



Ministry of Social Development

Social Outcomes Modelling – 2022 Results

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IDI disclaimer:

Access to the data used in this study was provided by Stats NZ under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. The results presented in this study are the work of the authors, not Stats NZ or individual data suppliers.

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit <https://www.stats.govt.nz/integrated-data/>

The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.

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1 Executive summary

The purpose of this report is to provide information to the Ministry of Social Development (MSD) about long-term trends in benefit and public housing dynamics, offering insight into how the benefit and public housing systems are changing over time.

This report uses the Social Outcomes Model (the Model) to provide a view of how people move into, through, and out of the benefit and public housing systems, and their interactions across government services. In this way, the Model estimates future service use for the population of New Zealand, based on past experience and future economic assumptions. A summary of the Model is set out in Appendix C of this report. There is also a separate full technical report describing the full workings of the Model.

The Model is developed inside the Stats NZ Integrated Data Infrastructure (IDI). The IDI is a large research database which holds administrative data about people's life events like education, income, benefits, migration, justice, and health. The data comes from government agencies, Stats NZ surveys, and non-government organisations, and is linked together and de-identified. Further information about the IDI can be found on the Stats NZ website.

For this report, the Model takes data available up to 30 September 2022. In doing so, it builds on the experience of people seen in the pre-COVID-19 period, as well as the period since the pandemic started. The future economic assumptions used in the Model are those provided by The Treasury in their 2022 Half Year Economic and Fiscal Update (HYEFU 2022). All assumptions used in the Model are set out in the 2022 Social Outcomes Modelling Technical Report.

Through the findings outlined in this report, the Model shows the future outcomes we may expect to see, if current policy and social settings remain unchanged and economic forecasts hold true.

A glossary of terms and acronyms are set out in Appendix A of this report.

The outputs from the Model are not official statistics, and due to the range of data used, the numbers in this report may not match to official figures.

The rest of this summary is split into three sub-sections:

- Core benefit and public housing system results
- Focus areas:
 - Results by region
 - Results for disabled people
 - Future time in employment
- Key questions raised by the modelling results that warrant further investigation.

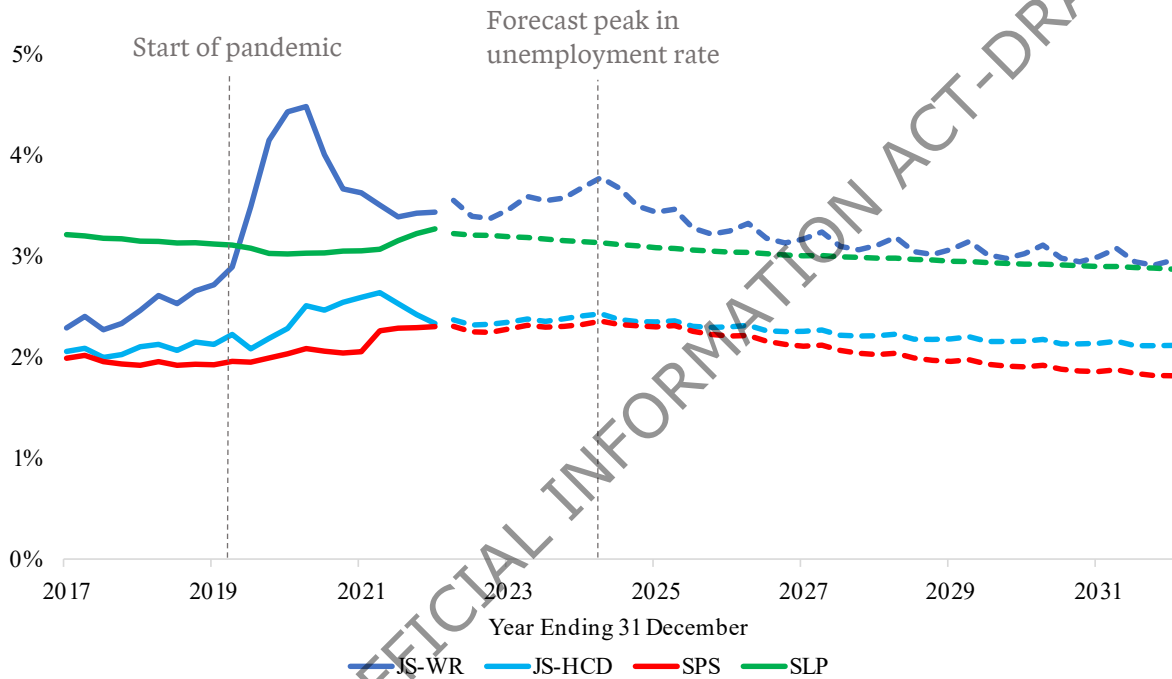
1.1 Core benefit and public housing system results

Forecast deterioration in labour market conditions will place pressure on the system

Treasury’s Half-Year Economic and Fiscal Update 2022 forecasts labour market conditions to deteriorate through 2023 and 2024, with the unemployment rate forecast to reach a peak of 5.5% by mid-2024. Coupled with pre-pandemic trends (particularly decreasing rates of people exiting JS-WR and SPS), this would result in significantly more people on benefit than pre-pandemic and place pressure on the system – see Figure 1.1.

For example, the proportion of the working-age population on JS-WR is estimated to reach a peak of 3.8% in 2024, compared with 2.3% in 2017.

Figure 1.1 – Actual and estimated proportion of 16-65-year-old population supported by main benefits



This has operational implications and consequences for clients:

- Increased pressure on frontline resources and increasing need for intensive/specialist services from an increasing number of clients. The modelling provides detailed demand estimates to support resource planning.
- Increasing number of clients with severely limited employment and earnings prospects. The modelling provides detailed estimates of client mix as a signal of demand for specific services, including intensive/specialist services and coordinated cross-agency services.

Increased pressure on the system partly reflects pre-pandemic trends leading to increased average estimated future years on main benefit

Decreasing exit rates, and to a lesser degree increasing re-entry rates, since early 2017 have resulted in average estimated future years on main benefit increasing across most main benefit categories – see Table 1.1. We show 2019 modelling results as a pre-pandemic baseline, given that 2020/21 was significantly impacted by the pandemic.

Table 1.1 – Average estimated future years on main benefit to age 65 by high-level benefit category

Segment		Avg. future years on main benefit			
		2019	2021	2022	
Main Benefits	Youth Benefit	YP/YPP	16.4	20.8	24.0
	Job Seeker	Work Ready	10.5	11.7	13.0
		HCD	11.0	11.8	12.3
		Sub Total	10.8	11.7	12.7
	Sole Parent Support		12.5	15.5	17.0
Supported Living		12.3	12.7	12.7	
NOMB	Supplementary benefits only		2.7	3.4	3.7
Recent Exits	Benefit history within last year		5.5	5.9	6.9
Longer Exits	Benefit history within 1-5 years		2.7	3.1	3.6
	No benefit history within last 5 years		0.8	1.0	1.2
	Sub Total		1.0	1.2	1.4
Total			2.3	2.8	3.0

Comparing 2022 to 2019 shows significant increases:

- 46% for YP/YPP clients, from 16.4 years to 24.0 years
- 23% for JS-WR clients, from 10.5 years to 13.0 years. This is now higher than for JS-HCD clients.
- 11% for JS-HCD clients, from 11.0 years to 12.3 years
- 36% for SPS clients, from 12.5 years to 17.0 years

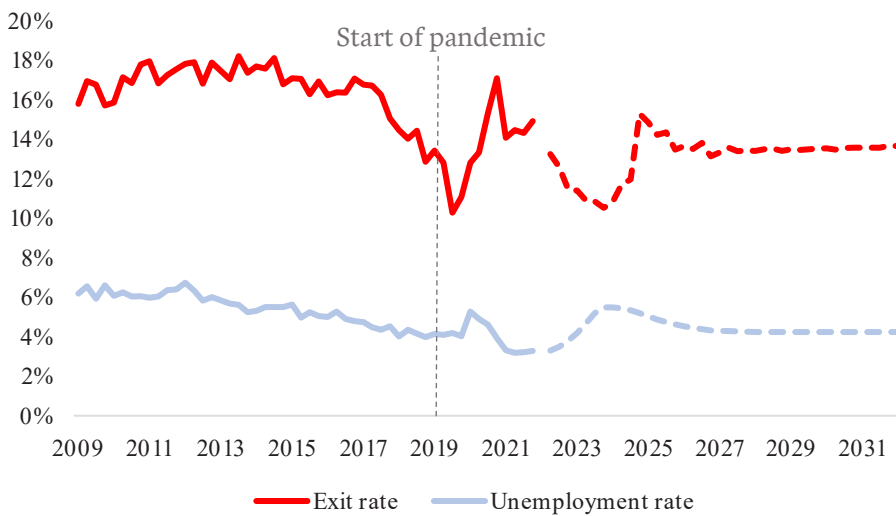
While some of the increase between 2021 and 2022 reflects a forecast deterioration in labour market conditions, the key message is that clients are staying on benefit for longer independent of labour market conditions.

COVID-19 effects on the benefit system have largely dissipated and system dynamics are now similar to the pre-pandemic period

Over 2020 and 2021 the benefit system experienced significant change due to the labour market and financial effects of the pandemic. In particular, an influx of JS-WR clients during 2020 changed the dynamic of the system, with many of these clients having relatively low barriers to employment aside from the pandemic-related labour market effects. Through 2021 and 2022 many of these clients exited the system to employment.

While main benefit client numbers remain higher than pre-pandemic levels, the rates at which people enter and exit the system are now similar to 2019 levels. Figure 1.2 illustrates this. It shows the proportion of people supported by JS-WR who exit main benefit each quarter.

Figure 1.2 – Quarterly exit rates – JS-WR



The public housing system is increasingly rigid, with historically low movements in and out of the system affecting access to public housing and increasing the length of time households spend in public housing

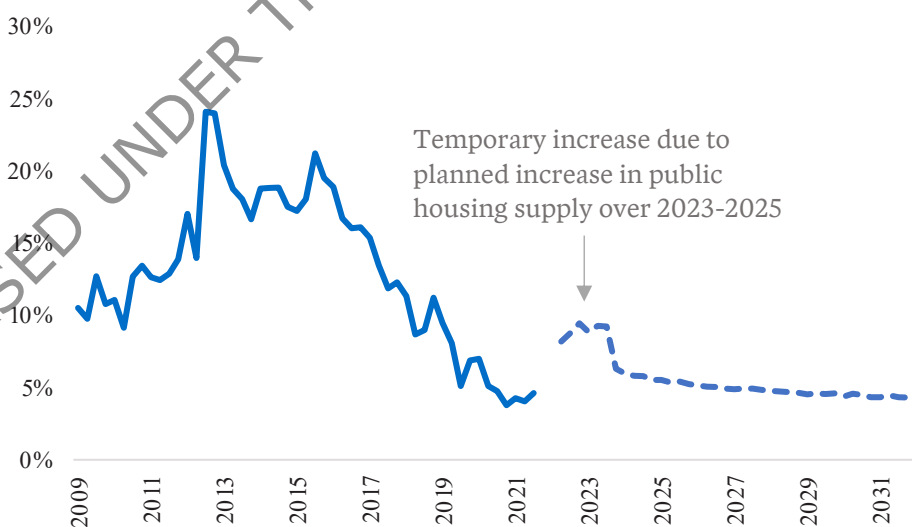
Entry rates to the housing register have approximately doubled in the last 10 years and exit rates from public housing have nearly halved. This has caused a system bottleneck, with wait times on the register increasing significantly (and consequently the number of households on the register) and average estimates of future years in public housing continuing to increase.

This has placed stress on other housing supports, notably emergency housing, and impacted households' access to stable housing, with implications for people's broader wellbeing outcomes.

The proportion of households on the register being housed has fallen significantly and is projected to remain low – see Figure 1.3. This will remain the case without:

- Significant increases in public housing supply
- A significant reduction in the demand for public housing
- Faster movement from public housing into the private housing market.

Figure 1.3 – Proportion of register households housed each quarter



Note that the modelling can be used to develop detailed supply signals (at Territorial Local Authority/Auckland Board level and by number of bedrooms) to help inform decisions about the location and size of new public housing supply.

Table 1.2 shows average estimated future time in public housing for various segments. 2019 estimates are shown as a pre-pandemic baseline, with increases evident across most segments. Particularly for households in public housing who have children.

The public housing system does not tend to change quickly. Reversing increased duration in public housing would require significant change in system dynamics (e.g. the rate at which households exit public housing into the private housing market) and/or underlying factors impacting demand (e.g. housing affordability).

Table 1.2 – Average estimated future years in public housing by high-level housing category

Segment		Ave. future years in public housing			
		2019	2021	2022	
On register	Priority A	8.4	9.0	8.4	
	Priority B and Other	5.9	6.4	6.1	
	Sub total	8.0	8.7	8.3	
IRRS recipients, primary aged <65	Less close / IRRS > \$150	Child in the household	18.1	20.7	20.7
		No child in the household	16.0	17.7	17.2
	Closer / IRRS < \$150	Child in the household	14.4	17.1	17.4
		No child in the household	13.2	15.3	14.9
	Sub total	16.8	19.2	18.9	
IRRS recipients, primary aged >65	IRRS 65+	9.8	10.5	9.9	
Rest of the population	Receiving AS	2.5	2.6	2.4	
	Not receiving AS	0.4	0.4	0.4	
	Sub total	0.5	0.6	0.6	
Total		1.0	1.2	1.2	

Note that average estimates of future years in public housing have decreased for some IRRS recipient segments between 2021 and 2022. This is mainly because of updates to mortality assumptions which increased mortality rates for older ages i.e. not because households are exiting into the private housing market any quicker.

The decrease in average estimated future years in public housing between 2021 and 2022 for households on the register reflects:

- Increasing wait times on the register (median days increased from 182 in September 2021 to 295 in September 2022), reducing the potential future time households can be in a public housing and increasing the likelihood that households exit the register before being housed
- A slight shift in the mix of households on the register towards those not currently receiving AS. These households tend to exit at a faster rate once placed in public housing.

1.2 Focus areas

This year, we have included reporting on three focus areas:

- Results by region
- Results for disabled people
- Future time in employment.

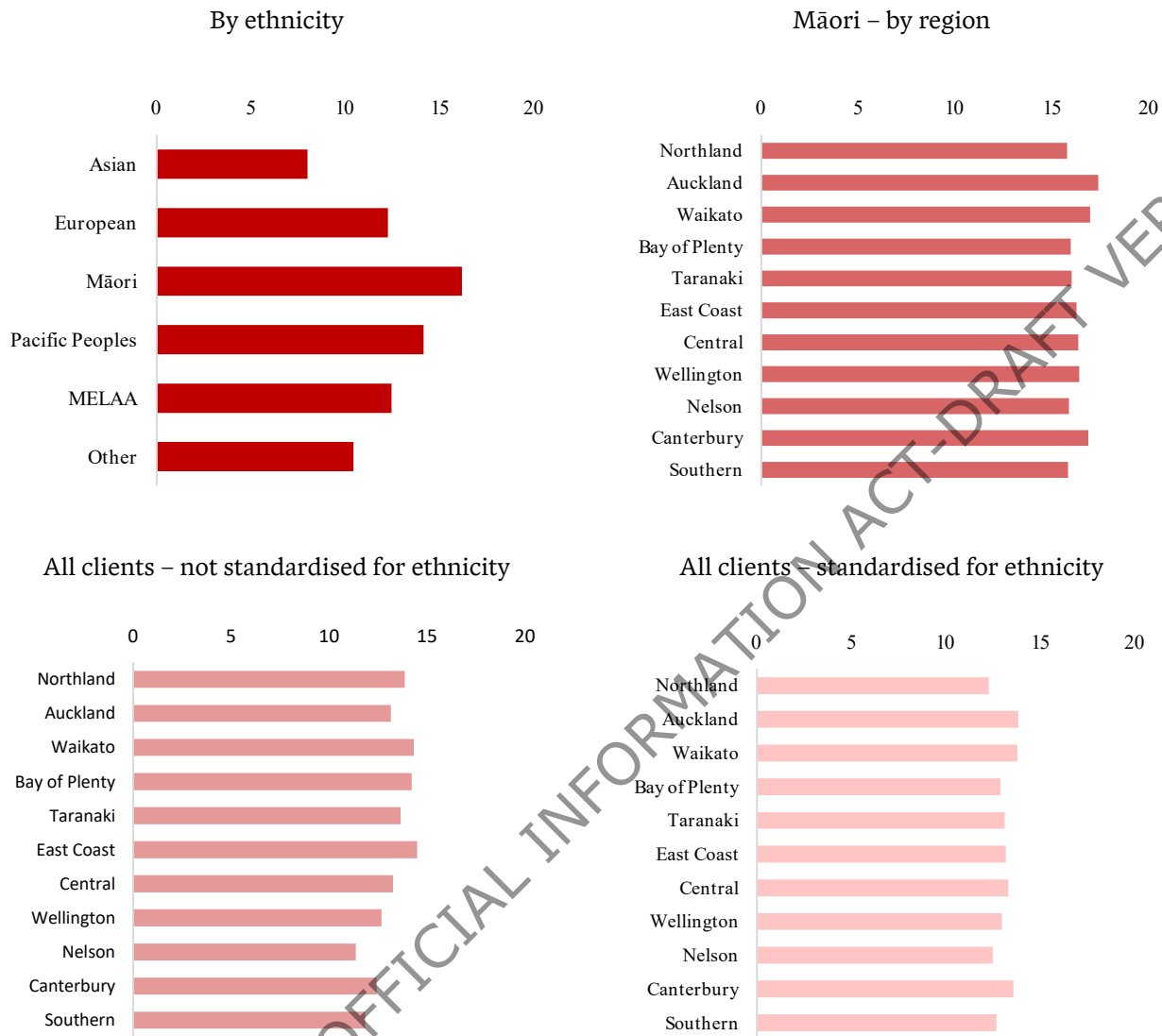
1.2.1 Results by region

When we control for ethnicity, there is very little variation in average estimated future years on main benefit by region

In Figure 1.4 we show average estimated future years on main benefits for JS-WR clients:

- By ethnicity for all clients – This clearly shows significant variation. Note that this figure shows ethnicity on a total response basis – where a person identifies with more than one ethnic group, they are included in each ethnic group that they identify with.
- By region for Māori – This shows relatively little variation. This is the case for all ethnicities.
- By region for all clients (not standardised for ethnicity) – This clearly shows significant variation. Regions with historically high unemployment are the highest (e.g. East Coast) and regions with historically low unemployment are the lowest (e.g. south island regions).
- By region for all clients (standardised for ethnicity) – Most of the variation disappears when we standardise for ethnicity, and a relationship between historical regional unemployment rates is not apparent.

Figure 1.4 – Average estimated future years on main benefits to age 65 – JS-WR clients



This is an important observation because:

- It somewhat dispels the hypothesis that regional factors (particularly differences in regional labour markets) explain differences in the time people spend on main benefit
- It suggests that factors correlated with ethnicity (though not necessarily ethnicity itself) influence duration on benefit.

Understanding these factors could have significant operational implications.

1.2.2 Results for disabled people

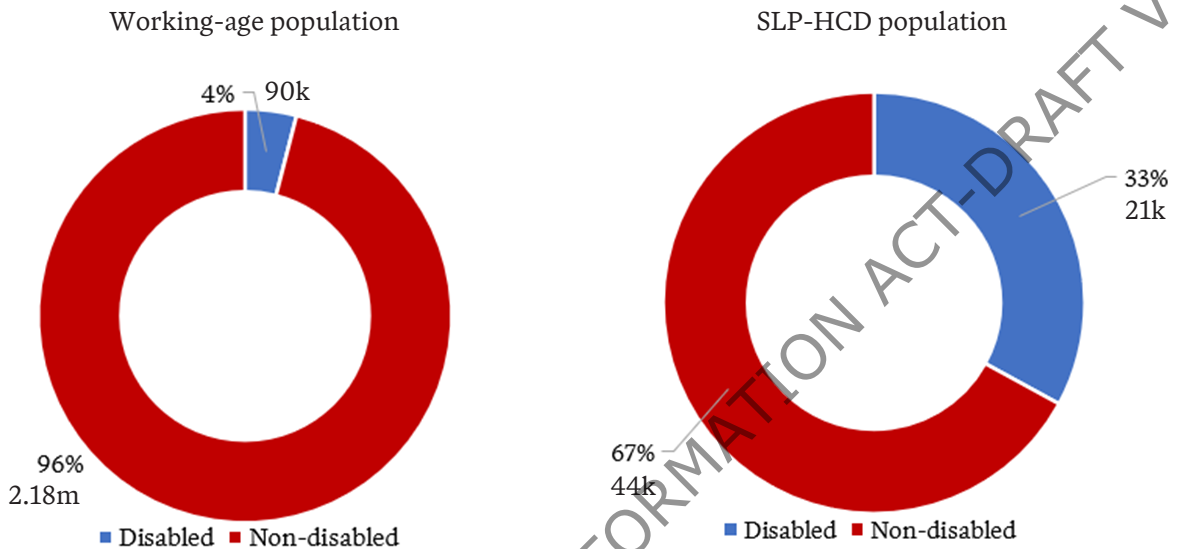
Disabled people are one of the Ministry’s priority groups. As part of the modelling this year, we have linked the current client population with the 2018 census and used disability-related questions to determine a cohort of disabled people based on the Washington Group Short Set definition (see Section 6 for details). 56% of the current main benefit population answered these questions in the 2018 census. This relatively low response rate introduces some extra uncertainty when interpreting the results below.

33% of SLP-HCD clients who answered the census said they have a disability

Figure 1.5 shows that among people who answered 2018 census disability questions, 4% of the working-age population and 33% of the SLP-HCD population are disabled.

The eligibility criteria for SLP have some conceptual similarities to the disability definition we have used. Hence, we might have expected a higher proportion of SLP-HCD clients to appear in our cohort of disabled people. This warrants further investigation in case it has policy or operational implications.

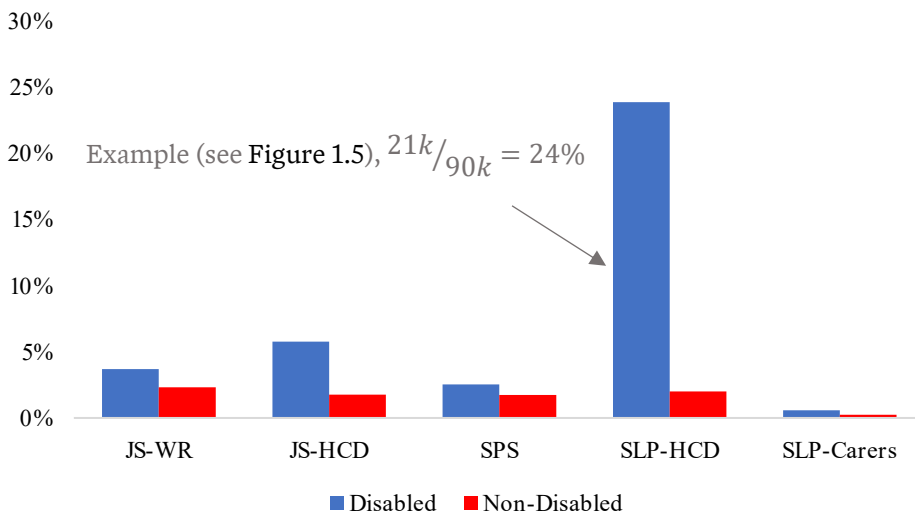
Figure 1.5 Proportion of people answering the 2018 census disability questions who are disabled



Disabled people are significantly over-represented in the benefit system

Figure 1.6 shows that over-representation is common across all main benefit categories, including work-obligated categories. Including SLP clients, about 36% of disabled working-age people are on a main benefit, compared to about 8% of non-disabled working-age people. About 17% of disabled working-age people who aren't on SLP-HCD are on other main benefits (compared to about 6% of non-disabled working-age people).

Figure 1.6 – Proportion of disabled and non-disabled working-age population receiving a main benefit



Disabled people also have moderately higher average estimates of future benefit receipt and a higher prevalence of risk characteristics

For example, on average, disabled JS-WR clients are estimated to spend 62% of the next 10 years on main benefit, compared to 55% for non-disabled JS-WR clients.

