grew by 13 per cent, compared to a fall of 1.5 per cent for Gippsland. In terms of full-time work, the trends are different for men and women, particularly in Gippsland, where the skill intensity of occupations increased for women, but remained almost static for Gippsland. For Melbourne Inner and Victoria, the skill intensity of occupations increased for both men and women, but the growth was stronger for women than it was for men in the whole of Victoria, but not so for Melbourne Inner. These results highlight the increasingly important role of women in full-time employment, but the difference is small. This demonstrates a trend similar to that of the Australian economy. For overall employment, job creation in Gippsland is favouring occupations which require lower skill levels compared to the Melbourne Inner and Victoria for total employment.

**Skill intensity scores and indices change for total employment, and male and female full-time employment, 1986 to 2016**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | Gippsland | Melb. Inner | VIC | Gippsland | Melb. Inner | VIC | Gippsland | Melb. Inner | VIC |
| Total Employment | | | Male full-time | | | Female full-time | | |
| 1986 | 16.6 | 16.1 | 16.1 | 17.0 | 16.4 | 16.6 | 16.9 | 16.2 | 15.7 |
| 1991 | 16.7 | 16.8 | 16.4 | 17.3 | 17.3 | 17.1 | 17.0 | 17.1 | 16.2 |
| 1996 | 17.1 | 17.4 | 16.6 | 17.7 | 18.1 | 17.3 | 17.8 | 17.7 | 16.6 |
| 2001 | 16.9 | 17.9 | 16.7 | 17.5 | 18.6 | 17.3 | 17.6 | 18.3 | 16.8 |
| 2006 | 16.4 | 17.9 | 16.6 | 17.1 | 18.7 | 17.3 | 17.1 | 18.2 | 16.8 |
| 2011 | 16.3 | 18.1 | 16.7 | 17.0 | 19.0 | 17.4 | 17.0 | 18.5 | 17.0 |
| 2016 | 16.4 | 18.2 | 16.9 | 17.1 | 19.2 | 17.6 | 17.2 | 18.7 | 17.4 |
| **Skill Intensity Index growth** | | | | | | | | | |
| 1986 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1991 | 100.9 | 104.3 | 101.7 | 101.7 | 105.6 | 102.6 | 101.1 | 105.5 | 103.3 |
| 1996 | 103.2 | 107.8 | 103.4 | 104.3 | 110.3 | 104.3 | 105.6 | 109.1 | 105.8 |
| 2001 | 101.9 | 111.0 | 103.8 | 102.8 | 113.9 | 104.1 | 104.4 | 112.6 | 107.1 |
| 2006 | 99.1 | 110.9 | 103.0 | 100.5 | 114.3 | 103.9 | 101.6 | 112.4 | 106.9 |
| 2011 | 98.5 | 112.4 | 103.8 | 100.1 | 115.9 | 104.8 | 100.7 | 113.8 | 108.3 |
| 2016 | 98.6 | 113.0 | 104.8 | 100.5 | 117.6 | 105.9 | 101.9 | 115.5 | 110.4 |

Source: Australian Bureau of Statistics, Census, 1986 to 2016. Skill intensity index 1986 =100. Authors’ calculations.

When disaggregating the data in terms of job type (i.e. male and female full-time), the results are very similar. Employment creation in full-time work in Gippsland shows trends of low skill intensive job creation. Conversely, for women the trends in Gippsland show that job creation favours higher skilled occupations. Disaggregation into part-time work for men and women shows considerable declines in the skill intensity for male part-time work and a relatively small increase for women in the Gippsland region.

All other employment creation in terms of part-time work favoured women more than men in all of the regions considered. These trends in job creation indicate that occupations in part-time work for men are of a lower quality than those of women in the region and furthermore are of much lesser quality than jobs created in both Melbourne Inner and the rest of Victoria. Aggregate Skills of Total Employment: Gippsland, Melbourne Inner and Victoria.

**Change in skill intensity for part-time work for men and women, Gippsland, Melbourne Inner and Victoria, 1986 to 2016.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Gippsland | Melbourne Inner | Victoria | Gippsland | Melbourne Inner | Victoria |
| **Year** | **Male part-time** | | | **Female part-time** | | |
| 1986 | 15.4 | 14.9 | 14.9 | 15.1 | 15.3 | 15.2 |
| 1991 | 15.0 | 14.9 | 14.6 | 15.6 | 15.8 | 15.4 |
| 1996 | 15.0 | 15.1 | 14.7 | 16.0 | 16.3 | 15.8 |
| 2001 | 14.9 | 15.6 | 14.9 | 16.1 | 16.7 | 16.1 |
| 2006 | 14.6 | 15.7 | 14.9 | 15.5 | 16.5 | 15.7 |
| 2011 | 14.7 | 15.8 | 15.0 | 15.5 | 16.8 | 15.8 |
| 2016 | 14.6 | 15.8 | 15.0 | 15.5 | 16.8 | 16.0 |
|  | **Skill Intensity Index growth** | | | | | |
| 1986 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1991 | 97.5 | 99.8 | 97.9 | 102.8 | 102.8 | 101.0 |
| 1996 | 97.5 | 101.4 | 98.7 | 105.7 | 106.1 | 104.0 |
| 2001 | 97.0 | 104.4 | 100.3 | 106.1 | 108.5 | 105.5 |
| 2006 | 95.1 | 105.0 | 100.1 | 102.7 | 107.6 | 103.2 |
| 2011 | 95.4 | 106.3 | 100.7 | 102.2 | 109.8 | 104.1 |
| 2016 | 95.1 | 105.8 | 100.7 | 102.6 | 109.2 | 105.3 |

Source: Australian Bureau of Statistics, Census, 1986 to 2016. Skill intensity index 1986 =100. Authors’ calculations.

The Figure below shows details of the seven skill areas for the whole populations Gippsland, Melbourne Inner and Victoria. The changes are quite dramatic for all of the populations. The highlight is the decline in technical skills for all of the areas, indicating the decline in importance of manufacturing as an employer, not just in the State of Victoria, but also in the rest of Australia.

For women and men in full time and part-time work all skill areas increased, but the magnitude of the changes were largest in Melbourne Inner, followed by Victoria. Each of the seven areas is discussed below.

**Percentage change in skill area requirement for all employees for Gippsland, Melbourne Inner and Victoria, 1986 to 2016.**

Source: Australian Bureau of Statistics, Census, 1986 to 2016. Authors’ calculations.

In terms of Resource Management skills, Gippsland only experienced a slight increase in full-time and part-time work for men but declines for women. Victoria and Melbourne Inner experienced sizeable increases. The declines for Gippsland suggest that the developed capacities used to allocate resources efficiently in the labour market are quite important for men in full-time employment. These include skills in time management, management of financial and material resources, and management of personnel resources. The increase in demand suggests that employees require a set of skills that enable them to act in response to an increasingly complex and rapidly changing work environment, thus needing to adapt quickly to new situations and challenges and increasing competitiveness. In contrast, for women in Gippsland the demand for these skills declined. It can be interpreted that women in full-time and part-time occupations require lower levels of management skills, indicating that this skill set is either being lost or is not in high demand. Men’s increases in this area was steady, but not as pronounced as Melbourne Inner or Victoria.

The demand for social skills experienced sizeable increases in Gippsland, but these were not as large as those found in Melbourne Inner and Victoria. This skill area is concerned with the developed capacities used to work with people and needed to achieve goals in work-related situations. The large increases indicate that employees require a set of skills that are concerned with persuading colleagues to do things differently or take different approaches to work, negotiation skills required to bring employees together to reconcile differences or to solve work-related issues, coordination of the work of colleagues, and teaching colleagues new work systems or procedures. Furthermore, it is important to note the continued growth in service-oriented skills, which are reliant on the provision and delivery of services. Finally, social skills also relate to communication both internally and externally, with organisations that may form part of the production and delivery of a variety of services and products. This skill set has become increasingly important, particularly for women in all regions, but for men in Gippsland the growth has been relatively modest.

Systems skills grew in all job types and regions with the exception of part-time work for men in Gippsland. This skill area is concerned with the developed capacities used to understand, monitor and improve socio-technical systems. **Socio-technical systems** are an approach to complex organisational [work design](http://www.fact-index.com/w/wo/work_design.html) that recognises the interaction between people and technology in workplaces. This type of skill requires employees to develop particular work systems and to find ways of improving them over time. In these occupations, employees are required to quickly respond to challenges such as identifying the work procedures that need to be changed in order to improve productivity, understanding the relative costs and benefits of actions taken or that need to be taken, and constantly evaluating and upgrading the different mixes of systems performance indicators, while at the same time taking into account their accuracy and validity. For women, the increase was quite significant in all regions, indicating the importance this skill set plays in employment creation for women.

**Number of persons and total hours worked in healthcare and social assistance occupations (2 digits ANZSCO), 1986 to 2016**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation ANZSCO | Number of Persons | | | Annual Growth | | Total hours Worked | | | Annual Growth | |
| 1986 | 2001 | 2016 | 1986-2016 | 2001-16 | 1986 | 2001 | 2016 | 1986-2016 | 2001-16 |
| 13 Specialist Managers (health) | 52 | 66 | 214 | 10.4 | 14.9 | 1,360 | 2,384 | 8,130 | 16.6 | 16.1 |
| 23 Medical Laboratory Scientists | 54 | 67 | 28 | -1.6 | -3.9 | 1,579 | 1,719 | 755 | -1.7 | -3.7 |
| 25 Health Professionals | 2,162 | 2,796 | 4,399 | 3.4 | 3.8 | 64,499 | 71,724 | 134,679 | 3.6 | 5.9 |
| 27 Welfare Professionals | 27 | 196 | 376 | 43.1 | 6.1 | 254 | 4,947 | 11,291 | 144.6 | 8.5 |
| 31 Medical technicians | 126 | 121 | 271 | 3.8 | 8.3 | 4,754 | 5,188 | 7,349 | 1.8 | 2.8 |
| 41 Health and Welfare Support Workers | 701 | 691 | 1,613 | 4.3 | 8.9 | 20,294 | 19,089 | 49,245 | 4.8 | 10.5 |
| 42 Carers and Aides | 677 | 3,015 | 5,420 | 23.4 | 5.3 | 14,760 | 75,559 | 146,993 | 29.9 | 6.3 |
| **Total** | **3,799** | **6,952** | **12,321** | **7.5** | **5.1** | **107,500** | **180,610** | **358,442** | **7.8** | **6.6** |

Source: Authors’ calculations.

Process skills, showed similar trends for both men and women, as discussed for the previous skill areas. This area declined for men in part-time work but increased in all other work types and regions. This skill set is concerned with the procedures that contribute to the acquisition of skill and knowledge in a variety of work situations, and with the application and use of a number of basic skills. These are critical thinking, the application of active learning strategies when learning or teaching new things to colleagues at work, and the assessment of how well a particular job or task is being performed.

The growth in the demand for complex and problem-solving skills indicates that this skill area is growing in importance in full-time work in all regions, but not so much in part-time work for men in Gippsland. This skill area is concerned with solving ill-defined problems in complex work settings, identifying, proposing and evaluating solutions to problems, and observing and assessing the outcomes of a solution to identify lessons learned for the future. The strong increases in the demand for this skill set for women in all regions indicates the increasing importance of problem-solving activities and the increasingly significant role that women are playing in such activities, particularly at a time when the nature of work is changing rapidly. The fall in the demand for this skill for men part-time work in Gippsland contrasts with the increases elsewhere, indicating that this skill set is becoming less relevant for men in part-time work.

Content skills are concerned with the background structures that are needed for the successful completion of job tasks and the acquisition of new and more specific skills needed to operate effectively at work. It is made up of reading and comprehension, active listening, writing, speaking, mathematics and science. The background structures needed for successful work performance are reading and listening, which represent the two major ways in which information is conveyed between individuals at work. These skills provide the necessary structures that assist in the acquisition of more specific skills and knowledge in different work situations. As the nature of jobs in the three geographical regions changes for men and women and new technologies are introduced, these basic skills assist employees in adapting. The decline in content skills for men in part-time work is consistent for those seen in other skill areas discussed. The basic skills of reading, writing and mathematics are regarded as important in terms of contributing to the development of new and more complex skills valuable to the labour market, thus the increases seen for women in both regions and men in Melbourne indicate the increasing relevance of this skill set in the modern workplace. Such appears not to be the case for men in part-time work in Gippsland.

