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Aged care service model and funding review

Phase 2: Modelling options for improved funding and service models

David Moore, Rohan Trill, Mehrnaz Rohani, Julius Ohrnberger, Lockie Woon

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Contents

Tables

Figures

Glossary

Abbreviation	Stands for
ARC	Aged residential care
ARRC	Age-related residential care
BMI	Body Mass Index
CA	Contact Assessment
CAGR	Compound annual growth rate
Capex	Capital expenditure
CAPM	Capital asset pricing model
CCCI	Cordell Construction Cost Index
CCPS	Clients Claims Processing System
COD	Cost of debt
COE	Cost of equity
CPI	Consumer Price Index
CS	Company credit spread
DCF	Discounted cash flow
EY	Ernst & Young
FCF	Free cash flows
FFS	Fee-for-service
GDP	Gross domestic produce
GT	Grant Thornton
HC	Home Care
HCSS	Home and community support services
IBT	In-between travel
IRR	Internal rate of return
LCI	Labour cost index
LNPF-ECD	Low need physical function (excluding carer distress)
LTCF	Long Term Care Facilities
MRP	Market risk premium
NASC	National Assessment Service Co-ordinator
NHI	National Health Index

NPV	Net present value
NZ RUGIII-15	New Zealand Resource Utilisation Groups (15 group model)
NZACA	New Zealand Aged Care Association
Opex	Operating expenditure
ORA	Occupational right agreement
PWC	PricewaterhouseCoopers
RBNZ	Reserve Bank of New Zealand
RUG-III	Resource Utilisation Group
SP	Size premium
SPAG	Settlement Party Action Group
SWL	Safe working load
TLA	Territorial Local Authority
WACC	Weighted average cost of capital

Executive summary

In response to Te Pae Tata, Health New Zealand has initiated a review of the funding and service models for aged care services. We are conducting the review in two phases.

In the first phase, we set out a comprehensive picture of the current state of aged care and the prevalent issues in the sector. We identified five pressing issues:

1. Both age residential care (ARC) and home care support services (HCSS) are under-funded.
2. The funding models used to distribute funding to the sector are no longer fit for purpose.
3. There are material ethnic inequities in accessing aged care services.
4. The aged care sector continues to face significant workforce pressures.
5. Issues with aged care are exacerbated in regional and rural New Zealand.

Increasing funding alone is not sufficient to generate improved outcomes. While funding models are required for both age residential care (ARC) and home care support services (HCSS) to incentivise the efficient delivery of services, the system also needs to be designed in a way to enable pathways of care that allow people to live at their desired level of independence.

This report presents our findings from phase two in which we focus on modelling and predicting the impacts of options and scenarios for better funding and service models in ARC and HCSS. Working together with Health New Zealand and using expert inputs from providers in the aged care sector and academia, we landed on the options used in this report. There is more complexity and focus on HCSS options which we identified in phase one as a key area for change. The key options and findings from our analysis are outlined below.

Reducing pressures on aged residential care demand: supporting lower acuity individuals in HCSS instead of ARC

ARC option: changing the options presented to older people who would normally enter the current ARC service model so that HCSS support independent living, instead of ARC. We call this the substitution scenario.

- We estimate ARC demand by 2039/40 of 49,363 individuals based on population growth and utilisation trends by age and care level (five-year trend scenario). We estimate demand by 2039/40 of 45,309 individuals for the ARC option (five-year trend + substitution scenario).
- Compared to the base year 2022/23, which is the same for the estimations, we predict ARC growth of 53 per cent for the five-year trend estimation compared to a significantly reduced growth of 40 per cent for the ARC option.

Improving efficiency of HCSS: a nationwide adoption of a case-mix

HCSS option: transitioning to a nationally consistent case-mix model in HCSS, supporting individuals with low needs in HCSS instead of ARC and removing lowest need individuals from HCSS (1A – 2B clients).

- We estimate annual HCSS hours to reach 11.9 million in the HCSS option by 2039/40. In comparison, under the status quo, which has a mixed fee-for-service and case-mix system and no additional demand shifted from ARC, HCSS hours are predicted to reach 15 million by 2039/40.

- Transitioning fee-for-service regions to a case-mix, removing lowest need clients from HCSS, and supporting low needs residents in HCSS instead of ARC, may result in a 20 per cent reduction in annual hours by 2039/40.

Economic viability requires a cost uplift in ARC

We determine the bed-day price at which an ARC facility becomes economically viable for the four ARC services and rest home combined with hospital care.

Using a cost model and scenario analysis, we estimate lower and upper bounds to optimise Territorial Local Authority (TLA) pricing. Lower bound estimates are identified using the base case scenario representing charitable facilities without premium and occupational right agreements (ORA) that are on average 20 years old. The upper bound estimates are based on scenario 1—new investment in charitable facilities without premium and ORA.

- Price uplifts are required for all types of aged residential care services, including the rest home and hospital mix, in both the lower bound/base case scenario and the upper bound/scenario 1.
- Focusing on rest home and hospital mix, the base case suggests an uplift ranging between zero and 3.3 per cent. The upper bound scenario estimates an uplift between 11.9 and 17.8 per cent.
- Our estimates highlight regional variations. The highest required uplifts for the upper boundary are estimated for Auckland and Waitematā driven by higher property values in these regions.

Changing ARC funding models can significantly reduce fiscal costs for ARC in the long run

We compare the status quo extrapolation to an alternative scenario for funding ARC, and predict from 2024/25 out to 2039/40:

Status quo maintains current structures without introducing the aged residential care substitution scenario.

ARC model option proposes eliminating maximum funding contributions, requiring all residents above income and asset limits to pay unsubsidised care fees, with the substitution scenario.

- Under the status quo, ARC fiscal costs amount between $2,826 - $3,606 million by 2039/40.
- Under the ARC model option, we estimate annual fiscal costs between $1,815 - $2,325 million by 2039/40, thereby potentially reducing annual fiscal costs by $1,011 - $1,281 million compared to the status quo.

The adoption of a nationwide case-mix, supporting low need individuals in HCSS, and removing lowest need from HCSS can result in fiscal savings of about $1,694 million between 2024/25 and 2039/40

We compare the status quo extrapolation to an alternative model for HCSS care and predict from 2024/25 out to 2039/40:

Status quo maintains current practices, with no reduction in hours in fee-for-service districts, low acuity residents remaining in ARC, and specific client types continuing to receive HCSS in all districts.

HCSS model option involves a nationwide adoption of a case-mix model in HCSS, with lower acuity individuals receiving support in HCSS instead of ARC, and lowest need individuals removed from HCSS.

- By 2039/40, annual fiscal HCSS costs are projected to increase to $1,121 million under the HCSS model option, compared to $1,294 million under the status quo.
- The total cost differential over the period from 2024/25 until 2039/40 amounts to $1,694 million.
- Despite increased demand from supporting low-needs individuals in HCSS rather than ARC, the HCSS model option is expected to yield 11.4 per cent lower aggregate HCSS costs from 2024/25 to 2039/40 compared to the status quo.

Implementing the HCSS and ARC model options can reduce the whole system fiscal cost of aged care services by $11,823 million between 2024/24 and 2039/40

We compare the status quo extrapolations of our ARC and HCSS fiscal estimations to our combined HCSS and ARC model options.

- Under the status quo, the total fiscal cost for aged care amounts to $48,673 million between 2024/25 and 2039/40.
- In comparison, when using our combined ARC and HCSS model options over the same period with the same assumed bed-day prices, the total fiscal cost for aged care is 24 per cent lower and amounts to $36,850 million.
- The implications are strong for the fiscus. Our ARC and HCSS models are predicted to result in fiscal savings of $11,823 million between 2024/25 and 2039/40, compared to the status quo.

1. Forecasting demand for aged residential care

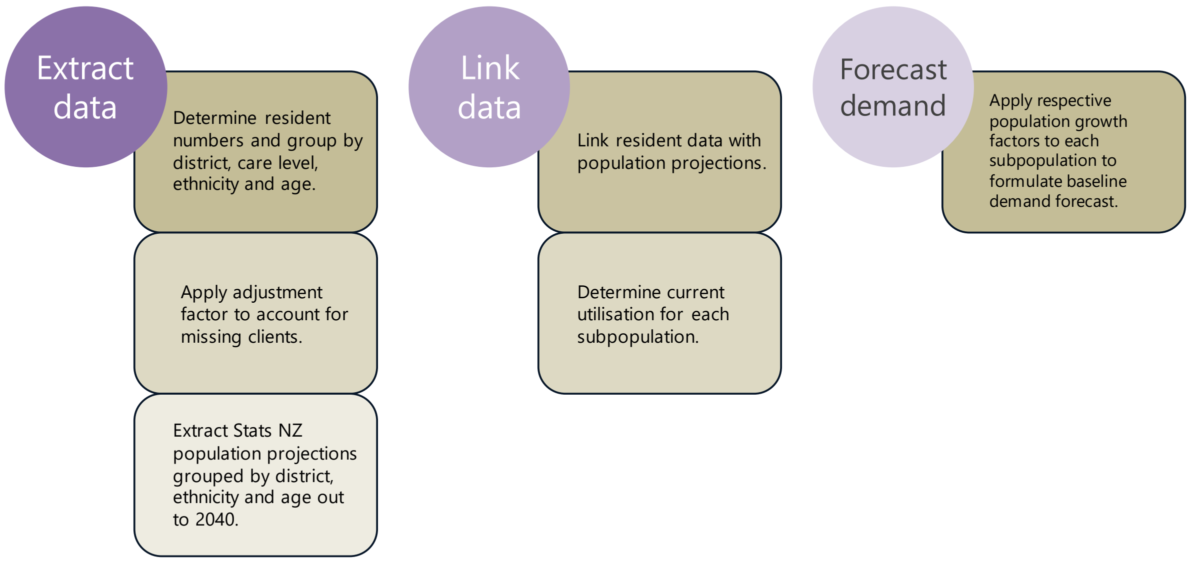
Projecting demand is crucial in determining the required capacity for aged residential care (ARC). A prediction of future demand for aged residential care was developed. The model uses ARC status quo (2022/23) utilisation patterns grouped by region, ethnicity, and age, and predicts demand based on the respective predicted population growth in each subpopulation. We note other factors can influence demand beyond population growth, such as supply-related factors, workforce capacity, and levels of funding to providers.

It is important to note that baseline forecasts are not necessarily what we expect to occur. Rather, these are solely determined by expected population growth projections.[1] Despite population ageing being a significant driver of demand for aged care services, a reduction in population-based utilisation over the last decade suggests other factors must be considered to determine future demand for aged care services. Therefore, we model different scenarios to account for these other factors. The scenarios account for potential utilisation trends, changes in policy settings, introduction of standardised care entry thresholds into home care support services (HCSS), and service substitution through the identification of low-complex older people in ARC.

1.1 Modelling the baseline demand forecast for ARC

Our baseline forecast for ARC combines current utilisation patterns and projected population growth to estimate future demand. Current utilisation by district, care level, ethnicity and age are derived from the Clients Claims Processing System (CCPS) dataset. Population forecasts are derived from Statistics New Zealand. A summary of this methodology is depicted in Figure 1.

Figure 1: Status quo demand forecasting methodology for ARC



[1] https://nzdotstat.stats.govt.nz/wbos/Index.aspx

Below we set out our methodology in detail.

Step 1: Extract 2022/23 resident numbers by district, care level, ethnicity, and age

The first step involves deriving current utilisation patterns by sorting 2022/23 CCPS[2] data into bed-days by subpopulation. The criterion of each variable is described in Table 1.

Table 1: CCPS resident grouping variables

District	Care level	Ethnicity	Age
Auckland	Rest home	Māori	<65
Bay of Plenty	Hospital	Pacific peoples	65-69
Canterbury	Dementia	Asian	70-74
Capital & Coast	Psychogeriatric	NZ European/Other	75-79
Counties Manukau			80-84
Hawke's Bay			85-89
Hutt Valley			90+
Lakes			
MidCentral			
Nelson Marlborough			
Northland			
South Canterbury			
Southern			
Tairāwhiti			
Taranaki			
Waikato			
Wairarapa			
Waitematā			
West Coast			
Whanganui			

We derive bed-days for each combination of district, care level, ethnicity, and age. An extract of this output is provided in Figure 2.

[2] Source: 230809 220701 230630, Extract: 24/08/2023

Figure 2: Grouping extract

District	Care level	Ethnicity	Age	Bed days
Auckland	Dementia	Asian	65-69	422
Auckland	Dementia	Asian	70-74	562
Auckland	Dementia	Asian	75-79	2994
Auckland	Dementia	Asian	80-84	2840
Auckland	Dementia	Asian	85-89	787
Auckland	Dementia	Asian	90+	878
Auckland	Dementia	Asian	Under 65	25
Auckland	Dementia	Maori	65-69	806
Auckland	Dementia	Maori	70-74	1146
Auckland	Dementia	Maori	75-79	1336
Auckland	Dementia	Maori	80-84	1451
Auckland	Dementia	Maori	85-89	269
Auckland	Dementia	Maori	90+	412
Auckland	Dementia	Maori	Under 65	316

Step 2: Apply adjustment factor to account for missing data

The CCPS dataset only includes residents that are fully or partly subsidised. Residents who self-fund care at a rest home level are excluded, and there is no information on age or ethnicity. We apply an adjustment factor to address this shortcoming in the data. Using the total number of residents (the population sample) in each region at each care level from Health New Zealand's quarterly survey of facilities (2023-06), we correct our CCPS sample to the population sample with an adjustment factor. The approach is explained in the example below. We use the assumption that the observed CCPS sample of subsidised rest home residents is representative of the total rest home population demographically. The margins of error in each region are less than two per cent at a 95 per cent confidence level. Statistically, this means there is a 95 per cent confidence factor at play representing the demographic mix in each region, and a margin of error within two percentage points above or below the observed demographic mix.

Example:

In Auckland, 734 (64 per cent) out of 1,153 total rest home residents received a subsidy in 2022/23.

We assume the subsidised rest home demographic distribution is representative of the total rest home population.

We apply an adjustment factor of 1.57 (1153/734) to the Auckland rest home subgroupings.

Step 3: Link Statistic NZ population projections (2023 – 2040) to CCPS data

Step 3 involves extracting Statistic NZ's population projections[3] out to 2040, grouped by district, ethnicity, and age, and linking to CCPS data. Including population projections specific to each subpopulation allows for more accurate forecasting, reflecting varying utilisation patterns between districts, ethnic groups, and age.

> **Example:**
>
> In Auckland, the NZ European/Other population aged 70-74 and 80-84 is expected to grow 27 per cent and 116 per cent by 2040, respectively.
>
> The 80-84 age group are higher users of ARC for all care levels in Auckland. The combination of greater ARC utilisation and greater forecasted population growth will have a larger weighting and impact on overall predicted demand.

Step 4: Apply subpopulation growth factors to current utilisation patterns

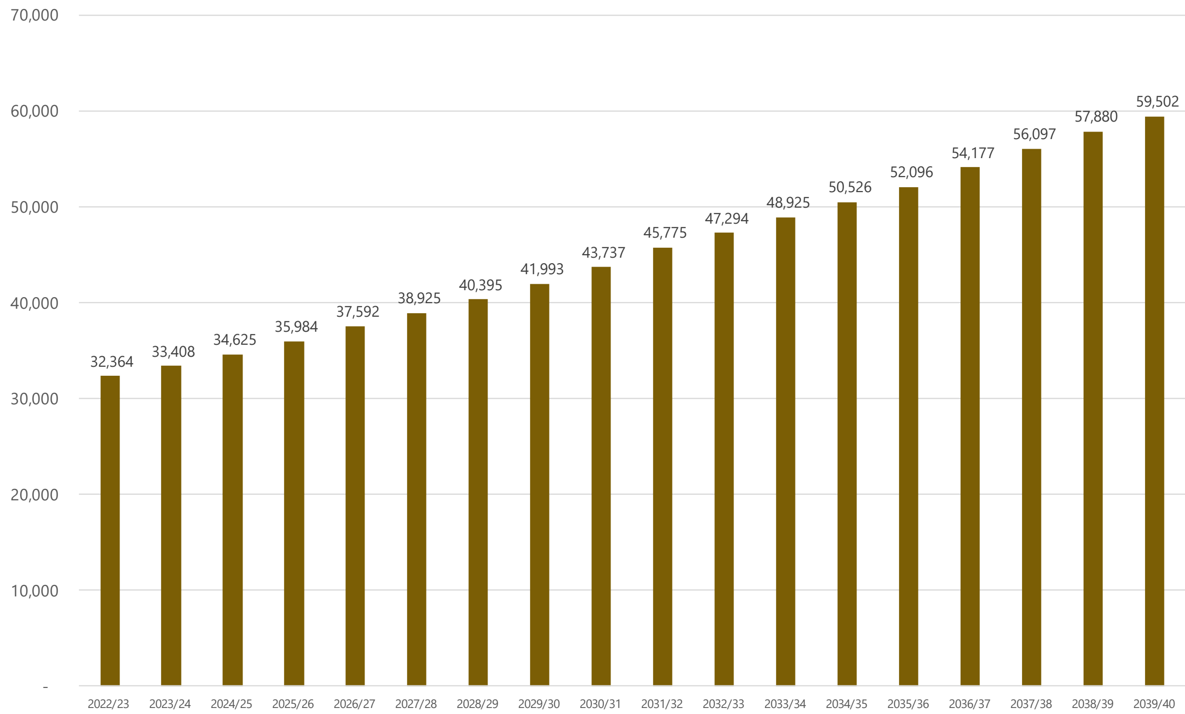
Step 4 applies predicted population growth to current utilisation patterns. The baseline forecast is purely determined by population growth. The resulting output is forecasted bed-days in each year for each subpopulation by district, care level, ethnicity, and age.

Total bed-days in each year is divided by 365 to determine the expected average number of ARC residents.

[3] https://nzdotstat.stats.govt.nz/wbos/Index.aspx

Results

Figure 3: Baseline ARC demand forecast



Our baseline forecast suggests that by 2040, using population growth and current utilisation trends, demand for ARC services would increase by 84 per cent.

1.2 Building on the baseline: two scenarios for forecasting demand for ARC

We build on and adapt the baseline demand forecast in this section, using two scenarios as explained below. While population ageing is a significant driver of demand for aged care services, a reduction in population-based utilisation over the last decade suggests other factors must be considered, beyond those used in the baseline forecast. We have identified the following relevant factors to be considered:

1. **A healthier population**

   Decreasing utilisation of aged care may reflect changes to overall health and life expectancy among New Zealanders. Acting against this to some extent is the increasing prevalence of dementia-level care.

2. **Increasing preference to age in place**

   The Ageing in Place policy directive was established by Health New Zealand in 2002 with an aim to support older people remaining at home longer. Home care services have strengthened over the last decade, and decreasing utilisation in ARC may be a result of an increasing substitution and preference towards home care services.

3. **Potential substitution of aged residential care**

   There are potentially a group of residents in aged residential care with low-need physical function, identified using the interRAI Long Term Care Facilities (LTCF) assessment, who could be supported at home.

To account for these factors, we provide scenario analysis to include a downwards utilisation trend based on past observations, and potential service substitution for low-acuity individuals in aged residential care.

Scenario 1: Five-year trend in reducing utilisation by care level and age continued for another five years.

Scenario 2: Five-year trend + substitution of low-acuity individuals from ARC to HCSS.

1.2.1 Scenario 1: Five-year trend

An observed decline in ARC utilisation over the past decade suggests this trend may persist. To account for declining use, we apply a five-year trend scenario to the baseline forecast model that considers the average change in utilisation from 2017/18 to 2022/23, i.e. a compound annual growth rate (CAGR). Utilisation rates are grouped by care level and age.[4] An extract is provided in Figure 4.

Figure 4: CAGR extract

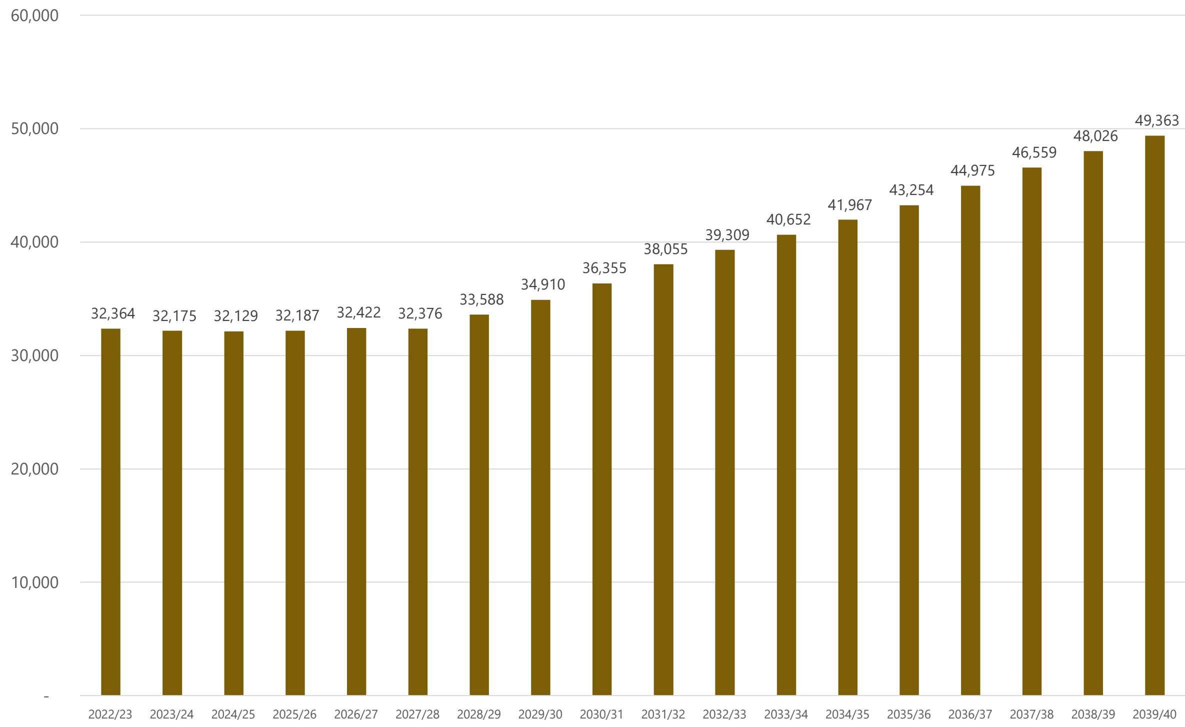
Care level	Age	CAGR
Rest Home	65-69	-0.03
Rest Home	70-74	-0.0472
Rest Home	75-79	-0.0716
Rest Home	80-84	-0.0687
Rest Home	85-89	-0.0608
Rest Home	90+	-0.0508
Rest Home	Under 65	-0.0216
Hospital	65-69	-0.0097
Hospital	70-74	-0.0023
Hospital	75-79	-0.0307
Hospital	80-84	-0.0351

EYs Funding Review of Aged Residential Care and Demand Planner (2019) used a similar trend to account for reductions in ARC utilisation.

Results:

[4] Utilisation rates for district and ethnicity were aggregated/not specified in addition to care level and age as the sample sizes became too small.

Figure 5: ARC demand forecast – Five-year trend



Key assumptions:

- Utilisation of ARC continues to trend downwards at the average rate observed over the last five years for another five years. Utilisation trends were grouped by care level and age.
- Population-based utilisation remains constant after five years—we assume that utilisation will not/cannot fall indefinitely.

Observations:

- ARC demand grows 53 per cent by 2040 (compared to 84 per cent without reduced utilisation rates).
- Demand stays relatively flat until 2028/29 as the reduction in utilisation initially mitigates the effects of population growth.

1.2.2 Scenario 2: Five-year trend + substitution of low-acuity individuals from ARC to HCSS

We further adapt the baseline forecast in Scenario 2, including the five-year trend from Scenario 1. Scenario 2 considers, in addition, the substitution of low-acuity individuals from ARC to HCSS.

There are cohorts of low-complex individuals in ARC that could potentially be cared for in the community. Bupa Health Foundation, Bupa New Zealand and The University of Auckland have researched and adapted a case-mix model derived from the interRAI Long-Term Care Facilities (LTCF) assessment. The model was adapted from the RUG-III case-mix tool, which has been used across North America for long-term care (LTC) assessments. The adapted model (NZ RUGIII-15) has been validated for use in New Zealand. The NZ RUGIII-15 allocates individuals at their LTC assessment to one of 15 groups of ARC care need. The 15 groups are determined by the individual’s level of disability (three levels: low, medium and high) and their key care need category (five categories: rehabilitation, complex needs, cognitive impairment, behavioural problems and physical function) (Parsons et al., 2019).

Table 2 and Table 3 show the distribution of residents across the NZ RUGIII-15 groups on admission into ARC in pre-COVID (2018/19) and post-COVID (2022/23) periods. Timeframes for both periods are 1 July until 30 June the following year.

Table 2: NZ RUGIII-15 distribution of individuals who entered ARC in pre-COVID period (2018/19)

ADL collapsed group	**Physical function**		**Behavioural problems**		**Cognitive impairment**		**Clinically complex**		**Rehabilitation**	
	N	%	N	%	N	%	N	%	N	%
Low need (4-8)	2,875	25.2	356	3.1	1,751	15.3	2,898	25.4	148	1.3
Medium need (9-14)	660	5.8	15	0.1	163	1.4	968	8.5	93	0.8
High need (15-18)	482	4.2	0	0.0	0	0.0	941	8.2	80	0.7

11,340 individuals entered ARC in 2018/19. We have identified admission into ARC by determining the first LTCF assessment, as new residents must be assessed within three weeks of entering an ARC facility. No residents were found to be classified under high-need behavioural problems or cognitive impairment, which was also the case in Parsons et al. (2019).

Table 3: NZ RUGIII-15 distribution of individuals who entered ARC in post-COVID period (2022/23)

ADL collapsed group	Physical function		Behavioural problems		Cognitive impairment		Clinically complex		Rehabilitation	
	N	%	N	%	N	%	N	%	N	%
Low need (4-8)	3,334	26.9	445	3.6	1,803	14.5	2,940	23.7	211	1.7
Medium need (9-14)	752	6.1	20	0.2	179	1.4	934	7.5	122	1.0
High need (15-18)	627	5.1	0	0.0	0	0.0	933	7.5	94	0.8

12,394 individuals entered ARC in 2022/23. There are variations in the prevalence of NZ RUGIII-15 groups on admission to ARC between these periods. These include a small increase in the proportion of people entering ARC in the 'low-need physical function' group (26.9 per cent post-COVID vs. 25.2 per cent pre-COVID).

