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Financial and Cost Benefit Implications of the Recommendations of the National Aged Care Staffing and Skills Mix Final Report

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Key findings

This report quantifies the net direct and indirect implications of implementing the recommendations of the ANMF *National Aged Care Staffing and Skills Mix* report released in 2016. The purpose is to value the benefits and trade-offs of these relative to the direct costs associated with increasing the level and skill base of the aged care workforce.

The modelling indicates that, based on the level of demand for aged care services, workforce characteristics estimated for 2016, and on a range of preliminary assumptions, the following outcomes could be expected to flow:

- Implementing the recommendations of the ANMF Staffing Report would in 2016 have resulted in an increase in the base wages and other costs in the residential aged care sector of $5.3 billion.
- However, it is expected that this would be offset by some improved cost efficiencies (reduced workforce attrition, improved operational effectiveness) reducing the net financial impact on the delivery of aged care services to $4.8 billion based on the level of demand in 2016.
- There is a further estimated offset in terms of reduced costs in the hospital system and an increase in the taxation take (with respect to the increased wages bill) of $2.1 billion, bringing the net social cost down to $2.7 billion.
- The literature strongly supports that increased resourcing and improved skill mix will have an impact on the quality of care that residents experience whilst in use of residential aged care services. Using what can be considered as conservative assumptions with respect to impact and valuations of this improved care, it is indicatively modelled that the cost increases would be offset by these social/quality of life benefits (valued at $2.8 billion).
- With growing demand for aged care services into the future (and an increase in the acuteness of care required) the costs of implementing the recommendations will grow over time, reaching a net financial cost increase to the sector of $8.9 billion by 2036 (in today's dollars).
- Financial offsets are also expected to grow, as will the quality of life benefits at a somewhat greater rate. Based on conservative assumptions, the modelling shows that there would be a net social gain of $0.5 billion annually by 2036 (totalling $9.4 billion and growing beyond then).
- Factoring in a 10% wage increase on top of implementing the increased workforce and skills mix recommendations, the modelling shows a net financial cost to the sector in 2016 of $5.7 billion. However, this financial cost is offset by indirect benefits totalling $2.4 billion and intangible, quality of life benefits totalling $3.4 billion.

Given the limited evidence available to underpin some of the parameter assumptions contained in the modelling, conservative values have been adopted. To further account for the uncertainty around some variables, a Monte Carlo simulation approach has been used to test the possible range of outcomes. This is still focussed at the conservative end, and suggests that it is possible that even in the base year the net benefits could easily reach an estimated $2 billion or more.

In summary the modelling suggests that the recommendations are at least benefit cost neutral. The assessment does not consider a number of practical issues which arise as a consequence of implementing the recommendations, which include:

- The most effective financial models that would facilitate these changes;
- The implications of the significant increase in the need for qualified and trained nurses, and a consideration of supply factors (training needs and costs etc.).

1 Context

In response to meeting the needs of an ageing population the ANMF *National Aged Care Staffing and Skills Mix Report* - hereafter ANMF Staffing Report (Australian Nursing and Midwifery Federation, 2016) – highlights the importance of efforts designed to develop the skills and capabilities of the aged care workforce. The report highlights that while various Productivity Commission Reports and Senate Inquiries have consistently recommended establishing a method for determining safe staffing levels and skills mix in the aged care sector**,** this has remained an under-addressed area of inquiry, particularly in terms of assessing the likely benefits of investment in the aged care workforce.

The report also notes that –

> *A growing body of national and international research and evidence clearly demonstrates that inadequate levels of qualified nursing staff leads to an increase in negative outcomes for those in their care, which results in increased costs. In the acute setting, the implementation of safe mandated minimum staffing has been shown to prevent adverse incidents and outcomes, reduce mortality and prevent re-admissions thereby cutting health care costs. It is widely agreed that the same improvements could be achieved in the aged care sector (ANMF 2016, p 2).*

According to the ANMF Staffing Report, under-servicing in the public hospitals sector in a general sense can result in:

- Increased incidence of serious health issues due to insufficient preventative activity – which the evidence suggests has a higher cost (including re-admissions, reduced mortality etc.);
- Increased risk of poor administrative systems (e.g. less thorough resident notes, less time on maintenance and evaluation);
- Greater stress in the workplace resulting in higher lost time, injury and staff turnover;
- Misallocation of resources, with higher cost resources (e.g. doctors or administrators) being required to deal with low care issues;
- Decreased resident comfort and increased resident stress (e.g. stress during waiting for response to requests for help/support).

Given commonalities between the public hospital sector and the aged care sector, it is reasonable to expect that under-servicing in the latter is likely to produce a similar range of adverse effects.

The concern is that restructuring the aged care staffing and skills mix to address under-servicing in the aged care sector is likely to have financial implications at a range of levels. These include increased costs in terms of:

- The direct costs of more (in number) and more highly skilled staff within the aged care sector;
- Indirect costs incurred in supporting these staff (although this is likely to be marginal).

However, based on the conclusions of the ANMF report, it is important to examine whether these extra costs are likely to be offset (and possibly surpassed) by cost reductions achieved through:

- Improved practices and efficiencies in the overall services provided by nursing staff in aged care, and better overall staffing structures;
- Reduced incidence of critical care episodes within the aged care sector (which carry higher costs) through the prevention effects of the better care, thereby reducing care delivery costs;

- Reduced costs elsewhere in the health system, again through prevention and better risk management – resulting in reduced admissions to hospitals and reduced pressure on (scarce) primary and tertiary health care resources.

Additionally, the improved quality of care experienced by aged care residents and their families and other social benefits need to be considered in a cost benefit framework.

2 Review of the ANMF National Aged Care Staffing and Skills Mix Report

The ANMF Staffing Report (Australian Nursing and Midwifery Federation, 2016) provides a significant research base to inform modelling. The report lays out a number of propositions, and provides a recommendations relevant to each of these. These propositions set the context for this financial and cost benefit analysis. This section of the report summarises both the propositions and the evidence presented for those propositions.

2.1 Main propositions of the ANMF Staffing Report

Proposition 1: The Residential Aged Care Sector is under-resourced

The report suggests that direct care being provided in the residential aged care sector is around half[1] that required for appropriate care. The evidence presented to support this proposition includes the following:

- Hours of direct care per resident in Australia are significantly lower than observed in the aged care sector in other countries;
- Modelling of the activities involved in care (for the specified resident profiles) and prescribed allocations shows that given the mix of residents and the activities required to support them, the number of hours of carer attention per resident should be much higher.

Proposition 2: The Residential Aged Care Sector is "under-skilled"

The report makes a case that relative to other sectors the aged care workforce does not include sufficient skilled staff, with a heavy reliance on underqualified staff. The evidence presented in support of this proposition includes:

- Temporal trends that indicate that growth in demand in the sector has led to (some) growth in staffing, but it has mostly been at the less and/or unqualified end of the workforce (Assistants in nursing/personal care workers (AINs/PCWs)[2]) – which has resulted in a declining proportion of qualified staff (registered nurses).
- It can be argued that that the relative decline in qualified staff is a consequence of economies of scale in provision of resident services. However the modelling of care

1 The ANMF staffing report suggests that care is currently 2.84 hours of direct care per resident (based on a Bentley Aged Care Survey (2015)) but needs to be 4.3 on average. However, the latest aged care census and survey (Commonwealth Department of Health, 2017) suggests care per resident is currently at 2.56 hours.