1.3 Future time in employment

Viewing modelling results through the lens of employment is aligned to the ministry’s strategy and operational focus

This year we have provided a reframing of results based on future time in employment¹ as an alternative to future time on main benefit. A modelling focus on future time in employment has several advantages:

- It is aligned with the Ministry’s core operational focus and intent to achieve sustainable employment for groups that experience poor labour market outcomes
- We model income and industry, which can be used to provide a more in-depth picture of off-benefit pathways and provide a direct link to material wellbeing
- It is likely to be seen as less stigmatising of beneficiaries
- It can provide a human capital lens including GDP, tax receipt and conceptual linkage to the Living Standards Framework.

Estimates of future time in employment show significant disparities

Figure 1.7 shows, by benefit category, the average estimated proportion of time spent in part-time and full-time employment over the next 10 years². For example, SPS clients are estimated to spend, on average, about 15% of the next 10 years in full-time employment and 13% of the next 10 years in part-time employment (and hence 28% of the time in full- or part-time employment).

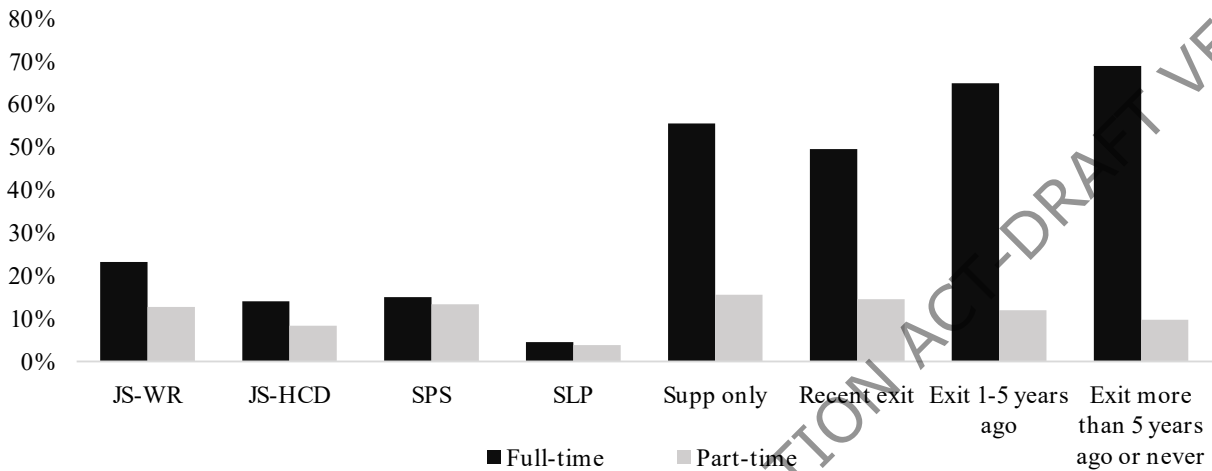
¹ Part-time means earning the equivalent of between 20 and 40 hours per week at minimum wage and full-time means more earning more than the equivalent of 40 hours per week at minimum wage.

² The 10-year employment measures only consider clients aged under 55.

The results for SPS clients are heavily skewed by clients who are estimated to spend little or none of the next 10 years in employment. For example, nearly 50% of SPS clients are estimated not to spend any time in full-time employment, and only 11% are estimated to spend more than 50% in full-time employment.

In general, employment and earnings prospects for main benefit clients are limited, with implications for long-term material wellbeing.

Figure 1.7 – Average estimated proportion of the next 10 years in employment



A clear understanding of what limits SPS clients’ employment and earnings potential would be operationally useful. The modelling helps with this as it allows us to characterise clients with relatively poor (or relatively good) employment and earnings prospects and quantify the impact these characteristics have on our estimates of future employment.

Segmentation of clients based on estimates of future employment can be used as a basis for triaging clients for further analysis, case management and/or employment assistance programmes

From an operational perspective, knowing which clients are expected to have relatively poor employment and earnings prospects, particularly when they first apply for a main benefit, is the first step to being able to address their employment-related needs.

As an illustration, we have developed a segmentation for YP and JS-WR clients under age 25 based on estimated proportions of the next 10 years in employment – see Table 1.3.

The segmentation uses only variables available in MSD data. Hence, it is operationally viable. The segments highlighted in red (i.e. the ones with the poorest employment prospects) include about 7,200 clients who:

- Are female
- Have intergenerational benefit history
- First received a benefit during their teens.

Note that sole parents are disproportionately female and this likely explains some of the differences between females and males shown in Table 1.3.

Table 1.3 Segmentation – YP and JS-WR clients under age 25

Cohort segmentation				%cohort	%of next 10 years in employment	
					Full-time	Part or Full-time
Female	Intergenerational benefit history	Age >=20	First received benefit during teens	14.4%	15.2%	29.0%
			First received benefit aged >= 20	3.7%	26.7%	43.5%
		Age < 20		12.4%	15.5%	30.6%
	No intergenerational benefit history	Age >=20	First received benefit during teens	6.3%	24.0%	41.3%
			First received benefit aged >= 20	6.2%	36.7%	54.4%
		Age < 20		5.4%	24.2%	42.7%
Male	Intergenerational benefit history	Age >=20	First received benefit during teens	18.5%	23.4%	35.8%
			First received benefit aged >= 20	5.8%	34.3%	48.0%
		Age < 20		10.6%	24.6%	38.9%
	No intergenerational benefit history	Age >=20	First received benefit during teens	6.9%	34.1%	48.5%
			First received benefit aged >= 20	7.7%	47.8%	61.5%
		Age < 20		4.7%	35.8%	51.7%
Total				100 %	26.8%	41.9%

1.4 Key questions raised by the modelling results that warrant further investigation

In Table 1.4 we summarise other key questions raised throughout the report that potentially warrant further investigation to inform policy and operational thinking.

Table 1.4 – Key questions raised by the modelling results

Questions	Operational relevance	Report reference
Why did the rate of people moving into SLP increase sharply in 2022?	Small changes in transition to SLP can have a significant effect over time, given few people exit SLP before age 65. Hence, it is important to monitor rates to ascertain if they remain elevated and if so, investigate why.	Section 3.2.2
What factors correlated with ethnicity are important influences on main benefit receipt?	When we account for ethnicity, there is very little variation in average estimated future years on main benefit by region. Understanding the factors correlated to ethnicity that are important influences on main benefit receipt will likely help inform policy and operational thinking.	Section 5.2
How can regional client segmentation be used to help inform which clients (at time of benefit entry or later) need the most support?	Understanding who is likely to need the most support, at the point of entry to the benefit system, can help with the efficient allocation of frontline resources.	Section 5.3
Why do a minority of SLP clients fit the definition of disabled used in the census, given the potential overlap with SLP eligibility criteria?	Only 33% of SLP clients who answered 2018 census disability questions fit the WGSS definition of disabled. Understanding why may help provide a more nuanced view of SLP clients' barriers to employment and where there are opportunities to support clients into work.	Section 6.1

Questions	Operational relevance	Report reference
How do SLP clients who do and don't fit the WGSS definition of disabled differ, and does this have any implications for how they are managed?	See previous question	Section 6.1
Is the extent to which disabled people are over-represented in the benefit system reasonable, including in work-obligated benefit categories?	Based on the definition of disability used in this report, one in six main benefit clients are disabled. Disability and work capacity are often related but are not synonymous. There might be good opportunities to support some disabled clients into employment.	Section 6.2
To what extent are disabilities for clients receiving work-obligated benefits acting as a barrier to employment? Are there specific interventions that could address these barriers?	Employment assistance programmes targeted at clients with non-HCD benefits may not accommodate or support disabled people adequately. Understanding their specific disability may help inform targeted interventions.	Section 6.2
What limits SPS clients' employment and earnings potential?	Many SPS clients are estimated to spend little or no time in employment over the next 10 years. And what time they do spend in employment is more skewed to part-time employment than for other main benefit categories. Having a nuanced understanding of limiting factors is likely to help inform policy and operational thinking.	Section 7.2
What other factors reflect barriers or enablers of employment for segments with poor employment prospects e.g. prior work history?	Barriers or enablers of employment may be factors that the ministry can improve with targeted policy and operational interventions.	Section 7.3

2 Introduction

2.1 Guide to this report

The report covers core modelling results and output from alternative modelling scenarios, in a structure and format similar to last year's report.

- Section 3 – System level results – Benefit system – We explore how the benefit system has changed and how this impacts estimates of people's future outcomes. We consider the experience of the system through key gateways in, through and out of the system.
- Section 4 – Core modelling results – Public housing – We explore how the public housing system has changed and how this impacts estimates of people's future outcomes. We consider the experience of the system through key gateways in, through and out of the system.
- Section 5 – Regional results – We explore modelling results for the Canterbury region. Equivalent results can be sourced for any of the eleven MSD regions (and indeed any particular cohort of interest, geographically defined or otherwise).
- Section 6 – Disabled clients – We use disability-related questions in the 2018 census to determine a cohort of disabled clients and explore how their representation in the benefit system and estimates of future benefit receipt differ to non-disabled people.
- Section 7 – Future time in employment – Historically, the core modelling results relating to the benefit system have been framed around estimates of future time on benefit. We explore results using an alternative framing based on estimates of future time in employment.

A range of appendices are also included for reference.

Status of this report

This is the final version of the report. It supersedes all prior versions.

2.2 The Social Outcomes Model

The Social Outcomes Model is a mathematical model that estimates future outcomes. Key aspects of the Model are:

- The population being modelled – New Zealand (NZ) residents aged 16 or older, and people entering this population over the next ten years.
- The future outcomes that are being modelled – including benefit receipt, public housing use, income, justice activity, educational factors and health outcomes. Fiscal costs of some outcomes are also modelled.
- The time horizon over which the future outcomes are being modelled – Every quarter for people's future lifetimes.
- Assumptions – The Model is underpinned by a range of assumptions which are either implied by the construction and parameterisation of mathematical equations, or explicitly made. The derivation of the mathematical equations is informed by historical data. Explicit assumptions relate to variables that the Model does not estimate but are built into model because they are important for estimating future outcomes, e.g. the future unemployment rate as a measure of future labour market conditions.

For every NZ resident aged 16 or older, the Model estimates a range of outcomes for every quarter over their full future lifetimes.

Further detail can be found in Appendix C. There is also a technical report covering the workings of the Model.

2.3 Model purpose

The Model is designed to serve a number of purposes and use cases. It simulates people's trajectories so we can estimate what will happen to people under current policy settings and based on recent experience. This can be used to:

- Identify cohorts of people suited to targeted interventions
- Test scenarios to assess the potential impact of proposed interventions to inform business cases and budget bids
- Monitor the impact on people by comparing what happens to what was previously estimated
- Monitor the benefit and public housing systems and quantify the long-term potential impact of changing experience
- Quantify the long-term impact of significant policy changes
- Produce long-term financial forecasts.

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3 System level results – Benefit System

Key points from this section

- Forecast deterioration in labour market conditions would place pressure on the system – Exit rates, particularly from JS-WR, are estimated to decrease significantly through 2023/2024, in line with a forecast deterioration in labour market conditions. Entry rates are also estimated to increase.
- Increased pressure on the system partly reflects pre-pandemic trends leading to increased average estimated future years on main benefit. Average estimated future years on main benefit has increased significantly for youth benefits, JS and SPS. This mainly reflects increased allowance for pre-pandemic experience in the modelling assumptions – exit rates decreased significantly between 2017 and 2019.
- Some of the increase in average estimated future years on main benefit reflects a forecast deterioration in labour market conditions (as reflected by HYEUFU 22).
- COVID-19 effects on the benefit system have largely dissipated and system dynamics are now similar to the pre-pandemic period. While main benefit client numbers remain higher than pre-pandemic levels, entry rates into and exit rates out of the system have since reverted back close to 2019 levels.

In this section, we analyse how the benefit system has changed over the last three years and what this means for peoples' long-term outcomes.

We describe:

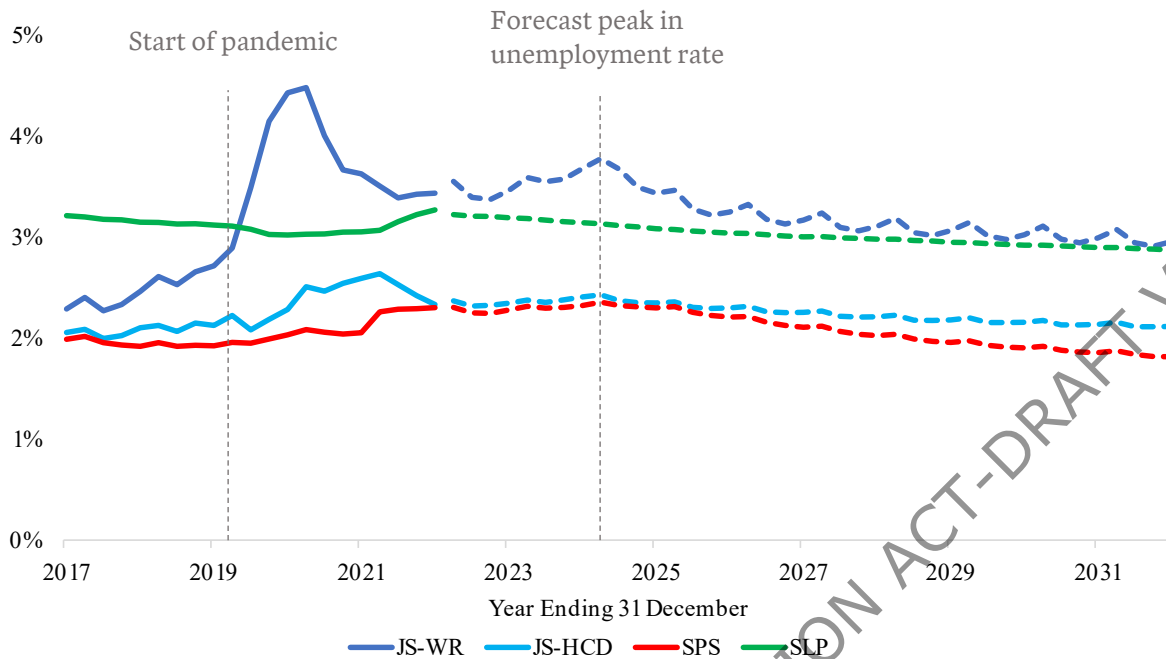
- How the benefit system population has changed through the COVID-19 pandemic (“pandemic”) and how key rates of transition (or “gateways”) in, through, and out of the benefit system have changed
- The impact on estimates of peoples' future years on main benefit.

While most of the pandemic effects have dissipated, estimates of future time on main benefit have increased significantly from pre-pandemic estimates.

3.1 Changes in the main benefit population

Figure 3.1 shows the impact of the pandemic, and associated labour market effects, on the proportion of the working-age population on main benefit. The dashed lines are estimates derived from the modelling.

Figure 3.1 – Actual and estimated proportion of 16-65-year-old population receiving main benefits



The proportion of the working-age population receiving JS-WR increased significantly from late 2019. Also note that:

- The proportion of people receiving JS-WR was increasing before the pandemic. This mainly reflects decreasing rates of JS-WR clients exiting main benefit – see Section 3.2.1.
- The proportion of the working-age population receiving JS-WR is estimated to increase to 3.8% over the period to late 2024. This is about 0.7% lower than the pandemic-related 2020 peak. The increase reflects the HYEPU 2022 unemployment rate forecast which implies unemployment rising to 5.5% by mid-2024 before dropping from late 2024 to an assumed long-term average of 4.3% by mid-2027.
- Note that since the modelling has been completed, BEFU 2023 has been released. This has a slightly different unemployment rate forecast that would not materially change the modelling results.
- The proportion of the working-age population receiving SPS is also estimated to increase to a peak of 2.4% by late 2024. This also reflects the HYEPU 2022 unemployment rate forecast and a broader trend of lower exit rates from SPS.
- The increase in the proportion of the working-age population receiving JS-HCD from late 2019 is partly due to new JS-HCD benefit grants and partly a flow-on effect of more JS-WR clients, some of which subsequently transfer to JS-HCD. The proportion is estimated to remain broadly stable over the next 10 years.
- The proportion of the working-age population receiving SPS increased in late 2021. This reflects about 5,600 clients who were reclassified from JS-WR to SPS due to the removal of the Subsequent Child Policy.

The forecast deterioration in labour market conditions would place pressure on the system. This has operational implications and consequences for clients:

- Increased pressure on frontline resources and increasing need for intensive/specialist services from an increasing number of long-duration clients. The modelling provides detailed demand forecasting to support local resource planning.
- Increasing number of clients with severely limited employment and earnings prospects. The modelling provides detailed estimates of client mix as a signal of demand for specific services, including intensive/specialist services and coordinated cross-agency services.

3.2 Movements in, through and out of the benefit system

To describe how rates of movement in, through and out of the benefit system have changed, we focus on five key system gateways. Collectively these gateways explain most of the change to the benefit system over the last few years and the impact this has on our estimates of peoples' long-term outcomes. The five gateways are:

- **Jobseeker Support and Sole Parent Support**
 - New clients receiving Jobseeker Support
 - Jobseeker Support clients exiting from main benefit
 - Sole Parent Support clients exiting from main benefit.
- **Health Condition and Disability benefits**
 - JS-WR clients moving to JS-HCD and JS-HCD clients moving to JS-WR
 - Clients moving to Supported Living Payment from other main benefit categories.

We express the gateways as rates. While counts are also useful to consider, rates control for the size of the relevant population to give a clearer sense of relative change. For example, as the number of JS-WR clients increased during the first year of the pandemic, the count of exits also increased. However, the rate of exit (count of exits *divided by* number of JS-WR clients) actually decreased.

We show rates for historical data for the last 10 years (solid lines) and estimates from the modelling for the next 10 years (dashed lines). Rates have been seasonally adjusted. In general (but not exclusively), assumed long-term future rates have been set at levels consistent with the period preceding the pandemic (i.e. 2017 – 2019). Variation in the near future typically reflects anticipated changes to population characteristics and/or the assumed rate of unemployment.

COVID-19 effects

The economic impacts of COVID-19 had large visible effects on the five benefit gateways from early 2020 onwards, reflecting quickly changing labour market conditions. While these are interesting effects, most have now dissipated. Hence, we focus our commentary more on the trends evident before the pandemic and experience over 2022. In most cases, rates have reverted close to pre-pandemic levels. Where appropriate, near-term residual pandemic effects have been built into the modelling assumptions.

3.2.1 Jobseeker Support and Sole Parent Support

New clients receiving Jobseeker Support

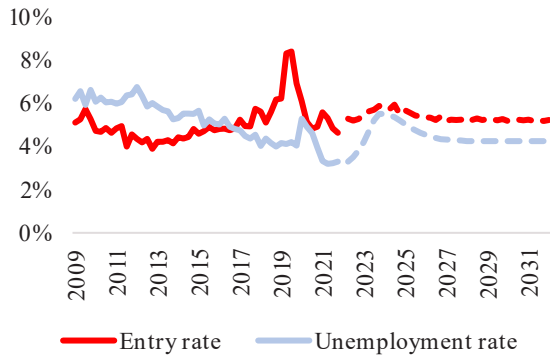
Jobseeker Support is by far the most common entry point into receiving main benefits. 60%-80% of main benefit grants are for Jobseeker Support, varying with the time of year. Hence, the rate at which the working-age population enters this benefit category, and whether they are returning clients, is an important measure for the benefit system as a whole. A small, sustained movement in the rate can make a big difference to the size of the main benefit population, because the underlying working-age population is large (circa 3.3 million people) e.g. 1% equals about 33,000 people.

Figures 3.2 shows the rates at which people from the general population enter JS-WR and JS-HCD for:

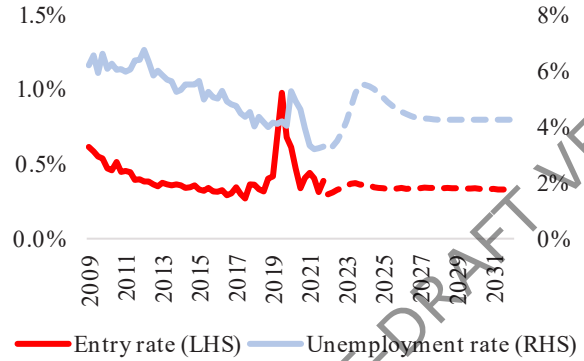
- Those who exited the benefit system in the last 12 months i.e. recent exits
- The wider working-age population, including people who have never received a benefit in the past.

Figures 3.2 – Quarterly entry rates to JS-WR and JS-HCD

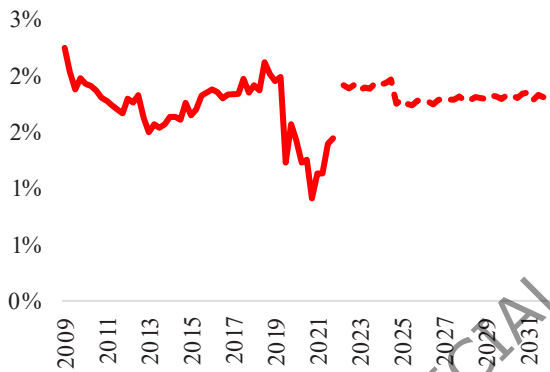
Entry rate to JS-WR – from those who exited the system in the last 12 months



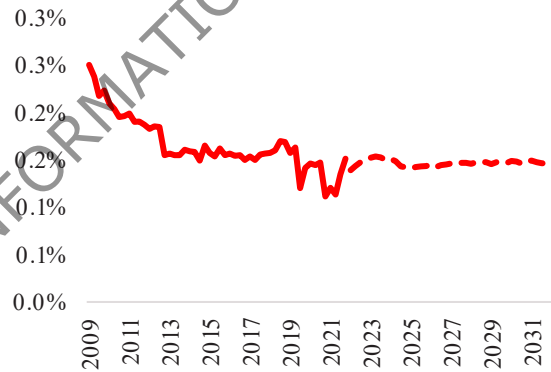
Entry rate to JS-WR – from the wider working-age population



Entry rate to JS-HCD – from those who exited the system in the last 12 months



Entry rate to JS-HCD – from the wider working-age population



Entry rates to JS-WR are estimated to increase over 2023/2024, reflecting the HYEPU unemployment rate forecast. While these changes look small in percentage terms, the underlying populations they apply to are large. Hence, they are material estimated changes. The increase in estimated entry rates to JS-WR from those who exited the system in the last 12 months, also reflects a long-term increasing trend.

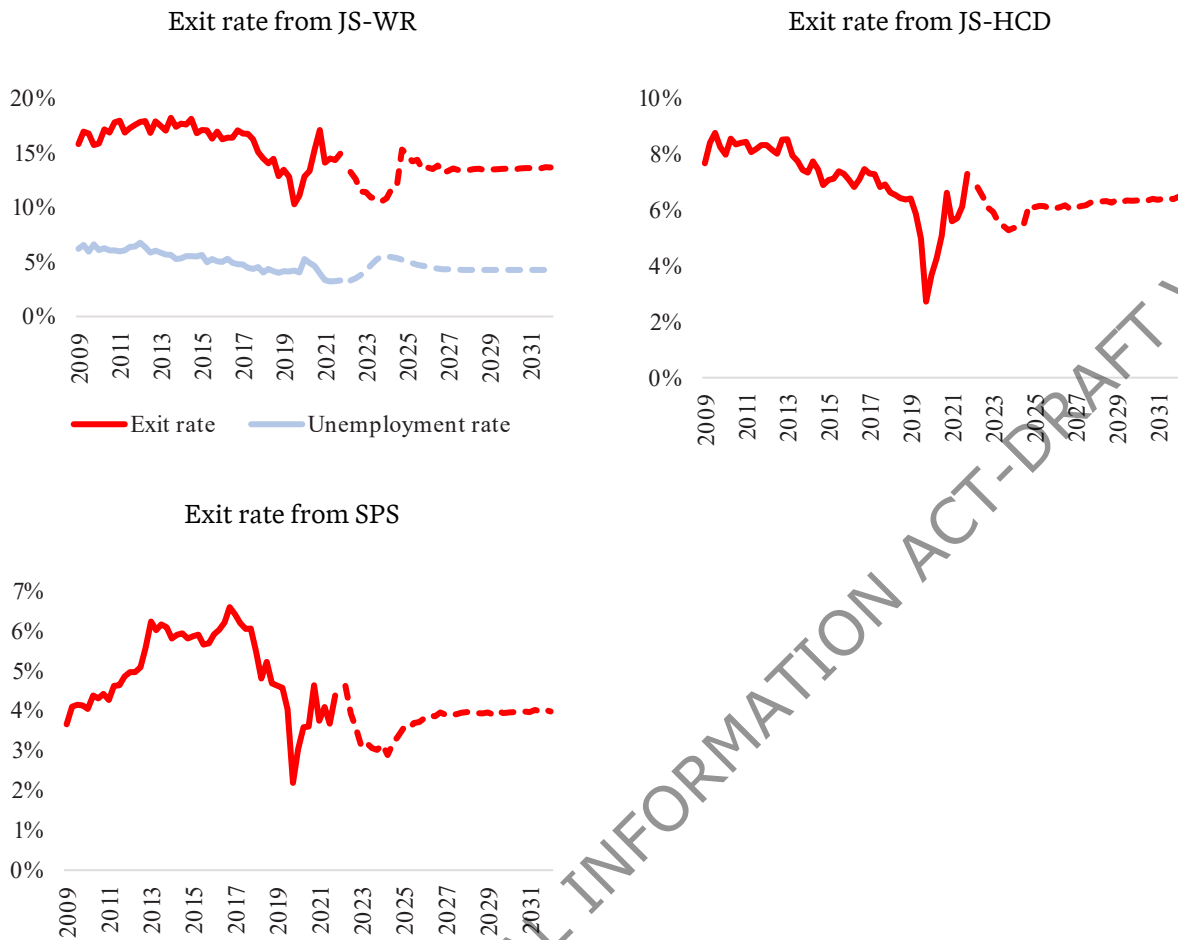
The entry rates to JS-HCD also show significant pandemic factors, with reduced rates over 2020 and 2021. In 2022, entry rates increased and are estimated to revert back to pre-pandemic levels through 2023 and beyond.