Low-need physical function represents the group of lowest complexity. Some individuals in this group could potentially be supported in their own home with HCSS instead of an ARC facility, if the HCSS service model was efficient and responsive.[5] This group is the basis for our forecasts which identify the potential substitution of low-acuity individuals from ARC to HCSS.

We identify potential ARC cohorts that could be safely and economically cared for at home by analysing the following factors for the low-need physical function group on admission to ARC:

- Change in function (NZ RUGIII-15 group) over time in subsequent LTCF assessments (typically occurring every six months)
- Mortality
- Carer distress prior to entering ARC.

Carer distress has been identified as being independently associated with ARC placement (Holdaway et al., 2021). Jamieson et al. (2019) found that the risk of entry into care was 28 per cent higher when carer distress was recorded in InterRAI Home Care (HC) assessments between June 2012 and December 2015. The pre-COVID period is used as the basis for our analysis as it allows for sufficient time after individuals' first LTCF assessment to explore changes in function and mortality. It also mitigates the COVID effects to carer distress. Schluter et al. (2022) found that the prevalence of carer distress increased significantly during COVID to a peak of 48.5 per cent in March 2020.

2,875 residents entered ARC at the low-need physical function group in the pre-COVID (2018/19) period. To determine the prevalence of carer distress, we identified the last HC assessment for everyone prior to entering ARC. Carer distress is defined as recording 'yes' to 'primary informal helper

[5] We note that there may be other factors in place relating to capacity for respite care in ARC, reliance on responses in community services or individual housing conditions. These elements are not modelled in our analysis. Therefore, our estimates are considered upper-bound estimates.

expresses feelings of distress, anger, or depression.’ Of residents in the low-need physical function group, 25.5 per cent (734) recorded ‘yes’ to carer distress in their last HC assessment.

When exploring potential low-complex cohorts who could be cared for at home and avoid entering ARC sooner than necessary, we exclude residents that recorded carer distress in their last HC assessment. Figure 6 and

Table 4 show the change in function and mortality of the low-need physical function group over time (excluding individuals that recorded carer distress).

Residents can be categorised through time in each subsequent LTCF assessment as the following:

- **Stable:** individuals that remain in the low-need physical function group.
- **Worsened:** individuals whose function worsened and now fit into a more complex NZRUGIII-15 group.
- **Mortality**: individuals who have no further LTCF assessment recorded and are assumed to have died.

Figure 6: Changes in function and mortality of 'low-need physical function' cohort in ARC (pre-COVID)

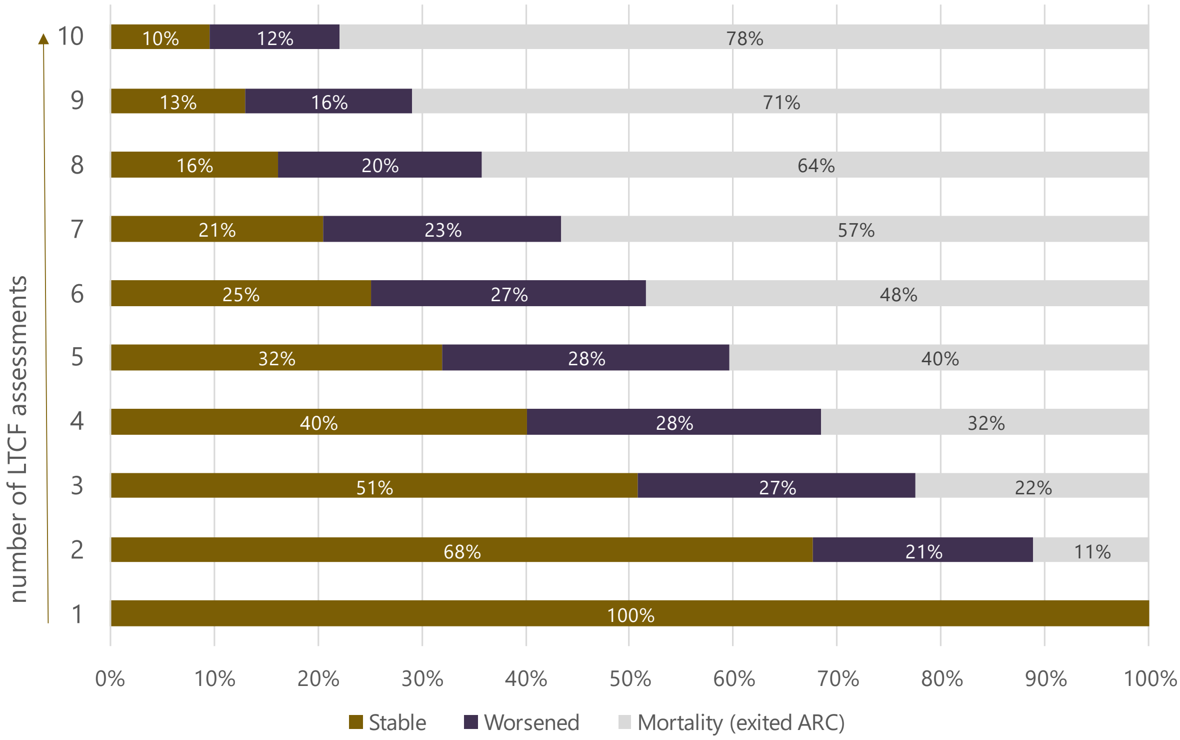


Table 4: Changes in function and mortality of 'low-need physical function' cohort in ARC (pre-COVID)

LTCF assessment	**Stable**		**Worsened**		**Mortality**	
	N	%	N	%	N	%
on admission	2,141	100	0	0	0	0
2	1,439	67.2	452	21.1	250	11.7
3	1,071	50.0	563	26.3	507	23.7
4	845	39.5	591	27.6	705	32.9
5	671	31.3	572	26.7	898	41.9
6	522	24.4	552	25.8	1,067	49.8
7	424	19.8	473	22.1	1,244	58.1
8	321	15.0	421	19.7	1,399	65.3
9	264	12.3	344	16.1	1,533	71.6
10	200	9.3	259	12.1	1,682	78.6

LTCF assessments are generally undertaken every six months or when residents' health needs change. 31.3 per cent of residents (excluding those recording carer distress) remained in this low-complex group after their fifth LTCF assessment. This is most likely around two years after entering, and longer than the average length of stay for all ARC residents. Table 5 shows the proportions of ARC cohorts that may be safely cared for at home by HCSS in relation to the total residents that were admitted in the pre-COVID period.

Table 5: Proportion of ARC residents by NZRUGIII-15 group and changes in function through time (pre-COVID)

Time	**Group**	**N**	**%**
On admission to ARC	Total (all NZRUGIII-15 groups)	11,340	100
	Low-need physical function	2,875	25.4
	Low-need physical function (excl. carer distress)	2,141	18.9
~1 year after entering	Low-need physical function (excl. carer distress)	1,071	9.4

~2 years after entering	Low-need physical function (excl. carer distress)	671	5.9
~3 years after entering	Low-need physical function (excl. carer distress)	424	3.7
~4 years after entering	Low-need physical function (excl. carer distress)	264	2.3
>4 years after entering	Low-need physical function (excl. carer distress)	200	1.8

Table 6 shows the district breakdown of ARC residents who entered at low-need physical function (excluding carer distress) in the pre-COVID period.

Table 6: Low need physical function (excluding carer distress) by district (entering in pre-COVID period)

District	N	%
Auckland	241	11.3%
Bay of Plenty	130	6.1%
Canterbury	352	16.4%
Capital and Coast	76	3.5%
Counties Manukau	194	9.1%
Hawke's Bay	86	4.0%
Hutt Valley	34	1.6%
Lakes	35	1.6%
MidCentral	88	4.1%
Nelson Marlborough	81	3.8%
Northland	95	4.4%
South Canterbury	33	1.5%
Southern	165	7.7%
Tairāwhiti	23	1.1%
Taranaki	81	3.8%
Waikato	182	8.5%
Wairarapa	23	1.1%
Waitematā	177	8.3%
West Coast	26	1.2%
Whanganui	19	0.9%

It is important to consider the impact on both demand and supply constraints of home care services if low-complex cohorts in ARC continued to have their needs met by HCSS, especially in rural and underserved HCSS areas. Individuals can be allocated into the currently used home and community support case-mix groups based on their recent HCSS assessment prior to entering ARC. We can estimate how many hours individuals would have received if they did not enter ARC and remained at home with home and community support service. We identify the respective HCSS case-mix groups of the potential substitution cohorts outlined in Table 5. We explore this in section 2 by estimating the additional HCSS required from meeting low-acuity individuals' needs at home (see Figure 19).

Quantifying the demand impacts of substitution

Here, we estimate the impact on demand for ARC when HCSS is provided for people with low physical function needs instead of admission to ARC. As discussed in the previous section, we use the proportion of people with low physical function needs admitted to ARC, excluding carer distress (LNPF-ECD), who remain stable or worsen through time in the pre-COVID period as a benchmark to project future demand. Our approach is based on the following key assumptions:

1. **Low-need people without carer stress can be identified prior to entering ARC.**
    - The HC assessment can be used to identify LNPF-ECD individuals prior to their admission to ARC.
    - Supporting people with low physical function needs at home relies on this pre-admission identification. It is unlikely that LNPF-ECD individuals already in ARC could be moved back into the community, as institutionalisation is typically permanent. We assume interventions aimed at keeping low-needs individuals out of ARC will apply to new residents in future periods, not to the current LNPF-ECD cohort.
2. **The proportion of individuals entering ARC at LNPF-ECD remain stable over time, and worsening over time is constant in future periods.**
    - The proportions of individuals entering ARC at LNPF-ECD who remain stable or worsen over time are assumed to remain constant in future periods.
    - We use the pre-COVID cohort as a benchmark to estimate the annual demand attributable to LNPF-ECD individuals and their respective changes in function. This period allows sufficient time to measure changes in function and mortality and removes the effects of COVID-related carer distress.
3. **The proportion of LNPF-ECD who worsen over time, measured through subsequent LTCF assessments, does not change if they are receiving HCSS rather than being in a facility.**
    - We assume the likelihood of LNPF-ECD individuals worsening, i.e., changing NZRUGIII-15 group, remains constant whether they are at home or in a facility.
    - Table 4 shows that 26.3 per cent of the pre-COVID LNPF-ECD cohort worsened after a year and 23.7 per cent died. These proportions are used to estimate impacts to future demand.
4. **All LNPF-ECD individuals prior to admission remain at home until their NZRUGIII-15 group changes.**
    - We assume LNPF-ECD individuals will remain at home until their NZRUGIII-15 group changes.
    - There is a cumulative effect which is estimated using the proportion of LNPF-ECD who remain stable (

- Table 4). Part of the estimated annual ARC demand in our baseline forecast and five-year trend scenario inherently captures LNPF-ECD who have entered in previous years, but have remained stable over time. We account for both the number of people who enter at LNPF-ECD in each year, and the cumulative effect from stable LNPF-ECD individuals who entered in previous years.

5. **An intervention that identifies low need individuals prior to admission could be implemented from 2025/26 onwards.**

    - We assume the substitution implementation occurs from 2025/26 onwards. Supporting individuals within HCSS instead of ARC is dependent on home care capacity and provider readiness.

6. **Four years of stability at LNPF-ECD is the maximum time when considering cumulative effects to demand.**

    - Less than two per cent of LNPF-ECD individuals in the pre-COVID baseline remained stable in ARC for longer than four years, making the sample size and cumulative effects negligible beyond this timeframe.

Results

Table 7 outlines the model parameters and assumptions used to estimate the impact on demand for ARC from moving low-acuity individuals to HCSS.

Table 7: 'Stable' and 'worsened' LNPF-ECD individuals in proportion to total ARC demand (pre-COVID)

	Pre-COVID LNPF-ECD cohort				
	On admission	1yr	2yr	3yr	4yr
	2018/19	2019/20	2020/21	2021/22	2022/23
Total in ARC	31,749	32,432	32,937	32,515	32,364
N = Stable	2,141	1,071	671	424	264
% = Stable	6.7%	3.3%	2.0%	1.3%	0.8%
N = Worsened	N/A	563	572	473	344
% = Worsened	N/A	1.7%	1.7%	1.5%	1.1%

Total ARC demand is sourced from CCPS data.[6] We use the benchmark proportions of Stable/Worsened individuals from the pre-COVID cohort to estimate the impact on future demand. The five-year trend scenario is used as the baseline when analysing the net change in demand from substituting low-complex residents from ARC to HCSS. The rationale is because we expect the five-year trend to be more reflective of what will occur, as it takes utilisation trends into account rather than just extrapolating population projections.

[6] Source: 230809 220701 230630, Extract: 24/08/2023.

To estimate the fiscal implications of supporting individuals in HCSS instead of ARC, it is important to determine the care level and respective bed-days that will reduce. Table 8 shows the LNPF-ECD cohort by stability and care level in the pre-COVID period.[7]

Table 8: LNPF-ECD cohort by care-level (pre-COVID)

LNPF-ECD cohort	Rest Home		Hospital		Dementia		Psychogeriatric		Total
	N	%	N	%	N	%	N	%	
Stable on admission	1,673	82.3%	300	14.8%	56	2.8%	3	0.1%	2,032
Worsened 1yr	373	66.7%	152	27.2%	28	5.0%	6	1.1%	559
Worsened 2yr	317	55.6%	200	35.1%	47	8.2%	6	1.1%	570
Worsened 3yr	230	48.8%	180	38.2%	54	11.5%	7	1.5%	471
Worsened 4yr	162	47.4%	133	38.9%	40	11.7%	7	2.0%	342

It is expected that most individuals entering ARC at LNPF-ECD are in rest home care (82.3 per cent), which is the least complex care level. Those that worsen, i.e., change NZRUGIII-15 group, become increasingly likely to shift into higher care levels (hospital, dementia and psychogeriatric).

When estimating the effects to net demand from substituting low-complex individuals from ARC to HCSS, we use observed data from the pre-COVID cohort. We assume that 82.3 per cent of the initial reduction from stable LNPF-EDC individuals on admission can be attributed to rest home demand, 14.8 per cent to hospital, 2.8 per cent to dementia and 0.1 per cent to psychogeriatric. Similarly, when estimating the cohort who delay entry to ARC when their health worsens through time, we assume the impact on demand by care level to be attributed to the proportions outlined in Table 8 for the respective worsened cohorts.

817 (51.2 per cent) of rest home residents at LNPF-ECD in 2018/19 privately funded all their care.[8] It is important to consider the fiscal impact of supporting individuals in HCSS instead of ARC, as only the reduction of subsidised residents will result in a net reduction in public funding. 37.1 per cent of all rest home residents in 2018/19 were privately funding all their care,[9] meaning rest home residents entering at LNPF-ECD are more likely to self-fund their care than the general rest home population.

Figure 7 shows the cumulative effects to ARC demand by supporting low-acuity individuals in HCSS instead of ARC, using assumptions derived from observed pre-COVID data, and the five-year trend demand scenario as the baseline.

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[7] The total resident numbers in Table 8 are slightly lower than the total LNPF-ECD cohort in Table 7 as a small proportion of individuals are in 'Other' types of care or have 'NA' recorded for care level. We ignore these when using the proportions to estimate the impact to ARC demand.

[8] An individual is assumed to pay the full cost of care privately at Rest home level if they don't appear in the CCPS data, i.e., they do not receive a subsidy.

[9] Source: 230809 220701 230630, Extract: 24/08/2023.

Figure 7: Cumulative effects to ARC demand from substituting low-acuity individuals from ARC to HCSS

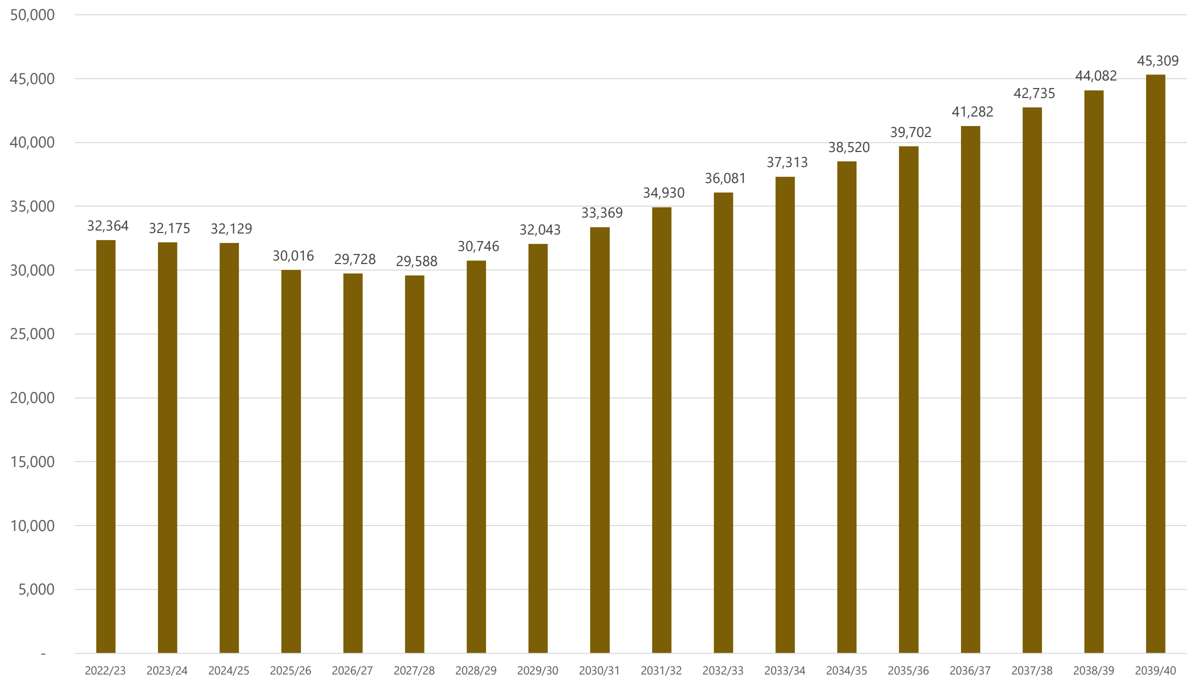
		2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
ARC demand: 5-year trend		32,364	32,175	32,129	32,187	32,422	32,376	33,588	34,910	36,355	38,055	39,309	40,652	41,967	43,254	44,975	46,559	48,026	49,363
− Estimated reduction of demand from individuals entering ARC at LNPF-ECD	2025/26				2,171	1,071	660	438	285										
	2026/27					2,186	1,069	684	455	297									
	2027/28						2,183	1,109	711	474	310								
	2028/29							2,265	1,153	741	496	321							
	2029/30								2,354	1,201	775	513	332						
	2030/31									2,452	1,257	801	530	342					
	2031/32										2,566	1,298	828	547	353				
	2032/33											2,651	1,342	855	564	367			
	2033/34												2,741	1,386	881	586	380		
	2034/35													2,830	1,428	916	607	392	
	2035/36														2,917	1,485	949	626	403
	2036/37															3,033	1,538	978	644
	2037/38																3,140	1,586	1,006
	2038/39																	3,239	1,630
	2039/40																		3,329
Decrease in ARC demand: shifting LNPF-ECD from ARC to HCSS					-2,171	-3,257	-3,912	-4,496	-4,958	-5,163	-5,405	-5,583	-5,774	-5,960	-6,143	-6,388	-6,613	-6,821	-7,011
+ Estimated increase in demand from LNPF-ECD individuals delaying entry into ARC	2025/26					563	562	489	371										
	2026/27						562	583	508	386									
	2027/28							583	606	529	404								
	2028/29								606	631	554	418							
	2029/30									631	661	572	432						
	2030/31										661	683	591	446					
	2031/32											682	706	610	460				
	2032/33												706	729	629	478			
	2033/34													729	751	654	495		
	2034/35														751	781	677	510	
	2035/36															781	809	699	525
	2036/37																808	834	718
	2037/38																	834	857
	2038/39																		857
Increase in ARC demand after delaying entry to LNPF-ECD who worsen over time in HCSS						563	1,124	1,655	2,091	2,178	2,280	2,355	2,435	2,514	2,591	2,694	2,789	2,877	2,957
Net change in ARC demand					-2,171	-2,694	-2,788	-2,841	-2,867	-2,986	-3,125	-3,228	-3,339	-3,447	-3,552	-3,694	-3,824	-3,944	-4,054
ARC demand: substitution scenario		32,364	32,175	32,129	30,016	29,728	29,588	30,746	32,043	33,369	34,930	36,081	37,313	38,520	39,702	41,282	42,735	44,082	45,309

Legend (reduction): = Stable on admission; = Stable after 1 year; = Stable after 2 years; = Stable after 3 years; = Stable after 4 years

Legend (increase): = Worsened after 1 year; = Worsened after 2 years; = Worsened after 3 years; = Worsened after 4 years

Substituting low-acuity individuals from ARC to HCSS predominantly affects demand for rest home level care. Those that worsen through time and eventually enter ARC (the demand increasing effect) generally enter at the higher care levels (hospital, dementia or psychogeriatric). Those that are substituted initially prior to admission (the demand decreasing effect) are generally at rest home level. The overall impact on demand for hospital, dementia and psychogeriatric care is not material. Low-complexity individuals prior to admission and those that remain stable through time are generally in rest home care. Figure 8 shows the projected ARC demand based on utilisation trends and the assumption that low-complex individuals can be substituted to HCSS.

Figure 8: ARC demand forecast – five-year trend + substitution scenario



Key assumptions:

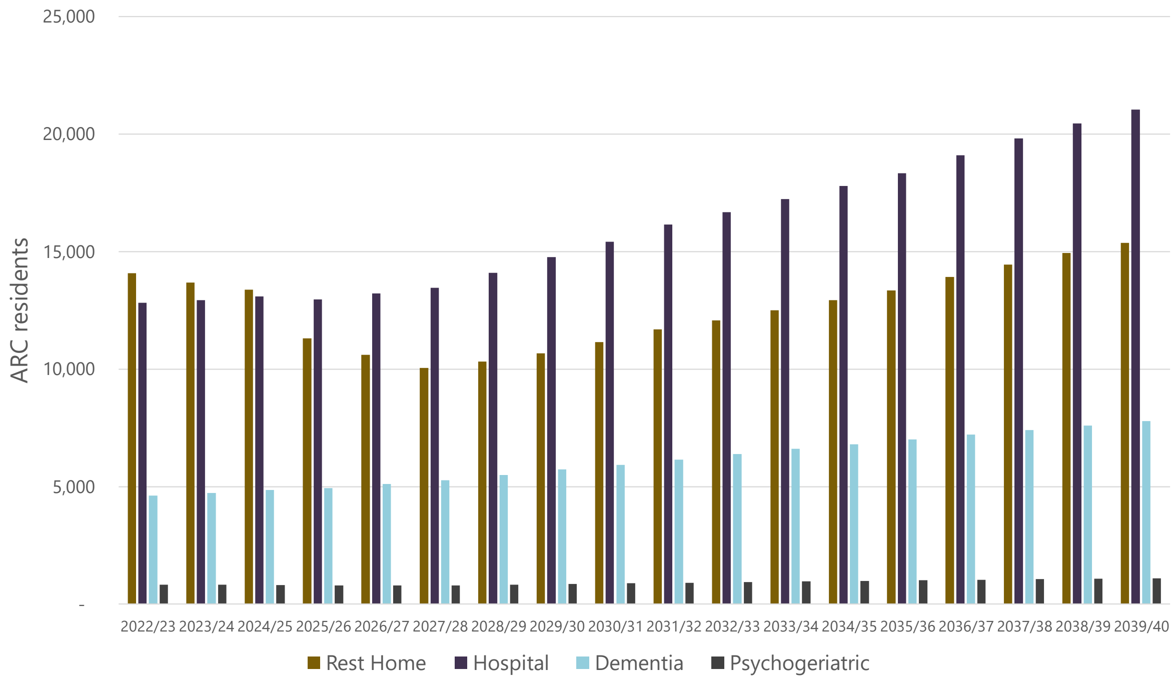
- The number of individuals predicted to enter ARC in each year at LNPF-ECD remain at home receiving HCSS until their health worsens, i.e. their NZRUGIII-15 group changes.
- Using the five-year trend scenario as the baseline, the net change in ARC demand in each year is attributed to the difference between the number of new LNPF-ECD identified prior to admission who are assumed to remain at home longer, and the number of LNPF-ECD individuals identified in previous years who have delayed entry until their health has worsened.

Observations:

- ARC demand grows 40 per cent by 2040.
- Demand initially drops at the beginning of the substitution implementation period (2025/26), and rises at a slower rate than our baseline/five-year trend scenarios as there is a net decrease in demand of those that are assumed to substitute to HCSS.

Figure 9 shows the five-year trend + substitution scenario by care level.

Figure 9: ARC demand forecast – five-year trend + substitution scenario by care level



The demand for hospital, dementia and psychogeriatric care remains relatively flat until 2027/28. The five-year utilisation trend initially mitigates the effects of population growth, and the substitution impacts are negligible for these higher care levels. The demand for rest home care initially reduces in 2025/26 at the start of the substitution implementation period, and gradually increases out to 2039/40 due to population growth and demographic change, delaying entry of the LNPF-ECD cohort.

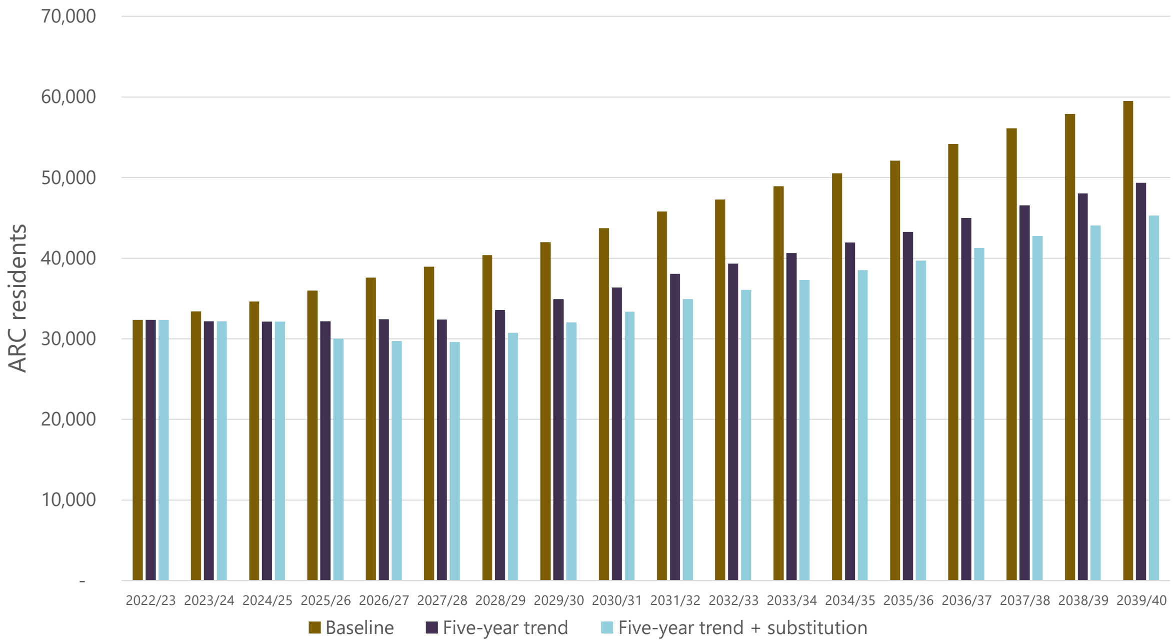
Figure 10 summarises all ARC demand scenarios:

- **Baseline:** driven solely by population growth.
- **Five-year trend:** driven by population growth and five-year utilisation trends by care level and age.
- **Five-year trend + substitution:** driven by population growth, five-year utilisation trends by care level and age, and substitution impacts from supporting low-acuity individuals in HCSS instead of ARC.