2 This level of worker has a number of titles from state to state, all representing pretty much the same role, so they are generally referred to as AINs/PCWs – this way this means the national context is covered.

hours per resident undertaken in the ANMF Staffing Report suggests this is not the case. This outcome is also supported by The Aged Care Workforce, 2012 - Final Report (2012, p. 9) which concludes that "three quarters of residential facilities and half of community outlets reported skill shortages in one or more occupations. Of the skill shortages in residential facilities, two-thirds reported Registered Nurse shortages and half reported Personal Care Attendant shortages; of the skill shortages in community outlets, a third reported Community Care Worker shortages and 15 per cent reported shortages of Registered Nurses". The updated (for the year 2016) aged care workforce report (2017, p. 54) notes that "Almost two-thirds of residential facilities (63 per cent) reported a shortage of workers in at least one direct care occupation. When examining skill shortages for participant occupations, a shortage of RNs was most common (reported by 41 per cent of facilities). This perceived shortage is set against the current expectations and funding models and does not take account of the additional perspectives of the ANMF Staffing Report.

The above propositions are the major (summarised) findings of the ANMF Staffing Report. Recent related studies give rise to a third proposition.

Proposition 3: The Residential Aged Care Sector is "under-valued"

It is argued that work in the aged care sector is under-valued in terms of lower wage rates paid (by the order of at least 10%) and also in terms of being seen as an "inferior" activity within the nursing profession. The evidence provided to support this comes from:

- The Productivity Commission Inquiry into Aged Care also determines that the quality of aged care services in Australia is variable and of below the necessary quality, but also concludes that "Workforce shortages are exacerbated by low wages and some workers have insufficient skills" (2011, p. XVIII), with the recommendations to deal with these focussing on regulatory and structural reform. While some of the recommendations have been instituted in the Commonwealth Aged Care (Living Longer Living Better) Act 2013, the wage rate gape continues to exist (see the next dot point).
- The Australian Nursing and Midwifery Federation in their Submission to Senate Enquiry provide evidence that in 2016 "nationally, the difference between the average base rate of pay for a full time Registered Nurse level 1 at the level 1 structure in the public sector and in residential aged care is 15%" and "for an AIN/PCW with a certificate 3 qualification, the difference is currently 14% (2016, p. 19).

2.2 Implications of the ANMF Staffing Report main propositions

The research conducted for the ANMF Staffing Report, including the supporting literature, confirms that the propositions set out above result in the following outcomes which need to be taken into account in assessing the benefits and costs of additional investment in the workforce:

- There is a high attrition and low retention rate for staff in the aged care sector, with work stress leading to difficult working conditions and poor staffing morale.
- There is an under-provision of care – generally expressed as resident under-servicing - which is primarily related to:
    - Insufficient attention and detail in terms of assessment;
    - Insufficient time and detail in communication with relatives/carers;
    - Rushed care in daily tasks (e.g. rushed showering, supports in walking);
    - Reduced social engagement with residents (leading to lack of emotional support, increased anxiety etc.).

2.3 The evidence base for appropriate staff levels and mix in aged care

Whilst not repeating all the evidence from the ANMF Staffing Report, it is important in establishing the extent of the benefit cost relationship to summarise the core relationships between staffing level and mix and resident outcomes identified in the literature. These include:

- Evidence regarding staffing levels and care delivery - the literature as cited in the ANMF Staffing and Skills report (Dellefield, Castle, McGilton, & Spilsbury, 2015), (Spilsbury, Hewitt, Stirk, & Bowman, 2011), (Shin & Bae, 2011), (Dunton, Gajewski, Klaus, & Pierson, 2007), (Zuniga, et al., 2015), shows that the level of staffing is positively associated with:
    - A reduction in reporting of total care deficiencies;
    - Improvements in resident quality of life (the social needs of residents tend to be overlooked where staffing levels are low);
    - Reduced missed care (e.g. time to answer bell, toileting, other support)
    - Reduced fall rates.
- Evidence regarding the skill mix and care delivery - the literature shows that:
    - Improved RN staffing ratios have been associated with decreases in pressure ulcers, infections including UTIs, complaints of pain, rates of hospitalisation (Backhaus, Verbeek, van Rossum, Capezuti, & Hamers, 2014)), lower restraint use, decreased mortality rates, fewer deficiency citations (Dellefield, Castle, McGilton, & Spilsbury, 2015), decreased deterioration in ADLs, and use of nutritional supplements (Horn, Buerhaus, Bergstrom, & Smoul, 2005) and reduced likelihood to rescue and improved administrative outcomes;
    - Improved EN staffing ratios show a positive relationship (although less consistent) with decreases in pressure ulcers, incontinence, and restraint use, and improvements in activity, feeding assistance, eating patterns, and pain management.

3 Recommendations of the Staffing and Skills Mix Report

The ANMF Staffing Report recommends that an evidence based staffing methodology should be adopted. It is further recommended that the methodology should -

- Include all of the activities that relate to the quality of care - including direct nursing, indirect nursing, personal care tasks and assessment tasks;
- Represent the minimum bench mark for funding purposes.

Drawing on the research outlined in the ANMF Staffing Report, their proposed methodology posits that:

- The average resident needs 4.30 hours of care per day (overall, but will vary from institution to institution based on resident mix). This compares with the current provision of around 2.5 -2.8 hours per day (with the observed range across institutions from 2.5 to 5 hours per day).
- The appropriate average skill mix is:

- Registered Nurses[3] – 30% (currently 14.8% (Commonwealth Department of Health, 2017) down from 15.1% in 2012 (The Aged Care Workforce, 2012 – Final Report, 2012))
- Enrolled Nurses – 20% (10.2% in 2016 down from 11.5% in 2012)
- Personal Care Workers – 50% (70.3% in 2016, up from 68.2% in 2012)
- Currently, an 'other' category represents 4.7% of the skills mix down from 5.1% in 2012, not factored into the new skills mix proposition.

In addition to these recommendations the ANMF submission to Senate Enquiry identified the need to introduce frameworks for the achievement and maintenance of wage parity in the sector, given existing estimates that qualified aged care staff are 15% under-paid compared with their equivalents in the health care sector. The Productivity Commission (Caring for Older Australians: Productivity Commission Inquiry Report - Overview, 2011) review of the Aged Care sector also recommended improvements in financial and regulatory parameters in the sector to improve attraction and retention.

4 Valuing the implementation of the ANMF staffing recommendations

The objective of this report is to identify the possible net direct and indirect financial implications of implementing the ANMF Staffing Report recommendations. This involves examining the potential broader level benefits and trade-offs associated with the cost increases. The analysis provides a foundational contribution to developing a more holistic understanding of the implications of the ANMFs recommendations. Further analysis is warranted to fully validate expectations and assumptions. Many of the parameters used in the analysis are based on observed characteristics of the sector, as identified in the literature. However, some of the parameters - particularly in relation to the identification of indirect benefits – while grounded in the research, are not necessarily quantified in the research. Where this is the case conservative assumptions have been adopted and sensitivity testing undertaken to provide some perspective on the possible range of outcomes.

4.1 Pertinent characteristics of the aged care sector

The demand for bed places in aged care residential facilities in 2014 was 263,788 places. This has increased with an estimated annual growth rate of 3.9% (over the eight years to 2010-11). The median length of stay of each person in a facility was between 8 and 9 months (Australian Nursing and Midwifery Federation, 2016, p. 13).

Further the ANMF (supported in the reports from the Productivity Commission and the cited literature) points to the expectation that the growth rate of admissions into the future will increase, while the length of stay is expected to decrease over time. The factors that are expected to lead to these trends include:

[3] Also includes a very small number of Nurse Practitioners.