Clients exiting from main benefits

While exits from main benefit do not necessarily indicate increased material wellbeing, they represent a degree of financial independence, noting that many exiting clients continue to receive supplementary benefits. Exit rates from work-obligated main benefit categories (i.e. JS-WR and some SPS clients) are a measure of clients achieving some degree of financial independence.

Figures 3.3 shows quarterly exit rates for JS-WR, JS-HCD and SPS.

Figures 3.3 – Quarterly exit rates from main benefit for JS and SPS clients



Exit rates decreased significantly for these three key benefit categories in the period from mid-2017 to late-2019 i.e. pre-pandemic. Over this period:

- JS-WR exit rates decreased from 17.1% a quarter to 12.8%
- JS-HCD exit rates decreased from 7.5% to 5.9%.
- SPS exit rates decreased from 6.6% to 4.6%

By late 2022, JS-WR and JS-HCD exit rates had reverted to close to 2019 levels. These movements require careful interpretation:

- The influx of JS-WR clients during 2020 changed the dynamic of the system, with many of these clients having relatively low barriers to employment aside from the pandemic-related labour market effects. Through 2021 and 2022, many of these clients exited to employment, temporarily increasing the exit rate. The Model looks through this effect and estimates exit rates to decrease through 2023 and 2024, as the unemployment rate is forecast to increase. As the unemployment rate is forecast to decrease beyond 2024, exit rates are estimated to increase again before levelling off at a rate close to pre-pandemic levels.
- The medical recertification process for JS-HCD clients was put on hold during the pandemic and re-introduced in early 2022. This appears to have resulted in a rebound in exit rates above pre-pandemic levels. This is likely to be a temporary effect, with rates estimated to decrease to close to late-2019 levels.

SPS exit rates have also rebounded from pandemic-lows to close to 2019 levels (circa 4% per quarter). Rates are estimated to decrease to a low of about 2.9% through 2023 and 2024 due to the forecast high unemployment rate, before moving towards 4% by 2026.

JS-WR and SPS exit rates are sensitive to labour market conditions. Hence, over 2023 and 2024 they will depend significantly on the extent to which these conditions deteriorate.

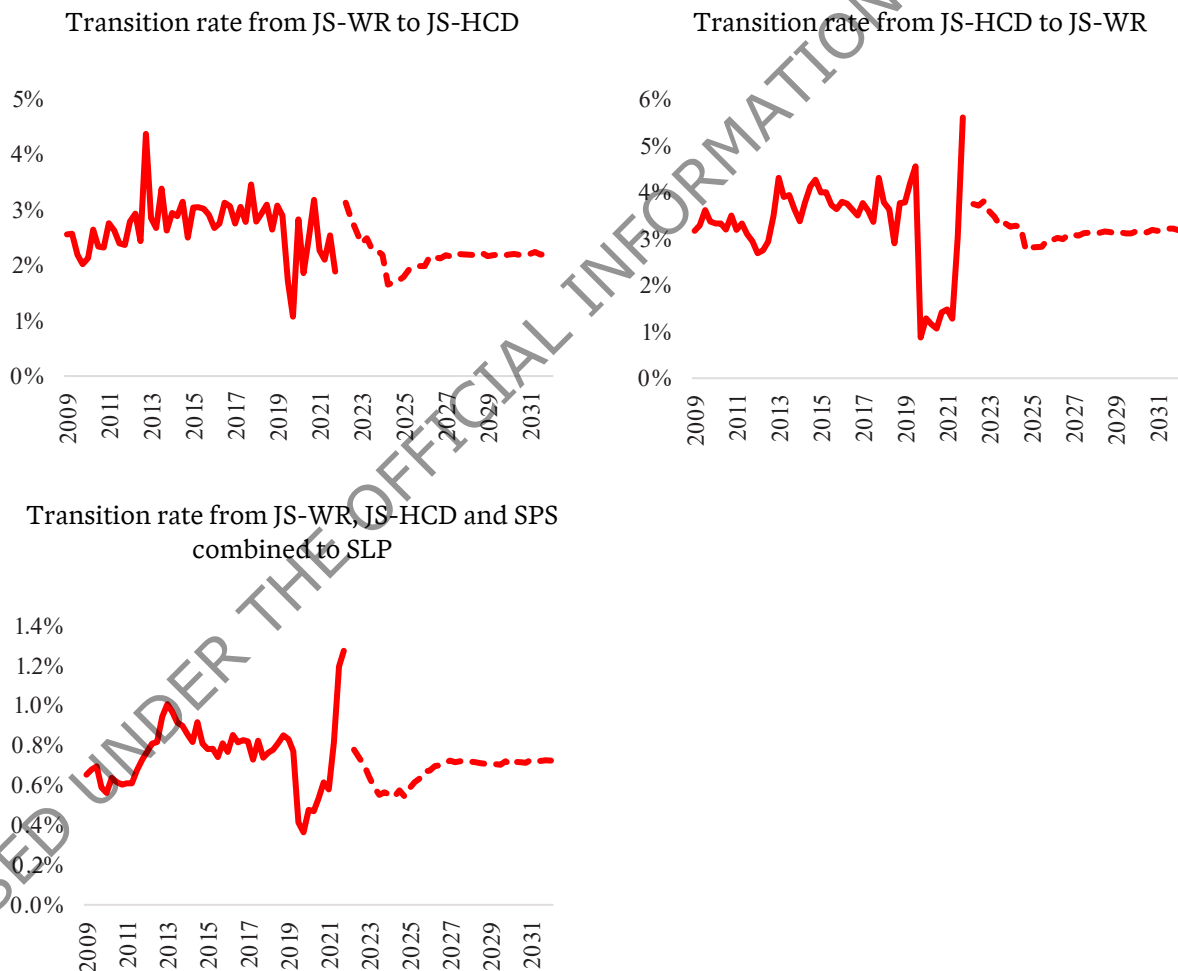
3.2.2 Moving to high-duration benefits

Movement from JS-WR to JS-HCD, and transition from any benefit to SLP reflects a reduced likelihood that someone will be able to exit main benefits in the near future. These transitions stem from a client's health condition or disability status and at a system level are a reasonable measure of worsening circumstances for clients.

Figures 3.4 shows the following quarterly transition rates:

- The rates at which JS-WR clients transition to and from JS-HCD
- The rate at which JS-WR, JS-HCD and SPS clients combined transition to SLP.

Figures 3.4 – Quarterly transition rates to high-duration benefits



These transition rates show no discernible trend in the pre-pandemic period. However, rates dropped significantly during the first year of the pandemic:

- This partly reflects lockdowns and people's reduced capacity to consult with medical practitioners and obtain medical certificates.

- Medical re-certification requirements for JS-HCD and SLP clients were suspended for a period of time. This is evident in the right-hand side chart of Figures 3.4, where the transition rate from JS-HCD to JS-WR decreases from about 4% in 2019 to 1% in mid-2020. With the reinstatement of medical re-certification requirements in early 2022, there was a catch-up effect, with rates estimated to soon revert back to pre-pandemic levels.

Transition rates to SLP exhibit a sharp increase in 2022. This may be due to the reinstatement of medical certification requirements. Given that this increase only represents two data points, we have not built it into our modelling assumptions. However, it should be monitored carefully, as a long-term change to 2022 levels would have quite a significant impact on system dynamics and outcomes for people.

3.3 Future time receiving main benefits

The modelling produces estimates of people's use of benefits over their future lifetimes. Each year we recalibrate the Model to:

- Update the modelling population to the modelling date (30 September 2022)
- Update assumptions:
 - Economic assumptions underpinning the modelling e.g. inflation, wage growth and rental growth. These assumptions are typically taken from central estimates.
 - Model assumptions determining the rates at which people are estimated to move into, through, and out of the benefit system, including the five key benefit gateways.
 - Model assumptions determining estimates of other social outcomes e.g. public housing use, income, and mental health service use.

The updates to the Model assumptions are informed by observed experience, such as that illustrated in Section 3.2. Ordinarily, more weight is given to more recent experience. However, most of the COVID-19 related effects on the system appear to have been temporary and generally speaking we have not carried forward experience from 2020 and 2021 into the modelling assumptions. That said, some COVID-19 related effects appear to be persisting. Hence, we have made assumptions about how these effects will last. More detail can be found in the technical report³.

Table 3.1 shows estimates of average future years on main benefit by high-level benefit segments, including segments for people not currently receiving a main benefit. For clarity:

- NOMB – refers to people who are not receiving a main benefit, but are receiving a supplementary benefit e.g. AS
- Recent exits – refers to people who are not receiving any benefit, but have done in the year prior to 30 September
- Longer exits – refers to people who are not receiving any benefit and didn't in the year prior to 30 September.

We show last year's modelling results for comparison, plus 2019 modelling results as a pre-COVID-19 baseline.

It is important to note that the characteristics of the benefit system population have changed significantly through the period since the start of 2020. Particularly for work-obligated benefit categories such as JS-WR. In particular:

- Through 2020 there was an influx of new clients as the pandemic materially impacted certain industries e.g. tourism. Many of these clients were expected to move back into employment relatively quickly and so the influx served to reduce average estimated future years on main benefit i.e. average

³ Social Outcomes Modelling 2022 – Technical Report

estimated future years on main benefit in 2020 would have been much higher were it not for the influx of new clients.

- The opposite effect has occurred through 2021 and 2022 as many of the clients who entered the system in 2020 exited, serving to increase average estimated future years on main benefit.

We discuss year-on-year change between 2021 and 2022 results in Section 3.4. Though in general, we think it is best to compare 2022 results to the 2019 pre-pandemic baseline.

Table 3.1 – Average estimated future years on main benefit to age 65 by high-level benefit category

Segment		Counts			Avg. future years on main benefit			
		2019	2021	2022	2019	2021	2022	
Main Benefits	Youth Benefit	YP/YPP	2,061	2,136	2,031	16.4	20.8	24.0
	Job Seeker	Work Ready	87,420	121,938	113,346	10.5	11.7	13.0
		HCD	68,307	84,693	76,467	11.0	11.8	12.3
		Sub Total	155,727	206,631	189,813	10.8	11.7	12.7
	Sole Parent Support		61,515	73,737	74,916	12.5	15.5	17.0
Supported Living		100,758	101,517	106,941	12.3	12.7	12.7	
NOMB	Supplementary benefits only		107,853	123,528	123,867	2.7	3.4	3.7
Recent Exits	Benefit history within last year		97,743	145,041	128,784	5.5	5.9	6.9
Longer Exits	Benefit history within 1-5 years		229,761	193,368	221,502	2.7	3.1	3.6
	No benefit history within last 5 years		2,400,423	2,430,813	2,476,203	0.8	1.0	1.2
	Sub Total		2,630,184	2,624,181	2,697,705	1.0	1.2	1.4
Total			3,155,841	3,276,771	3,324,057	2.3	2.8	3.0

Table 3.1 shows some significant changes in estimated average future years on main benefit between the 2019 and 2022 modelling rounds, including:

- Youth benefits increasing by 7.6 years (or 46%) to 24.0 years
- SPS increasing by 4.5 years (or 36%) to 17.0 years
- JS-WR increasing by 2.5 years (or 23%) to 13.0 years
- Recent exits increasing by 1.4 years (or 24%) to 6.9 years.

Most of the changes reflect the changes in experience discussed in Section 3.2, which have been factored into the modelling assumptions. Particularly:

- Decreased assumption for JS-WR exit rates
- Decreased assumption for SPS exit rates.

An increasing prevalence of use of mental health-related supports is also important, as experience tells us that people accessing these supports exit the benefit system at lower rates than other people. The mental health sub-models of the Model were refit this year and this has served to increase average estimated future years on main benefit moderately – see Section 3.4.

In practical terms, this means people are estimated to spend more of their future lifetimes to age 65 receiving main benefit financial support.

3.3.1 Distribution of estimated future outcomes

Figure 3.5 shows the same modelling results as Table 3.1 in graphical form, with parameters that describe the distributional spread of estimated future years on main benefit.

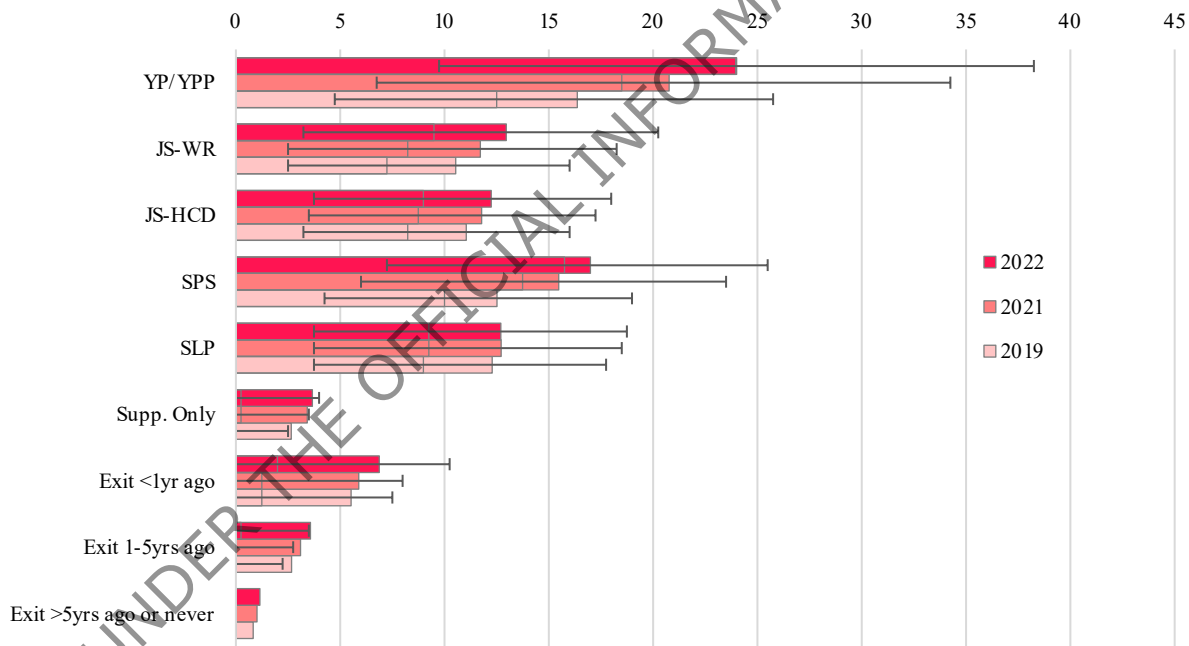
The bars represent mean averages consistent with Table 3.1. The black lines represent the interquartile ranges. If all people in each cohort were lined up in order of their estimated future years on main benefits, the interquartile range represents the quarter and three-quarter points on that line. The median is the half-way point and marked somewhere along each black line e.g. for JS-WR clients the 2022 estimates show an interquartile range from 3.25 years to 20.25 years. Another way to express this is that the Model estimates that 25% of JS-WR clients will spend less than 3.25 future years on main benefit and 25% will spend more than 20.25 future years on main benefit over their working lifetime.

This gives us useful information about the distribution of estimated outcomes within each category.

Note some points of interpretation about the interquartile ranges:

- In every case other than for YP/YPP, the median average is lower than the mean average. This highlights that in most categories there is a concentration of people with very high future estimated years on main benefit.
- For some categories, parts of the interquartile range are not visible e.g. Exit <1yr ago. This is because over 25% of people in these categories have 0 estimated future years on main benefit. Hence, the starting point of the interquartile range is 0.

Figure 3.5 – Average future years on main benefit to age 65 by high-level benefit category



Across benefit categories with some or all clients having work obligations (YP/YPP, JS-WR and SPS), there have been material increases in estimated average future time on main benefit, as represented by the movement in the interquartile ranges.

For example, the average estimated future years on main benefit for YP/YPP has increased from 16.4 years in 2019 to 24.0 years in 2022. Furthermore, 25% of YP/YPP clients are estimated to spend more than 38.25 future years on main benefit, compared to 25.75 years in the 2019 modelling round. Similarly, amongst SPS clients, 25% are estimated to spend more than 25.5 future years on main benefit, compared to 19 years in the 2019 modelling round.

3.4 Analysis of change

This section describes core modelling results and how they have changed since the 2021 modelling round. We summarise the key points in Section 3.4.1 and describe the detail of this analysis in Section 3.4.2.

3.4.1 Analysis of change – summary of key points

- The total estimated future years on main benefits for people receiving a benefit (or who have in the prior 12 months) has increased by 4.0% from 6.18 million years in 2021 to 6.43 million years in 2022. This follows a 5.2% increase between 2020 and 2021 modelling rounds. There were three key factors driving the increase this year:
 - A reduction in the number of clients over the year to 30 September 2022 (mainly JS-WR clients), resulting in a decrease in total estimated future years on main benefit of 0.19 million years
 - A deteriorating economic forecast (HYEFU 22 vs. HYEFU 21), resulting in an increase of 0.26 million years
 - Increased allowance for lower rates of exit from JS-WR and SPS, and increased allowance for use of mental health-related supports in our modelling assumptions, resulting in an increase of 0.18 million years.
- Average estimated future years on main benefit has increased for YP/YPP, JS-WR, JS-HCD and SPS for similar reasons. For example, average estimated future years on main benefit for JS-WR increased by 1.3 years from 11.7 years in 2021 to 13.0 years in 2022. The deteriorating economic forecast accounts for 0.5 years of the increase, with most of the rest due to increased allowance for lower rates of exit and use of mental health-related supports in our modelling assumptions.
- The effect of the deteriorating economic forecast is greatest on youth benefit clients. This is because youth tend to be disproportionately impacted by adverse labour market conditions.

3.4.2 Analysis of change – detail

Changes in modelling results over time can stem from a range of factors including:

- Changes to the population being modelled – As time passes, the population naturally changes. This can have a significant effect on modelling results, as it did through the pandemic.
- Updates to model assumptions – These might be assumptions for factors external to the benefit system (such as the unemployment rate), or assumptions reflecting the behaviour of people and their interactions with various government services. Changes to the population being modelled and updates to model assumptions are often related e.g. the behaviour of people (which informs model assumptions) influences the size and mix of characteristics of the benefit system population.
- Modelling methodology changes – Sometimes changes are made to the modelling methodology e.g. to accommodate new outcomes to be estimated. Typically, these have little impact at total population level, but they can have significant impacts at cohort level. This year there have been no material modelling methodology changes.

Understanding the contributions of these factors to changes in modelling results helps us understand the extent to which:

- Change was expected or unexpected – Some year-on-year change is expected, particularly given expected changes in labour market conditions (as represented by the unemployment rate forecast used).
- Change relates to factors that MSD can or can't influence – For example, MSD has limited influence over labour market conditions, but may be able to influence peoples' employment prospects.

In this section, we show an analysis of change, to break the change in modelling results down into these factors.

The analysis of change can be performed for any cohort of people, for any outcome estimated by the Model and over any future time horizon. We show six sets of analysis:

Table 3.2 – Sets of analysis of change

Set	Population	Outcome	Time horizon
1	All people receiving a benefit at 30 September or who have in the prior 12 months	Total future years receiving a main benefit	Future lifetime to age 65
2	People receiving YP/YPP at 30 September	Average future years receiving a main benefit	Future lifetime to age 65
3	People receiving JS-WR at 30 September	Average future years receiving a main benefit	Future lifetime to age 65
4	People receiving JS-HCD at 30 September	Average future years receiving a main benefit	Future lifetime to age 65
5	People receiving SPS at 30 September	Average future years receiving a main benefit	Future lifetime to age 65
6	People receiving SLP at 30 September	Average future years receiving a main benefit	Future lifetime to age 65

Set 1 is a system-level view framed around an ‘at-risk’ population definition. It is analogous to the way analysis of change was reported in 2017 and prior.

Sets 2 to 6 cover each main benefit category. Sets 4 to 6 are covered in Appendix B.

Figure 3.6 to Figure 3.8 show the analysis of change for these sets in a consistent format. These ‘waterfall’ charts show the 2021 and 2022 results at either end in grey and the contributions to the change from different factors (increases in blue and decreases in green). Table 3.3 describes what each of these factors of change mean and whether they represent expected or unexpected changes.