In summary, we estimate an ARC demand by 2039/40 of 59,502 individuals under the baseline scenario, 49,363 under the five-year trend scenario, and 45,309 under the five-year trend + substitution scenario.

Compared to the base year 2022/23, this is a predicted ARC demand growth of 84 per cent for the baseline estimation, 53 per cent for the five-year trend scenario and 40 per cent for the five-year trend scenario + substitution.

Figure 10: All ARC demand scenarios



2. Transitioning home and community support services fee-for-service regions to a nationally consistent case-mix model

There are two distinct HCSS funding models: bulk funding, and fee-for-service (FFS). Approximately half of clients are supported by providers who are compensated through fee-for-service arrangements, and the other half are under bulk-funded case-mix models.[10] Between 2008 – 2020 there has been a gradual transition from a traditional FFS service and funding model to bulk funding based on a restorative case-mix service model. There are differences across districts in how bulk funding has been implemented leading to different renumeration rates, and FFS regions have different hourly rates. The lack of national standardisation has resulted in a lack of transparency and disconnect about how prices are set. The fee-for-service model can promote inefficiencies and may not be suitably linked to patient outcomes. There is a strong case for transitioning to a nationally standardised case-mix model. Building on input from Health New Zealand, the Southern model offers successful attributes that could be applied nationwide. Key features of the Southern model include the following, in order of dependency:

Identifying homogenous groups of clinical needs

- Utilisation of a case-mix algorithm derived from InterRAI assessments to categorise clients into homogenous groups of similar clinical needs.

Monitoring and transparency

- Operation of a dashboard that offers transparency to both the funder and providers, with monthly updates of client data including case-mix categories, client numbers, hours delivered, provider comparisons, discharges to ARC, ethnic breakdowns, in-between travel (IBT) volumes and costs.

Quality improvement

- Regular meetings to continue quality improvement and identify places for development, as well as a strategic finance-oriented meeting for data review. Meetings typically have active participation and engagement from all relevant stakeholders.

Appropriate allocation of funding

- Funding allocation to providers based on market share, complexity of clients and case-mix algorithms, with redistribution occurring quarterly.

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[10] **Definition fee-for-service model**: The funder allocates hours of specific tasks to each client (e.g., dressing, showering, feeding), based on the number of hours that the needs assessment specified should be delivered. HCSS providers are paid in blocks of time for services delivered at agreed hourly rates. **Definition bulk-funded case-mix model**: HCSS providers are allocated a fixed amount of funding based on an estimate of the volume and complexity of the clients. The providers then have responsibility for their client's assessments and care planning.

Increased competition

- Presence of three providers that ensures adequate competition. Providers determine actual service delivery. A competitive market provides clients with a choice of providers given preferences or other factors.

A comparison of fee-for-service and bulk-funded (case-mix) funding models is detailed below, which is informed by documents received from Health New Zealand and our research.

Fee-for-service

Table 9: Fee-for-service

Commonly used when:	Balance of Risk
• Service scope is narrow and defined (or a few bands of complexity) . • Volume-delivery cost relationship is relatively clear. • Funder wishes to incentivise fast rollout/uptake. • Can pay for measured output with a strong output-outcome relationship. • Service delivery is low trust with funder allocating service via a third party needs assessment process.	• Provider holds risk of under delivery of volume, payor is insulated. • Provider holds risk if unit cost exceeds price, payor is insulated. • Funder holds risk of volume growth over time, provider is insulated. • Consumer does not bear risk.

Advantages of this approach

- Transaction variables are transparent i.e., units allocated are units paid.
- Easy to track and monitor service delivery efficiency.
- For provider—is insulated from funding, not keeping pace with population need growth.

Cautions from this approach

- Lack of integration with registered health professionals means support workers do not deliver an optimal support service that is able to respond to changing health needs or support independence effectively.
- Highly funder prescribed—little room for provider innovation in models of care and delivery.
- Poor at cost containment.
- Can create perverse incentives for low value activity. Service delivery is task-based i.e., household management, and not focused on achieving goals to enhance independence or increase function/activities of daily living.
- Relies on a third party (Needs Assessment and Service Coordination Service) to assess needs and allocate service units.
- Third party allocation of service means provider cannot flex up or down to meet client needs in a timely manner and must wait for NASC reassessment to change service delivery.

Bulk funding (case-mix)

Table 10: Bulk funding (case-mix)

Commonly used when:	Balance of Risk
• Can categorise clients into relatively homogenous groups based on the level of support needed.	• Risk is shared between funder and providers. • Funder holds volume and complexity risk.

• Share of funding is calculated regularly and can be distributed amongst multiple providers based on their share of case-mix clients.	• Provider holds servicing risk if they are delivering services above the average price.

Advantages of this approach

- Can define service inputs for client groupings in an equitable and sustainable manner (based on need).
- Demonstrates appropriate client outcomes and opportunities for efficiencies in service delivery—service funding is constrained which incentivises providers to deliver more effective and efficient services.
- Promotes independence.

Cautions from this approach

- Need to ensure there are contractual and funding mechanisms in place for volume and complexity changes.
- For case-mix to work, providers need flexibility in delivering services.
- The model requires providers to be more responsible and accountable for case and risk management and outcomes.
- The restorative focus (goal-based enablement of activities of daily living) requires a workforce that is skilled in restorative support and further input and supervision from registered health professionals.

2.1 Methodology for HCSS demand forecast

Client Claims Processing System (CCPS) data records fortnightly HCSS activity in fee-for-service regions. The dataset includes district, hours, service type and total funding at the National Health Index (NHI) level. To identify the client mix in 2022/23, we isolate a single service period closest to the end of the fiscal year (2013-06-12 – 2023-06-25). To estimate the change in hours delivered from shifting fee-for-service regions to case-mix, we use the weighted average weekly hours delivered by case-mix group in Southern, Canterbury, Waikato, Capital & Coast and Hutt Valley as a benchmark.

Because we are using weekly hours as a benchmark, it is important to isolate a service period that reflects this time. Analysing a longer service period runs the risk of overestimating the client count at a specified point in time. Counting the number of distinct clients will include those that have exited the service. Our methodology is as follows:

- **Step 1:** extract the fortnightly service period closest to the end of the 2022/23 period to determine the total number of HCSS clients receiving care in each district at the specified point in time [2023-06-12 – 2023-06-25].
- **Step 2:** link NHIs with the most recent Home Care (HC) or Contact (CA) assessment recorded in the interRAI assessment data to identify the respective case-mix group for each client.
- **Step 3:** calculate the weighted-average weekly hours delivered in Southern, Canterbury, Waikato, Capital & Coast and Hutt Valley by case-mix group to use as benchmark.
- **Step 4:** predict the average weekly hours of care per client in fee-for-service regions using case-mix benchmark if providers have had sufficient time to optimise service delivery.
- **Step 5:** apply the per cent predicted change in average hours by district to total annual volume of current hours to estimate the change in total volume of hours delivered under case-mix.

Table 11 shows the average weekly hours delivered by case-mix group in Southern, Canterbury, Waikato, Capital & Coast and Hutt Valley.

Table 11: Average weekly hours by case-mix group in benchmark districts

Case-mix group	Southern (11-23)	Capital & Coast and Hutt Valley (06-23)	Canterbury (11-23)	Waikato (07-23)
1A	0.0	0.0	1.2	1.2
1B	0.7	0.0	0.8	1.0
2A	0.9	0.5	0.9	1.0
2B	0.9	0.5	0.9	0.9
3A	1.9	1.1	2.6	3.1
3B	1.9	1.4	2.6	2.9
4A	2.3	1.8	1.7	3.4
4B	3.0	2.3	3.4	4.8
4C	3.1	2.2	3.1	5.0
4D	3.7	2.7	3.3	5.4
4E	3.4	4.2	4.1	4.1
4F	4.4	4.5	5.5	5.8
4G	5.3	4.4	5.5	6.3
4H	4.9	5.5	8.4	7.7
5A	2.6	1.5	1.7	3.1
5B	3.5	3.2	2.2	2.7
5C	5.0	2.3	2.1	6.7
5D	3.2	2.8	4.4	3.9
5E	4.2	2.7	3.5	5.1
5F	4.7	3.9	4.8	4.7
5G	5.1	4.5	5.8	6.2
5H	5.8	5.6	7.7	6.4
6A	2.4	3.0	3.1	5.0
6B	2.2	3.2	3.1	5.1
6C	6.4	2.9	2.9	6.5
6D	4.9	3.5	3.5	4.9
6E	4.4	5.0	4.9	6.2
6F	4.2	3.5	5.1	7.1
6G	5.9	5.5	6.2	7.1
6H	6.0	7.3	9.8	6.9
7A	2.9	2.5	2.7	5.6

7B	4.5	1.7	1.2	3.5
7C	3.9	4.6	4.7	3.5
7D	3.8	2.2	3.9	5.3
7E	4.1	4.5	3.4	4.8
7F	4.4	4.4	3.5	5.4
7G	5.2	4.5	4.9	6.8
7H	7.1	7.5	7.2	7.6
8	5.3	5.7	5.5	4.7
Complex	2.9	2.8	2.1	2.9

We use the weighted average weekly hours delivered in these districts as a benchmark to predict the weekly hours delivered in fee-for-service regions if they moved to case-mix.

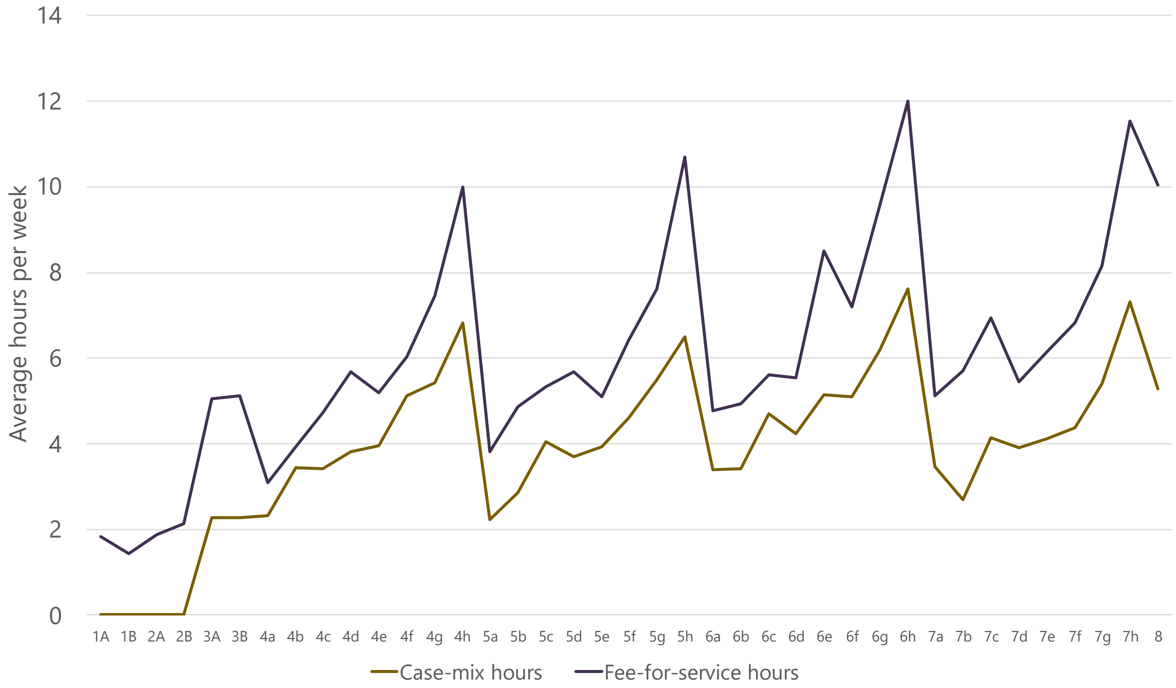
Assumptions

1. We assume that providers in fee-for-service regions fully optimise service delivery to a level observed in Southern, Canterbury, Waikato, Capital & Coast and Hutt Valley after a transition period of three years from 2025/26.
2. Clients at 1A, 1B, 2A and 2B[11] are assumed to no longer receive HCSS. It has been indicated in discussions with Health New Zealand expert representatives that individuals at 1A-2B could receive alternative services and HCSS is not necessarily appropriate for their needs.[12]
3. We consider core services in our modelling, relating to the following service codes: HSHM, HSPC, HSPC-ST, S-HSHM, S-HSPC, HSPCSO, HSPC1, HSPC3. We exclude individualised funding arrangements and services relating to long term chronic conditions for people under 65.

Figure 11 compares the actual average weekly hours delivered by case-mix group in fee-for-service regions, and the predicted average weekly hours delivered by case-mix group using the benchmark.

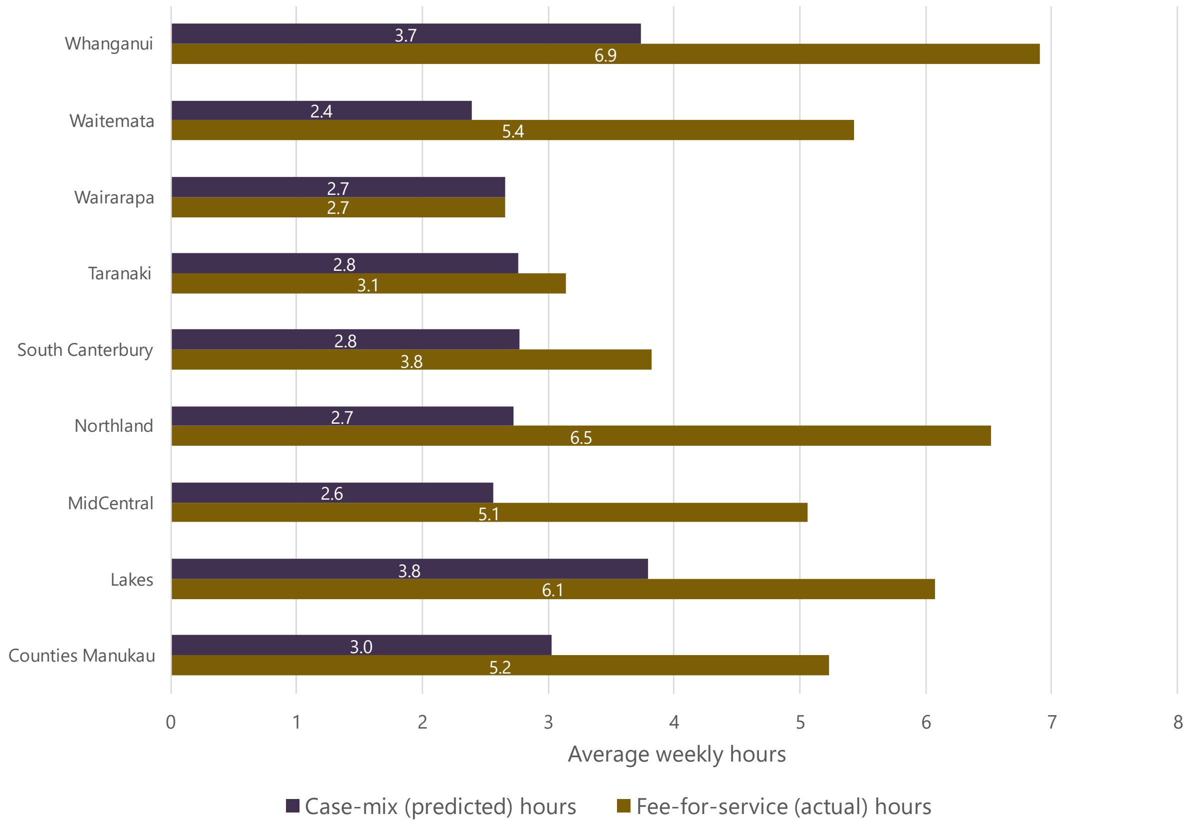
[11] 1A to 2B clients are stable and non-complex. They are classified as requiring no personal care support, receiving homework support and/or shopping support.
[12] Discussed in expert group meetings: 02/07/24 & 04/07/24

Figure 11: Average weekly hours – fee-for-service vs. case-mix



There is a clear correlation between fee-for-service and case-mix in hours delivered. However, hours are predicted to be lower for every case-mix group under case-mix. This output demonstrates the efficiency of case-mix funding models, and the optimisation of service delivery in Southern, Canterbury, Waikato, Capital & Coast and Hutt Valley. Figure 12 compares the predicted average weekly hours using the benchmark, and the actual average weekly hours in all fee-for-service districts.

Figure 12: Actual vs. predicted average weekly hours in fee-for-service districts



We estimate that all fee-for-service districts will observe a decrease in average weekly hours per client under an optimised case-mix state, except for Wairarapa which predicts no material change. Table 12 shows the count of distinct clients in the June 2023 fortnightly extract and the actual/predicted average weekly hours in each fee-for-service region.

Table 12: Client count, actual hours and predicted hours by fee-for-service region[13]

District	HCSS clients in June extract	Average weekly hours (actual)	Average weekly hours (predicted)	Estimate change in hours delivered under case-mix
Counties Manukau	3386	5.2	3.0	-42.2%
Lakes	978	6.1	3.8	-37.6%
MidCentral	1687	5.1	2.6	-49.3%
Northland	1695	6.5	2.7	-58.2%
South Canterbury	810	3.8	2.8	-27.4%

[13] 663 (4%) of fee-for-service clients cannot be matched to interRAI HC or CA assessment data. These individuals have been excluded from this analysis.

Taranaki	1459	3.1	2.8	-12.1%
Wairarapa	706	2.7	2.7	0%
Waitematā	4340	5.4	2.4	-56.0%
Whanganui	517	6.9	3.7	-46.0%
Total	15578	5.2	2.8	-45.8%

2.2 Forecasting demand for HCSS

We use a similar methodology to our demand modelling of ARC to project demand growth by using subpopulation projections grouped by district, ethnicity, and age (see section 1). In fee-for-service regions, the current client mix is based on observed data from the June 2023 extract in the CCPS. In case-mix regions, it is based on three years of interRAI Home Care and Contact assessments (excluding those who entered ARC).[14] A summary of the methodology is depicted in Figure 13 below.

Figure 13: HCSS demand forecasting methodology

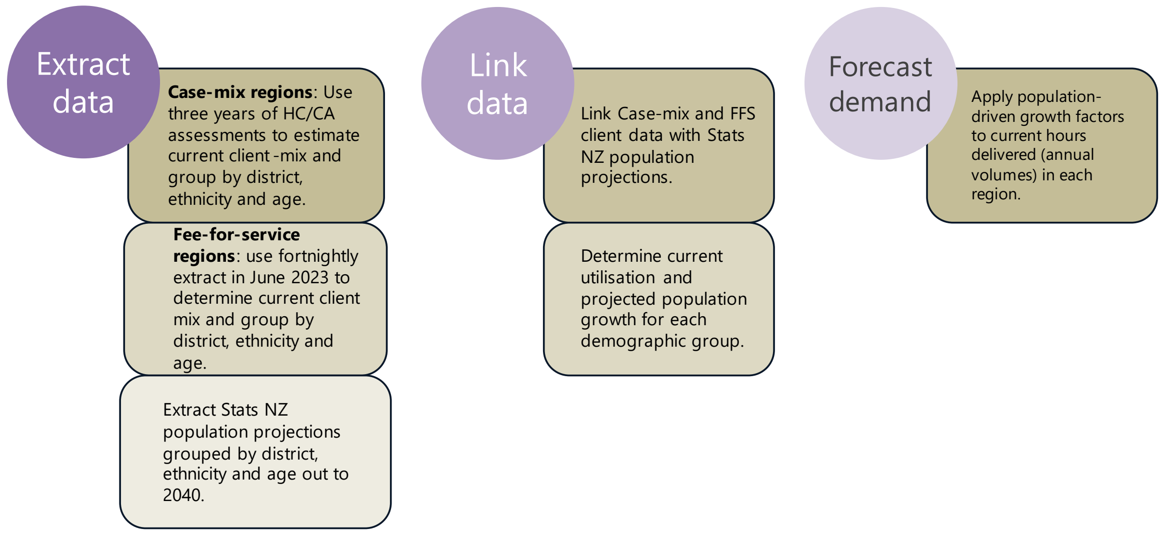


Table 13 shows the projected growth in HCSS demand by district using the 2022/23 fiscal year as the baseline.

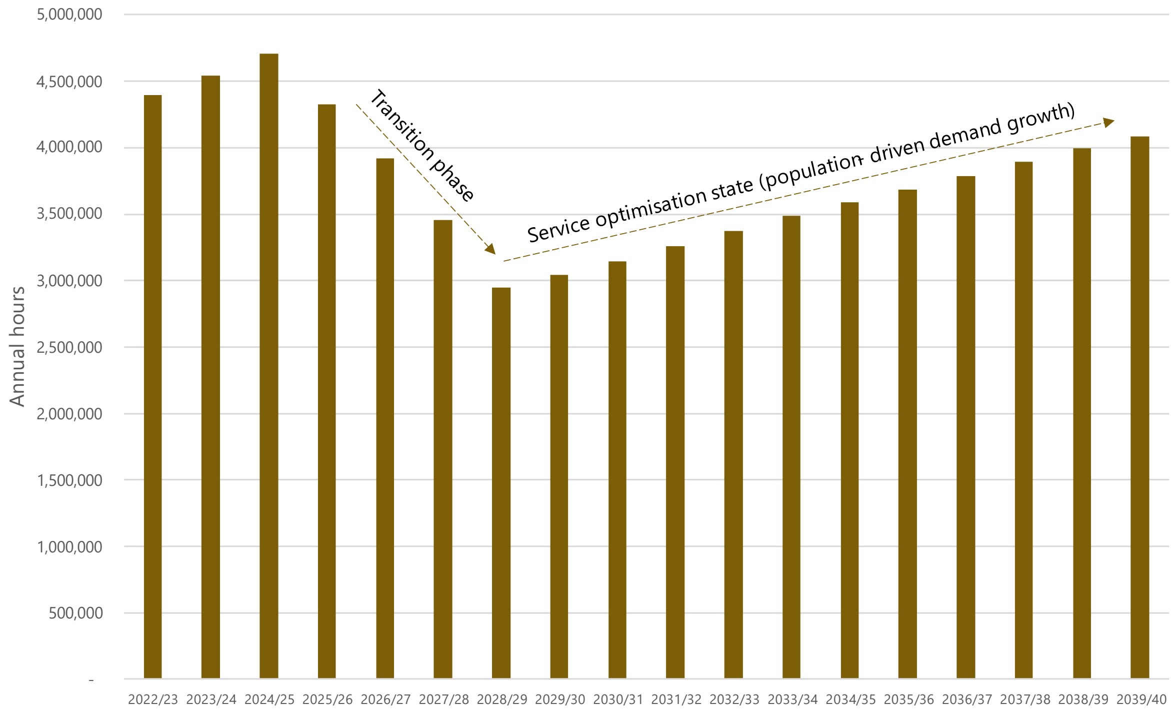
[14] We use HC/CA assessment data from 2020/21 to 2022/23 to estimate the HCSS client mix, as many case-mix regions do not report client demographic information. We exclude individuals who entered ARC by identifying NHIs appearing in LTCF assessment data.

Table 13: Projected growth in HCSS demand by district

Funding	District	Projected demand growth (2022/23 baseline)					
		2024/25	2027/28	2030/31	2033/34	2036/37	2039/40
Fee-for-service	Counties Manukau	8.0%	22.3%	37.0%	54.0%	70.6%	87.6%
Fee-for-service	Northland	8.2%	23.7%	38.7%	54.3%	69.2%	81.8%
Case-mix	Auckland	7.5%	20.6%	35.0%	50.5%	65.6%	81.1%
Case-mix	Nelson Marlborough	8.9%	25.0%	39.6%	54.4%	67.6%	78.6%
Fee-for-service	Lakes	6.7%	20.1%	34.0%	48.8%	62.8%	76.4%
Case-mix	Capital and Coast + Hutt Valley	7.0%	19.9%	32.6%	47.2%	61.3%	75.7%
Case-mix	Waikato	7.6%	21.1%	34.3%	48.6%	62.1%	74.5%
Case-mix	Bay of Plenty	7.4%	20.6%	33.5%	46.7%	59.5%	71.3%
Case-mix	Hawke's Bay	6.7%	18.5%	30.6%	43.8%	56.3%	67.9%
Case-mix	Southern	6.4%	19.3%	31.0%	44.6%	56.6%	67.3%
Fee-for-service	Waitematā	6.9%	18.6%	29.7%	42.6%	53.8%	65.3%
Fee-for-service	Taranaki	6.1%	17.3%	28.6%	42.1%	53.3%	64.6%
Fee-for-service	Wairarapa	7.5%	20.3%	31.7%	45.2%	55.1%	64.1%
Case-mix	Tairāwhiti	5.1%	17.5%	29.8%	41.7%	53.8%	63.5%
Case-mix	MidCentral	6.8%	18.0%	29.1%	42.3%	52.9%	62.7%
Case-mix	Canterbury	6.0%	17.3%	28.3%	41.1%	52.5%	62.4%
Fee-for-service	Whanganui	6.1%	16.9%	27.7%	40.5%	50.9%	60.2%
Fee-for-service	West Coast	6.1%	18.5%	30.1%	40.2%	50.2%	57.1%
Fee-for-service	South Canterbury	5.0%	15.1%	24.3%	35.3%	44.1%	52.5%

The regional variation in forecasted demand is due to variation in population growth, typically for the older population and demographic groups with high HCSS utilisation. To project future demand for HCSS in fee-for-service regions, we consider both the expected growth in hours based on population projections, and the estimated reduction in hours based on service optimisation and efficiency gains from moving to case-mix. Figure 14 shows the projected demand of HCSS hours in fee-for-service regions assuming a move to case-mix.