- The underlying aging of the population as baby boomers move into the upper age groups. The ABS median population forecasts indicate that the number of people in the over 65 age group will grow by 2.7% per annum over the next 20 years, with the 64-74 year age group growing at 1.9%, the 75-84 age group growing at 3.6% per annum and the 85+ group growing at 3.9%.
- Health sector strategies designed to manage the costs of the hospital system by implementing hospital avoidance strategies in the aged care sector.

The complexity of resident care within the aged care sector is continuing to increase, again linked to the implementation of hospital avoidance strategies, and also due to the funding systems for aged care services providing greater reward for residents with acute care needs (noting that this policy has not been matched by increases in the trained and qualified workforce). Between 2003 and 2014 the proportion of aged care residents with high care needs increased from 64.4% to 83% (Australian Nursing and Midwifery Federation, 2016, p. 12).

It is noted in the research that demand in the residential aged care sector is pronounced in the last year of life, with 6.8% of admissions dying within 4 weeks and 17.8% within 6 months of entry (Australian Nursing and Midwifery Federation, 2016, p. 14).

In terms of labour force characteristics, the aged care sector workforce is older than the average workforce and also older than the workforce in the health sector as a whole. In 2012 the average age of registered nurses in the aged care sector is 51 years, of enrolled nurses is 59 years, and of others in the sector is 47 years. The workforce is predominantly female (90% of direct care workers) and there are high attrition rates. The workforce is also predominantly part time, with the proportion of workers in the sector who work full time at a low 19.4% for registered nurses, lower still at 10.5% for enrolled nurses and 6.9% for other (mostly personal care workers) (Australian Nursing and Midwifery Federation, 2016, p. 9).

5 Developing an indicative Financial and Cost Benefit Analysis Model

It is important to emphasise that the objective of this paper is to provide an initial or preliminary assessment of the relative values of the costs and offsetting benefits involved with implementing the proposed ANMF staffing methodology. While as noted above the literature strongly supports the existence of these benefits, there is much less evidence on the level (in value terms) of those benefits.

In the absence of quantified evidence, the present modelling uses indicative parameters and undertakes a Monte Carlo simulation process[4] to indicate the possible range of associated outcomes. A spreadsheet model was developed to compare estimates of the costs and benefits of the recommended policies being adopted against a base case of continued under-resourcing (present case scenario). The model assesses the cost benefit impact based on the current level of activity, as well as taking a long term view and acknowledging the continuing increase in demand in the aged care sector. The model is developed at the national level (i.e. for the aged

[4] Monte Carlo simulation is a computerized mathematical technique that allows people to account for risk in quantitative analysis and decision making, http://www.palisade.com/risk/monte_carlo_simulation.asp

care sector as a whole), noting that applications will vary across states and certainly at the individual entity level.

The model is structured to recognise (as a preliminary perspective):

- **Direct wage costs** – The main direct costs are the current number of nurses multiplied by the salaries involved (which with skill increases will be higher than current);
- **Indirect costs** – this will include any additional costs required to support the additional workers (including administration services, uniforms, training, etc)
- **Direct Benefits** -The modelling will include the impacts of any restructuring that might occur that will result in potential cost savings. For example, acknowledging changes in the numbers of nursing staff required, relative to support and administration personnel;
- **Indirect Benefits** - Examples include possible savings in the public hospital system (as discussed above) and better care outcomes for residents in the sector.

The model has been set against a base case of 'not adopting the skill recommendations', and will project forward with consideration of expectations of increased demand on the aged care sector.

The model has been parametrised based on the level of care required for different categories of residents.

5.1 Assumptions applied in the modelling

The modelled outcomes in terms of the financial implications of adopting the recommendations of the ANMF Staffing Report are dependent on several assumptions.

The Australian Bureau of Statistics (ABS) prepares population projections by age for Australia using the 2011 Census data as a base and projecting forward population by age group forward to 2101 based on assumptions around fertility, mortality and immigration (Australian Bureau of Statistics , 2013) . They provide three series – a low growth (Series A), a medium growth (Series B) and a high growth (Series C). According to Series B, by 2036 there will be an estimated 3.1 million people aged 65-74 years, 2.4 million people aged 75-84 years, and 1.14 million people aged 85+ years (compared to 2.1 million, 1.1 million and 0.49 million respectively now). By 2100 these projected numbers will have grown to an estimated 6.69 million people aged 65-74 years, 5.8 million people aged 75-84 years, and 5.4 million people aged 85+ years.

The 6 group resident profile from the ANMF Staffing Report is used as a base for the **estimated number of bed places demanded each year**. It is assumed that older populations are more likely to be more highly represented in the higher-level care groupings. The proportions in each age group and profile are based on presumptions with respect to different health needs by age. The overall proportion is calibrated against the estimates provided in the ANMF Staffing Report, and illustrated in Table 1.[5]

[5] The implication of these assumptions is that with the increasing proportion of people in the older age groups, there will be an ongoing "drift" to the higher care end of the resident profile (consistent with the experience of the last 10 years).

Table 1: Proportion of each age group by resident profile, 2016

Resident Profile	Age Group			
	65-74	75-84	85+	Total 65+
1	5.3%	4.8%	4.3%	5.0%
2	10.9%	9.3%	7.9%	10.0%
3	7.5%	7.5%	7.5%	7.5%
4	21.9%	23.0%	24.1%	22.5%
5	17.3%	17.7%	18.1%	17.5%
6	37.2%	37.8%	38.1%	37.5%

Source: Modelling calibrated to ANMF Staffing Report (2016)

Using these proportions, the total number of estimated bed places demanded in 2016 is 279,290 (compared to 263,788 in 2014).

Table 2 below is a re-presentation of Table 2.5 in the ANMF Staffing Report and shows the resource requirements (resident hours per day) calculated for the different residential care profile categories.

Table 2: Recommended care workload per resident group and skill category

Resident Profile	Hours per day	Minutes	RN	EN	PCW/AIN
1	2.5	150	45	30	75
2	3	180	54	36	90
3	3.5	210	63	42	105
4	4	240	72	48	120
5	4.5	270	81	54	135
6	5	300	90	60	150

Source: ANMF Staffing Report (2016)

Using the information presented above and assuming that the workforce has grown at half the rate of bed places, the current (2016) estimated workforce of direct care workers is 153,854 (up from 147,086 in 2012). However, the growth has primarily occurred in personal care workers rather than in nurses -with the proportion of registered and enrolled nurses declining 2012 suggesting a worsening in the skill gap.

The hourly wage rates as identified in the most recent National Aged Care Workforce Census (2017) were applied along with the assumption of a full time working week of 38 hours. The resulting workforce characteristics applied in the present modelling are illustrated in Table 3. Table 3 also includes in the final column the recommended workforce (FTEs) based on estimated demand for beds and recommended resident hours per day (see Tables 1 and 2) which involve both increasing the care hours, and weighting the hours more towards RN's.

Table 3: Direct Care Workforce Characteristics – estimated for 2016

Skill Mix	Current workforce	Annual FT Wage	Number	Ave hours	Current FTE's	Recommended workforce (FTE's)
Register Nurses[6]	14.8%	$77,636	22,841	26.0	14,857	48,676
Enrolled Nurses	10.2%	$54,600	15,697	23.3	9,126	32,451
Personal Care Workers	70.3%	$44,720	108,126	25.9	69,983	81,127
Other	4.7%	NA	7,189	22.0	3,954	NA
Total	100.0%	$50,884	153,854	25.5	97,920	**162,254**

In terms of modelling the financial implications of increasing the staffing levels and changing the skill mix, and quantifying other benefits and costs, it is necessary to work from a range of further assumptions. In many cases, the literature clearly identifies the relationship between care levels and skill mix and the implications for patient outcomes (as summarised above), however there is little or no direct evidence regarding the size of the parameters to be assumed. For example, miscellaneous workforce costs such as consumables to support the workers will increase with the number of direct care workers, however there is no direct evidence to point to the magnitude of the effect. Hence, the estimates provided here are indicative and represent a first step in attempting to determine the value imparted by the ANMF staffing methodology. The assumptions are provided and discussed in Table 4.

