TAYLOR FRY

Annual report on the Public Housing System

As at 30 June 2017

This report has been produced for the Ministry of Social Development

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2017 report at a glance

Headline numbers

Duration

18.1

Future years in public housing for current working-age tenants

$18.4b

Current value of future lifetime housing support payments for those in public housing or on the register in 2016/17

Demand

+39%

Change in the number of households on the public housing register over 2016/17

$0.29b

Additional lifetime support required to house the existing register today (known unmet need)

Supply

89%

The 'match rate' - Proportion of housing stock that is occupied and an appropriate size for the household (within ±1 bedroom)

+880

Change to the number of households in public housing over 2016/17, largely due to fewer unoccupied houses

Performance story

+.7% Increase in future lifetime support due to experience.

Some decreases seen for those who are closer to the market, and some increases for recent exits re-engaging with public housing faster than forecast.

+2.1% Increase in future lifetime support due to unexpected rent movements. This includes both overall market rent increases plus extra increases specific to public housing stock.

+0.11b

Increase in known unmet need over the year, largely reflecting the increased size of the register. The result is not as large as it could have been; placement rates from register into housing have been stable despite the increased register size, due to the increased number of total tenancies over the year.

-330

The difference between planned supply increases and actual change to the total number of public housing places. This has been more than offset by the decrease in unoccupied housing.

-1% The match rate has dropped one percentage point as householder exits leave more places underused.

Regional results

- Auckland represents three-fifths of future housing support payments, despite only being a third of the population.
- Canterbury region saw a marked decrease in average future housing support to tenants, in part due to falls in market rents over the year.

- All regions saw an increase in register demand.
- Bay of Plenty and Nelson regions are seeing particularly high levels of demand.

- All regions see an undersupply of 1-bedroom places when comparing register need with vacated properties.
- Auckland remains a key focus area for planned new housing supply.

2017 report at a glance

Features of interest

Each year we conduct new analysis to extract further insight from our projection model. We present a selection of features of interest from this year's report.

Financial barriers to housing exits

The financial barrier to public housing exit (the difference between rent payable in a public house and that in the private market) continued to grow in 2016/17. The average $14 increase in IRRS corresponds to a 0.1 percentage point decrease in exit rates (2.3% to 2.2% of households per qtr) and adds 0.1 years to the average future duration. The duration effect is quite marked; a household someone with weekly IRRS support of $300 will be in housing 2.6 years longer than someone with $50 of IRRS support (with all other factors held constant).

Intergenerational effects

The proportion of signatories of new public housing tenancies who were once in public housing as a child is rising. People who were in public housing as teenagers are over-represented by a factor of about three times among young signatories entering public housing. These entrants are more likely to be sole parents, and have higher expected tenancy duration at entry.

Households not receiving income support benefits

While a third of primary tenants below retirement age were not receiving main benefit support at 30 June 2017, the majority of these tenants have a history of main benefit receipt while in their tenancy (typically within the last five years). Many of these clients are also projected to return to benefits in the future.

These results are relevant because those not on benefits tend to (sustainably) exit housing more quickly. Someone currently receiving a main benefit will spend one to two years more in public housing (depending on benefit type). Households not receiving benefits with higher incomes exit housing even faster.

Duration to house

Over the year to 30 June 2017 there were about 7,000 applications housed with a mean time on the register of 115 days and a median time of about 54 days. The large difference between mean and median shows there is a significant skew (caused by longer wait times for lower priority applicants); a sixth of applicants take longer than six months to be housed.

There is a clear relationship between duration to house and the ratio of register size to tenancy exit numbers. This explains the longer durations in Bay of Plenty and Nelson regions.

Tenancy reviews

Of the 5,100 tenancy reviews finalised by 30 June 2017, just under a quarter resulted in an exit from public housing. Those exited have required much less subsequent housing support compared to more general exits from the public housing system, with 89% receiving no support in the following year and 10% receiving some Accommodation Supplement. We estimate these exits have released 14,000 years of public housing that has now been redirected to other households with higher current need of housing support.

Tenancy and register exit reasons

The reason a household exits a public housing place or the register is important; sometimes the reason represents a poor outcome (for example, eviction for failure to pay the already subsidised public housing rent). Over the two years to 30 June 2017, almost a third of tenancy exits have a reason corresponding to a poor social outcome, with the most common of these reasons being rental arrears (32%), personal safety issues (16%) and neighbourhood issues (10%). The rate of poor social outcome exits appears slightly higher than the two years to 30 June 2015, although this comparison spans different IT systems.

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Part A – Introduction

1 EXECUTIVE SUMMARY

1.1 Introduction and background

The public housing system is run by the Government to help ensure that all New Zealanders have access adequate accommodation. It complements other types of housing support (such as that provided through the benefit system) to help those with particularly high needs. An effective public housing policy will:

- Reduce homelessness
- Reduce over-crowding in residences
- Reduce the number of households in poor quality housing environments
- Help people who cannot afford to rent in the private market
- Provide housing stability while other needs are present (e.g. escaping from domestic violence).

This is the third annual projection model and report on New Zealand's public housing system. The first report, as at 30 June 2015, set a baseline in assessing lifetime housing payments, public housing demand and how well supply matched current needs. The 2016 report had our first analysis of change and related performance estimates. The current report projects the public housing system (and other accommodation support provided by the government) from 30 June 2017, and looks at developments over 2016/17.

This report covers the lifetime projected housing support for the 156,000 adults or 70,900 households who were in a public house or were on the public housing register at some time in 2016/17. Projected housing support includes time in public housing (and the corresponding income-related rent subsidies, or IRRS), as well as time receiving Accommodation Supplement (AS), plus Temporary Additional Support (TAS) payments. We project lifetime future housing support at an individual level, but with individuals linked across households – this report is primarily presented at the household level.

We also provide short features of interest in Chapter 3. These focus on new findings associated with this year's projection model. These findings arise from new capabilities added to the projection model, the exploration of historical and projected patterns for trends, and from specific areas of interest developed in consultation with MSD. Some included topics include: the longer-term impacts of increasing financial barriers, intergenerational public housing support trends and the impact of tenancy reviews.

There are three key areas of interest when understanding the performance of the public housing system, each of which we track in this report. These are summarised in the table below; additional detail is provided in our previous reports.

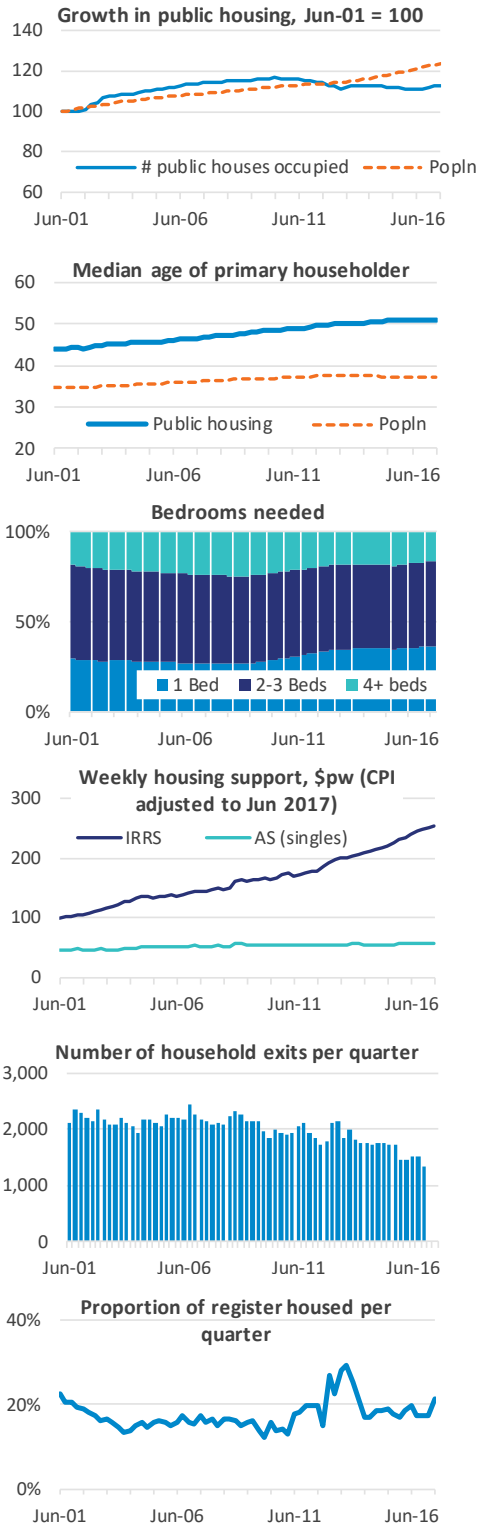
Table 1.1 Key elements of reporting public housing performance

Performance area	Rationale	How we measure performance
Duration and transitions	MSD aims to manage tenancies actively so as to: » Make the best use of New Zealanders' investment in public housing as an opportunity to stabilise the predictors that drive each household's need for public housing, and » Where appropriate, build pathways towards independence from public housing, thereby freeing up spaces from those capable of independence to be available for new entrants with high need.	We project future housing pathways for people based on their characteristics and estimate their associated **lifetime housing support** payments at an individual level (the sum of future IRRS, AS and TAS payments). We sum individuals to get the total by household. » Stabilising underlying need faster and sustainably moving people into the private rental market will lead to decreases in future housing support » Lowering churn (the rate at which former tenants require public housing support in the future) will similarly reduce the metric. Pathway projections also allow MSD to understand progress through the system and the impact of policy and operational changes.
Demand and unmet need	The public housing register represents unmet need of people known to be eligible for public housing but cannot be placed. Unmet need can also take the form of inappropriate housing, such as overcrowding.	We measure known unmet need by estimating the **'additional notional lifetime housing support'** for these clients. This is the additional lifetime payments if their current need was adequately addressed now. This is effectively assuming that right-sized housing is available today for those with unmet needs. » Reducing the register size will reduce the additional notional future housing support. » The metric also reduces the risk of perverse incentives, where 'cost' reductions through reducing housing supply would see a corresponding increase in unmet need. » There are also notional savings that can be estimated for households in too-large properties for their needs. Related to this, we also consider the **size and dynamics of the register** over the year as an indicator of performance.
Public housing supply	Housing stock should ideally match demand; the size and location of properties should match the needs of those in the system and applying to the register. MSD signals changes to supply needs through its purchasing intentions statements. The measures used in our report help inform purchasing intention decisions.	We produce **matching** estimates, the rate at which current tenancies are well-matched. We define a mismatch as occurring if a house is empty, if a household is on the transfer register, if a public housing place is overcrowded or if a place is underutilised. This focuses on the 'stock' aspect of housing supply. We have also previously provided MSD with the capacity to run '**idealised purchasing**' projections, which track how properties should be bought and sold to best match current trends in register demand. This focuses on the 'flow' element of housing supply.

1.2 Long-term trends affecting the public housing system

Long-term trends have combined to make the system less dynamic and more costly over time.

Figure 1.1 Long-term trends affecting the public housing system



Between 2001 and 2010, public housing supply grew in line with population growth. Supply has been flat since then, but population growth has accelerated with high net migration. Public housing per capita has fallen 12% over six years. Current supply targets would help reverse this trend, although it would not fully address the related challenges discussed below.

The median age of a primary householder has increased by over 7 years to 51 since 2001, compared to an increase of 2.3 years for the general population; entries by younger applicants are too low to offset the aging of occupants. This in turn adds pressure to the system, as tenants aged 50-75 are the least likely to exit public housing.

About 80% of the public housing stock is 2- or 3-bedroom places, whereas only 47% of current households need a house with 2- or 3-bedrooms. There has been increasing need for 1-bedroom places (which includes empty-nesters who previously needed a larger house). There is also a continuing shortfall of about 4,000 larger (4-bedrooms or more) places.

Market rents have grown much faster than the incomes of those in public housing, and this creates a gearing effect that means the subsidy level grows faster still – average weekly IRRS has grown at 6% pa above CPI inflation over the last 15 years. This creates a large gap between market rents and benefit system support, which in turn reduces public housing exit rates. In 2001 average weekly IRRS support was $53 (in 2017 dollars) higher than AS support for singles; now it is $196 higher. Such trends vary across New Zealand, with higher rents in Auckland creating a larger financial barrier to exit. Growth in rents also contributes to demand for public housing places.

The increasing financial barrier and the impact of aging have meant that exit rates from public housing have been falling steadily. The number of household exits is now a third lower than in 2001/02. This trend fundamentally reduces the ability to place people on the register into public housing, particularly in the absence of new housing supply.

Despite this, the rate at which people are placed into housing has been fairly steady over time. This is driven partly by policy changes; the qualification for the register was tightened in 2010, significantly reducing numbers of accepted applications. A steady rate of 'other exits' from the register (for those not housed) also prevents rapid growth in the size of the register.

1.3 Features of interest

In each report we explore new findings associated with the projection model. These findings arise from the exploration of historical and projected patterns for trends, and focusing on areas interest identified in discussion with MSD.

1.3.1 Financial barriers to housing exits

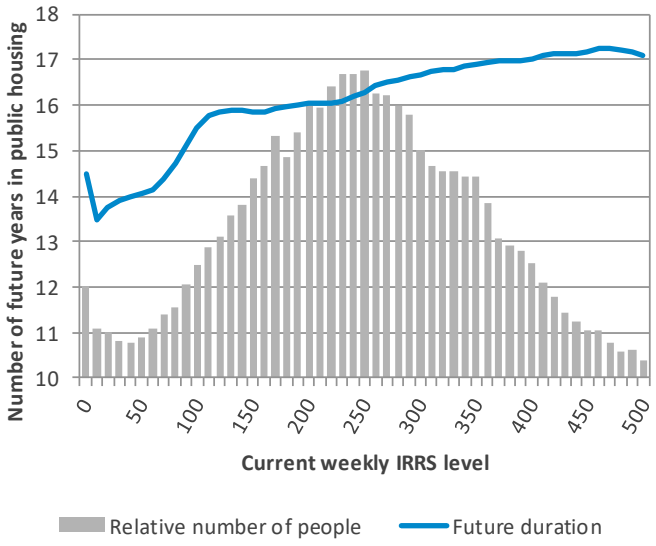
One of the key long-term trends in the public housing system is the increasing financial barrier to exiting public housing; rents have consistently grown faster than incomes of those in public housing. This trend continued in 2016/17; after allowing for CPI inflation, market rents increased by a further 3.6% and IRRS increased by 6% (or $14 per week) as a result. Public housing tenants are therefore less able to afford housing in the private rental market.

These changes affect exit rates and durations. The $14 per week increase equates to a 0.1 percentage point decrease in exit rates (2.3% to 2.2% of households per quarter, all else equal, or 65 fewer public houses vacated per quarter). The impact on future duration due to this $14 is an additional 0.1 years in housing, all else equal, but this is just the impact of a single year of rent increases; the effect stacks over successive years. The partial dependence[1] plot in Figure 1.2 shows the overall relationship between IRRS level and time on benefit. On average, a household with weekly IRRS support of $300 will be in housing 2.6 years longer than someone with $50 of IRRS support (with all other factors held constant).

The implications for this effect on future payments is larger again; the longer duration combines with the higher IRRS level of support to give much higher lifetime housing payments. The average value of lifetime housing support for households with current IRRS > $150pw is more than twice that of households with IRRS < $150pw.

Slower exit rates reduces the supply of vacant properties, which in turn increases the time to house those on the register.

Figure 1.2 Partial dependence effect of IRRS level on number of future predicted years in public housing



[1] Partial dependence refers to the average effect of a variable holding all other factors constant. For example here, region is correlated with IRRS level but we exclude any regionality effects in the partial dependence effect of IRRS.

1.3.2 Intergenerational effects

We have explored the prevalence of intergenerational use of public housing.

Those who were in a public house as a child are more likely to need housing support themselves when they become adults, and the trend, if anything, appears to be growing. For example, we studied the proportion of signatories of new public housing tenancies who were once in public housing as a child. The proportion of new signatories aged between 18 and 24 (inclusive) who were previously in a public house when aged between 14 and 17[2] has increased from under 25% in 2012 to well above 30% currently. There are several potential reasons that may explain this trend; for example, it may reflect better targeting of need in the prioritisation of register applicants.

We estimate that 11% of all people aged between 18 and 24 have lived in a public house while aged 14-17[3]. This means that the group who spent some childhood time in public housing is over-represented by a factor of about three times among young adult entrants into public housing. This over-representation and related trend highlights the intergenerational cycle as well as an opportunity for supporting these young people while still living with caregivers.

Focusing still on this 18- to 24-year-old age group, public housing signatories who were in a public house as a child also tend to have different characteristics compared to those who aren't part of the intergenerational cycle. This group:

- Are significantly more likely to be receiving Sole Parent Support (SPS) in the benefit system; 55% compared to 45%,
- Have slightly larger households on average and,
- Have higher average IRRS support levels (6%).

Exit rates are lower for people on income support and for those with higher levels of IRRS support. This means we carry higher estimates of future public housing duration for these younger clients with intergenerational history. Indeed, primary householders in the 2017 cohort who are under the age of 25 are expected to spend an additional 2 years in a public house if they were in a public house as a child.

1.3.3 History of primary householders not currently receiving benefit support

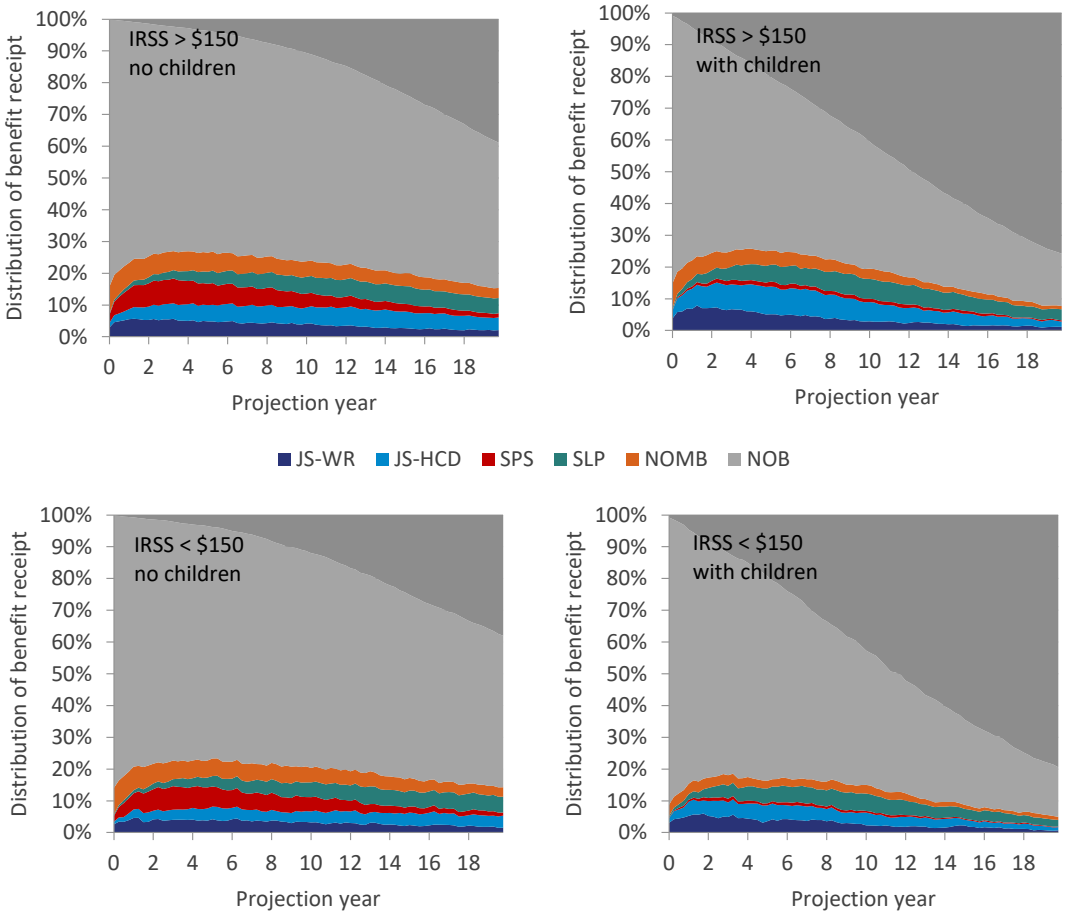
Given the large (and natural) overlap between the public housing and benefit systems it is interesting to consider the group in public housing but not accessing main benefit support. While a third of primary tenants below retirement age were not receiving main benefit support at 30 June 2017, the majority of these tenants have received main benefit support in the past:

- Primary tenants of households with children are more likely to have had benefit support in the past; this relates to higher incidence of SPS history.
- Primary tenants further from the market (defined in this report as those with weekly IRRS > $150) are also more likely to have had benefit support in the past. This reflects a correlation between current low income and previous benefit receipt.

Some of these tenants will re-enter the benefit system in the future too. Figure 1.3 shows projected benefit usage for the primary tenants in the 2017 cohort who are not currently receiving main benefit support. It is estimated that about one in five tenants who are currently further from the market will be a main benefit recipient in four years' time. In comparison, those who are closer to the market are less likely to require benefit support with about 15% projected to be on a main benefit in four years' time.

[2] Our choice of adult applicant ages 18-24 and child ages 14-17 is dictated by the history of data available.
[3] Comparing MSD housing numbers with Statistics NZ Infoshare population estimates.

Figure 1.3 Projected future benefit receipt for current NOMB primary tenants in public housing. A key for benefit system acronyms is included in the Glossary, at the back of this report.



We therefore see a strong interaction between the public housing and benefit systems; tenants tend to have a prior history of main benefit support and a significant amount of them are expected to receive support in the future, even if they aren't current income support recipients. This interaction is important; those on benefits will have longer tenancy durations and are much less likely to exit a public house each quarter. Holding all other factors constant (including household income), we estimate that someone currently receiving a main benefit will spend one to two years more in public housing (depending on benefit type). This effect is larger again when the income effect is included; non-beneficiaries tend to have higher incomes, which reduces their IRRS and duration (as discussed in Section 1.3.1).

1.3.4 Duration to house

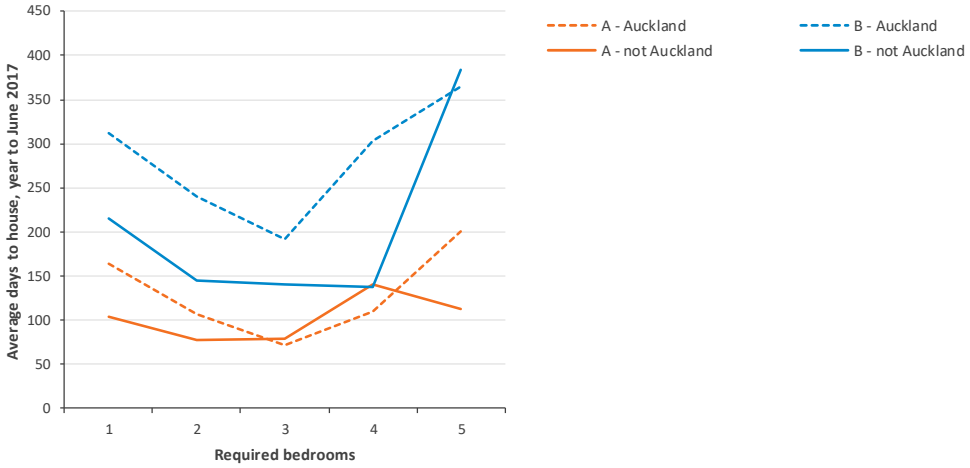
The length of time waiting on the register before being housed is a key measure of the effectiveness of the public housing system. Here we consider this duration, which is the same measure MSD uses for their reporting. Register wait time is largely driven by supply and demand; an application can only be placed if there is a suitable place (either an existing property is vacated, or new housing supply added) and if there is no other application considered to have higher need.

Over the year to 30 June 2017 there were about 7,000 applications housed with a mean time on the register of 115 days and a median time of 54 days. Nationally:

- About 30% of housed applications spend less than 4 weeks on the register
- A further 35% spend between 4 and 13 weeks on the register
- 6% spend over 52 weeks on the register before being housed.

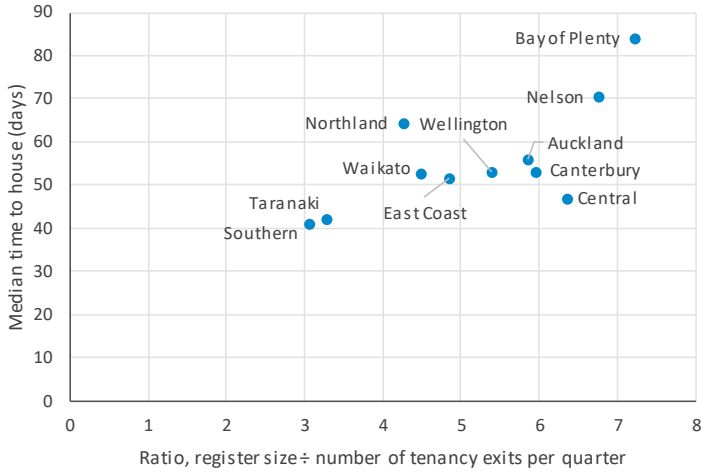
Waiting times vary by factors such as region and household size; for example, the proportion spending over 52 weeks before being housed is 9% in the Auckland region, higher than for other groups on the register. Figure 1.4 shows the average (mean) duration to house by the required number of bedrooms; durations are shortest for 2 and 3-bedroom places across priority A/B applications and regional effects This reflects the relative undersupply of 1-bedroom and 4+ bedroom places.

Figure 1.4 Mean days to house, year to 30 June 2017. Split by register priority and Auckland/ non-Auckland



The key drivers of time to house are the number of applicants and the number of houses made available. This is illustrated in Figure 1.5 below. There is a direct and close relationship between the duration to house and ratio of register size to housing exits. An increase of one unit in the ratio (the register size increasing by the number of quarterly exits) corresponds to an increase of 9 days in median time to house. This relationship means that it is possible to predict how the duration to house will evolve, given assumed trends in the register and housing supply. Over the next three years the current projection allows about 2,100 new houses (an effective tenancy exit in the sense that a vacant property is available); this is sufficient to decrease the ratio substantially and reduce time to house in regions affected. The relationship also explains the higher durations observed in Nelson and the Bay of Plenty regions.

Figure 1.5 Regional plot of median time to house against the ratio of register size divided by number of tenancy exits per quarter. Average over 2016/17.



1.3.5 Tenancy reviews

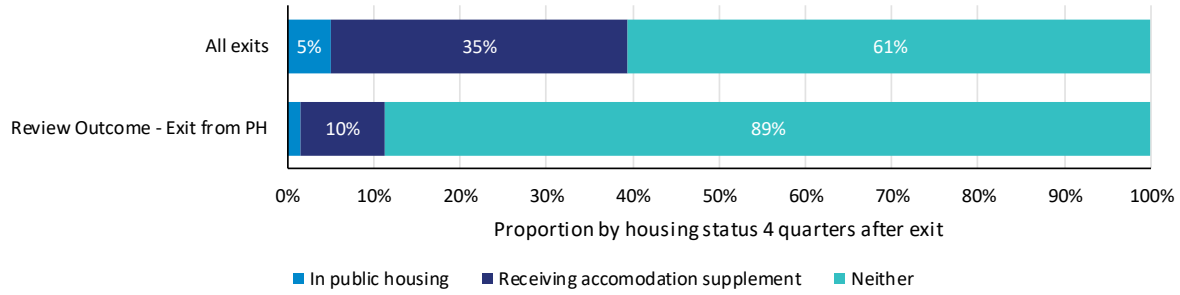
Tenancy reviews have been carried out by MSD since July 2014. These were initially targeted at lower-IRRS households to see if they had continued need for public housing. We have been provided data on 7,600 tenancy reviews undertaken by MSD. Two-thirds of these reviews were finalised at 30 June 2017, of these:

» 76% were found to still be eligible for public housing support, and
» the remaining 24% were exited from public housing.

Compared to the broader public housing population the households that underwent reviews tended to have lower IRRS levels and have older (but under age 75[4]) primary householders. These two characteristics are correlated, since older primary householders are more likely to be market renters.

Where reviews resulted in an exit from housing we observed them to be more sustainable than other housing exits. Figure 1.6 compares the housing status four quarters after exit for tenancy review exits to all public housing exits.

Figure 1.6 Distribution of housing status four quarters after exit for all exits and for tenancy reviews resulting in an exit



Compared to other exits, primary householders which exited following a tenancy review were much less likely to be accessing any housing support four quarters later. Less than 2% had re-entered housing (either via the register or joining an existing household) compared to 5% of other exits. While early days, this suggests the reviews were effective in identifying people who, given the right support, can transition to private housing.

With limited housing stock a transition to private housing means another household may be placed. There are 1,200 households that exited housing as a result of a tenancy review before 30 June 2017. Without tenancy reviews we would otherwise have forecast this group to spend an average of 12 further years in public housing. The represents about 14,000 years of re-directed public housing support.

1.3.6 Tenancy exit reasons

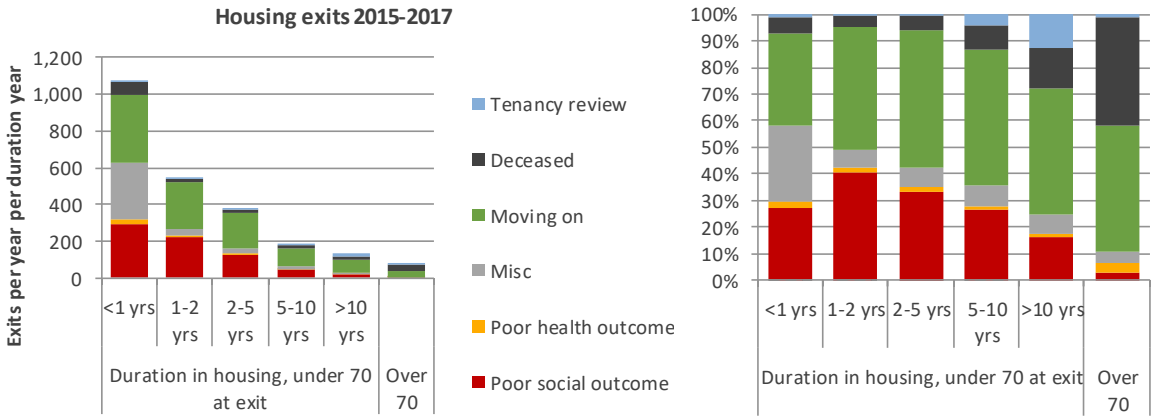
The reason a household exits a public housing place is important. Some tenancy exits may be desirable (a tenant sustainably moving to the private rental market) whereas some reflect poor social outcomes, such as failure to pay income-related rent or if the tenants are evicted for causing issues in the neighbourhood. Ideally poor exits should be reduced, as there are likely to be underlying needs for which stable housing would help. Exit reasons are collected by MSD, although this dataset is considered to have lower reliability than other types of administrative data.

Figure 1.7 shows reason for household exit (excluding transfers) over the two years to 2017. Almost a third of tenancy exits have a reason corresponding to a poor social outcome. Exits for poor social results are relatively more likely in the first few years of a tenancy. While the reasons vary, the most common

[4] Those over age 75 and those in a property modified for their needs do not undergo tenancy reviews.

causes of poor exits are rental arrears (32%), personal safety (19%) and neighbourhood issues (14%). These outcomes suggest that broader support may be warranted to help stabilise those at risk of such exits, particularly early in a tenancy.

Figure 1.7 Reason for household exit (excl. transfers), average over two years to 2017



Rates of poor social outcome exits appear to be slightly higher than those estimated in our 2015 report, but the comparison is across two different data systems, although this comparison spans different IT systems and Ministry responsibilities.

In our 2015 report we looked at what factors could be used to predict a poor outcome. Higher likelihood was seen for:

- Those with corrections history (as a result of a criminal conviction)
- Māori and Pacific Islander tenants
- Those not receiving the age pension or Supported Living Payment income support.

We have not repeated the analysis in this report, but would expect similar findings.

1.3.7 Register exit reasons

In similar fashion to tenancy exits, we have also examined the recorded reasons for exit from the housing register. We have grouped the reasons for exit provided into four categories:

- Eligibility: Change of circumstance, inability to confirm eligibility etc.
- Self-withdrawals: Contact by the applicant, no longer requiring public housing etc.
- No response: Inability to contact, Offer withdrawals, etc.
- Miscellaneous: Death of applicant, unknown etc.

While it is problematic to describe non-response as a 'poor' exit reason (a person may not respond because they have no ongoing housing need, so no need to follow up with MSD), the relatively high rate of re-entry to the register amongst those that exit (see discussion on page 74) suggest that more could be done in supporting these applicants. Better data on these exits, including linked emergency housing support data, would improve our understanding of client pathways.

Over the two years to 2017 the largest common group is those with No response (36%) followed by Self-withdrawal (33%).

1.4 Public housing performance overview

1.4.1 Overview

New Zealand households who were either in public housing or on the register sometime in the year to 30 June 2017 are expected to spend 13.4 years in a public house in the future on average. This corresponds to average future housing payments of about $205,000 per household, and total future lifetime payments of $18.4 billion including related expenses for MSD.