Figure 14: Projected HCSS demand in fee-for-service districts under a move to case-mix



We assume that providers would optimise services to levels observed in the benchmark districts after a transition phase of approximately three years, implementing from 2025/26 onwards. We use 2022/23 actual data as the baseline to forecast growth in demand and gains in efficiency from case-mix. Lower estimated hours in 2039/40 relative to actual hours delivered in 2022/23 implies that the negative effect to volume from the efficiency of case-mix exceeds the positive effect from the growth in population-driven demand. The reduction in hours is also driven by the removal of 1A-2B clients.

To estimate the reduction in annual hours from removing 1A-2B clients in current case-mix districts, we either use observed data or estimate using the benchmark districts.[15] Table 14 shows the estimated annual reduction in hours from removing 1A-2B clients by district.

Table 14: Estimated effect of removing 1A-2B clients in current case-mix districts

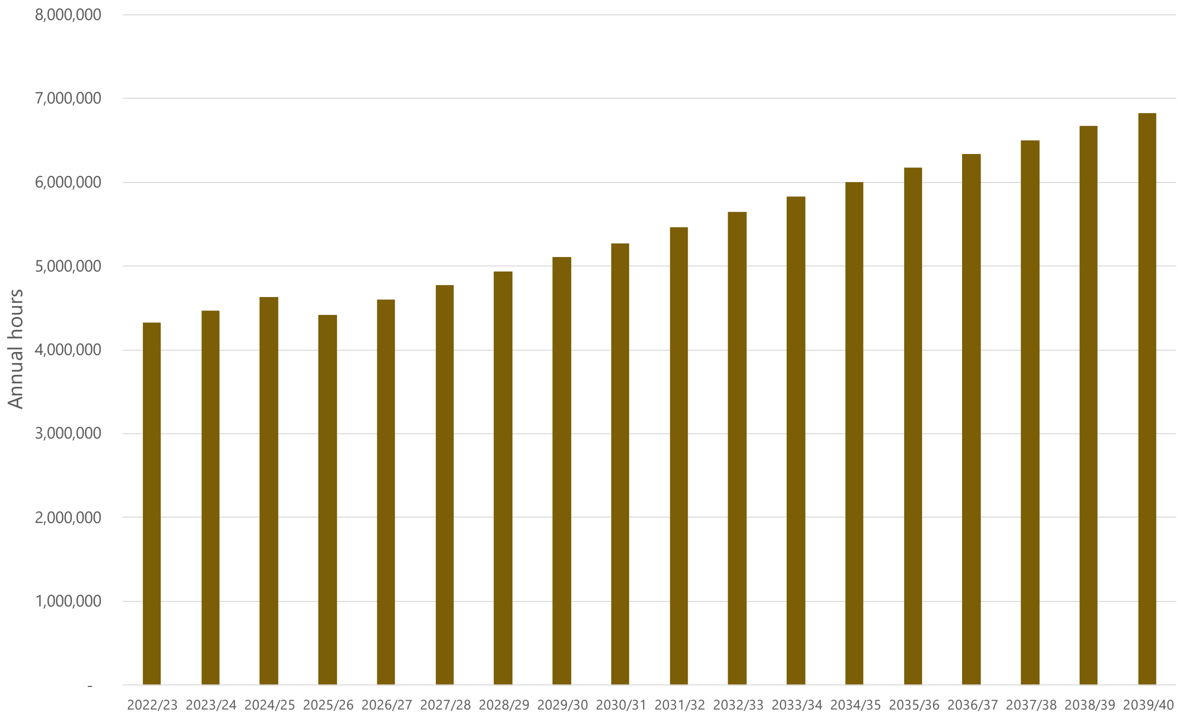
Data quality	District	Estimated reduction in hours
Actual	Auckland	10.4%
Estimate	Bay of Plenty	3.2%

[15] In the benchmark districts (Southern, Canterbury, Waikato, Capital & Coast and Hutt Valley), we determine the proportion of hours attributed to 1A-2B clients using data provided to us on clients and average weekly hours by case-mix group. We were also provided data for Auckland and Hawke's Bay that enables us to determine this proportion. For the other case-mix districts where case-mix level data was not available (Bay of Plenty, Nelson Marlborough, Tairāwhiti and West Coast), we estimate the proportion of hours attributed to 1A-2B clients using the average hours delivered in the benchmark districts, and the distribution of clients by case-mix group using 2020/21 – 2022/23 HC and CA assessment data (described in Figure 13).

Actual	Canterbury	16.0%
Actual	Capital & Coast and Hutt Valley	3.2%
Actual	Hawke's Bay	0.2%
Estimate	Nelson Marlborough	7.6%
Actual	Southern	12.0%
Estimate	Tairāwhiti	3.9%
Actual	Waikato	8.7%
Estimate	West Coast	14.1%

For current case-mix districts, we estimate the reduction in hours after removing 1A-2B clients (2025/26 onwards) and forecast out using the expected growth in demand (see Table 13 & Figure 15).

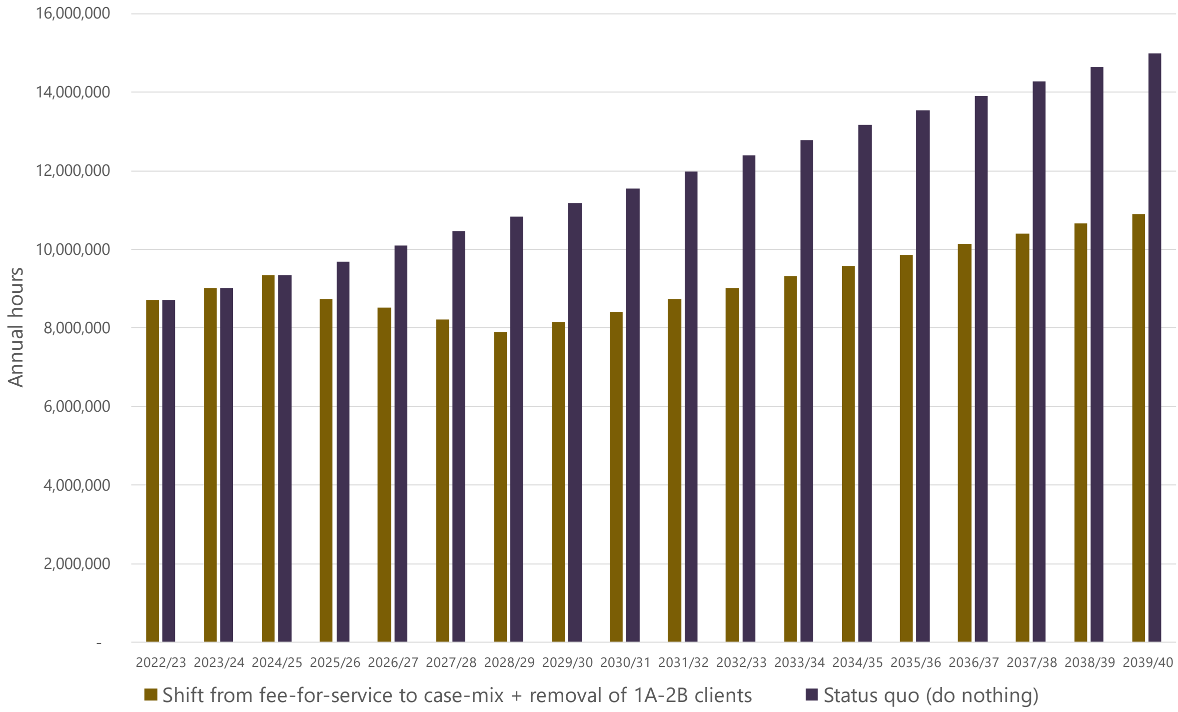
Figure 15: Projected HCSS demand in current case-mix districts[16]



[16] **Caveats:** Bulk-funded regions provided us with aggregate 2022/23 data on total hours, clients and funding. Bay of Plenty could not provide hours delivered in 2022/23—we estimate hours using the total funding, and the average hourly rate of districts with observed data. In Auckland, providers are only required to submit their hours over a six or 12-week period, so annual hours for 2022/23 have been extrapolated out. 2022/23 data in Hawke's Bay has not been validated and is significantly below previous volumes. Hawke's Bay also has intensive home support services that do not report on hours delivered.

The increase in demand out to 2040 is driven by the respective weightings of expected population growth in each district. Figure 16 shows the estimated national HCSS demand inputting the assumptions described above.

Figure 16: Projected national HCSS demand (Scenario 1 vs. status quo)

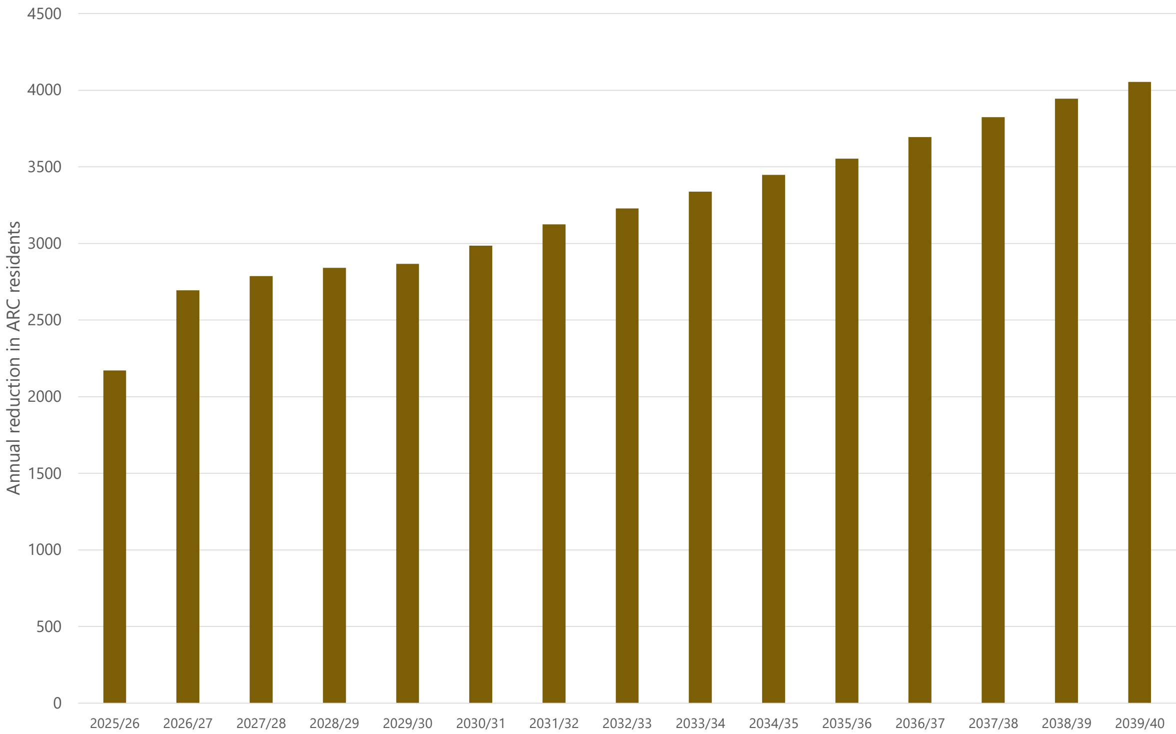


We also show the status quo (do nothing) forecast for comparison, which considers no reduction in hours in fee-for-service districts, and 1A-2B clients continuing to receive HCSS in all districts.

2.3 Estimating additional HCSS hours from supporting ARC low-acuity individuals

In section 1.2, we identified low-acuity individuals that could be supported in HCSS rather than in ARC. The net change in annual demand in the five-year trend + substitution scenario can be attributed to additional demand for HCSS. The net change in demand is equal to the reduction of LNPF-ECD individuals prior to admission to ARC, and the increase of those delaying entry to ARC once their health worsens (see Figure 7). Figure 17 shows the annual reduction in ARC demand in the five-year trend + substitution scenario, when supporting low-acuity individuals in HCSS instead of ARC. We estimate the number amounts to about 4,054 individuals by 2039/40.

Figure 17: Annual reduction in ARC residents (five-year trend + substitution scenario)

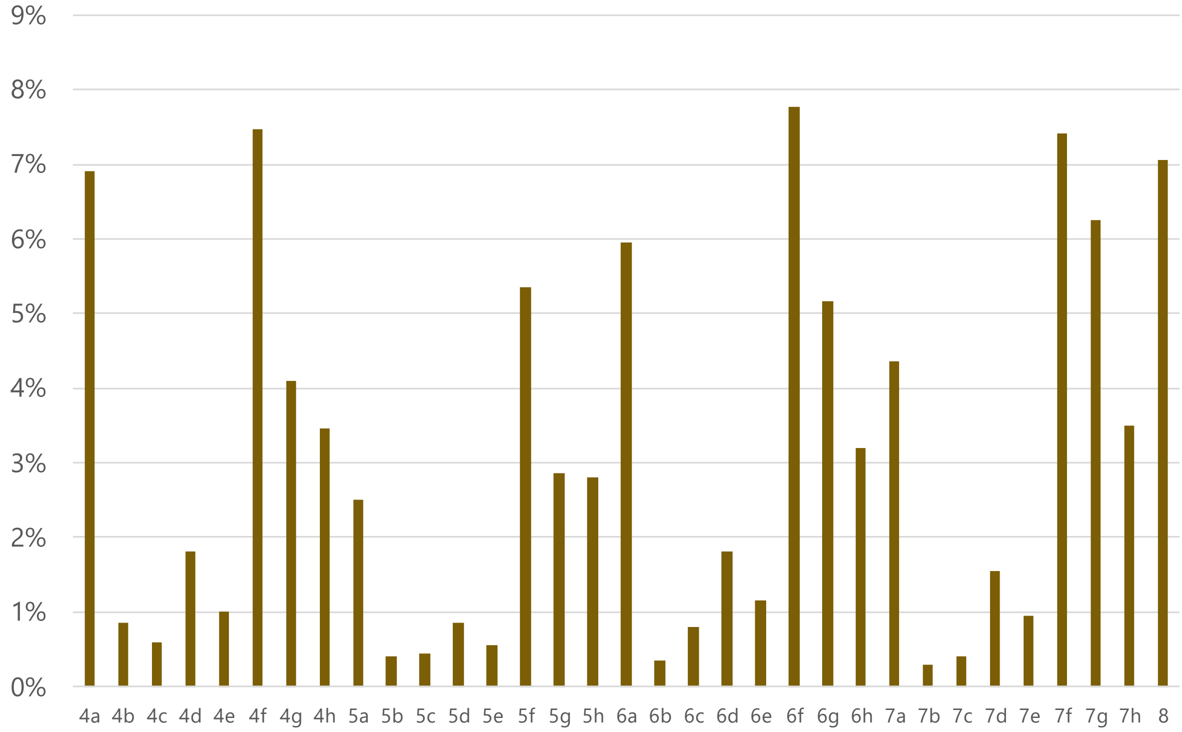


The ARC analysis weights annual utilisation by the number of occupied bed-days, therefore the annual reduction in ARC demand is equivalent to the average number of residents/individuals during the year. To estimate the additional HCSS hours required from supporting low-acuity individuals in HCSS instead of ARC, we use the following formula:

$$Additional\ HCSS\ hours_t = net\ change\ in\ ARC\ demand_t * average\ weekly\ hours * 52$$

To estimate the average weekly hours that LNPF-ECD individuals would receive if they were shifted to HCSS, we determine the respective case-mix group in their most recent HC assessment prior to entering ARC. Figure 18 shows the distribution of case-mix groups for the LNPF-ECD cohort in the most recent HC assessment prior to admission.

Figure 18: Case-mix distribution of LNPF-ECD cohort (pre-COVID)



Using the average weekly hours delivered by case-mix group in the benchmark districts (see Table 11), the LNPF-ECD cohort would receive approximately 4.8 hours of care per week if they were shifted to HCSS. Figure 19 shows the estimated additional HCSS hours required from supporting low-acuity individuals in HCSS instead of ARC. We estimate the additional annual hours to rise from 541,327 in 2024/25 to 1,011,064 in 2039/40.

Figure 19: Estimated additional HCSS hours required from supporting low-acuity individuals in HCSS

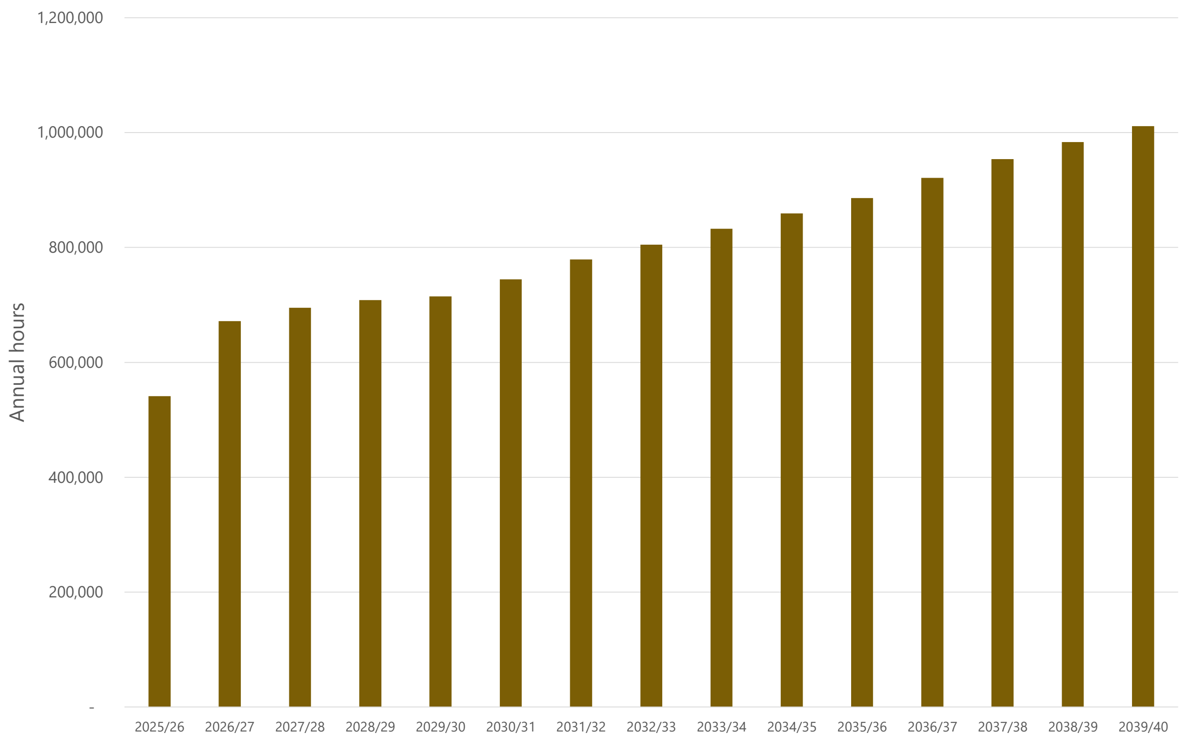
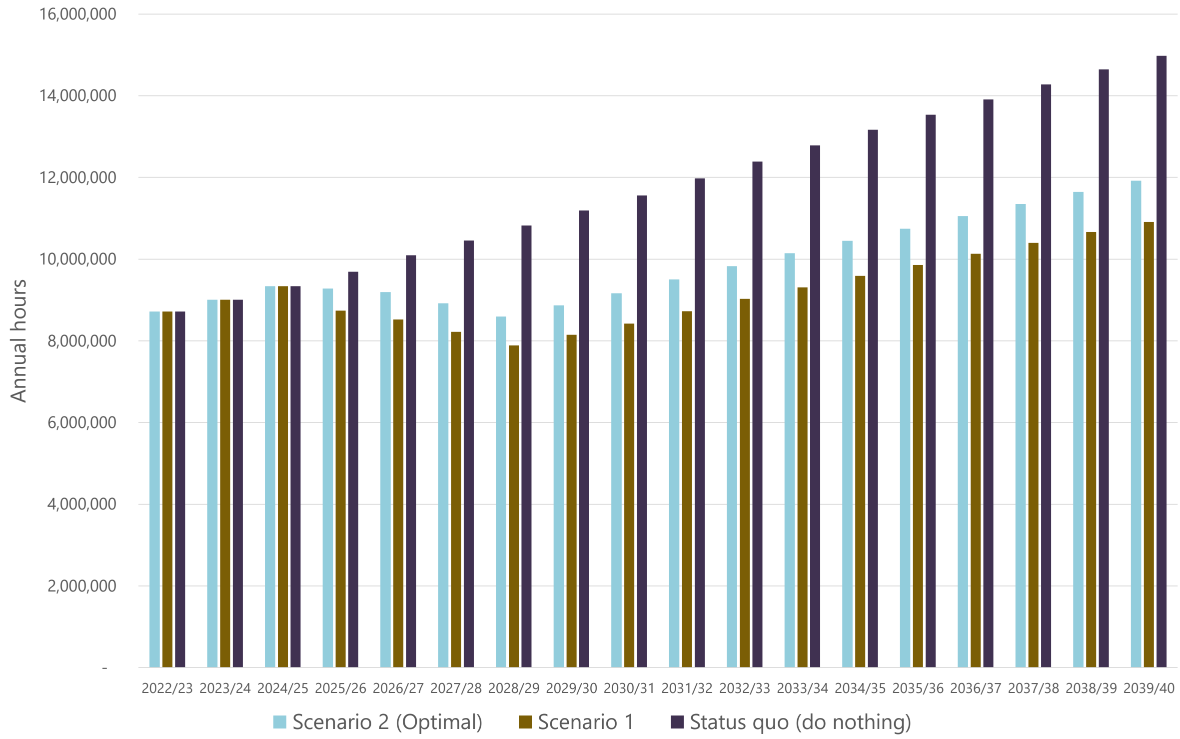


Figure 20 shows the estimated HCSS demand in all scenarios:

- Scenario 2 (optimal): shift from fee-for-service to case-mix + removal of 1A-2B clients + additional hours from substitution scenario.
- Scenario 1: shift from fee-for-service to case-mix + removal of 1A-2B clients.
- Status quo (do nothing).

Figure 20: All HCSS demand scenarios



Under Scenario 2 (optimal) and Scenario 1, we estimate annual HCSS hours to reach 11.9 million and 10.9 million by 2039/40, respectively. Under the status quo, we estimate annual hours to reach 15 million by 2039/40. This demonstrates that transitioning fee-for-service regions to case-mix, removing 1A-2B clients from HCSS and supporting low needs residents in HCSS instead of ARC, may result in a net 20 per cent reduction in annual hours by 2039/40.wa

3. Financial modelling for aged residential care

The objective of the cost model is to estimate the Territorial Local Authority (TLA) price level that maximises returns on both capital investments and operational efficiency across various geographic areas. This is accomplished by comparing the internal rate of return (IRR) of the modelled ARC facility—which represents the total revenue relative to the total cost over its useful life—with the estimated weighted average cost of capital (WACC), the rate that optimises returns on total capital and operating expenditures for the sector.

3.1 Methodology for ARC financial modelling

This section details the methodology, data, and assumptions used to develop a building block financial model.

The financial model includes the following main components that are described in detail in the rest of this section:

- Service characteristics: assumptions around the ARC facility's type of service(s), the share of each service in the mix of services, geographic area, age, occupancy rate, build area to land area, etc.
- Revenue: the estimated revenue from occupied beds
- Capex: including capital costs and charges
- Opex: including care and non-care operation costs
- WACC
- Results of the financial model
- Targeted bariatric patients' day price
- Sensitivity analysis.

Estimation of the break-even price for each area, single service, and dual services

We use a discounted cash flow (DCF) analysis, incorporating the discount rate and the opening book value to provide a robust method for estimating the bed day price that would generate an adequate return to the providers capital. By projecting future free cash flows (FCFs) and discounting them to their present value using WACC, the DCF model captures the time value of money and the risk associated with the investment. The discount rate reflects the return required by investors, accounting for the company's risk profile.

There are two sources of capital return in this modelling, return of capital (depreciation) and return on capital. To avoid double counting, return on capital is received on the opening book value in each year, which represents the total recorded value of the company's assets at the start of each year after accounting for depreciation (Berk & DeMarzo, 2024). This approach ensures a comprehensive valuation by factoring in both the historical investments and the current asset base. This inclusion provides a more accurate picture of the facility's overall value, beyond just future cash flows.

As a result, we estimate the internal rate of return for an ARC facility and the break-even price. If the IRR is lower than the WACC, it signals a potential funding gap. The break-even price is the level at which the ARC facility becomes financially feasible, and meeting this price would make the IRR equal to the WACC, indicating an optimal funding rate. Below is a definition for each of the terms used in this description.

- **IRR**: a metric used to evaluate the profitability of an investment. It represents the discount rate at which the net present value (NPV) of the investment becomes zero.
- **WACC**: the average rate of return a company is expected to provide to all its investors, including equity and debt holders. It serves as the benchmark for evaluating the attractiveness of an investment.
- **Funding gap**: the difference between the IRR and WACC represents a funding gap. This suggests that the ARC facility may not be able to generate enough returns to cover the total costs, including capital costs and charges and operating costs, indicating a potential shortfall in funding.
- **Break-even price**: this is the price that would make the IRR equal to the WACC. It represents the point at which the ARC facility becomes economically viable. This is a crucial metric as it helps identify the optimal funding rate required for investment in an ARC.

3.1.1 Financial model scenarios

Our financial model tests the base case scenario and three other scenarios varying by type of facilities and size. We estimated IRR for the scenarios and five categories of individual and dual services for the selected geographic areas. Our scenarios are related to the type and size of ARC facilities. They include:

- Base case scenario: charitable individual or minor group
- Scenario 1: new build charitable, individual, or minor group (no premium, no ORA)
- Scenario 2: new build medium size
- Scenario 3: new build large size.

Table 15 presents a breakdown of some of the key general assumptions we used in the model.