6 Including a small number of Nurse Practitioners

Table 4: Discussion of other assumptions for estimating the direct costs

Parameter	Assumed value	Comment
Assumed other workforce costs	20%	It is assumed that with employing additional workers, and changing the skill mix there are number of other costs that will also rise including labour on-costs (superannuation, worker compensation insurance, long service leave and payroll tax), but also there will be some increase in costs in other items such a consumables, office items etc.
Productivity increase/cost shifting	3.3%	While the increased numbers of workers generate a higher wage bill, based on the literature it is reasonable to expect that mitigation of current under-resourcing in aged care will improve certain workforce characteristics (it will attract a broader range of applicants, they will stay longer, there will be stronger workplace culture. This in turn will improve overall service delivery quality and result in more effective structures and operations. This will reduce costs associated with heightened work place stress levels.
% of costs saved from reduced workforce attrition	6.7%	Over-worked staff leads to burn-out and low morale. Accordingly, the aged care sector has an acknowledged high level of attrition, with an estimated annual cost of 25% of the wages bill. It is reasonable to expect that increasing the level of resources and improving the skill mix will reduce the attrition rate, and it is indicatively assumed that this is reduced by 6.7 percentage points.

Table 5 illustrates the assumed parameters and provides a discussion of the explanation/rationale for quantifying the indirect and intangible benefits extending from implementing the recommendations.

Table 5: Discussion of other assumptions for estimating the indirect and intangible benefits

Parameter	Assumed Value	Comment
Avoided Hospitalization		
Reduced probability of incidence	50%	It is assumed that there is 50% reduction in the probability of incidence - from 100% to 50%. The 100% current parameter allows for some residents requiring multiple hospitalizations and some requiring none
Length of stay in hospital (days)	4	The assumption of the average length of stay for hospitalizations should they occur
Cost per day of stay in hospital (acute care)	$2,027	Source: As estimated for 2014 (Independent Hospital Pricing Authority, 2016) with assumed increase of 5% per annum over the last two years
Cost per day of stay in aged care	$572	Source: (Independent Hospital Pricing Authority, 2016) again with an assumed increase in cost of 5% per year
Mortality Improvement		
Increase in average days of life	20	It is assumed that better care will extend the average life of a resident by 20 days
Additional Value per day	20%	It is conservatively assumed that the cost per day of stay represents a minimum value and that the additional value created is 20% of what people/residents are prepared to pay per day.
Quality of resident life		
Increase in value per day	3.3%	It is assumed that the cost per day of stay represents a minimum value and that the additional value created by improved resident care is 3.3% of this actual payment.
Quality of "relatives/carers" experience		
Increase in value per day	1.7%	It is assumed that the cost per day of stay represents a minimum value and that the additional value for relatives/carers of residents (i.e. they feel more comfortable about the care of their relatives in aged care residence because of the improved resident care) is 1.7% of that (i.e. half of the value to the resident themselves)

5.2 Cost Benefit Evaluation – 2016 Scenario

5.2.1 Modelling Outcomes – Base

The modelling applied the assumptions outlined above in assessing the estimated annual cost to the aged care sector had the recommendations of the ANMF Staffing Report been applied in 2016. The results are shown in Table 6.

In summary, the estimated increase in the cost of servicing the sector nationally in line with the ANMF recommendations is $4.8 billion (after allowing for assumed offsets). The increase in resourcing overall (i.e. the number of care workers so as to increase the hours of care to each resident) is the main driver, while improving the skill mix (i.e. increasing the proportion with appropriate qualifications) represents about 20% of the net effect (as modelled).

Table 6: Modelled Outcomes: Financial Implications of adopting the recommendations of the ANMF Staffing Report - 2016

Financial Costs	$ million	Summary Description
Direct Costs		
Increased wages bill		
Due to increased staffing	$3,475	The additional cost from increasing the care hours to the recommended levels
Due to the Skill mix	$923	The incremental cost from increasing the proportion of registered nurses involved in direct care staffing
Increased support costs	$879	Additional costs to support the extra workforce
Total direct cost increase	***$5,277***	
Cost "Offsets"		
Likely savings from reduced staff attrition	$293	Benefits associated with better workplace conditions resulting in reduced resignations and a more stable staffing profile
Productivity gain/Cost shift	$176	Modelling of savings through catching problem earlier with better diagnosis and more care – including reduction in falls and as such saving treatment costs
Net Financial Outcome	**$4,808**	

However as discussed above, while implementing these recommendations has a direct financial cost, the additional resourcing also provides a range of indirect benefits and further improves the care experience for residents.

Using the assumptions and parameters as discussed above, the modelling shows that while there is an increase in costs of $4.8 billion, this is offset by indirect benefits to the value of $2.1 billion thereby reducing the pressure on government budgets (see Table 7). There is an estimated value of further intangible benefits of $2.8 billion. The total figure of $4.9 billion in other benefits accrued clearly offsets the increase in costs incurred by implementing the ANMF recommendations. Importantly, this conclusion is based on the assumptions used in the analysis, which could reasonably be considered conservative.

Table 7: Indicative estimation of other benefits arising from adopting the ANMF Staffing Report

Other Benefits	$ million	Summary Description
Indirect Benefits		
Reduced Hospitalization Costs	$813	The reduced costs in the hospital system through earlier diagnosis and better daily care meaning residents can be treated in the aged care facility and avoid hospitalisation
Offset in Tax Take	$1,254	The increase in wages will result in a higher income taxation take to the government. Note that this is conservative as it will also increase GST revenue
Intangible Benefits		
Reduced mortality	$639	The value gained from extending resident lives due to extra care and preventative activity
Quality of resident life	$1,439	Value gained from reduced stress and depression of residents as they feel more cared for
Quality of "relatives/carers" experience	$720	As above but for relatives/carers of residents
Total Other Benefits	***$4,865***	

5.2.2 Modelling Outcomes – Sensitivity

As noted above, the relationships identified in the cost benefit evaluation are confirmed by the literature, but the strength of the relationship is not effectively quantified - especially in the case of the intangible benefits (e.g. quality of life). The modelling undertaken for this project has deliberately used conservative estimates in this context, but to provide a further indication of possible outcomes a Monte Carlo Simulation has been performed. This assumes that each of the uncertain variables is distributed as a log-logistic distribution with a mean as per the assumptions above[7] (ie conservative).

The results of the alternative simulation analysis are shown in Figure 1, which demonstrates an indicative probability distribution of net benefit to cost outcomes – ranging primarily between -$2 billion and +$8 billion, but concentrated around the neutral net benefit situation.