Households who are currently in public housing are expected to spend another 16.3 years in public housing compared to 10.5 years for those on the register and 2.2 years for those who exited a public house in the last year. Durations for those on the register are shorter than those in housing for two reasons. First, a portion of applicants will exit the register without being housed, reducing the average. Second, exit rates from public housing are higher in the early years of a tenancy as well as for younger clients (which register applicants often are).

Total lifetime housing payments have decreased from $18.7 billion as estimated in the previous projection. The main components of change were:

- A decrease of $1.1 billion due to increasing real interest rates (higher discount rates partially offset by higher CPI inflation rates)
- An increase of $0.4 billion due to rental growth of the public housing stock being higher than expected
- An increase of $0.8 billion due to significantly more register applications than expected but also direct entries into existing households which aren't allowed for by the model
- An increase of $0.2 billion due to more recent exits re-engaging with the system.

1.4.2 Main economic variable changes affecting results

The value of future housing payments is affected by assumptions for Consumer Price Index (CPI) inflation (we assume housing support payments increase with CPI plus additional margins) and risk-free 'discount rates', based on the yields on Government bonds. The discount rates reflect the time value of money – effectively allowing for interest earned if money was put aside today. Our inflation and discount assumptions are set consistent with Treasury's published assumptions and so are outside of the control of MSD. Compared to the previous projection the real rates of return (discount rate minus inflation) have increased, being 0.5% higher on average between 2020 and 2045. The combined effect is a decrease in the total projected payments of about $1.1 billion (or 6%).

The projection also uses assumptions for average weekly earnings (AWE), as NZ Superannuation payments are indexed to AWE. All else equal, higher AWE will increase incomes for older tenants and reduce the required rental subsidy. AWE inflation was 2.1% over 2016/17 compared to 1.2% assumed in the 2016 projection. We assume AWE inflation is fixed at 1.5% above CPI after 9 years, so the long-term AWE assumption remains the same as the previous projection at 3.5%. The medium-term assumptions are now about 0.2% higher.

Market rents have a large influence on demand for public housing, IRRS levels as well as the ability of existing households to exit public housing. The national rental growth rate was 4.8% during 2016/17, this was over twice the rate projected at the previous projection, and our updated short-term projection assumptions are also higher. Our medium to long-run assumptions (effectively a margin over AWE) are largely unchanged. We allow for regional trends in rents; see Section 4.2.3 for more information.

Finally, the unemployment rate has an indirect influence on our assumptions; it affects the number of people requiring income support, which in turn affects public housing demand. The unemployment rate at 30 June 2017 is close to what was projected in our last report and our forecast follows Treasury assumptions.

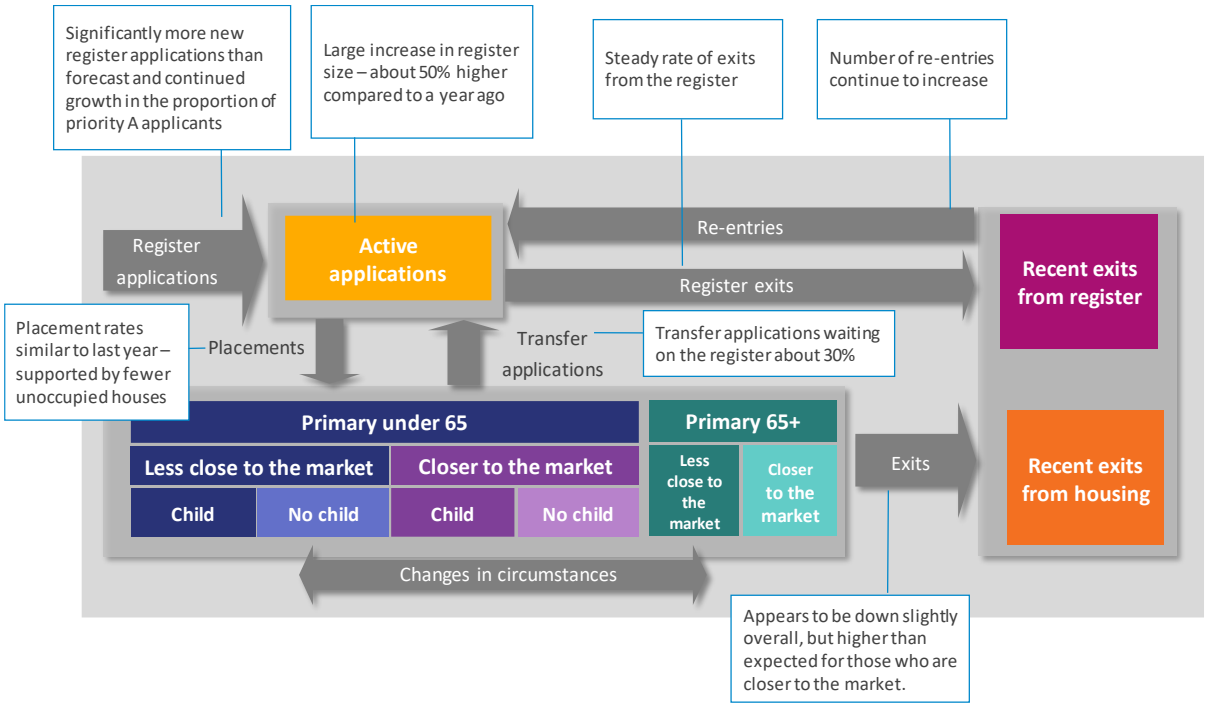
The combined impact of AWE, rental growth and unemployment rate experience over the past year and corresponding assumption changes is an increase in the value of future payments of $0.37 billion (or 2.1%). Growth in rents is the biggest driver of this result. The effect on average duration is smaller – less than a 1% increase over the year.

1.4.3 Recent performance and trends

Duration and transitions

The main features of the experience during the year to 30 June 2017 are depicted below.

Figure 1.8 Public Housing dynamics: changes in 2016/17



Register applications are the key input into understanding demand for housing. Over 2016/17:

- The number of new register applications was much higher than the levels observed in the prior two years. There were almost 3,000 new register applications per quarter which represents a 40% increase relative to the year to 30 June 2016. The size of the Housing register has grown by 50%, increasing from 4,302[5] households on the waitlist to 6,475[6].
- Despite the large increase in register applications, placement rates have remained reasonably comparable to experience in the previous year. This is partly supported by better utilisation of existing housing stock. The number of unoccupied properties has fallen by about 740 over the year. Every quarter, about 22% of priority A applications and 8% of priority B applications are placed.

Transition rates out of public housing are an important input into our estimation of future housing duration. Over 2016/17:

[5] We have changed the definition of active register application slightly in 2017, so this comparison is not like for like. On a consistent basis the register size has grown by 39% over the year (from 4,667 to 6,475). The change in definition related to the treatment of applications closed (often temporarily) in the month of June. The like for like numbers are close to the 38% reported by MSD, which uses a slightly narrower basis.

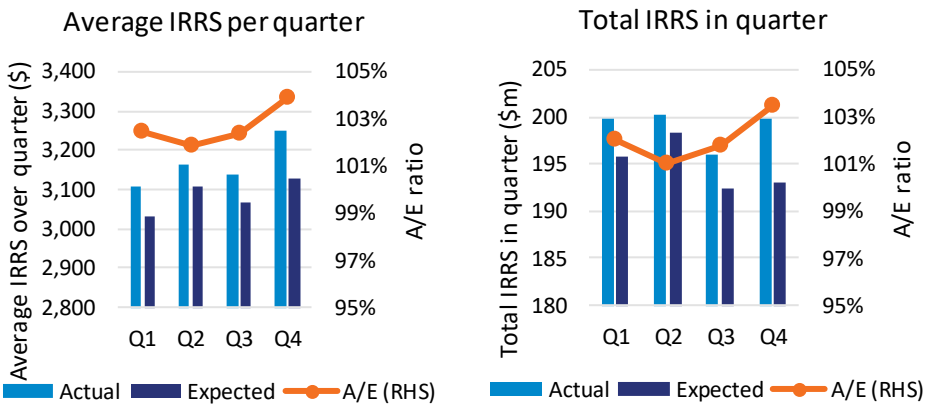
[6] Our register size measure includes pending placements and Priority C and D applicants, so is slightly higher than statistics reported elsewhere by MSD.

- Household exit rates were down slightly compared to forecast in the previous projection. The overall exit rate for households with working-age primary tenants was 2.2% per quarter compared to the assumed rate of 2.3%. This is consistent with higher growth in market rents. However, those who are closer to the market appear to be exiting slightly faster than expected, especially if the primary tenant is not receiving main benefit support.
- The rate of exit of non-signatory adults from their household has remained at a significantly higher level. The average rate of exit for the two years to 30 June 2017 is about 7.5% compared to experience of under 5% over the two years to 30 June 2015. Current exit rates are more comparable with experience recorded before 2014 and it is possible that the low levels observed during 2014 and 2015 are related to data issues rather than changes in the underlying rate. Such exits are important, as they have implications for matching and the underuse of public housing stock.
- We have continued to see significant numbers of people re-engaging with the public housing system after exiting the register or housing. About 6% of clients who exited a public housing tenancy and 11% of clients who exited the register during 2015/16 have re-engaged with the system.

IRRS levels influence both exit rates for current households and projected payments. Further, increased IRRS levels may reflect increased housing costs which increase demand for public housing.

- IRRS payments were 2% higher than expected over the year. Total IRRS payments averaged $199m per quarter compared to the $195m per quarter previously projected. Actual IRRS payments compared to forecast are shown in Figure 1.9.

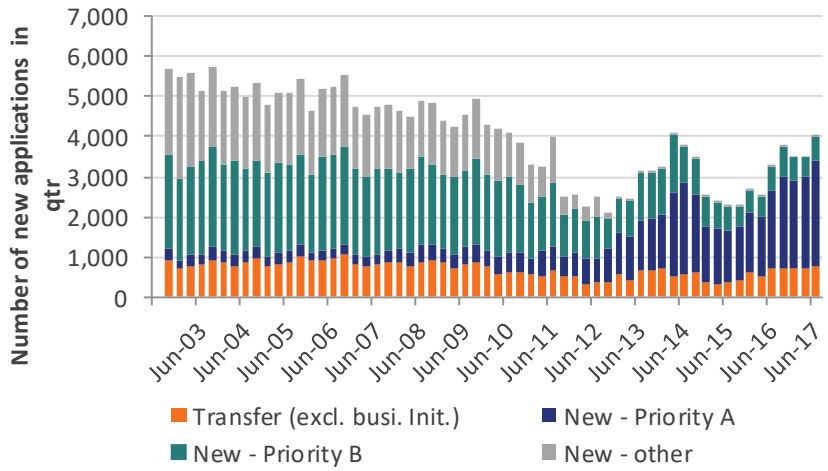
Figure 1.9 Actual and expected IRRS levels for the 2016/17 year. Note axes do not start at zero to highlight differences.



Housing demand

Figure 1.10 shows that the number of new applications per quarter has been volatile over the past few years. There have been important changes to policy and delivery over time that influence these trends, these are described in Section 4.3.3. There were almost 3,000 new register applications per quarter in the year to 30 June 2017. This represents a 40% increase relative to the year to 30 June 2016. The proportion of applications which are priority A has increased from 74% to 79%.

Figure 1.10 Register applications by quarter



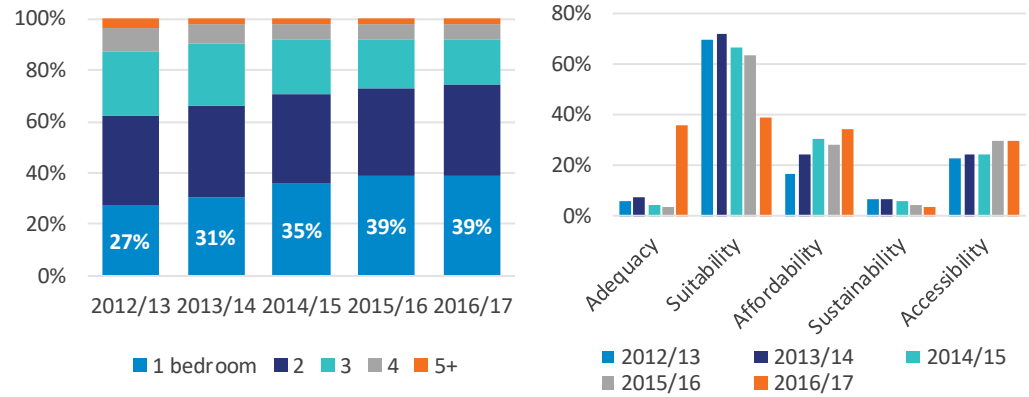
There are also some visible time trends in the nature of applications, as shown in Figure 1.11:

» The household size of Priority A register applicants has been falling. In the last two years almost two-fifths of applicants require a property with a single bedroom.

» The proportion of Priority A applications with the maximum possible scores for Accessibility and Affordability has increased. Out of all applications made in the last year, 29% scored the maximum score for Accessibility and 34% scored the maximum score for Affordability.

However, the biggest change visible is 36% of applications scored the maximum score for Adequacy compared to 4% in 2016. This is related to changes in the SAS scoring process that occurred in November 2016; SAS scores were increased for people who are homeless, in emergency housing or at risk of family violence. This change may also have contributed to the higher overall number of applications accepted over 2016/17.

Figure 1.11 Priority A application characteristics. The left panel shows the distribution of bedrooms needed by application year. The right panel shows what proportion of Priority A applications have the maximum score for a SAS subcategory.



Housing supply

There are about 880 additional properties which are occupied by public housing tenants compared to a year ago; there were 64,416 occupied properties as at 30 June 2017 compared to 63,532 occupied properties as at 30 June 2016. This increase has been driven by a higher occupancy rate of the existing public housing stock rather than increases in house supply:

» About 740 more properties are now occupied.
» There were 140 additional houses introduced over the year (net buys minus sells). This is lower than the expected increase of about 470 properties.

Table 1.2 Reconciliation of occupied properties at 30 June 2017

	Number of places
Occupied properties 30 June 2016 (a)	63,532
Expected increase in house supply, 2016/17	471
Actual increase in house supply (b), 2016/17	140
Net change in unoccupied houses (c)	-744
Occupied properties 30 June 2017 (= a + b - c)	64,416

1.4.4 Longer term implications of recent trends

Duration and transitions

Table 1.3 Future lifetime housing support by segment for those in public housing system in 2016/17, plus a comparison to the previous projection results.[7]

Segment				2017 Projection			2016 Projection			% Change		
				# Households [Individuals]	# future years in public housing	Average HH future payments ($k)	# Households [Individuals]	# future years in public housing	Average HH future payments ($k)	# Households [Individuals]	# future years in public housing	Average HH future payments ($k)
On register	Priority A			4,520	11.6	162	2,808	10.7	164	+61%	+8%	-1%
	Priority B and other			1,955	7.8	126	1,494	7.1	128	+31%	+11%	-1%
	Sub-total			6,475	10.5	151	4,302	9.4	152	+51%	+11%	-0%
IRRS recipients, primary aged < 65	Less close / IRRS > $150	Child in the household	Work obligated	9,028	20.0	309	8,575	19.9	334	+5%	+0%	-8%
			Not work obligated	8,733	20.2	327	8,405	20.4	362	+4%	-1%	-10%
			NOMB	8,345	19.9	329	7,577	19.5	356	+10%	+2%	-8%
		No child in the household	Work obligated	1,833	16.8	241	1,757	16.6	253	+4%	+1%	-5%
			Not work obligated	10,725	17.2	250	9,647	17.9	276	+11%	-4%	-9%
			NOMB	3,698	16.8	264	3,309	16.6	272	+12%	+2%	-3%
	Closer / IRRS ≤ $150	Child in the household	Work obligated	1,020	14.6	145	1,351	14.6	154	-25%	-0%	-6%
			Not work obligated	856	15.1	152	1,227	15.5	171	-30%	-3%	-11%
			NOMB	2,695	15.2	173	3,239	15.0	205	-17%	+1%	-16%
		No child in the household	Work obligated	316	12.9	114	417	12.7	116	-24%	+2%	-2%
			Not work obligated	1,730	13.9	107	2,336	14.8	119	-26%	-6%	-10%
			NOMB	1,810	12.4	120	2,216	12.4	134	-18%	+0%	-10%
	Sub-total			50,789	18.1	269	50,056	18.0	286	+1%	+1%	-6%
IRRS recipients, primary aged 65+	Less close / IRRS > $150	Child in the household		1,484	11.6	244	1,402	10.4	252	+6%	+12%	-3%
		No child in the household		9,704	9.8	151	9,119	9.4	147	+6%	+4%	+2%
	Closer / IRRS ≤ $150	Child in the household		150	9.5	112	220	9.3	136	-32%	+3%	-18%
		No child in the household		2,289	8.3	62	2,735	8.3	60	-16%	+1%	+2%
	Sub-total			13,627	9.7	146	13,476	9.3	141	+1%	+5%	+4%
Recent exit from housing	Receiving AS			[3,089]	6.6	99^	[3,140]	6.9	104^	-2%	-3%	-5%
	Not receiving AS	Aged <60		[17,000]	1.6	20^	[14,308]	2.8	36^	+19%	-43%	-45%
		Aged 60+		[1,373]	0.2	6^	[1,325]	0.4	10^	+4%	-44%	-35%
	Sub-total			[21,462]	2.2	30	[18,773]	3.3	46	+14%	-33%	-33%
Recent exit from register	Receiving AS			[3,953]	5.5	93^	[3,110]	5.5	98^	+27%	-0%	-6%
	Not receiving AS			[2,906]	2.8	38^	[2,566]	2.9	40^	+13%	-1%	-5%
	Sub-total			[6,859]	4.4	69	[5,676]	4.3	72	+21%	+1%	-3%
Total				**70,891**	**13.4**	**205**	**67,834**	**13.8**	**224**	**+5%**	**-2%**	**-8%**

[7] We have changed the definition of active register application slightly in 2017, so the 51% increase in numbers on the register is not like for like. On a consistent basis the register size has grown by 39% over the year (from 4,667 to 6,475). The definition change related to applications closed (often temporarily) in the month of June.

Table 1.3 summarises segment-level results for future duration in public housing and average lifetime future housing payments. The segments aim to identify groups with different housing needs; some will have natural pathways to private market housing, whereas other subgroups will require more extended support.

New Zealand households who were close to the public housing system in the year to 30 June 2017 are expected to spend 13.4 years in a public house in the future on average. This corresponds to average future housing support payments of about $205,000 per household, and total future lifetime housing payments of $18.4 billion including related expenses. The bulk (90%) of these payments are future IRRS payments. Average lifetime payments are highest for households who are currently in public housing as they have longer future durations in public housing than other segments.

For the **register**, the large increase in household numbers is visible. The average future duration in public housing for households on the register has increased from 9.4 years to 10.5 years. However, this change is driven by an improvement to the projection methodology rather than any change in observed experience; we separate out this effect in our change analysis.

Our estimate of register future housing duration and payments above excludes notional unmet need for these people; the cost if they were placed in a house today. This amount would add an additional 23% to future payments, as shown in Table 1.4.

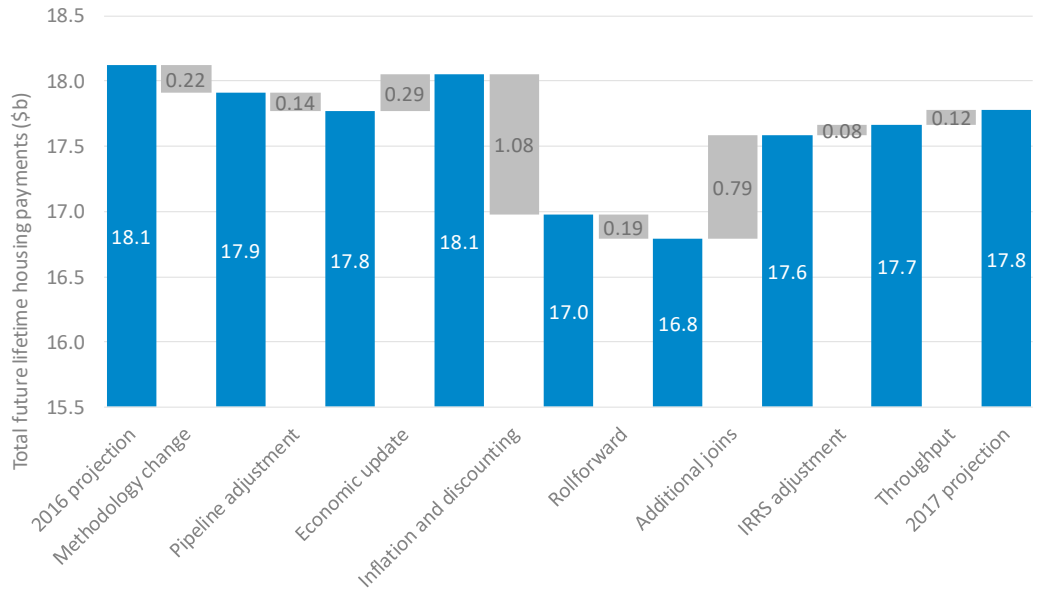
Average duration for **tenants** in public housing varies significantly. For the highest segments – those primary tenants under age 65 who have children and an IRRS of more than $150 per week – it is about 20 years. For the lowest segments – primary tenants over 65 with no child and IRRS of less than $150 per week – it is less than half that, about 8 years.

Households with primary tenant <65 have an average duration of 18.1 years, up fractionally from 18.0. Differences between segments within this group remain the same; durations are higher for households less close to the housing market and for those with children.

There has been a material decrease in the average future duration in public housing for **individuals who recently exited a public house**, falling from 3.3 years to 2.2. This change is largely due to compositional differences between the two projections rather than any change in assumptions for the level of re-engagement with the public housing system.

The total housing support payments, including related administration expenses is $18.4 billion. Excluding expenses, it is $17.8 billion, down $0.3 billion from last report. This change comes from a variety of sources, as shown in the figure below.

Figure 1.12 Change in total future lifetime housing payments over 2016/17, excluding administration expenses

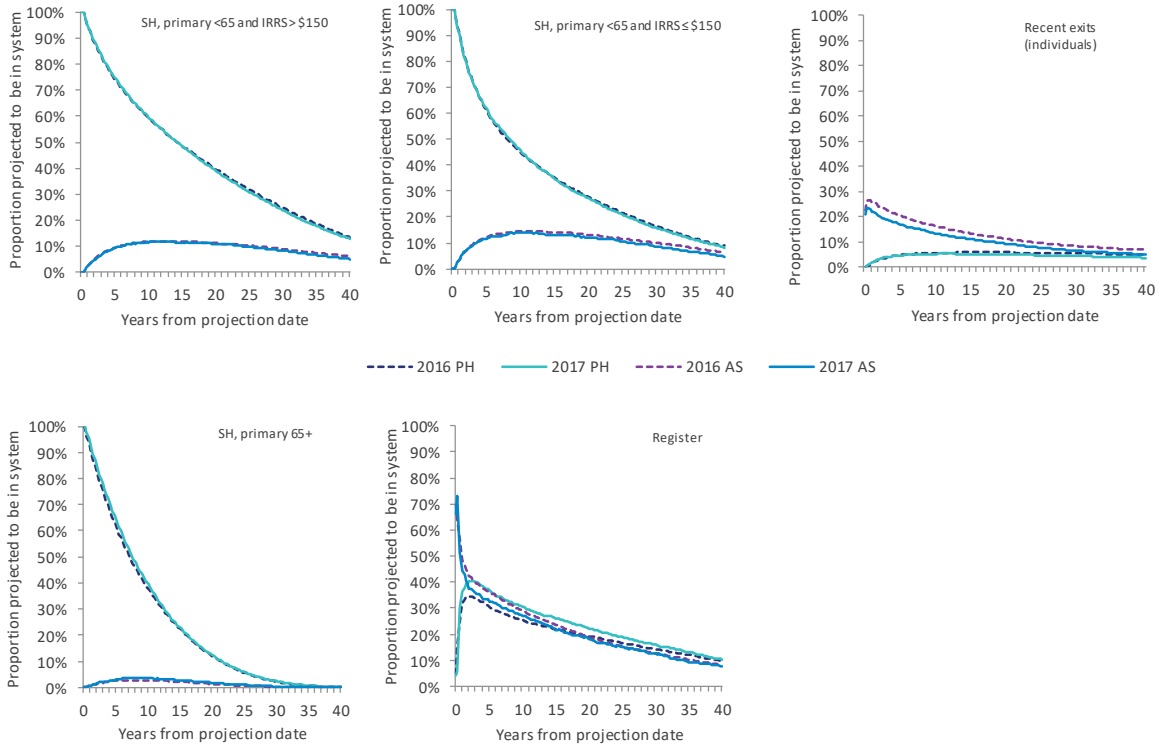


The elements of change are discussed in more detail in Section 4.4.1. The biggest changes arise from inflation and discounting assumptions, economic update (higher rents over 2016/17) and additional joins (particularly new entrants joining existing tenancies directly, which we do not attempt to allow for in our projection).

However, one of the most important components of change is the rightmost element in the figure, **throughput**. This component looks at the cohort who were in the projection as at 30 June 2016, and compares what we predicted their future lifetime payments to be at 30 June 2017, to what we now predict their lifetime payments to be at the current projection. Decreases correspond to clients moving through the public housing system more quickly than expected. The throughput result has increased total future lifetime payments by $0.12b. This is driven by a $0.16b increase due to recent exits re-engaging with the public housing system at a higher rate than anticipated. The throughput results were slightly negative for tenant segments (i.e. a reduction in future cost, all else equal), suggesting transition rates out of housing have not fallen more than previously anticipated.

The pathway plots below show the average housing projection pathway for top-level segments and compare this to that at the previous projection.

Figure 1.13 Lifetime plots for various housing segments compared to the previous projection; first 40 years



We observe:

» Pathways are virtually unchanged for households with a working-age primary tenant.

» Households where the primary is aged 65 and over are projected to spend slightly more time in public housing, mainly due to their higher average IRRS level.

» Households on the register are now projected to move into a public house faster with a corresponding reduction of time on accommodation supplement benefit. This is due to a refinement of the projection method rather than a change in underlying experience (separated out in the change analysis).

» Recent exits are now projected to spend less time on accommodation supplement benefits. Entry rates into supplementary-only benefit receipt has reduced significantly over the past two years, which we have reflected in our projection assumptions.

Housing demand

We have raised projected register application numbers slightly, but not fully recognised the high levels observed over 2016/17; predicting register entries is difficult with significant volatility in the historical time series. The change increases our estimated register size over the course of the projection.

An important part of understanding the effectiveness of the public housing system is the amount of unmet need. The objective is to manage the housing register to ensure that housing places are available to households who need them most, but also that services are available – where appropriate – to resolve any underlying issues driving housing need. We estimate four components of unmet need to arrive at a estimate of total notional housing support payments.

» **Housing Register applications:** The total lifetime payments if those on the register were placed in a public housing place today.

» **Transfer Register applications:** If people are applying for a larger public housing place or are applying for a public housing place in a more expensive area, this may indicate an unmet need amongst

existing tenants. There are also notional savings associated with tenants applying for cheaper or smaller housing.

» **Overcrowded public housing places:** Some tenancies are overcrowded, even in the absence of a transfer application. There are notional long-term payments associated with addressing this unmet need.

» **Underused public housing places:** Some public housing places are underused. There is a notional saving associated with moving such a household to a smaller but right-sized public housing place.

Notional metrics are hypothetical, and aim to address counter-intuitive dynamics from lifetime payment estimates (for example, housing payments could in theory be reduced by unnecessarily keeping people on the register for longer periods when there are empty houses). Additional notional 'payments' associated with overcrowding can be understood as the extra payments associated with placing these households in places that suit their requirements. Notional 'savings' associated with underuse can be understood as the opportunity cost of inefficiencies currently within the system. That is, they are the potential financial savings that would arise if households were not allocated to places that exceed their requirements. This matters, because more dynamic management of the portfolio over the long-term would enable these savings to be invested elsewhere in the housing portfolio.

The difference between the estimates of total main lifetime housing payments and total notional payments for each of the four subgroups is shown in the table below. A comparison to the previous projection is also given.

Table 1.4 Lifetime housing payments for current clients compared to previous, excludes expenses.

	2017 Projection				2016 Projection			
	Main ($b)	Additional notional ($b)	Total ($b)	% additional	Main ($b)	Additional notional ($b)	Total ($b)	% additional
Register	0.95	0.29	1.24	23%	0.63	0.24	0.87	27%
Transfer	0.49	0.05	0.54	8%	0.31	0.01	0.32	3%
Over-crowding	2.26	0.54	2.80	19%	2.81	0.64	3.45	19%
Underuse	5.42	-1.72	3.70	-46%	5.26	-1.56	3.70	-42%
Well matched	8.65	0.00	8.65	0%	9.11	0.00	9.11	0%
Total	**17.77**	**-0.84**	**16.93**	**-5%**	**18.12**	**-0.68**	**17.45**	**-4%**

As with previous reports the notional savings associated with underuse is larger than the other components of additional notional payments. This implies that the hypothetical financial savings from moving households with underuse into smaller houses would be larger than the cost of placing everyone on the register into a house today.

The (known) unmet need for those on the register is $0.29 billion. This is $0.05 billion higher than the estimate in our previous report, but is actually $0.11 billion higher after allowing for methodology changes; the latter figure is more relevant. This result is entirely due to the larger register size, and would have been larger still were it not for the effective increase in housing supply over the year (via fewer unoccupied houses).

Housing supply

To better understand supply, we look at 'matching'. We define the matching rate to be the proportion of households that are appropriately housed, with a mismatch occurring if:

» A usable public housing place is **empty** [8]
» A household is (voluntarily) **on the transfer register**
» A public housing place is **over-crowded** (too few bedrooms)
» A public housing place is **underused** (too many bedrooms).

We define a near match as when the number of required and actual bedrooms differs by one or less; MSD typically uses this tolerance when assessing the appropriateness of a house size. The near match rate of the public housing system is 89% on an unweighted basis, and higher if we weight using dollars. Underuse (a household have a larger housing place than they need) again represents the largest contribution. About 7% of public housing places have underuse and 1% have overcrowding.

Table 1.5 Matching rates at 30 June 2017. Left shows dollar weighted rates, the right is unweighted

Dollar-weighted	$m per week	
	Exact match	Match within ± 1 bedroom
Unoccupied houses	0.2	0.2
Transfer	0.1	0.1
Overcrowded	0.6	0.1
Underused	2.9	0.8
Total mismatch	**3.9**	**1.2**
Total weekly rent	24.3	24.3
Matching rate	84%	95%

Unweighted	Number	
	Exact match	Match within ± 1 bedroom
Unoccupied houses	540	540
Transfer	1,924	1,924
Overcrowded	7,189	400
Underused	26,112	4,433
Total mismatch	**35,765**	**7,297**
Total	64,956	64,956
Matching rate	45%	89%

The (unweighted) matching rate has deteriorated by one percentage point (from 90% to 89%) over the 2016/17. About 200 households who were well matched a year ago are now on the transfer register. In addition, about 1,200 households have had members exit meaning the house is now underused. As the cross-table below shows, the mismatch primarily stems from too few 1-bedroom and 4-bedroom places relative to household need; about 14% of 3-bedroom tenancies only require a single bedroom.

Table 1.6 Occupied public housing places at June 2017, split by current number of bedrooms and need

Bedrooms current	Bedrooms needed				
	1	2	3	4+	Number
1	97%	2%	0%	0%	6,236
2	55%	36%	7%	2%	24,483
3	14%	27%	39%	19%	26,158
4+	3%	8%	21%	67%	7,539
Total need	23,500	16,606	13,735	10,575	64,416

Match
Crowding
Underuse

1.5 Regional results

There are significant regional differences across New Zealand in private rental markets, labour markets, demographics and average Accommodation Supplement levels. These factors lead to large variations in both need of housing support and lifetime housing payments.