Table 15: Building block financial model scenarios and assumptions

<table>
<tr><th>Variable</th><th>Base case scenario charitable individual or minor group (no premium, no ORA)</th><th>Scenario 1 New built charitable (no premium, no ORA)</th><th>Scenario 2 New built medium size (no premium, no ORA)</th><th>Scenario 3 New built larger facilities (Ryman, summerset, BUPA, Oceania)</th><th>Note</th></tr>
<tr><td rowspan="2">Geographic area</td><td colspan="4">Auckland, Hamilton, Tauranga, Wellington, Christchurch and Queenstown</td><td rowspan="3">The geographic areas included, and the service types were discussed and approved by Health New Zealand</td></tr>
<tr><td colspan="4">Urban, provincial, and rural</td></tr>
<tr><td>Service type</td><td colspan="4">Each of the four individual services and rest home and hospital mix</td></tr>
<tr><td>Premium to total bed rate</td><td>0%</td><td>0%</td><td>0%</td><td>53%</td><td>Based on our discussion and NZACA's survey results</td></tr>
<tr><td>Service scale (# beds)</td><td>55</td><td>55</td><td>70</td><td>100</td><td>Align with Ansell strategic report's categories</td></tr>
</table>

Variable	Base case scenario charitable individual or minor group (no premium, no ORA)	Scenario 1 New built charitable (no premium, no ORA)	Scenario 2 New built medium size (no premium, no ORA)	Scenario 3 New built larger facilities (Ryman, summerset, BUPA, Oceania)	Note
Facility size (m2 per resident)	45	36	36	36	The new facilities will be more space-efficient
Occupancy rate	95%	95%	95%	95%	Agreed in the previous stage
Site coverage (build area to land area)	35%	35%	35%	35%	EY (2019) assumption
Rest home share	40%	40%	40%	40%	Agreed in the previous stage
Hospital share	60%	60%	60%	60%	Agreed in the previous stage
Capital investment (construction cost)	×	✓	✓	✓	
Capital charge	×	✓	✓	✓	
WACC	6.66%	6.66%	7.57%	7.57%	Discussed later in this chapter
Inflation rate for all costs and income except wages	2%	2%	2%	2%	Discussed later in this chapter
Wage increase	2.1%	2.1%	2.1%	2.1%	
Construction cost growth rate	2.54%	2.54%	2.54%	2.54%	
Prices growth rate	2.1%	3%	3%	3%	

3.1.2 Prices used for the modelling

The current (2023) TLA prices were used in the financial model as the unit value of revenue. The TLA prices are calculated on a per bed-day basis, representing a day occupied by a resident in a facility. Providers receive payment based on the number of days in a two-week period that their available beds are occupied by residents. This revenue structure ties directly to the occupancy of the facility, meaning that providers' income is influenced by how many beds are filled and the mix of residents, particularly for providers offering multiple categories of care.

Table 16 shows the contract price across selected TLAs by care category as of 1 July 2023. The table shows that the dementia price is approximately 35 per cent higher than the rest home care price, hospital 64 per cent higher and psychogeriatric about 79 per cent higher.

Table 16: Contract price by TLA and care category, as at 1 July 2023

Geographic area		Rest home	Dementia	Hospital	Psychogeriatric
Auckland	Urban (Auckland City)	$186.27	$292.11	$249.63	$317.29
	Provincial (Rodney District)	$181.03	$291.06	$243.42	$317.29
	Rural (Franklin District)	$176.35	$285.77	$237.97	$317.29
Waikato	Urban (Hamilton City)	$178.09	$287.72	$240.06	$317.29
	Provincial (Matamata-Piako District)	$173.74	$282.82	$234.95	$317.29
	Rural (Waikato District)	$173.74	$282.82	$234.95	$317.29
Bay of Plenty	Urban (Tauranga District)	$178.96	$288.79	$241.16	$317.29
	Provincial (Western Bay of Plenty District)	$176.35	$285.77	$237.97	$317.29
	Rural (Whakatane District)	$175.57	$284.91	$237.13	$317.29
Wellington	Urban (Wellington City)	$182.02	$292.20	$244.68	$317.29
	Provincial (Lower Hutt City)	$179.24	$289.10	$241.42	$317.29
	Rural (Masterton District)	$173.43	$282.47	$234.59	$317.29
Canterbury	Urban (Christchurch City)	$177.42	$287.01	$239.36	$317.29
	Provincial (Waimakariri District)	$176.35	$285.78	$237.97	$317.29
	Rural (Timaru District)	$173.74	$284.14	$234.95	$317.29
Otago	Urban (Queenstown-Lakes District)	$179.32	$289.13	$244.48	$317.29
	Provincial (Central Otago District)	$173.08	$282.06	$239.23	$317.29
	Rural (Clutha District)	$172.47	$286.38	$238.49	$317.29

3.1.3 Costs used for the modelling

Costs include capital costs and charges and operating costs. In developing our financial model, we relied on data and information from various sources, including Ansell Strategic (2023), EY (2019), Grant Thornton (2010), a recent unpublished NZACA survey (2023), Health New Zealand Quarterly Reporting

Survey 30 June 2023, and New Zealand Infrastructure Commission (2023). Our cost assumptions are set out below in Table 17. The details of cost estimates are presented later in this section of the report.

Table 17: ARC's financial modelling cost assumptions

Parameter	Our modelling assumptions
Period of analysis	The cash flows for the facility were projected over a period of thirty-five years, which corresponds to the expected life of the building. This long-term projection allows for a comprehensive assessment of the financial viability of the investment. A 50% residual value of the building is included in the cashflow.
Land costs	Land costs were sourced from the Infrastructure Commission's (2023) report, incorporating land values per square metre for selected urban areas and relative rural land values. Sapere estimated land values for provincial locations using the midpoint value of urban and rural value. The land cost is not directly used in the model; it is used for the estimate of annual land yield.
Construction costs	Assumptions for construction costs include: demolition cost is zero or the facility is built on bare land; single-level facilities are constructed everywhere except Auckland and Christchurch; costs are net of taxes and legal fees and costs are assumed not to be lower for larger facilities.
Capital charge per annum	The capital charge per annum was estimated using a land yield at 5% of its value, depreciation and WACC charge on opening book value. We assumed 50 per cent residual value for the building.
Operating costs	The operating costs per resident day were estimated using the high-level data received from several providers and EY (2019) operating costs estimate.

3.1.4 Cash-flows used for the modelling

The cash flows include a charge on the current value of land at a rate of five per cent. The 2021 base land values in each area, as referenced in the Infrastructure Commission's (2023) report, were incorporated into the model. These values were subsequently updated to reflect a 10 per cent[17] increase for the year 2023. The estimated market value of the land at the end of the period was not added to the analysis.

[17] The project team assumes that land prices will experience a modest annual growth of five per cent, despite a national decline of 15 per cent in property prices from their peak in 2021 to 2023, see CoreLogic. This conservative estimate is based on historical trends where, between 2010 and 2021, average land value significantly increased in all areas except Christchurch. For instance, Wellington saw a minimum increase of 154 per cent, while Tauranga experienced the highest growth at 343 per cent see the Infrastructure Commission's (2023) report. Given these trends for land value and the recent price corrections, the project team anticipates only minor annual growth moving forward.

Table 18: Land value by area ($/m^2)

City	Area	Average land value (2021)	Average land value (2023) estimate
Auckland	Urban (Auckland City)	$1,762	$1,938
	Provincial (Rodney District)	$1,081	$1,189
	Rural (Franklin District)	$400	$441
Hamilton	Urban (Hamilton City)	$648	$713
	Provincial (Matamata-Piako District)	$428	$471
	Rural (Waikato District)	$208	$229
Tauranga	Urban (Tauranga District)	$1,504	$1,654
	Provincial (Western Bay of Plenty District)	$929	$1,021
	Rural (Whakatane District)	$353	$388
Wellington	Urban (Wellington City)	$913	$1,004
	Provincial (Lower Hutt City)	$588	$647
	Rural (Masterton District)	$264	$290
Christchurch	Urban (Christchurch City)	$444	$488
	Provincial (Waimakariri District)	$315	$346
	Rural (Timaru District)	$185	$204
Queenstown	Urban (Queenstown-Lakes District)	$880	$968
	Provincial (Central Otago District)	$578	$636
	Rural (Clutha District)	$276	$303

3.1.5 Construction cost

We used EY (2019) assumptions for construction cost and a 2023 CCCI convertor of 25 per cent to update the costs. Some of the other assumptions for this part of the capital cost are as follows:

- Demolition cost is zero or the facility is built on a bare land.
- Single level facilities are built everywhere except Auckland and Christchurch.
- Costs are net of taxes and legal fees.

- It is assumed costs are not lower for larger facilities.
- Size of land estimated based on the number of construction levels and buildup area to land coverage.
- The latest Cordell Construction Cost Index (CCCI) convertor to 2023 was used to inflate the construction costs from 2019 to 2023 (CoreLogic NZ, 2022).[18]

Table 19 provides a summary of construction unit costs.

Table 19: Construction cost by main components

	City	2019 values	2023 values	Unit
Construction cost single-level	Auckland	$4,000	$4,980	per m2
	Christchurch	$4,100	$5,105	per m2
	Other locations	$3,900	$4,856	per m2
Multi-story (additional level)	Auckland and Christchurch only	$250	$311	per m2
Landscaping, drainage, parking areas etc		$350	$436	per m2
Landscaping, drainage, parking areas etc (additional cost)	Urban	$8,000	$9,961	per bed
	Provincial	$12,000	$14,941	
	Rural	$15,000	$18,677	
Fit-out costs building		$15,000	$18,677	per bed
Fit-out costs client		$10,000	$12,451	per bed

3.1.6 Operating costs

The estimated operating cost is derived from the financial data of several providers, incorporating high-level figures and utilising EY's (2019) data on the ratio of non-wage costs to wage costs.

[18] CoreLogic NZ, C. N. (2022, July 20). *Construction costs rising at the fastest pace on record*. CoreLogic New Zealand. https://www.corelogic.co.nz/news-research/news/2022/construction-costs-rising-at-the-fastest-pace-on-record

Table 20: Estimated per resident per day operating cost of ARC facilities by cost components and level of care

	Rest home	Hospital	Dementia	Psychogeriatric
Care wage	$90	$167	$144	$177
Other care costs	$3	$7	$4	$10
Catering	$19	$28	$25	$27
Cleaning	$4	$6	$5	$6
Laundry	$5	$8	$6	$8
Property & maintenance	$15	$19	$18	$19
Administration	$12	$17	$20	$17
Other costs	$2	$4	$3	$4
Total	**$150**	**$222**	**$192**	**$236**

3.1.7 Inflation assumptions

To account for cost inflation from 2024 onwards, we used a blended approach incorporating general and construction cost inflation data.

For non-wage operating costs, we used the Reserve Bank of New Zealand's (RBNZ) long-run forecast of a two per cent general inflation rate, as measured by the Consumer Price Index (CPI).

The wage growth rate, measured by the Labour Cost Index (LCI) healthcare and social assistance, was modelled to change in line with the average CPI rate, consistent with the RBNZ of two per cent CPI target, resulting in an estimated rate of 2.09 per cent.

The construction cost growth rate, measured by non-residential building construction, was modelled to change in line with the average CPI rate, consistent with the RBNZ of two per cent CPI target, resulting in an estimated rate of 2.54 per cent.

3.1.8 WACC, the desired rate of return

WACC represents the required rate of return that the providers of capital (both debt and equity) anticipate from providing their capital to an ARC facility. In our analysis, we conducted three scenarios to determine the most suitable WACC for ARC providers in the initial phase of our contract.

- To derive our initial WACC estimate, we incorporated several assumptions from EY, and updated risk-free rate and D/E (debt to equity) ratios based on the capital structures of key publicly listed providers. Specifically, we examined the capital structures of Ryman, Oceania, Arvida, and Summerset, weighting them according to their respective proportions of ARC bed supply (as outlined in the ARC sector profile for 2024). This approach yielded a figure for our model that fell between the values proposed by EY and Grant Thornton.
- In this iteration, we continued amalgamating insights from both EY and Grant Thornton, while fine-tuning the beta, risk-free rate, and D/E ratios based on the capital structures of major publicly listed providers for the base case and scenario providers, alongside a few other

assumptions outlined later in this report. We computed the WACC for each of the chosen publicly listed providers—Ryman, Oceania, Arvida, and Summerset—factoring in their capital structure and beta. Subsequently, we weighted these WACC estimates according to their respective proportions of ARC bed supply. This methodology resulted in a WACC figure for scenarios 2 and 3 that differs from the values suggested by EY and Grant Thornton. Furthermore, we derived the WACC for the base case and scenario 1 groups of providers by introducing additional assumptions to our WACC calculation for publicly listed providers.

3.1.9 Beta

Beta serves as a real-time gauge of a company's share price volatility relative to its local market index (the stock market index that tracks the performance of a country's stock market). Beta captures fluctuations in both share price volatility and index composition, making recent estimates preferable due to their timeliness.

EY's beta estimate draws from New Zealand firms, offering insight into the risk associated with NZ-listed aged care providers, with the caveat that country-level risks can significantly impact required returns. Grant Thornton's estimate, derived from local and international comparators with a focus on developed markets, provides a broader perspective on 'developed market aged care provider risk.' However, the lack of specific detail on the sources of their estimates limits their applicability, especially considering differing market dynamics, such as property market influences.

Grant Thornton's beta estimate is sourced from local and international comparators with a focus on developed markets. We have not been able to source more accurate detail than that on where their estimates are coming from, which limits usefulness as these markets are not identical. Property market dynamics, particularly in New Zealand with historically low rental yields and high expected capital appreciation, contribute to higher beta for firms with property exposure. This is due to the uncertainty surrounding capital appreciation compared to income from rental yields. Conversely, in certain US metropolitan markets where rental yields have historically been higher and capital appreciation lower, share price movements are less volatile, resulting in a lower beta.

In our WACC estimate, we ran two regressions for asset beta when i) measured as weekly returns over the last two years and ii) measured as monthly returns over the last five years, for the following publicly listed ACR providers:

- Summerset Group Holdings Limited
- Arvida Group Limited
- Oceania Healthcare Limited
- Ryman Healthcare Limited.

We estimated the WACC for each company using their beta. We used the betas measured as weekly returns because it includes a higher number of observations compared to the monthly returns.

Debt-to-equity ratios

Following discussion with Health New Zealand, we decided to reevaluate our analysis in the base case scenario, focusing on providers who do not operate ORA or premium charges. In the absence of these funding sources, these providers are likely to rely more on equity to fund their operations.

We initially employed estimated capital structure for a listed provider. However, considering that unlisted providers typically have lower D/E ratios due to their limited access to cheap debt, we have adjusted our approach accordingly. Specifically, providers not engaged in ORAs or premium charges for aged care are expected to have lower D/E ratios. This adjustment accounts for the fact that ORAs essentially allow firms to access interest-free debt, facilitating faster construction (but might not be available to all providers).

For the base case and scenario 1, we applied a reduction of 50 per cent[19] from the weighted average D/E of publicly listed providers for the 'individual or minor group private,' 'major group/charitable individual' or 'minor group/charitable' facilities. The sensitivity of the results to this assumption will be tested as part of the sensitivity analysis.

Table 21 summarises the components of the revised WACC estimate for our base case as well as scenario 1, and scenarios 2 and 3 including sources of information. The table presents Grant Thornton, EY and our revised estimates for comparison purposes.

[19] Expert judgment based on previous work.

Table 21: WACC calculation

Cost of equity (CAPM)	GT (2010) min &max	EY (2019)	Sapere's estimate for the base case and scenario 1	Sapere's estimate for scenarios 2 and 3	Description	Source of Sapere's estimate
Risk free rate (R_f)	5.9%	2.9%	4.67%	4.67%	The risk-free rate of return is approximated by the yield on Government Bonds	RBNZ, Secondary market government bond yields, 10 year As of 30 March
Post-tax risk free rate (R_fT_c)	4.2%	2.1%	3.4%	3.4%	The risk-free rate adjusted for the corporate tax rate (28%)	Derived
Equity market risk premium (MRP)	7.5%	5.5%	7.5%	7.5%	Difference between expected market return and risk-free rate	GT (2010) and PWC (2002) New Zealand market risk premium
Asset beta (β_a)	0.6 & 0.7	1.05	-	-	a point-in-time estimate of how volatile a company's share price is relative to its local market index	Asset beta for ARC providers in Australia, internal modelling
Geared beta estimate (β_e)	1 & 1.17	1.2	Equity beta (β_e) 0.56		Asset beta geared by the estimated debt-to-equity ratio	Derived
Size premium (SP)	3% & 4%	0%	0		The size premium is used to adjust the estimate of D/E that is based on the larger publicly listed providers	There is a higher risk associated with smaller providers' equity investment compared to publicly listed providers. This risk has been included in the WACC estimate by the adjustment made to the D/E ratio
Cost of equity (R_e)	14.7% & 17%	9.5%	8.0%		R_fT_c+ (β_e*MRP) +SP	Derived
Cost of debt						
Company credit spread (CS)	2.5% & 3.5%	3.4%	2.5%	2.5%		GT's minimum assumption
Cost of debt (R_d)	8.4% and 9.4%	6.3%	7.2%	7.2%	R_f+ CS	Derived and it is consistent with the RBNZ yield on loans for total business loans
Cost of Debt post tax			5.2%	5.2%	Rd*(1-T)	Derived
Capital structure						
D/E	67%	20%	59.8%			Adjusted value for the base case organisations based on publicly listed providers' capital structure
D/V	40%	17%	37.4%		(D/E)/(D/E+1)	Provider capital structure
E/V	60%	83%	62.6%		1/(1+D/E)	Provider capital structure
WACC						
Corporate tax rate (T)	28%	28%	28.0%	28.0%		NZ corporate tax rate
Weighted-average post-tax COE	8.8% & 10.2%	7.9%	4.7%		R_e*(E/V)	Derived
Weighted-average post-tax COD	2.4% & 2.7%	0.8%	1.9%		R_d*(D/V)	Derived
WACC (post-tax, nominal)	11.3% & 12.9%	8.7%	6.66%	7.57%	COE+COD	Derived

3.2 Financial model results: base case (lower-end) vs scenario 1 (upper-end)

Table 22 presents an overview of the 2023 rates and the estimated uplifts for the categories of care: rest home, hospital, dementia, psychogeriatric, as well as mixed rest home and hospital across multiple regions. We estimate the base case and scenario 1 for all levels of care. For the mixed rest home and hospital care, we estimate all three scenarios and the base case.

The base case and scenario 1 represent the lower and upper bounds of the potential uplift spectrum, respectively. The other two scenarios fall somewhere in between. Scenario 2 offers substantial increases, more closely aligned with scenario 1 than the base case. Scenario 3 typically signifies a moderate improvement, which, while less than scenario 2, is still significantly higher than the base case for most areas, especially Auckland and Waitematā. This trend can be attributed to the higher land values in these areas compared to the rest of the country.

Table 22: Estimated required uplift in the price by care level for base case (20 years old charitable surviving) vs scenario 1 (brand new charitable) and for rest home and hospital mix for all the base case and the three scenarios

	Rest home			Hospital			Dementia			Psychogeriatric			R&H				
	2023 rate	Base case uplift	Scenario 1 uplift	2023 rate	Base case uplift	Scenario 1 uplift	2023 rate	Base case uplift	Scenario 1 uplift	2023 rate	Base case uplift	Scenario 1 uplift	2023 rate	Base case uplift	Scenario 1 uplift	Scenario 2 uplift	Scenario 3 uplift
Auckland	$186	$0	$51	$292	$0	$39	$250	$9	$53	$317	$0	$23	$250	$0	$44	$41	$33
Waitematā	$181	$5	$47	$291	$0	$31	$243	$16	$50	$317	$0	$14	$247	$2	$38	$35	$27
Counties Manukau	$176	$9	$42	$286	$3	$27	$238	$21	$46	$317	$0	$4	$242	$7	$33	$31	$22
Bay of Plenty	$177	$6	$44	$286	$0	$29	$239	$18	$48	$317	$0	$7	$243	$4	$35	$32	$24
Capital and Coast	$178	$5	$38	$288	$0	$22	$240	$17	$42	$317	$0	$2	$244	$3	$29	$26	$18
Canterbury	$176	$10	$43	$286	$4	$27	$237	$22	$47	$317	$0	$5	$242	$8	$33	$31	$23
Otago	$175	$9	$42	$286	$0	$24	$241	$16	$41	$317	$0	$3	$241	$5	$31	$28	$20
Rest of the country	$175	$8	$39	$284	$2	$24	$237	$20	$43	$317	$0	$1	$241	$6	$30	$27	$18

3.3 Bariatric care could add 16 to 25 per cent to the price uplift estimated for option 1 (upper end)

The provision of care for bariatric patients in aged care facilities presents unique challenges and necessitates a comprehensive approach to address their specific health and mobility needs. This section outlines the additional costs incurred in managing bariatric care.

New Zealand has the third highest adult obesity rate in the OECD with an ongoing increase in these rates from 31.2 per cent in 2019/2020 to 34.3 per cent in 2020/21 (NZ Health Survey). One in three adult New Zealanders is classified as obese. Obese is defined as a person having a body mass index (BMI) of 30 or more.

Pacific peoples (63 per cent) and Māori (48 per cent) are more likely to be obese than other ethnicities (bpac.org.nz). People in the most deprived communities are 1.8 times as likely to be obese than those in the least deprived.

Bariatric is a medical term relating to the treatment of obesity in New Zealand, generally relating to people who are 150Kg or more, with a BMI of 40 or more, or who have large physical dimensions, a lack of mobility or other conditions that make moving and handling difficult.[20] They are at a higher risk of medical complications or need equipment larger than the capacity of standard.

The Health New Zealand contracted providers' aids and equipment guidelines exclude people who are bariatric from accessing disability support-related equipment if they are in a long-term age-related residential care service. This leaves the cost of purchasing or renting bariatric equipment to be covered by the ARC provider, who will still be funded on a bed-day basis set down by the ARRC agreement.

> "This results in:
>
> A reluctance of ARC providers to accept someone with bariatric needs if they do not have equipment already available to them.
>
> Delays in being discharged from hospital or being admitted into ARC while required aid/equipment is accessed and made available in the facility.
>
> Providers needing to consider the skills, knowledge, and expertise of their staff to manage someone who is exceptionally large and the equipment that will be required.
>
> Provider concerns about the need to store equipment if not in use, or costs of repair & maintenance if damaged." Health New Zealand (2024), p2.[21]

Bariatric patients require:

- specialised equipment and facility adaptations including the following:

[20] https://www.acc.co.nz/assets/provider/bc9f7f9b2e/acc6075-moving-guide-bariatric.pdf

[21] Naomi Bondi et al (2024). Scoping document – Bariatric equipment for Aged Residential Care Facility documents.

  - Bariatric beds and mattresses that can support higher weights and provide pressure-relieving surfaces to prevent bedsores. These beds often come with additional features such as adjustable height and tilt functions, which facilitate easier patient handling and improve comfort.
  - Lifts and hoists to safely transfer bariatric patients. Facilities must invest in heavy-duty lifts and hoists. These devices are crucial for minimising the risk of injury to both patients and caregivers during transfers and movements.
  - Specialised wheelchairs and mobility aids that are designed to support their weight and provide adequate mobility. These aids often need to be customised or reinforced to meet individual patient needs effectively.
- Additional staffing and training including the following:
  - Increased staff ratios as patients often require more intensive care. We were advised by Health New Zealand experts that the ratio is two to three caregivers per patient. Additional caregivers ensure that adequate support is available for activities of daily living and emergency situations.
  - Specialised training to bariatric care, including safe patient handling, awareness of bariatric-specific health issues, and emergency response procedures tailored to the needs of bariatric patients.
  - Nutritional experts including consulting or hiring dietitians who specialise in bariatric care is essential.
- Enhanced medical care including wound care, respiratory support and special medication needs.
- Structural modifications and infrastructure enhancement, including modifying facility layouts to accommodate bariatric patients e.g. adjustments to common areas, bathrooms and living spaces, widening doorways and reinforcing furniture.

To estimate the daily price for bariatric beds, we incorporated insights from Health New Zealand's expert opinion on the necessary additional staffing and equipment costs, along with findings from a literature review on the additional infrastructure requirements for bariatric patients.

Table 23 provides a list of bariatric equipment and their cost. Table 24 summarises the results of a study by Hales et al. (2020) on the differences between required standard building specifications for bariatric patients compared to three facilities' building characteristics. It shows the difference between the average of three facilities and the required size of hallways, bathrooms, rooms, doorways, common space, car park and flooring.

To estimate the cost of additional staff requirements for facilities with bariatric patients, we assumed the need for an extra Level 0 caregiver. As shown in Table 25, the cost of additional staff per bariatric patient per day ranges from $44 to $63, depending on the level of care required by the patient. This represents an increase of 26 per cent for psychogeriatric care and up to 35 per cent for rest home care.

Table 23: Bariatric equipment and their estimated cost per patient

Bariatric item	Cost per 1 item[22]
Wi-bo Sentida SC ultra low bed – King single/lindberg oak SWL 215kg	$5,636
Greenline hyper-foam mattress – King single SWL 150kg	$797
Alova XXL Mattress 1200mm -1950 x 1170 x 170mm with Promust PU HD Integral Cover Max Patient weight – 135 to 270 kg	$2698
Levitop full body hoist Full-body hoist, 230kg capacity, electric base adjustment	$5886
Silvalea Fastfit mesh padded leg sling – XL With head support. SWL 220kg	$529
Silvalea Fastfit mesh padded leg sling – XXL With head support. SWL 220kg	$609
Viking Maxi shower stool SWL up to 400 kg	$585
Juvo Viking Maxi 600 Attendant Propelled – Urethane seat Stainless Steel Shower commode. 600mm width between arms, sliding footplate, User weight 300kg including urethane open front seat (For less mobile users to be able to be wheeled into shower)	$2049
Vermeiren V100 manual wheelchair – XL SWL 170kg	$1798
Metzeler Prestige Tube 250kg max user weight	$5000-$7000 (depending on which sized mattress either super single, double, queen)
Aeria 8 Pro Bariatric 110 Wide – Mattress air alternating Max user weight 250kg	$5000-$5500

Source: Correspondence with Health New Zealand experts

Table 24: Bariatric care's structural requirement compared to average facilities

	Recommended for bariatric patients	Average Facilities
Bedroom m2	25.9	11.3
Doorway m	1.5	1.1
Ensuite m2	6.5	3.7
Floor	Vinyl	carpet and vinyl in wet floor area

[22] Prices are GST exclusive and include freight unless specified.

Carpark (m)	Carpark space 90° park 3.5m wide 5m length	90° park 3.9m 4.3m
Communal spaces	10-20% lounge seating should be bariatric friendly	Standard sized recliners and armchairs
Entrance ways (m)	Automatic doors Minimum width 1.8m Minimum height 2.0m	1.3 m 2- 3.4 m

Source: (Hales et al., 2020b)

Table 25: Cost of an additional caregiver Level 0 for bariatric care

	Level 0 caregiver wage rate per hour*	Hours per resident per day**	Estimated additional care cost per bariatric patient***
Rest Home	$23.38	1.88	$43.95
Hospital		2.72	$52.61
Dementia		2.63	$53.07
Psychogeriatric		2.74	$63.59

* Health and Disability Sector 1 July 2023 Funding Increases – Proposed Care and Support Worker Wage Increase – Tripartite Discussions and Sector Proposal.
**NZACA survey results 2017-18
*** Sapere calculation

We estimated the additional cost of facilities, including bariatric beds, by factoring in a higher care wage for 20 per cent of the beds in a new charitable facility (option1). The results show that this adjustment would increase the price uplift from 16 per cent for Auckland facilities to 25 per cent for Capital and Coast facilities compared with option 1 without bariatric beds (see Table 26).