The demand for technical skills declined everywhere for both men and women in all regions. This area is concerned with the developed capacities used to design, set up, operate and correct malfunctions involving the use of machinery and technological systems. It includes technology design, equipment selection (e.g. operating machinery) and installation, programming of computers, testing of equipment, and product and equipment maintenance. The decline reflects a long-term period of structural change from a manufacturing-based economy to a services economy. For Gippsland these declines are attributed to the closure of large employers such as the Hazelwood Power Station. The analysis that follows looks at the change in total number of employees and corresponding total hours worked. We use an approximation of the ANZSCO classification of occupations, ensuring that only health and allied healthcare and social assistance occupations are counted as detailed in the previous Table.

**Annual growth in total hours worked by O\*NET Skills, O\*NET skill areas, 1986 to 2016 and 2001 to 2016.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Gippsland | | Melbourne Inner | | Victoria | |
| 1986-2016 | 2001-2016 | 1986-2016 | 2001-2016 | 1986-2016 | 2001-2016 |
| Content | 5.9 | 5.5 | 7.9 | 3.8 | 5.8 | 5.2 |
| Process | 6.1 | 5.8 | 7.8 | 3.9 | 6.0 | 5.5 |
| Social Skills | 6.3 | 5.8 | 7.6 | 4.1 | 6.1 | 5.5 |
| Complex Problem Solving | 5.6 | 5.4 | 7.6 | 3.7 | 5.6 | 5.3 |
| Technical Skills | 7.0 | 5.7 | 7.7 | 3.5 | 6.1 | 4.8 |
| System Skills | 4.7 | 5.4 | 6.3 | 3.9 | 4.7 | 5.2 |
| Management | 4.4 | 6.2 | 5.0 | 3.6 | 4.4 | 5.7 |

Source: Australian Bureau of Statistics, Census, O\*NET database. Authors’ calculations.

The Table above shows the demand for skills in each of the seven skill areas. The growth for health skills in Gippsland is greater, particularly between 2001 and 2016 due to a higher proportion of workers working in healthcare. For the 2001 to 2016 period, the strongest growth was in management skills (management of financial resources, management of material resources, and management of personnel resources).

**Conclusion**

The above analysis shows that the O\*NET combined with Australian Census data can provide valuable information on the evolution of the Australian labour market. This methodology can also be applied in regional employment analysis. The period from 1986 to 2016 demonstrates employment growth in both Melbourne Inner and Victoria, but the distributional growth in Gippsland shows different trends. Part-time work is now taking a significantly greater share of employment growth. Women’s participation in the workforce has also grown. Despite these similarities, there are striking differences between employment patterns in Gippsland, Melbourne Inner and Victoria, as well as within the geographical regions in Gippsland. Gippsland differs in terms of the skill intensity of occupations, having slightly declined compared to Melbourne Inner and Victoria. Skill intensity declined for the whole of Gippsland. It increased in full-time work for men and for women. In terms of part-time work, it increased for women but declined considerably for men, impacting negatively in the whole region. These results are in contrast to those found in Melbourne Inner and Victoria where the skill intensity rose in all areas. Aggregate skills grew faster in low skilled occupations while the proportion of high skilled jobs also declined in Gippsland but not so for Melbourne Inner and Victoria.

An examination of the seven aggregated O\*NET skill areas showed clear signs of a shift from a manufacturing base towards a services-based economy, as shown by the sharp decline in technical skills in all of the three regions examined. The highest decline in this area was seen in Gippsland. Examination of the healthcare and social assistance sectors was conducted using total hours worked. These results indicate that the proportion of hours worked increased from 3.6 per cent in 1986 to 10.7 per cent, a larger magnitude than those seen in Melbourne Inner and Victoria. In terms of skill areas, the strongest growth was seen in Gippsland between 2001 and 2016, indicating the strength of these sectors, not just as a key employer for the region, but also as an engine for economic growth regionally

**Case Study: Bairnsdale Regional Health Service: A model for staff retention and development**

A major challenge for regional health services is attracting and retaining expert staff and to make them feel part of vibrant local communities. Valentine Agugo, Allied Health Manager Bairnsdale Regional Health Service (BRHS), explains that this is a challenge not easy to overcome.

BRHS is the largest healthcare provider in East Gippsland, located at the gateway to the Lakes and Wilderness region, and an easy three hour drive from Melbourne, the regional service provider is strategically located. “It has easy access to the Gippsland lakes and beaches, national parks and the snowfields”, explains Agugo. The region has many lifestyle opportunities available to enjoy a healthy, diverse lifestyle combined with the opportunity to develop a career in allied health. BRHS main challenge is to retain and to encourage staff to come to work in one of Australia’s most idyllic locations. Opportunities abound especially at a time when the population is growing rapidly and is also experiencing a demographic change characterised by “… lots of babies being born”, explains Agugo.

This creates a growing demand for professionally qualified occupations such as physiotherapists, radiologists, occupational therapists and dental officers, which tend to be difficult to fill and are in high demand throughout regional Victoria and Australia as a whole. An apparent disadvantage for our regions is that many of the young graduates come from large cities such as Melbourne and perceive that country life may be boring, uninteresting or lacking job opportunities. To overcome this perception, Agugo and his colleagues, together with help from the State Government of Victoria have devised an ingenious program to entice and retain highly qualified allied health staff.

The organisation has a training package for graduates. BRHS offers a 12 month Graduate Program designed to provide new graduates with an exciting and diverse consolidation year following their professional allied health course completion from tertiary institutions.

The program consists in BRHS employing new graduates in the region and offering them first experience at work once they finish university. In these roles, graduates rotate through different complex health related roles.

The training packages are designed to ensure that graduates are exposed to acute inpatient, rehabilitation and outpatient services, providing graduates with job variety and an array of learning opportunities in their graduate year. Working in regional Health Services graduates are exposed to a varied caseload. “This benefits consolidation of their University training in that graduates benefit from supervision and support from experienced health professionals across our dedicated multidisciplinary team”, explains Agugo.

The package is designed to provide with the basic opportunities and information to apply university-based learning into practice in real life work settings. Clinical supervision and general supervision are closely monitored by highly experienced allied health professionals, imparting practical knowledge and experiences. An important feature of the six to twelve-week program is that the training packages are delivered outside of working hours. However, participants are remunerated for attendance, thus creating a learning environment that is diverse, holistic and flexible, according to Agugo.

The program is very successful with employee retentions being healthy, staying in the region for periods of three years and longer. Program participants also enjoy a host of excellent benefits not found elsewhere, including access to generous salary packaging options to enable great tax savings, paid professional development leave with generous subsidies of $2,000 and an additional $500 to enable attendance at conferences. There is also a comprehensive Health and Wellbeing and Employee assistance program, making life in Gippsland truly enjoyable.

# Knowledge intensity of occupations in full-time employment

The indices in the following Table show that the knowledge intensity of occupations had declined for total employment in Gippsland but had grown significantly for Melbourne Inner and Victoria. This means that occupations created in Gippsland require lower levels of knowledge compared to other occupations in the other two regions. For men the index remained unchanged, but grew for women by a small margin, in contrast to sharp rises for Melbourne Inner and Victoria.

These trends indicate that in terms of job creation, the knowledge requirements of occupations are higher in Melbourne Inner and the rest of Victoria. In terms of each of the six LGAs that comprise Gippsland the intensity of knowledge declined in total employment for Bass Coast, Baw Baw, South Gippsland and Wellington. Increases were only found in the Latrobe LGA. For men the quality of employment declined in terms of knowledge in Bass Coast, East Gippsland, South Gippsland and Wellington. For women Bass Coast, East Gippsland and Latrobe experienced increases. The performance of Gippsland in terms of knowledge intensive full-time work is of particular concern, not only because it declined, but because this trend contrasts with the experience of the Melbourne Inner and Victoria (see Langworthy et. al. 2009).

**Knowledge intensity scores and indices change for total employment, and male and female full-time employment, 1986 to 2016**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | Total Employment | | | Male full-time | | | Female full-time | | |
| Gippsland | Melbourne Inner | VIC | Gippsland | Melbourne Inner | VIC | Gippsland | Melbourne Inner | VIC |
| 1986 | 13.2 | 12.0 | 12.2 | 13.7 | 12.3 | 12.9 | 13.2 | 11.8 | 11.5 |
| 1991 | 13.1 | 12.5 | 12.2 | 13.8 | 12.9 | 13.1 | 13.2 | 12.6 | 11.8 |
| 1996 | 13.6 | 13.1 | 12.6 | 14.3 | 13.6 | 13.2 | 14.2 | 13.4 | 12.5 |
| 2001 | 13.4 | 13.5 | 12.7 | 14.0 | 14.0 | 13.2 | 13.9 | 13.8 | 12.7 |
| 2006 | 13.0 | 13.6 | 12.6 | 13.8 | 14.2 | 13.3 | 13.5 | 13.9 | 12.7 |
| 2011 | 12.9 | 13.9 | 12.7 | 13.7 | 14.5 | 13.4 | 13.3 | 14.2 | 12.9 |
| 2016 | 12.9 | 13.9 | 12.9 | 13.7 | 14.7 | 13.6 | 13.5 | 14.4 | 13.2 |
| Knowledge Intensity Index | | | | | | | | | |
|  | Gippsland | Melbourne Inner | VIC | Gippsland | Melbourne Inner | VIC | Gippsland | Melbourne Inner | VIC |
| 1986 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1991 | 99.6 | 104.3 | 100.5 | 100.8 | 104.9 | 101.4 | 99.7 | 106.3 | 102.5 |
| 1996 | 103.4 | 109.7 | 103.6 | 104.1 | 110.2 | 102.8 | 107.4 | 113.0 | 108.4 |
| 2001 | 101.6 | 112.9 | 104.0 | 102.1 | 113.4 | 102.4 | 105.4 | 117.1 | 109.8 |
| 2006 | 98.8 | 113.8 | 103.6 | 100.3 | 115.5 | 103.0 | 102.0 | 117.7 | 110.2 |
| 2011 | 97.8 | 116.0 | 104.5 | 99.5 | 117.8 | 104.1 | 100.4 | 120.0 | 111.7 |
| 2016 | 97.8 | 116.7 | 105.6 | 100.0 | 119.5 | 105.4 | 101.9 | 122.0 | 114.2 |
| Change | **-2.2** | **16.7** | **5.6** | **0.0** | **19.5** | **5.4** | **1.9** | **22.0** | **14.2** |

Source: Australian Bureau of Statistics, Census. Knowledge intensity index 1986 =100. Authors’ calculations. Not stated and inadequately described not included in calculations.

**Knowledge intensity of occupations in part-time employment**

The trends for part-time employment for men were similar to those for full-time employment, but not for women as shown in the following Table. The main difference is that the knowledge intensity in part-time employment for women increased in Gippsland, whereas for men it declined by 5.7 per cent. For Gippsland the knowledge intensity of male employment started from a higher base in 1986, declining consistently to 11.5. For women in Gippsland, the knowledge intensity of workers increased by 4.9 per cent over the same period. In contrast, the Melbourne Inner experienced considerable increases in the knowledge intensity of work for men and women, indicating that part-time work created requires higher knowledge levels. The whole of Victoria experienced increases in the knowledge intensity of work. These changes may be interpreted as a process of skill-bias towards occupations that require high levels of knowledge intensity for the whole of Melbourne Inner and Victoria, but not so for Gippsland. This may indicate that the quality of occupations being created requiring high knowledge intensity is not being shared evenly across Victoria, with the bulk of high knowledge intensive jobs being concentrated in Melbourne Inner. Gippsland experienced declines in the knowledge intensity of jobs, indicating lower knowledge intensive jobs being created in full-time work for men. Women have fared slightly better, showing increases in the indices of knowledge intensity in most of the LGAs. In terms of part-time work, job creation appears to favour occupations that require lower levels of knowledge intensity for men, but not for women. Melbourne and Victoria fared much better.