Table 3.3 – Description of analysis of change stages

Stage of analysis	Commentary	Expected or unexpected change
1. 2021 result	The 2021 modelling results as at 30 September 2021, based on the population and modelling assumptions set at that point i.e. the results disclosed in last year’s report.	N/A
2. Use actual economics	Stage 1 results, restated to replace economic assumptions for the period from 30 September 2021 to 30 September 2022 with actual economic outcomes e.g. unemployment rate, inflation rate. <i>The difference between stage 1 and 2 shows the impact on results from using actual economic inputs for the year to 30 September 2022 compared to using what we assumed for the 2021 results.</i>	Unexpected

Stage of analysis	Commentary	Expected or unexpected change
3. Roll forward	<p>The roll forward stage uses the stage 2 results to show what we expected the results to be as at 30 September 2022 based on the 2021 model and 30 September 2021 population (and actual economics over the year to 30 September 2022). It incorporates:</p> <ul style="list-style-type: none"> Expected changes to the client cohort (entries, exits, transfers etc) Expected outcomes over the year to 30 September 2022 Other expected changes with respect to people’s circumstances e.g. ageing Change implied by the Model from actual economics over the year to 30 September 2022. <p><i>The difference between stage 2 and 3 shows how we expected the results to change from moving ahead in time by one year to 30 September 2022.</i></p>	Expected
4. Update client cohort	<p>Stage 3 results with the actual population as at 30 September 2022.</p> <p><i>The difference between stage 3 and stage 4 shows the impact on results from the difference between the actual population as at 30 September 2022 and what we expected the population to be. The difference in population reflects how experience over the year differed to that represented by the 2021 modelling assumptions (allowing for actual economic conditions during the year).</i></p>	Unexpected
5. Update future economics	<p>Stage 4 results with updated economic assumptions for the period from 30 September 2022.</p> <p><i>The difference between stage 4 and stage 5 shows the impact of updating economic assumptions for the period from 30 September 2022</i></p>	Unexpected
6. Recognition of experience	<p>Stage 5 results with updated modelling assumptions (entry rates, exit rates etc).</p> <p><i>The difference between stage 5 and stage 6 shows the impact from adjusting modelling assumptions to reflect how an additional year of data informs our view of the future</i></p>	Unexpected
7. 2022 result	No changes from stage 6.	N/A

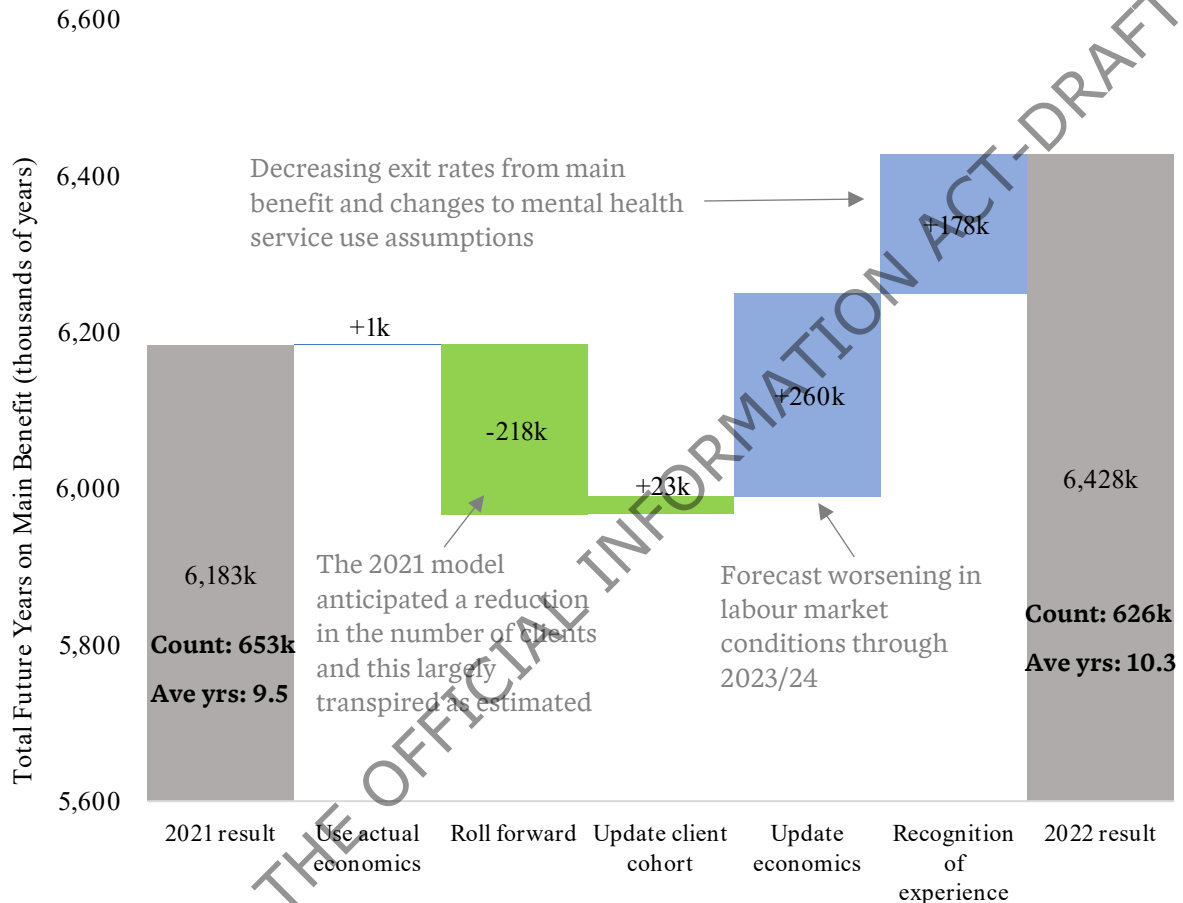
Set 1 – All people receiving a benefit at 30 September 2022 or who have done in the prior 12 months

Set 1 defines a population of people receiving a benefit or who are close to the benefit system. Where ‘close’ is defined as people who are not currently receiving a benefit but have done at some point in the year prior. It reconciles the total estimated future years on main benefit for this population from the 2021 and 2022 modelling results. This gives a high-level view of system change, incorporating:

- Whether the number of people receiving a benefit or who are close to the benefit system has increased or decreased over the year
- The extent to which people receiving a benefit or who are close to the benefit system are estimated to spend more or less time on benefit in the future.

We have noted the count of people in the population and the estimated average future time on main benefit at each modelling date. This allows us to see how much of the increase in total years related to an increase in people and how much relates to an increase in average future time on main benefit.

Figure 3.6 – 2021/2022 analysis of change – Set 1 – Total estimated future years on main benefit to age 65+ – All people receiving a benefit at 30 September or who have done in the prior 12 months



The key steps of the analysis to highlight are:

- Roll forward -218,000 years – Client numbers, particularly for JS-WR, were anticipated to fall further from their 2020 highs
- Update economics +260,000 years – HYEUFU 22 forecasts the unemployment rate to increase significantly through 2023/24, limiting clients’ employment prospects. The HYEUFU 22 forecast is for significantly higher unemployment than implied by the HYEUFU 21 forecast (which underpins the 2021 results).
- Recognition of experience +178,000 years – This step reflects the long-term effect of accommodating experience into the modelling assumptions. It reflects:
 - Increased allowance for lower rates of exit from JS-WR and SPS
 - Updates to the models that determine estimates for future use of mental health-related supports based on recent experience. Generally speaking, and all else being equal, clients accessing mental health-related supports tend to have greater ongoing need for main benefit support.

In summary, there are fewer people receiving a benefit or close to the benefit system. However, the effect of this on total future years on main benefit is more than cancelled out by the increase in average estimated future years on main benefit.

Set 2 – People receiving YP/YPP at 30 September

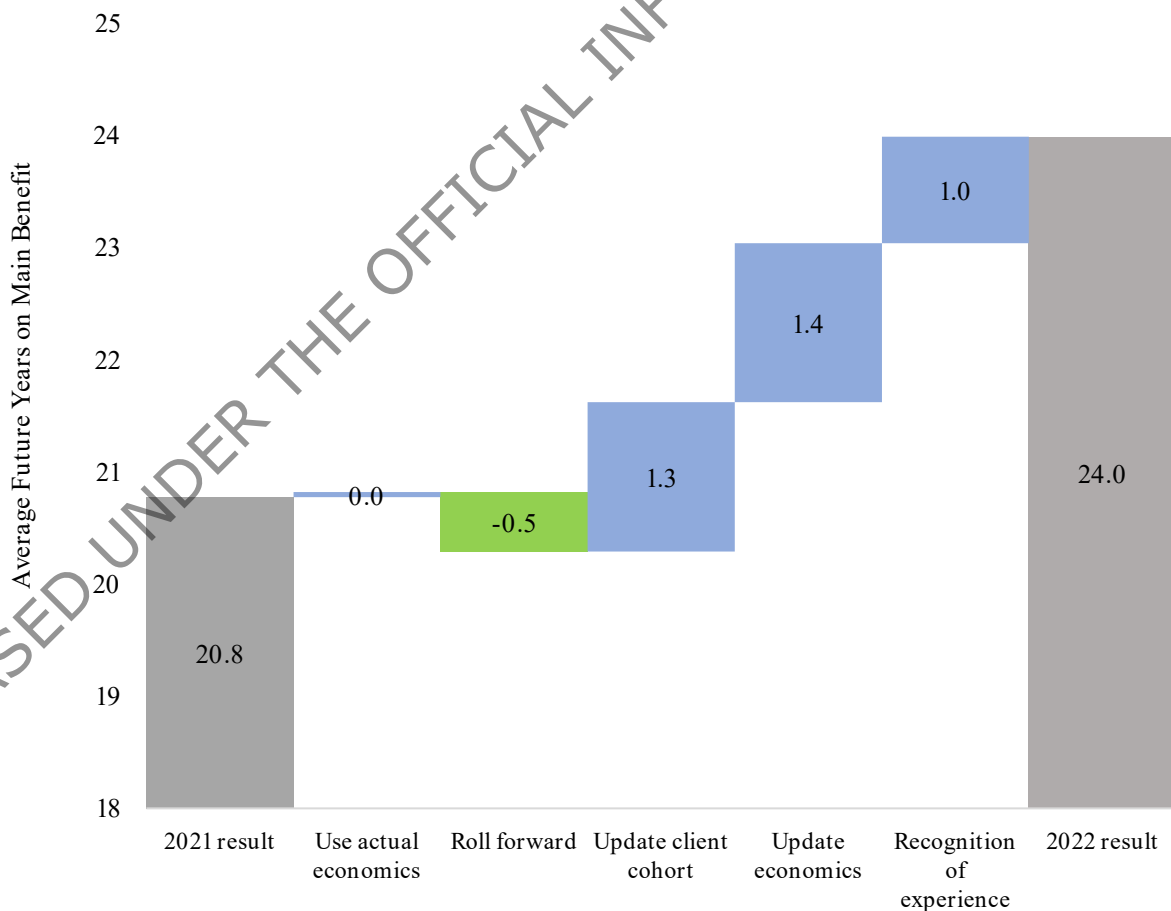
We show the analysis of change for YP/YPP clients in Figure 3.7.

This analysis considers average rather than total future years.

The key steps of the analysis to highlight are:

- Roll forward and Update client cohort +0.8 years – The YP/YPP is a relatively small cohort of people. Hence, the ‘Roll forward’ and ‘Update client cohort’ steps can be volatile in size and direction. It is better to think of these two steps in combination i.e. an increase of 0.8 years. This partly reflects increasing main benefit duration among this client group which is key predictor for future main benefit receipt.
- Update economics +1.4 years – The impact of the forecast increase in unemployment rate (‘Update economics’ step) is larger than for other main benefit categories. This is because youth tend to be disproportionately impacted by adverse labour market conditions and sustained periods of unemployment during younger years tends to impact future employment prospects significantly.
- Recognition of experience +1.0 years – As for Set 1, this reflects increased allowance in the modelling for lower rates of exit from JS-WR and SPS, and updates to the modelling of use of mental health-related supports.

Figure 3.7 – 2021/2022 analysis of change – Set 2 – Average estimated future years on main benefit to age 65 – YP/YPP clients at 30 September



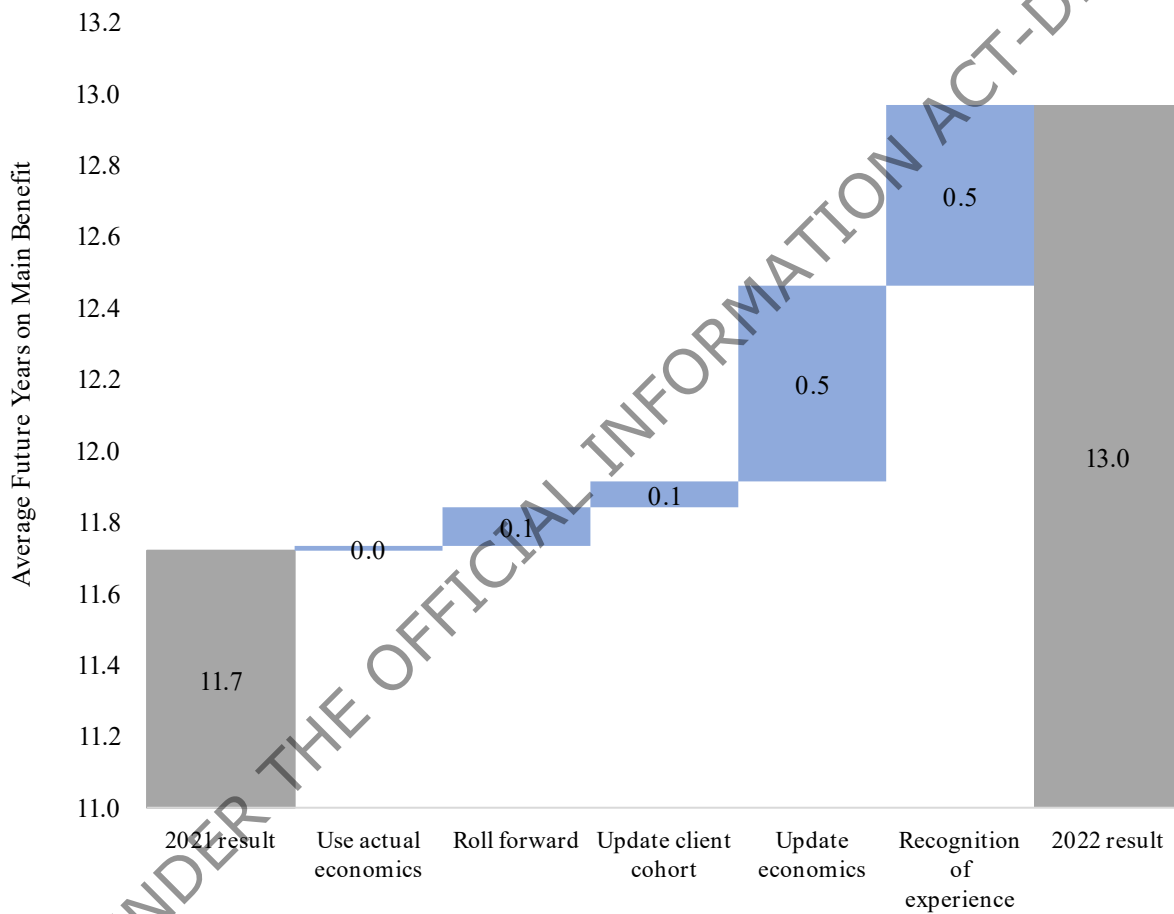
Set 3 – People receiving JS-WR at 30 September

We show the analysis of change for JS-WR clients in Figure 3.8.

The analysis shows a similar picture to that for YP/YPP clients, with the overall increase in average estimated future years on main benefit largely driven by the forecast deterioration in labour market conditions, and updates to modelling assumptions to reflect lower rates of exit from JS-WR and SPS, and updates to the modelling of use of mental health-related supports.

Similar analyses for JS-HCD, SPS and SLP clients (sets 4, 5 and 6) are shown in Appendix B. These show similar pictures for JS-HCD and SPS as for JS-WR. Change in average estimated future years on main benefit for SLP clients is far less significant, reflecting the nature of SLP clients’ financial support needs and the relatively little impact labour market conditions have on these.

Figure 3.8 – 2021/2022 analysis of change – Set 3 – Average estimated future years on main benefit to age 65 – JS-WR clients at 30 September



4 Core modelling results – Public housing

Key points from this section

- The public housing system is increasingly rigid, with historically low movements in and out of the system, affecting access to public housing and increasing the length of time households spend in public housing.
- Compared to 2019, average estimated future years in public housing has increased for people in public housing, reflecting prior years’ decreases in rates of moving out of public housing. The average for households on the register is largely unchanged because increasing wait times on the register reduce the potential future time households can be in a public house.
- Forecast increases to public housing supply (over 5,000 net new public houses over 2023/24) will help alleviate some pressure on the system. However, any impact on the register size and wait times is unlikely to persist unless one or a combination of the following occur:
 - Public housing supply continues to increase materially beyond 2024
 - Entry rates to the housing register decrease materially
 - Exit rates from public housing increase materially.

In this section, we analyse how the public housing system has changed over the last three years and what this means for peoples’ long-term outcomes.

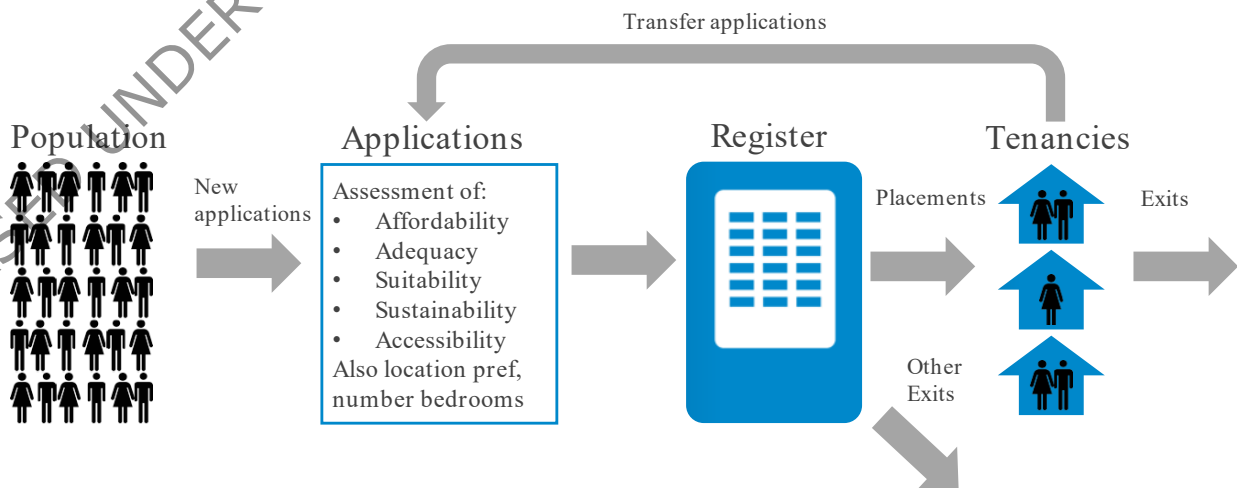
We describe:

- How the population of people in public housing or on the register has changed through the COVID-19 pandemic (“pandemic”) and how key rates of transition (or “gateways”) in, through and out of the public housing have changed
- The impact of change on peoples’ long-term outcomes
- How estimates of peoples’ long-term outcomes vary for different population cohorts.

4.1 Movements in, through and out of the public housing system

The public housing system is represented in Figure 4.1.

Figure 4.1 – Public housing system



To describe how rates of movement in, through and out of the system have changed, we focus on five key system gateways. Collectively these gateways explain most of the change to the public housing system over the last few years and the impact this has on our estimates of peoples’ long-term outcomes. The five gateways are:

- New households on the public housing register
- New clients receiving AS
- Households housed from the register
- Tenants exiting public housing – Under 65s
- Tenants exiting public housing – Over 65s.

We express the gateways as rates. If sustained, a change in rates can have significant long-term implications. The slow-moving nature of the system means that the effect of small changes can accumulate significantly over long periods.

We show rates for historical data for the last 10 years (solid lines) and estimates from the modelling for the next 10 years (dashed lines).

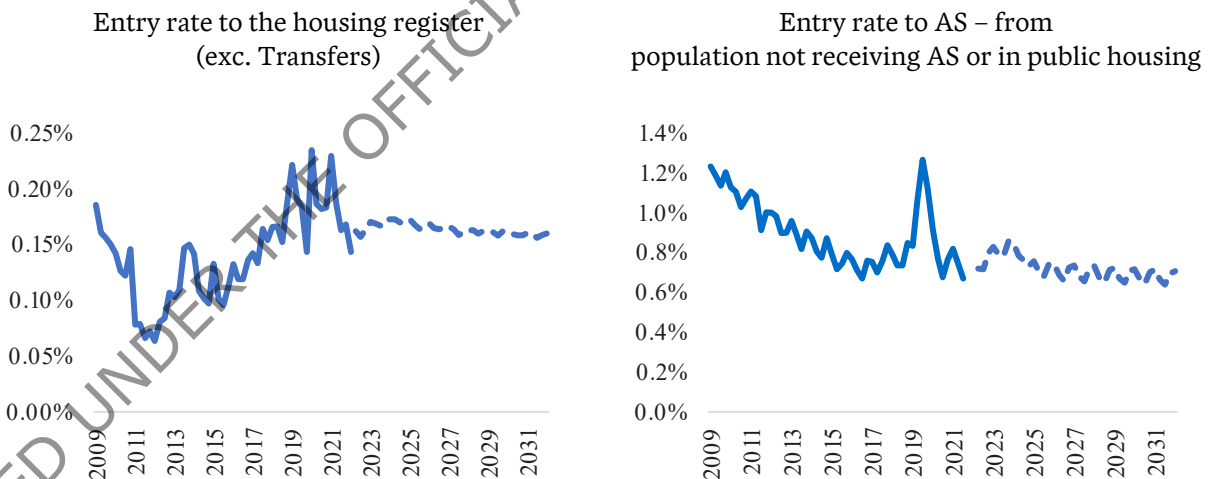
4.1.1 Entry to the public housing system

Public housing and AS are the two primary forms of housing support. Hence, the rate at which households move onto the register and the rate at which people take up AS represent the primary entry points into the housing support continuum, noting that people can be on the register and receiving AS.

Figure 4.2 shows entry rates from the whole population to:

- The public housing register
- Receiving Accommodation Supplement.

Figure 4.2 – Quarterly entry rates to the register and AS



The left-hand chart shows the steady increase in the entry rate to the housing register since 2016. The rate has nearly doubled. This upwards trend seems to have levelled off over the pandemic period, though there may be some pandemic effects influencing this. Our modelling assumption for the future has the rate broadly at 2019 levels.

The rate at which people start receiving AS had been in a long-term decline until 2017, after which it rose a little pre-pandemic, before increasing significantly at the start of the pandemic. Rates have since reverted back to close to pre-pandemic levels. Our modelling assumptions for the future have rates increasing through 2023 and 2024, reflecting HYEPU 2022’s forecast increase in the unemployment rate.

4.1.2 Households moving from the register to public housing

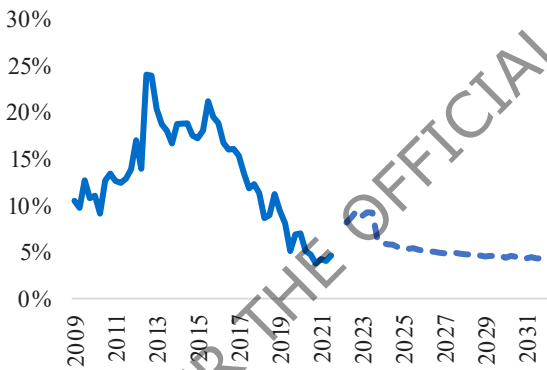
The likelihood of a household on the register being housed depends on the specific circumstances of the household, relative to other households on the register, and the availability of a suitable public house to move into. Availability itself is a product of the overall supply of public houses and the rate at which people exit public housing.

In Figure 4.3, we show the proportion of register households being housed each quarter. Our modelling assumes growth in public supply in line with the Ministry’s public housing supply pipeline forecast for the period to June 2027 – see Table 4.1. The planned supply forecast is limited to a three-year period, after this time the Model assumes no increase in net public housing places. However, it is likely the net public housing supply will be positive for 2026 and beyond.

Table 4.1 – Net new public housing supply forecast from 30 Sep 2022

Year end	Net new public houses
2022	1,214
2023	3,786
2024	1,727
2025	65
2026	0
2027	0

Figure 4.3 – Proportion of register households housed each quarter



The decreasing proportion of register households housed each quarter is primarily a product of the increasing entry rate to the register and decreasing exit rates from public housing. This is also reflected in official measures recording the time it takes for households on the register to be housed (amongst those that are housed in a quarter). The median time to house has increased from 50 days in September 2017 to 295 days in September 2022.

Our modelling assumptions for the future have the proportion of register households being housed increasing in the near term. This reflects anticipated increases in the stock of public housing over the period to mid-2024. After which the assumed rate returns to levels consistent with the recent past.

The forecast increases to public housing supply will help alleviate some pressure on the system. However, any impact on the register size and wait times is unlikely to persist unless one or a combination of the following occur:

- Public housing supply continues to increase materially beyond 2024

- Entry rates to the housing register decrease materially
- Exit rates from public housing increase materially.

Note that the modelling can be used to develop detailed supply signals (at Territorial Local Authority/Auckland Board level and by number of bedrooms) to help inform decisions about the location and size of new public housing supply.

4.1.3 Tenants exiting public housing

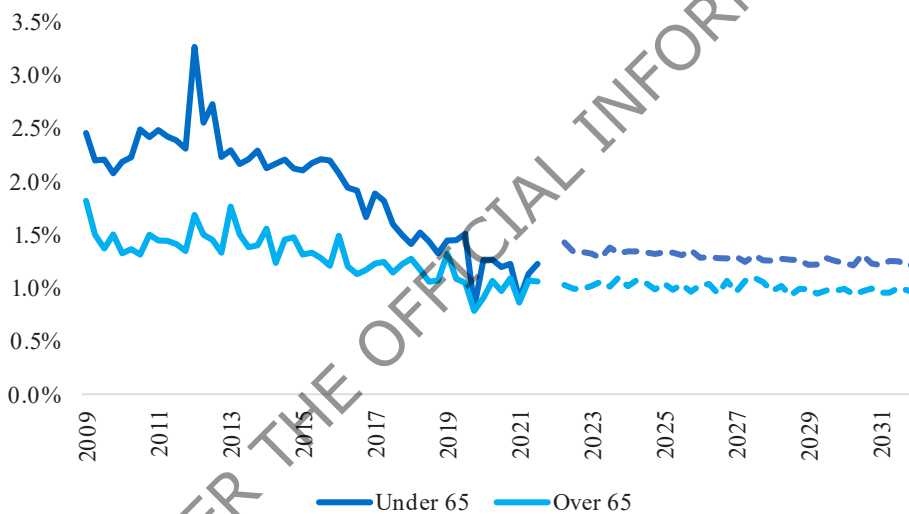
The rate at which tenants move out of public housing reflects, in most cases, movement into the private housing market. Tenants moving out also represents an opportunity for a household on the register to have their housing need met. Hence, potential unmet need, as reflected by the number of households on the register, is driven by both:

- The inflow of new households on the register
- The rate at which tenants move out of from public housing (exit rates).