Table 26 estimated price uplift for new charitable ARCs with and without 20 per cent bariatric beds

TLA or Region	2023 rate	Scenario 1 without bariatric (rest home and hospital mix)	Scenario 1 with 20% bariatric beds (rest home and hospital mix)
Auckland	$250	$44	$51
Waitematā	$247	$38	$45
Counties Manukau	$242	$33	$40
Bay of Plenty	$243	$35	$42

Capital and Coast	$244	$29	$36
Canterbury	$242	$33	$40
Otago	$241	$31	$39
The rest of the country	$241	$30	$37

3.4 The estimated price uplifts are highly sensitive to assumptions about care wage

We have assessed the sensitivity of the estimated price uplift for rest home and hospital mix under the base scenario and scenario 1.

The results of this analysis demonstrate a high sensitivity to operating costs, particularly care wages, which are the primary component of these costs. Using EY's (2019) updated operating cost assumptions, the estimated rate of price increase rises by an average of seven percentage points.

Scenario 1 also shows sensitivity to the weighted average cost of capital (WACC). An increase in the WACC by just 0.91 percentage points results in an average rate of price uplift of four percentage points.

Neither scenario is sensitive to changes in the number of beds or the construction cost growth rate, whether using residential instead of non-residential growth rates, (see Table 27 and Table 28).

The overall variability of the estimated price uplifts under the base scenario and scenario 1 illustrated in Figure 21. The longer error bars for the base scenario indicate greater variability in the estimates compared to scenario 1.

Table 27 Sensitivity of the percentage price uplift to some of the key assumptions, base scenario

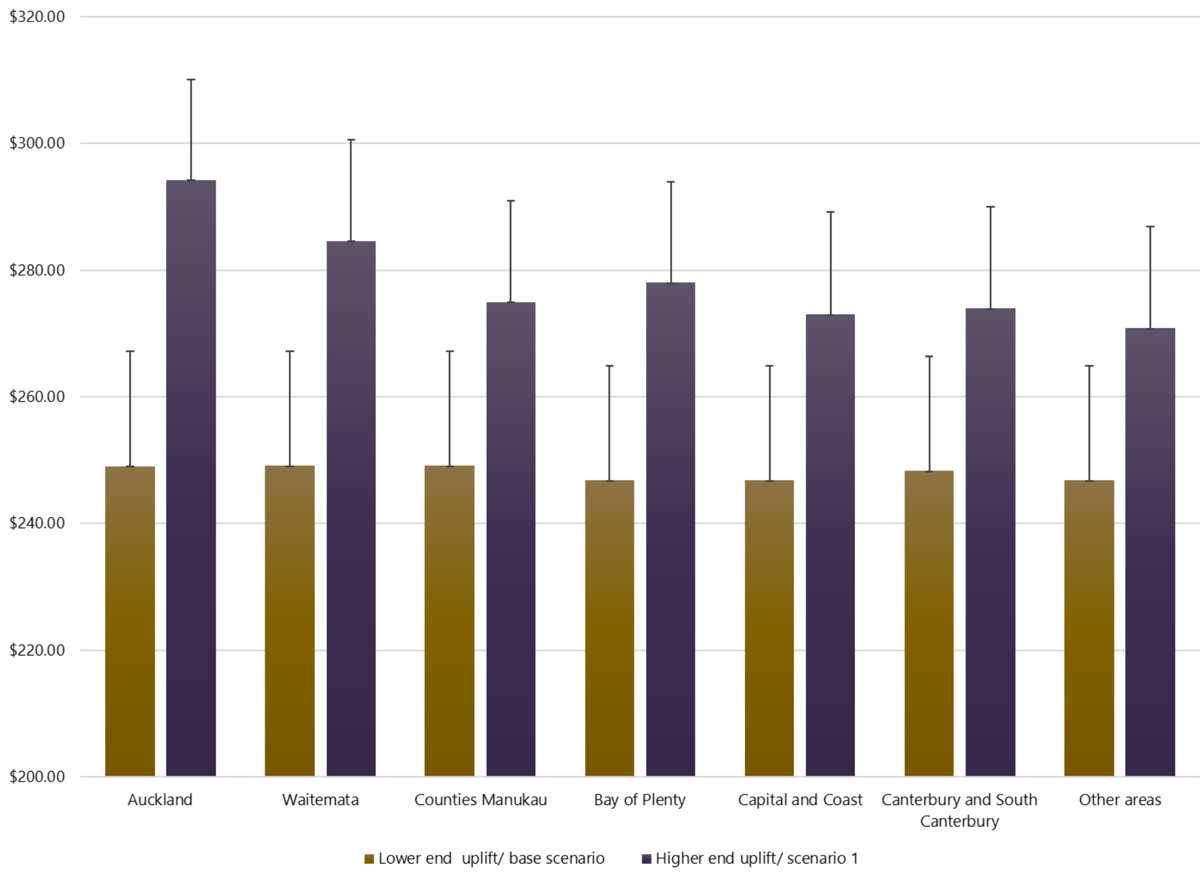
	Auckland	Waitematā	Counties Manukau	Bay of Plenty	Capital and Coast	Canterbury and South Canterbury	Other areas
Base case scenario - base estimate	0%	1%	3%	2%	1%	3%	3%
Operating cost (based on EY 2019)	7%	8%	10%	9%	9%	10%	10%
Residential construction cost growth	0%	1%	3%	2%	1%	3%	3%
Doubled service scale (110 beds)	0%	1%	3%	2%	1%	3%	3%

Higher WACC of 7.57%	1%	2%	4%	3%	2%	4%	4%

Table 28 Sensitivity of the percentage price uplift to some of the key assumptions, scenario 1

	Auckland	**Waitematā**	**Counties Manukau**	**Bay of Plenty**	**Capital and Coast**	**Canterbury and South Canterbury**	**Other areas**
Scenario 1- Base estimate	18%	15%	14%	15%	12%	13%	12%
Operating cost (based on EY 2019)	24%	22%	20%	21%	19%	20%	19%
Residential construction cost growth	18%	16%	14%	15%	12%	14%	13%
Doubled service scale (110 beds)	18%	15%	14%	15%	12%	13%	12%
Higher WACC of 7.57%	22%	20%	18%	19%	16%	18%	17%

Figure 21 Variability associated with the estimated price uplift under each scenario based on the tested variables



4. Fiscal cost forecast for aged residential care

Fiscal cost forecasts are estimated using estimates of bed-day rates and bed-day demand from 2024/25 to 2039/40. Fiscal cost forecasts are provided for:

- the lower and upper estimate of bed-day rates[23] (see section 3)
- demand forecasts using the five-year trend and five-year trend + substitution scenarios
- a public and private funding allocation under the status quo and under a scenario where the maximum contribution is removed.

The result is eight different scenarios based on combinations of each. Fiscal cost forecasts are estimated for the eight scenarios.

This subsection first estimates the public and private funding allocations under the status quo and for an option where the maximum contribution is removed. It next estimates fiscal cost forecasts across each of the eight scenarios.

4.1 Public and private funding allocations

Aged residential care funding is examined across the four care levels—rest home, dementia, hospital, and psychogeriatric. Funding magnitude and composition (i.e. proportion private and public) varies by care level.

Rest home care funding is composed of subsidised and non-subsidised portions. Subsidised rest home care is available to residents with less than the asset limit. For these residents, they receive a Residential Care Subsidy (paid by Health New Zealand) and contribute most of their superannuation and other income. Non-subsidised rest home care applies to all residents with assets over the asset limit. These residents are required to privately fund the full rest home care cost.

For rest home care, the Residential Care Subsidy is the public contribution. All other payments are private payments. A summary of this funding is shown below.

Figure 22: Rest home care funding composition

[23] Bed-day prices for the lower and upper estimates are assumed to increase annually by 2.09 per cent and 3 per cent, respectively.

Dementia, hospital, and psychogeriatric care are funded similarly. Residents with less than the asset limit receive the Residential Care Subsidy, make a superannuation and other income contribution, and receive a 'top-up subsidy' for the additional care cost.

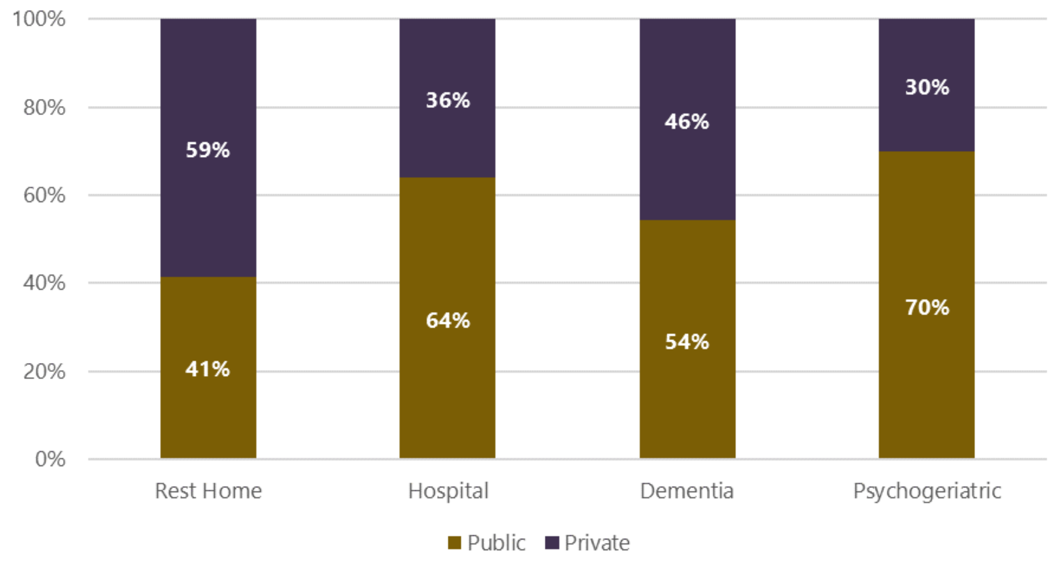
Residents with assets over the limit must pay the rest home cost for their region. Any costs exceeding this sum are covered by the top-up subsidy. That is, there is a maximum contribution that these residents pay.

For these care levels for residents with assets below the threshold, the public contribution now constitutes the Residential Care Subsidy as well as the top-up subsidy. A summary of this funding composition is presented below.

Figure 23: Dementia, hospital, and psychogeriatric care funding composition

Health New Zealand has undertaken work forecasting the public and private funding allocations for the four care levels in 2024/25. The results of this allocation are shown in Figure 24 below. Public funding is the main source of funding across all care levels. It is expected to vary between 41 and 70 per cent of funding in 2024/25.

Figure 24: 2024/25 fiscal cost funding allocation



Public and private funding allocations are forecasted through to 2039/40 under two scenarios:

- **Status quo** – no change to the existing structure.
- **Option 1** – remove the maximum funding contribution. All residents outside of the income and asset limit would pay all care fees (i.e., non-subsidised).

4.1.1 Forecasting the public and private funding allocation under the status quo

The public and private funding allocations are first forecasted out to 2039/40 under the status quo. The logic is that as New Zealanders' wealth increases, the proportion of residents with income and assets over the limit—and therefore the proportion of private funding—will increase.

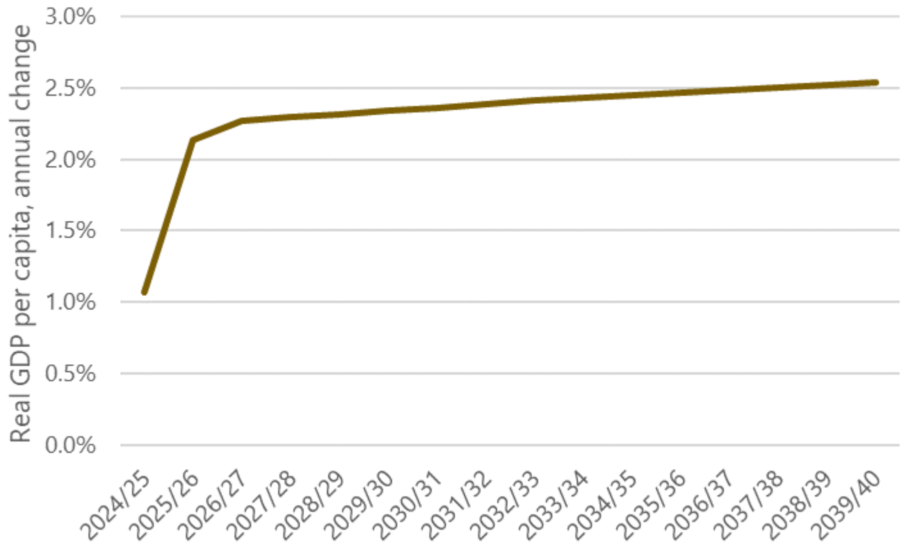
Public and private funding allocations are computed for each care type individually.

Step 1: Estimate the wealth increase

New Zealanders' wealth is proxied through the growth in the real rate of gross domestic product (GDP) per capita. GDP per capita represents the average economic output per person in a country. We would expect that as GDP per capita increases, incomes increase, and consequently wealth increases.

Real GDP growth is observed from the Reserve Bank of New Zealand's May Monetary Policy Statement. Estimates beyond 2026/27 (the limit of the Reserve Bank's forecasts) are assumed equal to the 2026/27 figure. New Zealand's population growth is observed from Statistics New Zealand's population estimates. The resulting real GDP growth is shown in Figure 25.

Figure 25: Real GDP per capita forecast



Step 2: Estimate the public allocation that can be influenced by New Zealanders' expected wealth increase

The public allocation that can be influenced by the wealth increase is the non-top-up subsidy portion. As New Zealand's population becomes wealthier, more people will exceed the asset threshold and will therefore pay the full private payment.

However, top-ups as a proportion of Health New Zealand's total subsidy expenditure will not change as long as the rest home price increases at the same rates as other service prices. Top-ups are provided by Health New Zealand for all residents, regardless of their income and assets. The composition of the funding allocation (i.e., the proportion of people receiving/not receiving the Health New Zealand subsidy) will therefore not impact the top-up proportion of Health New Zealand's subsidy.

The top-up proportions are also not impacted by the aggregate number of residents paying for aged residential care i.e., as resident numbers increase, we would expect top-up expenditure to increase proportionate to the aggregate expenditure increase.

Data on Health New Zealand's top-up expenditure was provided in Health New Zealand's previous analysis. This data is observed as a proportion of Health New Zealand's total subsidy expenditure. The results include 28 per cent, 33 per cent, and 29 per cent for dementia care, hospital care, and psychogeriatric care respectively (rest home care does not receive the top-up subsidy).

The public allocation that can be influenced is then estimated by multiplying the previous year's public allocation by the non-top up proportion of Health New Zealand's total subsidy expenditure.

$$Influenceable\ public\ allocation_t = Public\ allocation_{t-1} \times (1 - top\text{-}up\ proportion)$$

Step 3: Estimate the change in public allocation

The change in public allocation is estimated by multiplying the wealth increase with public contribution that is influenceable.

$$Change\ in\ public\ allocation_t = Influenceable\ public\ allocation_t \times Real\ GDP\ growth\ per\ capita_t$$

The change in public allocation is then computed by subtracting the loss in public contribution from the previous years' public contribution. The private allocation is estimated as the remaining proportion of funds.

The above steps are computed for each care level, for each year through to 2039/40.

Step 4: Combine with fiscal cost forecasts

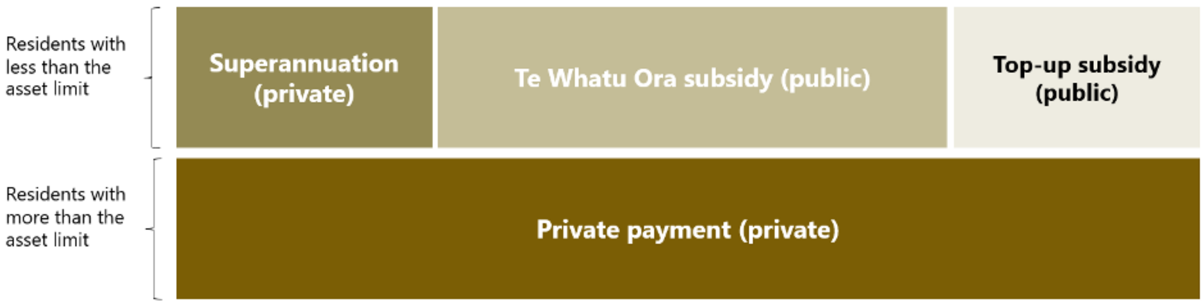
The final step is to combine the public and private funding allocations with the fiscal cost forecasts for the respective year and care level.

4.1.2 Forecasting the public and private funding allocation under option 1: removing the maximum limit on resident funding contribution

Option 1 removes the maximum funding contribution for dementia, hospital, and psychogeriatric residents. Rest home funding does not change because it is not impacted by the top-up subsidy.

Option 1's proposed funding composition is shown in Figure 26 below. The public funding available to residents with income and assets under the limit does not change. However, now residents with income or assets above the limit must pay the full cost of the care, i.e., there is no maximum contribution and they do not receive the top-up subsidy.

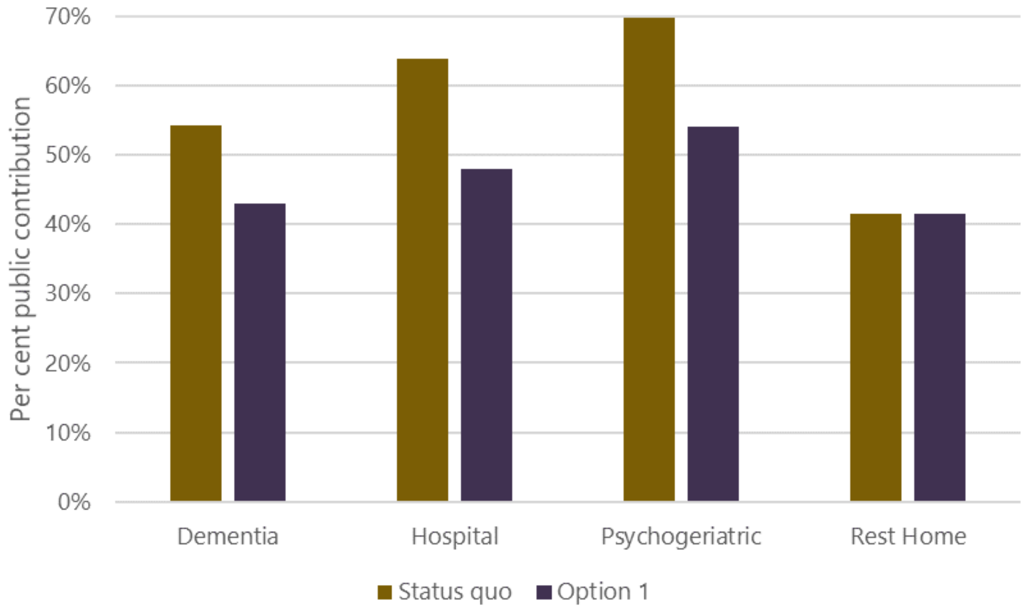
Figure 26: Option 1's dementia, hospital, and psychogeriatric care funding composition



To estimate option 1's public and private funding allocation, we subtract the maximum contribution from the total subsidy allocation (and add it to the private allocation) in Health New Zealand's work forecasting the public and private funding in 2024/25. The public contribution as a proportion of total funding is then computed.

A comparison of the status quo and option 1's public funding allocation is shown in Figure 27. Option 1 results in a public contribution decrease for dementia, hospital, and psychogeriatric care because of the removal of the maximum contribution and therefore top-up subsidy for residents over the income and asset limit. Concurrently, rest-home care is not impacted because it does not incur a top-up subsidy under the status quo.

Figure 27: Comparison of options in 2024/25



The change in public allocations is now estimated as follows:

$$Change\ in\ public\ allocation_t = Public\ allocation\ (excluding\ MC)_t \times Real\ GDP\ growth\ per\ capita_t$$

The change in public allocation in time *t* is equal to the public allocation excluding maximum contribution multiplied by the real GDP growth rate per capita for the same period. It is estimated by care level for each year through to 2039/40. We note that the real GDP growth per capita is estimated using the same method as the status quo.

4.2 Fiscal cost forecasts

The following eight scenarios have fiscal cost forecasts provided for:

- **Scenario 1:** five-year trend demand, low bed price, status quo allocation
- **Scenario 2:** five-year trend demand, low bed price, option 1 allocation
- **Scenario 3:** five-year trend demand, high bed price, status quo allocation
- **Scenario 4:** five-year trend demand, high bed price, option 1 allocation
- **Scenario 5:** five-year trend + substitution demand, low bed price, status quo allocation
- **Scenario 6:** five-year trend + substitution demand, low bed price, option 1 allocation
- **Scenario 7**: five-year trend + substitution demand, high bed price, status quo allocation
- **Scenario 8:** five-year trend + substitution demand, high bed price, option 1 allocation.

A summary of the fiscal cost forecasts in each scenario is presented in the table below. By 2039/40, the fiscal cost for the status quo allocation without demand substitution is estimated to lie between $2,826 and $3,606 million. Fiscal costs for option 1 with substitution are estimated to be between $1,815 and $2,325 million. Comparing those two, option 1 would reduce the fiscal costs by between $1,011 and $1,281 million in 2039/40.

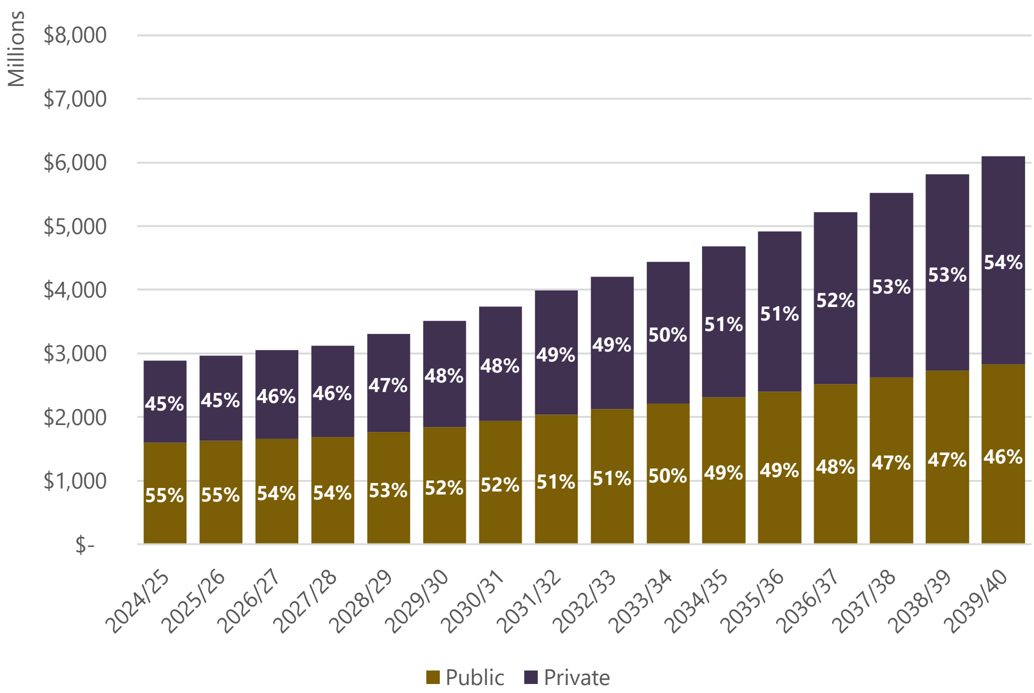
Table 29: Total and fiscal cost summary across the eight scenarios ($ millions)[24]

($ Million)	2024/25			2039/40		
	Total cost	Fiscal cost	Public contribution	Total cost	Fiscal cost	Public contribution
Scenario 1	$2,886	$1,599	55%	$6,097	$2,826	46%
Scenario 2	$2,886	$1,308	45%	$6,097	$1,923	32%
Scenario 3	$3,262	$1,793	55%	$7,863	$3,606	46%
Scenario 4	$3,262	$1,474	45%	$7,863	$2,474	31%
Scenario 5	$2,886	$1,599	55%	$5,719	$2,719	48%
Scenario 6	$2,886	$1,308	45%	$5,719	$1,815	32%
Scenario 7	$3,262	$1,793	55%	$7,345	$3,459	47%
Scenario 8	$3,262	$1,474	45%	$7,345	$2,325	32%

Scenario 1 fiscal cost forecasts

Scenario 1 is the five-year trend demand, low bed price, and status quo public/private funding allocation. Costs grow from $2,886 million in 2024/25 to $6,097 million in 2039/40. The public contribution also decreases from 55 per cent to 46 per cent over the period.

Figure 28: Scenario 1 fiscal cost forecasts

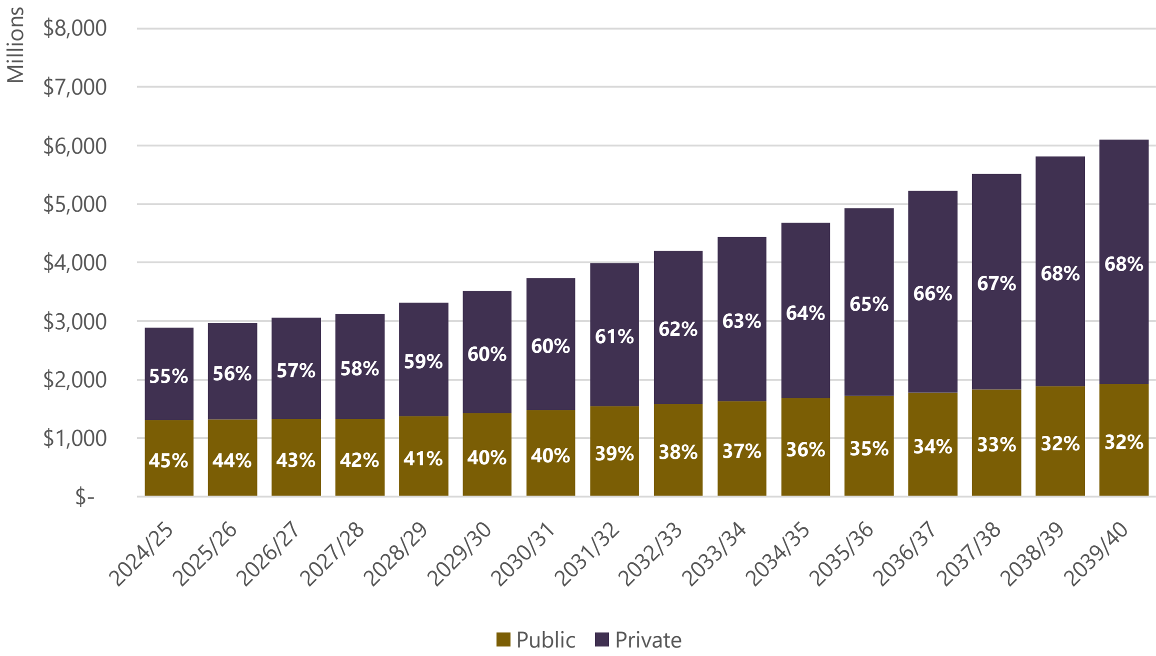


[24] The low and high bed prices for all care levels are assumed to increase annually by 2.09 per cent and three per cent, respectively. These uplifts are in line with the cost model assumptions (see section 3).