**Knowledge intensity scores and indices change for total employment, and male and female part-time employment, 1986 to 2016**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | Total part-time Employment | | | Male part-time | | | Female part-time | | |
| Gippsland | Melbourne Inner | VIC | Gippsland | Melbourne Inner | VIC | Gippsland | Melbourne Inner | VIC |
| 1986 | 11.5 | 11.2 | 11.1 | 12.1 | 11.2 | 11.3 | 11.3 | 11.3 | 11.1 |
| 1991 | 11.6 | 11.5 | 11.1 | 11.7 | 11.2 | 10.9 | 11.5 | 11.7 | 11.1 |
| 1996 | 12.1 | 12.1 | 11.7 | 11.7 | 11.5 | 11.1 | 12.3 | 12.4 | 12.0 |
| 2001 | 12.2 | 12.4 | 11.9 | 11.6 | 11.8 | 11.3 | 12.4 | 12.8 | 12.2 |
| 2006 | 11.8 | 12.4 | 11.7 | 11.6 | 12.0 | 11.4 | 11.9 | 12.6 | 11.8 |
| 2011 | 11.8 | 12.6 | 11.8 | 11.6 | 12.2 | 11.4 | 11.8 | 12.9 | 11.9 |
| 2016 | 11.7 | 12.5 | 11.9 | 11.5 | 12.0 | 11.4 | 11.8 | 12.8 | 12.1 |
| Knowledge Intensity Index | | | | | | | | | |
|  | Gippsland | Melbourne Inner | VIC | Gippsland | Melbourne Inner | VIC | Gippsland | Melbourne Inner | VIC |
| 1986 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1991 | 100.6 | 102.3 | 99.6 | 96.2 | 99.8 | 96.5 | 102.4 | 103.6 | 100.8 |
| 1996 | 105.4 | 107.5 | 105.3 | 96.3 | 103.0 | 98.4 | 109.1 | 110.1 | 108.2 |
| 2001 | 105.8 | 110.2 | 107.0 | 95.7 | 105.3 | 99.7 | 109.9 | 113.1 | 110.2 |
| 2006 | 102.4 | 110.0 | 105.1 | 95.1 | 106.9 | 100.5 | 105.3 | 111.8 | 107.0 |
| 2011 | 102.1 | 112.5 | 106.0 | 95.2 | 108.9 | 101.3 | 104.9 | 114.6 | 108.0 |
| 2016 | 101.8 | 111.5 | 106.7 | 94.3 | 107.6 | 101.0 | 104.9 | 113.8 | 109.4 |
| Change | 1.8 | 11.5 | 6.7 | -5.7 | 7.6 | 1.0 | 4.9 | 13.8 | 9.4 |

Source: Australian Bureau of Statistics, Census. Knowledge intensity index 1986 =100. Authors’ calculations. Not stated and inadequately included in calculations.

**Knowledge Requirements of Occupations**

As described earlier, knowledge is defined in the O\*NET as a set of collected but related facts, information and principles about a particular area of work. The knowledge taxonomy is made up of 33 descriptors. For this analysis, attention is paid to ten areas which describe the knowledge requirements of Australian occupations. The following Table shows details of the ten knowledge areas for men and women in Gippsland, Melbourne Inner and Victoria. A detailed description of the changes is detailed below under each of the ten knowledge areas.

Changes to business and management practices were significant for both men and women. For women in the Gippsland, Melbourne Inner and Victoria, the increases were between 0.8 per cent to as high as 4.8 per cent respectively, whereas for men the changes were smaller, with increases ranging from 1.3 to 6.4 per cent. An explanation is that employees increasingly require knowledge in new and innovative management and business techniques. Many workplaces now require employees to possess knowledge of the principles and facts related to the successful operation of businesses and their correct administration, especially at a time when the role of many occupations and the demands of work are changing. Many employees need to possess knowledge in areas such as human and material resource management, sales and marketing, economics and office information, and organisational systems.

**Knowledge area requirement changes for full-time employment, Gippsland, Melbourne Inner and Victoria, 1986 to 2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Men | | | Women | | |
| Gippsland | Melb’ Inner | VIC | Gippsland | Melb’ Inner | VIC |
| Business and Management | 1.3 | 6.4 | 2.5 | 0.8 | 4.8 | 2.8 |
| Manufacturing and Production | -2.2 | -0.6 | -1.3 | -5.9 | -0.5 | -2.0 |
| Engineering and Technology | -0.4 | 2.0 | 0.5 | -2.4 | 1.8 | 0.0 |
| Mathematics and Science | -0.3 | 1.6 | 0.1 | 0.9 | 2.9 | 2.2 |
| Health Services | 0.4 | 1.2 | 0.7 | 4.3 | 2.6 | 3.8 |
| Education and Training | 0.7 | 4.6 | 2.0 | 3.3 | 4.4 | 4.6 |
| Communication | 1.4 | 4.3 | 2.3 | 1.8 | 3.8 | 2.6 |
| Law and Public Safety | 0.2 | 1.1 | 0.5 | -0.2 | 1.2 | 0.9 |
| Arts and Humanities | 0.3 | 1.8 | 0.7 | 1.6 | 1.8 | 1.5 |
| Transport | -0.5 | -2.3 | -1.2 | -2.3 | 0.2 | -0.6 |

Source: Authors’ calculations.

Manufacturing and production knowledge decreased for men and women in all regions, with women in Gippsland experiencing the largest decline of all. The declines in these areas of knowledge show that manufacturing has experienced a decline in terms of importance as an industry. This is because much of the manufacturing in Australia is highly automated requiring low numbers of highly skilled workers. In this area, the knowledge intensity declined for men and women in Gippsland but increased in Melbourne and the whole of Victoria.

Engineering and Technology knowledge is concerned with the design, development and application of technology in different settings. It consists of knowledge related to engineering and technology, design, building and construction, mechanical, and computer and electronics. The decline can be attributed to a shift in job creation away from manufacturing towards high end value adding.

Mathematics and science knowledge is concerned with the application of physical, biological, social, mathematical and geographical knowledge. These changes show that mathematical and scientific knowledge are becoming important aspects of full-time employment, particularly as it refers to women in all of the regions. Unfortunately, for men in Gippsland this index declined by -0.3 per cent. These increases in employment indicate how complex and knowledge intensive occupations have become for women since 1986. The decline in this knowledge area for men in Gippsland points towards employment creation that requires lower levels of knowledge in mathematics and science.

Health services knowledge is related to medicine, dentistry, and therapy and counselling. It also relates to the principles and facts regarding the diagnosis, cure and prevention of disease, and ensuring that people’s mental and physical health and wellbeing are maintained. The changes in this area were positive in all of the regions for men and women, where the knowledge intensity rose considerably for women particularly for women. These changes show that employment creation requiring health services knowledge is not as prominent for men as it is for women.

In Education and training the knowledge concerned is in instructional methods and training techniques designed to improve productivity. The rises for women indicate the increasing role that they play in education and training. This knowledge requirement has become increasingly important as a result of constant changes in work practices and the need to adapt to a rapidly evolving work environment. More employees are now required to participate in training programs. The education sector has experienced strong expansion in terms of employment over the last three decades and this trend is not likely to abate. Furthermore, this is a sign that workplaces and occupations have become more knowledge intensive.

Arts and humanities knowledge increased for men and women in all areas as well. It is concerned with the facts and principles related to the branches of learning that deal with human thought, language and the arts. It is made up of variables that include knowledge of English and foreign languages, fine arts, history and archaeology, and philosophy and theology. Although the increases are modest, they remain important for all of the regions

Knowledge of the law and public safety fell for women only in Gippsland but increased in all the regions for both genders. This area is concerned with having an understanding of the regulations and methods for maintaining people and property free from danger, injury or damage. The increases in this area of knowledge intensity in full-time employment for men may be due to the emergence and rise of the security industry since the late 1980s, and an increase in awareness and importance of health and safety issues in the workplace. Women are playing an increasing role in this type of work, as evidenced by increases in the number working in law and jurisprudence related occupations in Melbourne and Victoria, but not so in Gippsland.

Communication experienced the same trend in all regions as for the knowledge area Health Services and Education and Training. It rose by between 1.4 per cent and 4.3 per cent in all of the regions for men and women. This area of knowledge is concerned with the technical areas of telecommunications and the knowledge of media production, communication and dissemination techniques used to inform and entertain via written, oral or visual media.

Knowledge in transportation fell in all areas except for women in the Melbourne Inner. This may indicate that this industry sector has consolidated over the years as a result of deregulation and the creation of a highly competitive market. This area is concerned with the knowledge of principles and methods for moving people or goods by air, rail, sea or road, including their relative costs, advantages and limitations. This area of knowledge requires lower knowledge intensity than the other nine. The declines in knowledge intensity in this area for women show that this type of knowledge is not a prerequisite knowledge area for women at work.

**Knowledge Requirement Trends for Part-Time Employment: Gippsland, Melbourne Inner and Victoria**

The trends for part-time employment creation (see the following Table) in terms of knowledge areas tend to be of a similar nature to those in full-time work for men and women. Men in part-time work in Gippsland experienced increases in the knowledge requirements of employment in the following areas: business and management, health services, and communication. All other areas declined. Women in Gippsland, on the other hand, experienced declines in manufacturing, engineering and technology, law and public safety and transport.

**Knowledge area requirement changes for part-time employment, Gippsland Region, Melbourne Inner and Victoria, 1986 to 2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Men | | | Women | | |
| Gipps  land | Melb. Inner | VIC | Gipps  land | Melb. Inner | VIC |
| Business and Management | 2.3 | 3.7 | 2.8 | 0.9 | 2.9 | 1.6 |
| Manufacturing and Production | -2.2 | 1.0 | -0.7 | -2.0 | -0.1 | -1.0 |
| Engineering and Technology | -3.4 | -1.0 | -2.1 | -1.4 | 0.0 | -0.8 |
| Mathematics and Science | -1.2 | 0.6 | -0.3 | 1.8 | 2.5 | 2.3 |
| Health Services | 0.2 | 0.9 | 0.7 | 3.6 | 3.0 | 3.3 |
| Education and Training | -0.8 | 2.8 | 1.5 | 3.1 | 4.0 | 3.9 |
| Communication | 1.1 | 2.0 | 1.5 | 1.3 | 2.2 | 1.7 |
| Law and Public Safety | -2.7 | -1.5 | -1.8 | -2.1 | -1.0 | -1.4 |
| Arts and Humanities | -0.2 | 0.2 | 0.1 | 0.6 | 1.0 | 0.9 |
| Transport | -2.2 | -1.9 | -1.9 | -0.8 | -0.5 | -0.5 |

Source: Authors’ calculations.

**Conclusion**

In summary, the trends found in the analysis of knowledge intensity requirement for full-time employment indicate similar trends to those found in the skill areas. Women are performing relatively better in full-time employment creation compared to men in the six LGAs. The demand for knowledge areas for men rose mostly in full-time work, but fell in part-time work, indicating that the demand for knowledge intensive work for men is still important, although job creation has not been very knowledge intensive. Women fared somewhat better, but in terms of knowledge employment creation, Gippsland is not performing as well as Melbourne Inner or the rest of Victoria, indicating that the region could be falling behind others in Victoria. This raises policy concern issues at both the Federal and State level, where governments should encourage investment in industry that are both skill and knowledge intensive in order to make Gippsland a more vibrant and forward looking region.

**Case Study: Sharing the most specialised and highly qualified people**

One way to make use of the most highly qualified specialists, with skills that are hard to find his through the sharing of personal. One example is the case of Dr Ralf Brachold a Senior Staff Anaesthetist with more than 20 years’ experience in medicine in Australia and overseas.

He works for Sunshine Coast Hospital and Health Service (Sunshine Coast HHS). His central responsibility is as Campus Liaison Lead, facilitating adherence to HHS processes across the health services network of hospitals in regional Queensland and assisting non-specialist anaesthetists in one of them. Sunshine Coast HHS’s main remit is to provide services through a number of hospitals and health organisations, including Sunshine Coast University Hospital (SCUH); Nambour General Hospital; Caloundra Health Service; Gympie Hospital; and Maleny Soldiers Memorial Hospital. The network provides a comprehensive range of sub-acute, ambulatory and extended care, community health, mental health and oral health services, and an aged care services at the Glenbrook Residential Aged Care Facility. Through the opening of SCUH and the transformation of existing facilities at Nambour and Caloundra, the Sunshine Coast HHS has invested to meet the growing healthcare needs of a rapidly expanding community delivering excellence in health care to a population of more than 400,000 people.