The increase in the public housing register over the last few years is due to the combination of increased entry rates to the public housing register and decreased exit rates from public housing.

In Figure 4.4, we show exit rates for under 65-year-old and over 65-year-old primary tenants. This split reflects the fact that most exits for over 65-year-olds are due to death, hospitalisation or movement into some form of aged care, whereas exits for under 65-year-olds tend to be driven by other factors.

Figure 4.4 – Quarterly exit rates for primary tenants



Exit rates out of public housing have been in a long-term downward trend, though there is some evidence of stabilisation more recently. The downward trend is partly a compositional effect, caused by a combination of compounding factors:

- **Increasing levels of IRRS** due to rents growing at a faster rate than incomes/benefits. Tenants who are further away from being able to afford the private market are less likely to exit.
- **Increasing average age** of tenants. All else being equal, older tenants are less likely to exit.
- **Increasing average duration in public housing.** All else being equal, the longer people have been in public housing the less likely they are to exit.

4.2 Future time in public housing

The modelling produces estimates of households' time in public housing (and on the register) over their future lifetimes. Each year we recalibrate the Model to:

- Update the modelling population to the estimation date (30 September 2022)
- Update economic and model assumptions.

The updates to the Model assumptions are informed by observed experience, including that illustrated in Section 4.1. Generally, more weight is given to recent experience.

Table 4.2 shows estimates of average future years in public housing by high-level housing segments, including segments for people not receiving housing supports.

We show last year's modelling results for comparison, plus 2019 modelling results as a pre-COVID-19 baseline.

The updates to the modelling population and the updates to the assumptions impact these modelling results.

Table 4.2 – Average estimated future years in public housing by high-level housing category

Segment		Average Age			Ave. future years in public housing			
		2019	2021	2022	2019	2021	2022	
On register	Priority A	39.4	39.7	39.6	8.4	9.0	8.4	
	Priority Band Other	43.4	45.5	45.0	5.9	6.4	6.1	
	Sub total	40.1	40.3	40.1	8.0	8.7	8.3	
IRRS recipients, primary aged <65	Less close / IRRS > \$150	Child in the household	34.5	34.5	34.3	18.1	20.7	20.7
		No child in the household	44.2	44.4	44.3	16.0	17.7	17.2
	Closer / IRRS < \$150	Child in the household	35.5	34.7	35.3	14.4	17.1	17.4
		No child in the household	45.0	45.4	44.2	13.2	15.3	14.9
	Sub total	38.8	38.9	38.9	16.8	19.2	18.9	
IRRS recipients, primary aged >65	IRRS 65+	63.5	64.1	63.7	9.8	10.5	9.9	
Rest of the population	Receiving AS	44.2	43.8	43.9	2.5	2.6	2.4	
	Not receiving AS	46.9	47.6	47.6	0.4	0.4	0.4	
	Sub total	46.7	47.2	47.2	0.5	0.6	0.6	
Total		46.6	47.1	47.0	1.0	1.2	1.2	

Note that the average ages are based on all people in public housing aged 16+, not just the primary tenant.

The changes in average estimated future years in public housing are more moderate than the changes in average future years on main benefit shown in Table 3.1. And pandemic effects are less obvious. More specifically:

- For register households, average estimated future years in public housing has decreased year-on-year, to the same level as the 2019 modelling rounds. This largely reflects:
 - Increasing wait times on the register, reducing the potential future time households can be in a public housing and increasing the likelihood that households exit the register before being housed
 - A slight shift in profile of households on the register towards those not currently receiving AS. These households tend to exit at a faster rate once placed in public housing.
- For IRRS recipients with primary tenants under the age of 65, average estimated future years in public housing is materially the same as the 2021 modelling round. This is above pre-pandemic 2019 baselines reflecting the long-term trend of declining exit rates.

- For IRRS recipients with primary tenant over the age of 65, average estimated future years in public housing reduced moderately year-on-year, to broadly the same level as the 2019 modelling round. The decrease from 2021 to 2022 reflects updates to the model of mortality for over 65-year-olds to better reflect more recent data. This has resulted in a higher estimated mortality rate for these tenants.

Year-on-year change in estimated future years in public housing is analysed and reconciled in Section 4.3.

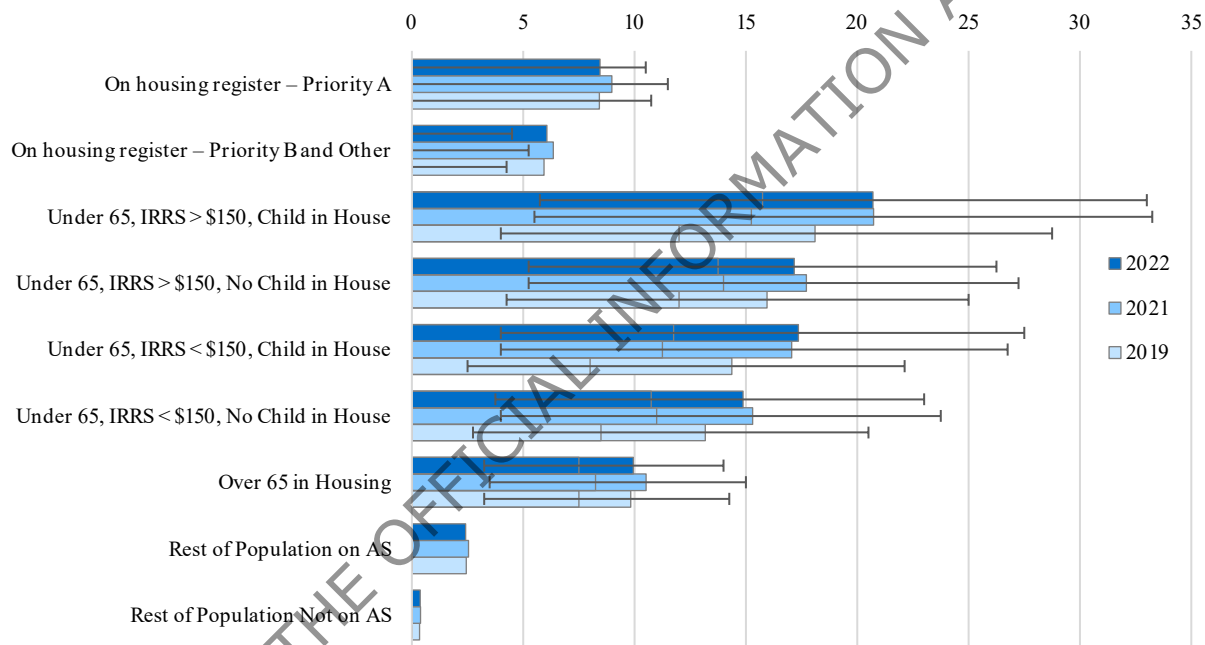
4.2.1 Distribution of estimated future outcomes

Figure 4.5 shows the same modelling results as Table 4.2 in graphical form.

Interquartile ranges and median averages are shown. 2021 and 2019 modelling results are also shown for comparison.

The interquartile ranges give a good indication of the range of average future years in public housing for different categories. For example, for the ‘Under 65, IRRS >\$150, Child in House’ category, 25% are estimated to spend less than 5.75 years in public housing and 25% are estimated to spend more than 33.0 years in public housing.

Figure 4.5 – Average future years in public housing by high-level housing category

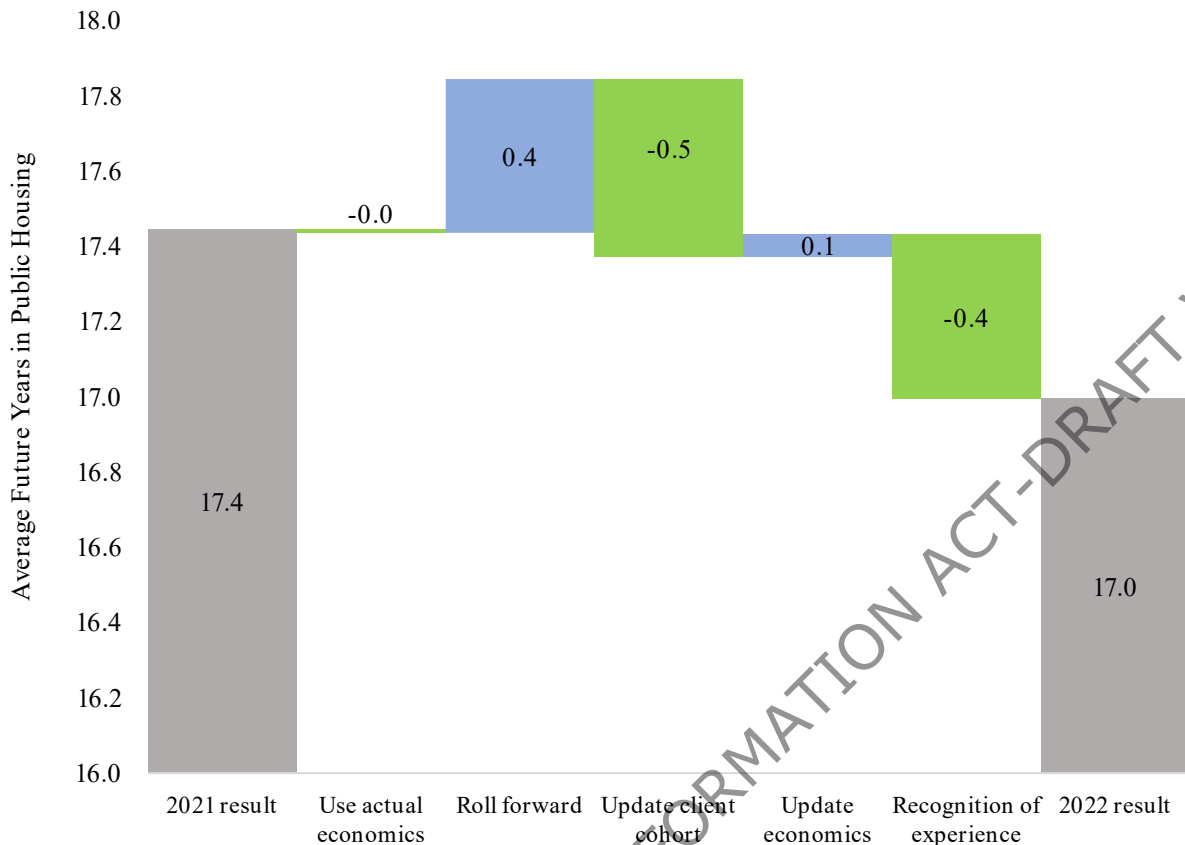


4.3 Analysis of change

Similar to Section 3.4 for the benefit system, we have broken down the year-on-year change between 2021 and 2022 modelling results into contributing factors.

In Figure 4.6, we show a system view. It considers average future years in public housing for the population of people in public housing or on the register at 30 September.

Figure 4.6 – 2021/2022 analysis of change – All people in public housing or on the register at 30 September



Overall, there has been a moderate decrease in the average estimated future years in public housing, from 17.4 years at 30 September 2021 to 17.0 years at 30 September 2022.

The key steps of the analysis to highlight are:

- Roll forward +0.4 years – We anticipated an increase ('Roll forward' step) due to expected continuation in the long-term trends such as increased average tenant age. We also anticipated an increase in the proportion of tenants who are on a main benefit. Main benefit clients tend to stay in public housing longer than other tenants on average.
- Update client cohort -0.5 years – However, the anticipated increase in proportion of tenants who are on a main benefit did not occur. Also, incomes grew faster than rents, resulting in slightly lower IRRS levels. All else being equal, lower IRRS households tend to stay in public housing for less time than other households. Income growth among households in public housing mainly reflects increases in main benefit payment levels (both indexation increases and ad hoc increases). This largely cancelled out the 'Roll forward' step.
- Recognition of experience -0.4 years – The mortality modelling was updated, resulting in higher assumed mortality rates among over-65-year-old tenants. Also, among households on the register, average estimated future years in public housing reduced slightly due to longer wait times on the register. Longer wait times reduces the potential future time households can be in public housing and increases the likelihood that households leave the register before being housed in a public house.

5 Regional results – Canterbury

Key points from this section

- Differences in estimates of future benefit receipt by region can be largely explained by the differences in ethnicity mix – When we control for ethnicity mix, differences between regions are very small.
 - This somewhat dispels the myth that regional factors (particularly differences in regional labour markets) explain differences in the time people spend on main benefit.
 - This does not mean that a person’s ethnicity explicitly drives their benefit outcomes. However, understanding the factors correlated with ethnicity that do, could have significant operational implications.
-

In this section, we explore modelling results at a regional level. We show results for Canterbury clients with comparisons to clients in the rest of New Zealand and clients in the rest of the South Island. Equivalent results are available for other regions.

By exploring results by region, we draw out specific regional insights that may be useful for regional management.

5.1 Client profile

In Figure 5.1, we show how Canterbury clients compare to the rest of New Zealand and the rest of the South Island. We compare:

- Demographics – Gender, age and total ethnicity
- Number of priority groups
- Proportion of the working-age benefit on each main benefit.

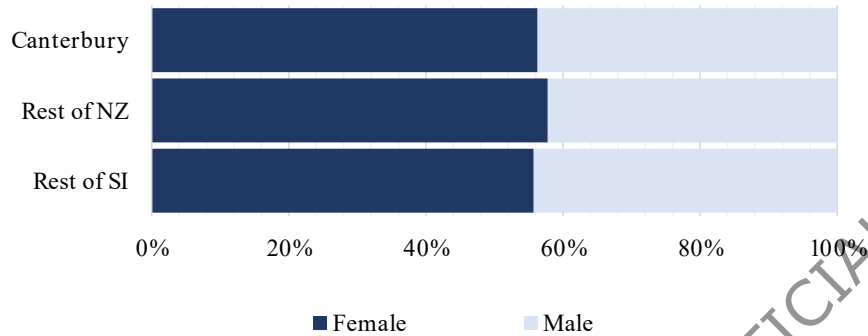
Canterbury clients represent about 10% of the total main benefit population. They have a similar gender and age-band mix to the comparison groups. However, total ethnicity is significantly more weighted to NZ Europeans and away from other ethnicities (most notably Māori and Pacific Peoples) than the rest of New Zealand (specifically the North Island). 81% of Canterbury clients identify as NZ European and 26% identify as Māori. Compared to the rest of New Zealand of whom 57% identify as NZ European and 45% identify as Māori.

Figure 5.1 – Canterbury profile

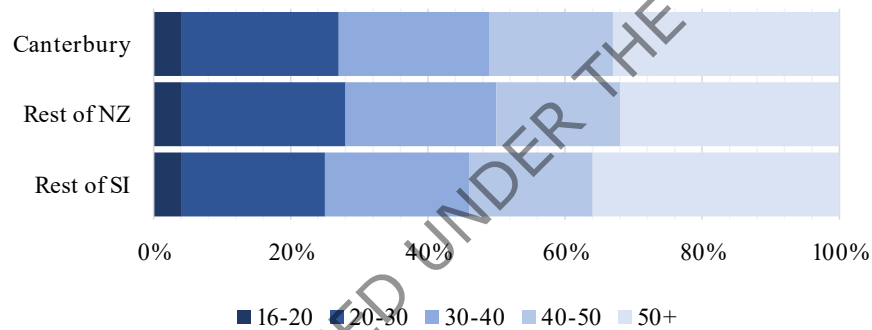
Number of main benefit clients

28,700
9.9% of the main benefit population

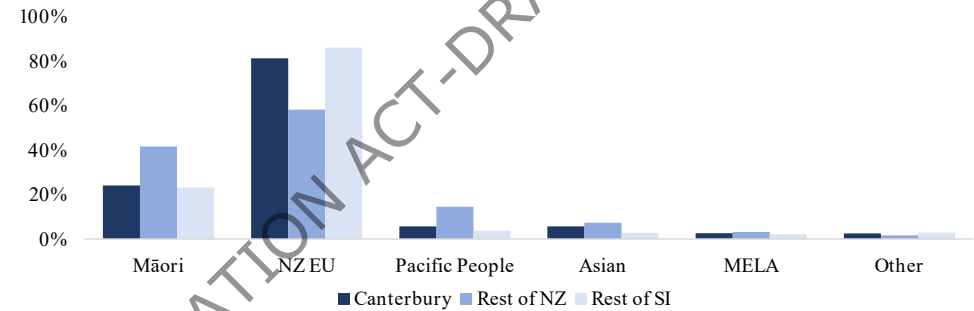
Gender



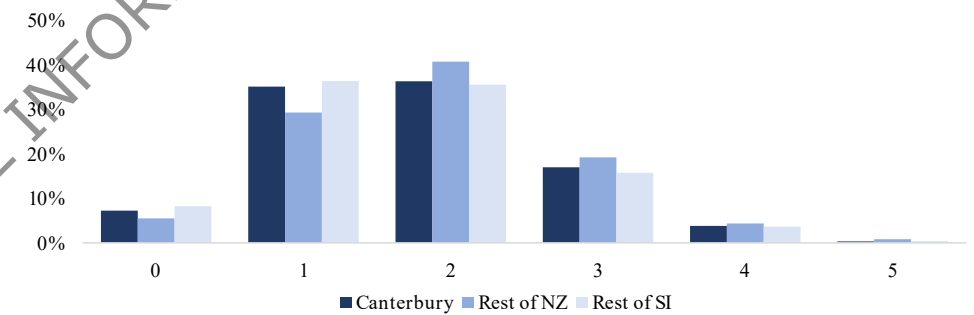
Age band



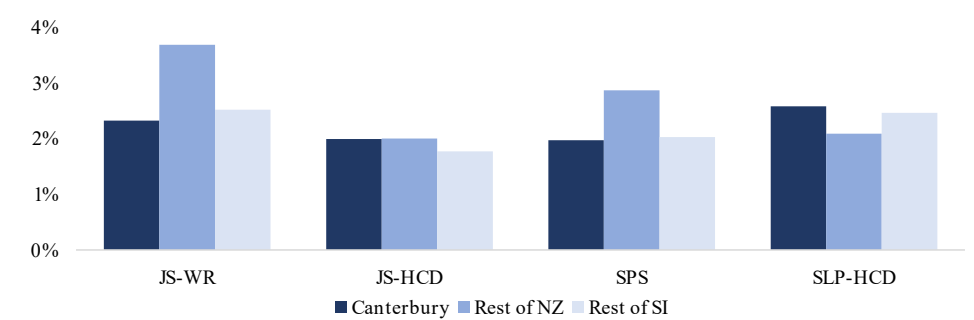
Total ethnicity



Number of priority groups



% of working-age population on benefit



MSD's priority groups as set out in the Ministry's Employment and Social Outcomes Investment Strategy 2022 to 2025⁴. They are:

- Women
- Māori
- Pacific people
- Young clients (aged under 25)
- Older clients (aged 50-65 or aged 45-65 for JS-HCD)
- Disabled clients (notionally defined as all JS-HCD and SLP clients).

As a consequence of the ethnic mix, Canterbury clients belong to fewer priority groups on average than clients in the rest of New Zealand. 42% belong to 0 or 1 priority group, compared to 35% for the rest of New Zealand.

Canterbury also has a much lower proportion of the working-age population on JS-WR and SPS than the rest of New Zealand:

Table 5.1 – Proportion of working age population on benefit

Benefit category	Canterbury	Rest of NZ
JS-WR	2.3%	3.7%
JS-HCD	2.0%	2.0%
SPS	2.0%	2.9%
SLP-HCD	2.6%	2.1%

Labour market factors may explain some of the differences, particularly for JS-WR. Historically, Canterbury, and the rest of the South Island, has had a lower unemployment rate than the North Island. Although at the modelling date, Canterbury's unemployment rate (3.2%) was not materially different to the national unemployment rate (3.3%).

The relatively high proportion of the Canterbury working-age population on SLP-HCD is noteworthy. At 2.6%. Consequently, 29% of Canterbury's main benefit clients are on SLP-HCD, whereas only 19% of main benefit clients in the rest of New Zealand are on SLP-HCD.

Differences in ethnic mix at least partly explain this. People who identify as Māori are far less over-represented among SLP clients than other main benefit categories, and a much lower proportion of people in Canterbury identify as Māori.

5.2 How estimated future time on main benefit compares regionally

In Figure 5.2, we show how average estimated proportion of the next 10 years (or to age 65 if earlier) on a main benefit differs for Canterbury compared to the rest of New Zealand and the rest of the South Island. There is relatively little difference between the groups on this measure. And the differences that do exist largely disappear if we control for differences in age, gender, and ethnic mix.

Indeed, while equivalent charts for other regions are not shown in this report, they show a similar picture.

⁴ <https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/investment-approach/investment-strategy-2022-to-2025.pdf>

Figure 5.2 – Average estimated proportion of the next 10 years (or to age 65 if earlier) on a main benefit – by main benefit category (comparison groups are not demographically standardised)

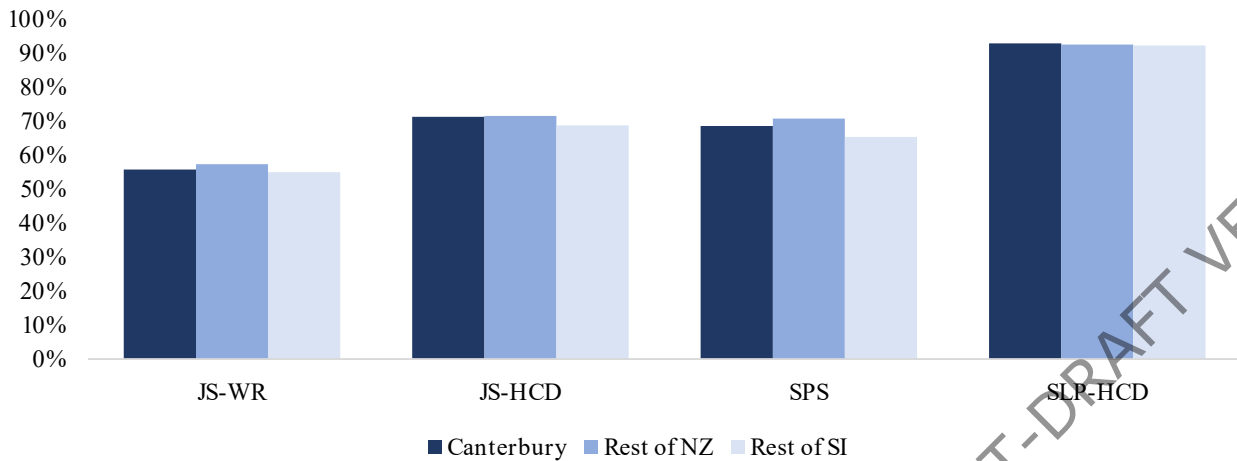
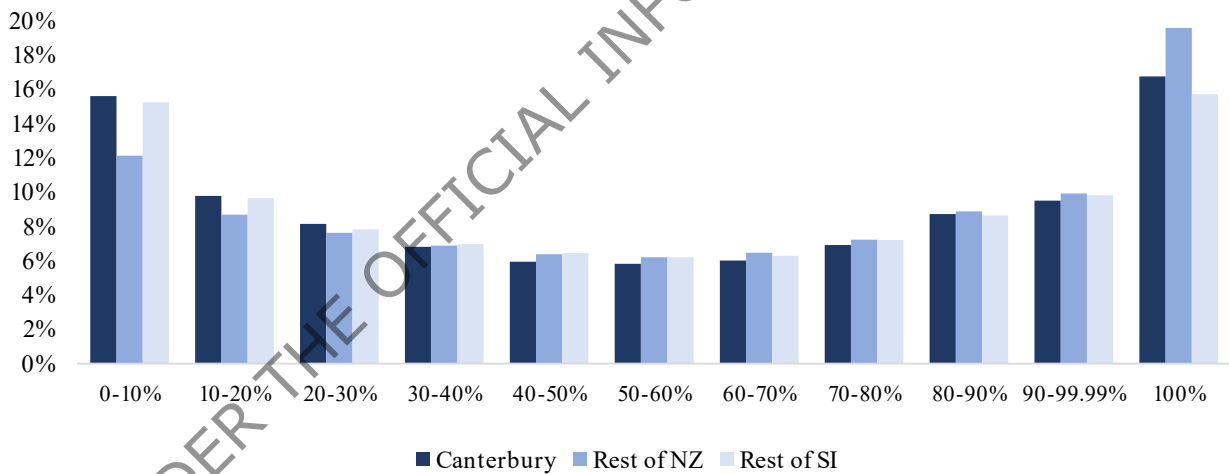


Figure 5.3 shows the distribution of estimated proportion of the next 10 years (or to age 65 if earlier) on a main benefit for Canterbury. It shows that differences in the average (as shown in Figure 5.2) are mainly due to differences at the extreme ends of the distribution i.e. a higher proportion of Canterbury JS-WR clients estimated to spend less than 10% of the next 10 years on a main benefit, and a lower proportion estimated to spend more than 90% of the next 10 years on a main benefit.