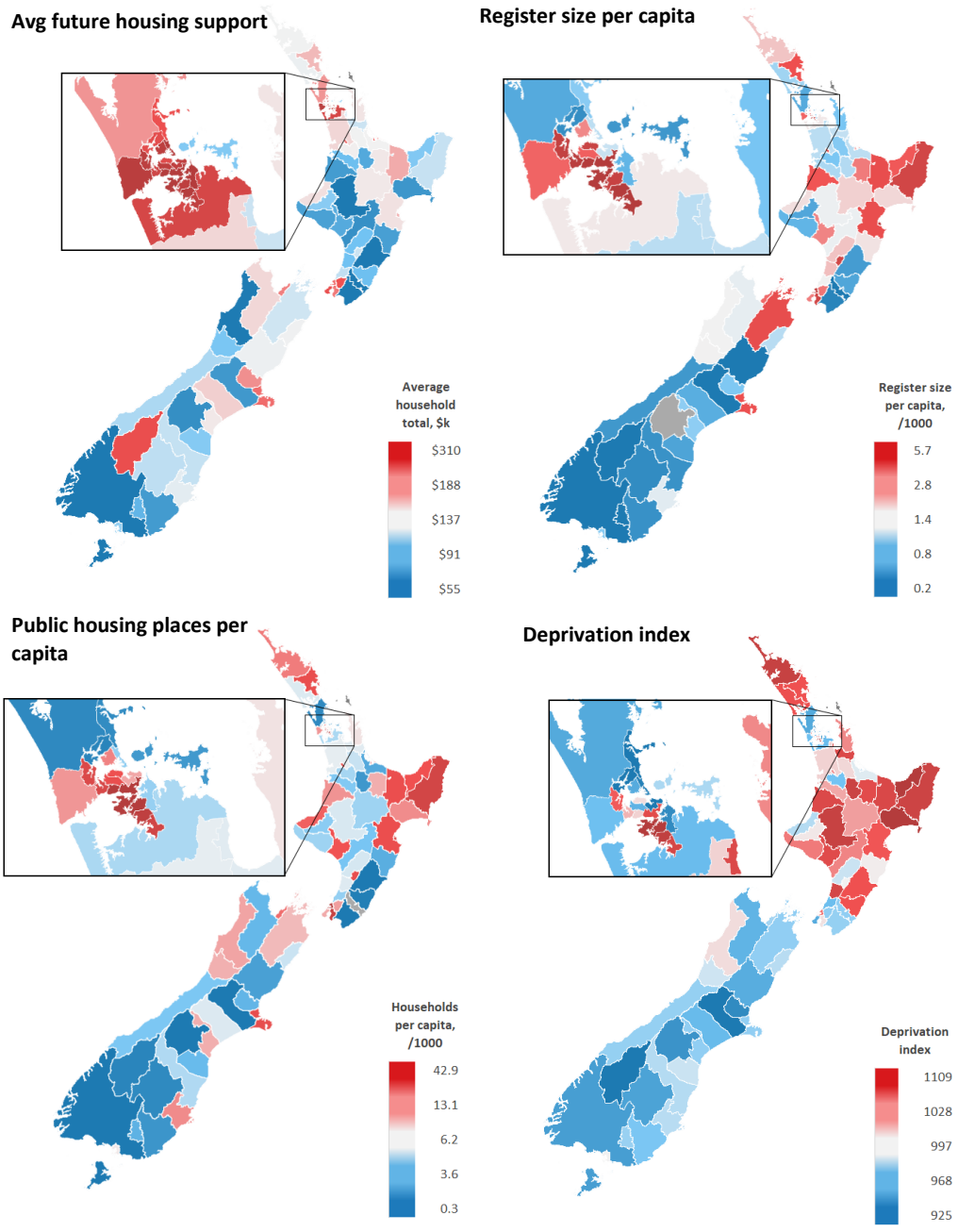
Figure 1.14 highlights the variation that exists by geographical location by showing some key metrics:

» The projected average future lifetime housing payments for current public housing tenancies
» The size of the Housing register per capita
» The number of public housing tenancies per capita

[8] Often an empty public housing place is 'unavailable' due to repairs, sale/transfer or other event. We exclude these from matching statistics.

» The NZDep2013 index of socioeconomic deprivation.

Figure 1.14 Differences in some key public housing metrics by region



We note that:

» The cost of housing support varies significantly, driven by differences in private rental markets between regions. Households in regions with higher market rents such as Auckland require larger IRRS payments. Furthermore, higher market rents mean a larger financial barrier to housing independence so the expected tenancy durations for these households are longer.

» The size of the register varies from 0.7 applications per 1000 people in Southern region to 2.3 applications per 1000 people in the Bay of Plenty.

» The number of public housing tenancies in each region is generally correlated with the size of the register.

» Differences in the deprivation index by region is broadly consistent with differences in register size and the number of public housing tenancies. This suggests potential correlation between the need for housing support and other factors captured by the index.

1.5.1 Lifetime housing support

Figure 1.15 below compares the distribution of general population, public housing population and lifetime housing payments.

» Auckland is significantly overweight in terms of both numbers of households and future housing payments; the Auckland region represents just over a third of the national population, but just under half of public housing places and over three-fifths of total future lifetime housing payments. Higher market rents in the Auckland region generates more demand for public housing, higher support levels for those in a public house, and longer tenancies as households are further from the private market. Those in need of public housing support in the region also tend to be in slightly larger households which increases the cost of support.

» Projected lifetime housing payments for those in a public house in the Canterbury region has decreased by 17%, from $235k per household to $196k per household compared to the previous projection. This is partly due to higher real interest rates (which affects all regions) but also because of market rents in the region falling 2.3% over the year. However, market rents in the Canterbury region are still the third highest, behind Auckland and Wellington.

Figure 1.15 Regional composition of lifetime housing payments – households in public housing only

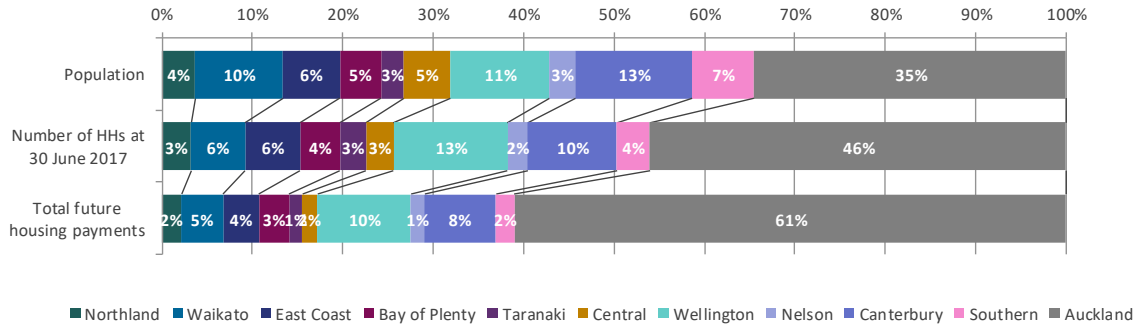
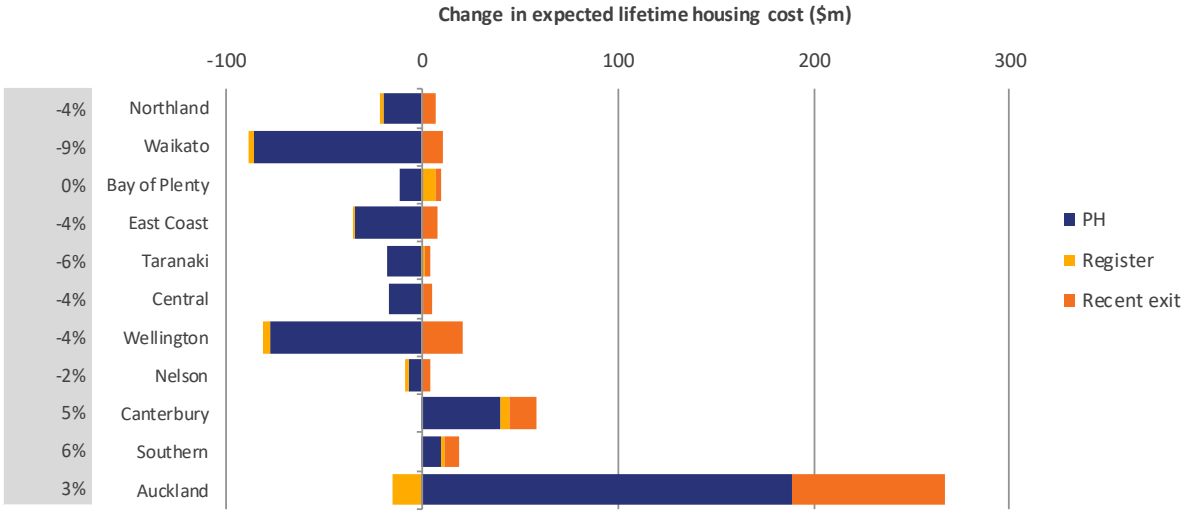


Figure 1.16 splits the $117m throughput increase (that is, the increase in future lifetime housing support due to experience) by region at 30 June 2016. It can be seen that:

» Throughput is consistently positive (i.e. higher future cost) across all regions for those who were recent exits from the public housing system in 2016. This suggests that re-entry rates into the public housing system was higher than expected in all regions.

» For those in public housing at June 2016 (the blue bars in the figure), a $230m increase for those in the Auckland and Canterbury regions offsets a $261m reduction for those in other regions. The slight overall improvement reflects tenancy exit rates not falling as much as expected. Those who are older and currently receive large IRRS payments are expected to remain in public housing for longer than before. This change disproportionately affects the Auckland and Canterbury regions. The increase for Auckland also reverses some of the changes allowed for in the previous report, which had decreases in throughput for the region.

Figure 1.16 Throughput change by region



1.5.2 Demand and the register

An increased number of new register applications was seen across all regions in 2017. The largest increases were seen in the Central, Nelson, Taranaki and Waikato regions. As a result, these regions had the largest growth in register size. The number of households on the waitlist in these regions have more than doubled except for in the Waikato region. In the Central region, the size of the register is 2.5 times larger, increasing from 138 households to 345 households. The Canterbury region saw the introduction of 356 additional public housing properties over the year which has helped to ease demand pressures.

Table 1.7 Change in the register June 2016 to June 2017[9]

	Jun 17						Jun 16		
	#		% A		3+ beds		#	% A	3+ beds
	Value	Change on 2016	Value	Change on 2016	Value	Change on 2016			
Northland	193	+30%	68%	-11%	22%	-8%	149	79%	30%
Waikato	387	+76%	64%	+6%	29%	+2%	220	57%	27%
East Coast	481	+78%	71%	+6%	23%	-3%	270	66%	27%
Bay of Plenty	465	+20%	72%	+6%	28%	-1%	389	66%	29%
Taranaki	178	+107%	79%	+10%	26%	+1%	86	69%	24%
Central	345	+150%	82%	-4%	20%	-6%	138	86%	26%
Wellington	668	+63%	69%	-2%	18%	-6%	411	71%	24%
Nelson	243	+119%	65%	+6%	19%	+3%	111	59%	15%
Canterbury	626	+17%	66%	-4%	11%	-3%	537	70%	14%
Southern	193	+77%	67%	-8%	15%	-0%	109	75%	15%
Auckland	2,696	+43%	70%	+9%	22%	-1%	1,882	60%	23%
National	**6,475**	**+51%**	**70%**	**+5%**	**21%**	**-2%**	**4,302**	**65%**	**23%**

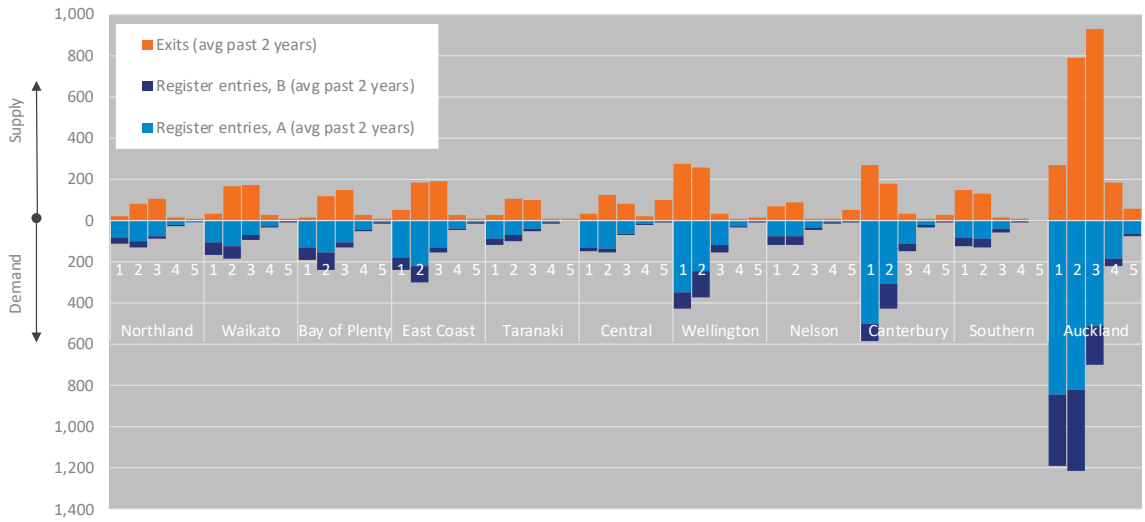
Known unmet need, as measured by notional total lifetime housing payments, is highest in Auckland, Bay of Plenty and Wellington regions in both absolute and relative terms. These regions together account for 83% of the total $289m of known unmet need for those on the register.

[9] We have changed the definition of active register application slightly in 2017, so the 51% increase in numbers on the register is not like for like. On a consistent basis the register size has grown by 39% over the year (from 4,667 to 6,475). The change in definition related to the treatment of applications closed (often temporarily) in the month of June.

1.5.3 Housing supply

When a current household exits a public housing place, this property becomes available for a new household to move into from the register. This natural flow represents the main component of housing supply each year. Ideally this supply would be well matched to the demand (register applications) in terms of size and location, however in reality exiting households will likely differ to those on the register. The figure below contrasts historical demand and supply from public housing exits over the past two years (but excludes new supply).

Figure 1.17 Historical supply from housing exits and demand, past two years. Register demand is split by priority



All regions show an:

- Undersupply of 1-bedroom places; nationally demand is about two times higher than supply of current stock, and
- Oversupply of 3-bedroom places; nationally demand is about 70% of the level of current stock supply but this varies by region.

Overall, register applications were about 55% higher than the number of exits in the last two years. Using this measure, the highest levels of undersupply were in the Canterbury and Bay of Plenty regions. In the Canterbury region, supply from current household exits would have provided enough places for less than half of the accepted register applications.

Another component of house supply is the addition of new properties to the public housing portfolio each year. The Auckland, Canterbury and Waikato regions were the only regions that saw increases in size of their public housing stock over 2017. The Canterbury region had the largest increase with 356 additional properties, which means a 6% growth in stock. This is a positive result given the continued increase in register application rates in the region. However, the number of additional houses is still relatively small compared to the current rate of almost 1,400 new applications per year (which is more than twice the number of public housing properties exited).

In Section 1.4.4 we reported that 89% of occupied houses meet the bedroom requirements of its tenants (within one bedroom). This (near) match rate varies from 85% to 91% depending on region. The Auckland region has the highest match rate of 91% with only 5% of houses being underused. This is partly because those in need of housing support in the Auckland region tend to have larger households. In comparison, the Taranaki region has a match rate of 85% with 11% of houses being underused and a smaller average household size.

1.6 Sensitivity and Scenarios

Our long-term estimates are found by simulation. At an aggregate level the simulation results are stable, whereas results for individual households, or small groups of households, are subject to greater simulation variability. Our projections are also very sensitive to some of the input assumptions. Section 6 of the report shows estimates for simulation variability and sensitivity to key assumptions.

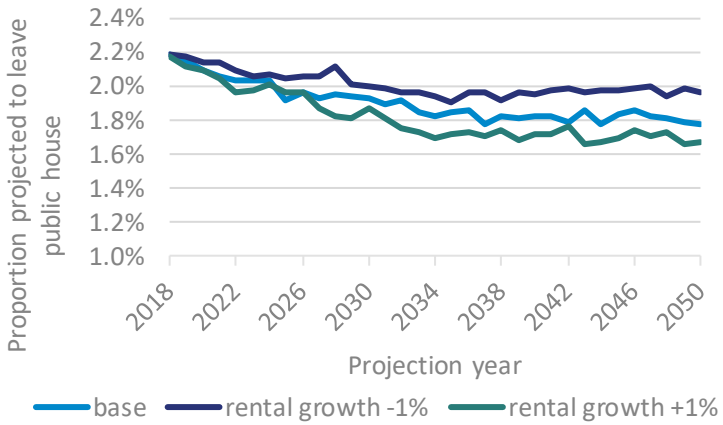
The public housing system is most sensitive to the rate of growth in rents. If rental growth was 1% higher per year over the course of the projection the resulting total future housing support payments would be about 20% higher. There is a three-pronged effect that causes this result:

- The increase in market rents directly increases IRRS payments, even if incomes grew at the same rates
- The growth in rents above tenant incomes means that the proportion of rent paid by the tenant falls, so the rate of IRRS growth is higher than the rental growth
- The higher level of IRRS means tenants are further from the market which decreases exit rates and increases durations.

In addition to the change in projected housing support payments, it is also important to consider how unmet need changes for those on the register. Scenarios which lead to longer durations for those in public housing means it is more difficult to place applications on the register without additional supply as less houses become vacant. As exit rates fall it becomes increasingly important to introduce additional supply to support the needs of those on the register.

Figure 1.18 shows projected tenancy exit rates under the scenarios where rental growth is 1% higher and 1% lower per year, compared to the base projection. Stronger rental growth is expected to reduce the number of public housing exits by about 6% after 20 years. This equates to roughly 300 less vacated public houses per year. In comparison, weaker rental growth means the private rental market becomes more affordable. Under the scenario where rental growth is 1% lower per year it is expected that an additional 9% of tenants will transition out of public housing after 20 years.

Figure 1.18 Projected exit rates under different rental growth scenarios



1.7 Reliances and limitations

There are some limitations to our analysis due to the quality of the historical housing data. For instance, IT system changes in 2009, 2012 and 2015 all cause data dislocations and changes in trends. Missing fields and identity matching with benefit system data are also data-related limitations. We have attempted to remedy these issues and done quality and reasonableness checks on the various aspects of the data.

As with any projection model of a complex system, there are limitations related to simplifications, economic assumptions, and future changes to policy or tenant behaviours.

The estimation of future housing use is subject to influences whose effects cannot be determined with complete accuracy. Consequently, it is a virtual certainty that the ultimate results will depart from any estimate, but the extent of this departure is subject to uncertainty. If potential outcomes and their relative likelihoods were expressed as a probability distribution, we would consider our estimates to be the mean of that distribution. In particular, the estimates provided in this report contain no deliberate bias towards over or under estimation.

2 INTRODUCTION AND BACKGROUND

Inside this chapter

2.1 Background and structure of this report

The purpose of the public housing projection is to report to the Ministry of Social Development (MSD) on projected lifetime housing pathways and housing support payments of those in or close to the Government-funded public housing system (defined further in Section 2.2). Its broader scope includes other related information, such as long-term projections of the demand for, and supply of, public housing places that assist MSD in making investment decisions about the sector.

This is the third annual report on New Zealand's public housing system. The first report, as at 30 June 2015, set a baseline in assessing lifetime housing cost, public housing demand and how well supply matched current needs. The 2016 report had our first analysis of change and related performance estimates. This current report projects the public housing system (and other accommodation support provided by the government) from 30 June 2017, and looks at developments over 2016/17.

This projection of the public housing system (as at 30 June 2017) provides:

- An estimate of future durations in housing for those in or close to the public housing system in 2016/17 (as defined in Section 2.2)
- An estimate of the associated lifetime housing payments for those in or close to the public housing system in 2016/17
- An estimate of various types of unmet need in the public housing system, where known
- An assessment of how well the existing housing supply is matched to current and future demand
- A forecast of demand to help inform MSD's purchasing intentions for housing places, and inform providers' asset investment decisions
- An overview of the key drivers of long term payments and trends observable over time
- Further analysis on some groups of interest

Part A – Introduction is comprised of Chapter 1 – Executive Summary, and Chapter 2 – Introduction and Background.

Part B – Results is comprised of Chapters 3 to 6. Part B contains a full description of the projection results and analysis. It will be most useful for readers who are seeking a comprehensive understanding of the June 2017 projection and its implications.

Part C – Approach is comprised of Chapters 7 to 10. These chapters will be useful to technical readers, such as other actuaries and analysts.

Terms and acronyms used in this report are explained in the **Glossary**, Chapter 10.

Appendices are provided to give further information on more technical aspects of the projection, including assumptions, data, modelling approach and more detailed results. Appendix B provides further

background about the projection for readers seeking context about New Zealand's public housing system.

This chapter includes some background on the rationale and approach to the housing projection model.

2.1.1 New Zealand's public housing system

About New Zealand's public housing system

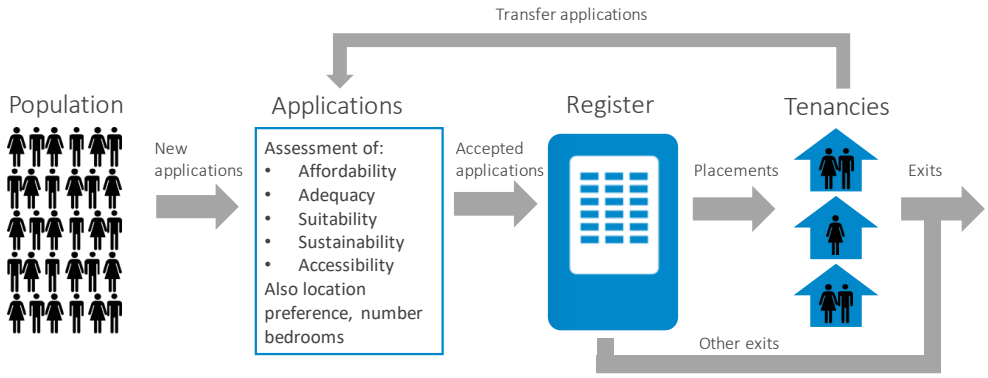
The public housing system is run by the Government to help ensure that all New Zealanders have access adequate accommodation. It complements other types of housing support (such as that provided through the benefit system) to help those with particularly high needs. An effective public housing policy will:

- Reduce homelessness
- Reduce over-crowding in residences
- Reduce the number of households in poor quality housing environments
- Help people who cannot afford to rent in the private market
- Provide housing stability while other needs are present (e.g. escaping from domestic violence).

A public housing place is not an entitlement[10] and aggregate support payments are not affected by demand in the short term. Rather, the constrained supply of housing means that support is managed within a financial envelope. There is an application process based on need to determine which households are eligible for public housing. Households who are eligible, but do not yet have a place in public housing, are placed on the 'public housing register'. The register also includes tenants who are already in public housing and are waiting to move to a different housing place.

Figure 2.1 shows a simplified schematic of the flow of households through New Zealand's public housing system via the application process, on and off the register, and into and out of public housing. Note that the schematic is simplified; for example, there are pre-assessment stages such as screening, emergency housing and advice before an application is made.

Figure 2.1 Schematic of public housing register and tenancies



At 30 June 2017, 93% of public housing tenancies are managed by Housing New Zealand (HNZ), with the remaining 7% managed by Community Housing Providers (CHPs).

The rent associated with a property is a market rent estimate based on comparable housing in the area. However, the amount of rent tenants actually pay – called 'Income-Related Rent' (IRR) – is based on their household's income to ensure affordability for low-income families. The difference between market rent

[10] This is an important difference from demand-driven working-age benefits — which are available to all who qualify – in interpreting long-term financial trends in the sector.

and IRR is subsidised by the Government – this subsidy is called the 'Income-Related Rent Subsidy' (IRRS). Most tenants contribute 25% of their income in rent, with the difference between this and the market rent being the IRRS. Some public housing tenants are 'market renters' who have sufficiently high income to pay the market rent and the corresponding IRRS is zero. Total IRRS in 2016/17 totalled about $800m, and at 30 June 2017 the average IRRS per occupied property was just over $250 per week, compared to market rents of $375 per week.

For low- and modest-income households that are *not* housed in public housing, there are other housing-related payments to assist with housing affordability:

- **Accommodation Supplement** (AS): A supplementary benefit paid to assist with the cost of housing. It can go towards rent, board or mortgage payments. It is often (but not always) paid in conjunction with a main benefit (e.g. Jobseeker Support). The payment varies with income, household type and region.
- **Temporary additional support** (TAS): A type of hardship benefit paid to beneficiaries, primarily to assist with housing-related costs.

It is appropriate to include these payments when considering public housing performance, since they are partial substitutes. Tenants who exit a public house are often not yet independent of housing support and receive AS. This means considering IRRS only will understate the total need for housing support.

MSD's role in managing the public housing system

The Government's Social Housing Reform Programme[11] introduced a suite of changes to increase the diversity and supply of public housing in New Zealand and to provide better housing services to tenants. The key objectives of the reform programme are:

- People who need housing support can access it and receive social services that meet their needs
- Public housing is of the right size, configuration and in the right areas, for households that need it
- Public housing tenants are helped to independence, as appropriate
- There is more diverse ownership or provision of public housing
- There is more innovation and more responsiveness to public housing tenants and communities
- The supply of affordable housing is increased, especially in Auckland.

Through the reform, some responsibilities for the management of public housing have moved from HNZ to MSD. While HNZ continues to manage the bulk of the public housing portfolio, MSD is now the **purchaser of housing places** – they now have a role in directing future housing supply. This reform seeks to increase the supply of public housing and improve responsiveness to changes in housing demand.

MSD has three key functions in relation to managing the public housing system:

- **Managing the public housing register** – determining which applicants to public housing are eligible and have the highest need, with the aim to reduce unmet need for public housing (i.e. addressing demand).
- **Purchasing public housing places** – allocating eligible applicants on the register to public housing places in HNZ or CHPs and matching applicants to their properties, with the aim to ensure people who need housing are matched to suitable places (i.e. addressing supply); forecasting demand and setting purchasing intentions to ensure an appropriate supply of suitable places to purchase going forward.
- **Helping tenants –** working with tenants to move toward improved housing stability and eventual transition to independence, including reviewing tenancies as required (i.e. addressing duration).

[11] See http://www.socialhousing.govt.nz/

The public housing projection is designed to assist MSD to carry out each of these three functions.

2.1.2 The investment approach and the public housing projection

The **investment approach** was originally the evidence-based policy and delivery framework underpinning New Zealand's Welfare Reform. Since then, this type of thinking has expanded across New Zealand's social sector. The Treasury notes "*[s]ocial Investment is about improving the lives of New Zealanders by applying rigorous and evidence-based investment practices to social services*."[12]

MSD has stated that taking a social investment approach to public housing means:

- Using data and information to understand the characteristics of people MSD is seeking to support
- Understanding what services they are currently accessing
- Measuring the effectiveness of these services
- Sharing what is learned so that future investment is based on evidence of what works and for whom.[13]

Underpinning an investment approach in the public housing sector is the ability to take a long-term view of public housing pathways and the underlying drivers of risk, so that MSD can invest up front to reduce long-term social disadvantage and related service costs. For example:

- Those on the register may have their needs better met by increased short-term spending, reducing longer-term public housing use.
- Those at risk of eviction from public housing may have high future costs associated with service usage in public housing, homeless services and the benefit system. Stabilising their current tenancy may give better long-term results.
- Encouraging those with lower need to exit public housing and enter the private housing market improves the ability to meet unmet need on the register, and reduces the long-term cost of public housing to some households.

Long-run projection models facilitate this investment approach. These models take inspiration from the social insurance and private insurance schemes. In the social sector context, such projections introduce a long-term, person-centred, whole-of-system view that is relevant because of the long-term dynamics of social disadvantage and service usage. They provide visibility of expected future trends, and create a feedback cycle that shows the long-term implications of policy and operational decisions. They also provide insight into concentrations of risk and cost, which management can use to guide its decisions on how to improve social outcomes and financial sustainability.

2.2 Key concepts

Current cohort population

The scope of our report's 'main estimate' is the **current cohort population** which consists of those households who were in a public house or on the public housing register at some time in 2016/17. These households are considered to be close to the public housing system.

- There were 64,400 households in public housing at the reporting date (30 June 2017).
- Another 6,500[14] households were on the register at the reporting date.

[12] The Treasury, *Social Investment:* http://www.treasury.govt.nz/statesector/socialinvestment
[13] https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/housing/2016/purchasing-strategy-final.pdf

» Additionally, there were another 28,300 adults who have been in a public house or on the register sometime in 2016/17, but weren't at the reporting date (recent exits).
» In all, this is 156,000 adults[15], 84,000 children and 70,900 households in the 2017 report.

The projection is done at individual level, but with individuals linked across households – this report is primarily presented at the **household level**. Changing household composition is highly significant in understanding changing housing needs.

There is a large overlap with the benefit system client population – 64% of the primary householders (either in public housing or on the register) in this projection are also included in the benefit system projection. A further 20% of the primary householders are receiving NZ Super. As such, we estimate full lifetime payments for public housing, as many tenants stay in public housing till advanced age. This differs to our annual benefit system report, where we project working-age benefits up to age 65.

Of the current public housing households:

» Almost five out of ten are in Auckland and of these:
  • Two out of five households are one- or two-person households
  • Three in five households have three or more people
  • Auckland households are larger, on average. In Auckland, 28% of households have five or more people, whereas this is true for only 13% of public housing places in other regions.
» A further two in ten are in Wellington or Canterbury
» One in three households have a Māori primary householder
» One in four households have a Pacific primary householder.

Future cohort population

While the main estimate for the lifetime housing support payments includes only current households (as defined above), we also project public housing entry, tenancy and related payments for **future** households. That means households expected to enter the register or establish a public housing tenancy each year for the next 100 years. This is necessary to understand future demand and where future housing places might be needed, but is not included in estimates of the aggregate total payments or aggregate notional total payments.

Housing places

At the reporting date there were about 65,200 public housing properties (excluding those not available, such as those for sale), with 780 of them unoccupied and 64,400 of them occupied[16]. Of these public housing properties, 93% are managed by HNZ and 7% are managed by CHPs. MSD purchasing intentions will help determine the level, location and size of the future housing portfolio.

Public housing register

Households' eligibility for public housing is assessed through the public housing needs assessment – the Social Allocation System (SAS). Need for public housing is assessed across five dimensions: adequacy, suitability, affordability, sustainability and accessibility. Applicants are given a combined need score out of 20 (with 20 indicating highest need), plus a priority category (A for high priority, B for lower priority).

[14] These numbers differ from MSD statistics due to differences in how client status is determined for the purpose of our modelling. Please see Section 8.3.6 for further detail.
[15] We generally include youths aged 16 or 17 as 'adults' in our commentary. These youths eligible to apply for public housing, and sometimes receive housing support through the benefit system too.
[16] These are numbers provided to us by MSD. The equivalent numbers used in our projection are slightly different due to data differences at a unit record level.

Of the 6,500 households on the register at the reporting date[17], about 70% are priority A. This is up significantly compared to a year earlier.

Applicants remain on the register until a suitable available place is found (currently about 1,650 placements a quarter), or they are no longer eligible or in need of a place.

Once in a tenancy, transfer applications are sometimes made if the current place is no longer suitable. These are either business-initiated (HNZ or the CHP initiate the transfer) or at the request of the household.

When a household exits from a tenancy (typically after a number of years) that place becomes available for another household on the register.

Scope of housing-related payments and other expenses

There are three key housing-related payment types in scope for this projection that we estimate at an individual level:

- Income-related rent subsidy (IRRS)
- Accommodation Supplement (AS) (but only those AS payments attributable to people in or close to the public housing system)
- Temporary Additional Support (TAS).

In addition to the above, we include MSD's housing-related investments and expenses in relation to administering the public housing system. These include products and services that assist with housing independence, and expenses associated with MSD's management of the housing sector. These are discussed in Chapter 7 of this report.

This report does not attempt to estimate other 'costs' associated with public housing, such as:

- Any charge, where applicable, for the cost of capital.
- Housing New Zealand administrative expenses, rates, or costs of repair. This is mainly to avoid double counting; the market rent of a property in the private market typically includes the cost of property management and maintenance by the landlord. However, these costs are potentially important and may warrant future analysis; understanding how management costs vary across households is useful in understanding household-level need.
- Future costs for renewal and reconfiguration of the current public housing stock.
- Any measurement of 'unknown' demand (for example, the potential housing costs of people who would qualify for a public housing placement but currently don't apply).

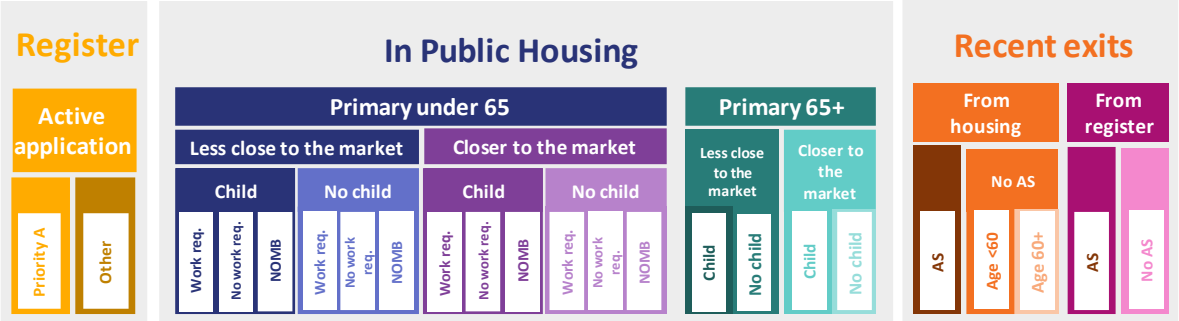
Future reports may include some of these costs.

Segments

We have retained the same segments used in the previous report. Households are assigned to a segment based on the status of the primary tenant. Segments are based on public housing system status, proximity to the market, whether there are children in the household, and work requirements.