Dr Brachold works for the health service’s Department of Anaesthesia and Perioperative Medicine. He has over ten years’ experience as a specialist anaesthetist with a special interest in rural anaesthesia and he is registered with the Australian Health Practitioner’s Regulation Authority (AHPRA). “My role sits within the Department of Anaesthesia and Perioperative Medicine, which is embedded in the Surgical Services Group of the health services”.

The Department is responsible for the provision of anaesthesia, perioperative analysis and services, and pain control. As anaesthetists, his team’s responsibilities include planning for surgical procedures and major interventions. This encompasses different types of medical assessments, optimisation of patients’ medical conditions prior and the detailed planning of surgical interventions designed to ensure the most efficient utilisation of staff, hi-tech medical equipment and secondary resources. “In my role”, explains Dr Brachold, “I am the designated lead for liaison of hospital campuses.”

Planning and operations are conducted at the main site of Sunshine Coast HHS and coordinated with staff at other network hospitals. His role is varied working in four different locations as lead and mentor to newly qualified and trainee anaesthetists. “We get information from surgeons and assess patients’ needs and then as a team we choose the optimal time for intervention to ensure that patient risk is minimised in order to ensure best outcomes and to safeguard patient wellbeing,” explains Dr Brachold.

In his role Dr Brachold travels to different hospitals on the Sunshine Coast covering hundreds of kilometres in a week. “For example, at Gympie hospital we have anaesthetists, who require my expertise in assessing patients for more complex interventions,” explains Dr Brachold. Dr Brachold’s complex job is compounded due to the diversity in the region’s client base. “We anaesthetize all ages from infants to the frail and elderly. The work encompasses elective and emergency surgery, except for a few surgical subspecialties.”

The Sunshine Coast HHS continues to expand, with new and expanded existing services expected to be increased over the next five years. As healthcare needs in regional communities grow, the model provided by Sunshine Coast HHS, appears to meet the bill. Dr Brachold’s omnipresence is hard to miss.

# Occupational forecasts

The healthcare and social service assistance sectors’ workforce will grow at a faster rate than that of the overall region’s economy, and the Victorian and Australian economy. As shown earlier, the healthcare and social assistance sector grew by almost 51 per cent between 2001 and 2016, which will continue at a slightly slower rate over the next 20 years.

This will place tremendous pressures on these sectors’ future workforce and regional population needs. Disaggregation in terms of skill needs of this healthcare and social assistance workforce shows the magnitude of the challenge. Earlier provided information on the level of skills in the healthcare and social assistance sectors over the period 1986 to 2016 for the Gippsland region and broken down to the six LGAs, indicated the growth in particular skills required to perform complex healthcare and social assistance occupations.

Again, and as stated earlier, the growth in the demand for ‘strategic healthcare and social assistance skills’ will be greater in Gippsland than for the rest of Victoria and Australia. To quantify these demand skill changes we use total hours worked. Of great significance is the growth in the demand for skills in healthcare and social assistance in skills such as: social skills (5.8 per cent), persuasion (5.5 per cent), coordination (5.6 per cent) problem solving skills (5.4 per cent), decision-making skills (5.6 per cent), technical skills (5.7 per cent), operation and monitoring skills (6.7 per cent) to name a few. To obtain a deeper understanding of the demand for skills required into the future for the sector, we conducted a detailed analysis of the skill base of the Gippsland region’s healthcare and social assistance sector.

Furthermore, we analyse the skill and knowledge base of 42 healthcare and social assistance sector occupations, in order to clearly understand the past, current and future knowledge and skill requirements of these occupations. This detailed analysis helped us understand the future training and retraining requirements for the workforce, in order to meet the future healthcare and social assistance needs of the population of Gippsland.

**Skills and knowledge requirement of the Gippsland workforce**

We used O\*NET to analyse the workforce because it is an information system consisting of a framework made up of occupational information that allows jobs to be described in terms of more general descriptors that reflect the modern labour market. An advantage of the O\*NET is that the detailed data collected on worker characteristics and job requirements can be used to examine and analyse changes in the labour market. A further advantage is that the O\*NET can be connected to ASCO 1st and 2nd editions and ANZSCO (e.g. Esposto, 2011). In combining these two databases, we are then able to conduct a detailed analysis of the skill and knowledge requirements of healthcare and social assistance occupations, utilising 35 skills and 33 knowledge descriptors for 42 healthcare occupations.

The labour market has experienced a major transformation over the last three decades. A major feature of this change has been the increasing diversity in the nature of work and types of employment. For example, up until the 1970s, most Australian workers were in permanent, full-time employment. During the early 1970s, just over one in ten worked in part-time employment – defined by the Australian Bureau of Statistics as employment that involves less than 35 hours per week. By 2018 part-time employment rose by more than 32 per cent of jobs (Australian Bureau of Statistics, *Characteristics of Employment, Australia*, 2018). Furthermore, in the early 1980s, alternative work arrangements began to flourish, especially casual employment (Esposto 2008, p. 84).

**Annual growth in total hours worked by O\*NET Skills for 42 healthcare and social assistance, occupations, 1986 to 2016 and 2001 to 2016. Ranked by importance.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| O\*NET Skill | 1986-2016 | 2001-2016 | O\*NET Skill | 1986-2016 | 2001-2016 |
| Monitoring | 11.7 | 6.7 | Judgment and Decision Making | 5.7 | 5.6 |
| Troubleshooting | 12.2 | 6.7 | Reading Comprehension | 6 | 5.5 |
| Quality Control Analysis | 16.6 | 6.5 | Active Listening | 6.6 | 5.5 |
| Service Orientation | 8.3 | 6.4 | Writing | 5.3 | 5.5 |
| Management of Financial Resources | 3.0 | 6.4 | Critical Thinking | 6 | 5.5 |
| Monitoring | 7.0 | 6.3 | Persuasion | 4.6 | 5.5 |
| Instructing | 5.9 | 6.0 | Negotiation | 4.5 | 5.4 |
| Management of Material Resources | 1.1 | 6.0 | Complex Problem Solving | 5.6 | 5.4 |
| Operation and Control | 13.4 | 5.9 | Installation | 6.8 | 5.3 |
| Mathematics | 6 | 5.8 | Repairing | 5.7 | 5.1 |
| Learning Strategies | 6.4 | 5.8 | Equipment Selection | 10.5 | 5.0 |
| Technology Design | 4.8 | 5.8 | Management of Personnel Resources | 3.2 | 5.0 |
| Systems Analysis | 4 | 5.8 | Equipment Maintenance | 5.1 | 4.9 |
| Resource Management | 2.7 | 5.8 | Systems Evaluation | 3.9 | 4.9 |
| Speaking | 6.1 | 5.7 | Programming | 3.2 | 4.7 |
| Active Learning | 5.2 | 5.7 | Science | 4.9 | 4.4 |
| Social Perceptiveness | 7.4 | 5.6 | Operations Analysis | 0.8 | 3.7 |
| Coordination | 6.1 | 5.6 |  | | |

Source: Authors’ calculations.

The Table above shows the growth in skills. Each skill growth is ranked in terms of highest to lowest, or most important annual growth rate for the healthcare and social assistance sectors in Gippsland. All 35 skills showed considerable annual growth indicating the increasing complexity of working in the healthcare and social assistance sectors. Added to this is the increasing variety of skills that employees in this sector are required to possess and improve on a continual basis. Furthermore, this also indicates how fast and quickly the healthcare and social assistance sectors are changing in terms of how much employees need to adapt to new technologies, management structures and innovations occurring in the sector.

As shown in the Table above, the five most important skills in terms of growth were the following together with their definition, indicating the value of each of these skills to their respective occupation.

1. Monitoring: Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.
2. Troubleshooting: Determining causes of operating errors and deciding what to do about it.
3. Quality Control Analysis: Conducting tests and inspections of products, services, or processes to evaluate quality or performance.
4. Management of Financial Resources: Determining how money will be spent to get the work done, and accounting for these expenditures.
5. Learning strategies: Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things (6.11 per cent).

The above growth in skills is also matched by strong growth in social skills which consists of the following elements:

1. Social Perceptiveness: Being aware of others' reactions and understanding why they react as they do (5.6 per cent).
2. Coordination: Adjusting actions in relation to others' actions (5.6 per cent).
3. Persuasion: Persuading others to change their minds or behaviour (5.6 per cent).
4. Negotiation: Bringing others together and trying to reconcile differences (5.4 per cent).
5. Instructing: Teaching others how to do something (6.0 per cent).
6. Service Orientation: Actively looking for ways to help people (6.4 per cent).

These increases in demand are also matched by increases in the demand for knowledge in the areas of healthcare services (4.7 per cent), education and training (4.0 per cent), communication (3.2 per cent) and business and management (2.1 per cent).

These set of skills and knowledges are very important for the modern work place in that they highlight the importance of lifelong learning, clear communication, working in groups and meeting continuous challenges at work as they arise. The strong growth in all 35 skills indicates how rapidly the nature of these occupations is changing and varied and diverse the skill sets required by workers in this sector are becoming, thus making these occupations more demanding in terms of skills and knowledge requirements for effective work delivery. This indicates that the healthcare and social assistance sectors are increasingly becoming more complex in its delivery as well as in the demands placed upon each of the 42 occupations analysed.

**Forecasts**

Forward looking forecasts for occupations in the Gippsland healthcare and social assistance sectors are provided in the following Tables. These are first at the aggregate level and then for a selection of occupations. The detailed description of the methods used to make these forecasts are provided in the longer version of the Final Report.

**Gippsland Region, and LGAs actual employment in the healthcare and social assistance sectors, and forecasts up until 2036**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2016 | 2021 | 2026 | 2031 | 2036 |
| Bass Coast Shire | 1,505 | 1,700 | 1,880 | 2,050 | 2,240 |
| Baw Baw Shire | 2,343 | 2,680 | 3,030 | 3,420 | 3,850 |
| East Gippsland Shire | 2,237 | 2,410 | 2,590 | 2,780 | 2,990 |
| Latrobe City | 4,133 | 4,400 | 4,720 | 5,080 | 5,470 |
| South Gippsland Shire | 1,186 | 1,260 | 1,350 | 1,440 | 1,540 |
| Wellington Shire | 2,128 | 2,260 | 2,410 | 2,580 | 2,760 |
| Gippsland Region | 13,532 | 14,710 | 15,980 | 17,350 | 18,850 |

Source: Australian Bureau of Census and Statistics, Census. National Health Workforce Database.

As can be seen from the forecasts in the Table it is expected that there will be an increase in overall numbers in each of the LGA’s, although the rate of increase will be greatest in the Baw Baw and Bass Coast Shires. In the case of the individual occupations there will be a growth in a number of all of them, but this rate of growth will vary. On average those

most closely associated with caring for elderly people will be the ones that have the greatest growth in numbers.

As well as looking at the overall numbers it is possible to look at individual occupations to see how demand for these people will change over time. Also, it is possible to look at the nature of the occupations and how these are expected to change. These forecasts are provided in the following Table.