Figure 5.3 – Distribution of estimated proportion of the next 10 years (or to age 65 if earlier) on a main benefit – JS-WR clients



While regional differences in the estimated proportion of the next 10 years on a main benefit are relatively small, differences in the estimated number of future years on a main benefit over clients’ lifetimes to age 65 are more significant. This stems from differences in the total ethnic mix in each region – See Figure 5.4, which shows JS-WR as an example:

- The first chart shows that average estimated future years on main benefit varies significantly by ethnic group. Note that geographic profiles vary significantly between ethnic groups.
- The second chart shows that there is relatively little variation by region for Māori. This is true for other ethnic groups. Regional labour markets vary and historically some regions have tended to consistently have higher unemployment rates than others.
- The third and fourth charts show that across all JS-WR clients, most of the variation by region disappears when we standardise for ethnicity. That is, differences in geographic profiles by ethnicity explain the variation by region.

- This does not mean that a person’s ethnicity explicitly drives their benefit outcomes. Rather, factors correlated with ethnicity influence benefit outcomes. Understanding these factors could have significant implications.

Figure 5.4 – Average estimated future years on main benefits to age 65 – JS-WR clients



Note: MELAA stands for Middle Eastern/Latin American/African

We might have expected greater regional differences given differences in regional labour markets. However, differences by ethnic group are more significant and consistent across all regions. It is not clear why this is the case. Further investigation is warranted, to help inform policy and operational thinking.

The answers are likely to be complex and multi-faceted, but we can at least isolate and test the significance of some factors that are captured in available data e.g. differences in educational attainment. The modelling can be used to isolate such factors and estimate how average estimated future years on main benefit for each ethnicity varies with different factors, while holding other variables in the Model constant.

Other factors not currently part of the modelling could also be investigated. For example, clients’ proximities to towns and cities (as proxies for labour markets).

5.3 Risk characteristics among JS-WR clients

In this sub-section we focus on Canterbury clients on JS-WR and the prevalence of risk characteristics that tend to correlate with future benefit receipt. Table 5.2 lists the risk characteristics and:

- The age range over which we can consider the risk characteristic, based on the available data.

- Whether the risk characteristic is derived from MSD data or another data source. This is important because risk characteristics derived from MSD data can easily be used in an operational context.

Table 5.2 – Risk characteristics

Risk characteristic	Age range	Data source
Achieved less than National Certificate of Educational Achievement (NCEA) Level 2 or equivalent	16-30	Other
Been stood down or suspended while at school	16-30	Other
Received a main benefit in the last three years	16-65	MSD
First received a benefit during teenage years	16-42	MSD
Having intergenerational main benefit history ⁵	16-30	MSD
Lived in public housing in the last three years	16-65	MSD
Having interacted with care and protection services in childhood ⁶	16-30	Other
Having youth justice history	16-30	Other
Being proceeded against by the Police in the last three years	16-65	Other
Use of mental health-related supports in the last year	16-65	Other
Being hospitalised for acute care in the last three years	16-65	Other
Zero earned income in the quarter to 30 June 2019	16-65	Other

We split our analysis into under 30-year-olds and over 30-year-olds, given that some risk characteristics aren't available for over 30-year-olds.

Figure 5.5 shows the distribution of the number of risk characteristics for under 30-year-old JS-WR clients. For example, 25.9% of the Canterbury clients have two or fewer risk characteristics compared to 19.9% for the rest of New Zealand. Canterbury clients have fewer risk characteristics on average, though have a slightly higher proportion of clients with 9+ risk characteristics (9.8% vs. 9.1%).

⁵ Supported by parent/guardian on main benefit at some point during ages 13-18.

⁶ Had a report of concern submitted in respect of them or a higher level of interaction with care and protection services.

Figure 5.5 – Number of risk characteristics – under 30-year-old JS-WR clients

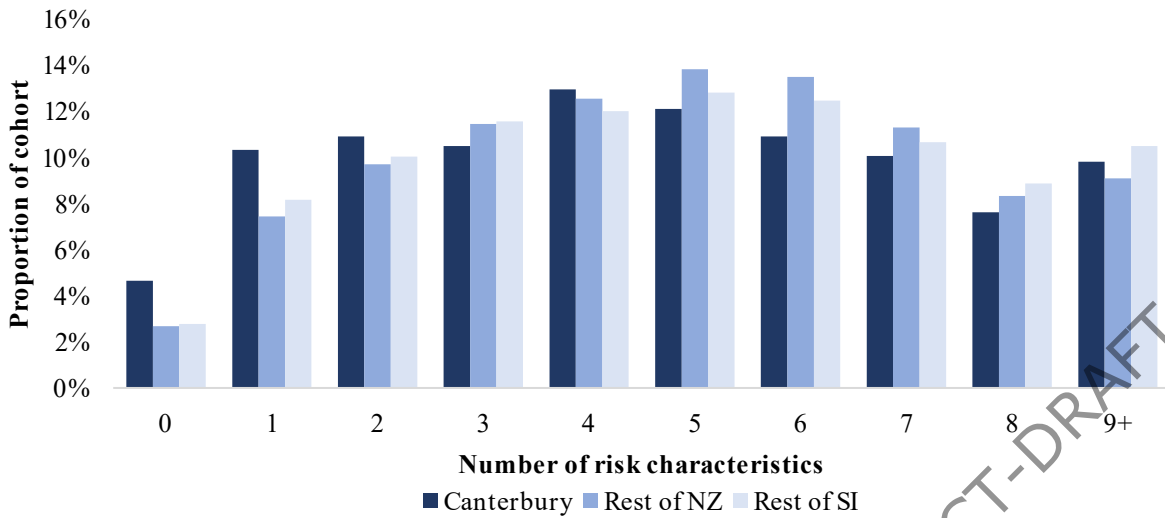


Figure 5.6 shows how estimates of time on main benefit over the next 10 years vary with number of risk characteristics. It shows a clear correlation between the number of risk characteristics and estimates of the proportion of the next 10 years on a main benefit. Clients with more complex needs are estimated to spend more time supported by a main benefit:

- Canterbury clients with no risk characteristics are estimated, on average, to spend 20.2% of the next 10 years supported by a main benefit
- Canterbury clients with 9+ risk characteristics are estimated, on average, to spend 77.7% of the next 10 years supported by a main benefit
- These proportions are very similar for the rest of New Zealand and the rest of the South Island.

Figure 5.6 – Average estimated proportion of the next 10 years on a main benefit by number of risk characteristics – under 30-year-old JS-WR clients

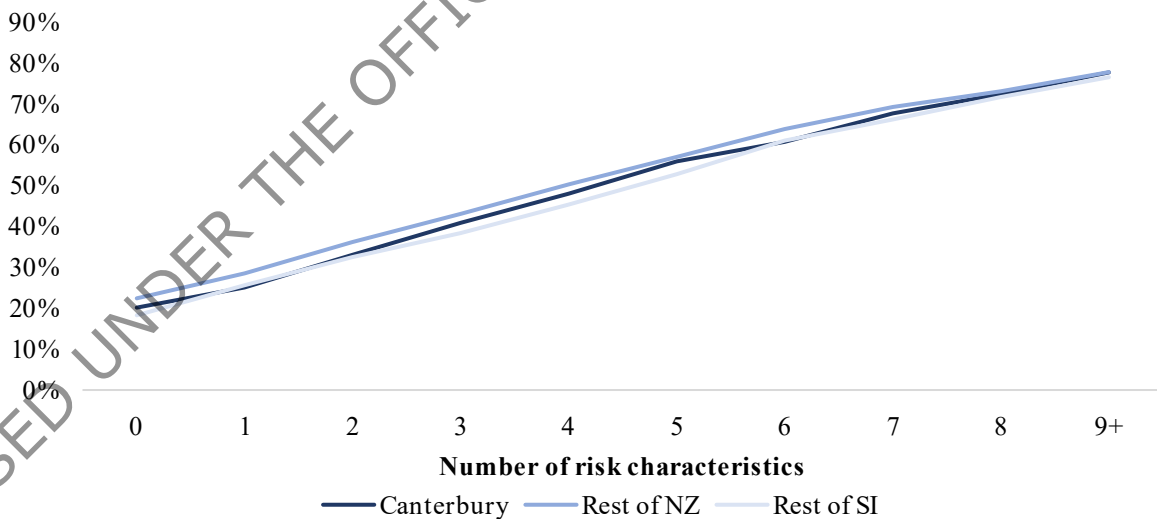


Figure 5.7 and Figure 5.8 show equivalent information for over 30-year-old JS-WR clients, with similar patterns in terms of the number of risk characteristics and how estimates of future main benefit receipt vary with the number of risk characteristics.

Figure 5.7 – Number of risk characteristics – over 30-year-old JS-WR clients

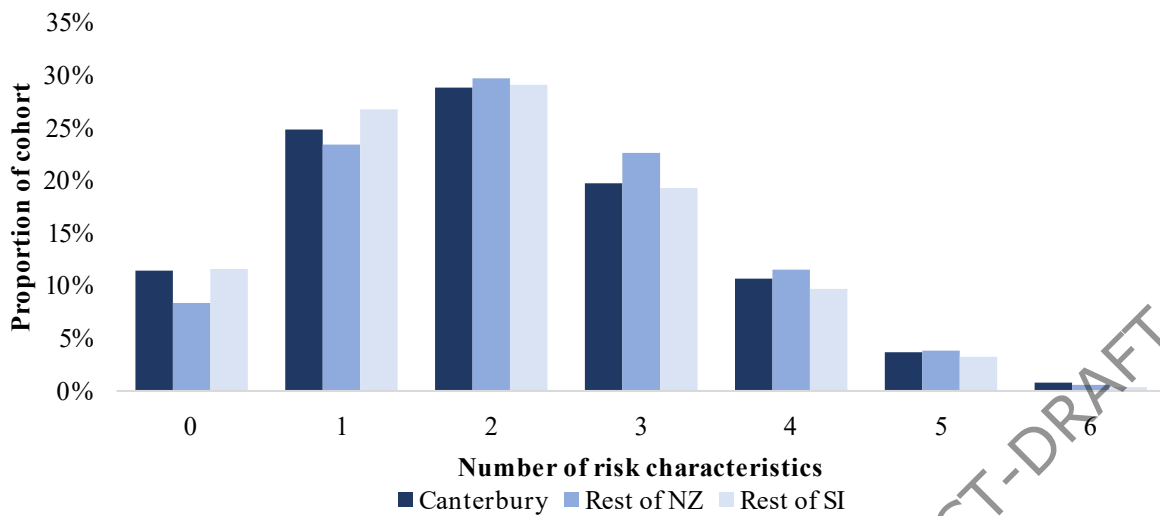
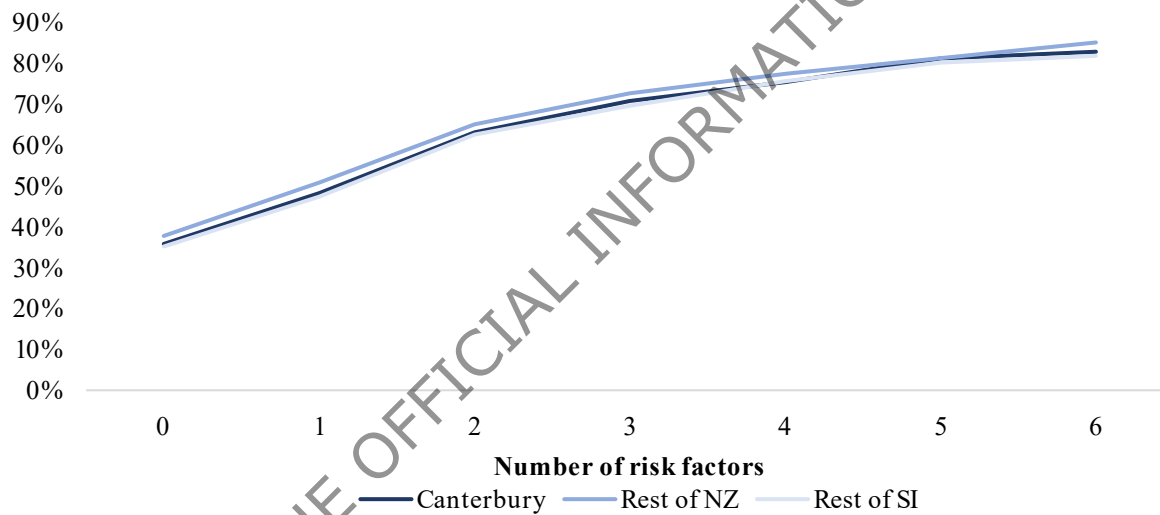


Figure 5.8 – Average estimated proportion of the next 10 years (or to age 65 if earlier) on a main benefit by number of risk characteristics – over 30-year-old JS-WR clients



5.4 Conclusions and questions

When controlling for key demographic factors (gender, age and ethnic group), differences in representation in the benefit system and estimated of future time on main benefit are relatively small between regions. Arguably this is somewhat surprising given relatively significant differences in regional labour markets.

Further investigation may be useful to help understand:

- The inter-relationship between differences in regional labour markets, differences in estimates of future benefit receipt and differences in other factors correlated with ethnicity, and hence help understand the extent to which regional differences drive differences by ethnicity (and/or vice versa).
- How regional client segmentation could help inform which clients (on benefit entry or otherwise) need the most support to find sustainable employment and obtain financial independence. Particularly for under 30-year-olds where we have more MSD data on which to base segmentations.

6 Disabled clients

Key points from this section

- We have used the Washington Group Short Set disability questions in the 2018 census to determine a cohort of disabled people among the benefit system population.
- Disabled people are significantly over-represented in the benefit system. About 36% of disabled people are supported by a main benefit, compared to about 8% of non-disabled people. About 17% of disabled people who aren't on SLP are supported by a main benefit, compared to about 6% of non-disabled people.
- Disabled people also have moderately higher average estimates of future benefit receipt and a higher prevalence of risk characteristics – this reflects a higher prevalence of other risk characteristics (such as low educational attainment) among disabled people.
- Only about 33% of SLP-HCD clients are disabled. Note that the eligibility criteria for SLP have conceptual similarities to the disability definition we have used.

Disabled people are one of the Ministry's priority groups. However, identifying which clients are disabled is not straightforward given:

- Differing ways in which disablement can be defined
- Limited information on client disablement beyond what affects entitlement for JS-HCD, SLP and Disability Allowance.

As part of the modelling this year, we have linked the client population with the 2018 census. The census asks a set of six questions referred as the Washington Group Short Set (WGSS) Questions⁷. The questions ask about difficulties people may have doing certain activities – see Table 6.1. These questions, or an extended version of them, are sometimes used as the basis for determining a cohort of disabled people. Indeed, the Washington Group Extended Set Questions is being used to screen respondents for the 2023 Disability Survey. Specifically, a person is defined as being disabled if they answer 'a lot of difficulty' or 'cannot do at all' to at least one of the questions.

Table 6.1 – Washington Group Short Set Questions

This question is about difficulties you may have doing certain activities because of a health problem. Do you have difficulty with any of the following:		Response options:
	Seeing, even if wearing glasses?	No difficulty
	Hearing, even if using a hearing aid?	Some difficulty
	Walking or climbing steps?	A lot of difficulty
	Remembering or concentrating?	Cannot do at all
	Washing all over or dressing?	
	Communicating using your usual language, for example understanding or being understood by others?	

For the purposes of our analysis, we have defined a person as disabled if they answer 'a lot of difficulty' or 'cannot do at all' to at least one of the WGSS questions. This approach has noted limitations:

⁷ <https://www.washingtongroup-disability.com/question-sets/wg-short-set-on-functioning-wg-ss/>

- The questions don't capture important concepts such as the age of onset, cause and permanency of disablement, use and impact of assistive devices, or the nature of environmental barriers.
- The questions are limited in picking up people with psychosocial, intellectual or neurodevelopmental disabilities.
- They reflect difficulties people may have doing certain activities at the time of the 2018 census. People's responses to these questions may change over time and so:
 - Some people defined as disabled on this basis may not be defined as disabled if they were asked the questions today.
 - Some people not defined as disabled on this basis may be defined as disabled if they were asked the questions today.

Note that the WGSS questions were asked as part of the 2023 census, but these data are not available in the IDI yet.

- Many current clients either:
 - Didn't respond to the 2018 census out of choice or because they were not present in the country on the day of the census
 - Responded to the 2018 census, but did not respond to the WGSS questions

Undoubtedly, there will be some bias present in our analysis due to this.

Despite these limitations, the analysis provides a reasonable basis for considering disablement amongst the benefit system population.

6.1 Population statistics

First, we describe the proportion of 30 September 2022 population who responded to the WGSS questions in the 2018 census – see Table 6.2.

Table 6.2 – Population coverage

Benefit category	Proportion of 30 September 2022 population who answered the WGSS 2018 census questions	Number of those who answered the WGSS 2018 census questions	Proportion of those who answered the WGSS 2018 census questions who are disabled	Number of those who answered the WGSS 2018 census questions who are disabled
JS-WR	48%	53,700	6%	3,300
SPS	53%	40,000	6%	2,300
JS-HCD	57%	43,400	12%	5,200
SLP-HCD	67%	65,000	33%	21,400
SLP-Carers	64%	5,900	9%	500
Total main benefit	56%	208,100	16%	32,700

Benefit category	Proportion of 30 September 2022 population who answered the WGSS 2018 census questions	Number of those who answered the WGSS 2018 census questions	Proportion of those who answered the WGSS 2018 census questions who are disabled	Number of those who answered the WGSS 2018 census questions who are disabled
Rest of 16–65-year-old population	70%	2,060,800	2.8%	57,100
Total 16–65-year-old population	68%	2,268,900	4.0%	90,000

Overall, 56% of the main benefit population at 30 September 2022 answered the WGSS questions in the 2018 census (compared to 70% of the rest of the 16–65-year-old population). Note that 84% of the main benefit population responded to the 2018 census to some degree. So, 28% responded to some of the census, but didn't answer the WGSS questions.

56% represents about 208,100 people. Of these people, 16% fit the definition of disabled. This compares to 2.8% for the rest of the population. While a large difference here is expected, given that JS-HCD and SLP eligibility reflects health conditions and disabilities, it is noteworthy that only 33% of SLP clients who answered the WGSS 2018 census questions are disabled. There may be good reasons for this. For example, SLP clients who have difficulties with the activities covered by the WGSS questions may have been less able/inclined to respond to the 2018 census (and so would be underrepresented). Regardless, we might have expected this proportion to be higher, and think this is worthy of further exploration, because:

- To be eligible for SLP, you must be either:
 - Permanently and severely restricted in your ability to work because of a health condition, injury or disability, or;
 - Totally blind.

Conceptually, this eligibility requirement has a large degree of overlap with the WGSS questions, if you assume ability to work is at least partly based on core physical and mental abilities i.e. to see, hear, remember, communicate etc.

- SLP is the largest main benefit category and very few SLP clients exit benefit into employment.

We also note that there are a reasonable number of people in work-obligated benefit categories who are disabled – about 6% for both JS-WR and SPS. This is important as it highlights potential barriers to employment that won't necessarily be the focus of employment assistance programmes targeted at JS-WR and SPS clients.

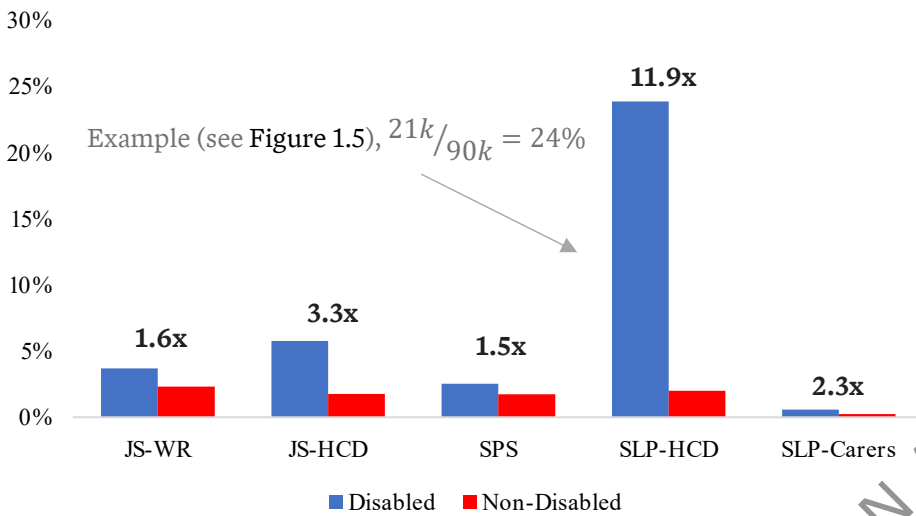
6.2 Overrepresentation in the benefit system

Disabled people are over-represented in the benefit system. Disablement can be a fundamental barrier to employment and specific benefits are designed to support disabled people. However, disabled people are over-represented across all benefit categories.

Figure 6.1 shows the proportion of disabled and non-disabled people (who answered the WGSS 2018 census questions) who receive each main benefit type. Overall, 36.4% of disabled people are on a main benefit, compared to 8.0% of non-disabled people (4.5x). SLP clients account for a large part of this. However, even if we exclude SLP, 16.5% of disabled people who aren't on SLP are on other main benefits, compared to about 6.2% of non-disabled people.

Overrepresentation is common across all benefit categories, including work-obligated benefit categories (1.6x for JS-WR and 1.5x for SPS).

Figure 6.1 – Proportion of working-age population receiving a main benefit



Disabled clients are also estimated to spend more future years on main benefit than non-disabled clients – see Figure 6.2. While the differences are not large, they are consistent across benefit categories. Note that the non-disabled comparison group has been standardised to be demographically equivalent (in terms of age, gender and prioritised ethnic group) to the disabled group. This enables a more meaningful comparison, as it helps to control for differences between the two groups that correlate with demographic factors.