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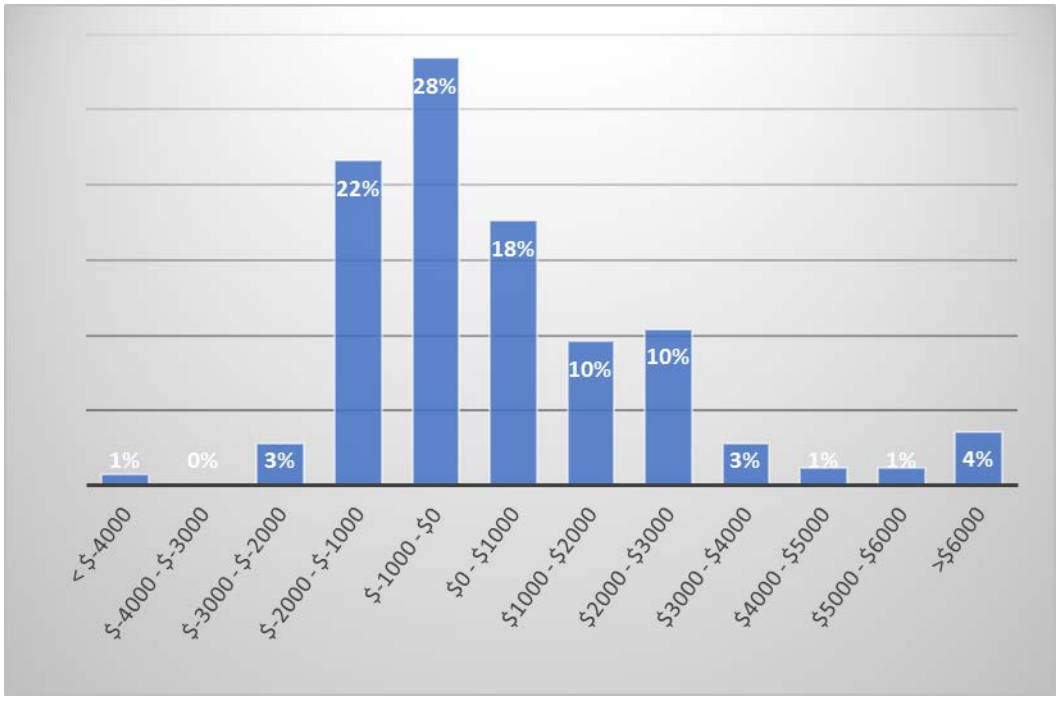
7 The simulation involves random sampling 250 observations of the variables considered the most uncertain, using a log logistic distribution. The log logistic distribution is a right skewed probability distribution, and has been chosen to illustrate that the parameters have been set in what is possibly a quite conservative way. The variables that have been varied and the parameters used for the log-logistic distribution are:

- Productivity increase ⇨ λ=2, α= 0.04, β = 005
- % cost saved ⇨ λ=2, α= 0.08, β = 001
- Probability of incidence -avoided hospital ⇨ λ=3, α= 0.4, β = 1
- Length of stay – avoided hospital ⇨ λ=3, α= 2, β =0.5
- Mortality, days of life ⇨ λ=3, α= 10, β = 2
- Mortality, value of day ⇨ λ=2, α= 0.02, β = 02
- Quality of resident experience ⇨ λ=2, α= 0.04, β = 005
- Quality of relative's experience ⇨ λ=2, α= 0.02, β = 005

This simulation therefore provides an indication of the potential range of outcomes, suggesting that with the uncertainty about the actual value of a number of the key parameters, it is likely that in a social benefit context the adoption of the recommendations would be at least somewhat neutral (i.e. smaller probabilities of significant negatives, but with the potential for significant positive outcomes).

Figure 1: Probability Distribution of Net Benefit to Cost from Adopting the ANMF Skills Report Recommendations 2016, $million



5.2.3 Modelling Outcomes – Case study evidence

A further method of validating the modelling outcomes would be to consider case study evidence. One example of such evidence is the CEDRIC Project (Coordination through Emergency Department, Residential Aged Care and Primary Health Collaboration) (http://www.cedric.org.au/).

CEDRIC has three aims: to strengthen the capacity of the residential aged care sector to deliver care; to improve care for older adults in hospital; and to improve interaction between the sectors.

The model involves advanced practice nurses based at aged care homes, the development of advanced care plans for residents, better coordination with general practitioners in care delivery, and training programs for staff. There are two elements:

1. HIPS (Health Intervention Projects for Seniors) – which involves Residential Aged Care Facilities and primary health sector mediated interventions including provision of a Nurse Practitioner Candidate within the RACFs to support to an enhanced model of primary health care encompassing general practitioners; development of advanced care plans for residents; better coordination of GP care in the aged care facility; a training program for facility staff; and development of a sustainable model of care through endorsed Medicare billing.
2. GEDI (Geriatric Emergency Department Intervention) - a hospital emergency department mediated intervention providing a dedicated

single point of contact within the emergency department and primary health professionals; rapid frontload comprehensive assessment of aged care residents and frail older persons from the community on presentation; streamlined patient flow in in the emergency department; clear and timely inter-sectoral communication; focused discharge planning and health professional education and training.

The formal evaluation of the project is not yet complete, but the anecdotal evidence suggests that adding specific skills into the operations mix is delivering both quality of care benefits and cost savings (at both the aged care and hospital end) (http://www.cedric.org.au/Research-Results.php). The results seem to be confirming the general results of this study indicating the benefits of improved skills mix in aged care.

5.3 Cost Benefit Evaluation – Longer term view to 2036

The ABS provides population projections by age using the 2011 Census data as a base and projecting forward based on assumptions regarding fertility, mortality and immigration. The projections provide an indication of the growth that will occur in the aged care sector over the coming years, deepening workforce imbalances and increasing levels of stress in the system if responding measures are not implemented.

The current modelling has forecast the ratio of additional hours by skill mix required to achieve the ANMF-recommended staffing profiles, based on the underlying parameters – with the projected growth in demand with an aging population, and an increase in the proportion of those needing higher levels of care – and the consequent estimated wage bill implications. However, it is also considered that in the base case (non-implementation of resourcing the recommended staffing level and mix), the gaps in quality of service will increase, and as such the impact of adopting the recommendations will increase relative to this base case. As the gap between actual resourcing and recommended resourcing increases the stress levels in the system are expected to increase, for example in missed resident care, the extent of mis-diagnosis, etc. To represent this likelihood, the parameters assumed for the improved quality of service factors are assumed to increase by 0.2% per year.

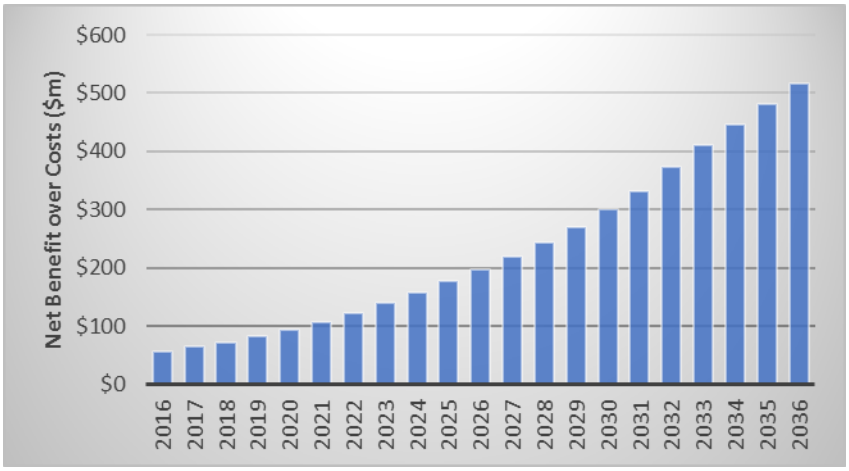
5.3.1 Modelling Outcomes – Base

Figure 2 illustrates the outcomes of the modelling in terms of the difference between the net benefits (including indirect and intangible benefits) over the increased costs, based on the middle scenario of population projections and the assumptions outlined above.