**Gippsland healthcare and social assistance occupations, actual 2016, forecast 2021 to 2036**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2016 | 2021 | 2026 | 2031 | 2036 |
| Health and Welfare Services Managers | 223 | 244 | 266 | 290 | 317 |
| Pharmacists | 235 | 248 | 263 | 278 | 294 |
| Dental Practitioners | 132 | 138 | 146 | 154 | 162 |
| Occupational Therapists | 150 | 164 | 179 | 195 | 212 |
| Physiotherapists | 167 | 182 | 199 | 217 | 237 |
| Audiologists and Speech Pathologists\Therapists | 79 | 86 | 94 | 103 | 113 |
| General Practitioners, Resident Medical Officers | 267 | 291 | 318 | 346 | 377 |
| Medical Imaging Professionals | 116 | 126 | 137 | 148 | 161 |
| Occupational/Environmental Health Professionals | 179 | 196 | 213 | 233 | 254 |
| Midwives | 239 | 253 | 268 | 282 | 297 |
| Nurse Managers | 189 | 207 | 226 | 247 | 270 |
| Registered Nurses | 2,730 | 2,979 | 3,246 | 3,534 | 3,846 |
| Enrolled Nurses | 623 | 678 | 735 | 795 | 859 |
| Medical Technicians | 287 | 314 | 342 | 373 | 406 |
| Ambulance Officers and Paramedics | 272 | 290 | 309 | 328 | 347 |
| Dental Assistants | 227 | 242 | 258 | 275 | 292 |
| Psychologists | 160 | 175 | 192 | 209 | 228 |
| Social Workers | 244 | 267 | 292 | 318 | 347 |
| Diversional Therapists | 80 | 88 | 95 | 104 | 113 |
| Massage Therapists | 172 | 189 | 206 | 225 | 245 |
| Welfare Support Workers | 672 | 733 | 799 | 870 | 948 |
| Child Carers | 1,075 | 1,132 | 1,190 | 1,246 | 1,304 |
| Education Aides | 1,298 | 1,374 | 1,458 | 1,544 | 1,632 |
| Aged and Disabled Carers | 1,945 | 2,195 | 2,483 | 2,805 | 3,167 |
| Nursing Support and Personal Care Workers | 918 | 1,006 | 1,100 | 1,202 | 1,312 |
| Other | 853 | 911 | 976 | 1,044 | 1,116 |
| **Total healthcare and social services** | 13,532 | 14,708 | 15,992 | 17,368 | 18,855 |

Source: Australian Bureau of Statistics, Census. National Health Workforce Database. Authors’ estimate

As well as healthcare and social assistance related employees it is possible to look at the forecast number of people in non-clinical management, professional and clerical and administrative workers employed in the two sectors in Gippsland. Estimates of the numbers of employees from 2016 and 2036 are calculated using population growth weights applied to Australian Census data for people employed in the healthcare and social assistance sectors. We expect proportion of people in the overall sector in these categories to be 15 per cent. This means that numbers in administration and clerical roles should reach 2,790 by 2036.

**Non-clinical selected healthcare and social assistance occupations, Gippsland region.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ANZSCO code | Occupation | Estimate number of employees employed | | | | |
| *1000* | *Management* | *2016* | *2021* | *2026* | *2031* | *2036* |
| 1111 | Chief Executives and Managing Directors | 47 | 54 | 62 | 71 | 82 |
| 1112 | General Managers | 50 | 58 | 66 | 76 | 87 |
| 1342 | Community services manager | 32 | 37 | 42 | 49 | 56 |
| 1342 | Health and Welfare service managers | 39 | 45 | 52 | 59 | 68 |
| 1341 | Child Care Centre Managers | 12 | 14 | 16 | 18 | 21 |
| 1399 | Quality and safety manager | 72 | 83 | 95 | 110 | 126 |
| 1342 | Director of Medical services | 32 | 37 | 42 | 49 | 56 |
| 1322 | Finance manager | 28 | 32 | 37 | 43 | 49 |
| ***2000*** | ***Professionals*** |  |  |  |  |  |
| 2211 | Accountant | 93 | 107 | 123 | 142 | 163 |
| 2212 | Auditors, Company secretaries | 7 | 8 | 9 | 10 | 12 |
| ***5000*** | ***Clerical and Administrative workers*** |  |  |  |  |  |
| 5122 | Administrative assistants | 19 | 22 | 25 | 29 | 33 |
| 5211 | Personal assistant | 36 | 42 | 48 | 55 | 63 |
| 5212 | Secretary | 48 | 56 | 64 | 73 | 84 |
| 5421 | Receptionist | 227 | 261 | 300 | 345 | 397 |
| 5121 | Office Managers | 159 | 183 | 210 | 242 | 278 |
| 5513 | Payroll clerks or payroll officers | 32 | 37 | 42 | 49 | 56 |
| 5612 | Couriers and Postal Deliveries | 54 | 62 | 71 | 82 | 94 |
| 5611 | Betting Clerks | 1 | 1 | 1 | 2 | 2 |
| 5616 | Switchboard Operators | 4 | 4 | 5 | 6 | 7 |
| 5619 | Other Clerical and Office Support Workers | 36 | 42 | 48 | 0 | 1 |
|  | Non-specified health sector occupations | 971 | 996 | 1,009 | 1,060 | 1,054 |
| **Total** | | **2,000** | **2,180** | **2,370** | **2,570** | **2,790** |

Source: Author calculations based on estimates derived from the Australian Census.

**Selected occupations**

As well as the overall number sit is possible to look for specifically at a few of the most important occupations in the sector in terms of numbers employed.

*Registered nurse*

One of the most sizable occupations in term of numbers in the healthcare sector is that of registered nurse. According to the O\*NET definition nurses: “assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management”. The Australian Bureau of Census and Statistics, states that: “*registered nurses* provide nursing care to patients in hospitals, aged care and other health care facilities, and in the community”. The O\*NET audit of the skills, knowledge and Tasks of this occupation are as follows:

*Tasks*

* Maintain accurate, detailed reports.
* Administer medications to patients and monitor patients for reactions.
* Record patients' medical information and vital signs.
* Monitor, record, and report symptoms or changes in patients' conditions.
* Consult and coordinate with team members to assess, plan, implement, or evaluate patient care plans.
* Modify patient treatment plans as indicated by patients' responses and conditions.
* Monitor all aspects of patient care, including diet and physical activity.
* Direct or supervise less-skilled nursing or healthcare personnel or supervise a particular unit.
* Prepare patients for and assist with examinations or treatments.
* Instruct individuals, families, or other groups on topics such as health education, disease prevention, or childbirth and develop health improvement programs.

*Knowledge*

* Medicine and Dentistry; Knowledge of the information and techniques needed to diagnose and treat human injuries, diseases, and deformities. This includes symptoms, treatment alternatives, drug properties and preventive health-care measures.
* Customer and Personal Service; Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
* Psychology; Knowledge of human behaviour and performance; individual differences in ability, personality, and interests; learning and motivation; psychological research methods; and the assessment and treatment of behavioural and affective disorders.
* English Language; Knowledge of language structure and content (meaning and spelling of words, composition rules and grammar).
* Education and Training; Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.
* Therapy and Counselling; Knowledge of principles, methods, and procedures for diagnosis, treatment, and rehabilitation of physical and mental dysfunctions, and for career counselling and guidance.
* Mathematics; Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
* Biology; Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.
* Sociology and Anthropology; Knowledge of group behaviour and dynamics, societal trends and influences, human migrations, ethnicity, cultures and origins.
* Computers and Electronics; Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

*Skills*

* Active Listening Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
* Social Perceptiveness; Being aware of others' reactions and understanding why they react as they do.
* Service Orientation; actively looking for ways to help people.
* Speaking; talking to others to convey information effectively.
* Coordination; adjusting actions in relation to others' actions.
* Critical Thinking; using logic and reasoning to identify the strengths and weaknesses of alternative solutions or approaches to problems.
* Reading Comprehension; Understanding written sentences and paragraphs in work related documents.
* Judgment and Decision Making; Considering the relative costs and benefits of potential actions to choose the most appropriate one.
* Monitoring; monitoring performance of yourself, other individuals, or organizations to make improvements or take corrective action.
* Writing; communicating effectively in writing as appropriate for the needs of the audience.

The Table below provides the O\*NET indicators of skill levels associated with this occupation. Active learning, critical thinking, speaking and social perspectives are all important aspects. Analysis provided in the full report shows the growth in skills for each of the six Gippsland LGAs and for the total Gippsland region for Registered Nurses (ANZSCO 2544). The five most important skills in terms of growth were the following together with their definition, indicating the value of each of these skills to their respective occupation.

1. Monitoring: Assessing performance of yourself, others, or organisations to make improvements or take corrective action (6.59 per cent).
2. Troubleshooting: Determining causes of operating errors and deciding what to do about it (6.99 per cent).
3. Quality Control Analysis: Conducting tests and inspections of products, services, or processes to evaluate quality or performance (6.81 per cent).
4. Management of Financial Resources: Determining how money will be spent to get the work done, and accounting for these expenditures (6.68 per cent).
5. Learning strategies: Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things (6.11 per cent).

**Registered nurses employed, Gippsland, actual 2001 to 2016, estimated 2021 to 2036**

Source: Australian Bureau of Statistics, Census. National Health Workforce Database. Authors’ estimates

**Registered nurse skill indicator score**

|  |  |  |
| --- | --- | --- |
|  | Registered nurses  ANZSCO 2544  O\*NET 25-4021 | |
|  | *Importance* | *Level* |
| Critical Thinking | 72 | 57 |
| Active Listening | 78 | 57 |
| Judgment and Decision Making | 69 | 54 |
| Reading Comprehension | 72 | 61 |
| Writing | 66 | 52 |
| Speaking | 75 | 57 |
| Science | 47 | 43 |
| Complex Problem Solving | 60 | 46 |
| Monitoring | 69 | 55 |
| Social Perceptiveness | 78 | 63 |
| Service Orientation | 75 | 57 |
| Active Learning | 78 | 57 |
| ***Average skill score*** | ***70*** | ***55*** |
| ***Average skill cross product score*** | ***39*** |  |

The growth in skills is also matched by strong growth in social skills which consists of:

1. Social Perceptiveness: Being aware of others' reactions and understanding why they react as they do (5.89 per cent).
2. Coordination: Adjusting actions in relation to others' actions (5.95 per cent).
3. Persuasion: Persuading others to change their minds or behaviour (5.80 per cent).
4. Negotiation: Bringing others together and trying to reconcile differences (5.65 per cent.
5. Instructing: Teaching others how to do something (6.30 per cent).
6. Service Orientation: Actively looking for ways to assist (6.76 per cent).

Nurses have been trained at hospitals in Gippsland since the late nineteenth century and in the 1980s the Gippsland campus of Federation University began to deliver these degrees. Since then the numbers of nurses educated at Federation University has grown steadily and many Gippsland students have attended these courses going onto careers in local hospitals.

The ratio of nurses to population is higher in Gippsland than in the rest of the country, which is perhaps a result of the contribution made by the Gippsland campus. In 2016 there were 2,730 registered nurses in Gippsland, a number that is expected to grow steadily (see Figure).

*Aged care worker*

Another occupation where there are large numbers employed in Gippsland is that of aged and disabled care. The O\*NET defines “Personal Care Aides” as those who: “Assist the elderly, convalescents, or persons with disabilities with daily living activities at the person's home or in a care facility. Duties performed at a place of residence may include keeping house (making beds, doing laundry, washing dishes) and preparing meals. May provide assistance at non-residential care facilities. May advise families, the elderly, convalescents, and persons with disabilities regarding such things as nutrition, cleanliness, and household activities.” The Australian Bureau of Statistics bundles aged care and disability care numbers together and states that they: “provide general household assistance, emotional support, care and companionship for aged and disabled persons in their own homes”.

In Addition, a significant number of people are employed in residential aged care facilities not directly employed as carers, but as administrators, cooks, cleaners etc. The Victorian Government Department of Health and Human Services estimates the total number of people employed in residential aged care facilities to be 3,000.

*Tasks*

* Administer bedside or personal care, such as ambulation or personal hygiene assistance.
* Prepare and maintain records of client progress and services performed, reporting changes in client condition to manager or supervisor.
* Perform healthcare-related tasks, such as monitoring vital signs and medication, under the direction of registered nurses or physiotherapists.
* Participate in case reviews, consulting with the team caring for the client, to evaluate the client's needs and plan for continuing services.
* Care for individuals or families during periods of incapacitation, family disruption, or convalescence, providing companionship, personal care, or help in adjusting to new lifestyles.
* Perform housekeeping duties, such as cooking, cleaning, washing clothes or dishes, or running errands.
* Instruct or advise clients on issues such as household cleanliness, utilities, hygiene, nutrition, or infant care.
* Plan, shop for, or prepare nutritious meals or assist families in planning, shopping for, or preparing nutritious meals.
* Transport clients to locations outside the home, such as to physicians' offices or on outings, using a motor vehicle.
* Provide clients with communication assistance, typing their correspondence or obtaining information for them.

*Knowledge*

* Customer and Personal Service — Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
* English Language; Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
* Psychology; Knowledge of human behaviour and performance; individual differences in ability, personality, and interests; learning and motivation; psychological research methods; and the assessment and treatment of behavioural and affective disorders.
* Administration and Management; Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modelling, leadership technique, production methods, and coordination of people and resources.
* Transportation Knowledge of principles and methods for moving people or goods by air, rail, sea, or road, including the relative costs and benefits.
* Education and Training; Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.
* Medicine and Dentistry; Knowledge of the information and techniques needed to diagnose and treat human injuries, diseases, and deformities. This includes symptoms, treatment alternatives, drug properties and interactions, and preventive health-care measures.
* Public Safety and Security; Knowledge of relevant equipment, policies, procedures, and strategies to promote effective local, state, or
* national security operations for the protection of people, data, property, and institutions.
* Mathematics; Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
* Therapy and Counselling; Knowledge of principles, methods, and procedures for diagnosis, treatment, and rehabilitation of physical and mental dysfunctions, and for career counselling and guidance.