[17] This number differs from MSD's official figure of 3,877 at the same date, because of differences in how client status is determined for the purpose of our modelling and projections compared to MSD's standard definition. Please see Section 8.3.6 for further details.

Figure 2.2 Housing report segments



We use 'closer to the (private rental) market' to describe clients with an IRRS level ≤ $150 per week (in June 2017 dollars). Conversely, we describe those with an IRRS level above this level as 'further from the (private rental) market'. A client may be in receipt of a main benefit with work requirements (namely Jobseeker Work-ready, Emergency Benefit and Sole Parent Support with youngest child at least 3 years old), in receipt of a main benefit without work requirements (any other main benefit such as Supported Living Payment), or not on a main benefit (NOMB). Recent exit segments are split on whether people receive Accommodation Supplement (AS).

Regions

Housing markets vary significantly between regions, and people tend to prefer housing in areas they are familiar with. MSD has responsibility for purchasing intentions, where housing needs are detailed by location and size. To reflect this, we have carried out the projection at the territorial authority level. Further, in the Auckland territorial authority we have subdivided to a local board level. In all there are 85 territorial authorities and boards that we produce forecasts for. In this report 'territorial authority' almost always means 'territorial authority and Auckland local board'.

To summarise our analysis in this report, we often break down the projection population into 11 regions, based on MSD's Service Delivery regions already built into the benefit system projection.

2.3 Key measures and management applications

There are three key areas of interest when understanding the performance of the public housing system, each of which we track in this report. These are summarised in the table below. More detail on the rationale behind these measures is given in our previous reports.

Table 2.1 Key elements of reporting public housing performance

Performance area	Rationale	How we measure performance
Duration and transitions	MSD aims to manage tenancies actively so as to: » Make the best use of New Zealanders' investment in public housing as an opportunity to stabilise the risk factors that drive each household's need for public housing, and » Where appropriate, build pathways towards independence from public housing, thereby freeing up spaces from those capable of independence to be available for new entrants with high need.	We project future housing pathways for people based on their characteristics and estimate their associated **lifetime housing support** payments at an individual level (the sum of future IRRS, AS and TAS payments). We sum individuals to get the total by household. » Stabilising underlying need faster and sustainably moving people into the private rental market will lead to decreases in future housing support » Lowering churn (the rate at which former tenants require public housing support in the future) will similarly reduce the metric. Pathway projections also allow MSD to understand progress through the system and the impact of policy and operational changes.
Demand and unmet need	The public housing register represents unmet need of people known to be eligible for public housing but cannot be placed. Unmet need can also take the form of inappropriate housing, such as overcrowding.	We measure known unmet need by estimating the **'additional notional lifetime housing support'** for these clients. This is the additional lifetime payments if their current need was adequately addressed now. This is effectively assuming that right-sized housing is available today for those with unmet needs. » Reducing the register size will reduce the additional notional future housing support. » The metric also reduces the risk of perverse incentives, where 'cost' reductions through reducing housing supply would see a corresponding increase in unmet need. » There are also notional savings that can be estimated for households in too-large properties for their needs. Related to this, we also consider the **size and dynamics of the register** over the year as an indicator of performance.
Public housing supply	Housing stock should ideally match demand; the size and location of properties should match the needs of those in the system and applying to the register. MSD signals changes to supply needs through its purchasing intentions statements. The measures used in our report help inform purchasing intention decisions.	We produce **matching** estimates, the rate at which current tenancies are well-matched. We define a mismatch as occurring if a house is empty, if a household is on the transfer register, if a public housing place is overcrowded or if a place is underutilised. This focuses on the 'stock' aspect of housing supply. We have also previously provided MSD with the capacity to run '**idealised purchasing**' projections, which track how properties should be bought and sold to best match current trends in register demand. This focuses on the 'flow' element of housing supply.

2.4 Projection methodology

The methodology used to model the public housing system is the same as previous reports. At its heart, it is an individual-level quarterly projection of housing pathways. The pathways allow for differences between individuals such as demographic characteristics, household characteristics, income, and benefit system history. There are additional models for housing support payments associated with these pathways. Some important features of the approach are:

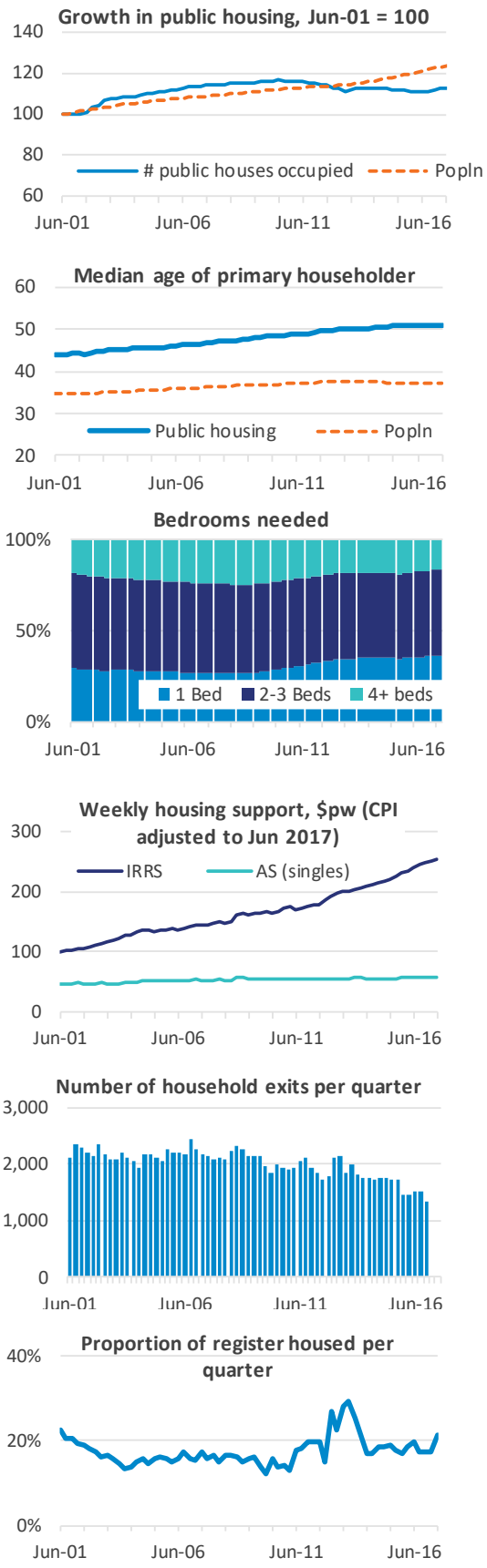
- **Individual-level, but reportable at a household-level.** The projected statuses and cashflows are assigned to each individual person in the projection scope. Summing these together for individuals in the same household gives a household-level view. We build in many household-level effects too; a household in a public housing place is very likely to exit as a household, rather than individually.
- **Non-independence across households.** We project as an entire system which allows us to enforce house supply constraints. For instance, people on the register in an area will not be able to enter a house unless one is released (via a public housing exit) or new supply is added.
- **Integration with the benefit system projection model.** The heavy overlap between public housing and benefit system populations, plus the inclusion of AS and TAS (paid through the benefit system) as a housing support payment mean that studying joint pathways are of great interest. Benefit status also allows us to better predict housing pathways. Even though we have separate reports for the two systems, the underlying model and projection is unified.
- **Responsive to economic variables.** The projection incorporates assumptions related to Average Weekly Earnings (AWE) growth, regional rental growth (relative to Consumer Price Index (CPI) growth), and regional unemployment rates. This allows us to better explain observed experience and test the sensitivity of results to these factors.

A description of our methodology is given in Chapter 8.

2.5 Long-term trends affecting the public housing system

The long-term trends are an important part of understanding the public housing system. Factors have combined to make the system less dynamic and more costly over time. These are summarised in the figure below.

Figure 2.3 Long-term trends affecting the public housing system



Between 2001 and 2010, public housing supply grew in line with population growth. Supply has been flat since then, but population growth has accelerated with high net migration. Public housing places per capita has fallen 12% over six years. Current supply targets would help reverse this trend, although it would not fully address the related challenges discussed below.

The median age of a primary householder has increased by over 7 years to 51 since 2001, compared to an increase of 2.3 years for the general population; entries by younger applicants are too low to offset the aging of occupants. This in turn adds pressure to the system, as tenants aged 50-75 are the least likely to exit public housing.

About 80% of the public housing stock is 2- or 3-bedroom places, whereas only 47% of current households need a house with 2- or 3-bedrooms. There has been increasing need for 1-bedroom places (which includes empty-nesters who previously needed a larger house), and a continuing shortfall of about 4,000 larger (4-bedrooms or more) places.

Market rents have grown much faster than the incomes of those in public housing, and this creates a gearing effect that means the subsidy level grows faster still – average weekly IRRS has grown at 6% pa above CPI inflation over the last 15 years. This creates a large gap between public housing and benefit system support, which in turn reduces public housing exit rates. In 2001, average IRRS support was $53 (in 2017 dollars) higher than AS support for singles; now it is $196 higher. Such trends vary across New Zealand, with higher rents in Auckland creating a larger financial barrier to exit. Growth in rents also contributes to demand for public housing places.

The increasing financial barrier and the impact of aging have meant that exit rates from public housing have been falling steadily. The number of household exits is now a third lower than in 2001/02. This trend fundamentally reduces the ability to place people on the register into public housing, particularly in the absence of new housing supply.

Despite this, the rate at which people are placed into housing has been fairly steady over time. This is driven partly by policy changes; the qualification for the register was tightened in 2010, significantly reducing numbers of accepted applications. A steady rate of 'other exits' from the register (for those not housed) also prevents rapid growth in the size of the register.

2.6 Main policy and operational changes affecting 2016/17 results

In this section, we detail the major policy and operational changes affecting 2016/17 results, as well as noting announced future policy and operational changes that may affect future years' results.

2.6.1 Kiwibuild announcements

The government has announced that a new Housing Commission will be charged with ensuring adequate supply of affordable housing and new construction activity. Before the establishment of the Commission, a KiwiBuild Unit was set up within the Ministry of Business, Innovation and Employment.

While the initiative is targeted at increasing total housing supply (including affordable housing for the private sector), part of this activity will be dedicated to increasing the number of public housing places.

2.6.2 Growth in transitional housing places

The former government committed $354 million towards transitional (or emergency) housing places, with 1,663 transitional housing places delivered as at 30 September 2017. These places provide short-term accommodation for households with an urgent need for a place. A place might be provided for a few months while the household finds permanent accommodation (which may be a public housing place). Other support services, such as budgeting advice or social services, can be delivered at the same time.

Transitional housing programs includes the Housing First initiative – announced in March 2017. This is a joint initiative between the Government, Auckland Council and five CHPs which is based on the premise that it is easier to address issues such as mental health and substance abuse, once people are housed. It offers on-going wrap-around support to homeless Aucklanders. Housing First will help 472 homeless people over two years.

2.6.3 Changes in the way MSD interacts with tenants and those on the register

Public housing property offers

2016/17 saw a continuation of changes made in January 2016, which affected how people could respond to a public housing offer. The main changes were:

- A household could only decline an offer for a good and sufficient reason, or risk removal from the public housing register.
- Where it's geographically possible, a person must select at least three letting areas they want to live when applying for public housing.
- To help improve the matching process for clients, MSD can include a nearby letting area that someone may not have selected to live. This potentially opens clients up to a greater number of suitable properties that meets their needs.

Broadening of selection criteria for clients who may have a tenancy review

MSD has been undertaking tenancy reviews since July 2014 – to check whether tenants are living in public housing that best fits their needs, and move tenants who can move into private housing into private housing (with the right support). The initial focus was on those tenants paying market, or near market, rent and living in areas with a high supply of private housing. This scope was broadened in April 2016 and reviews continued in 2016/17. Exempt tenants include those:

- Who live in a property modified for their needs (e.g. with wheelchair access)
- Who have an agreed lifetime tenure with HNZ
- Who are 75 years or older.

2.6.4 The role of CHPs in providing public housing

The Social Housing Reform Programme seeks to partner with Community Housing Providers (CHPs) to help provide public housing. Since April 2014 CHPs have been eligible to receive IRRS on behalf of their eligible tenants, subject to meeting government regulations.

Registered CHPs can contract with MSD under two possible mechanisms. First, they can supply short-term spot contracts covering the duration of a specific tenancy. The majority of current IRRS places are on these short-term spot contracts. Second, CHPs can also take the form of longer-term capacity contracts covering a specific house, unit or apartment for a specified period of time; the terms of these contracts are negotiated between MSD and the provider.

Some of the largest CHPs are due to transfer of ownership of HNZ properties. The largest transfer was to the Tāmaki Regeneration Company (TRC), jointly owned by the Crown and Auckland Council, on 1 April 2016. All HNZ properties in the Tāmaki area (about 2,800) were transferred.

Another large transfer related to 1,140 properties in Tauranga. This took place on 1 April 2017. This was the first transfer of HNZ properties to a non-government CHP.

A transfer of 2,500 Canterbury public houses had been planned under the previous government, but this process has now been halted.

Some city councils manage their own public housing stock. Some of this stock is planned to be transferred to CHPs, and so will fall under the national public housing system. These have been included in our housing pipeline assumptions, consistent with MSD's Purchasing Intentions report.

2.6.5 Other housing initiatives

There are various other housing initiatives, either operational or in train. One area of focus is Auckland, which has the most expensive property market and some of the highest levels of need for housing support. This includes the redevelopment of Crown land in Auckland.

Part B – Results

3 FEATURES OF INTEREST

Inside this chapter

3.1 Introduction and highlights

This chapter focuses on new findings associated with this year's projection model. These findings arise from new capabilities added to the projection model, the exploration of historical and projected patterns for trends, and from specific areas of interest developed in consultation with MSD.

Financial barriers to housing exits

The financial barrier to public housing exit (the difference between rent payable in a public house and that in the private market) continued to grow in 2016/17. The $14 increase in IRRS corresponds to a 0.1 percentage point decrease in exit rates (2.3% to 2.2% of households per quarter, say) and adds 0.1 years to the average future duration. The duration effect is quite marked; someone with weekly IRRS support of $300 will be in housing 2.6 years longer than someone with $50 of IRRS support (with all other factors held constant).

Intergenerational effects

The proportion of signatories of new public housing tenancies who were once in public housing as a child is rising. People who were in public housing as teenagers are over-represented by a factor of about three times for young entries into public housing. These entrants are more likely to be sole parents, and have higher expected tenancy duration at entry.

Households not receiving main benefits

While a third of primary tenants below retirement age were not receiving main benefit support at 30 June 2017, the majority of these tenants have a history of main benefit receipt (typically within the last five years). Many of these clients are also projected to return to benefits in the future.

These results are relevant because those not on benefits tend to (sustainably) exit housing more quickly. We estimate that someone currently receiving a main benefit will spend one to two years more in public housing (depending on benefit type). This effect is larger again when the income effect is included.

Duration to house

Over the year to 30 June 2017 there were about 7,000 applications housed with a mean time on the register of 115 days and a median time of about 54 days. The large difference between mean and median shows there is a significant skew (usually for lower priority applicants); a sixth of applicants take longer than six months to be housed.

Tenancy reviews

Of the 5,100 tenancy reviews finalised by 30 June 2017, just under a quarter resulted in an exit from public housing. Those exited have required much less subsequent housing support compared to more general exits from the public housing system, with 89% receiving no support in the following year and 10% receiving some Accommodation Supplement. We estimate these exits have released 14,000 years of time in public housing that has now been redirected to other households with higher current needs.

Tenancy and register exit reasons

The reason a household exits a public housing place or the register is important; sometimes the reason represents a poor outcome (for example, eviction for failure to pay the already subsidised public housing rent). Over the two years to 30 June 2017, almost a third of tenancy exits have a reason corresponding to a poor social outcome, with the most common of these reasons being rental arrears (32%), personal safety issues (16%) and neighbourhood issues (10%). The rate of poor social outcome exits appears slightly higher than the two years to 30 June 2015, although this comparison spans different IT systems and Ministry responsibilities. The relatively high rates suggest that other forms of support might be useful to these tenants, particularly early in their tenancy.

A large portion of exits from the register are due to MSD being unable to contact the applicant ('no response'). While it is problematic to describe non-response as a 'poor' exit reason (a person may not respond because they have no ongoing housing need, so no need to follow up with MSD), the relatively high rate of re-entry to the register amongst those that exit suggests that more could be done in supporting these applicants.

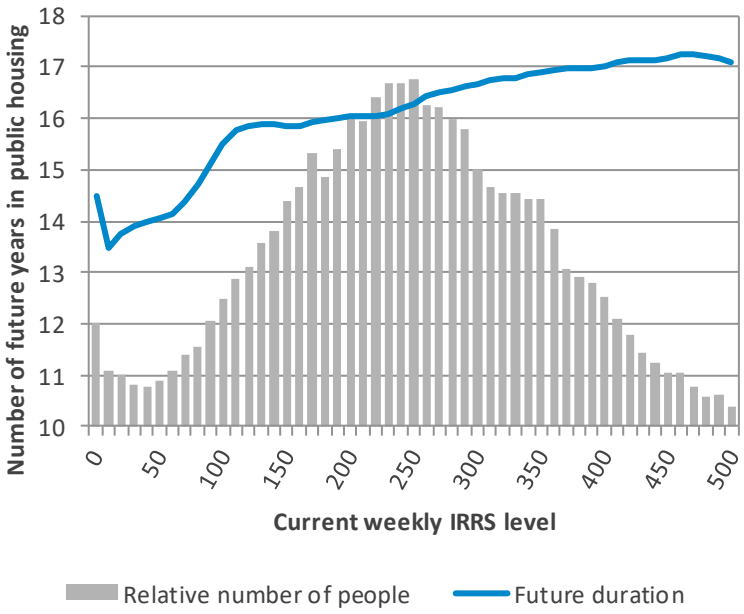
3.2 Financial barriers to housing exits

One of the long-term trends identified in Section 2.5 was the increasing financial barrier to exiting public housing; rents have consistently grown faster than incomes of those in public housing. This trend continued in 2016/17; after allowing for CPI inflation, market rents increased by a further 3.6% and IRRS increased by 6% (or $14 per week) as a result. Public housing tenants are therefore less able to afford housing in the private rental market.

These changes affect exit rates and durations. The $14 increase equates to a 0.1 percentage point decrease in exit rates (2.3% to 2.2% of households per quarter, all else equal, or 65 fewer public houses vacated per quarter). The impact on future duration due to this $14 is an additional 0.1 years in housing, all else equal, but this is just the impact of a single year of rent increases; the effect stacks over successive years. The partial dependence[18] plot in Figure 3.1 shows the overall relationship between IRRS level and time on benefit. For example, someone with weekly IRRS support of $300 will be in housing 2.6 years longer, on average, than someone with $50 of IRRS support (with all other factors held constant).

[18] Partial dependence refers to the average effect of a variable holding all other factors constant. For example here, region is correlated with IRRS level but we exclude any regionality effects in the partial dependence effect of IRRS.

Figure 3.1 Partial dependence effect of IRRS level on number of future predicted years in public housing



The implications of this effect on future payments are higher again; the longer duration combines with the higher IRRS level of support to give much larger lifetime housing payments. The average value of lifetime housing support for households with current IRRS > $150pw is more than twice that of households with IRRS < $150pw. Furthermore, all else equal, the lifetime housing support payable to a primary householder currently with $300 of IRRS per week is double that of someone with $50, or $110k higher.

Slower exit rates reduce the supply of vacant properties, which in turn increases the time to house those on the register.

As discussed in Section 2, the level of Accommodation Supplement support available to a household is a relevant comparison when considering financial barriers. Planned increases to some accommodation supplement payments will reduce this gap. All else equal, we would expect this to slightly increase public housing exit rates.

3.3 Intergenerational effects

Those who were in a public house as a child are much more likely to need housing support themselves when they become adults. While we have not formally built intergenerational effects into the lifetime projection model (partly due to the limitations of the data available), this subsection explores the prevalence of intergenerational use of public housing.

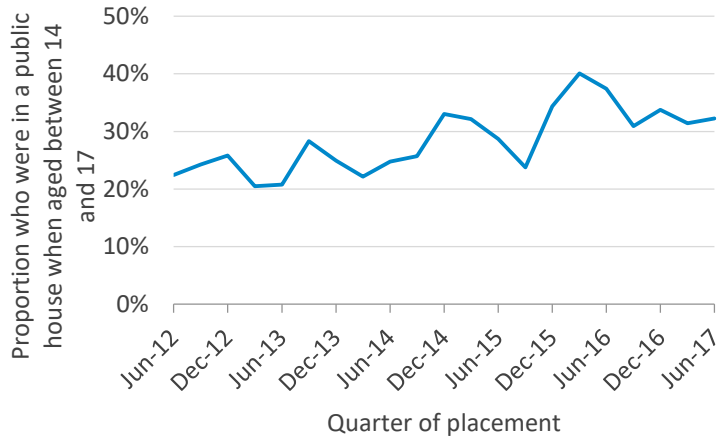
The proportion of signatories of new public housing tenancies who were once in public housing as a child is rising. This can be seen in Figure 3.2, which shows the proportion of new signatories aged between 18 and 24 (inclusive) who were in a public house when aged between 14 and 17 has increased from under 25% in 2012 to well above 30% currently. There are several potential reasons that may explain this trend; for example, it may reflect better targeting of need in the prioritisation of register applicants.

We estimate that 11% of people aged between 18 and 24 have lived in a public house while aged 14-17[19], so this group is over-represented by a factor of about three times for young new entries into public

[19] Comparing MSD housing numbers with Statistics NZ Infoshare population estimates.

housing. This over-representation and related time-trend highlights the intergenerational cycle as well as an opportunity for supporting these youths while still living with caregivers.

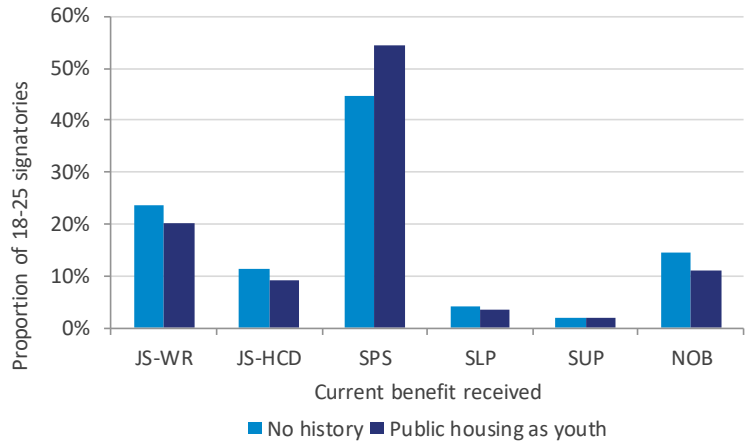
Figure 3.2 Proportion of signatories placed between 18 and 24 who were in a public house as a non-signatory while aged between 14 and 17.



Focusing still on this 18- to 25-year-old age group, public housing signatories who were in a public house as a child also tend to have different characteristics compared to those who aren't part of the intergenerational cycle. They are significantly more likely to be receiving Sole Parent Support (SPS) in the benefit system; 55% compared to 45%. They also have slightly larger households on average and average IRRS support levels are 6% higher. All these factors mean that such households have lower exit rates from public housing, giving higher estimates of future public housing duration for these younger clients with intergenerational history.

In total, primary householders in the 2017 cohort who are under the age of 25 are expected to spend an additional 2 years in public housing if they were in a public house as a child.

Figure 3.3 Benefit receipt for 18 to 25-year-old signatories, split based on being in a public house aged 14-17[20]



[20] Acronyms for benefit types included in the glossary

3.4 Households not receiving main benefits

Benefit receipt is important for understanding housing pathways. While a third of primary tenants below retirement age were not receiving main benefit support[21] at 30 June 2017, the majority of these tenants have a history of main benefit receipt. Figure 3.4 shows the proportion of primary tenants who were benefit recipients. We see:

» Primary tenants of households with children are more likely to have been on benefit support; this relates to higher incidence of SPS history.
» Primary tenants further from the market (weekly IRRS > $150) are also more likely to have been on benefit support. This reflects a correlation between current low income and previous benefit receipt.

It can be seen that about a third of primary tenants of households with children and further from the market were main benefit recipients within the last year. Furthermore, 85% have received main benefits at some point in the last ten years. Figure 3.5 shows the unsurprising result that, amongst those with a history on benefit, primary tenants of households with children are much more likely to have been receiving Sole Parent support.

Figure 3.4 Prior benefit receipt amongst current primary tenants not on main benefits (NOMB) at the projection date

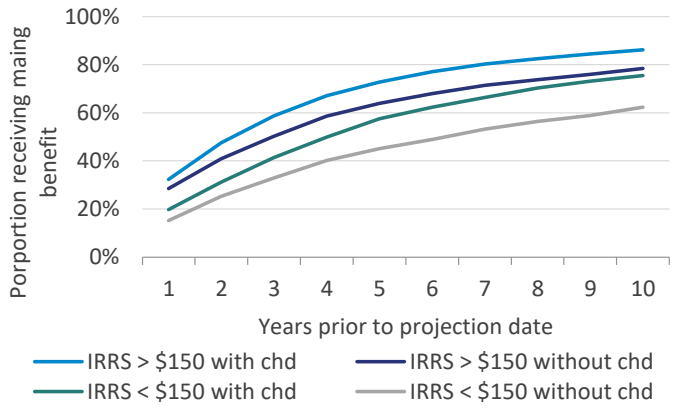
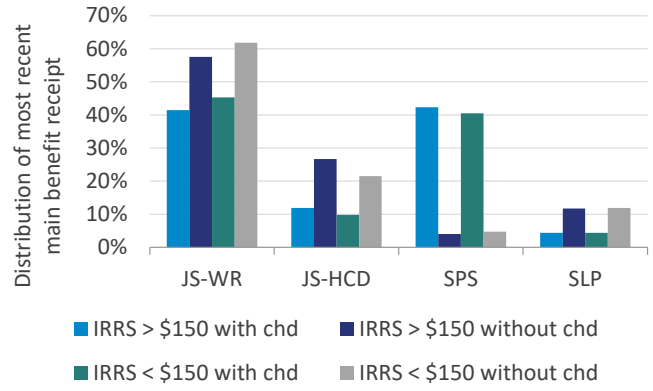


Figure 3.5 Distribution of most recent main benefit for those who had benefit support in the last 10 years

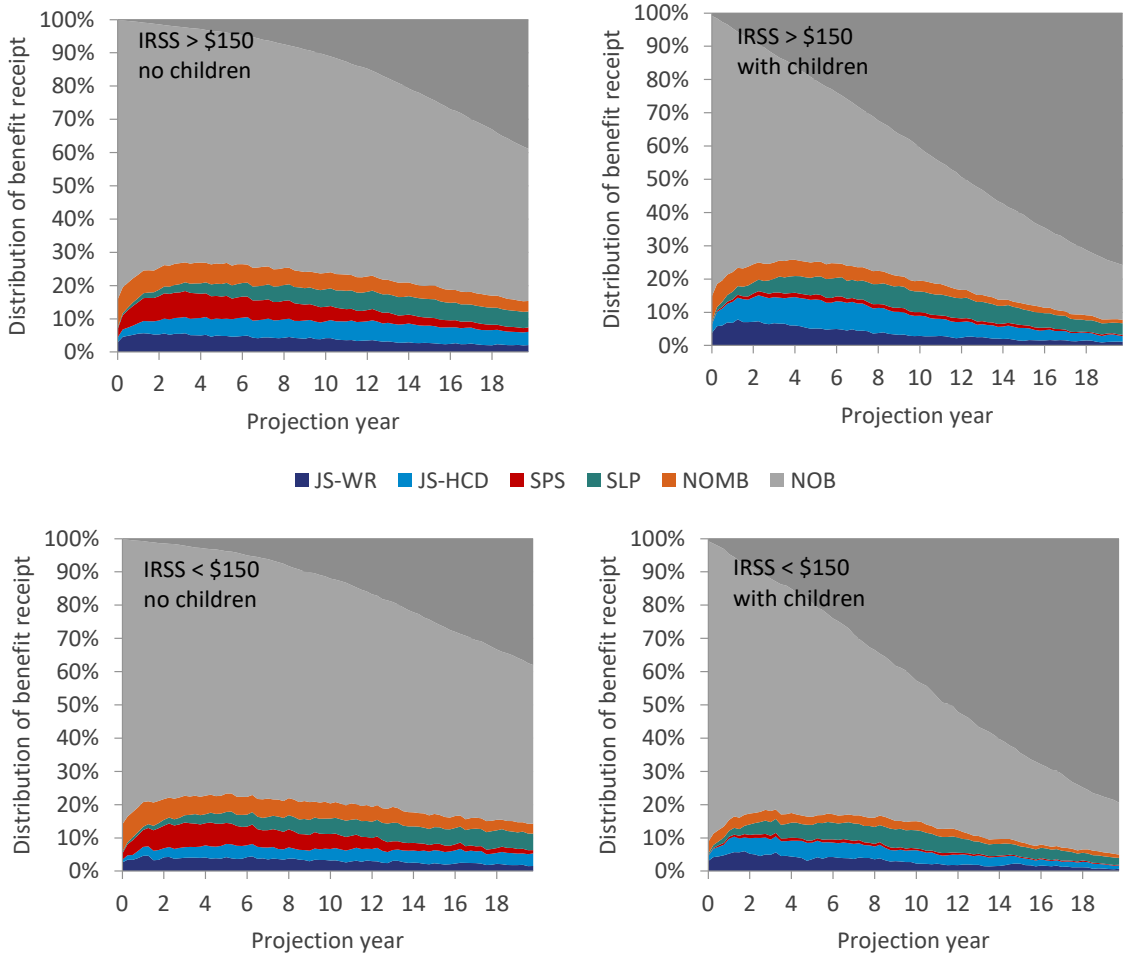


The previous discussion focuses on previous benefit use; some of these tenants will re-enter the benefit system in the future too. Figure 3.6 shows projected benefit usage for the primary tenants in the 2017

[21] 'Main benefits' refers to income support, and excludes those would receive only supplementary benefits. Main benefit types includes Jobseeker work-ready (JS-WR), Jobseeker with a health condition or disability (JS-HCD), Sole Parent Support (SPS) and Supported Living Payment (SLP).

cohort who are not currently receiving main benefit support. It is estimated that about one in five tenants who are currently further from the market will be a main benefit recipient in four years' time. In comparison, those who are closer to the market are less likely to require benefit support with about 15% projected to be on a main benefit in four years' time. For those who do enter the benefit system, those currently without children are more likely to be SPS recipients in the future (when they have children and meet the eligibility criteria).

Figure 3.6 Projected future benefit receipt for current NOMB primary tenants in public housing



We therefore see a strong interaction between the public housing and benefit systems; tenants tend to have a prior history of main benefit support and a significant amount of them are expected to receive support in the future, even if they aren't current income support recipients. This interaction is important; those on benefits will have longer tenancy durations and are much less likely to exit a public house each quarter. Holding all other factors constant (including household income), we estimate that someone currently receiving a main benefit will spend one to two years more in public housing (depending on benefit type). This effect is larger again when the income effect is included. Non-beneficiaries also have higher incomes which reduces their IRRS and duration (see Section 3.2).

3.5 Duration to house

The length of time waiting on the register before being housed is a key measure of the effectiveness of the public housing system. Here we consider this duration, which is the same measure MSD uses for their reporting.[22]

MSD aims to provide safe and secure housing as quickly as possibly for those who need it. Register wait time is largely driven by supply and demand; an application can only be placed if there is a suitable place (either an existing property is vacated, or new housing supply added) and if there is no other application considered to have higher need.

Over the year to 30 June 2017 there were about 7,000 applications housed with a mean time on the register of 115 days and a median time of 54 days. As shown in Figure 3.7 there is a large range of time to house:

- About 30% of housed applications spent less than 4 weeks on the register
- A further 35% spent between 4 and 13 weeks on the register
- Nationally 6% spent over 52 weeks on the register before being housed, although in Auckland where demand is high this is 9%.