Scenario 2 fiscal cost forecasts

Scenario 2 is the five-year trend demand, low bed price, and option 1 public/private funding allocation. Costs grow from $2,886 million in 2024/25 to $6,097 million in 2039/40. The public contribution also decreases from 45 per cent to 32 per cent over the period.

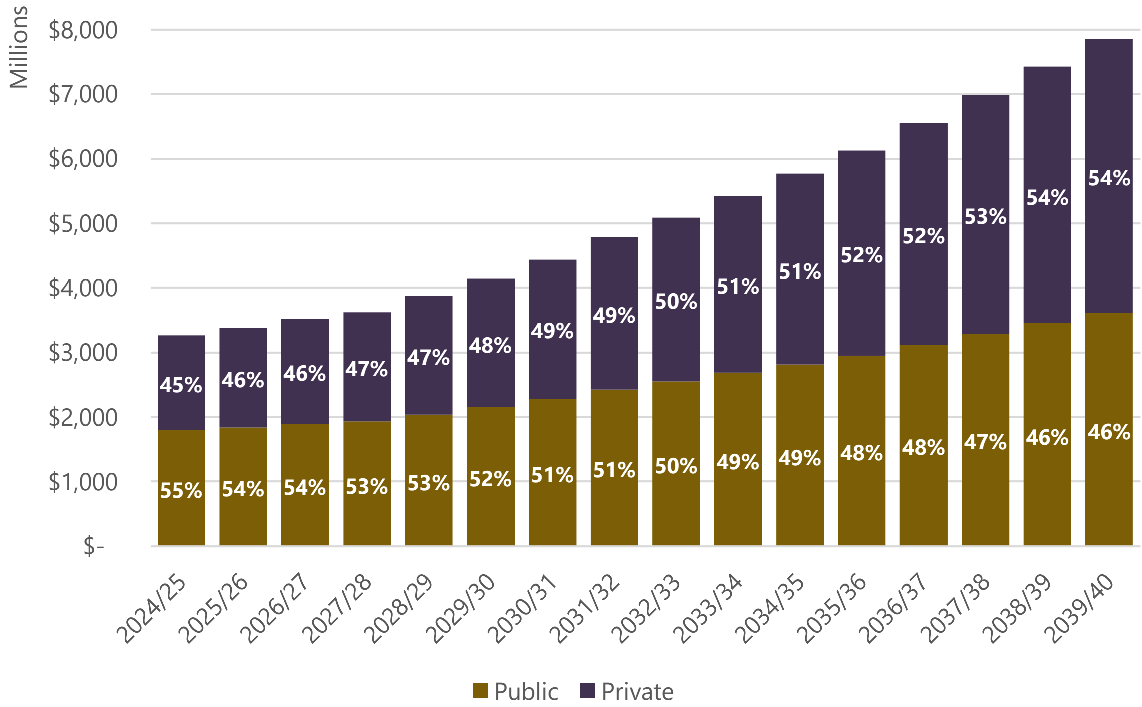
Figure 29: Scenario 2 fiscal cost forecasts



Scenario 3 fiscal cost forecasts

Scenario 3 is the five-year trend demand, high bed price, and status quo public/private funding allocation. Costs grow from $3,262 million in 2024/25 to $7,863 million in 2039/40. The public contribution also decreases from 55 per cent to 46 per cent over the period.

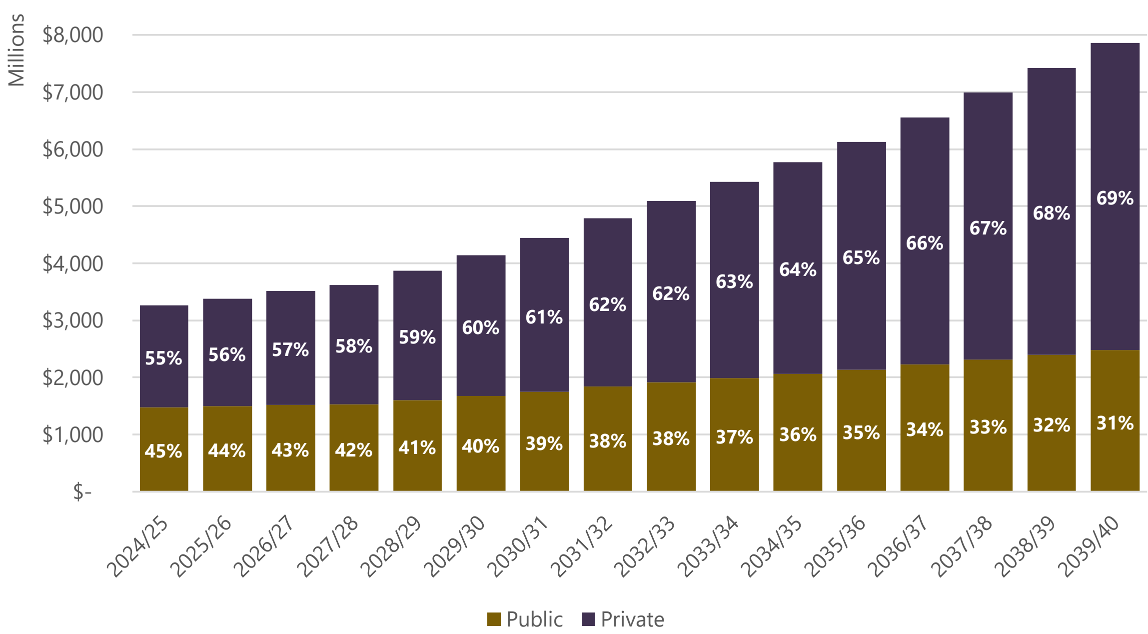
Figure 30: Scenario 3 fiscal cost forecasts



Scenario 4 fiscal cost forecasts

Scenario 4 is the five-year trend demand, high bed price, and option 1 public/private funding allocation. Costs grow from $3,262 million in 2024/25 to $7,863 million in 2039/40. The public contribution also decreases from 45 per cent to 31 per cent over the period.

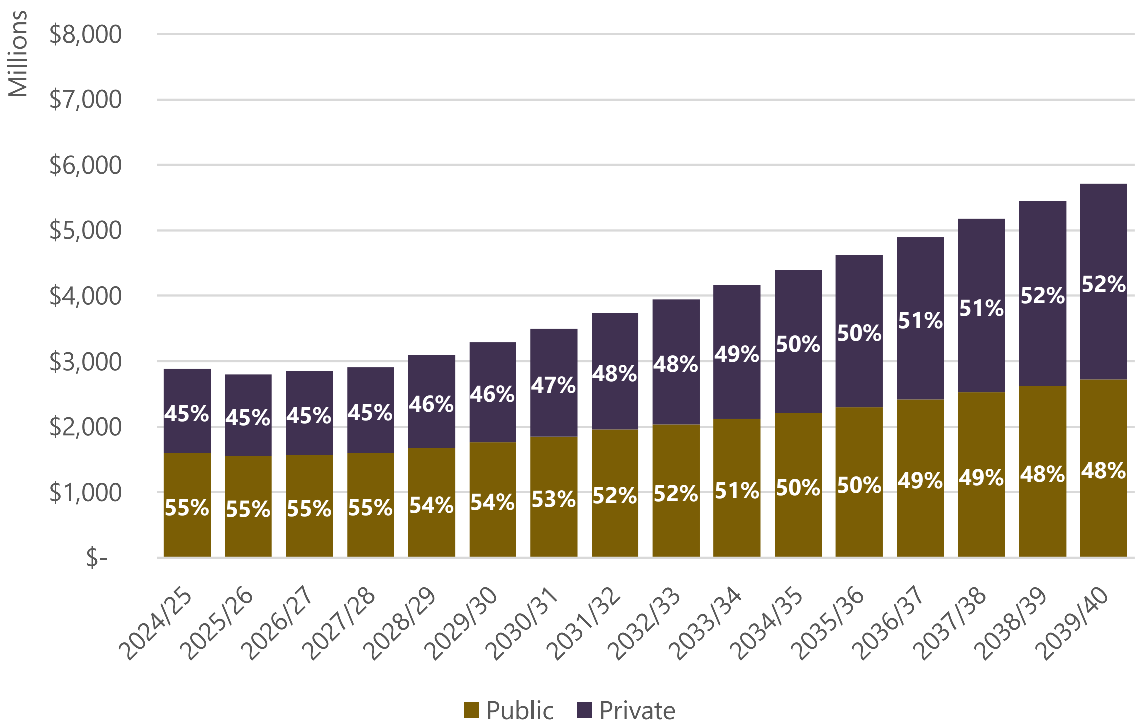
Figure 31: Scenario 4 fiscal cost forecasts



Scenario 5 fiscal cost forecasts

Scenario 5 is the substitution demand, low bed price, and status quo public/private funding allocation. Costs grow from $2,886 million in 2024/25 to $5,719 million in 2039/40. The public contribution also decreases from 55 per cent to 48 per cent over the period.

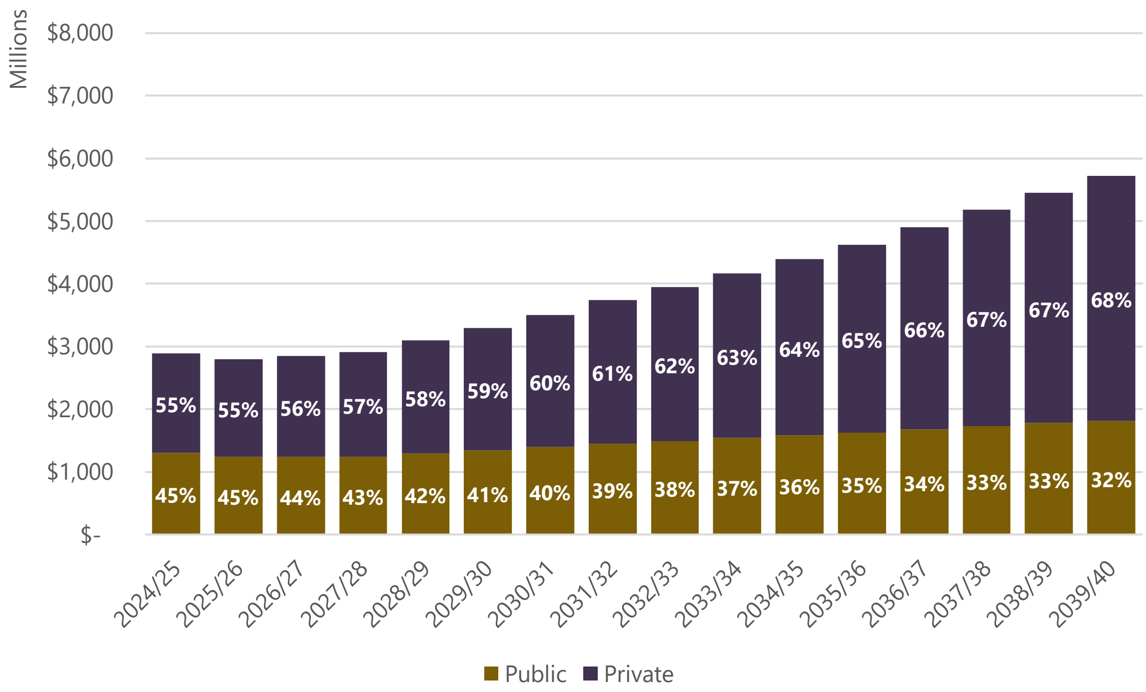
Figure 32: Scenario 5 fiscal cost forecasts



Scenario 6 fiscal cost forecasts

Scenario 6 is the substitution demand, low bed price, and option 1 public/private funding allocation. Costs grow from $2,886 million in 2024/25 to $5,719 million in 2039/40. The public contribution also decreases from 45 per cent to 32 per cent over the period.

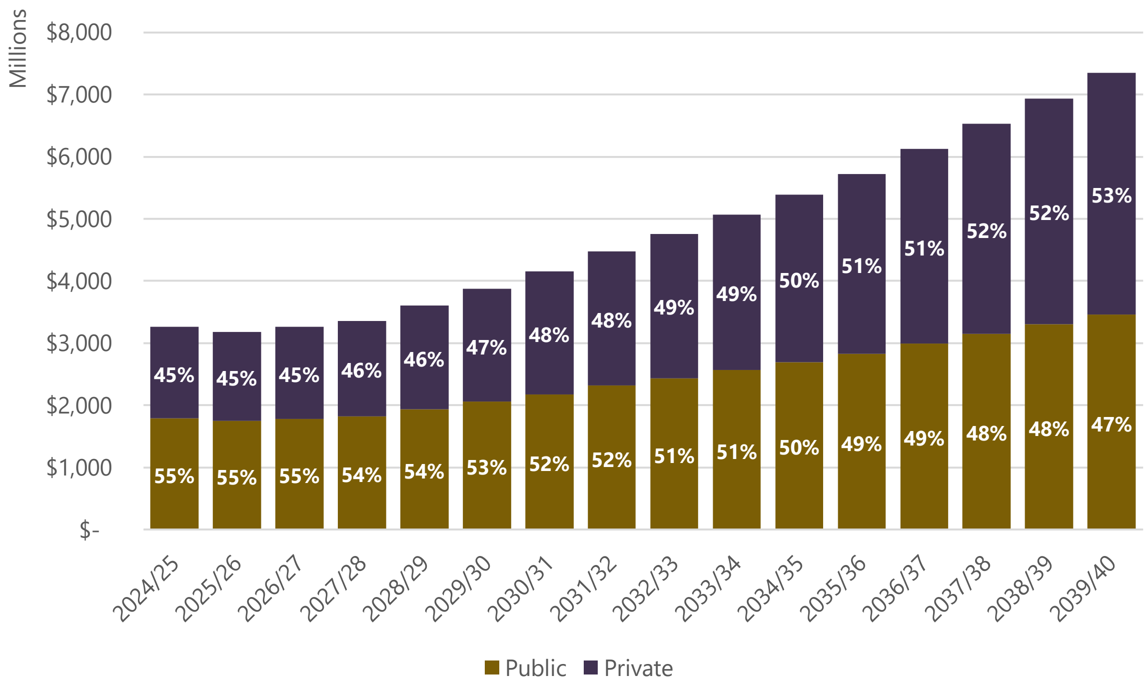
Figure 33: Scenario 6 fiscal cost forecasts



Scenario 7 fiscal cost forecasts

Scenario 7 is the substitution demand, high bed price, and status quo public/private funding allocation. Costs grow from $3,262 million in 2024/25 to $7,345 million in 2039/40. The public contribution also decreases from 55 per cent to 47 per cent over the period.

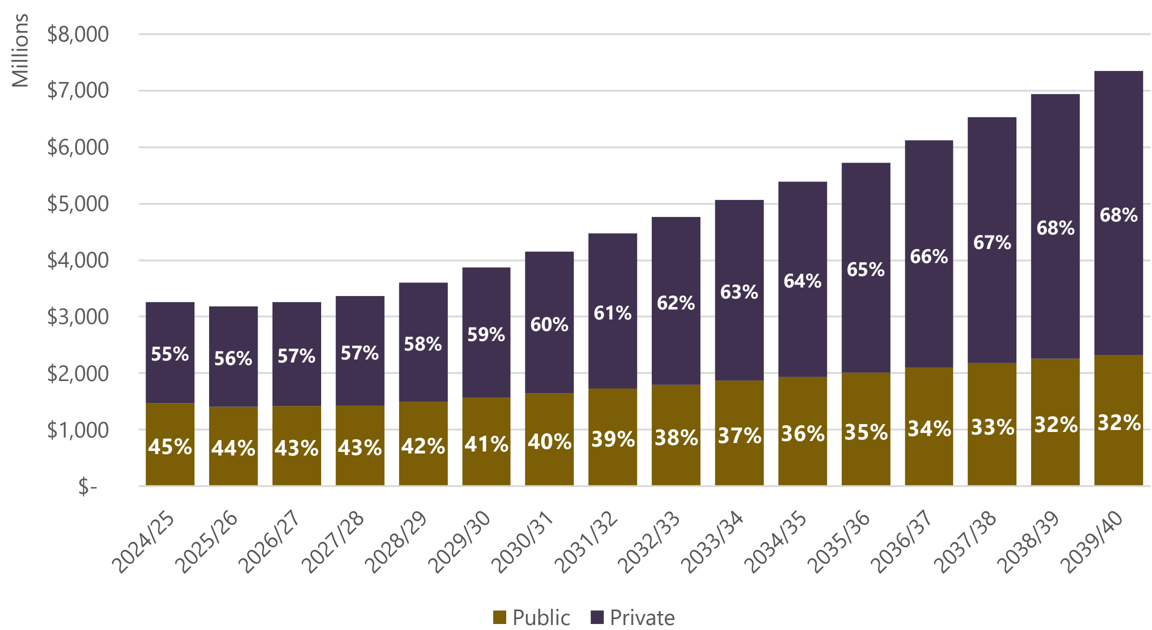
Figure 34: Scenario 7 fiscal cost forecasts



Scenario 8 fiscal cost forecasts

Scenario 8 is the substitution demand, high bed price, and option 1 public/private funding allocation. Costs grow from $3,262 million in 2024/25 to $7,345 million in 2039/40. The public contribution also decreases from 45 per cent to 32 per cent over the period.

Figure 35: Scenario 8 fiscal cost forecasts



5. Fiscal cost forecast for home and community support services

Our fiscal cost forecast for HCSS considers two scenarios, *optimal (or referred to as scenario 2),* and *status quo,* which we have used in our HCSS demand modelling in section 2. To recap, definitions of these two scenarios are:

Optimal: reflects a HCSS shift to a nationwide adoption of a case-mix model, a shift of lower-acuity receiving support in HCSS instead of ARC, and the removal of 1A-2B clients from HCSS.

Status quo: is the *do-nothing* scenario which considers no reduction in hours in fee-for-service districts, low-acuity residents remaining in ARC, and 1A-2B clients continuing to receive HCSS in all districts.

Relevant assumptions for the fiscal analysis for the two scenarios are stated in Table 30.

Table 30: Assumptions for fiscal the modelling of the scenarios optimal and status quo

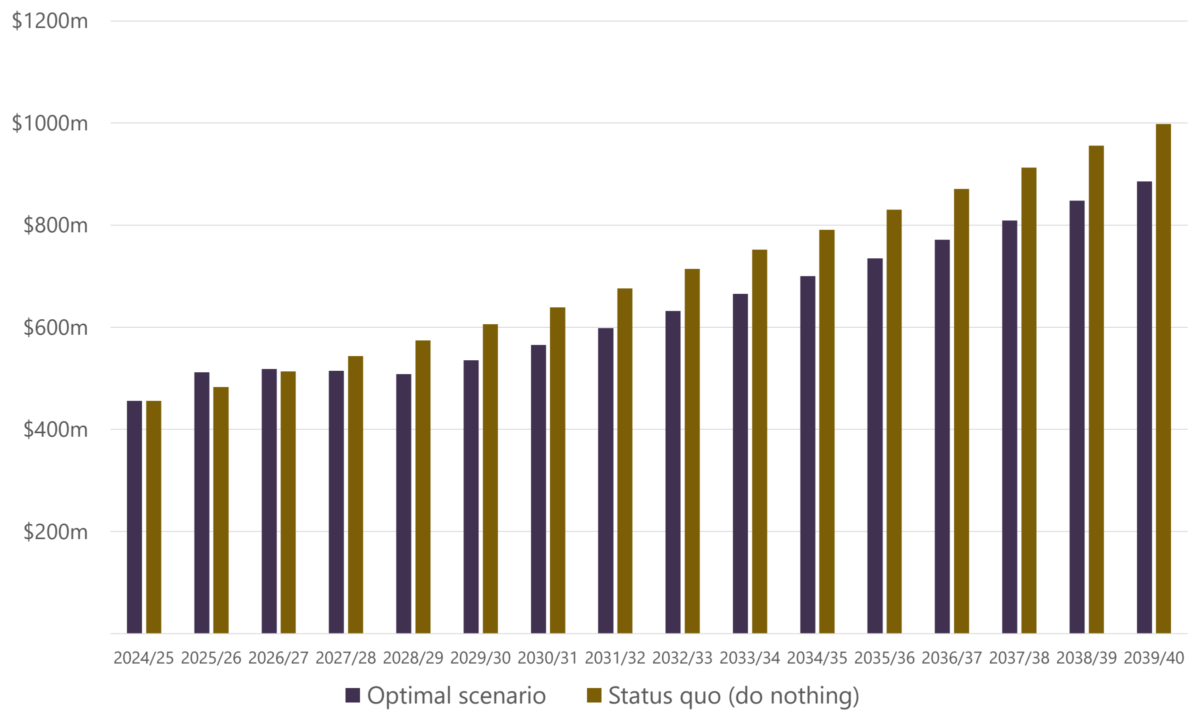
	Optimal	Status Quo
Hours	Computed annual hours correspond to scenario 2 modelled in section 2 (see Figure 20).	Computed annual hours correspond to the status quo scenario modelled in section 2 (see Figure 20).
	A cost model developed by the Settlement Party Action Group (SPAG) in 2019-20, and updated by sector participants, provides a basis for establishing a consistent hourly rate that could be adopted in current fee-for-service districts under a shift to case-mix. The hourly rate from 1 July 2023 was $50.61, and we assume an uplift of 2.09%[25] annually, mostly accounting for increases in wages.	Fee-for-service districts do not observe efficiency gains as the current funding model is maintained.
Funding	Total estimated funding in current case-mix districts is a function of population-driven demand growth (see Table 13) and inflation-driven price growth.	Total estimated funding in <u>all</u> districts is a function of population-driven demand growth (see Table 13) and inflation-driven price growth.

[25] 2.09 per cent is equal to the Labour Cost Index (LCI) long-run estimate (see section 3).

Supporting low needs in HCSS instead of ARC	The SPAG rate is applied to the additional HCSS hours required from supporting low-acuity individuals in HCSS instead of ARC.	*Not applicable*
IBT	*Same for both scenarios:* IBT data for 2022/23 is used as the baseline. Total IBT cost = $133,856,147, IBT trips = 13,061,580, average cost per trip = $10.40, total IBT hours = 974,430[26].	
IBT growth	*Same for both scenarios:* the number of annual in-between travel (IBT) trips increases in proportion to the expected increase in HCSS hours. IBT cost per trip increases by 1.5%[27] annually as we assume the wage component increases while the mileage component remains constant.	

Figure 36 shows the fiscal cost forecast for HCSS for the two scenarios based on the predicted HCSS care hours and excluding IBT costs.

Figure 36: HCSS fiscal cost forecast (excl. IBT)



[26] From IBT data updated 20/11/2023 – Sapere.

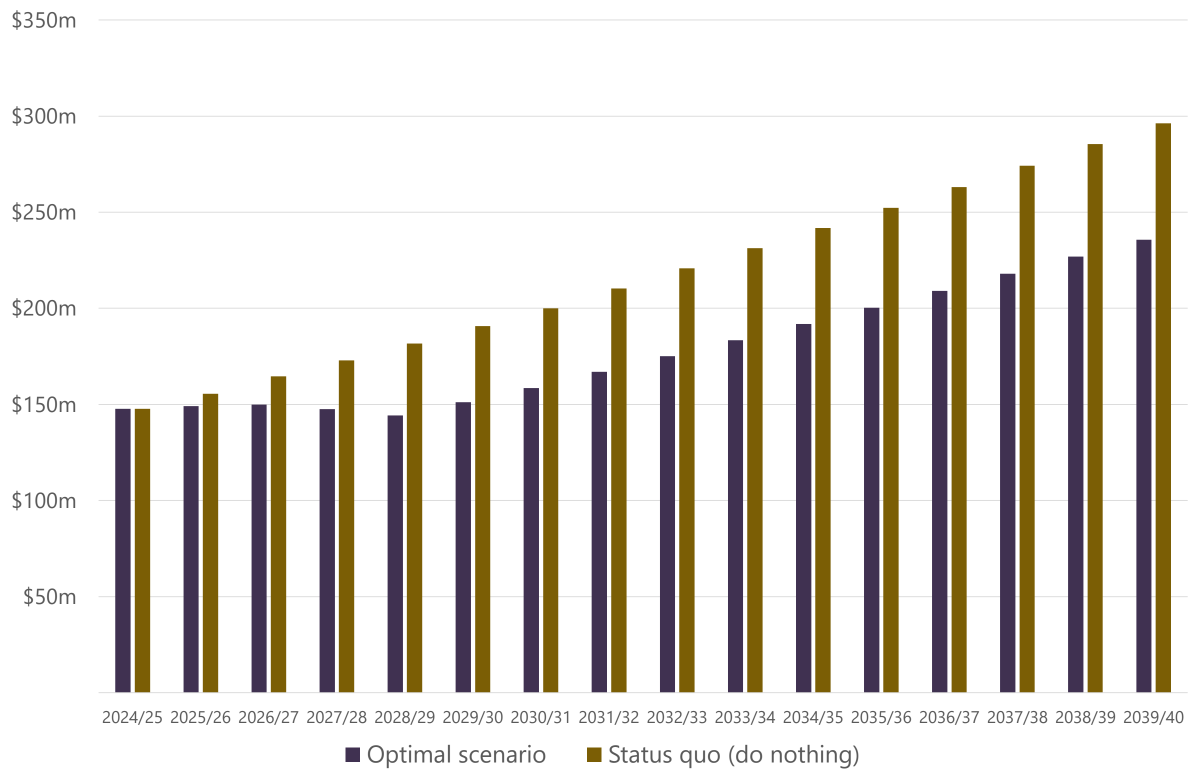
[27] We estimated that the mileage component accounts for approximately 28 per cent of total IBT costs (from IBT data updated 20/22/2023 – Sapere). We assume that the remaining 72 per cent increases in line with the LCI and the 28 per cent mileage component remains fixed, we estimate that IBT cost per trip will increase by 1.5 per cent annually. The assumption was provided by experts.