Skills

* Service Orientation — actively looking for ways to help people.
* Social Perceptiveness — Being aware of others' reactions and understanding why they react as they do.
* Active Listening; Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
* Speaking; talking to others to convey information effectively.
* Monitoring; Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.
* Coordination; adjusting actions in relation to others' actions.
* Critical Thinking; using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
* Instructing; Teaching others how to do something.
* Judgment and Decision Making; Considering the relative costs and benefits of potential actions to choose the most appropriate one.
* Time Management; Managing one's own time and the time of others.

Ensuring that there is an adequate supply of aged and disability care workers in the future will be important. As the population of the Gippsland region continues to age there will be steady growth in demand for these types of employees.

**Aged care and disability care workers skill indicator score**

|  |  |  |
| --- | --- | --- |
| Skill Indicator Score | Aged care and disability care workers  ANZSCO 4231  O\*NET 39-9021.00 | |
|  | ***Importance*** | ***Level*** |
| Critical Thinking | 60 | 43 |
| Active Listening | 64 | 41 |
| Judgment and Decision Making | 60 | 36 |
| Reading Comprehension | 58 | 41 |
| Writing | 58 | 39 |
| Speaking | 65 | 41 |
| Science | 35 | 11 |
| Complex Problem Solving | 55 | 34 |
| Monitoring | 62 | 45 |
| Social Perceptiveness | 72 | 45 |
| Service Orientation | 78 | 54 |
| Active Learning | 55 | 39 |
| ***Average skill score*** | ***60*** | ***39*** |
| ***Average skill cross product score*** | ***24*** |  |

The Table above shows that social perceptiveness and service orientation are both very important aspects of this occupation. Further analysis provides the growth in skills for each of the six Gippsland LGAs and for the total Gippsland region for Aged and Disabled Workers (ANZSCO 4231). The five most important skills in terms of growth were the following together with their definition, indicating the value of each of these skills to their respective occupation.

1. Monitoring: Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action (4.25 per cent).
2. Troubleshooting: Determining causes of operating errors and deciding what to do about it (4.58 per cent).
3. Quality Control Analysis: Conducting tests and inspections of products, services, or processes to evaluate quality or performance (4.43 per cent).
4. Management of Financial Resources: Determining how money will be spent to get the work done, and accounting for these expenditures (4.33 per cent).
5. Learning strategies: Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things (3.86 per cent).

The above growth in skills is also matched by strong growth in social skills which consists of the following elements:

1. Social Perceptiveness: Being aware of others' reactions and understanding why they react as they do (3.85 per cent).
2. Coordination: Adjusting actions in relation to others' actions (3.68 per cent).
3. Persuasion: Persuading others to change their minds or behaviour (3.73 per cent).
4. Negotiation: Bringing others together and trying to reconcile differences (3.48 per cent).
5. Instructing: Teaching others how to do something (4.01 per cent).
6. Service Orientation: Actively looking for ways to help people (4.39 per cent).

The numbers of aged and disability care workers are expected to rise substantially in the next twenty years.

Source: Australian Bureau of Statistics, Census. National Health Workforce Database. Authors’ estimates

*Physiotherapist*

In recent years the growth in the number of older people in the Gippsland region has meant that there is a large number of physiotherapists being employed. As there are no degree courses conducted in this field in Gippsland all of these are recruited from outside of the region. The O\*NET defines physiotherapists as those that: “Assess, plan, organize, and participate in rehabilitative programs that improve mobility, relieve pain, increase strength, and improve or correct disabling conditions resulting from disease or injury”. The Australian Bureau of Statistics defines: “Physiotherapists assess, treat and prevent disorders in human movement caused by injury or disease”. The tasks, skills and knowledge of this occupation are as follows.

*Tasks*

* Plan, prepare or carry out individually designed programs of physical treatment to maintain, improve, or restore physical functioning, alleviate pain, or prevent physical dysfunction in patients.
* Perform and document an initial exam, evaluating data to identify problems and determine a diagnosis prior to intervention.
* Evaluate the effects of treatment at various stages and adjust treatments to achieve maximum benefit.
* Identify and document goals, anticipated progress, and plans for revaluation.
* Record prognosis, treatment, response, and progress in patient's chart or enter information into computer.
* Obtain patients' informed consent to proposed interventions.
* Test and measure patient's strength, motor development and function, sensory perception, functional capacity, or respiratory or circulatory efficiency and record data.
* Review physician's referral and patient's medical records to help determine the diagnosis and physical therapy treatment required.
* Discharge patient from physical therapy when goals or projected outcomes have been attained and provide for appropriate follow-up care or referrals.
* Instruct patient and family in treatment procedures to be continued at home.

*Knowledge*

* Medicine and Dentistry; Knowledge of the information and techniques needed to diagnose and treat human injuries, diseases, and deformities. This includes symptoms, treatment alternatives, drug properties and interactions, and preventive health-care measures.
* Customer and Personal Service; Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
* Psychology; Knowledge of human behaviour and performance; individual differences in ability, personality, and interests; learning and motivation; psychological research methods; and the assessment and treatment of behavioural and affective disorders.
* Therapy and Counselling; Knowledge of principles, methods, and procedures for diagnosis, treatment, and rehabilitation of physical and mental dysfunctions, and for career counselling and guidance.
* Biology; Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.
* English Language; Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
* Education and Training; Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.
* Administration and Management; Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modelling, leadership technique, production methods, and coordination of people and resources.
* Clerical; Knowledge of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.
* Law and Government — Knowledge of laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules, and the democratic political process.

*Skills*

* Reading Comprehension; Understanding written sentences and paragraphs in work related documents.
* Critical Thinking; using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
* Speaking; talking to others to convey information effectively.
* Active Listening; Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
* Monitoring; monitoring performance of yourself, other individuals, or organizations to make improvements or take corrective action.
* Service Orientation; actively looking for ways to help people.
* Social Perceptiveness; Being aware of others' reactions and understanding why they react as they do.
* Writing; communicating effectively in writing as appropriate for the needs of the audience.
* Judgment and Decision Making — Considering the relative costs and benefits of potential actions to choose the most appropriate one.
* Time Management — Managing one's own time and the time of others.

**Physiotherapists skill indicator score**

|  |  |  |
| --- | --- | --- |
| Skill Indicator Score | Physiotherapists  ANZSCO 2525  O\*NET 29-1123.00 | |
|  | ***Importance*** | ***Level*** |
| Critical Thinking | 80 | 55 |
| Active Listening | 78 | 59 |
| Judgment and Decision Making | 70 | 54 |
| Reading Comprehension | 82 | 64 |
| Writing | 75 | 57 |
| Speaking | 80 | 59 |
| Science | 62 | 43 |
| Complex Problem Solving | 68 | 48 |
| Monitoring | 78 | 52 |
| Social Perceptiveness | 78 | 57 |
| Service Orientation | 78 | 54 |
| Active Learning | 65 | 48 |
| ***Average skill score*** | ***74*** | ***54*** |
| ***Average skill cross product score*** | ***41*** |  |

The previous Table provides the skill indicator scores for physiotherapists. Further analysis shows the growth in skills for each of the six Gippsland LGAs and for the total Gippsland region for Physiotherapists (ANZSCO 2525). The five most important skills in terms of growth were the following together with their definition, indicating the value of each of these skills to their respective occupation.

1. Monitoring: Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action (10.58 per cent).
2. Troubleshooting: Determining causes of operating errors and deciding what to do about it (11.39 per cent).
3. Quality Control Analysis: Conducting tests and inspections of products, services, or processes to evaluate quality or performance (11.15 per cent).
4. Management of Financial Resources: Determining how money will be spent to get the work done, and accounting for these expenditures (10.98 per cent).
5. Learning strategies: Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things (10.23 per cent).

The above growth in skills is also matched by strong growth in social skills.

1. Social Perceptiveness: Being aware of others' reactions and understanding why they react as they do (9.94 per cent).
2. Coordination: Adjusting actions in relation to others' actions (10.02 per cent).
3. Persuasion: Persuading others to change their minds or behaviour (9.82 per cent).
4. Negotiation: Bringing others together and trying to reconcile differences (9.62 per cent).
5. Instructing: Teaching others how to do something (10.47 per cent).
6. Service Orientation: Actively looking for ways to help people (11.09 per cent).

The growth of these skills is much higher than the previous two occupations. One reason for this might be due to the fact that many physiotherapists run their own practices and are therefore required to use these skills at a higher rate than the other two occupations. The next Figure provides data on the expected number of physiotherapists in Gippsland over the next twenty years.

Source: Australian Bureau of Statistics, Census. National Health Workforce Database. Authors’ estimates

*Social workers*

One occupation that has been growing in demand is that of social worker. Social work is a profession that concerns itself with individuals, families, groups and communities in an effort to enhance social functioning and overall well-being.  The O\*NET describes social workers as: “Provid(ing) social services and assistance to improve the social and psychological functioning of children and their families and to maximize the family well-being and the academic functioning of children. May assist parents, arrange adoptions, and find foster homes for abandoned or abused children. In schools, they address such problems as teenage pregnancy, misbehaviour, and truancy. May also advise teachers.” The Australian Bureau of Statistics defines the role as having to: ***“***assess the social needs of individuals, families and groups, assist and empower people to develop and use the skills and resources needed to resolve social and other problems, and further human wellbeing and human rights, social justice and social development”. In Gippsland social workers typically work in child protection, family services, family violence services, homelessness, and alcohol and drug services. It is estimated that about half of those working in these fields have social work or related degrees.

The O\*NET listed tasks, skills, and knowledge of this occupation is as follows:

Tasks

* Maintain case history records and prepare reports.
* Interview clients individually, in families, or in groups, assessing their situations, capabilities, and problems to determine what services are required to meet their needs.
* Serve as liaisons between students, homes, schools, family services, child guidance clinics, courts, protective services, doctors, and other contacts to help children who face problems, such as disabilities, abuse, or poverty.
* Develop and review service plans in consultation with clients and perform follow-ups assessing the quantity and quality of services provided.
* Address legal issues, such as child abuse and discipline, assisting with hearings and providing testimony to inform custody arrangements.
* Counsel parents with child rearing problems, interviewing the child and family to determine whether further action is required.
* Consult with parents, teachers, and other school personnel to determine causes of problems, such as truancy and misbehaviour, and to implement solutions.
* Arrange for medical, psychiatric, and other tests that may disclose causes of difficulties and indicate remedial measures.
* Refer clients to community resources for services, such as job placement, debt counselling, legal aid, housing, medical treatment, or financial assistance, and provide concrete information, such as where to go and how to apply.
* Counsel individuals, groups, families, or communities regarding issues including mental health, poverty, unemployment, substance abuse, physical abuse, rehabilitation, social adjustment, child care, or medical care.

Knowledge

* Customer and Personal Service; Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
* Psychology; Knowledge of human behaviour and performance; individual differences in ability, personality, and interests; learning and motivation; psychological research methods; and the assessment and treatment of behavioural and affective disorders.
* Therapy and Counselling; Knowledge of principles, methods, and procedures for diagnosis, treatment, and rehabilitation of physical and mental dysfunctions, and for career counselling and guidance.
* English Language; Knowledge of the structure and content of the language including the meaning and spelling of words, rules of composition, and grammar.
* Clerical; Knowledge of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.
* Sociology and Anthropology; Knowledge of group behaviour and dynamics, societal trends and influences, human migrations, ethnicity, cultures and their history and origins.
* Education and Training; Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.
* Law and Government — Knowledge of laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules, and the democratic political process.
* Administration and Management — Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modelling, leadership technique, production methods, and coordination of people and resources.
* Computers and Electronics — Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

Skills

* Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
* Speaking — Talking to others to convey information effectively.
* Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
* Social Perceptiveness; Being aware of others' reactions and understanding why they react as they do.
* Judgment and Decision Making; Considering the relative costs and benefits of potential actions to choose the most appropriate one.
* Reading Comprehension; Understanding written sentences and paragraphs in work related documents.
* Service Orientation; Actively looking for ways to help people.
* Complex Problem Solving; Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
* Monitoring; Monitoring performance of yourself, other individuals, or organizations to make improvements or take corrective action.
* Coordination; Adjusting actions in relation to others' actions.