Figure 3.7 Proportion of housed applications by days to house, year to 30 June 2017

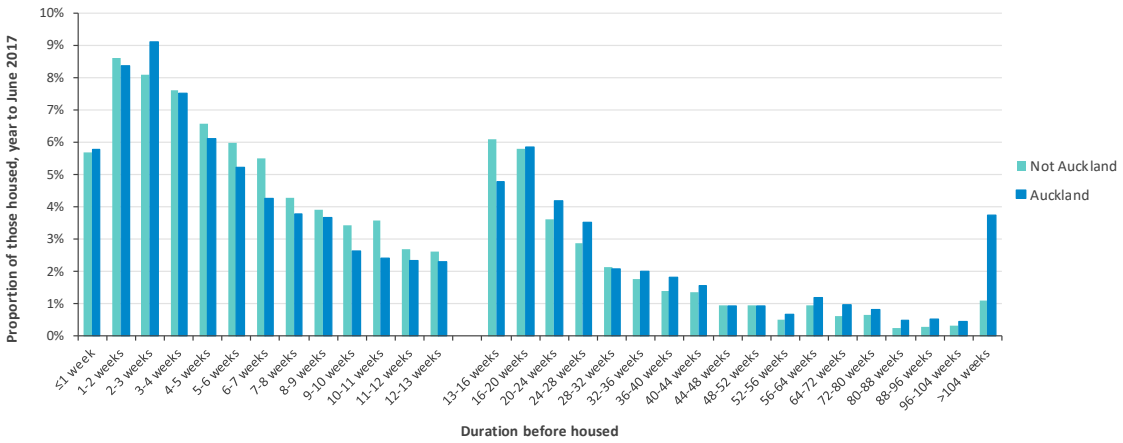
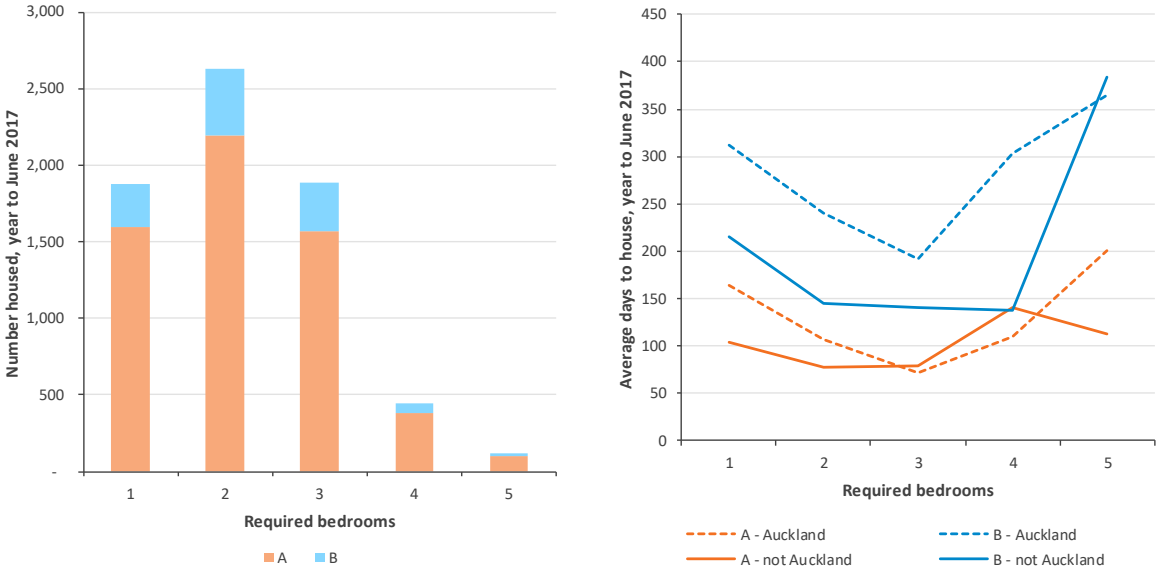


Figure 3.8 shows that housed applications are mostly priority A applications and durations are longer for priority B applications. Figure 3.8 also shows the duration to house by the required number of bedrooms; durations are shortest for 2 and 3-bedroom places. This reflects the relative undersupply of 1-bedroom and 4+ bedroom places.

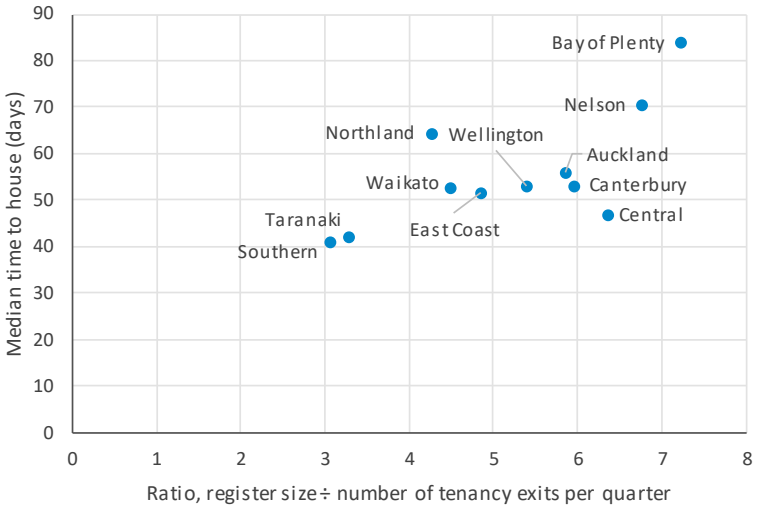
[22] See http://www.msd.govt.nz/about-msd-and-our-work/newsroom/2017/housing-quarterly-report-september-2017.html. After September 2015 time to house is defined as the number of calendar days between the date an application is first confirmed live on the Public Housing Register as an 'A' or 'B' priority and the date a tenancy is activated for that application. The date a tenancy is activated may differ from the tenancy start date. The quarter in which the tenancy was activated is the quarter in which the application has been reported as housed in. Applications housed may have been housed with Housing New Zealand Corporation or with a Community Housing Provider.

Figure 3.8 Number of applications housed (left panel) and average days to house (right panel), both year to 30 June 2017



The key drivers of time to house are the number of applicants and the number of houses made available. This is illustrated in Figure 3.9 below. The x-axis is the average register size over 2016/17 divided by the number of tenancy exits per quarter over 2016/17. For example, Nelson has an average register size of 270 on our dataset, compared to an average number of tenancy exits of 40, giving a ratio of 6.75. The y-axis in the figure is the median time to house. There is a direct and close relationship between the two, with Northland and Central regions being the main outliers. An increase of one unit in the ratio (the register size increasing by the number of quarterly exits) corresponds to an increase of 9 days in median time to house.

Figure 3.9 Regional plot of median time to house against the ratio of register size divided by number of tenancy exits per quarter. Average over 2016/17.



The relationship between this ratio and median time to house means that it is possible to predict how this measure will evolve, given trends in the register and housing supply. Over the next three years the current projection allows about 2,100 new houses (an effective tenancy exit in the sense that a vacant property is available); this is sufficient to reduce the ratio substantially and drive down time to house.

3.6 Tenancy reviews

Tenancy reviews have been carried out by MSD since July 2014. These were initially targeted at lower-IRRS households to see if they had continued need for public housing. We have been provided data on 7,600 tenancy reviews undertaken by MSD. Two-thirds of these (about 5,100) reviews were finalised at 30 June 2017, of these:

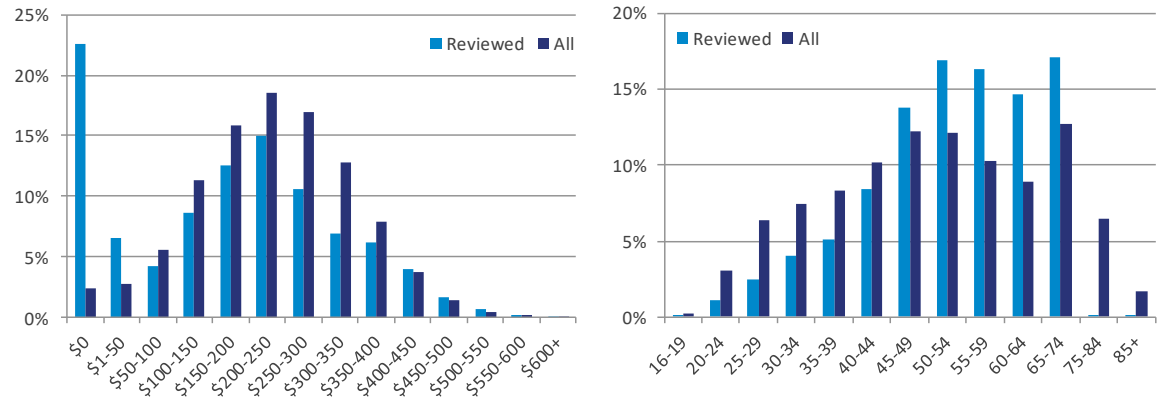
» 76% were found to still be eligible for public housing support, and

» the remaining 24% were exited from public housing.

The distributions of those reviewed are compared to the broader public housing population in Figure 3.10. About a third of all market renters (those able to afford the full rent of the public house) were reviewed, but a substantial number of households with higher IRRS were also reviewed.

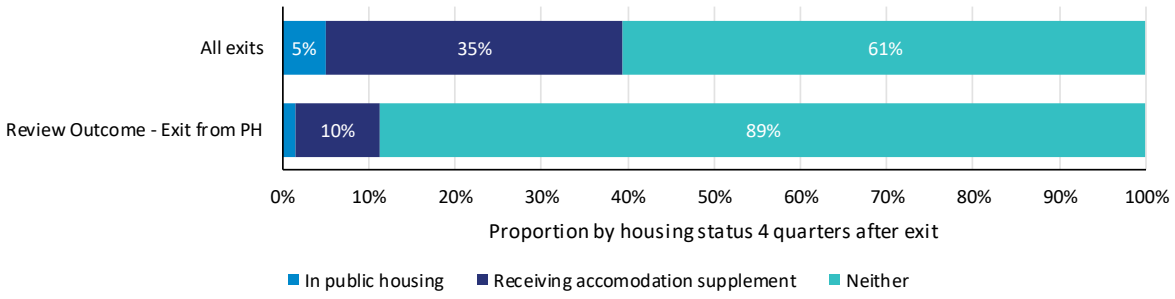
Older households tended to be reviewed, in part because they were more likely to be market renters. This distribution of reviews by age clearly stops at 75, this is consistent with MSDs policy to not review tenants aged over 75 and those in a property modified for their needs.

Figure 3.10 Distribution of tenancy reviews compared to public housing population by IRRS support level (left panel) and age group (right panel)



Where a review resulted in an exit from housing it is of interest to see if these exits are any more sustainable than other housing exits. There were about 600 reviews that resulted in an exit from public housing before 30 June 2016. For these reviews we have four quarters following the exit over which to observe rates of further housing support. The proportion of exits by housing status four quarters later is shown in Figure 3.11 and compared to that for other exits from public housing (those exiting but not because of a tenancy review).

Figure 3.11 Distribution of housing status four quarters after exit for all exits and for tenancy reviews resulting in an exit



Four quarters after a tenancy review exit 89% were not receiving any housing support (and only 1.5% had re-entered public housing). This compares favourably with other exits from public housing; for this

broader group of exits only 61% did not receive housing support over the year and 5% had re-entered public housing. While early days, this suggests the reviews were effective in identifying people who, given the right support, can transition to private housing.

For a mostly fixed supply of public housing, a transition to private housing means another household on the register can be placed. We have attached our projected lifetime durations in public housing of the households that exited as a result of a tenancy review. Before the tenancy reviews we would have forecast this group to spend, in total, a further 14,000 years in public housing; this has now been redirected to other households with higher current needs. A regional breakdown of the result is shown in Table 3.1. While these households had lower than average expected duration before review, the lengths were still substantial.

Table 3.1 Future years of housing support expected if households had not exited following tenancy review[23]

Region	Households that exited following tenancy review		
	Number	Expected future years in public housing prior to review	Total expected housing years prior to review
Northland	47	11.5	542
Auckland	478	13.3	6,373
Waikato	103	9.2	949
Bay of Plenty	73	10.7	778
East Coast	72	10.4	746
Taranaki	70	9.2	646
Central	74	10.3	760
Wellington	120	10.9	1,307
Nelson	61	12.1	738
Canterbury	3	15.3	46
Southern	65	11.0	714
All	**1,166**	**11.7**	**13,597**

3.7 Tenancy exit reasons

Not all tenancy exits are equal; some may be desirable (a tenant sustainably moving to the private rental market) whereas some reflect poor social outcomes, such as failure to pay income-related rent or if the tenants are evicted for causing issues in the neighbourhood. Ideally poor exits should be reduced, as there are likely to be underlying needs for which stable housing would help. We have, in consultation with MSD, grouped the reasons for exit provided into seven categories:

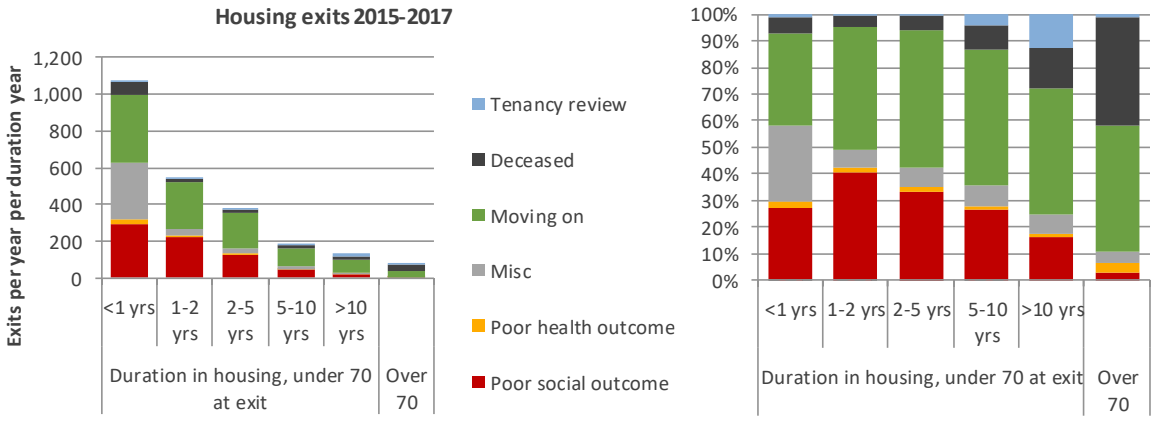
- **Moving on**: Tenant choice, change of circumstance, change of scene, employment opportunity, etc.
- **Poor social outcomes**: Rent arrears, personal safety issues, house abandonment, prison, neighbourhood issues, etc. These relate to tenant circumstances that could potentially be improved with more active tenant management.
- **Poor social outcomes (property)**: Property condition, fire damage, etc. These are not tenant specific.
- **Poor health outcomes**: Health issues, longer term care, etc.
- **Miscellaneous**: Property upgraded/sold and unknown reasons.
- **Tenancy reviews**
- **Deceased**.

[23] Numbers are for finalised reviews that resulted in a tenancy exit. They are slightly understated as we excluded a small number of reviews (<70) resulting in exits from housing as these were not easily matched to tenancies.

Exit reasons are collected by MSD, although this data is considered to have lower reliability than other types of administrative data.

Figure 3.12 shows reason for household exit (excluding transfers) over the two years to 2017. Almost a third of tenancy exits have a reason corresponding to a poor social outcome. Exits for poor social results are relatively more likely in the first few years of a tenancy. While the reasons vary, the most common causes of poor exits are rental arrears (32%), personal safety (19%) and neighbourhood issues (14%). These outcomes suggest that broader support may be warranted to help stabilise those at risk of such exits.

Figure 3.12 Reason for household exit (excl. transfers), average over two years to 2017



Rates of poor social outcome exits appear to be slightly higher than those estimated in our 2015 report, however the comparison spans different IT systems and Ministry responsibilities.

In our 2015 report we looked at what factors could be used to predict a poor outcome. Higher likelihood was seen for:

- Those with corrections history (as a result of a criminal conviction),
- Māori and Pacific Islander tenants
- Those not receiving the age pension or Supported Living Payment income support.

We have not repeated the analysis in this report, but would expect similar findings.

3.8 Register exit reasons

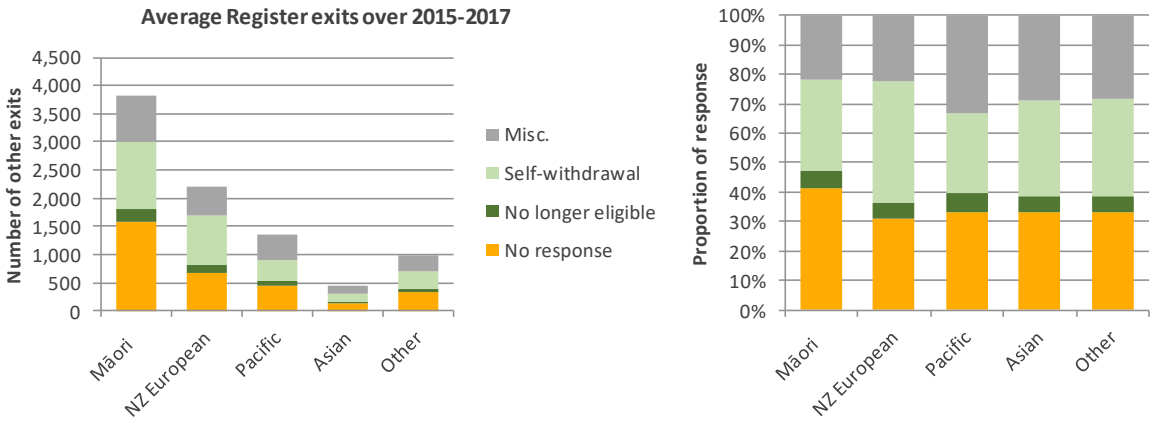
In similar fashion to Section 3.7, we have also examined the recorded reasons for exits from the housing register. We have grouped the reasons for exits provided into four categories:

- **Eligibility**: Change of circumstance, inability to confirm eligibility etc.
- **Self-withdrawals:** Contact by the applicant, no longer requiring public housing etc.
- **No response**: Inability to contact, Offer withdrawals, etc.
- **Miscellaneous:** Death of applicant, unknown etc.

While it is problematic to describe no response as a 'poor' exit reason (a person may not respond because they have no ongoing housing need, so no need to follow up with MSD), the relatively high rate of re-entry to the register amongst those that exit suggest that more could be done in supporting these applicants. Better data on these exits, including linked emergency housing support data, would improve our understanding of client pathways.

Figure 3.13 shows reason for housing register exit over the two years to 2017. The largest group is those with No response (36%) followed by Self-withdrawal (33%).

Figure 3.13 Reason for register exit, average over two years to 2017



Register exit reasons are fairly consistent across various ethnic groups with some over-representation from:

» Māori clients among non-responses, and
» NZ European clients among self-withdrawals.

This does not imply ethnicity is causative as there are other correlated factors, a similar effect is seen by age group. Those aged under 25 are over-represented among non-responses, and those over 60 are over-represented among self-withdrawals.

4 PUBLIC HOUSING SYSTEM PERFORMANCE: OVERVIEW

Inside this chapter

4.1 Introduction and highlights

This chapter discusses the main results for each of the key public housing measures. It provides an overview of the performance of the public housing system – covering both the recent performance against expectations and the long-term implications.

Performance of the public housing system in 2016/17 compared to expected

The number of new register applications was much higher than the levels observed in the prior two years. There were almost 3,000 new register applications per quarter, which represents a 40% increase relative to the year to 30 June 2016. As a result, the size of the Housing register has grown substantially to 6,475 households.

The number of clients re-engaging with the public housing system was roughly two times higher than what we projected. About 6% of clients who exited a public housing tenancy and 11% of clients who exited the register during 2015/16 have re-engaged with the system. While we set assumptions based on a longer-term history (partly due to additional uncertainty because of data system changes) we continue to monitor re-entry rates closely.

Despite the large increase in register applications, placement rates have remained relatively comparable to experience in the previous year. This is partly supported by better utilisation of existing housing stock. The number of unoccupied properties has fallen by about 740 over the year. Every quarter, about 22% of priority A applications and 8% of priority B applications are placed.

IRRS payments were 2% higher than expected over the year. Total IRRS payments averaged $199m per quarter on compared to the $195m per quarter previously projected. This is driven by higher than expected growth in market rents and more occupied properties than expected.

Duration – lifetime housing payments

New Zealand households who were close to the public housing system in the year to 30 June 2017 are expected to spend 13.4 years in a public house in the future on average. This corresponds to average future housing payments of about $205,000 per household, and total future lifetime housing payments of $18.4 billion including related expenses.

Households who are currently in public housing are expected to spend another 16.3 years in public housing compared to 10.5 years for those on the register and 2.2 years for those who exited a public house in the last year.

Total lifetime housing payments have decreased to $17.8b from $18.1b as estimated in the previous projection. The main components of change were:

- A decrease of $1.1b due to increasing real interest rates
- An increase of $0.4b due to rental growth of the public housing stock being higher than expected

» An increase of $0.8b due to significantly more register applications than expected but also direct entries into existing households which aren't allowed for by the model
» An increase of $0.2b due to more recent exits re-engaging with the system.

Demand: notional total projected payments

Notional lifetime housing payments are the hypothetical lifetime payments (the sum of future IRRS, AS and TAS benefits) that would be made if all people on the register were housed *today* (in contrast to the main lifetime housing payments, which estimates household lifetime payments given existing operational and supply constraints).

The notional lifetime housing payments for those on the register at 30 June 2017 total $1.24b compared to the main payments estimate of $0.95b. This means that there exists $289m of (known) unmet housing need. Alternatively, those on the register are estimated to spend an additional four years in a public house if there are no operational or supply constraints. This is offset by two and a half years less with accommodation supplement support due to faster placements.

Supply: match rates

To better understand supply, we look at 'matching'. We define a near match as when the number of required and actual bedrooms differs by one or less. The near match rate of the public housing system is 89%. Underutilisation represents the largest contribution. About 7% of public housing places have underuse and 1% have overcrowding.

The match rate has deteriorated slightly since the previous projection. About 200 households who were well matched a year ago are now on the transfer register. In addition, about 1,200 households have had members exit meaning the house is now underused.

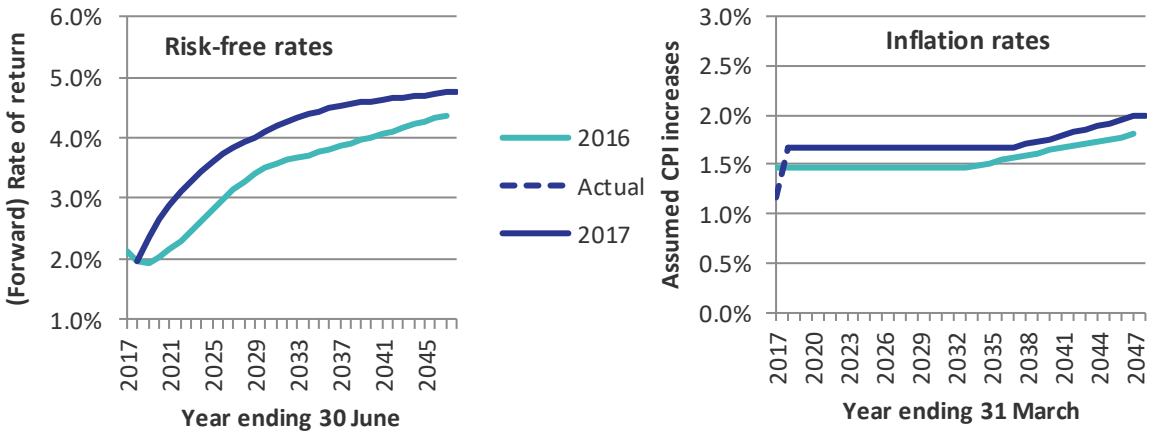
4.2 Main economic changes affecting results

Economic assumptions are an important part of future housing system dynamics and the level of future housing-related payments. We review the key changes to economic variables in this section.

4.2.1 Inflation and discounting

Our projection of payments is made first on a '30 June 2017 dollar' basis. Historical dollar values are inflated to June 2017 using the historical values of the Consumer Price Index (CPI). For final results we apply future CPI inflation assumptions to express amounts in actual dollars. We then apply discount factors to reflect the time value of money – effectively allowing for interest earned if money was put aside today. We use CPI assumptions and risk-free discount rates consistent with Treasury's published assumptions. Inflation and discount rates affect the future lifetime payment results, but are outside of the control of MSD. The assumptions at the current and previous report are shown in Figure 4.1.

Figure 4.1 Assumed risk-free discount and inflation rates



Compared to the previous projection:

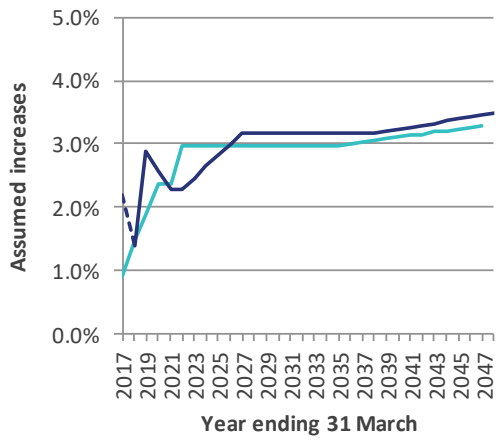
- CPI inflation has been revised upwards in the short-term by 0.2% but still converges to the same long-term rate of 2% per year.
- Discount rates have also been revised to converge to the 4.75% long-term rate faster. As a result, short and medium-term rates are higher than the previous projection by up to about 0.8%.
- Overall the real rates of return (discount rate minus inflation) have increased, being 0.5% higher on average between 2020 and 2045. The combined effect is a decrease in the total projected housing payments of about $1.1 billion (or 6%).

The impact of changes in inflation and discounting assumptions is large. This is a feature of longer-term payments, where changes to rates compound over multiple years. The discounted mean term of IRRS payments (the dollar-weighted average length of time till payment, after allowing for the time value of money) is about 17 years. IRRS payments make up the majority of total projected payments and so this reflects a very long-term payment stream.

4.2.2 AWE inflation

NZ Superannuation payments to those aged over 65 are indexed to changes in average weekly earnings (AWE). The assumed AWE rate at the current and previous projections are shown in Figure 4.2.

Figure 4.2 Assumed AWE inflation rate



Over the year to 30 June 2017, AWE inflation was 2.1% compared to 1.2% used in the 2016 projection. We assume AWE inflation is fixed at 1.5% above CPI after 9 years, so the long-term AWE assumption remains the same as the previous projection at 3.5%. The medium-term assumptions are now about 0.2% higher.

We have assumed that incomes for working-age clients in public housing grow at the rate of CPI, regardless of benefit status. This appears reasonable based on historical data. However, there is no inherent reason why the income of non-beneficiaries should be limited to CPI in the future.

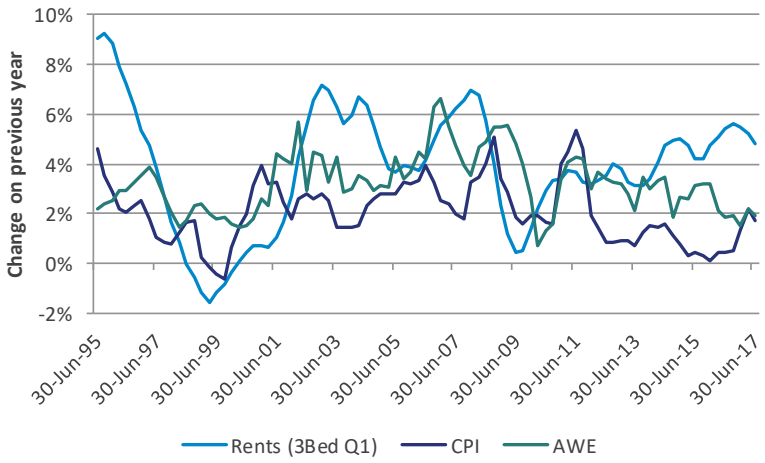
4.2.3 Market rental rates

Assumptions regarding the growth in market rents have a very large influence on the projection. The sensitivity testing in Section 6.3 shows that total future lifetime payments are extremely sensitive to a small change in the assumed growth of market rents. Rental growth rates affect future payments in two ways; higher market rents lead to higher IRRS payments and compounding this, higher IRRS levels are associated with reduced exit rates from public housing.

We use first quartile rent indices for our models, as these are usually close to average public housing rents.

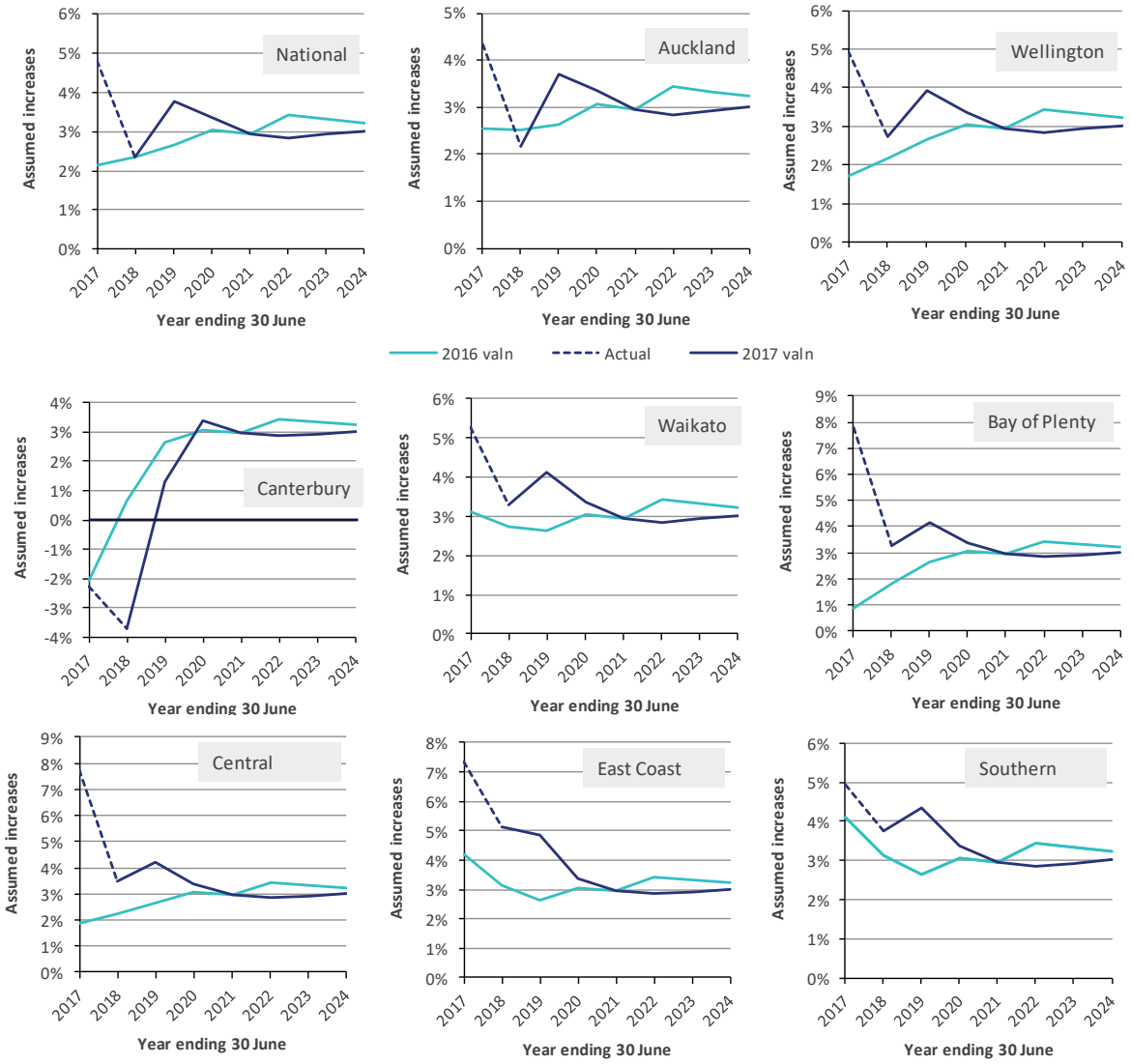
The relationship between CPI, AWE and rental growth has varied in time, the history is shown in the figure below. Over the year to June 2017 rental growth continues to be high, despite low AWE and CPI growth. Our rental growth rates are tied to AWE; after ten years we assume rents increase at the same rate as the AWE index. Rental growth assumptions have been selected based on discussions with MSD and Treasury. These rates are fairly conservative (that is, lower) compared to recent history.

Figure 4.3 Historical AWE, CPI and rental growth rates



The figure below compares our assumed rental growth rates at the previous and current projections for a selection of regions (and the national rate). The national rental growth rate was 4.8% during 2016/17, this was over twice the rate assumed at the previous projection.

Figure 4.4 Assumed rental growth – national and selected regions



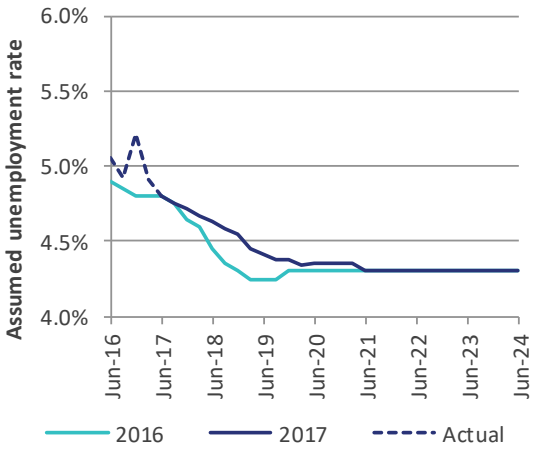
Different regions have different rental markets, the rate of growth varies according to demand (this is influenced by a host of factors including regional population, regional population growth, regional and national labour markets). At a regional level, rental increases were generally higher than projected, but as can be seen in Figure 4.4 there is a large variation by region. In the year to 30 June 2017 rents:

- Showed very strong growth of almost 8% in the Northland, East Coast, Bay of Plenty and Central regions. Rental growth in Bay of Plenty was particularly strong at 7.8%, relative to our assumed rate of 0.9% in our previous projection.
- Showed moderate growth of roughly 5% in the Waikato, Taranaki, Wellington, Nelson and Southern regions. Rental growth in Nelson was particularly strong at 5.0%, relative to our assumed rate of 0.4% in our previous projection.
- Grew 4.3% in the Auckland region compared to 2.5% assumed. Dynamics in Auckland strongly influence the national average given the size of the market. Auckland and Canterbury were the only regions where rental growth was lower than the national average.
- Rents in the Canterbury region fell 2.3% but this was broadly consistent with previous assumptions.