Figure 6.2 – Average estimated proportion of the next 10 years on a main benefit

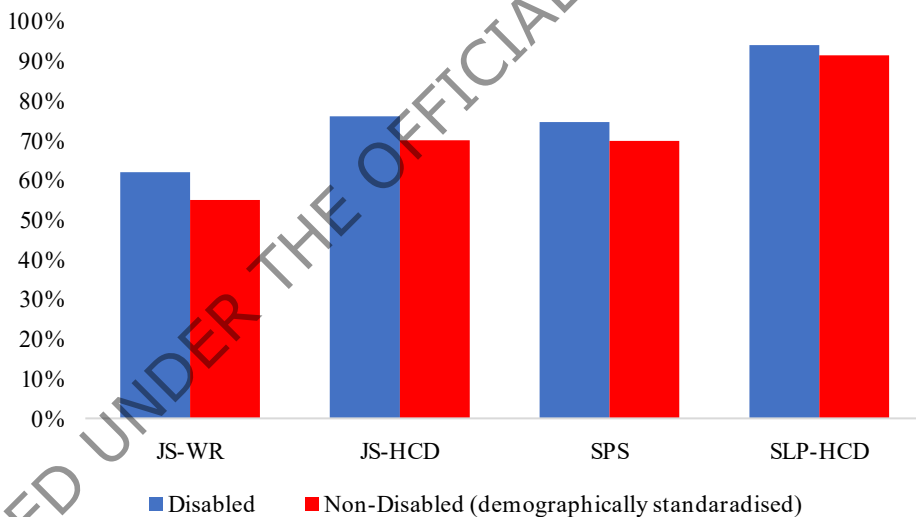
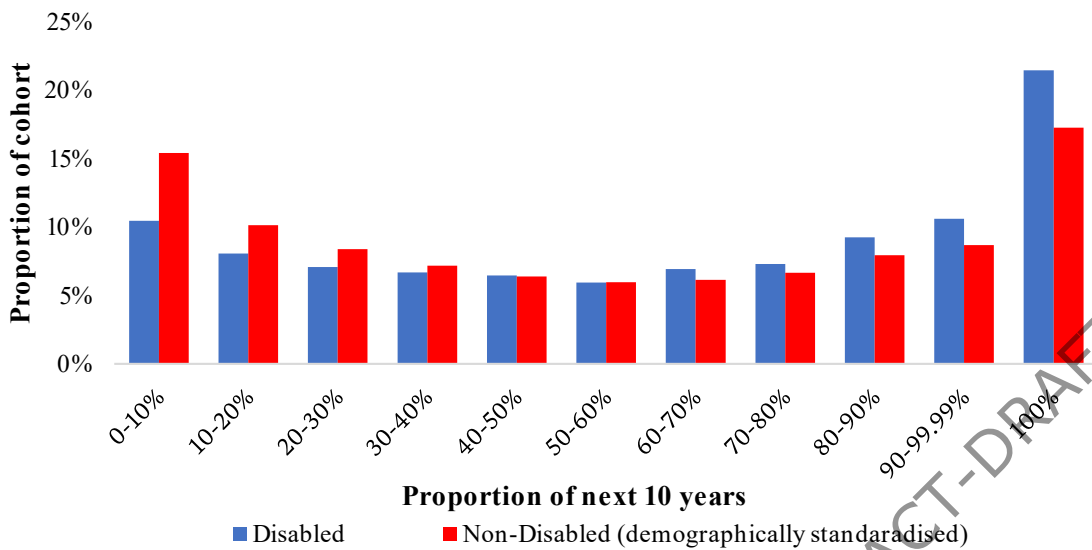


Figure 6.3 shows the distribution around the averages in Figure 6.2 for JS-WR. It highlights the difference in the average estimated proportion of the next 10 years on a main benefit (62.1% vs. 55.1%) predominantly stems from:

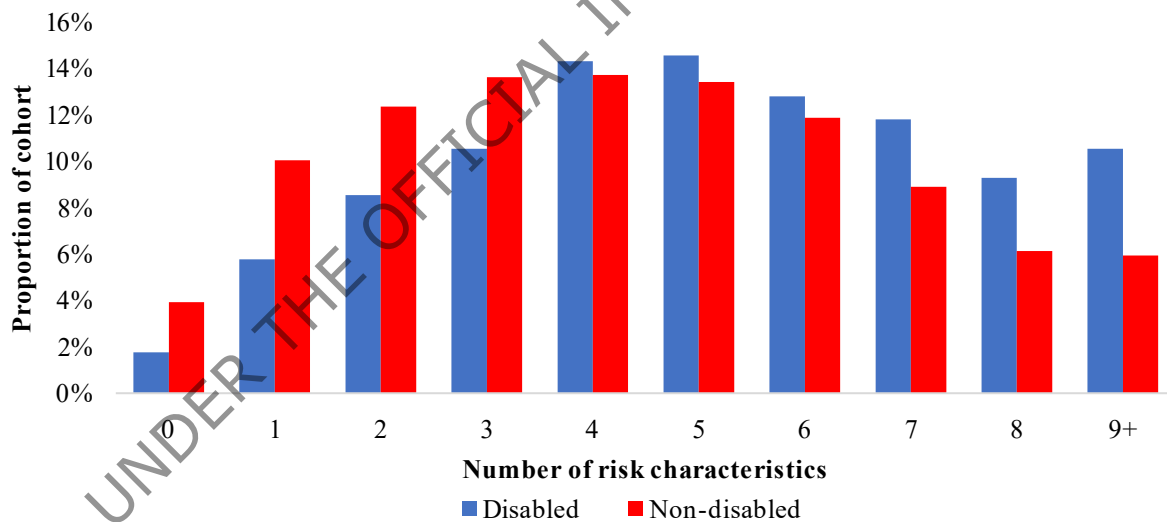
- A higher proportion of clients estimated to spend 80% or more of the next 10 years on a main benefit (41.2% vs. 33.8%), and;
- A lower proportion of clients estimated to spend less than 20% of the next 10 years on a main benefit (18.5% vs. 25.5%).

Figure 6.3 – Distribution of estimated proportion of the next 10 years on main benefit – JS-WR clients



The differences in estimates are largely driven by differences in the prevalence of the risk characteristics listed in Table 5.2. Disabled clients are more likely to have a high number of risk characteristics, suggesting a greater complexity of circumstances than non-disabled clients (which may or may not be connected to their disabilities). As an example, Figure 6.4 shows the number of risk characteristics for disabled and non-disabled under 30-year-old JS-WR clients. About 31.7% of the disabled clients have 7 or more risk characteristics, compared to about 21.0% for the non-disabled clients.

Figure 6.4 – Number of risk characteristics – under 30-year-old JS-WR clients



6.3 Conclusions and questions

Cross-referencing the benefit system population with people who responded to the 2018 census WGSS questions yields some noteworthy insights. These invite a number of questions which require further investigation to help understand operational and policy implications:

- Why do so few SLP clients fit the definition of disabled used in the census, given the apparent overlap with SLP eligibility criteria?
- How much impact does the time gap since the 2018 census have on this and how much does the picture change if we repeat the analysis on the 2018 main benefit population?

- How do SLP clients who do and don't fit the definition of disabled differ, and does this have any implications for how they are managed?
- Is the extent to which disabled people are over-represented in the benefit system reasonable, including in work-obligated benefit categories?
- To what extent are disabilities for clients receiving work-obligated benefits acting as a barrier to employment? Are there specific interventions that could address these barriers?

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7 Future time in employment

Key points from this section

- Viewing modelling results through the lens of employment is aligned to the ministry's strategy and operational focus. It can be used to:
 - Provide a baseline to monitor future experience against and identify trends early
 - Describe how changes in experience affects our estimates of the future
 - Identify cohorts likely to experience poor future employment outcomes
 - Highlight the risk and resilience factors correlated with good or bad employment outcomes, to help inform intervention strategies.
- We have also used it to segment clients based on estimates of the proportion of the next 10 years spent in employment. This can be used as a basis for triaging clients for further analysis, case management and/or employment assistance programmes, particularly if based on variables present in MSD data.
- For example, among YP and JS-WR clients under the age of 25, female clients who first received a benefit during their teens and who were supported by benefits as a child stand out as having poor employment prospects.

In Section 3, we explored modelling results framed around estimated future time on main benefits. In this section we explore an alternative framing using estimated future time in employment. This brings a slightly different lens to the modelling, focussing less explicitly on the need for financial support, and more explicitly on employment outcomes. While the two concepts are clearly related, a modelling focus on future time in employment has several advantages:

- Alignment with the Ministry's core operational focus and intent to achieve sustainable employment for groups that experience poor labour market outcomes
- We model related employment factors, income and industry, which can be used to provide a more in-depth picture of off-benefit pathways and provide a direct link to material wellbeing
- It is likely to be seen as less stigmatising of clients
- It can provide an economic human capital lens including GDP, tax receipt and conceptual linkage to the Living Standards Framework.

We use an income-based proxy for employment. Specifically, a person is defined as being in part-time employment in a quarter if they earn the equivalent of 13 weeks at between 20-40 hours per week at minimum wage. Based on the minimum wage in force at the modelling projection date (30 September 2022), this is \$5,512-\$11,024. Note that the minimum wage increased from \$21.20 to \$22.70 on 1 April 2023.

A person is defined as being in full-time employment in a quarter if they earn more than the equivalent of 13 weeks at 40 hours per week at minimum wage.

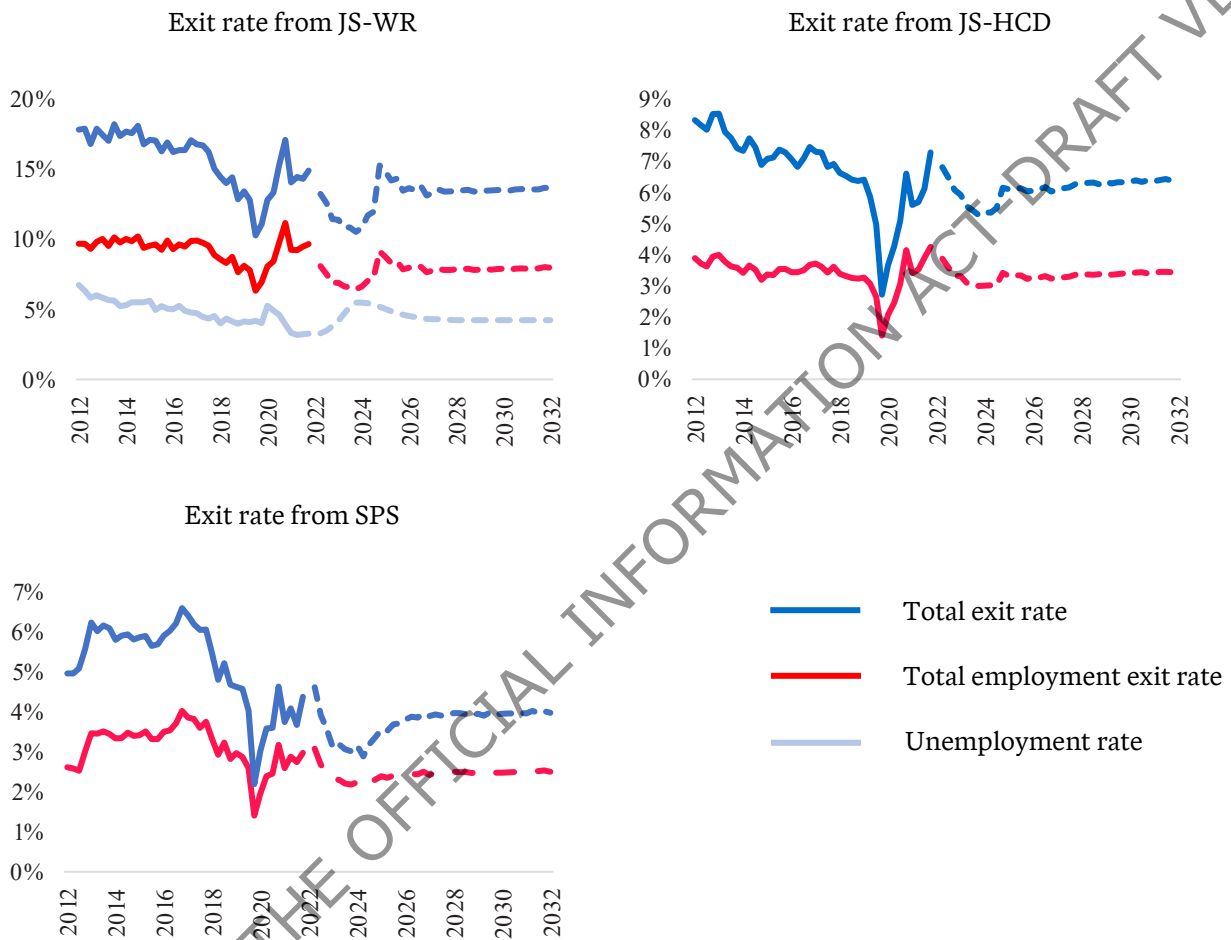
We discuss:

- Employment exits from main benefit over the last 10 years and estimates for the next 10 years.
- Distributions of the proportion of the next 10 years that clients are estimated to be in employment.
- For YP and JS-WR clients under the age of 25, the characteristics that define clients who are estimated to spend a high or low proportion of the next 10 years in employment. This includes characteristics based on MSD data that can be accessed outside of the IDI and wider social sector characteristics that can be accessed in the IDI.

7.1 Employment exits

The Ministry produces and publishes regular research on what happens to people who leave the benefit system⁸. This research uses an explicit definition for an employment exit which, as far as possible, we have replicated within the Model construct – Appendix A. Using this, we show by high-level benefit category, employment exit rates from main benefit in Figure 7.1. For comparison, we show total exit rates and the actual and forecast unemployment rate.

Figure 7.1 – Quarterly exit rates to employment from main benefit



The employment exit rates:

- Follow a very similar trajectory to the total rates for these main benefit categories. Employment exits represent about:
 - 55%-65% of total exits for JS-WR
 - 50%-60% of total exits for JS-HCD
 - 50%-70% of total exits for SPS.
- Are estimated to vary significantly over the next few years, particularly for JS-WR. This reflects varying labour market conditions represented by HYEUFU 22. JS-WR rates are estimated to reduce from just below 10% in mid-2022 to a low of about 6.5% by mid-2024, before returning to 9% by mid-

⁸ <https://msd.govt.nz/about-msd-and-our-work/publications-resources/research/benefit-system/what-happened-to-people-who-left-the-benefit-system.html>

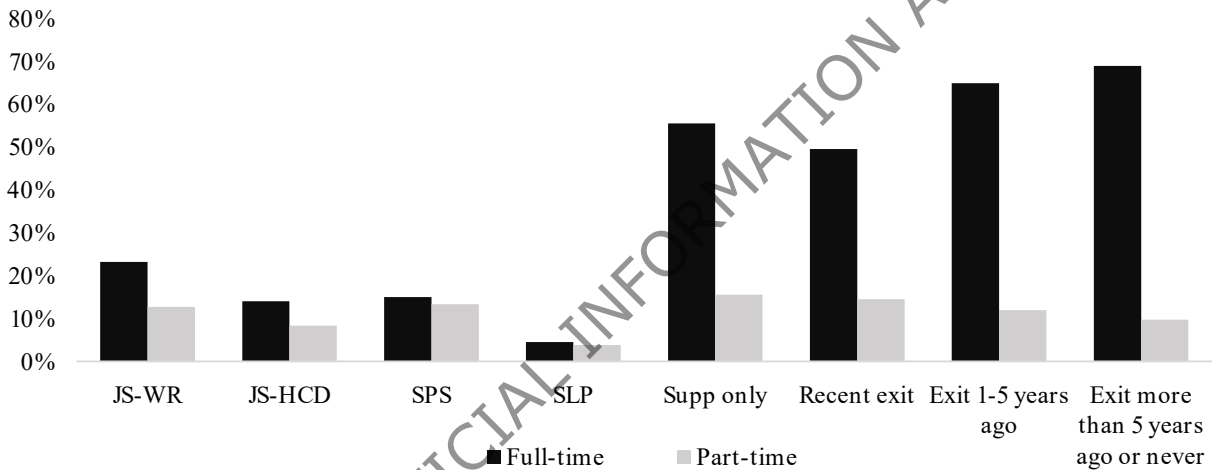
2025 (and a long-term assumed average of about 8% thereafter). The temporary 9% peak stems from the large estimated influx of clients during the forecast increase in unemployment rate, quickly exiting the system as the forecast rate decreases i.e. we should expect to see a spike in the exit rate (and more so the number of exits) as the unemployment rate falls from a high peak.

7.2 How future time in employment varies for main benefit clients

The ministry’s Employment and Social Outcomes Investment Strategy⁹ seeks to achieve sustainable employment and improve equity for groups that consistently experience poor labour market outcomes. To understand the status quo in this regard, and provide a baseline against which to measure ongoing change, it is useful to look at how estimates of future time in employment vary for main benefit clients.

Figure 7.2 shows the average estimated proportion of time in part-time and full-time employment over the next 10 years, by benefit category. For example, JS-WR clients are estimated to spend, on average, about 23% of the next 10 years in full-time employment and 13% of the next 10 years in part-time employment (and hence 36% of the time in full- or part-time employment).

Figure 7.2 – Average estimated proportion of the next 10 years in employment



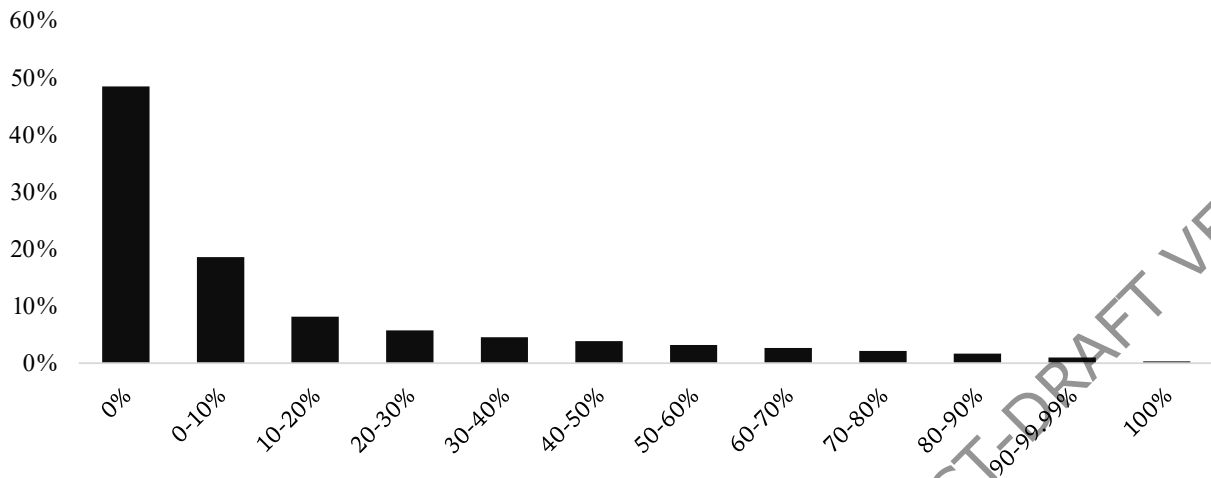
The differences between main benefit clients and non-beneficiaries (and clients receiving supplementary benefits only) are relatively large. Non-beneficiaries are estimated to spend the vast majority of the next 10 years in employment, and a much higher proportion of their time in employment in full-time employment.

Compare this with SPS clients, say, who are estimated to spend on average 28% of next 10 years in employment, of which nearly half is estimated to be part-time. Figure 7.3 shows the distribution of the full-time measure for SPS clients. Nearly 50% of SPS clients are estimated to spend no time in full-time employment over the next 10 years. And only 11% are estimated to spend more than 50% of the next 10 years in full-time employment. It’s subjective as to whether these differences are in line with expectations or not. Regardless, if improving employment prospects and earnings potential is a goal, they provide a baseline against which to monitor future experience as they can be updated annually to reflect the latest experience.

A clear understanding of what limits SPS clients’ employment and earnings potential would be operationally useful. The modelling can help with this, as it allows us to characterise clients with relatively poor (or relatively good) employment and earnings prospects and quantify the impact these characteristics have on our estimates of future employment.

⁹ <https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/investment-approach/investment-strategy-2022-to-2025.pdf>

Figure 7.3 – Distribution of estimated proportion of the next 10 years in full-time employment – SPS clients



All of the results in this report expressed in terms of future time on main benefit, can also be expressed in terms of future time in employment. We think this is a good basis for expressing modelling results and tracking change in the system, because it avoids any negative connotations of using future time on main benefit and the potential for that to stigmatise clients. Also, it can be used to:

- Provide a baseline to monitor future experience against and identify trends early
- Describe how changes in experience affects our estimates of the future
- Identify cohorts likely to experience poor future employment outcomes
- Highlight the risk and resilience factors correlated with good or bad employment outcomes, to help inform intervention strategies.

7.3 Young work-obligated clients

Youth clients are one of the ministry’s priority groups. In this sub-section we focus on YP and JS-WR clients under age 25, being a clearly defined group of young work-capable clients. The group contains about 28,000 people, or about 5% of all people in that age range. We highlight the characteristics that define the subsets of this population that have relatively poor and relatively good employment and earnings prospects over the next 10 years.

Figure 7.4 shows the distribution of the estimated proportion of the next 10 years in full-time employment for YP and JS-WR clients under age 25 i.e. equivalent information to Figure 7.3. Over 50% of these clients are estimated to spend less than 20% of the next 10 years in full-time employment. Or put another way, over 50% are estimated at least 8 of the next 10 years not in full-time employment.

Figure 7.4 – Distribution of estimated proportion of the next 10 years in full-time employment – YP and JS-WR clients under age 25

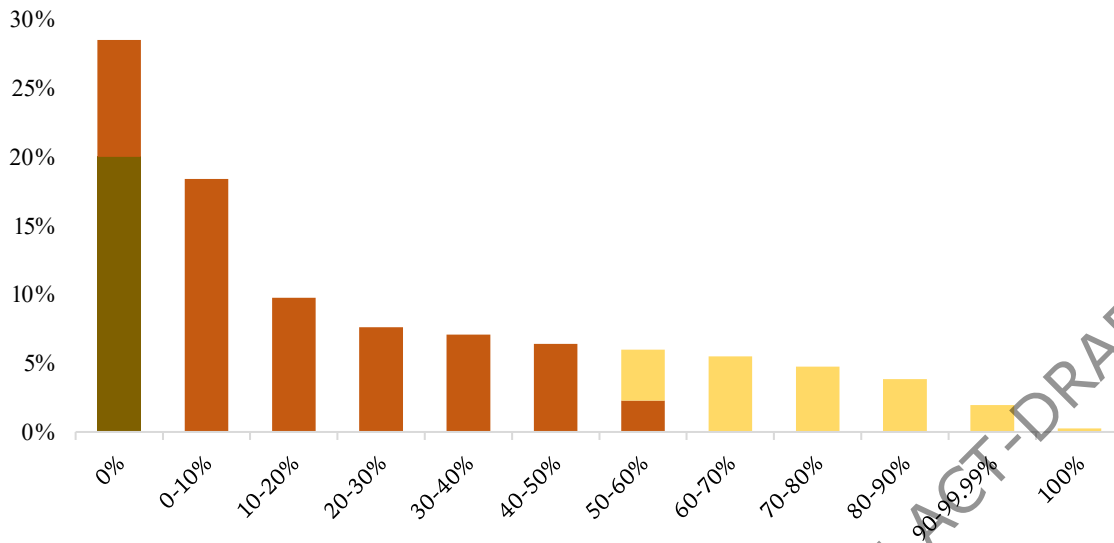
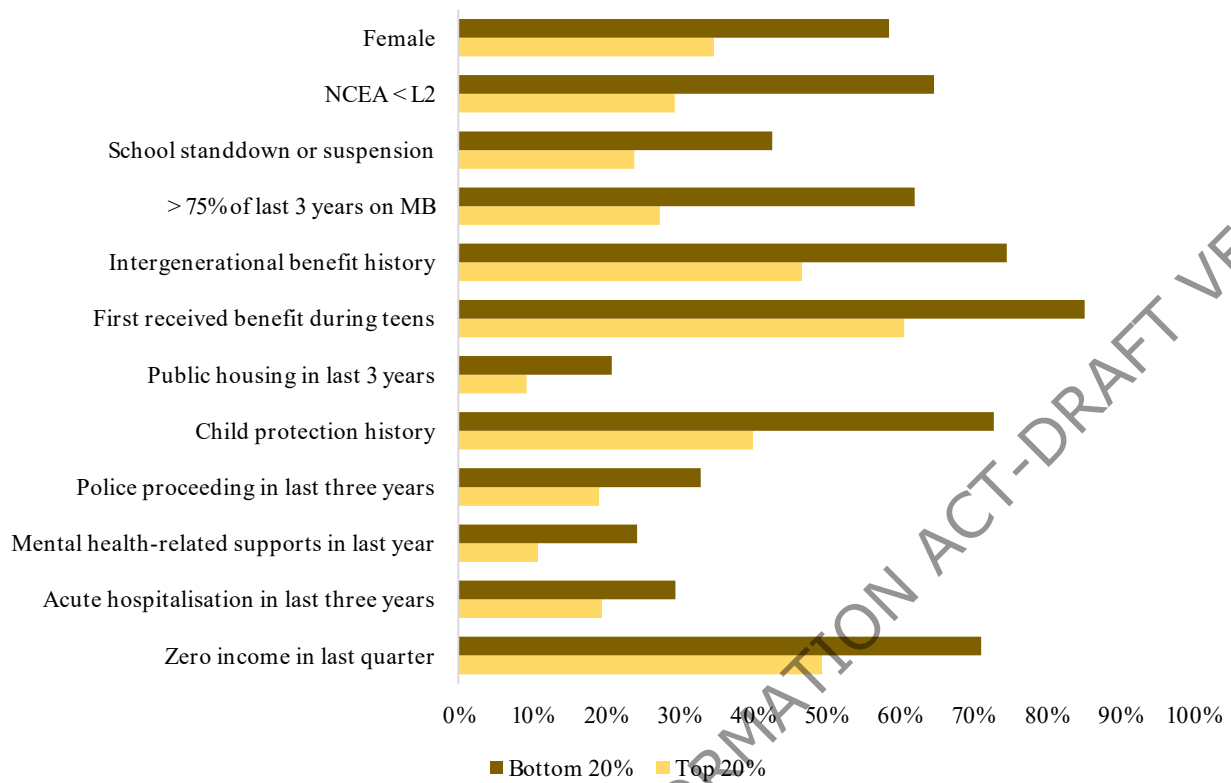


Figure 7.5 characterises the differences between the bottom and top fifth of the cohort in respect of estimated proportion of the next 10 years in full-time employment. These sub-cohorts are highlighted in Figure 7.4 by the dark (bottom fifth) and light (top fifth) overlays. We see notable differences in respect of:

- Gender – 59% of the bottom group are female, compared to 35% for the top group. Young females have a much higher likelihood of becoming a sole parent than young males. This explains most of the difference.
- NCEA level 2 attainment – 65% of the bottom group have not attained NCEA level 2, compared to 29% for the top group. This almost certainly limits employment opportunities. It would also be useful to ascertain whether those who haven't attained NCEA level 2 spend more of the next 10 years in education than other clients and hence less time to be full-time employed.
- Intergenerational benefit receipt – 75% of the bottom group were supported during their teenage years by parents/caregivers on benefit, compared to 47% for top group.
- Care and protection services – 73% of the bottom group have interacted with care and protection services during their childhood, compared to 40% for the top group. The age remit of care and protection services (and associated transition services) overlaps significantly with this cohort. It would be useful to understand the extent to which clients are currently interacting with both systems.
- Use of mental health-related supports – 24% of the bottom group have accessed mental health-related supports in the last year, compared with 11% for the top group. Note that the definition of mental health-related supports used here includes people who are not in the care of specialist mental health services but are accessing prescribed pharmaceuticals.