According to the O\*NET analysis of this occupation it scores high in terms of critical thinking, judgement and decision making, reading comprehension, writing and complex problem solving. In dealing with the social problems associated with a growth in unemployment, income inequality and ageing there has been a growing demand for social workers throughout Gippsland. This has meant that the number of social workers employed in Gippsland has grown steadily, more than doubling in number in the years 2001 to 2016 (from 110 to 244: see Figure below). It is expected that the numbers employed will continued to rise at a steady rate and reach 380 by the year 2036.

Gippsland at present has a ratio of social workers per 100,000 population comparable to that of Australia as a whole (91 people compared to 90). Despite this level a number of providers reported a chronic shortage of social workers and the difficulties in recruiting. At present no higher education provider delivers a Bachelor of Social Work in Gippsland. A number of people employed in Gippsland are undertaking quasi-social work without degree qualifications, typically the Diploma of Community Services. This qualification in a number of Victorian universities is a pathway into Degrees of social work (see for instance Victoria University which provides credit of up to one year for its Bachelor of Social Work from its TAFE Diploma of Community Services).

**Social worker, skill indicator score**

|  |  |  |
| --- | --- | --- |
| Skill Indicator Score | Social worker  ANZSCO 2725  O\*NET 21-1021.00 | |
|  | *Importance* | *Level* |
| Critical Thinking | 82 | 61 |
| Active Listening | 68 | 54 |
| Judgment and Decision Making | 80 | 57 |
| Reading Comprehension | 80 | 59 |
| Writing | 75 | 59 |
| Speaking | 90 | 59 |
| Science | 45 | 29 |
| Complex Problem Solving | 78 | 50 |
| Monitoring | 78 | 55 |
| Social Perceptiveness | 82 | 66 |
| Service Orientation | 80 | 59 |
| Active Learning | 68 | 54 |
| ***Average skill score*** | ***75*** | ***55*** |
| ***Average skill cross product score*** | ***42*** |  |

The previous Table shows the skill indicator scores for social workers. The growth in skills for each of the six Gippsland LGAs and for the total Gippsland region for Social Workers (ANZSCO 2725). The five most important skills in terms of growth were the following together with their definition, indicating the value of each of these skills to their respective occupation.

1. Monitoring: Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action (13.14 per cent).
2. Troubleshooting: Determining causes of operating errors and deciding what to do about it (13.75 per cent).
3. Quality Control Analysis: Conducting tests and inspections of products, services, or processes to evaluate quality or performance (13.48 per cent).
4. Management of Financial Resources: Determining how money will be spent to get the work done, and accounting for these expenditures (13.29 per cent).
5. Learning strategies: Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things (12.44 per cent).

The above growth in skills is also matched by strong growth in social skills which consists of the following elements:

1. Social Perceptiveness: Being aware of others' reactions and understanding why they react as they do (12.11 per cent).
2. Coordination: Adjusting actions in relation to others' actions (12.20 per cent).
3. Persuasion: Persuading others to change their minds or behaviour 11.97 per cent).
4. Negotiation: Bringing others together and trying to reconcile differences (11.75 per cent).
5. Instructing: Teaching others how to do something (12.71 per cent).
6. Service Orientation: Actively looking for ways to help people (13.41 per cent).

**Number of social workers employed in Gippsland, actual 2001 to 2016, estimated 2021 to 2036**

Source: Australian Bureau of Statistics, Census. Authors’ estimates

*Office Managers*

This occupation is one of the most important in healthcare and social assistance in the non-clinical or care categories. The reason it is taken as a case example, is that it is highly important in the administration and operation of small, large and medium sized health organisations. Office managers organise and control the functions and resources of offices such as administrative systems and office personnel. In ANZSCO, most occupations in this unit group have a level of skill commensurate with the qualifications and experience outlined below. Their general responsibility is to operate office machines, such as photocopiers and scanners, facsimile machines, voice mail systems, and personal computers. However, this description is quite limited. The O\*NET details of tasks, knowledge and skills are detailed below:

Tasks

* Answer telephones, direct calls, and take messages.
* Communicate with customers, employees, and other individuals to answer questions, disseminate or explain information, take orders, and address complaints.
* Maintain and update filing, inventory, mailing, and database systems, either manually or using a computer.
* Compile, copy, sort, and file records of office activities, business transactions, and other activities.
* Review files, records, and other documents to obtain information to respond to requests.
* Open, sort, and route incoming mail, answer correspondence, and prepare outgoing mail.
* Compute, record, and proofread data and other information, such as records or reports.
* Complete work schedules, manage calendars, and arrange appointments.
* Type, format, proofread, and edit correspondence and other documents, from notes or dictating machines, using computers or typewriters.
* Contributing to the planning and review of office services and setting priorities and office service standards.
* Allocating human resources, space and equipment.
* Assigning work to and monitoring work performance of staff.
* Managing records and accounts of the office.
* Liaising with Professionals to coordinate office business and to facilitate resolution of problems.
* Managing physical facilities and ensuring buildings and equipment are maintained.
* Ensuring compliance with occupational health and safety regulations.
* Ensuring work complies with relevant government legislation, policies and procedures
* Coordinating personnel activities such as hiring, promotions, performance management, payroll, training and supervision.

Knowledge

* Clerical; Knowledge of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.
* English Language; Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
* Customer and Personal Service; Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
* Administration and Management; Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modelling, leadership technique, production methods, and coordination of people and resources.
* Computers and Electronics; Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.
* Mathematics; Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
* Economics and Accounting; Knowledge of economic and accounting principles and practices, the financial markets, banking and the analysis and reporting of financial data.
* Public Safety and Security; Knowledge of relevant equipment, policies, procedures, and strategies to promote effective local, state, or national security operations for the protection of people, data, property, and institutions.
* Communications and Media; Knowledge of media production, communication, and dissemination techniques and methods. This includes alternative ways to inform and entertain via written, oral, and visual media.
* Personnel and Human Resources; Knowledge of principles and procedures for personnel recruitment, selection, training, compensation and benefits, labor relations and negotiation, and personnel information systems.

Skills

* Active Listening; Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
* Reading Comprehension; Understanding written sentences and paragraphs in work related documents.
* Speaking; talking to others to convey information effectively.
* Writing; communicating effectively in writing as appropriate for the needs of the audience.
* Coordination; adjusting actions in relation to others' actions.
* Critical Thinking; using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
* Service Orientation; actively looking for ways to help people.
* Social Perceptiveness; Being aware of others' reactions and understanding why they react as they do.
* Time Management; Managing one's own time and the time of others.
* Monitoring; Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

The five most important skills for this occupation are socially related ones and include:

1. Active Listening: Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
2. Active Learning: Understanding the implications of new information for both current and future problem-solving and decision-making.
3. Reading Comprehension: Understanding written sentences and paragraphs in work related documents.
4. Writing: Communicating effectively in writing as appropriate for the needs of the audience.
5. Speaking: Talking to others to convey information effectively.

**Understanding skill shortages and skill gaps**

Skills shortages are reported widely across regions within Australia and the rest of the world. Defining its impact on regions and economy wide is difficult and complex to measure and quantify. Nevertheless, its impact on the economy while not well defined includes lower productivity and the delay or cancellation of new regional projects. Furthermore, shortages are common in times of high economic growth and low unemployment and are present in regions where there exists a mismatch between the pool of skills available and the current levels of skills demanded (Australia, Department of Transport and Regional Services, 2006). The terms skill shortages and skill gaps are commonly used in the health and other economy wide sectors. While both terms are often used interchangeably, they are not the same thing and distinguishing between the two is important to highlight.

Labour market conditions have the ability to respond to changes in the working conditions and wages of workers. However, the market will not clear efficiently “… if there are few people with the required skills who are not already using them, it takes a long time to acquire such skills” (Richardson, 2007, p. 7).

There are different drivers of skill shortages which include firstly, training or the number of people entering training; secondly, wastage or

the number of people trained in a skill, but who are not working in an occupation which requires the given skills trained for; thirdly, migration which relates to the number of people entering or leaving a particular region; and fourthly, workforce exits or the number of people leaving the workforce permanently. In trying to understand these drivers, our approach has consisted of conducting a skills audit of the health labour force in Gippsland. Doing the skills audit has provided us with where the labour market has been, how it has changed overtime and where it is at in terms of understanding the current skills requirements of occupations. The purpose of the skills forecasts for the healthcare and social assistance occupations is to provide us with a window to the future, in terms of where the future demand for skills will be. These results can be interpreted as the future needs and skills shortages that the health labour market will require.

**Conclusion**

Over the years a number of changes have taken place and are taking place to the workforce in Gippsland. A major feature of these changes has been the increasing diversity in the nature of work and the types of employment. In particular part-time and casual employment is becoming more widespread.

The transformation of the economy of Gippsland has also had a major impact on the creation of jobs, and there has been an increase in low skilled job creation, which has meant that the skill base has been declining relative to other parts of Australia.

In terms of the healthcare and social assistance sectors the growth in numbers employed has seen a change in the complexity of the work. This means that although there has been a general fall in skill levels across all industries in Gippsland this is not the case in these two sectors. In these two sectors the five most important skills in terms of growth have been in:

* Monitoring
* Troubleshooting
* Quality control analysis
* Management of financial resources, and
* Learning strategies

In terms of the growth of skills these are matched by growth in social skills such as:

* Social perceptiveness
* Coordination
* Persuasion
* Negotiation
* Instructing and
* Service orientation

These changes are common in all occupations, but not to the same degree. The four occupations provided in this chapter (nursing, aged care, physiotherapy and social work) however all have some elements of these changes. It is expected that at an emphasis on all of these skills will be important in the future.

Finally, it is expected that the number of people employed in the two sectors will rise over the next twenty years. From approximately 14,000 in 2016 these numbers will rise to nearly 19,000 by 2036. Growth will not be uniform across the six LGAs or across all occupations but will be significant in all cases.

# Conclusion & recommendations

**Healthcare and social assistance employment in Gippsland**

Overall it is possible to make a number of conclusions from this study. The first is that the healthcare and social assistance sectors have become in recent years very substantial sectors of the economy of Gippsland. At present these sectors employ around 14,000 people, which is seven per cent of the workforce and generates around nine per cent of the region’s value added. The relatively high percentage of workforce compared to value added is a product of the sector’s relative labour intensity.

Over the past few decades growth in employment in the sector has been at an annual rate of between five and seven per cent and this rate is expected to slow to around three per cent for the next ten years and then two per cent in the decade after that. These reduced rates are still considerably higher than the growth of the economy and workforce overall (expected to be at an annual rate of around one per cent).

To a large degree this growth in employment in the sectors is driven by the ageing of the population of Gippsland. To a degree this process has already occurred, with the median age in Gippsland rising from 32 in 1986 to 45 by 2016. This helps to explain the past rapid growth in healthcare and social assistance related employment. The median age is expected to continue to rise but only to 47 by 2036.

At the same time that the population of Gippsland ages the overall population will continue to rise. This will be at a rate below that of the national average but in the two western LGAs (Bass Coast and Baw Baw) at a rate above that of the national average because of flow of the population into them from the outer suburbs of Melbourne. In five of the six LGAs it’s expected that the number of births will rise, slightly in East Gippsland, South Gippsland and Wellington, more solidly in Bass Coast and Baw Baw, with only Latrobe City experiencing a slight decline in numbers. This means that maternity and child related services will need to be maintained and, in some places, even extended.

Looking at the composition of the workforce nurses and aged and disability carers are most important occupations. Other important ones include social workers, and allied health workers such as physiotherapists, pharmacists, paramedics as well as doctors and dentists. Gippsland appears to have a cohort of healthcare related professionals that compared to the rest of the country are fewer in number compared to the population, disproportionately recruited from overseas and relatively old. One exception to this are the nurses who tend to match the rate of nurses/population in the rest of the country, a result of the successful delivery of nursing programs from the Gippsland Campus of Federation University. The ageing of the workforce will mean that strenuous efforts will need to be made to attract and retain people in the region.

In terms of the education and training of people for the sector, Gippsland historically has a low level of pass on of young people from secondary to tertiary level education, especially degree level studies. There is some evidence that the gap here is narrowing and Federation University at Churchill appears to be an attractive option for Gippsland students.