4.2.4 Unemployment rate

The unemployment rate has a comparatively small influence on the projection of future housing payments; it is not directly incorporated into our housing transition and payment models. However, the rate does affect the likelihood of needing income support through the benefit system, which in turn affects housing transitions, such as the likelihood of making a Housing Register application or the likelihood of exiting a public housing place. Higher unemployment will also lead to more AS and TAS payments for people who move into the benefit system.

Figure 4.5 Assumed national unemployment rate



Over the year to 30 June 2017, the national unemployment rate decreased from 5.0% to 4.8% in line with Treasury forecasts but not until the last quarter. Figure 4.5 compares the forecast unemployment rate at the previous projection and that used here. We have continued to base our assumptions on Treasury forecasts and the long-term rate remains at 4.3%. However, the long-term rate won't be reached until 2021 rather than at the end of 2019 as assumed in the previous projection.

4.3 Recent performance and trends

In this section, we compare the performance of the system against our forecasts from the 2016 projection.

4.3.1 Actual versus expected in 2016/17

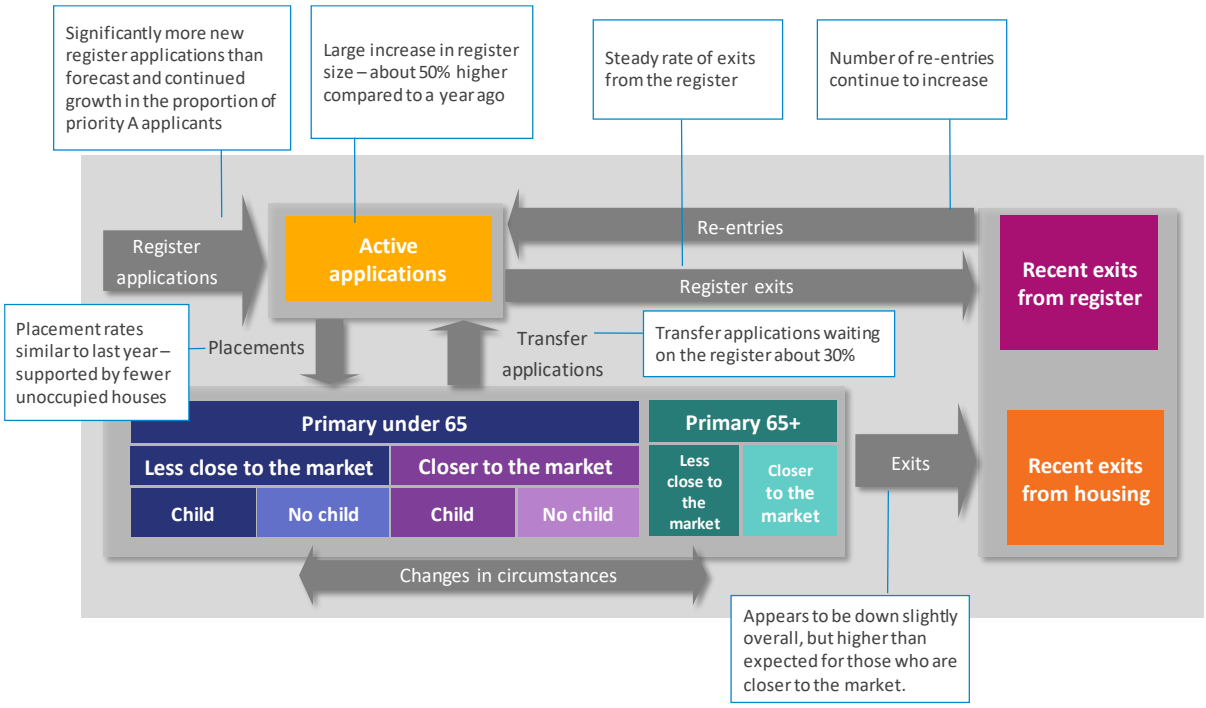
Movement through the public housing system

Figure 4.6 gives an overview of the movements of tenants and register applicants in the public housing system in 2016/17. The main features of the experience during the year compared to our forecasts from the previous projection include:

- New register applications were much higher than the levels observed in the prior two years. There were almost 3,000 new register applications per quarter in the year to 30 June 2017. This represents a 40% increase relative to the year to 30 June 2016, which had about 2,100 applications each quarter. The proportion of applications which are priority A has also continued to increase, going from 74% to 79%.
- Transfer applications have also increased about 30% relative to the previous year with an average of 720 applications per quarter.
- Despite the large increase in register applications, placement rates have remained relatively comparable to experience in the previous year. This is partly supported by a reduction in the number of unoccupied properties (or a better utilisation of existing housing stock). The number of unoccupied properties has fallen by about 740 over the year.

- The size of the Housing register has grown by 50%, increasing from 4,302[24] households on the waitlist to 6,475. Note this uses a broader definition than MSD statistics; among other things, we include applications that have accepted a provisional offer but not yet been placed.
- Household exits were down slightly compared to forecast. The overall exit rate for households with working-age primary tenants was 2.2% per quarter compared to the assumed rate of 2.3%. This is consistent with the observed growth in market rents. However, those who are closer to the market appear to be exiting slightly faster than forecast, especially if the primary tenant is not receiving main benefit support.
- The rate of exit of non-signatory adults has remained at a significantly higher level. The average rate of exit for the two years to 30 June 2017 is about 7.5% compared to experience of under 5% over the two years to 30 June 2015. Current exit rates are more comparable with experience recorded before 2014 and it is possible that the low levels observed during 2014 and 2015 are related to data issues rather than changes in the underlying rate.
- The number of clients re-engaging with the public housing system was once again much higher than what we assumed in the projection. About 6% of clients who exited a public housing tenancy in 2015/16 returned to the system in 2016/17 compared to 3% forecast. For clients leaving the register, 11% have re-engaged with the system compared to 4% forecast. While the rate of re-entry has increased over time, a large part of the difference between actual versus forecast is due to our assumptions being based on a longer-term history.

Figure 4.6 Public Housing dynamics: changes in 2016/17



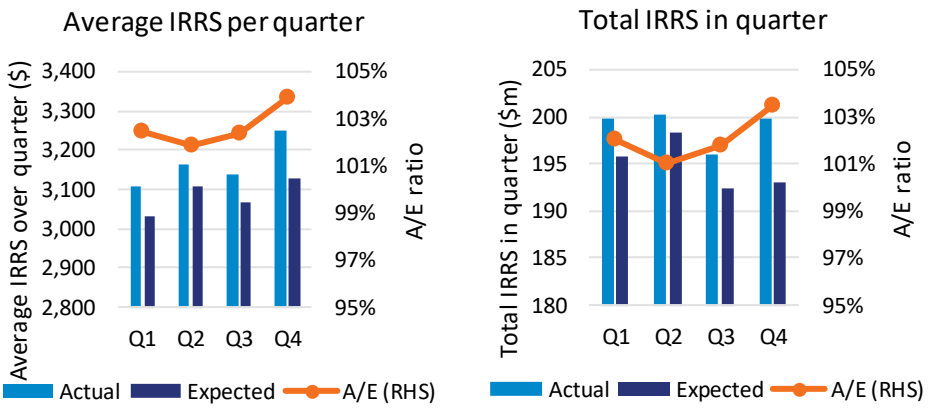
IRRS payments

Actual IRRS payments compared to expected by quarter are shown in Figure 4.7 (note that the differences appear magnified due to the choice of the vertical scale). IRRS payments were 2% higher than

[24] We have changed the definition of active register application slightly in 2017, so the change in numbers on the register is not like for like. On a consistent basis the register size has grown by 39% over the year (from 4,667 to 6,475). The change in definition related to the treatment of applications closed (often temporarily) in the month of June.

expected over the year. Total IRRS payments averaged $199m per quarter compared to the $195m per quarter previously projected. This was mainly due to higher than expected growth in market rents over the year. As a result, average IRRS levels were higher than expected.

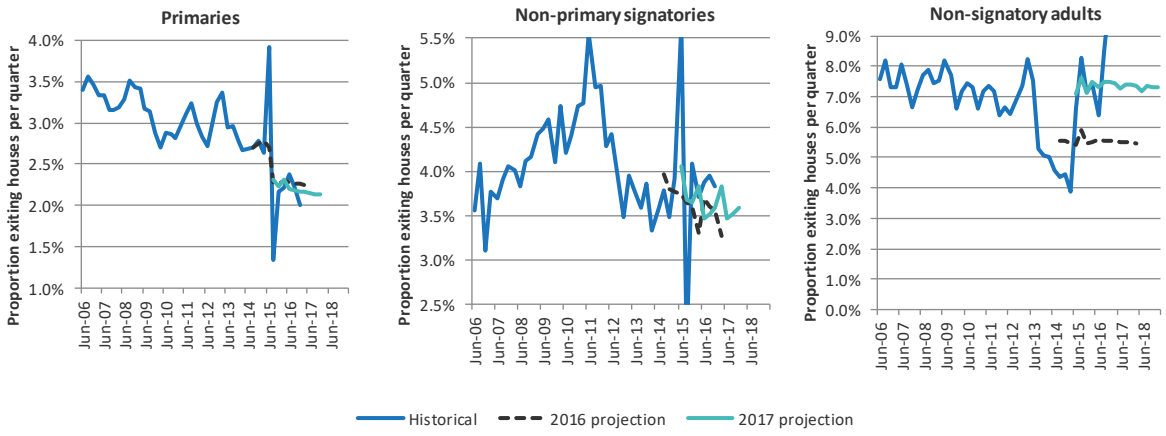
Figure 4.7 Actual and expected IRRS levels for the 2016/17 year



4.3.2 Duration and transitions: recent changes

Transition rates out of public housing are an important input into our estimation of future housing duration. Figure 4.8 shows the historical and projected transition rates for different householders. The experience over 2015/16 is very choppy, due to the IT changeover.

Figure 4.8 Quarterly exit rates for adults from public housing for different household roles. We generally regard the exit rate for primaries as an indicator of the overall household exit rate.



Our main observations are:

- Household exit rates[25] have been slightly lower than expected when averaged over the year. We expected 2.3% of households to exit per quarter, and observed 2.2%. This is consistent with the trend in our previous projection and our assumption is largely unchanged.
- The exit rates for non-primary signatories are generally volatile, but rates observed after the IT system change in 2015/16 have been higher than those seen in 2013/14 and 2014/15. The rate of exit per quarter was 3.8%, compared to our previously projected level of 3.5%. Due to the

[25] We measure household exit rates via a proxy of primary householder exits. The majority of the time the household will exit with the primary householder, so this proxy is reasonable.

uncertainty underlying the reliability of the data, we have only increased our exit rates slightly to 3.6%. Increased exit rate assumptions for these clients tends to decrease their individual lifetime duration in public housing, but not necessarily that of the household's.

» Exit rates have risen dramatically for non-signatory householders since the new IT system. The low rates observed in 2013/14 and 2014/15 now appear to have been misleadingly low. About 7.5% of such householders exited per quarter, compared to our previously projected level of 5.5% (which was based on giving partial weight to the post system change experience). We have revised our assumptions upwards to match recent experience assuming the unusually low rates observed in 2013/14 and 2014/15 are related to data issues. These exit rates tend to have smaller impacts on system-wide lifetime housing payments, as we do not allocate IRRS to non-signatories.

The net result of assumption changes is a minor increase in household (primary householder) duration in public housing, but significant reductions for other adults in a public housing place.

4.3.3 Housing demand: recent changes

Register applications are the key input into understanding demand for housing.

New register applications

Figure 4.9 shows that the number of new applications per quarter has been volatile over the past few years. There have been important changes to policy and delivery over time that influence these trends:

» The needs assessment process was overhauled in mid-2011. Entry onto the register was restricted to those assessed as Priority A or B (although those pre-existing applications with Priority C or D on the register at the time were retained) and there were some adjustments to the criteria for (and hence the characteristics of) Priority A and B applications. The process for client contact, pre-assessment and assessment saw further refinement in 2012.

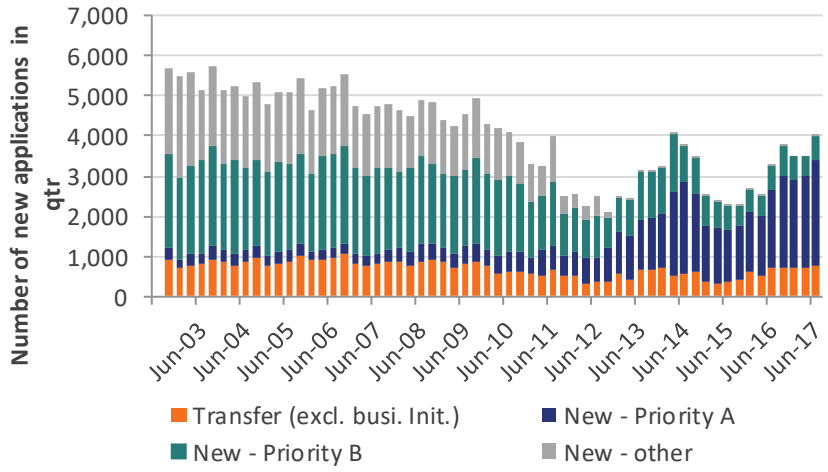
» The service delivery model changed substantially in 2012, including over-the-phone pre-assessments.

» The responsibility for assessment was transferred to MSD in April 2014. The first couple of quarters saw some unusual patterns as the changeover was bedded down. This included unusually high numbers of applications.

» A return to a low number of applications in 2015.

» An increase in application numbers, with a very strong switch to Priority A applicants (compared to Priority B and transfers), since the quarter ending 31 December 2015. This coincides with increased publicity regarding the public housing system, and the Government encouraging people to contact MSD to find appropriate housing options. There were almost 3,000 new register applications per quarter in the year to 30 June 2017. This represents a 40% increase relative to the year to 30 June 2016. The proportion of applications which are priority A has increased from 74% to 79% over the year.

Figure 4.9 Register applications by quarter



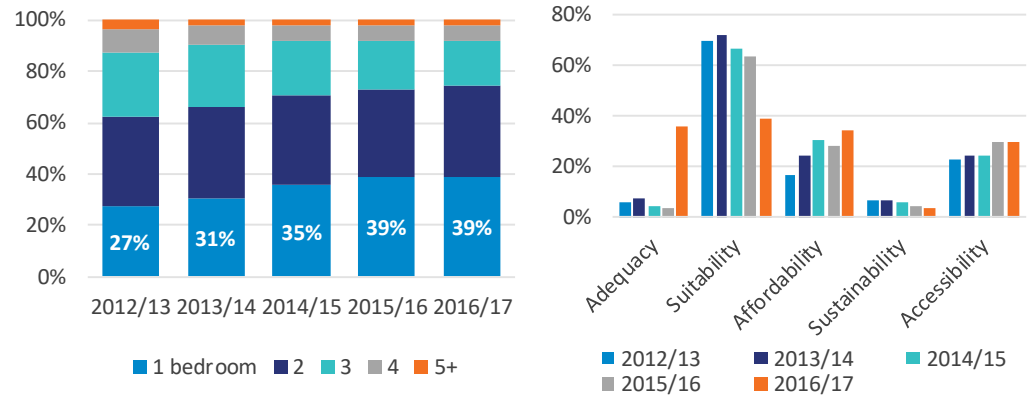
There are also some visible time trends in the nature of applications, as shown in Figure 4.10:

» The household size of Priority A register applicants has been falling. In the last two years almost two-fifths of applicants require a property with a single bedroom.

» The proportion of Priority A applications with the maximum possible scores for Accessibility and Affordability has increased. Out of all applications made in the last year, 29% scored the maximum score for Accessibility and 34% scored the maximum score for Affordability.

Note that 36% of applications scored the maximum score for Adequacy compared to 4% in 2016. This is related to changes in the SAS scoring process that occurred in November 2016; SAS scores were increased for people who are homeless, in emergency housing or at risk of family violence. This change may also have contributed to the higher overall number of applications accepted over 2016/17.

Figure 4.10 Priority A application characteristics. The left panel shows the distribution of bedrooms needed by application year. The right panel shows what proportion of Priority A applications have the maximum score for a SAS subcategory.



Stable supply, flat tenancy exit rates and increased application numbers have led to the (non-transfer) Housing Register growing from 4,302 households at 30 June 2016 to 6,475 households at 30 June 2017.

Housing placement rates

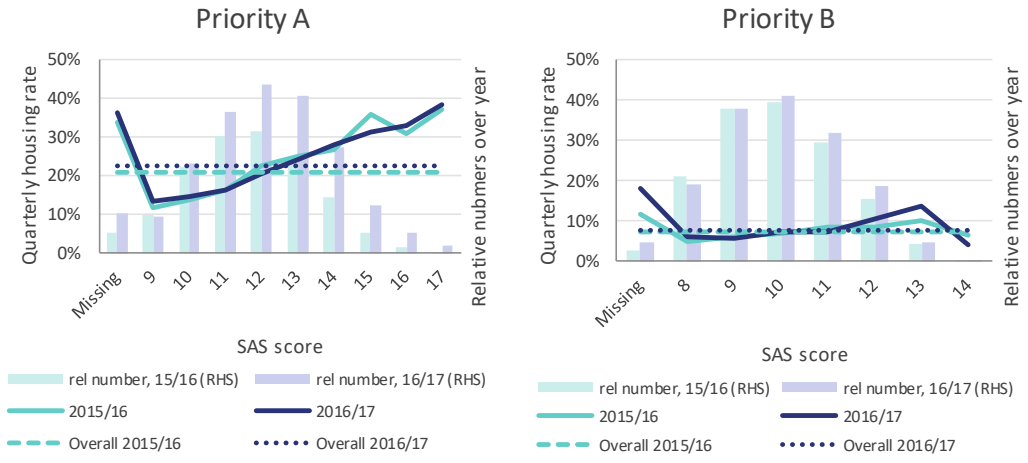
Figure 4.11 shows the quarterly transition rates for entry from the register into housing, split by priority:

» The entry rate into public housing is ultimately driven both by demand (the size of the register) and supply (rate of new public houses becoming available). While the number of new register applications has increased 40%, entry rates into public housing for both priority A and priority B

applications have so far remained similar to rates observed in 2016. This is partly supported by better use of the existing public housing stock with a decrease in the number of unoccupied properties over the year. Every quarter, about 22% of priority A applications and 8% of priority B applications are placed.

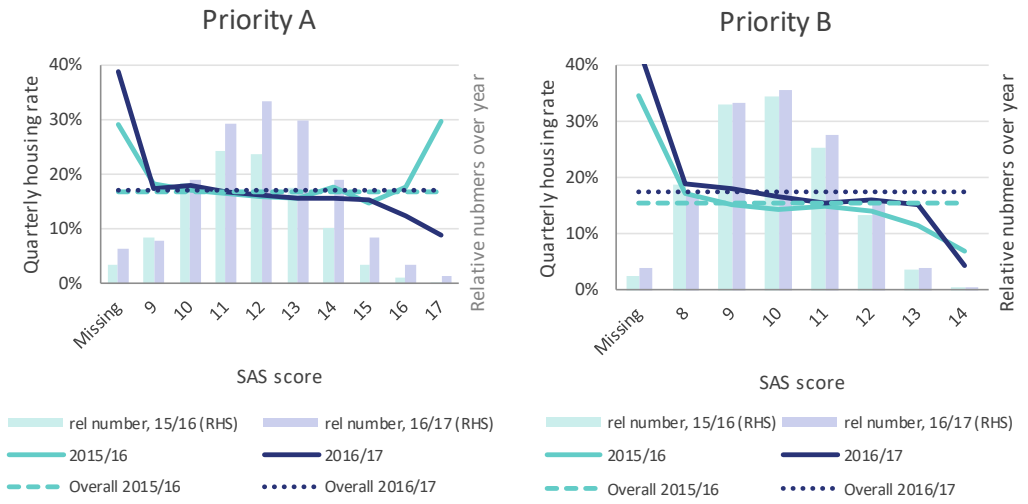
» Entry rates are strongly correlated with SAS score, consistent with policy intentions. For priority A applications, 14% of applications with a SAS score of 9 are placed every quarter compared to 39% of those with a SAS score of 17.

Figure 4.11 Entry rates to public housing from the register for Priority A applications (left panel) and Priority B applications (right panel)



In general, exits from the register (but not into a public house) are affected by demand – a longer wait increases the chance of such an exit. It is also driven by substitution effects – the availability of alternative pathways to public housing. For example, changes to the availability of transitional housing assistance may affect register dynamics. These exit rates are shown in Figure 4.12. Exit rates are similar for priority A applications but have increased for priority B applications from 15% to 18% per quarter.

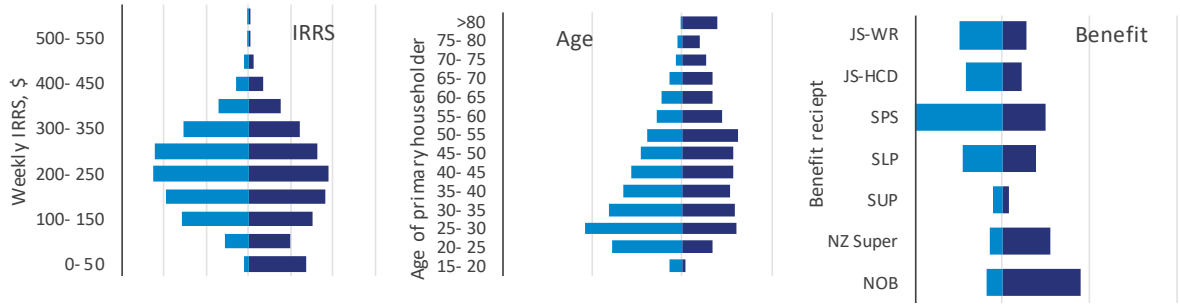
Figure 4.12 Exit rates from the register but not into public housing from the register for Priority A applications (left panel) and Priority B applications (right panel)



Comparing housing placements and housing exits

It is interesting to compare the characteristics of those entering public housing from the register with those who are leaving. This is shown in the figure below.

Figure 4.13 Entries and exits, by weekly IRRS band, age of primary householder and benefit receipt



We see that:

- The weekly IRRS is significantly higher ($30 per week on average) for those entering, and a much larger portion of those exiting have a very low or zero IRRS. This is consistent with policy objectives for better targeting households with highest current need of housing support, and transitioning tenants to the private market where appropriate.
- The primary tenant of an entering household is significantly younger than those exiting, as might be expected. About 70% of entrants are aged under 45, compared to 45% of those exiting.
- Over 85% of primary entrants are receiving a working-age main benefit, with 38% of these receiving SPS. This compares to just 48% of those exiting, with the proportion receiving SPS only 17%. This suggests that financial need is significantly higher for those entering public housing. However, the number of tenants who still require benefit support at the time of housing exit is still material.

4.3.4 Housing supply: recent changes

There are about 880 additional properties which are occupied by public housing tenants compared to a year ago; there were 64,416 occupied properties as at 30 June 2017 compared to 63,532 occupied properties as at 30 June 2016. This increase has been driven by a higher occupancy rate of the existing public housing stock rather than increases in house supply:

- About 740 fewer properties that are owned but unoccupied compared to 30 June 2016.
- There were 140 additional houses introduced over the year (net buys minus sells). This is lower than the expected increase of about 470 properties.

Table 4.1 Reconciliation of occupied properties at 30 June 2017

	Number of places
Occupied properties 30 June 2016 (a)	63,532
Expected increase in house supply, 2016/17	471
Actual increase in house supply (b), 2016/17	140
Net change in unoccupied houses (c)	-744
Occupied properties 30 June 2017 (= a + b - c)	64,416

4.4 Long-term implications of recent performance

In this section we summarise the key projection results and examine the effect of recent experience.

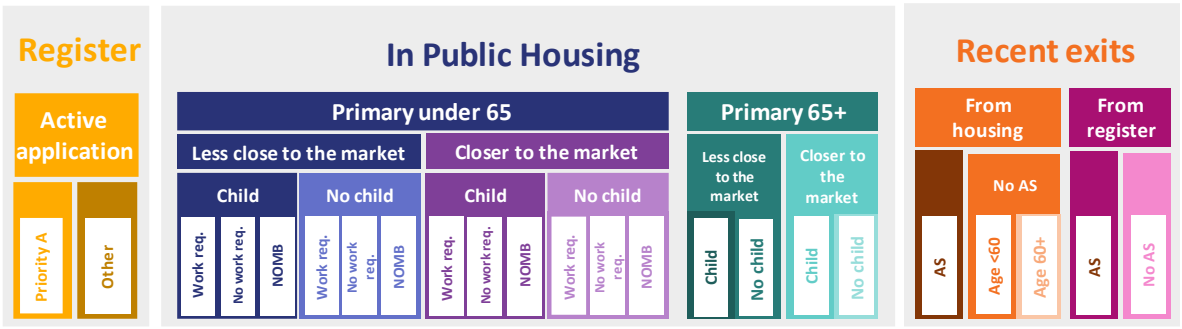
4.4.1 Duration and transitions

Projection population and segments

There were 64,416 households in public housing as at 30 June 2017 and another 6,475 households on the register[26]. Additionally, there are another 28,321 adults who have been in a public housing place or on the register sometime in 2016/17. In all, this gives about 155,774 adults[27] in scope for the current cohort projection. The numbers of households and people are about 5% higher than the previous projection. A large part of this increase is due to a higher rate of register applications over the last year.

We group tenants into segments to better monitor performance and describe trends. There are 23 segments which have been developed together with MSD and these are shown in the figure below.

Figure 4.14 Segmentation of projection population



These segments naturally collapse to form five top tier segments based on a household's current public housing status. Those on the register are split according to the assessed priority of their application. Other segment splits are based on age, IRRS level, welfare benefit receipt and whether there are children in the household.

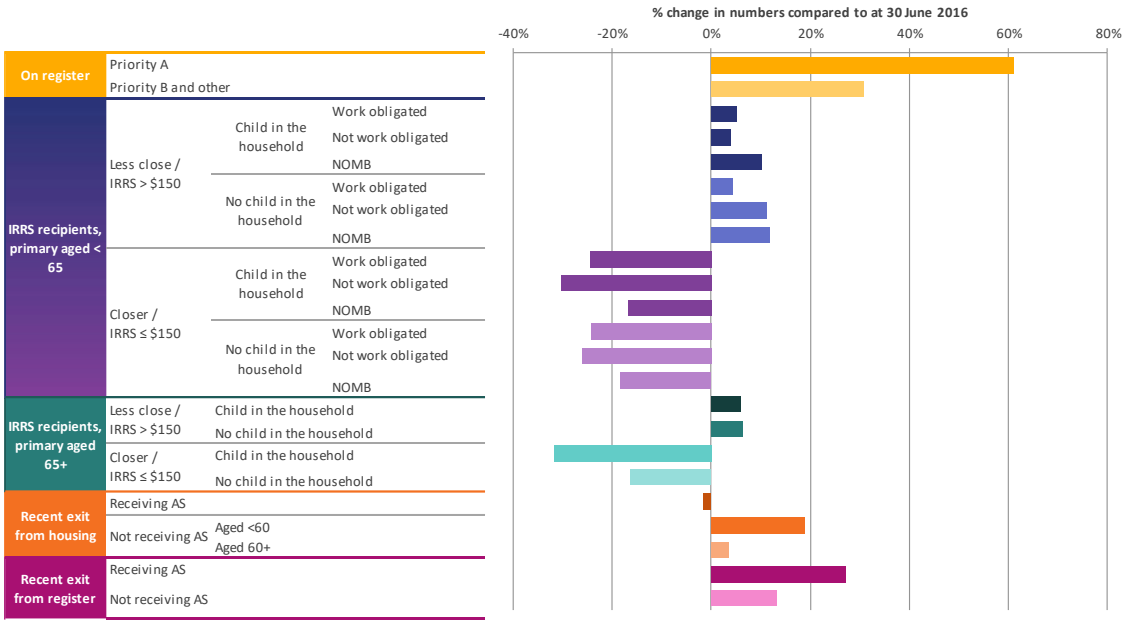
We use 'closer to the (private rental) market' to describe clients with an IRRS level ≤ $150 per week. Conversely, we describe those with an IRRS level above this level as 'further from the (private rental) market'. A client may be in receipt of a main benefit with work requirements (namely Jobseeker Work-ready, Emergency Benefit and Sole Parent Support with youngest child at least 3 years old), in receipt of a main benefit without work requirements (any other main benefit such as Supported Living Payment), or not on a main benefit (NOMB). Recent exit segments are split on whether people receive Accommodation Supplement (AS).

[26] These numbers differ from official MSD register statistics due to differences in how client status is determined for the purpose of our modelling. We include those who have accepted an offer but are not yet in housing, as well as priority C and D applicants. Please see Section 8.3.6 for further detail.
[27] We generally include signatory youth (aged 16 or 17) as 'adults' in our commentary.

There have been significant changes to the number of households (individuals) within each segment over the year to June 2017. Figure 4.15 shows the changes in numbers at 30 June 2017 compared to 30 June 2016. Of note:

- The number of households on the register, particularly priority A applications, has increased significantly. Overall the size of the register has increased by about 50%[28].
- While the number of households in a public house has remained relatively stable, the number of households has increased in each of the further from the market housing segments. In contrast the number of households has decreased in each of the closer to the market housing segments; the number of households in a public house who are closer to the market has reduced by 20%. This is consistent with public housing places being allocated to households with higher current need of housing support as well as increasing market rents.
- The number of individuals in the recent exit segments have mostly increased. However, less recent exits from public housing are receiving Accommodation Supplement support.

Figure 4.15 Change in numbers by segment compared to at 30 June 2016. Register and housing segments show in change in number of households, recent exit segments show change in number of individuals.



Lifetime housing support estimates

New Zealand households who were close to the public housing system in the year to 30 June 2017 are expected to spend 13.4 years in a public house in the future on average. This corresponds to average future housing support payments of about $205,000 per household, and total future lifetime housing payments of $18.4 billion including related expenses. The bulk of these payments are future IRRS payments ($16.0 billion). Average lifetime payments are higher for households who are currently in public housing as they have higher future durations in public housing than other segments. Households who are currently in public housing are expected to spend another 16.3 years in public housing

[28] We have changed the definition of active register application slightly in 2017, so the change in numbers on the register is not like for like. On a consistent basis the register size has grown by 39% over the year (from 4,667 to 6,475). The change in definition related to the treatment of applications closed (often temporarily) in the month of June.

compared to 10.5 years for those on the register and 2.2 years for those who exited a public house in the last year. Table 4.2 compares the results to the previous projection.

Note that durations for those on the register are shorter than those in housing for two reasons. First, a portion of applicants will exit the register without being housed, reducing the average. Second, exit rates from public housing are higher in the early years of a tenancy as well as for younger clients (which register applicants often are).