As a consequence of the ageing of the population and the increased demand for services, the net financial cost of implementing the recommendations will grow over time (from $4.8 billion in 2016 to $8.9 billion in 2036). However, *if the recommendations are not pursued* the stresses already existing in the system will intensify at a considerable cost to the sector. Moreover, the benefits of implementing the recommendations will also grow over time, to an estimated $9.4 billion in 2036.

The modelling suggests that benefits will outweigh the cost increases by 2021 (at this point moving out of negative territory, see Figure 2), with this gap reaching a positive $0.5 billion by 2036. Further detail on the modelling summarised in Figure 2 is provided in Appendix 1 Table A.1.

Figure 2: Projected Net Benefits over Costs of Implementing the ANMF Report Recommendations – Base Case



5.3.2 Modelling Outcomes – Sensitivity

As noted the modelling uses the base ABS population forecasts for these projections. Should the Series C projections eventuate, under the assumptions above, the results will not vary significantly.

However, on the benefits side the modelling is sensitive to the assumption concerning the extent of incremental workplace stress associated with the growing gap between benefit and cost (i.e. the assumption that the parameters increase by 0.2% per year). If this degree of stress does not increase, the "net gap" between indirect and intangible *benefits* and the increased net *costs* stays relatively close to the current level, and is immaterial in the context of the modelling. Should the stress levels be more significant than reflected in the base, the net gap gets bigger with the benefits even further outweighing the costs ever time.

5.4 Cost Benefit Evaluation – 2016 Scenario with a 10% wage increase

A cost benefit evaluation was also undertaken to model the impact of implementing the National Aged Care Staffing and Skills Mix Recommendations in 2016, factoring in the recommended wage increase.

The literature indicates that one of the stresses in the system concerns the lower wage rate paid for equivalent qualifications in the aged care sector relative to the health care sector. If the recommendation of the ANMF Submission to the Productivity Commission into the Aged Care Sector (2016) that a 10% wage increase in the sector be implemented, then clearly the wages bill increase will be even greater than that indicated above.

However, it is also expected that the benefits associated with the additional resources allocated to the sector would be further enhanced with a wage increase. The narrowing of the relativity gap in wages between the aged care sector and the rest of the health system will likely lead to the attraction of more qualified and experienced people into the sector. It will reduce staffing attrition and improve effectiveness of service delivery due to a more positive workplace culture and improved retention of experienced staff. Therefore a wage increase would be expected to produce some additional financial offsets and indirect and intangible benefits over and above those occurring as a result of the additional resources made available as modelled above.

Table 8: Parameter assumptions for modelling with and without wage increase included, 2016

Parameter	Assumed value – without wage increase	Assumed value – with wage increase
Assumed other workforce costs	20%	20%
Productivity increase/cost shifting	3.3%	5%
% of costs saved re reduced workforce attrition	6.7%	10%
Avoided Hospitalization		
Reduced probability of incidence	50%	50%
Length of stay in hospital (days)	4	4
Cost per day of stay in hospital (acute care)	$2,027	$2,027
Cost per day of stay in aged care	$572	$572
Mortality Improvement		
Increase in average days of life	20	20
Additional Value per day	20%	20%
Quality of resident life		
Increase in value per day	3.3%	4.3%
Quality of "relatives/carers" experience		
Increase in value per day	1.7%	2.1%

5.4.1 Modelling outcomes - Base

Table 9 illustrates the estimated total cost increase in 2016 including the impacts of the wage increase. A 10% wage increase in the sector will add directly almost $500 million of extra wages costs re the existing staffing levels, and a further $440 million of costs in terms of higher wages for the increased staffing levels. This is additional to the $5.3 billion estimated above (Table 5) from implementing the additional resourcing and skill mix recommendations. However, the offsetting cost reductions from improved attrition rates and from improved efficiencies mean the net financial outcomes for the sector are $5.7 billion (cost).

Table 9: Modelled Outcomes: Financial Implications of adopting the recommendations of the ANMF Staffing Report PLUS wage increase ($ million - 2016)

Financial Costs	$ Million
Direct Costs	
Increased wages bill (associated with increased workforce and skills mix recommendations)	
Increased staffing	$3,475
Change in skill mix	$923
Wages increase (associated with 10% wage increase recommendation)	
Current staffing	$498
New staffing	$440
Total wage increases	**$5,335**
Increased support costs	**$1,067**
Total direct cost increase	**$6,403**
Cost "Offsets"	
Possible savings from staff attrition	$427
Cost shift	$256
Net Financial Outcome	**$5,720**

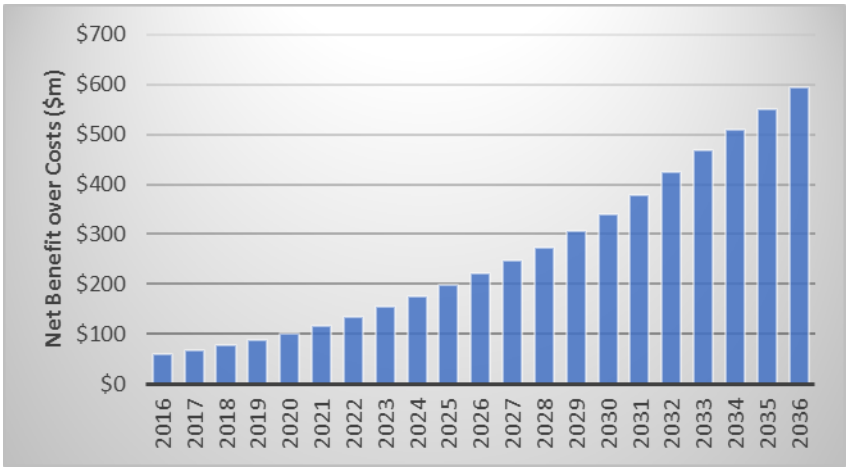
Table 10 provides the indicative estimates of value with respect to the benefits of adding the wage increase on top of the improved resourcing. Again – with the assumed parameters, the extent of the benefit matches the extra cost. $2.4 billion is an offset to the government budget from these higher funding levels, while the remainder is an indication of the value in life quality.

Table 10: Modelled Outcomes: Indicative benefits of implementing the ANMF Staffing Report PLUS wage increase ($ million), 2016

Other Benefits	
Indirect Benefits	
Reduced Hospitalization Costs	$813
Offset in Tax Take	$1,559
Intangible Benefits	
Reduced mortality	$639
Quality of resident life	$1,835
Quality of "relatives/carers" experience	$917
Total Other Benefits	**$5,763**

Figure 3 shows the projected gap between financial costs and the broader level of benefits over the next 20 years factoring in the 10% wage increase, showing a somewhat stronger upward trajectory to that reported in the absence of the wage increase. For detail of the modelling see Appendix 1 Table A.2.