**The change in occupations**

Over the years since 1986, a number of fundamental changes have occurred to the nature of work in Gippsland. Not only has the industry composition changed but so too the nature of work. Since 1986 there has been an increase in the participation of women in the workforce as well as women’s participation as well as part-time work, as opposed to full time work.

In addition, the study found that the skill intensity of work in the region has grown, but less so than in other parts of Victoria. Skill levels, therefore, have declined overall compared to the rest of Victoria. On the whole the aggregate skills growth has tended to be in lower skilled jobs and in addition the knowledge intensity of work has grown.

Looking more specifically at the healthcare and social assistance sectors, not only has there been a growth in the sheer numbers of people working in healthcare and social assistance, but the nature of the skills and knowledge required has changed also.

In nearly every occupation there has been a growth in the need for communication skills, IT skills, team work, critical thinking, problem solving and decision making on the part of employees. At the same time the sheer technical complexity of many jobs has also changed, which means that there is an increased need to people to engage in lifelong learning as the nature of their jobs change, and has they are expected to take on greater levels of responsibility.

These sorts of changes are not static in nature but will continue to develop in the future. As the workforce in the sector continues to grow in size people will not only need to be attracted to the sectors, and the region but will also have to develop their skills over time. Communication, team work and management skills will all become even more vital as the workforce continues to grow in size.

**Recommendations on an education and training strategy**

For the healthcare and social assistance sectors to develop and grow there will need to be a concerted effort on the part of all stakeholders to promote education and training in the region. Not only will it be the responsibility of tertiary education providers to train and educate people entering the sectors but also other people and organisations with an interest in the sector will need to be involved. This involvement could be in a range of fields.

1. First of all, it is important that school age children in Gippsland are made aware of the employment opportunities that are available in the healthcare and social assistance sectors. Furthermore, secondary schools should be encouraged to promote these opportunities, as well as provide some of the basic generic skills required in the modern workplace. Secondary school students should be exposed to the benefits of working in an expanding healthcare and social services sector in order to meet the needs of a growing sector resulting from an ageing population. Career counsellors should be provided with ongoing professional development specific to career opportunities available in the healthcare and social assistance sector in Gippsland.
2. One aspect is that it is important that strategies be designed to recruit and retain health professionals by creating retention and recruitment programs similar to that provided in the Bairnsdale Case Study.
3. In addition, the creation and upgrading of courses that include and highlight skills such as: critical thinking, active learning, learning strategies, social perceptiveness, negotiation, service orientation, instructing, judgement and decision making and generic management skills. Local educational providers should be encouraged to include the above ‘skill requirements’ of occupations into the curriculum. Employers and educators, should together, develop education programs and workforce plans in order to minimise skill gaps, mismatches and shortages using the skill forecasts provided. There should be a creation and expansion of partnerships between employers, employer representative groups, educational institutions and the community to explore career pathways that will help boost job retention Gippsland. As well partnerships should be further developed between employers, employer representative groups, educational institutions and the community aimed at encouraging health professionals to come to work in Gippsland through marketing campaigns that highlight the benefits of living and working in Gippsland.
4. As well it is important that key programs are maintained that are already in place. The maintenance of existing education and training programs is important to developing the healthcare and social assistance sectors. This is especially important in the case of nursing and aged and disability care. Given the large numbers employed in these areas, it will be important that the courses are delivered as widely across Gippsland as possible. To date the contribution made by Federation University and TAFE Gippsland has been considerable, especially regarding the education and training of nurses, community services and aged care. The contribution of the Monash Rural Health Unit at Churchill is also important. Healthcare providers and social assistance organisations should be encouraged as far as possible to engage with the tertiary education sector in pursuit of the maintenance and expansion of these programs.
5. More specifically there are some areas that are of strategic importance beyond those that are already catered for. The first is that of social work: across Gippsland, in both the public and private sector, there were reports to researchers of shortages of qualified social workers (also psychologists). It is expected that given the further ageing of the population and continued social problems additional social workers will be required. The possibility of the delivery of Degree level courses in social work in Gippsland should be investigated. In line with this, the development of pathways from Diploma level courses should be encouraged. To this end organisations with an interest in employing these sorts of graduates should be encouraged to engage with Degree providers to promote this.
6. The other major area where there is a skills gap in Gippsland is in allied health. Given the lower level of professionals in the allied health field than the national average, and continued growth in the number expected to be employed it is important that shortages be avoided by developing delivery in Gippsland in these fields. The areas in particular that should be examined include physiotherapy, occupational therapy, pharmacy, and para-medicine. These as far as is possible should involve pathways from relevant Diploma programs.
7. Pathways: Given the low educational standards on average in the region it is expected that there will continue to be a number of people who enter employment in through Certificate level courses, initially, and then transition up through Diploma and Degree level courses. It is critical then that the maximum number of possible pathways be developed from Certificate through Diploma and Degree level courses. These sorts of pathways can encourage adult workers to continually upgrade their skills and aspire.

**The future**

The future will see a continuation of the increasing diversity in the nature of work and the types of employment in Gippsland. In particular part-time and casual employment will remain widespread and the transformation of the economy will have a major impact on the creation of jobs.

In terms of the healthcare and social assistance sectors the most important skills in terms of growth have been and will contribute in the future to be in: Monitoring, Troubleshooting, Quality control analysis, Management of financial resources, and Learning strategies.

In terms of the growth of skills these are matched by growth in social skills such as: Social perceptiveness, Coordination, Persuasion, Negotiation, Instructing and Service orientation. These changes are common across all occupations, but to differing degrees.

Finally, it is expected that the number of people employed in the two sectors will rise over the next twenty years, from approximately 14,000 in 2016 to nearly 19,000 by 2036. Growth will not be uniform across the six LGAs or across all occupations but will be significant in all cases.

# References

*Australia, Department of Health, 2018, National Health Workforce Data Set. Canberra.* [*http://www.health.gov.au/internet/main/publishing.nsf/Content/health\_workforce\_data*](http://www.health.gov.au/internet/main/publishing.nsf/Content/health_workforce_data)

*Australia, 2017, 2016 National Aged Care Workforce Census and Survey – The Aged Care Workforce, 2016. Canberra, DH.*

*Australia, Department of Jobs and Small Business, 2019, Labour Market Information Portal,* [*http://lmip.gov.au/*](http://lmip.gov.au/)

*Australia, Department of Transport and Regional Services 2006, Skill Shortages in Australia’s Regions, Working Paper No. 68, Canberra, DTRS.*

*Australia, Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability 2019,* [*https://www.dss.gov.au/disability-and-carers/royal-commission-into-violence-abuse-neglect-and-exploitation-of-people-with-disability*](https://www.dss.gov.au/disability-and-carers/royal-commission-into-violence-abuse-neglect-and-exploitation-of-people-with-disability)

*Australian Bureau of Statistics, 1986-2016 Census 1986, 1991, 1996, 2001, 2006, 2011, 2016, Belconnen ACT, ABS.*

*Australian Institute of Health and Welfare, 2014, Australia’s Health 2014, Canberra, AIHW.*

*Bass Coast Shire Council 2019, Website, Wonthaggi VIC, http://www.basscoast.vic.gov.au/*

*Baw Baw Shire Council 2019, Website, Warragul VIC.,* [*http://www.bawbawshire.vic.gov.au/Home*](http://www.bawbawshire.vic.gov.au/Home)

*Dale, T. and Buckmaster, L., ‘*[*Funding the National Disability Insurance Scheme*](http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201516/NDIS)*’,*Budget Review 2015–16*, Research paper series, 2015–16, Parliamentary Library, Canberra, 2015.*

*Deloitte, 2019, 2019 Global Health Care Outlook: Shaping the Future, Deloitte.*

*Deloitte Access Economics, 2016, The Current and Future State of Victoria: A Macro Perspective, Advice to Infrastructure Victoria. Melbourne, Deloitte.*

*Deloitte Access Economics 2018, The Future of Work: Occupational and Education Trends in Australia, February, Deloitte Access Economics.*

*East Gippsland Shire Council 2019, Website, Bairnsdale VIC, https://www.eastgippsland.vic.gov.au/*

*Esposto, A., 2005, Dimensions of Earnings Inequality in Australia, PhD Thesis, Victoria University of Technology.*

*Global Health Workforce Alliance and World Health Organisation 2014, A Universal Truth: No Health without a Workforce, Paris, WHO.*

*Health Workforce Australia, 2014, Australia’s Future Health Workforce Nurses Overview Report. Canberra. Health.*

*Latrobe City Council, 2019, website, Morwell VIC.* [*http://www.latrobe.vic.gov.au/Our\_Community/Our\_Region/Population\_and\_Economic\_Profile*](http://www.latrobe.vic.gov.au/Our_Community/Our_Region/Population_and_Economic_Profile)

*Mumford, M. and Peterson, N. 1995, ‘Skills’, in Peterson, N., Mumford, M., Borman, W., Jeanneret, P. & Fleishman, E. (eds), An Occupational Information System for the 21st Century: The Development of the O\*NET, Utah, Department of Employment Security, Salt Lake City, 3.1–3.20.*

*National Disability Insurance Agency 2017, Annual Report: National Disability Insurance Agency, Canberra ACT, NDIA.*

*National Institute of Economic and Industry Research (NIEIR) 2014, States of Regions Report 2013-14, North Fitzroy VIC, NIEIR.*

*Occupational Information Network, O\*NET Consortium, 2004, O\*NET Data Collection, http://www.onetcenter.org/dataCollection.html, accessed 05/04/2004.*

*OECD 2015, The Innovation Imperative: Contributing to Productivity, Growth and Well-being. DOI: 10.1787/9789264239814-en.*

*OECD 2015, The Innovation Imperative: Contributing to Productivity, Growth and Well-being. DOI: 10.1787/9789264239814-en.*

*OECD 2016, OECD Regional Outlook 2016: Productive Regions for Inclusive Societies, OECD Publishing, Paris.* [*http://dx.doi.org/10.1787/9789264260245-en*](http://dx.doi.org/10.1787/9789264260245-en)

*O\*NET Resource Center 2006. O\*NET Data Collection Overview, <http://www. onetcenter.org/dataCollection.html>.*

*Richardson, S., 2007, “What is a skill shortage?’ National Institute of Labour Studies, Flinders University,* [*https://www.ncver.edu.au/\_\_data/assets/file/0019/7282/what-is-skill-shortage-4022.pdf*](https://www.ncver.edu.au/__data/assets/file/0019/7282/what-is-skill-shortage-4022.pdf) *accessed 17 April, 2019.*

[*Safavi*](https://hbr.org/search?term=kaveh%20safavi)*, K. and Dare, F. 2018, ‘Virtual health care could save the U.S. billions each year’, Harvard Business Review, April,* [*https://hbr.org/2018/04/virtual-health-care-could-save-the-u-s-billions-each-year*](https://hbr.org/2018/04/virtual-health-care-could-save-the-u-s-billions-each-year)

*South Gippsland Shire Council 2019, Website, Leongatha VIC, http://www.southgippsland.vic.gov.au/*

*United States Department of Labor, 1998, O\*NET Viewer, Version 1, CD-ROM. Department of Labor, Washington, DC.*

*Victoria, Department of Economic Development, Jobs, Transport and Resources, 2017, State of the Sector: Medical Technologies and Pharmaceuticals, Melbourne, DEDJTR. URL:* [*https://djpr.vic.gov.au/priority-industries-sectors/medical-technologies-and-pharmaceuticals*](https://djpr.vic.gov.au/priority-industries-sectors/medical-technologies-and-pharmaceuticals)

*Victoria, Department of Education and Training, 2018, Ontrack 2018 Survey Results. Melbourne, DET.*

*Victoria, Department of Environment, Land, Water and Planning 2016, Victoria in Future 2016, Melbourne, DELWP.*

*Victoria, Department of Health and Human Services, 2019, Unpublished Data held by Department, Melbourne.*

*Victoria, Royal Commission into Family Violence 2016, Report and Recommendations: Royal Commission into Family Violence, Melbourne, Royal Commission.*

*Victoria, Royal Commission into Victoria’s Mental Health System 2019, https:///rcvmhs.vic.gov.au*

*Wellington Shire Council 2019, Website, Sale VIC. http://www.wellington.vic.gov.au/*