Table 4.2 Future lifetime housing support by segment for those close to the public housing system in 2016/17, plus a comparison to the previous projection results. [29]

Segment				2017 Projection			2016 Projection			% Change		
				# Households [Individuals]	# future years in public housing	Average HH future payments ($k)	# Households [Individuals]	# future years in public housing	Average HH future payments ($k)	# Households [Individuals]	# future years in public housing	Average HH future payments ($k)
On register	Priority A			4,520	11.6	162	2,808	10.7	164	+61%	+8%	-1%
	Priority B and other			1,955	7.8	126	1,494	7.1	128	+31%	+11%	-1%
	Sub-total			6,475	10.5	151	4,302	9.4	152	+51%	+11%	-0%
IRRS recipients, primary aged < 65	Less close / IRRS > $150	Child in the household	Work obligated	9,028	20.0	309	8,575	19.9	334	+5%	+0%	-8%
			Not work obligated	8,733	20.2	327	8,405	20.4	362	+4%	-1%	-10%
			NOMB	8,345	19.9	329	7,577	19.5	356	+10%	+2%	-8%
		No child in the household	Work obligated	1,833	16.8	241	1,757	16.6	253	+4%	+1%	-5%
			Not work obligated	10,725	17.2	250	9,647	17.9	276	+11%	-4%	-9%
			NOMB	3,698	16.8	264	3,309	16.6	272	+12%	+2%	-3%
	Closer / IRRS ≤ $150	Child in the household	Work obligated	1,020	14.6	145	1,351	14.6	154	-25%	-0%	-6%
			Not work obligated	856	15.1	152	1,227	15.5	171	-30%	-3%	-11%
			NOMB	2,695	15.2	173	3,239	15.0	205	-17%	+1%	-16%
		No child in the household	Work obligated	316	12.9	114	417	12.7	116	-24%	+2%	-2%
			Not work obligated	1,730	13.9	107	2,336	14.8	119	-26%	-6%	-10%
			NOMB	1,810	12.4	120	2,216	12.4	134	-18%	+0%	-10%
	Sub-total			50,789	18.1	269	50,056	18.0	286	+1%	+1%	-6%
IRRS recipients, primary aged 65+	Less close / IRRS > $150	Child in the household		1,484	11.6	244	1,402	10.4	252	+6%	+12%	-3%
		No child in the household		9,704	9.8	151	9,119	9.4	147	+6%	+4%	+2%
	Closer / IRRS ≤ $150	Child in the household		150	9.5	112	220	9.3	136	-32%	+3%	-18%
		No child in the household		2,289	8.3	62	2,735	8.3	60	-16%	+1%	+2%
	Sub-total			13,627	9.7	146	13,476	9.3	141	+1%	+5%	+4%
Recent exit from housing	Receiving AS			[3,089]	6.6	99^	[3,140]	6.9	104^	-2%	-3%	-5%
	Not receiving AS	Aged <60		[17,000]	1.6	20^	[14,308]	2.8	36^	+19%	-43%	-45%
		Aged 60+		[1,373]	0.2	6^	[1,325]	0.4	10^	+4%	-44%	-35%
	Sub-total			[21,462]	2.2	30	[18,773]	3.3	46	+14%	-33%	-33%
Recent exit from register	Receiving AS			[3,953]	5.5	93^	[3,110]	5.5	98^	+27%	-0%	-6%
	Not receiving AS			[2,906]	2.8	38^	[2,566]	2.9	40^	+13%	-1%	-5%
	Sub-total			[6,859]	4.4	69	[5,676]	4.3	72	+21%	+1%	-3%
Total				**70,891**	**13.4**	**205**	**67,834**	**13.8**	**224**	**+5%**	**-2%**	**-8%**

Regarding the number of future years in public housing we observe:

» Average duration for tenants in public housing varies significantly by segment. For the highest segments – those primary tenants under age 65 who have children and an IRRS of more than $150 per week – it is about 20 years. For the lowest segments – primary tenants over 65 with no child and IRRS of less than $150 per week – it is less than half that, about 8 years.

» Average durations are substantially longer for those who are further from the market (IRRS of more than $150 per week). We project an average of 19 years in public housing for these tenants,

[29] We have changed the definition of active register application slightly in 2017, so the 51% increase in numbers on the register is not like for like. On a consistent basis the register size has grown by 39% over the year (from 4,667 to 6,475). The change in definition related to the treatment of applications closed (often temporarily) in the month of June.

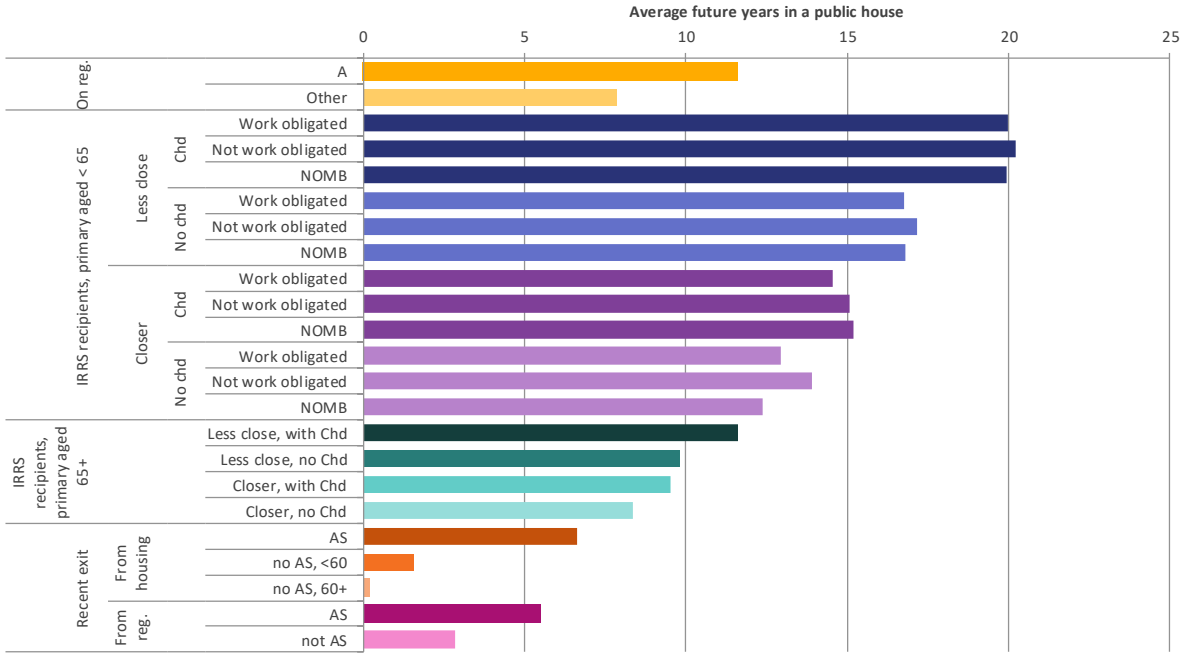
compared to 14 for those who are closer to the market; IRRS level is a good indicator of financial barriers to the private housing market.

- Those households with primary tenant aged under 65 are expected to be in public housing for an extra 8 years compared to those over 65. The difference is almost wholly due to age effects (such as mortality). A much shorter future duration in public housing means that while almost 20% of primary tenants are above 65, the segment only accounts for about 10% of total future lifetime housing payments.
- Those households that exit from the register without being placed into a public house are expected to be in public housing for 4.4 years in the future compared to 2.2 years for those that exit from a public house. This is because those that exit the register without being placed are much more likely to re-engage with the public housing system.
- Compared to the previous projection, the average future duration in public housing for households on the register has increased from 9.4 years to 10.5 years. However, this change is driven by an improvement to the projection methodology (see Section 8.4.2) rather than any change in observed experience.
- While the average future duration in public housing for households in a public house remains similar to the previous projection, average future duration where the primary tenant is an income support recipient without work obligations has decreased by roughly half a year. This is consistent with the action of tenancy reviews, where exits are more likely for those non-beneficiaries with higher incomes.
- There has been a material decrease in the average future duration in public housing for households who recently exited a public house, falling from 3.3 years to 2.2. This change is largely due to compositional differences between the two projections rather than any change in assumptions for the level of re-engagement with the public housing system.

Regarding future lifetime housing payments we observe that:

- The overall total of $18.4 billion is 2% lower than last year. A $1.1 billion decrease due to higher discount rates has been offset by a $0.8 billion increase in total payments due to significantly more clients engaging with the public housing system than expected. We go into more detail on drivers for the change in the next subsection.
- The contribution of future IRRS payments towards total future housing support payments varies by segment. For households in a public house, future IRRS payments accounts for 93% of total future support payments. This is compared to about 60% for households who have recently exited the system. Future accommodation supplement payments form a higher proportion of future support payments for recent exits.
- Our estimate of future housing payments for those on the register excludes notional unmet need for these people; the cost if they were placed in a house today. This amount would add an additional 23% to future payments, as discussed in Section 4.4.2.

Figure 4.16 Average futures years in public housing by segment



Drivers of change in future lifetime housing payments

There are many factors built into the projection model that affect lifetime housing payment estimates from year to year. Figure 4.17 shows the total lifetime housing payments estimate (but excluding related expenses) has decreased from $18.1b to $17.8b since last year. The main components of this decrease – described in more detail in Table 4.3 – were:

- Real interest rates have increased resulting to larger discounting reducing future payments by $1.1b.
- An increase of $0.3b due to higher market rental growth which means higher forecast IRRS payment levels given all else equal.
- The number of additional clients joining the public housing system was significantly higher than forecast increasing future lifetime payments by $0.8b. This included significantly more register applications but also direct entries into an existing household which isn't currently allowed for by our projection model.

We note that an overall increase in both IRRS payments and lifetime payments should not necessarily be interpreted as a decline in performance. This is because:

- More exits amongst tenants paying market rent and more entries amongst low-income households would increase IRRS but be consistent with policy intent. In the 2016 projection 22% of public housing households were 'close' to the market (IRRS less than $150 p/w), compared to 17% this year.
- IRRS levels are heavily influenced by changes to market rents, which are beyond management control.
- Increased demand through additional register applications are largely beyond management control.

Throughput is a measure that looks at how quickly cohorts are moving through the housing system. It looks at the cohort who were in the projection as at 30 June 2016, and compares what we predicted their lifetime payments to be at 30 June 2017, to what we now estimate their lifetime payments to be at the current projection. Throughput is most directly related to MSD management control. A decrease potentially reflects a good outcome if the shorter durations relates to appropriate exits to the private

housing market. The throughput result has increased slightly over 2016/17; total future lifetime payments have risen by $0.12b. The relative size of the throughput result differs by segment.

Figure 4.17 Change in total lifetime housing payments over 2016/17

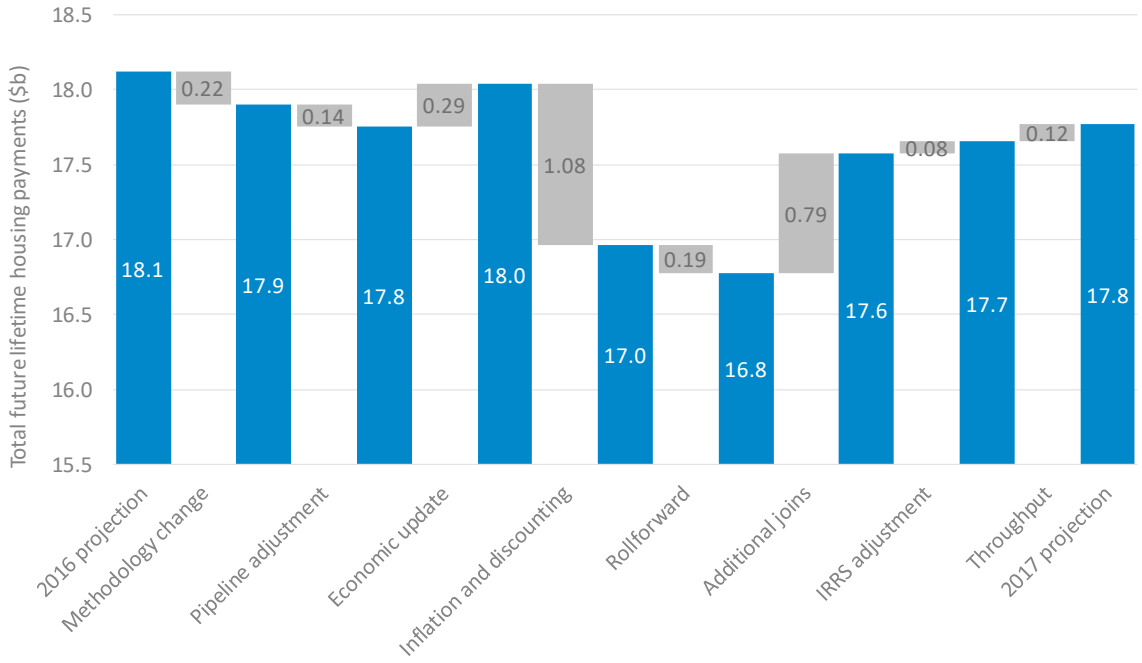


Table 4.3 Description of components driving change in total future lifetime housing payments over 2016/17

Driver	Commentary
Methodology changes **-$0.22b**	The projection model has changed this year to better simulate the allocation of available public houses and allow for teenagers currently in a public house to age into the projection. The modelled interactions with the benefit system have also been refined. The overall result of these methodology changes is a reduction in lifetime payments of $0.22b. The impact of the change is isolated from the other change elements and described further in Section 8.4.2.
Pipeline adjustment **-$0.14b**	Significantly fewer new houses added to the overall supply has decreased lifetime payments by $0.14b. The size of the housing stock was expected to increase by 471 houses over the year, but the actual increase was 140.
Economic update **+$0.29b**	An increase of $0.3b due to higher market rental growth than assumed which means higher expected IRRS payment levels given all else equal. National rents increased by 4.8% over 2016/17 compared to 2.2% assumed. Higher market rental growth is partly offset by higher average weekly earnings growth.
CPI inflation and discount rates **-$1.08b**	Higher discount rates (based on New Zealand government bond yields) mean that less money can be set aside today for a cash flow occurring in the future. Real discount rates are on average 0.5% higher between 2020 and 2045 compared to the previous projection. This increase has decreased lifetime future payments by $1.1b.
Rollforward to 2017 **-$0.19b**	We forecast a $0.19 reduction in total future payments on moving from 2016 to 2017 results. This is partly driven by the anticipated exits of non-primary tenants. Note that our current projection model does not allow for the direct entry of tenants into existing households. This means that the rollforward results should be considered with the additional joins component.
Additional joins **+$0.79b**	The number of additional clients joining the public housing system was significantly higher than forecast increasing future lifetime payments by $0.8b. This included significantly more register applications with the number of register entries being 63% higher than expected over the year. In addition, there were about 7,500 direct entries into an existing household which isn't currently allowed for by our projection model.
IRRS adjustment **+$0.08b**	The market rent of public housing increased at a rate above the private rental market over the year resulting to a further increase of $0.08b. Given rental growth in the private market over the year we expected market rents of the public housing stock to increase by 1.3% on average but they actually increased by 4.4%.
Throughput result **+$0.12b**	This is an assessment of the change in lifetime payments (relative to forecast change) for individuals and households included in the previous projection cohort. The throughput result has increased total future lifetime payments by $0.12b. This is driven by a $0.16b increase due to recent exits re-engaging with the public housing system at a higher rate than anticipated. This is likely due assumption setting being based on a longer-term view of historical experience rather than actual experience over the year deviating from recent history. The increase is partly offset by small relative reductions in the other segments totalling $0.04b.

Throughput over 2016/17

The throughput result shows a $117m increase over the year. This can be broken down to a household or individual level and allows us to see how throughput has varied by segment (as at 30 June 2016). This is shown in Figure 4.18 and Figure 4.19.

Figure 4.18 Breakdown of change due to experience by June 2016 segment

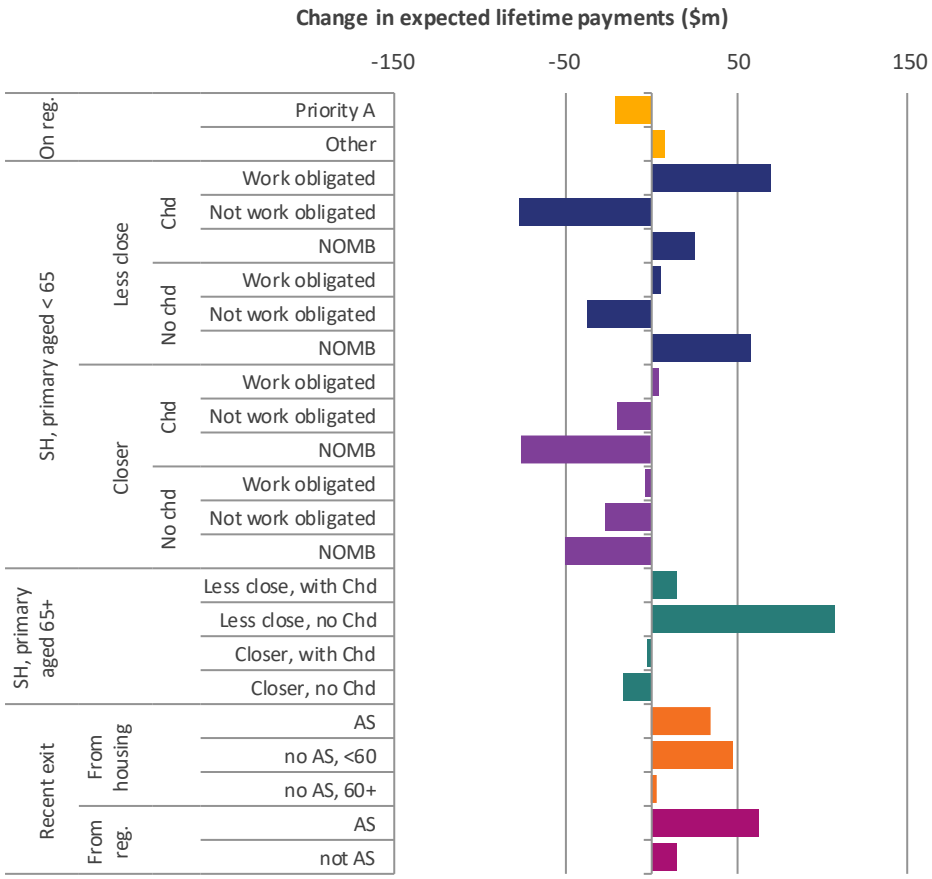
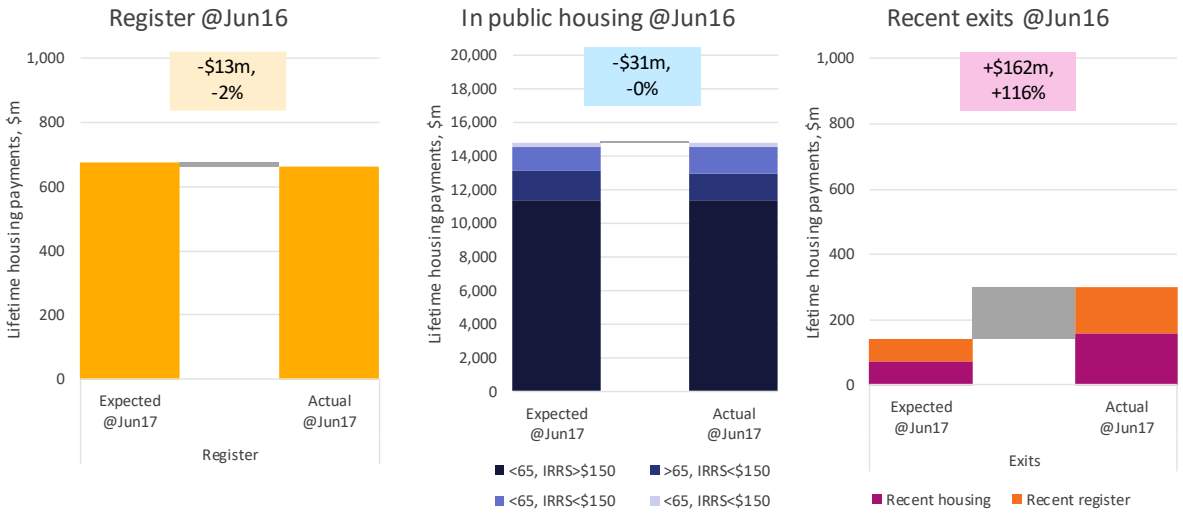


Figure 4.19 Throughput during 2016/17



The throughput result is primarily driven by the updated average lifetime payments for those who were recent exits at the previous projection being much higher than expected. More clients have re-engaged with the public housing system over the last year than assumed leading to a $0.16b revision in total future lifetime payments for these clients. We now expect clients who were receiving AS after exit to spend an additional 4.5 years in a public house compared to previous estimates. We note that similar results existed at the previous projection which suggests that our model assumptions haven't fully allowed for recent historical experience. A longer-term view has been taken for assumption setting due to data quality concerns. We don't recommend using this result as a performance indicator at this point in time.

In contrast, the throughput for those in a public house at the previous projection has been relatively stable, being a decrease of $31m. The stability at the aggregate level masks a $174m reduction for households who are closer to the market, or 10%. This reduction has been offset by an increase for those who are further from the market. This is consistent with those with lower needs now moving through the public housing system faster.

The throughput for those who were on the register at the previous projection is a slight decrease of $13m or 2%. With the higher number of register applications, we have assumed a lower proportion of those on the register will be placed into a public house, lowering future duration estimates slightly.

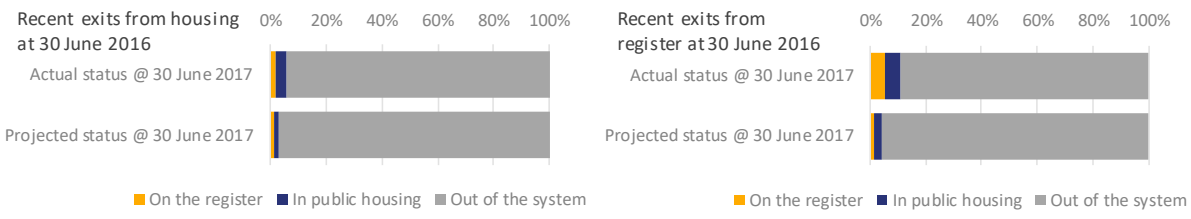
Re-engagement of recent exits

There was a much higher level of return to the public housing system than predicted. Data quality concerns means that we have taken a longer-term view when setting assumptions for the rate of re-engagement with the system. Current assumptions still do not fully allow for the high rates of re-engagement observed in the most recent two years but we are monitoring this result closely.

The figure below shows the public housing status for those who were recent exits at June 2016 compared to what was projected. The number of people returning to the register or public housing is roughly double what was expected:

- For those who exited a public house, 6% re-engaged with the public housing system compared to 3% expected.
- For those who exited the register, 11% re-engaged with the public housing system compared to 4% expected.

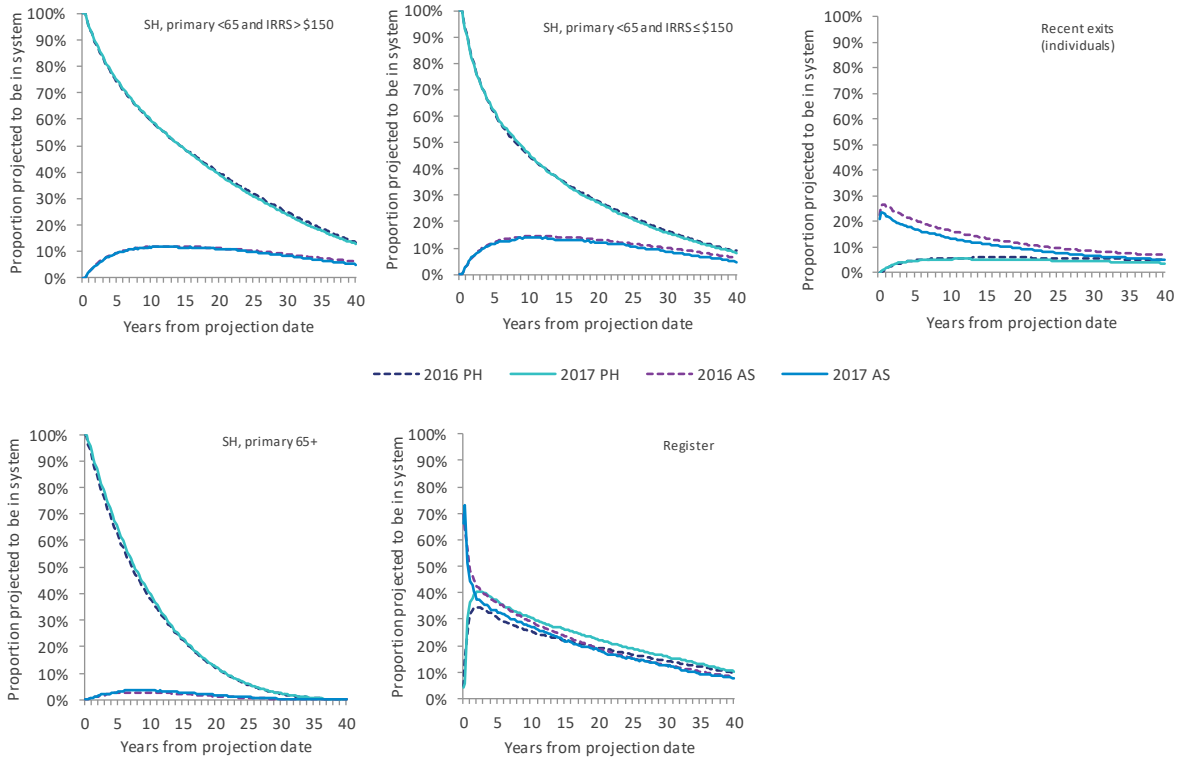
Figure 4.20 Recent exits at June 2016 by public housing status at June 2017



Projected pathways

The pathway plots below show the average housing projection pathway for top-level segments and compare this to at the previous projection.

Figure 4.21 Lifetime pathway plots for various housing segments compared to the previous projection; first 40 years

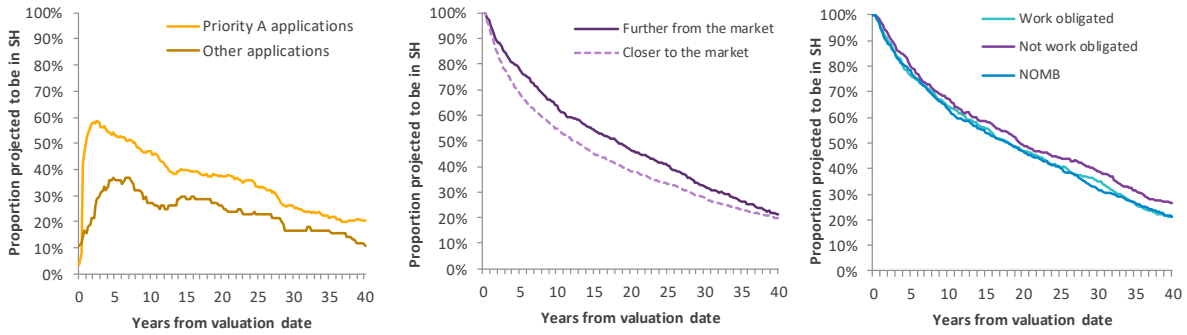


We observe:

- Pathways are virtually unchanged for households with a working-age primary tenant.
- Households where the primary is aged 65 and over are projected to spend slightly more time in public housing, mainly due to their higher average IRRS level.
- Households on the register are now projected to move into a public house faster with a corresponding reduction of time with accommodation supplement support. This is due to a refinement of the projection method rather than a change in underlying experience. The projection method refinement is described in Section 8.4.2.
- Recent exits are now projected to spend less time on accommodation supplement benefits. The assumed proportion of clients who receive accommodation supplement benefits upon exit proved to be too high and the assumption has been revised downwards at the current projection.

It is interesting to explore differences in pathways across (lower-level) segments. However, this is complicated by distributional effects. For example, if a higher proportion of clients live in Auckland within a given segment then that segment will show slower public housing exit rates, all else being equal. We have attempted to partially control for this in the figure below which shows the lifetime projections for those currently in Auckland with a primary householder aged 35-40 inclusive.

Figure 4.22 Pathways by segment at June 2017 for Auckland households with a primary aged 35-40 and on the register (left panel), in public housing with a child and NOMB (middle panel), and in public housing with a child (right panel).



While some distributional effects will still be present we can see:

- In the left panel, Priority A applications enter housing at a much faster rate than other applications; this reflects the effectiveness of the prioritisation process and is in line with policy intentions.
- In the middle panel, those closer to the (private rental) market are less likely to be in public housing.
- In the right panel, those on a main benefit but without work obligations show the slowest exits. These clients typically have long-term health conditions and disabilities, so a lower ability to transition to the private housing market is intuitive. Those not on main benefits exit faster; their IRRS is generally lower.

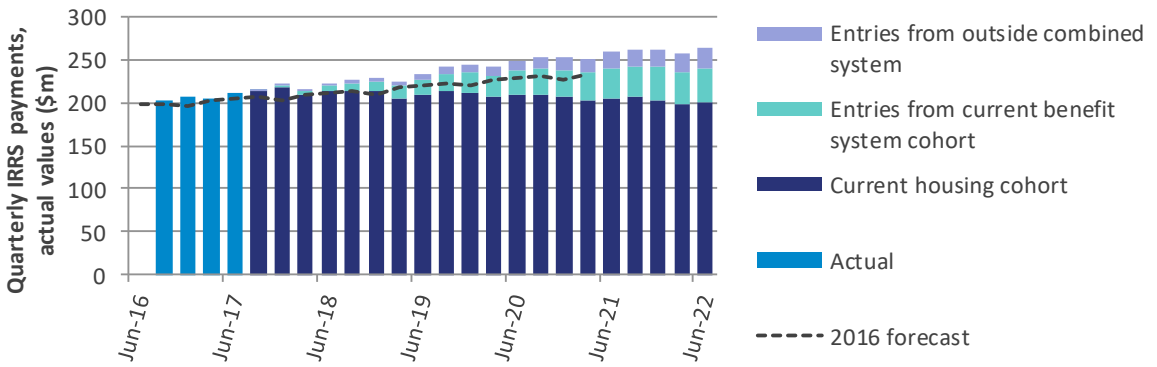
Future cohorts and projected IRRS

The total future IRRS payments of the public housing system are fairly easy to forecast – assuming a near full housing portfolio (which our forecast does), total payments is given by the average IRRS level (inflated for rent increases) multiplied by the number of houses in this housing portfolio. Total IRRS payments are made to a combination of households (and individuals) who:

- Are in the current housing cohort
- Are not in the current housing cohort, but are in the current benefit system cohort
- Have not interacted with the housing or benefit systems in 2016/17.

IRRS payments for the next five years are shown in Figure 4.23 as attributed to these three groups.

Figure 4.23 Forecast total IRRS payments



Total IRRS is forecast to grow at 4.6% p.a. in absolute terms for the next five years – quarterly IRRS is forecast to grow from $211m to $264m over this period. Payments to adults currently in public housing places are projected to decrease slowly; exit rates from public housing are projected to slow as rental growth is assumed to be stronger than income growth of those in need. Payments to current tenants are about three-fifths of the total over the next twenty-five years. Another one fifth of payments will be to

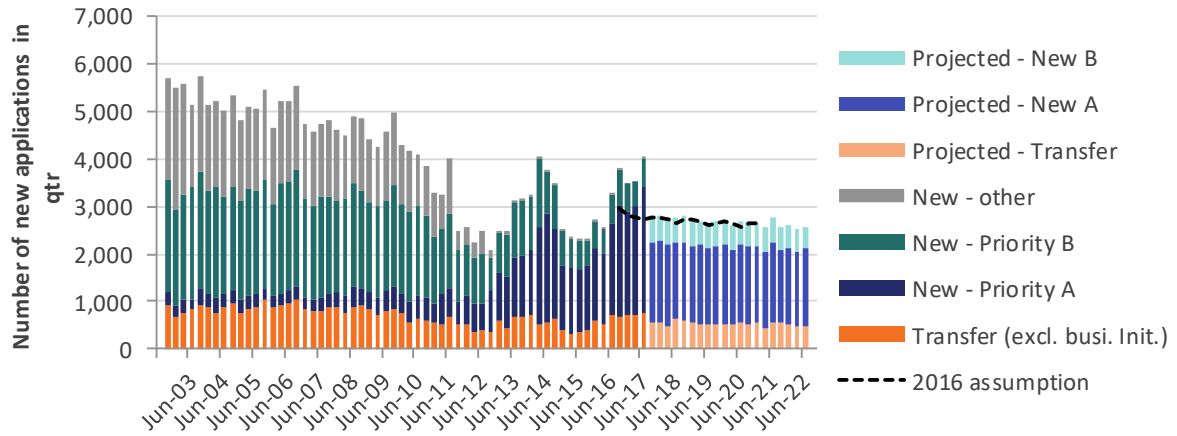
people in the benefit system cohort (current and recent beneficiaries entering public housing places), and the remaining fifth of payments will be to applicants from outside these groups.

4.4.2 Housing demand: Applicants on the register

Projected number of register applications

Figure 4.24 shows our projection of quarterly register applications. Our current assumptions for future application numbers are comparable to the previous projection (about 2% higher). While the number of register applications in the last year have been significantly higher than this, historically application numbers have been highly volatile, so it is unclear whether this level is temporary or permanent. Our current assumptions are higher than the numbers observed in the year to 2016. Note that the projected decreasing trend reflects assumed improvements in the unemployment rate.

Figure 4.24 Projected number of register applications



Notional lifetime housing payments

An important part of understanding the effectiveness of the public housing system is the amount of unmet need. The objective is to manage the housing register to ensure that housing places are available to households who need them most, but also that enough services are available – where appropriate – to resolve any underlying issues driving housing need.

There are many ways to understand unmet need. A complete view of unmet need is not possible since we can only measure the need MSD is aware of. Some unmet need is thus 'unknown.' One financial metric that attempts to estimate the known unmet need is notional lifetime housing payments. It represents the hypothetical lifetime housing payments if current (known) needs were met. We can estimate notional lifetime housing payments for four subgroups listed below.

- **Housing Register applications:** The total lifetime payments if those on the register were placed in a public housing place today.
- **Transfer Register applications:** If people are applying for a larger public housing place or are applying for a public housing place in a more expensive area, this may indicate an unmet need amongst existing tenants. There are also notional savings associated with tenants applying for cheaper or smaller housing.
- **Overcrowded public housing places:** Some tenancies are overcrowded, even in the absence of a transfer application. There are additional notional long-term payments associated with addressing this unmet need.

» **Underused public housing places:** Some public housing places are underused. There is a notional saving associated with moving such a household to a smaller but right-sized public housing place.