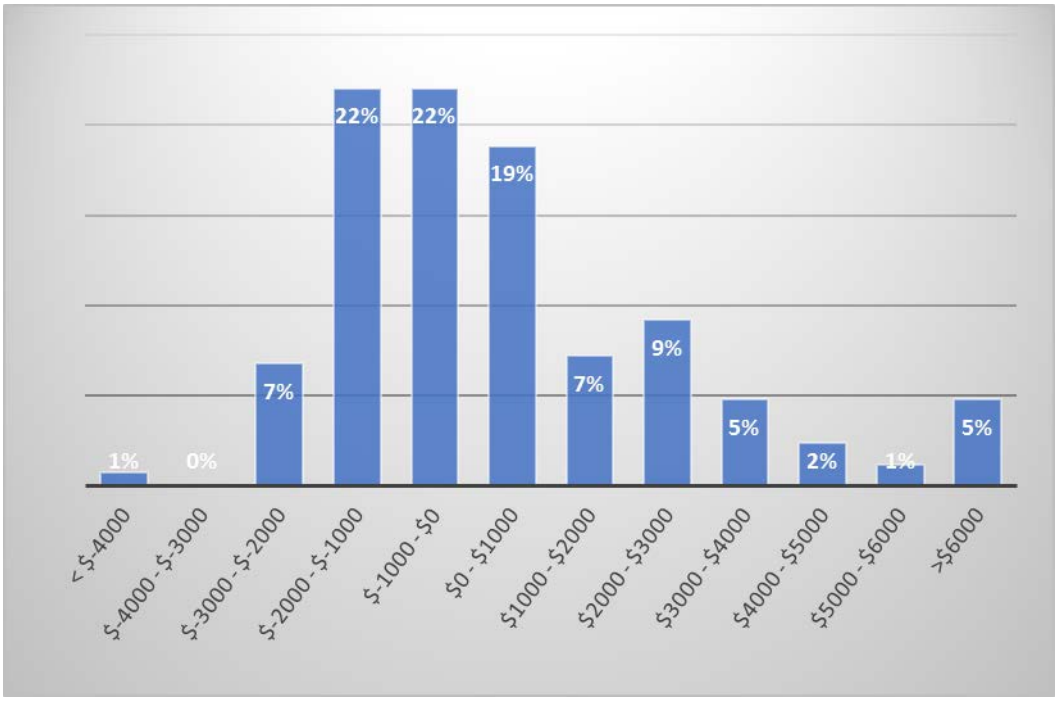
Figure 3: Projected Net Benefits over Costs of Implementing the ANMF Report Recommendations plus 10% wage rate increase



5.4.2 Modelling Outcomes – Sensitivity

As in the initial analysis of the ANMF Skills report recommendations, the outcomes from Table 10 are dependent on the assumed parameters. These have been tested for sensitivity using a Monte Carlo simulation and the results of these are depicted in Figure 4.

Figure 4: Probability Distribution of Net Benefit to Cost from Adopting the ANMF Skills Report Recommendations with 10% Wage Rate Increase



6 Summary and Conclusions

In summary, the modelling indicates that based on the level of demand for aged care services and demand and workforce characteristics estimated for 2016, the following outcomes could be expected:

- Implementing the recommendations of the ANMF Staffing Report would in 2016 have resulted in an increase in the base wages and other costs in the residential aged care sector by $5.3 billion
- However, this could be expected to be offset by some improved cost efficiencies (reduced attrition, improved operational effectiveness) indicatively estimated at $0.5 million – reducing the net financial impact on the delivery of aged care services to $4.8 billion based on the level of demand in 2016.
- In terms of overall healthcare system funding, it is further estimated that there is an offset in terms of reduced costs in the hospital system and an increase in the taxation take (with respect to the increased wages bill) of $2.1 billion, bringing the net social cost down to $2.7 billion
- The literature strongly supports that increased resourcing and improved skill mix will have an impact on the quality of care that residents experience whilst in use of residential aged care services. Using what can be considered as conservative assumptions with respect to impact and valuations of this improved care, it is indicatively modelled that the cost increases associated with implementing the ANMF recommendations would be further offset by these social/quality of life benefits (valued at $2.8 billion).

The modelling using illustrative parameters also demonstrates that:

- With growing demand for aged care services into the future (and an increase in demand for acute care required) the costs of implementing the recommendations will grow over time, reaching a net financial cost increase to the sector of $8.9 billion by 2036 (in today's dollars).
- However, it would be expected that the financial offsets will also grow, as will the quality of life benefits – and it is expected that these will grow at a somewhat greater rate. Again using illustrative but conservative assumptions the modelling shows that there would be a net social gain of $0.5 billion annually by 2036 (totalling $9.4 billion and growing beyond then).

Factoring in the recommended 10% wage increase required to bring aged care wages in line with acute care, the modelling showed that for 2016:

- The wage increase would directly add almost $500 million of extra wages costs related to paying existing staff more, $440 million of costs in terms of wages for the increased staffing levels and almost $120 million in increased support costs (over and above the $5.3 billion estimated from implementing the additional resourcing and skill mix recommendations alone).
- Cost offsets from improved attrition rates and from improved efficiencies mean the net financial cost for the sector for implementing the ANMF recommendations plus the wage increase amounts to $5.7 billion.
- However, this financial cost is offset by indirect benefits totalling $2.4 billion and intangible, quality of life benefits totalling $3.4 billion.

As has been made clear throughout the documentation there is little direct evidence to underpin some of the assumed parameter values used in the

modelling. In general therefore the values have been set at conservative values whereas actual values could easily exceed the assumptions. This has and can been dealt with in three ways:

- Firstly there is testing of the possible range of outcomes given the uncertainty around these variables - using a Monte Carlo Simulation approach. This is still focussed at the conservative end, and suggests that it is possible that even in the base year, the net benefits could easily reach an estimated $2 billion or more.
- The modelling could be interpreted in a "breakeven sense" – ie what is the likelihood that implementing the recommendation would breakeven in a cost benefit context. The modelling indicates that *the recommendations are* more than *benefit cost neutral* if the value of the parameters is **at least** the value that has been assumed. As discussed, the cost benefit evaluations have used values that are generally expected to be conservative. Therefore, the modelling results signal that implementing the ANMF recommendations will result in *a net benefit overall,* across all three modelled scenarios.
- Further research including surveys and workshops can be used to gather information about the strength of the benefits and as such validate the assumptions used in the modelling. Such a research agenda could include gathering expert opinion, or undertaking contingent value surveys of users of the aged care system to refine the interpretation of the outcomes of this cost benefit modelling.

It should also be recognised that this assessment does not consider a number of practical issues which arise as a consequence of implementing the recommendations, which include:

- The most effective financial models that would facilitate these changes, and the mix of social/government funding and user pays systems (including insurance); and the consideration of safety nets (as discussed to some degree in the Productivity Commission report).
- The implications of the significant increase in the need for qualified and trained nurses, and a consideration of supply factors (training needs and costs etc.).