For the optimal scenario, we predict higher initial costs and a subsequent decrease of costs from 2026/27 to 2028/29. The prediction reflects the costs of transitioning from a fee-for-service to a case-mix model nationwide. Providers reach a steady state in 2028/29 when they are assumed to have optimised their services.[28] Thereafter, fiscal costs in the optimal scenario rise in line with population-driven demand growth and inflation-driven price growth.

The status quo scenario shows a linear fiscal cost growth and exceeds the predicted fiscal cost in the optimal scenario from 2027/28 onward. Fiscal costs in the status quo scenario are driven by demand growth and inflation-driven price growth. By 2039/40, we predict a fiscal cost differential between the optimal scenario and the status quo of $112 million. The total cost differential between both scenarios across the entire period is $1,061 million.

Figure 37 shows estimated IBT costs in both scenarios, excluding the predicted hours for HCSS care.

Figure 37: Estimated IBT costs[29]



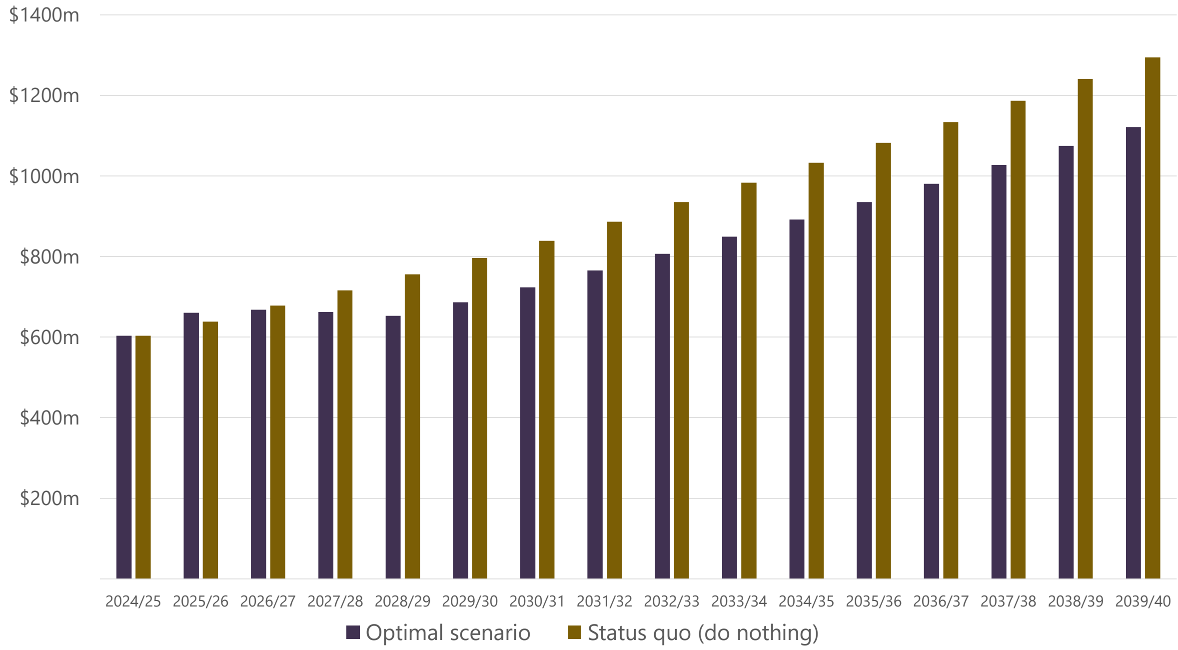
IBT costs are higher in the status quo scenario because total IBT fiscal costs are assumed to grow in proportion to HCSS hours. Under the status quo, IBT hours and associated costs are higher as there are no efficiency gains from shifting fee-for-service to case-mix. By 2039/40, we predict an IBT cost differential between the optimal scenario and the status quo of $61 million. The total cost differential

28 Assumptions around service optimisation requiring lower funding should be interpreted with caution, as forecasting a three-year optimisation phase and reduction in overall hours and funding does not necessarily justify immediate funding cuts. Our forecasts provide indicative figures based on several assumptions, and further engagement and analysis may be necessary before setting bulk-funding contracts under a national shift to case-mix.

29 IBT costs exclude Whaikaha payments.

between both scenarios across the entire period is $633 million. Figure 38 shows the total fiscal forecast for HCSS, combining the estimated hourly costs with the IBT costs.

Figure 38: HCSS fiscal cost forecast (incl. IBT)



Under the optimal scenario, we predict that total fiscal HCSS costs rise from $603 million in 2024/25 to $1,121 million in 2039/40. Alternatively, under the status quo we anticipate total HCSS costs to rise to $1,294 million in 2039/40. The total cost differential between both scenarios across the entire period is $1,694 million. Despite the additional demand from supporting low-needs individuals in HCSS instead of ARC, we predict 11.4 per cent lower aggregate HCSS costs under the optimal scenario relative to the status quo from 2024/25 to 2039/40.

Supply forecast for home and community support services

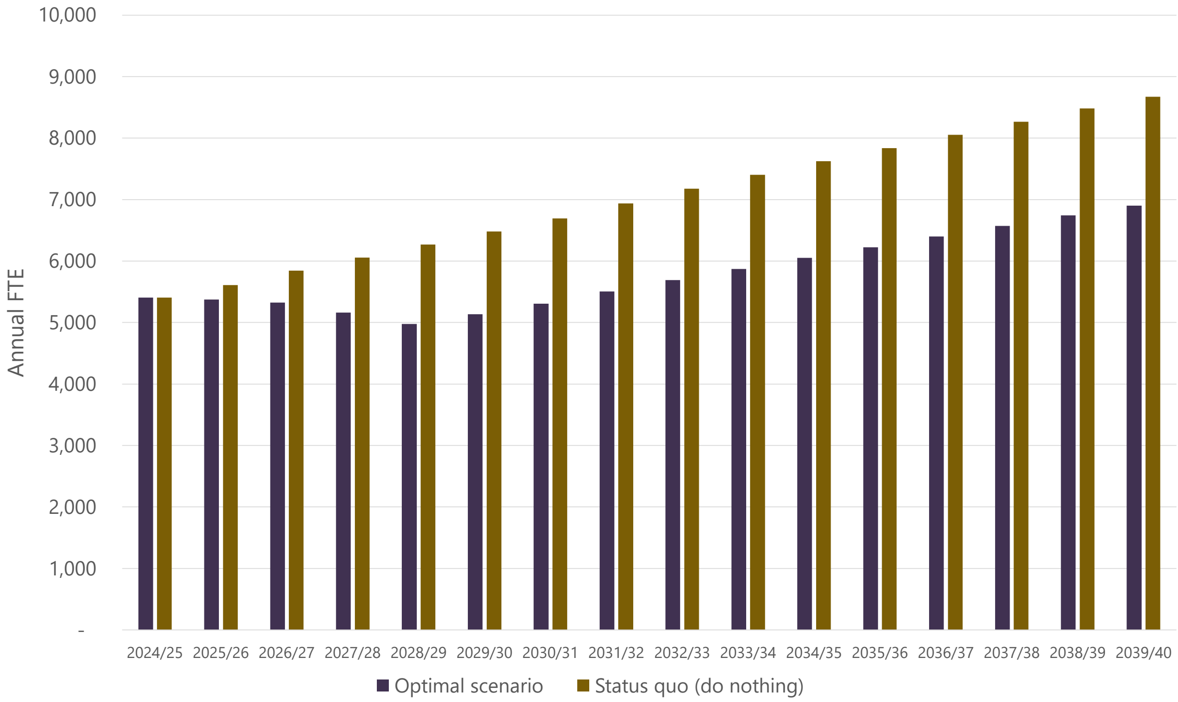
We model the supply forecast for HCSS using care hours for the respective optimal and status quo scenarios (see section 2, Figure 20) as well as IBT hours to estimate the annual FTE required for delivering client-facing elements of care. The calculation for estimating required FTE is as follows:

$$Annual\ FTE = (care\ hours + IBT\ hours)\ /\ 40\ /\ 48$$

We assume one FTE corresponds to a 40-hour work week, 48 weeks of the year. Total care hours for all scenarios are shown in Figure 20, and we assume total IBT hours increase in proportion to HCSS volume growth (see Table 30). Figure 39 shows the estimated annual FTE required under the optimal and status quo scenario. The changes in FTE over time in both scenarios are explained by the drivers of the predicted HCSS hours which we discussed above.

We predict that by 2039/40, a total FTE of 6,901 in the optimal scenario and 8,674 in the status quo is required for HCSS. The total difference between FTEs between both scenarios and from 2024/25 to 2039/40 is 20,164.

Figure 39: Estimated annual FTE required for HCSS[30]



[30] Note that annual FTE will not necessarily correspond to the total required workforce, as support workers may have contracts outside of Health New Zealand.

6. Whole system cost forecast of aged care services

In our whole system cost of aged care services analysis, we combine the total cost forecast (consisting of public or fiscal cost and private cost) for ARC and HCSS under three scenarios. The scenarios were used in the previous two sections for the separate fiscal cost analyses of ARC and HCSS. Table 31 summarises the combined assumptions for each scenario.

Table 31: Whole system cost of aged care services – parameters and scenarios

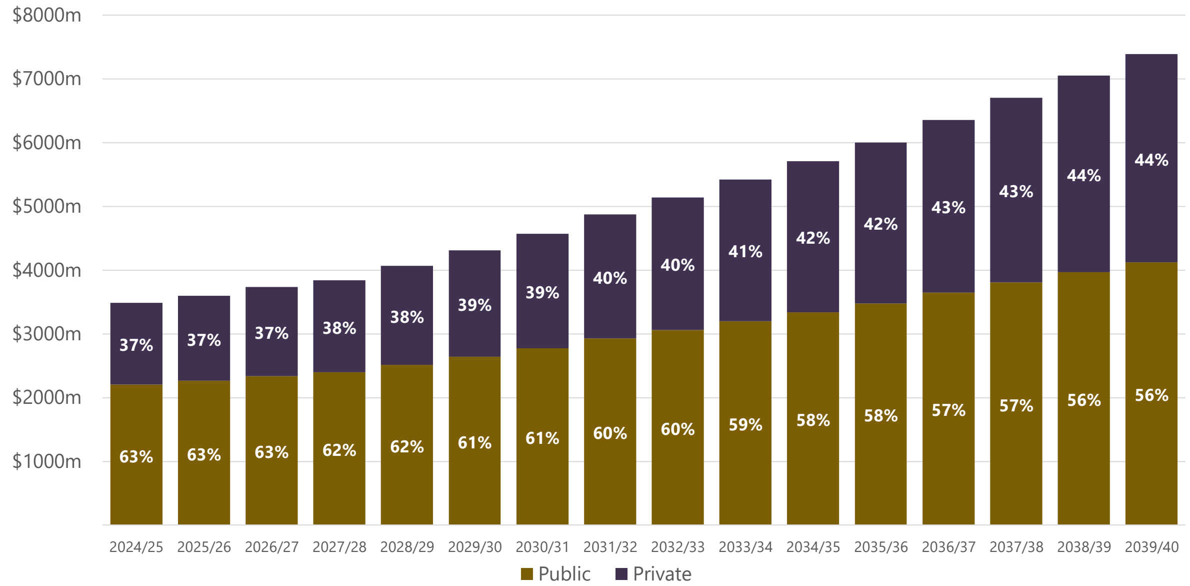
Assumptions	Scenarios		
	Status quo	Enhanced 1.0	Enhanced 2.0
ARC: cost	Low bed price (base case)	Low bed price (base case)	High bed price
ARC: funding allocation	**Status quo**: public/private allocation remains unchanged	**Option 1**: Remove maximum contribution: non-subsidised residents pay the higher care fee	**Option 1**: Remove maximum contribution: non-subsidised residents pay the higher care fee
ARC: demand	Five-year trend	Five-year trend + supporting ARC low acuity individuals in HCSS	Five-year trend + supporting ARC low acuity individuals in HCSS
HCSS: demand	**Status quo**: fee-for-service districts keep the current funding model, 1A-2B clients continue to receive HCSS nationally	**Optimal**: shift from fee-for-service to case-mix + removal of 1A-2B clients + additional hours from supporting ARC low acuity individuals in HCSS	**Optimal**: shift from fee-for-service to case-mix + removal of 1A-2B clients + additional hours from supporting ARC low acuity individuals in HCSS

The status quo scenario models the current state for both ARC and HCSS. The enhanced 1.0 scenario includes the following assumptions modelled in sections 1-5:

- maintaining the base case (lower) uplift to ARC bed prices (as in the status quo)
- removing the maximum contribution in ARC, which leads to non-subsidised residents paying the higher care fee
- shifting demand of low needs residents from ARC to HCSS
- transitioning current fee-for-service districts to case-mix (HCSS)
- removing 1A-2B clients from HCSS.

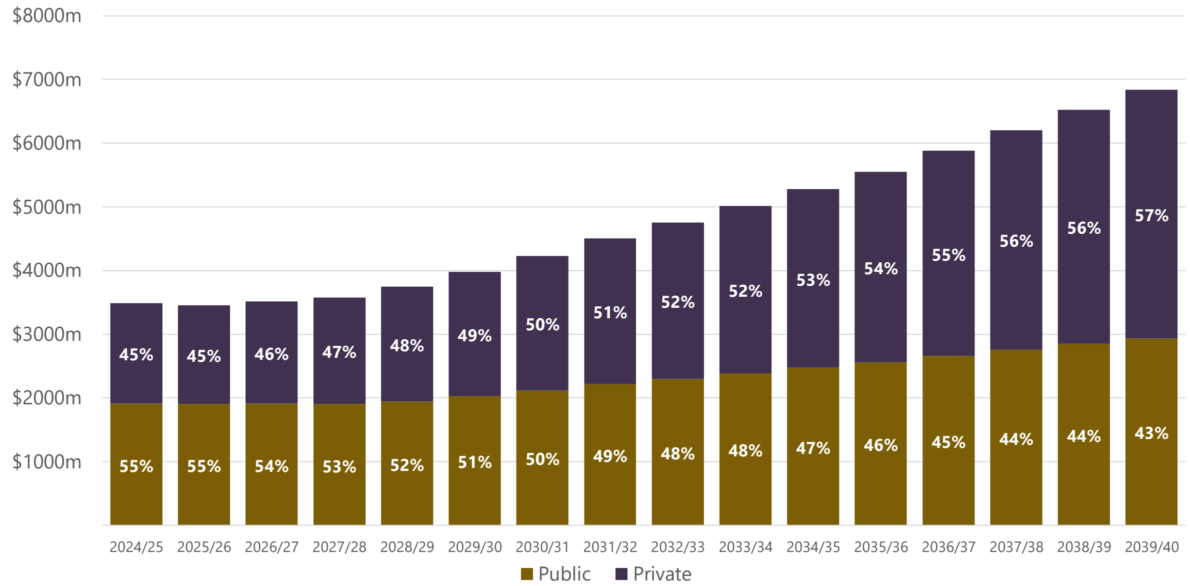
The enhanced 2.0 scenario considers the higher uplift to ARC bed prices and the remaining assumptions in the enhanced 1.0 scenario. Figure 40 shows the estimated whole system costs of aged care services from 2024/25 to 2039/40 under the status quo.

Figure 40: Whole system cost of aged care services – status quo



The total whole system cost of aged care services rises from $3,489 million in 2024/25 to $7,391 million in 2039/40 under the status quo. The public share (fiscal cost) of total costs reduces from 63 per cent in 2024/25 to 56 per cent in 2039/40.[31] We estimate aggregate total whole system cost of $82,269 million during this period. Figure 41 shows the estimated whole system cost of aged care services from 2024/25 to 2039/40 under the enhanced 1.0 scenario.

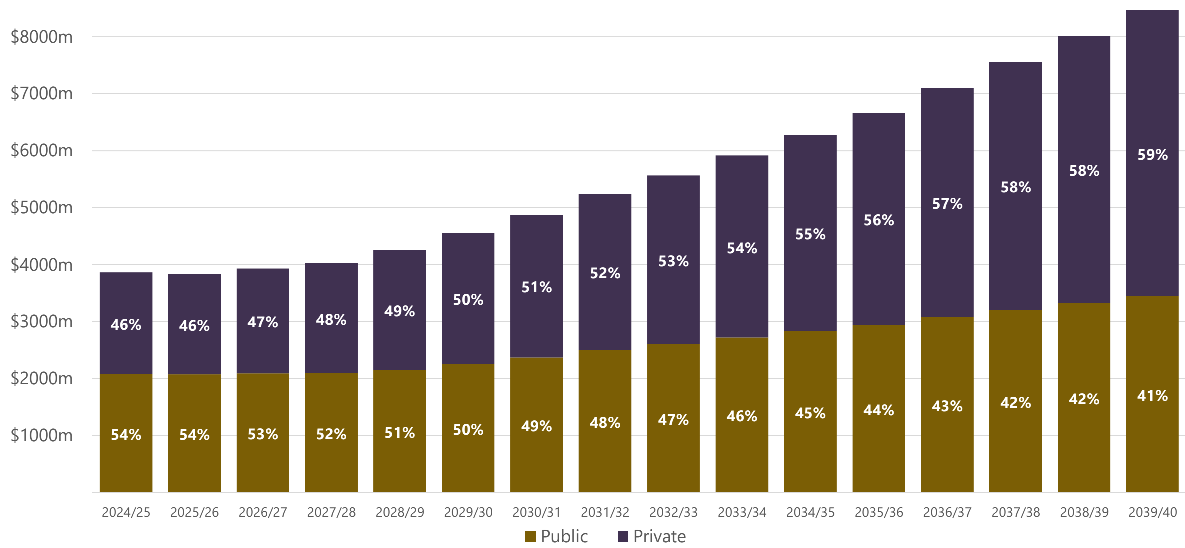
Figure 41: Whole system cost of aged care services – enhanced 1.0 scenario



[31] The private share of total aged care costs corresponds to private payments in ARC from residents who are non-subsidised. HCSS is publicly funded.

Total costs rise from $3,489 million in 2024/25 to $6,841 million in 2039/40 in the enhanced 1.0 scenario. The public share (fiscal cost) of total costs decreased from 55 per cent in 2024/25 to 43 per cent in 2039/40. We estimate aggregate costs of $76,544 million during this period. Figure 42 shows the estimated whole system costs of aged care services from 2024/25 to 2039/40 under the enhanced 2.0 scenario.

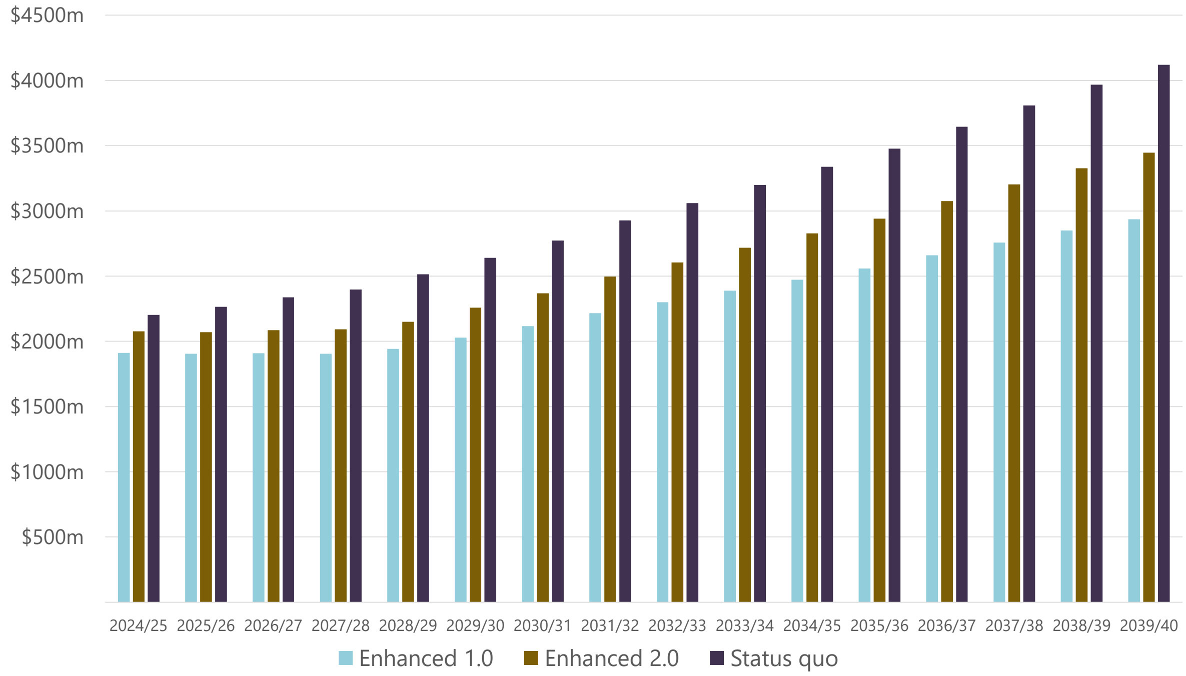
Figure 42: Whole system cost of aged care services – enhanced 2.0 scenario



The total whole system cost rise from $3,865 million in 2024/25 to $8,466 million in 2039/40 in the enhanced 2.0 scenario. The public share (fiscal cost) of total costs decreases from 54 per cent in 2024/25 to 41 per cent in 2039/40. We estimate aggregate costs of $90,144 million during this period.

Figure 43 shows the estimated annual fiscal (public) whole system cost of aged care services in each scenario from 2024/25 to 2039/40.

Figure 43: Fiscal whole system cost of aged care services



These results indicate that shifting fee-for-service districts to case-mix, removing 1A-2B clients in HCSS, supporting low-needs residents into HCSS instead of ARC and removing the maximum contribution may lead to significant fiscal savings. The estimated total whole system costs are higher in the enhanced 2.0 scenario relative to the status quo due to higher bed prices, but the public component is lower due to the removal of the maximum contribution for non-subsidised ARC residents. Table 32 shows the total and fiscal cost of aged care services for each scenario in 2024/25 and 2039/40.

Table 32: Whole system cost of aged care services

($ Million)	2024/25				2039/40		
	Total cost	Fiscal cost	Public contribution		Total cost	Fiscal cost	Public contribution
Status quo	$3,489	$2,202	63%		$7,391	$4,120	56%
Enhanced 1.0	$3,489	$1,911	55%		$6,841	$2,936	43%
Enhanced 2.0	$3,865	$2,077	54%		$8,466	$3,446	41%

By 2039/40, we estimate fiscal savings to exceed $1 billion annually when comparing the enhanced 1.0 scenario to the status quo. Both scenarios consider the base case (lower) uplift to ARC bed prices. In the enhanced 2.0 scenario, we anticipate annual fiscal savings of $510 million by 2039/40 relative to the status quo despite a higher uplift to ARC bed prices.

Overall, we estimate aggregate fiscal costs of aged care services of $48,673 million under the status quo between 2024/25 and 2039/40. In the same period, we estimate aggregate fiscal costs of aged care services of $36,850 million and $41,740 million for the enhanced 1.0 and enhanced 2.0 scenarios, respectively. We estimate aggregate fiscal savings of $11,823 million under the enhanced 1.0 scenario, and $6,934 million under the enhanced 2.0 scenario, relative to the status quo.

References

Ansell Strategic. (2023). *New Zealand Aged Residential Care Financial Performance Study—Summary o Findings Document*. https://s3.ap-southeast-2.amazonaws.com/assets.ansellstrategic.com.au/app/uploads/2023/10/13071435/New-Zealand-Aged-Residential-Care-Financial-Performance-Study-Summary-of-Findings.pdf

Berk, J., & DeMarzo, P. (2024). *Corporate Finance* (6th ed.). Pearson.

Ernst & Young. (2019). *Aged residential care funding model review*. [Wellington] : Central Region's Technical Advisory Services Limited, [2019]. https://natlib.govt.nz/records/44822161

Grant Thornton. (2010, September). *Aged Residential Care Service Review*. https://nzaca.org.nz/wp-content/uploads/2020/03/ARSCR-Full-Report.pdf

Hales, C., Amankwaa, I., Gray, L., & Rook, H. (2020a). Providing care for older adults with extreme obesity in aged residential care facilities: An environmental scan. *Nursing Praxis in Aotearoa New Zealand*, *36*(3), 24–36. https://doi.org/10.36951/27034542.2020.012

Hales, C., Amankwaa, I., Gray, L., & Rook, H. (2020b). Providing care for older adults with extreme obesity in aged residential care facilities: An environmental scan Te manaaki i ngā tūroro taikaumātua tino mōmona i roto i ngā whare noho mō te kaumātua: He karapa taiao. *Nursing Praxis in New Zealand Inc*, *36*, 24–36. https://doi.org/10.36951/27034542.2020.012

Holdaway, M., Wiles, J., Kerse, N., Wu, Z., Moyes, S., Connolly, M. J., Menzies, O., Teh, R., Muru-Lanning, M., Gott, M., & Broad, J. B. (2021). Predictive factors for entry to long-term residential care in octogenarian Māori and non-Māori in New Zealand, LiLACS NZ cohort. *BMC Public Health*, *21*(1), 34. https://doi.org/10.1186/s12889-020-09786-z

Jamieson, H., Abey-Nesbit, R., Bergler, U., Keeling, S., Schluter, P. J., Scrase, R., & Lacey, C. (2019). Evaluating the Influence of Social Factors on Aged Residential Care Admission in a National

Home Care Assessment Database of Older Adults. *Journal of the American Medical Directors Association*, *20*(11), 1419–1424. https://doi.org/10.1016/j.jamda.2019.02.005

New Zealand Infrastructure Commission. (2023). *Urban land prices—A progress report*. New Zealand Infrastructure Commission / Te Waihanga. https://tewaihanga.govt.nz/media/rmugllsi/urban-land-prices.pdf

Parsons, M., Parsons, J., & Rouse, P. (2019). *Moving forwards with the interRAI Long Term Care Facility (LTCF) New Zealand adapted Case-mix tool*. Bupa Health Foundation, Bupa New Zealand and The University of Auckland.

Schluter, P. J., Abey-Nesbit, R., Ahuriri-Driscoll, A., Bergler, H. U., Broadbent, J. C., Glanville, M., Keeling, S., & Jamieson, H. A. (2022). Carer distress among community living older adults with complex needs in the pre- and post-COVID-19 era: A national population study. *Scientific Reports*, *12*(1), 19697. https://doi.org/10.1038/s41598-022-24073-0

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