This paints a relatively complex picture of young clients' circumstances. Particularly for the bottom group, who are much more likely to have any individual risk characteristics present, and much more likely to have multiple risk characteristics with complex underlying drivers.

Figure 7.5 – Prevalence of characteristics



From an operational perspective, knowing who these clients are, particularly when they first apply for a main benefit, is the first step to being able to address some of their complex needs. A client segmentation is a useful tool for this purpose, as it can be used as a basis for triaging clients for further analysis, case management and/or employment assistance programmes.

As an illustration, we have developed two segmentation options for this cohort based on estimated proportions of the next 10 years in employment. The first option (Table 7.1) includes only variables captured in MSD data. Hence, it is operationally viable now. The second option (Table 7.2) adds an additional social sector variable (NCEA level 2 attainment) that improves the segmentation. With the obvious limitation that MSD does not currently have direct access to these educational data, and so the segmentation is not currently operationally viable.

Table 7.1 – Segmentation option 1 – YP and JS-WR clients under age 25

Cohort segmentation				%cohort	%of next 10 years in employment	
					Full-time	Part or Full-time
Female	Intergenerational benefit history	Age >=20	First received benefit during teens	14.4%	15.2%	29.0%
			First received benefit aged >= 20	3.7%	26.7%	43.5%
		Age < 20	12.4%	15.5%	30.6%	
	No intergenerational benefit history	Age >=20	First received benefit during teens	6.3%	24.0%	41.3%
			First received benefit aged >= 20	6.2%	36.7%	54.4%
		Age < 20	5.4%	24.2%	42.7%	
Male	Intergenerational benefit history	Age >=20	First received benefit during teens	18.5%	23.4%	35.8%
			First received benefit aged >= 20	5.8%	34.3%	48.0%
		Age < 20	10.6%	24.6%	38.9%	
	No intergenerational benefit history	Age >=20	First received benefit during teens	6.9%	34.1%	48.5%
			First received benefit aged >= 20	7.7%	47.8%	61.5%
		Age < 20	4.7%	35.8%	51.7%	
Total				100%	26.8%	41.9%

Table 7.2 – Segmentation option 2 – YP and JS-WR clients under age 25

Cohort segmentation				%cohort	%of next 10 years in employment		
					Full-time	Part or Full-time	
Female	Intergenerational benefit history	Age ≥20	First received benefit during teens	NCEA <L2	8.4%	11.4%	23.5%
			NCEA ≥ L2	6.0%	20.5%	36.8%	
		First received benefit aged ≥ 20	NCEA <L2	1.2%	17.7%	32.4%	
			NCEA ≥ L2	2.5%	31.0%	48.8%	
			Age < 20	NCEA <L2	7.0%	11.6%	24.9%
	NCEA ≥ L2	5.4%	20.5%	38.1%			
	No intergenerational benefit history	Age ≥20	First received benefit during teens	NCEA <L2	2.5%	16.7%	31.9%
			NCEA ≥ L2	3.8%	28.9%	47.6%	
		First received benefit aged ≥ 20	NCEA <L2	1.0%	24.0%	40.8%	
			NCEA ≥ L2	5.1%	39.2%	57.1%	
Age < 20			NCEA <L2	2.0%	17.6%	34.3%	
NCEA ≥ L2	3.4%	28.1%	47.6%				
Male	Intergenerational benefit history	Age ≥20	First received benefit during teens	NCEA <L2	12.4%	19.0%	30.5%
			NCEA ≥ L2	6.1%	32.3%	46.6%	
		First received benefit aged ≥ 20	NCEA <L2	2.6%	25.0%	37.9%	
			NCEA ≥ L2	3.2%	42.1%	56.5%	
			Age < 20	NCEA <L2	6.6%	20.2%	33.3%
	NCEA ≥ L2	4.0%	32.0%	48.2%			
	No intergenerational benefit history	Age ≥20	First received benefit during teens	NCEA <L2	3.3%	27.5%	40.8%
			NCEA ≥ L2	3.6%	40.1%	55.5%	
		First received benefit aged ≥ 20	NCEA <L2	1.7%	35.3%	48.8%	
			NCEA ≥ L2	6.0%	51.4%	65.1%	
Age < 20			NCEA <L2	2.1%	30.2%	45.2%	
NCEA ≥ L2	2.6%	40.4%	57.0%				
Total					100%	26.8%	41.9%

As an example, and using segmentation option 1, you might focus on the segments shaded in red. They include about 7,200 clients who:

- Are female
- Have intergenerational benefit history
- First received a benefit during their teens.

Note that sole parents are disproportionately female and this likely explains some of the differences between females and males shown in Table 7.1 and Table 7.2.

Further analysis might be warranted to understand barriers or enablers of employment for these segments, to help inform operational responses, including:

- Prior work history, including industry
- Familial factors including partnering and children
- Interactions with the justice system including criminal convictions
- Educational and training history
- Specific factors that describe those in these segments that do spend a high proportion of time in full-time employment.

The cohort of focus, the measure on which the segmentation is based, and the variables used to the segment are all things that can be changed and experimented with. The approach can be applied to any priority group or cohort of interest.

7.4 Conclusions and questions

Future time in employment provides an alternative measure to future time on benefit and is aligned to the Ministry’s employment focus. Arguably it provides a more direct connection to the Ministry’s operational intent (i.e. to support into employment rather than manage off of benefit), particularly for work-obligated benefit categories.

As for any output of the model, it can be used for as the basis of client segmentation, to identify clients with relatively good and bad outcomes.

The analysis underpinning this Section has raised questions which would require further investigation to address:

- Specifically what limits SPS clients' full-time employment prospects and what policy and intervention options may align with addressing this?
- Should the modelled estimates of future employment be used as a basis for monitoring experience against?
- What other factors reflect barriers or enablers of employment for segments with poor employment prospects e.g. prior work history?

Alternative future income measure

Another alternative measure for framing modelling results would be to consider future income including transfer payments. For example, future years receiving income under (or over) a threshold. This would focus on financial capacity as a proxy for material wellbeing. A living wage-based threshold would be conceptually useful e.g. the equivalent of 40 hours at the living wage (currently \$26 an hour or \$54,080 annually). The living wage is an income level that hypothetically allows individuals or families to afford adequate shelter, food, and other necessities. Its goal is to allow employees to earn enough income for a satisfactory standard of living and prevent them from falling into poverty.

Appendix A Glossary

The following table gives definitions for common acronyms used in this report.

Table A.1 Terms and definitions

Term	Definition
AS	Accommodation Supplement (and related assistance)
DA	Disability Allowance
Earned income	Taxable income earned from: <ul style="list-style-type: none"> – Wages & Salaries – ACC weekly compensation – Student Allowance – Withholding payments – Paid parental leave – Self-employed, partnership and company income
Employment exit	An exit from main benefit in quarter Q(0) is defined as an employment exit if: <ul style="list-style-type: none"> ▪ They receive a main benefit at some point in Q(0) ▪ They do not receive a main benefit in Q(1) ▪ Their income in Q(1) is greater than or equal to the equivalent of 13 weeks of 20 hours at minimum wage ▪ They do not reached age 65 in Q(1) ▪ They do not die in Q(1) ▪ They do not move from a state of being not enrolled in education in Q(-1) to being enrolled in education in Q(0) and/or Q(1).
GFC	Global Financial Crisis
HCD	Health condition, disability (sub-set of both Jobseeker Support clients with reduced work obligations and Supported Living Payment clients)
HYEFU	Half-year Economic and Fiscal Update
IDI	Integrated Data Infrastructure – research database containing microdata about people and households from a range of government agencies, surveys and non-government organisations
Income threshold	Income in a quarter equivalent to the minimum wage for 40 hours per week
IRRS	Income Related Rent Subsidy – a top-up payment to housing providers to bridge the difference between the income-related rent a client pays and the full rent for a public house

Term	Definition
JS	Jobseeker Support – benefit type introduced in 2013 (replacing the unemployment benefit and sickness benefit, and partially replacing the Domestic Purposes Benefit)
MELAA	Middle Eastern, Latin American, or African
Mental health-related supports	Mental health and addiction service events as defined by the Social Wellbeing Agency. Source code for the definition is available at https://github.com/nz-social-investment-agency/mha_data_definition . On advice from the Ministry of Health pharmaceuticals labelled in the definition as ‘potential’ have been removed.
MSD	Ministry of Social Development
NCEA	National Certificate of Educational Achievement
NOMB	Not supported by a main benefit but still receiving some benefit system support – supplementary benefits and/or Orphan’s Benefit
PH	Public housing
Police proceeding	An event on which police initiate a legal action against a person
Prioritised ethnicity	Ethnicity based on the Stats NZ source ranked ethnicity in the IDI. Where a person is indicated as associating with multiple ethnicities, a single ethnicity is chosen based on the following priority order: Māori, Pacific Peoples, Asian, Other, European
Recent exit	A client who is currently not receiving a benefit but has one in the last 12 months
SLP	Supported Living Payment – benefit type introduced in 2013 (replacing the invalid’s benefit and domestic purposes benefit – care of sick and infirm)
SPS	Sole Parent Support – benefit type introduced in 2013 (partially replacing the domestic purposes benefit)
Tenant	Clients are sometimes referred to as tenants where they reside in a property managed by Kāinga Ora or a Community Housing Provider. We usually refer to tenants aged 16+.
Tertiary education	Education at a tertiary education provider or industry training provider
WGSS	Washington Group Short Set
WR	Work-ready (sub-set of Jobseeker Support clients with work obligations)
YP	Youth Payment
YPP	Young Parent Payment

Appendix B Analysis of change by main benefit category

Figure B.1 – Average estimated future years on main benefit to age 65 – JS-HCD clients at 30 September

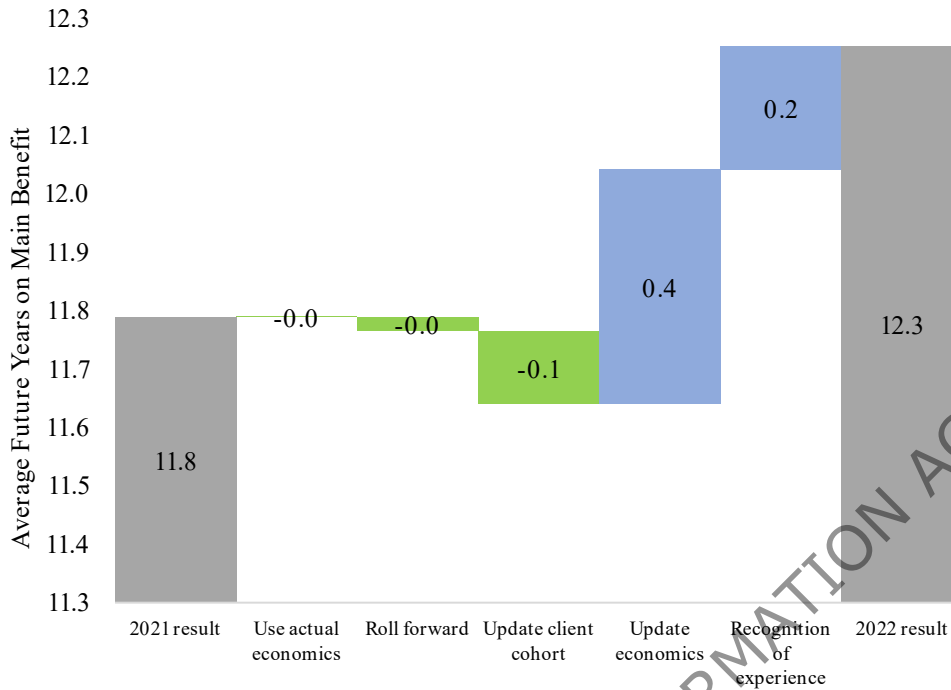


Figure B.2 – Average estimated future years on main benefit to age 65 - SPS clients at 30 September

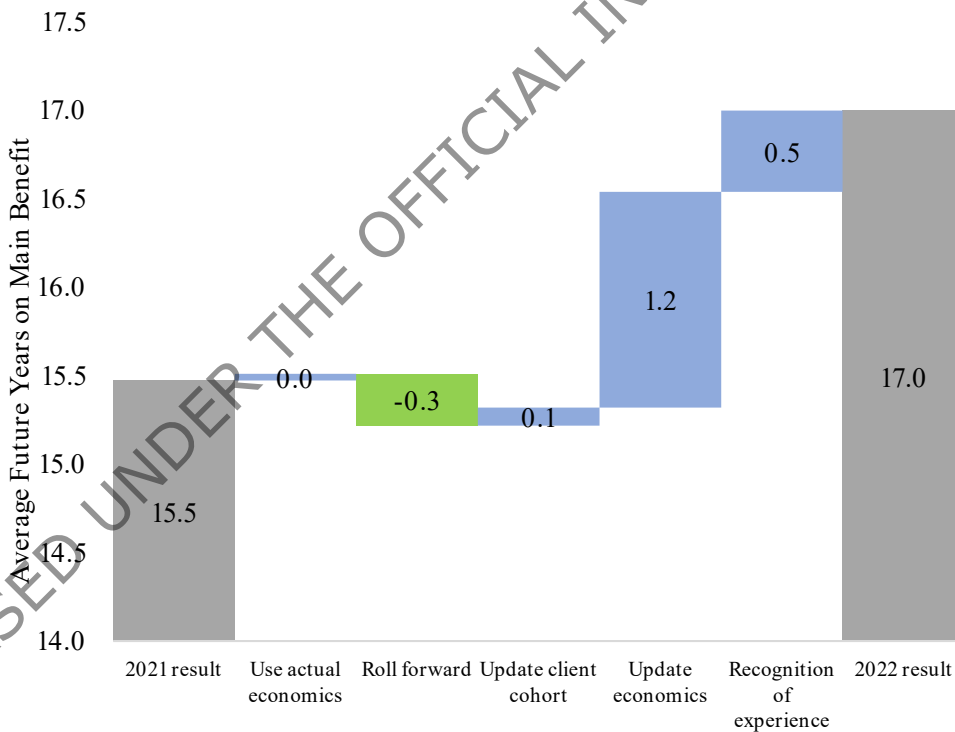
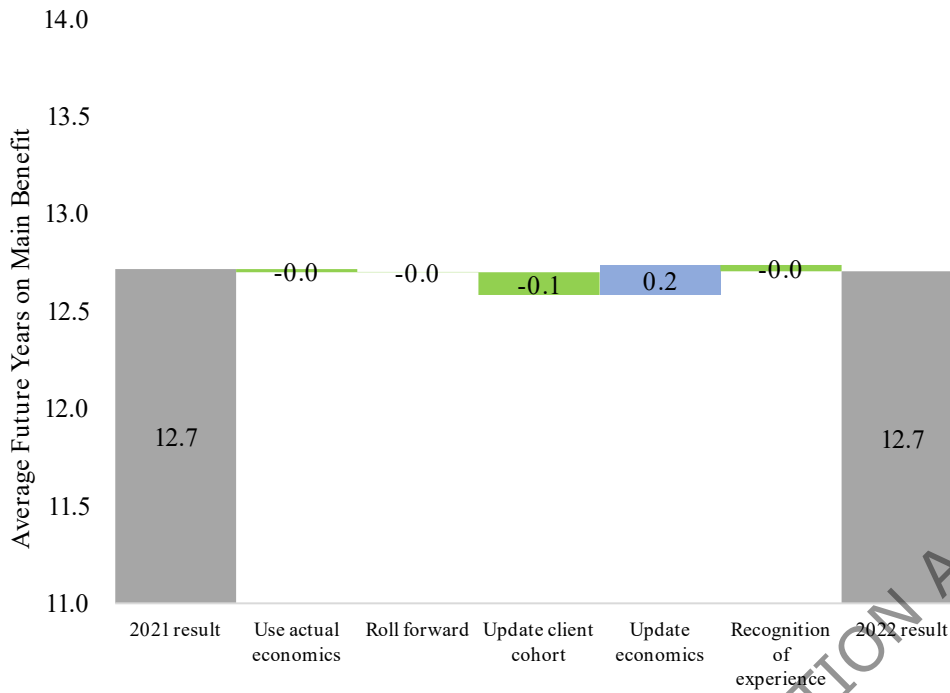


Figure B.3 – Average estimated future years on main benefit to age 65 - SLP clients at 30 September



Appendix C Modelling approach summary

This summary is a copy of Section 2 from the technical report¹⁰. Further detail on the modelling approach can be found in that report.

We give an overview of the Model in non-technical terms, answering core questions:

- What is the Model?
- What does the Model do?
- What outcomes does the Model estimate?
- How does the Model work?
- What does the Model not do?

C.1 What is the Model?

The term ‘model’ is broadly used to describe physical, mathematical and conceptual models. This model is a mathematical model. Many definitions of a ‘mathematical model’ centre on the notion of imitation or simulation i.e. a model imitates or simulates a real-world situation, often in a simplified way because the ‘situation’ being modelled is complex. In this sense, a model (including this one) might be described as a ‘simplification of reality’.

Key aspects of the modelling framework for this project are:

- The population being modelled – In this case, New Zealand (NZ) residents aged 16 or older, and people entering this population over the next ten years.
- The future outcomes that are being modelled – See Section C.3.
- The time horizon over which the future outcomes are being modelled – In this case, people’s future lifetime.
- The historical data – Used to understand the correlative relationships between variables (or combinations of variables) and the future outcomes being modelled. Variables may be characteristics (e.g. demographics), relate to events (e.g. experience of the modelled outcomes in the past) or be environmental (e.g. measures of labour market conditions). Understanding the correlative relationships informs the construction of the mathematical equations that define the model, and the parameters for these equations.
- Assumptions – The Model is underpinned by a range of assumptions which are either implied by the construction and parameterisation of the mathematical equations, or explicitly made. Explicit assumptions relate to variables that the Model does not estimate but are built into Model because they are important for estimating future outcomes, e.g. the future unemployment rate as a measure of future labour market conditions.

C.2 What does the Model do?

In Section C.1 we referred to the Model as an estimation of future outcomes for a defined population (over 16-year-old NZ residents) over a defined time horizon (people’s lifetimes). It does this by estimating people’s status in relation to these outcomes (and other associated characteristics and outcomes) over each quarter-year period in the future. This is indicatively shown in Figure C.1 below:

- For one person – a full model run produces estimates for all NZ residents aged 16 and over.

¹⁰ Social Outcomes Modelling 2022 – Technical Report

- Over 14 quarters – a full model run covers all people’s future lifetimes and so runs for about 400 quarters.
- In respect of four outcomes – other outcomes are estimated by the model.

Figure C.1 – Estimated pathways



Where relevant, estimated cash flows are modelled in relation to future estimated outcomes. For example, benefit payments are modelled for those in receipt of a benefit and income related rent subsidies paid to public housing providers are modelled for people in public housing.

In addition to estimating outcomes for the present NZ adult population, the Model also estimates outcomes for those entering the population over the next 10 years. Population entry may happen in two ways:

- Ageing-in: children are considered to enter the adult population in the quarter in which they turn 16. We use estimated output from the 2021 Oranga Tamariki children’s model.
- Migration: Both children and adults may enter the population via migration (which includes returning New Zealanders as well as foreign nationals).

Once in the population, outcomes for new entrants are estimated in the same manner as those in the present population.

C.3 What outcomes does the Model estimate?

The Model estimates a large range of outcomes:

- Benefit receipt** – This covers the incidence of benefit receipt and the associated payments. Benefit receipt is categorised into main benefit categories and supplementary assistance.
- Other benefit receipt characteristics** – These include, but are not limited to, partnered status, existence and age of children, and incapacity coding for health-related benefits.
- Public housing** – This covers entry to the public housing register and associated prioritisation rating, movement off the register (either into public housing or otherwise), income related rent subsidy, exit from public housing, size and location of house allocated, and future dissolution of households currently in public housing.
- Income** – This covers personal income, Working for Families (WFF) tax credits and NZ superannuation. The primary industry from which personal income is earned is indicated.

- **Justice activity** – This covers number and type of offences committed as well as community and custodial sentences managed by the Department of Corrections.
- **Education** – This covers secondary and tertiary enrolment in the quarter, secondary attainment, total days of any suspensions or stand downs at secondary school, highest New Zealand Qualification Framework (NZQF) level enrolled and attained at tertiary.
- **Child and protection (CNP) and Youth Justice (YJ)** – This covers the highest level of either type of intervention as well as the total number of days spent in placements.
- **Health** – this covers mental health and addiction pharmaceutical, specialist community and specialist inpatient events, acute hospital discharges and mortality.
- **Location** – this covers the region/TLA/Auckland board where an individual resides.

Most of these outcomes relate to specific indicators within the interim wellbeing framework used for this project.

C.4 How does the Model work?

Figure C.1 highlighted how the Model estimates outcomes at each quarterly time step.

Referring to the Model as a ‘model’, implies that it is single model. In fact, it is made up of over 200 individual models. Each of these individual models plays a specific part in the overall modelling construct. Some relate to how a person moves between different outcome states from one quarter to the next e.g. benefit state. Some relate to the evolution of other modelled outcomes e.g. personal income. Others relate to cash flows associated with particular outcomes e.g. benefit payment given an individual is estimated to be receiving a benefit in a quarter.

The vast majority of the models fall into the broad category known as regression models, which means they estimate one variable based on other variables. The remainder of the models are probability table models that attach probabilities to different outcomes.

The models are pulled together in what we refer to as the ‘projection code’. Many of the variables that each individual model relies upon are themselves modelled variables. For example, the models relating to transitioning between benefit states from one quarter to the next depend on, say, corrections activity variables which, in turn, are updated each quarter. The projection code runs each model in a set sequence for a future quarter, before moving onto the next quarter and repeating the sequence based on the updated variables. For this reason, the overall modelling construct is sometimes referred to as a ‘chained regression model’: it chains together regression models over a series of future time steps (in this case quarters).

C.5 What the Model does not do?

The Model is not a causal inference model. By this, we mean that the Model does not attempt to determine the causal factors relating to different outcomes. Rather, the Model is a predictive model, and thus seeks to determine factors that are correlated with outcomes. This difference is important. For example, a key finding of previous work is that long-term dependence on welfare is highly correlated with those who first receive benefits when under twenty years of age. So, age of first benefit is highly predictive of lengthy spells supported by benefit. However, it cannot be concluded that this is the cause of these spells. Nevertheless, knowledge about correlations and relationships between certain characteristics and outcomes is valuable information for policy and programme design and monitoring.

The Model is based on simulating individual pathways through various welfare and housing states (including not receiving any benefit/assistance) as well as other characteristics (family information, education, income, corrections sentences etc) over their lifetimes. There are many possible pathways from the modelling date to time of death, so the exact pathway is very uncertain. Results for any particular individual reflect the average for people with similar characteristics and are not intended to be an accurate

prediction of that individual person's future pathway. Results, therefore, should be considered for segments of the population, rather than at an individual level.

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