Appendix A: Modelling of Long Run Outcomes

Table A.1: Long Term Cost Benefit Modelling - Without Wage Increase

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Financial Impacts																					
Direct Costs																					
Increased wages bill																					
Increased staffing	$3,475	$3,582	$3,693	$3,811	$3,937	$4,070	$4,223	$4,371	$4,521	$4,675	$4,833	$4,993	$5,152	$5,312	$5,470	$5,626	$5,795	$5,957	$6,120	$6,282	$6,453
Skill shift	$923	$951	$981	$1,012	$1,045	$1,081	$1,121	$1,161	$1,200	$1,241	$1,283	$1,325	$1,367	$1,410	$1,452	$1,493	$1,538	$1,580	$1,623	$1,666	$1,712
Wages increase																					
Total wage increases	$4,397	$4,534	$4,674	$4,823	$4,982	$5,151	$5,344	$5,532	$5,721	$5,915	$6,116	$6,318	$6,519	$6,722	$6,921	$7,118	$7,332	$7,538	$7,743	$7,948	$8,165
Increased support costs	$879	$907	$935	$965	$996	$1,030	$1,069	$1,106	$1,144	$1,183	$1,223	$1,264	$1,304	$1,344	$1,384	$1,424	$1,466	$1,508	$1,549	$1,590	$1,633
Total direct cost increase	**$5,277**	**$5,440**	**$5,608**	**$5,788**	**$5,978**	**$6,181**	**$6,413**	**$6,638**	**$6,866**	**$7,099**	**$7,339**	**$7,582**	**$7,823**	**$8,067**	**$8,306**	**$8,542**	**$8,799**	**$9,045**	**$9,292**	**$9,538**	**$9,798**
Cost "Offsets"																					
Possible savings re staff attrition	$293	$302	$312	$322	$332	$343	$356	$369	$381	$394	$408	$421	$435	$448	$461	$475	$489	$503	$516	$530	$544
Cost shift/productivity factor	$176	$182	$188	$194	$201	$208	$216	$224	$233	$241	$250	$258	$267	$276	$285	$293	$303	$312	$321	$330	$340
Net Financial Outcome	***$4,808***	***$4,956***	***$5,109***	***$5,272***	***$5,445***	***$5,630***	***$5,840***	***$6,045***	***$6,252***	***$6,463***	***$6,682***	***$6,902***	***$7,121***	***$7,343***	***$7,560***	***$7,774***	***$8,007***	***$8,231***	***$8,455***	***$8,678***	***$8,913***
Other Benefits																					
Indirect Benefits																					
Reduced Hospitalisation Costs	$813	$839	$867	$896	$927	$961	$1,000	$1,037	$1,076	$1,115	$1,156	$1,198	$1,239	$1,282	$1,325	$1,368	$1,416	$1,461	$1,507	$1,552	$1,599
Offset in Tax Take	$1,254	$1,293	$1,333	$1,375	$1,421	$1,469	$1,524	$1,578	$1,632	$1,687	$1,744	$1,802	$1,859	$1,917	$1,974	$2,030	$2,091	$2,149	$2,208	$2,266	$2,328
Intangible Benefits																					
Reduced mortality	$639	$660	$681	$704	$729	$755	$786	$816	$846	$877	$909	$942	$975	$1,008	$1,042	$1,076	$1,113	$1,149	$1,185	$1,220	$1,257
Quality of patient life	$1,439	$1,486	$1,534	$1,586	$1,641	$1,701	$1,769	$1,837	$1,904	$1,974	$2,046	$2,120	$2,194	$2,270	$2,346	$2,422	$2,506	$2,587	$2,667	$2,747	$2,831
Quality of "relatives" experience	$720	$743	$767	$793	$821	$850	$885	$918	$952	$987	$1,023	$1,060	$1,097	$1,135	$1,173	$1,211	$1,253	$1,294	$1,334	$1,373	$1,415
Total Other Benefits	***$4,865***	***$5,021***	***$5,182***	***$5,355***	***$5,539***	***$5,736***	***$5,964***	***$6,186***	***$6,410***	***$6,640***	***$6,879***	***$7,121***	***$7,364***	***$7,613***	***$7,860***	***$8,107***	***$8,380***	***$8,641***	***$8,900***	***$9,159***	***$9,430***
Gap	$57	$65	$73	$82	$93	$106	$124	$140	$158	$177	$197	$219	$243	$270	$300	$332	$373	$410	$445	$481	$517

Table A.2: Long Term Cost Benefit Modelling - With Wage Increase

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Financial Impacts																					
Direct Costs																					
Increased wages bill																					
Increased staffing	$3,475	$3,582	$3,693	$3,811	$3,937	$4,070	$4,223	$4,371	$4,521	$4,675	$4,833	$4,993	$5,152	$5,312	$5,470	$5,626	$5,795	$5,957	$6,120	$6,282	$6,453
Skill shift	$923	$951	$981	$1,012	$1,045	$1,081	$1,121	$1,161	$1,200	$1,241	$1,283	$1,325	$1,367	$1,410	$1,452	$1,493	$1,538	$1,580	$1,623	$1,666	$1,712
Wages increase																					
Current staffing	$478	$493	$508	$524	$542	$560	$581	$601	$622	$643	$665	$687	$708	$730	$752	$773	$796	$818	$841	$863	$886
New staffing	$440	$453	$467	$482	$498	$515	$534	$553	$572	$591	$612	$632	$652	$672	$692	$712	$733	$754	$774	$795	$816
Total wage increases	$5,315	$5,480	$5,649	$5,830	$6,022	$6,226	$6,459	$6,686	$6,915	$7,150	$7,392	$7,636	$7,879	$8,125	$8,365	$8,603	$8,862	$9,110	$9,358	$9,606	$9,867
Increased support costs	$1,063	$1,096	$1,130	$1,166	$1,204	$1,245	$1,292	$1,337	$1,383	$1,430	$1,478	$1,527	$1,576	$1,625	$1,673	$1,721	$1,772	$1,822	$1,872	$1,921	$1,973
Total direct cost increase	**$6,378**	**$6,576**	**$6,779**	**$6,996**	**$7,226**	**$7,471**	**$7,751**	**$8,024**	**$8,299**	**$8,580**	**$8,871**	**$9,164**	**$9,455**	**$9,750**	**$10,038**	**$10,324**	**$10,634**	**$10,932**	**$11,230**	**$11,527**	**$11,841**
Cost "Offsets"																					
Possible savings re staff attrition	$425	$438	$452	$466	$482	$498	$517	$535	$553	$572	$591	$611	$630	$650	$669	$688	$709	$729	$749	$768	$789
Cost shift/productivity factor	$255	$264	$272	$282	$291	$302	$314	$325	$337	$349	$362	$375	$387	$400	$413	$426	$439	$452	$466	$479	$493
Net Financial Outcome	***$5,698***	***$5,874***	***$6,055***	***$6,248***	***$6,453***	***$6,671***	***$6,920***	***$7,163***	***$7,408***	***$7,658***	***$7,917***	***$8,178***	***$8,438***	***$8,700***	***$8,956***	***$9,210***	***$9,486***	***$9,751***	***$10,016***	***$10,279***	***$10,558***
Other Benefits																					
Indirect Benefits																					
Reduced Hospitalisation Costs	$813	$839	$867	$896	$927	$961	$1,000	$1,037	$1,076	$1,115	$1,156	$1,198	$1,239	$1,282	$1,325	$1,368	$1,416	$1,461	$1,507	$1,552	$1,599
Offset in Tax Take	$1,552	$1,600	$1,650	$1,703	$1,759	$1,818	$1,886	$1,953	$2,020	$2,088	$2,159	$2,230	$2,301	$2,373	$2,443	$2,513	$2,588	$2,660	$2,733	$2,805	$2,882
Intangible Benefits																					
Reduced mortality	$639	$660	$681	$704	$729	$755	$786	$816	$846	$877	$909	$942	$975	$1,008	$1,042	$1,076	$1,113	$1,149	$1,185	$1,220	$1,257
Quality of patient life	$1,835	$1,895	$1,956	$2,022	$2,093	$2,168	$2,256	$2,342	$2,428	$2,517	$2,609	$2,703	$2,797	$2,894	$2,991	$3,088	$3,196	$3,298	$3,400	$3,502	$3,609
Quality of "relatives" experience	$917	$947	$978	$1,011	$1,046	$1,084	$1,128	$1,171	$1,214	$1,259	$1,305	$1,352	$1,399	$1,447	$1,496	$1,544	$1,598	$1,649	$1,700	$1,751	$1,804
Total Other Benefits	***$5,757***	***$5,942***	***$6,131***	***$6,336***	***$6,554***	***$6,787***	***$7,056***	***$7,318***	***$7,583***	***$7,856***	***$8,138***	***$8,424***	***$8,711***	***$9,005***	***$9,297***	***$9,588***	***$9,911***	***$10,219***	***$10,525***	***$10,831***	***$11,151***
Gap	$59	$68	$77	$88	$101	$115	$135	$155	$175	$197	$220	$246	$273	$305	$341	$378	$425	$468	$509	$551	$593

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