Notional metrics are hypothetical, and aim to address counter-intuitive dynamics from lifetime payment estimates (for example, housing payments could in theory be reduced by unnecessarily keeping people on the register for longer periods when there are empty houses). Additional notional 'payments' associated with overcrowding can be understood as the extra payments that would be paid if these households were allocated places that suit their requirements. Notional 'savings' associated with underuse can be understood as the opportunity cost of inefficiencies currently within the system. That is, they are the potential financial savings that would arise if households were not allocated to places that exceed their requirements. This matters, because more dynamic management of the portfolio over the long-term would enable these savings to be invested elsewhere in the housing portfolio.

The difference between the main total lifetime housing payments and total notional payments for each of the four subgroups is shown in the table below. A comparison to the previous projection is also given.

Table 4.4 Main and Notional lifetime housing payments for current clients compared to previous, excludes expenses

	2017 Projection				2016 Projection			
	Main ($b)	Additional notional ($b)	Total ($b)	% additional	Main ($b)	Additional notional ($b)	Total ($b)	% additional
Register	0.95	0.29	1.24	23%	0.63	0.24	0.87	27%
Transfer	0.49	0.05	0.54	8%	0.31	0.01	0.32	3%
Over-crowding	2.26	0.54	2.80	19%	2.81	0.64	3.45	19%
Underuse	5.42	-1.72	3.70	-46%	5.26	-1.56	3.70	-42%
Well matched	8.65	0.00	8.65	0%	9.11	0.00	9.11	0%
Total	**17.77**	**-0.84**	**16.93**	**-5%**	**18.12**	**-0.68**	**17.45**	**-4%**

The notional future lifetime payments of those on the register at 30 June 2017 total $1.24b compared to the main estimate of $0.95b. This means that there exists $289m of known unmet housing need. It represents the additional payments that would be made in the hypothetical scenario where all applications on the register are placed into a public house of their needs today. Alternatively, those on the register are estimated to spend an additional four years in a public house if there are no operational or supply constraints. This is offset by two and a half years less with accommodation supplement payments due to faster placements.

For the register, we can see known unmet need is $0.05 billion higher than the estimate in our previous report. However, this is actually $0.11 billion higher after allowing for methodology changes (see Section 8.4.2); the latter figure is more relevant. This result is entirely due to the larger register size, and would have been larger still were it not for the effective increase in housing supply over the year (via fewer unoccupied houses).

The results for the other groups are also interesting:

» The additional notional lifetime payments attributable to the transfer register is small; the households with a notional saving partly offset those with an increase.

» The notional saving associated with underuse of the public housing portfolio is very large; over six times the additional notional lifetime payments of the register. This reflects a large number of small households in 2- or 3-bedroom public housing places.

When combining all categories there is a notional saving of $0.8b. This suggests that there are material financial savings available if underuse can be eliminated or at least reduced. The financial savings from transitioning tenants out of properties that are too large for their needs more than offsets the additional payments required to meet unmet needs of the register and the higher IRRS required larger properties

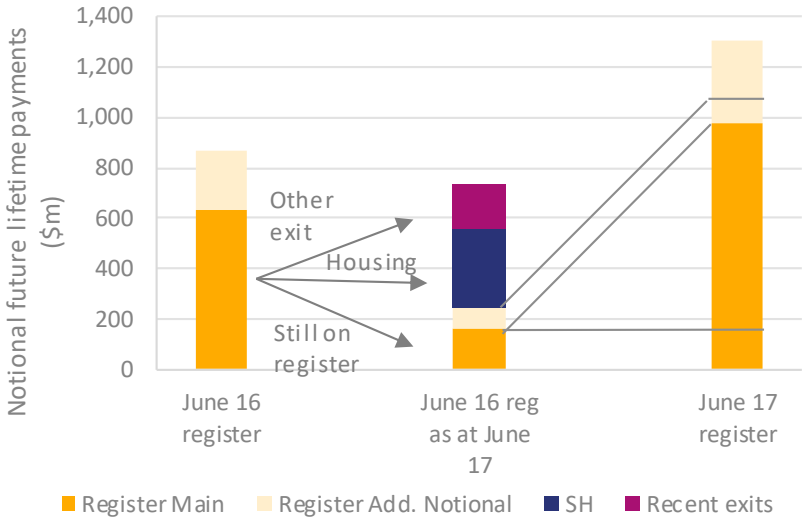
for tenants currently in overcrowded homes. However, these financial savings need to be considered along with any potential social costs associated with moving homes.

Evolution of the register

Figure 4.25 shows the evolution of the notional future lifetime payments for those applicants on the register at 30 June 2016. At June 2016, total lifetime payments for those on the register was $868m. This was made up of $633m related to the expected payment of IRRS and AS over their lifetimes and another $235m of notional lifetime payments –the hypothetical additional payments that would be made if places were available at the date of the projection.

The second column in the left panel of Figure 4.25 shows that during 2016/17, most of those people on the register have their notional lifetime payments 'crystallised' – either by exit from the register (the purple bar) or by placement into housing (the dark blue bar). At 30 June 2017 there remains only a small amount of lifetime payments and notional lifetime payments for those who were on the register at 30 June 2016 ($244m of the $868m). The third column in the left panel of Figure 4.25 shows the lifetime payments for all those on the register as at 30 June 2017, including their notional lifetime payments, is $1.3b – an increase of 50%. Most of this relates to new applicants during the year rather than those remaining on the register over 2016/17.

Figure 4.25 Evolution of the lifetime payment estimate for people on the register over 2016/17



4.4.3 Supply: Public Housing places

Definition of matching

We define the matching rate to be the proportion of households that are appropriately housed, with a mismatch occurring if:

- A usable public housing place is **empty** [30]
- A household is (voluntarily) **on the transfer register**
- A public housing place is **over-crowded** (too few bedrooms)
- A public housing place is **underused** (too many bedrooms).

[30] Often an empty public housing place is 'unavailable' due to repairs, sale/transfer or other event. We exclude these from matching statistics.

Then we can calculate the matching rate:

$$Matching = 1 - \frac{Weighted\ number\ of\ inappropriate\ public\ housing\ places}{Weighted\ number\ of\ public\ housing\ places\ in\ system}$$

There are various ways to define the weights used in the matching rate; we present two here. The 'raw' or unweighted rate gives every house equal weight. The 'dollar-weighted' rate would use dollars to measure the degree of mismatch:

$$Dollar\ weighted\ Matching = 1 - \frac{\begin{array}{c}Market\ rent\ of\ empty\ public\ housing\ places + Market\ rent\ changes \\ to\ fix\ transfers, overcrowding\ and\ underuse\end{array}}{Market\ rent\ of\ all\ properties\ in\ the\ public\ housing\ portfolio}$$

Under the dollar-weighted rate a public housing place where a household needs two additional bedrooms would carry more weight than a household that needs one more, since the dollar cost of resolving this would be greater. Thus, the dollar weighting attempts to measure what percentage of public housing market rent is well allocated.

The number of bedrooms required is only available for register applications on our datasets. For people in public housing we have attempted to calculate this based on MSD's rules[31]:

- A primary householder and their partner are allocated one bedroom.
- Children are allocated bedrooms with maximum occupancy of two per room.
- A child aged under 10 years is able to share a bedroom with another child of either gender, while a child of 10 years and over is able to share a bedroom with another child of the same gender only.

Other adults can be allocated one bedroom under some circumstances, but our data does not allow easy discrimination between those who qualify and those who don't. We have generally allocated other adults a bedroom, unless they are recorded as a boarder. We also don't allow for manual overrides, such as when an extra bedroom is allocated for medical reasons.

We note this approach has significant data-based limitations. We are not able to quantify how much higher or lower the matching rate would be if we better understood household characteristics.

We have also simplified bedroom numbers in the calculation. We have treated 0-bedroom public housing places – i.e. studios – as 1-bedroom public housing places, and we have defined no mismatch if a household needs more than 4 bedrooms but are in a 4-bedroom public housing place; as there are very few public housing places with 5 or more bedrooms.[32]

We define a **near match** as when the number of required and actual bedrooms differs by one or less. For example, a household which requires 3 bedrooms in a 2-bedroom house is a near match. MSD considers a near match as reasonable and would not consider moving such a household for right-sizing reasons. This approach enables applicants to be housed in a requested area faster given the exact number of bedrooms is not always immediately available.

It is important to note that while the results suggest a significant level of underutilisation this is based on the recorded data as disclosed by tenants. It's possible that a number of the "empty" bedrooms are occupied. It is similarly possible that houses that appear well matched based on the data available are actually overcrowded or underused.

[31] These rules are a modification of the approach used in Canada.

[32] Of the register applications who require four or more bedrooms, about 25% require five or more. About 20% of the existing stock with four or more bedrooms actually has at least five; the similarity of these figures suggests the shortage of five-bedroom places is comparable (in a relative sense) to the shortage of four-bedroom places.

Matching results

The left panel of Table 4.5 shows the dollar-weighted matching rate is 84% if we require an exact match, and 95% when considering a near match (± 1 bedroom).

For the near match calculation, the largest contributor to mismatch is housing underuse, with about 3% of total market rent being spent on larger properties that are not strictly required (representing about $0.8m per week). Overcrowding is a much smaller effect; the extra rent required to supply larger houses for those that are overcrowded is less than 0.5% of total rent, or $0.1m per week.

When considering an exact match, the proportion of total market rent spent on underutilised bedrooms increases to about 12% of total market rent. The extra cost of larger houses for overcrowded households on this basis is just 3%.

Table 4.5 Matching rates at 30 June 2017. Left shows dollar weighted rates, the right is unweighted

Dollar-weighted	$m per week	
	Exact match	Match within ± 1 bedroom
Unoccupied houses	0.2	0.2
Transfer	0.1	0.1
Overcrowded	0.6	0.1
Underused	2.9	0.8
Total mismatch	**3.9**	**1.2**
Total weekly rent	24.3	24.3
Matching rate	84%	95%

Unweighted	Number	
	Exact match	Match within ± 1 bedroom
Unoccupied houses	540	540
Transfer	1,924	1,924
Overcrowded	7,189	400
Underused	26,112	4,433
Total mismatch	**35,765**	**7,297**
Total	64,956	64,956
Matching rate	45%	89%

On an unweighted (raw) basis, we observe a near match rate of 89%. Underutilisation again represents the largest contribution. About 7% of public housing places have underuse and 1% have overcrowding. The exact match rate is much lower – 45%; about 45% of households are in a house which differs from their actual needs by just one bedroom. Table 4.6 shows the cross-table of bedroom need versus house size. The largest source of mismatch is households with one more bedroom than actually needed. For example, 55% of households currently in 2-bedroom places only require one bedroom. Housing stock is largely 2- or 3-bedroom places, however over half the current households would be better suited in a 1- or 4-bedroom place.

Table 4.6 Occupied public housing places at June 2017, split by current number of bedrooms and need

Bedrooms current	**Bedrooms needed**				
	1	**2**	**3**	**4+**	**Number**
1	97%	2%	0%	0%	6,236
2	55%	36%	7%	2%	24,483
3	14%	27%	39%	19%	26,158
4+	3%	8%	21%	67%	7,539
Total need	23,500	16,606	13,735	10,575	64,416

Match
Crowding
Underuse

The matching of housing places to demand has deteriorated slightly from 90% in 2016. New households from the register tend to be better matched to places compared to existing households. The reduction in the overall match rate is driven by the deteriorating match rate of existing households. That is, about 200 households who were well matched a year ago are now on the transfer register. In addition, about 1,200 households have had members exit meaning the house is now underutilised.

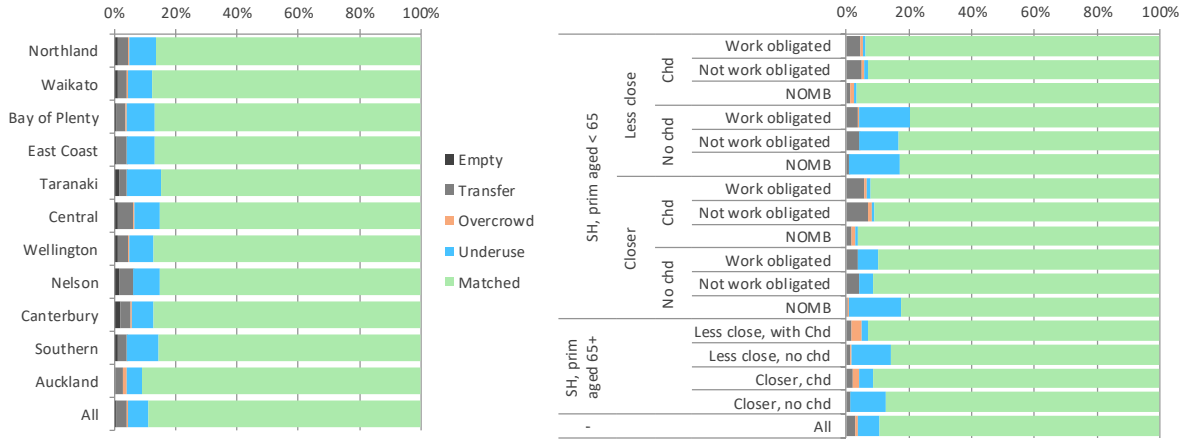
Table 4.7 Matching statistics (+/- 1 bedroom) at 30 June 2016

	June 2016	Net entries	Transitions	June 2017
Matched	89.8%	0.2%	-1.2%	88.8%
Transfer register	1.6%	0.8%	0.5%	3.0%
Overcrowding	0.8%	-0.1%	-0.1%	0.6%
Underuse	6.5%	-0.5%	0.8%	6.8%
Unoccupied houses	1.3%	-0.4%	0.0%	0.8%
Total	100%			100%

Figure 4.26 shows the unweighted near matching rates by region and segment. It can be seen that:

- The match rate varies from 85% to 91% across regions. Auckland has the highest match rate of 91% with only 5% of houses being underused. This is partly because those in need of housing support in the region tend to have larger households, with an average household size of 3.3. In comparison, Taranaki has a match rate of 85% with 11% of houses being underused. The average household size for those in housing in the region is 2.2.
- Households without children have much higher rates of underuse than those with children. About 13% of public houses for households without children are underused compared to 1% for those with children. This difference is partly due to households without children being smaller and hence they are more likely to be placed into a house that is larger than their needs at entry. However, part of the difference is due to the result of children previously in the household moving out reducing the number of bedrooms required over time.
- Overcrowding is most common among households with an older primary householder and at least one child in the household; these households usually have three generations present.

Figure 4.26 Unweighted near matching rates by region (left panel) and segment (right panel)



5 REGIONAL RESULTS

Inside this chapter

5.1 Introduction and highlights

This chapter discusses the main results for each of the key public housing measures at a regional level.

Lifetime housing support

Auckland is significantly overweight in terms of both numbers of households and future housing payments; the Auckland region represents just over a third of the national population, but just under half of public housing places and over three-fifths of total future lifetime housing payments. Higher market rents in Auckland generates more demand for public housing, higher support levels for those in a public house, and longer tenancies.

Projected lifetime housing payments for those in a public house in Canterbury has decreased by 17%, from $235k per household to $196k per household. This is partly due to higher real interest rates (which affects all regions) but also because of market rents in the region falling 2.3% over the year. However, market rents in Canterbury is still the third highest, behind Auckland and Wellington.

Demand and the register

An increased number of new register applications was seen across all regions in 2017. The largest increases were seen in Central, Nelson, Taranaki and Waikato. As a result, these regions had the largest growth in register size. The number of households on the waitlist in these regions have more than doubled except for in Waikato.

The concept of notional total lifetime housing payments is a way of measuring known unmet need of those on the register. It represents the additional cost of the hypothetical scenario where all applications on the register is placed into a public house of their needs today. Known unmet need is highest in Auckland, Bay of Plenty and Wellington in both absolute and relative terms. These regions together account for 83% of the total $289m of known unmet need for those on the register.

Housing supply

Auckland, Canterbury and Waikato were the only regions that saw increases in size of their public housing stock over 2017. Canterbury had the largest increase with 356 additional properties, which means a 6% growth in stock. This is a positive result given the continued increase in register application rates in the region.

The number of unoccupied properties in the Central, Taranaki and Wellington regions has more than halved from a year ago. This suggests better utilisation of existing public housing stock.

5.2 Differences by region

There are regional differences across New Zealand in private rental markets, labour markets, demographics and average Accommodation Supplement levels. These factors lead to large variations in both need of housing support and future lifetime housing support payments.

Figure 5.1 highlights the variation that exists by geographical location by showing some key metrics:

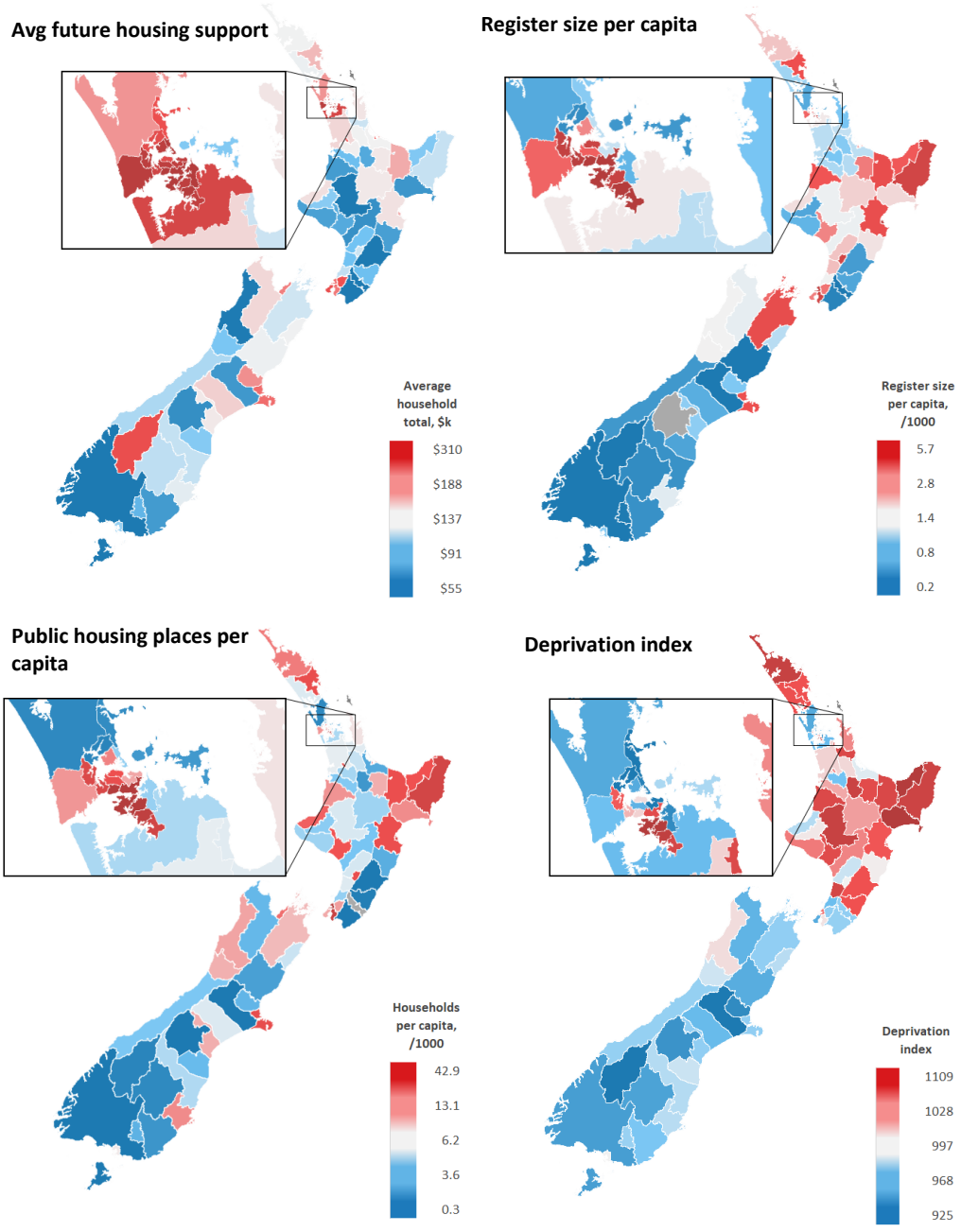
- The projected average future lifetime housing payments for current public housing tenancies
- The size of the Housing register per capita
- The number of public housing tenancies per capita
- The NZDep2013 index of socioeconomic deprivation.

It can be seen that:

- The cost of housing support varies significantly, driven by differences in private rental markets between regions. Households in regions with higher market rents such as Auckland require larger IRRS payments. Furthermore, higher market rents means a larger financial barrier to housing independence so the expected duration of tenancy for these households are longer.
- The size of the register varies from 0.7 applications per 1000 people in Southern to 2.3 applications per 1000 people in the Bay of Plenty.
- The number of public housing tenancies in each region is correlated with the size of the register as expected. However, there still exists significant differences in the number of tenancies per register application. The Bay of Plenty, Central and Nelson regions currently have less than 6 tenancies per register application. In comparison, Wellington has 11.6 tenancies per register application. Note however that placement rates depend on other factors such as the rate of exit from current tenancies as well.
- Differences in the deprivation index by region is broadly consistent with differences in register size and the number of public housing tenancies. This suggests potential correlation between the need for housing support and other factors captured by the index.

The following sections provide further commentary on how the need for housing support and the public housing portfolio varies by region.

Figure 5.1 Differences in some key public housing metrics by region



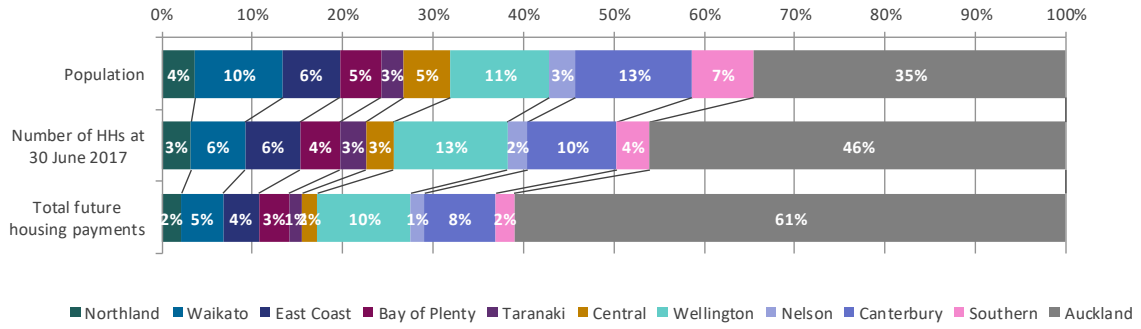
5.3 Lifetime housing support

Figure 5.2 below compares the distribution of general population, public housing population and lifetime future housing support payments. Note that because the number of households in a public house is generally limited by the supply of housing rather than the demand for housing we can't conclude that demand is low for regions where the public housing population is underweight. We discuss demand further by considering register applications in Section 5.4.

Auckland is significantly overweight in terms of both numbers of households and future housing support; the Auckland region represents just over a third of the national population, but just under half of public housing places and over three-fifths of total future lifetime housing support payments. Higher market rents in Auckland generates more demand for public housing, higher support levels for those in a public house, and longer tenancies as households are further from the private market. Those in need of public

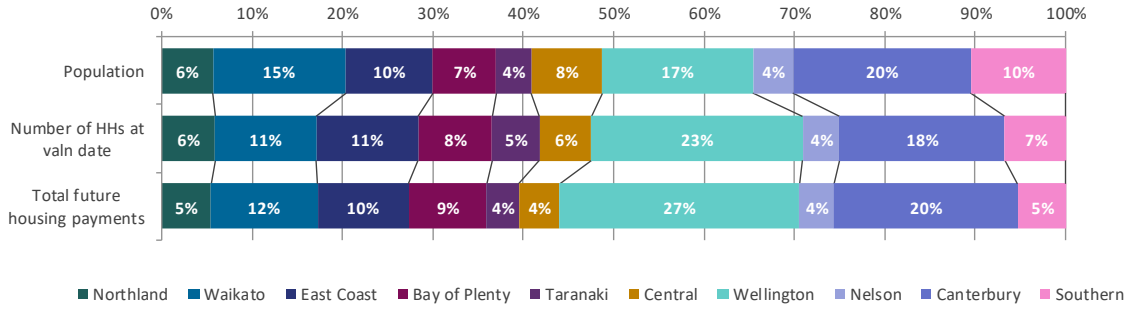
housing support in the region also tend to be in slightly larger households which increases the cost of support.

Figure 5.2 Regional composition of lifetime housing payments – households in public housing only



The Auckland effect is large and squeezes out other regional effects; we show these in Figure 5.3 where the Auckland region has been excluded.

Figure 5.3 Regional composition of lifetime housing payments, excludes Auckland – households in public housing



With Auckland removed, some further interesting regional variations are observable in the figure:

- Wellington and Canterbury have higher future lifetime payments driven by higher rents in these cities. The situation has improved in Canterbury with rents falling 2.3% over the year. However, market rents are still the third highest in the country behind Auckland and Wellington. The amount of support required by households in Canterbury is the second highest after Auckland with IRRS payments contributing to 67% of rent on average.
- Waikato is also overweight in terms of future housing support payments; average IRRS levels in Waikato are fairly close to the (above-average) levels seen in Wellington, despite a cheaper rental market. Compared to Wellington, houses are a little larger in Waikato, on average, and IRR contributions a little lower.
- Southern is underweight in terms of both the number of households and lifetime housing support payments, this reflects a relatively strong labour market and a low cost of private rentals.

Figure 5.4 shows regional differences in future lifetime housing payments per household for those in public housing, including:

- Our 2017 estimate
- Our 2016 estimate
- Our 2016 estimate, but updated for changes to economic assumptions (including higher discount rates).

Most regions saw a decrease in average future lifetime housing support payments after allowing for economic assumption changes. This is driven by higher real interest rates but the amount of reduction

varies by region due to differences in regional market rent and unemployment rate changes over the year. The Bay of Plenty, East Coast and Taranaki regions experienced higher than anticipated growth in market rents and higher unemployment rates which have largely offset the impact of higher interest rates.

Average future lifetime housing payments for those in public housing in 2017 is 2% higher than for those in public housing in 2016 after economic assumption changes. This is driven by the average payments for those in Auckland, East Coast and Central being about 4% higher. Note that this change in average payments is not an appropriate measure of performance because entries and exits over the year means that the payments relate to two underlying cohorts which aren't identical. For example, there will naturally be an increase in average payments if over the year those who are closer to the private rental market are transitioned out of public housing and replaced by those with higher needs. A more accurate measure of performance is throughput which measures how future lifetime housing payments have changed over the year relative to our projections for those who were in public housing a year ago; see Figure 5.5.

Figure 5.4 Future lifetime housing payments for current clients compared to the previous projection – households in public housing only

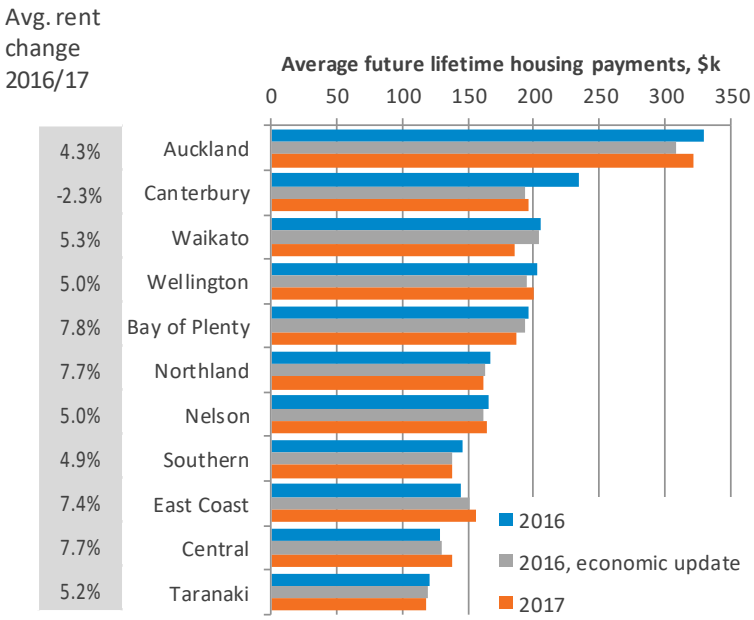
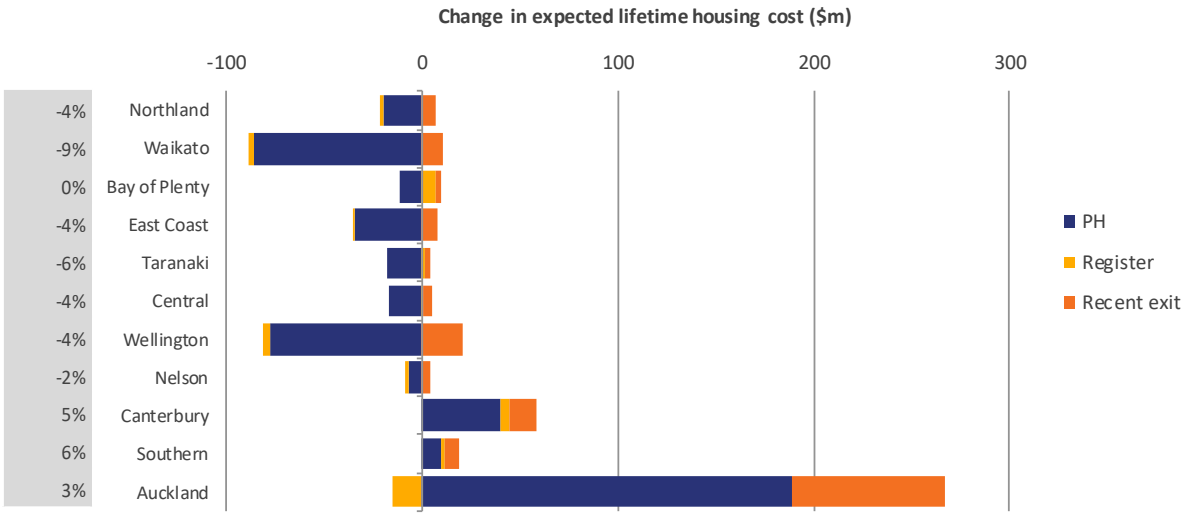


Figure 5.5 splits the $117m throughput increase by region at 30 June 2016. It can be seen that:

- Throughput is consistently positive across all regions for those who were recent exits from the public housing system in 2016. This suggests that re-entry rates into the public housing system was higher than expected in all regions.
- For those in public housing at June 2016 (the blue bars in the figure), a $230m increase for those who were in Auckland and Canterbury offsets a $261 reduction for those in other regions. We have assumed a stronger relationship between high IRRS and high duration in public housing, especially for those who are older. That is, those who are older and currently receive large IRRS payments are expected to remain in public housing for longer than before. This change disproportionately affects Auckland and Canterbury. The increase for Auckland also reverses some of the changes allowed for in the previous report.

Figure 5.5 Throughput change by region



5.4 Demand and the register

Section 4.3.3 highlighted that the number of new register applications increased by 40% in the year to 30 June 2017 compared to the previous year.

Figure 5.6 shows the number of new register applications each year split by region while Figure 5.7 shows the corresponding annual growth rates. An increased number of new register applications was seen across all regions in 2017, but the size of the increase varied noticeably:

- Central by far had the highest growth with more than twice the number of applications compared to the previous year. The number of applications increased by 114% to 721 in the year, a level which has not been observed since 2007.
- The regions of Nelson, Taranaki and Waikato also saw relatively large growth with increases of about 70%.
- Growth was low in Northland with application numbers being relatively comparable to last year, increasing from 360 to 369.
- While growth in Canterbury was less significant than other regions at 14%, it is the fifth consecutive year where register application numbers have increased; there is a consistent increasing trend in the Canterbury region.

Figure 5.6 Number of new register applications by region. Columns are year ending 30 June.

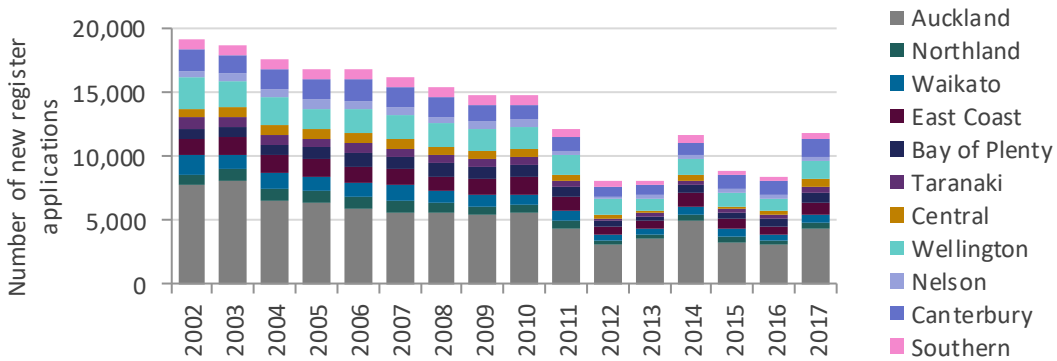
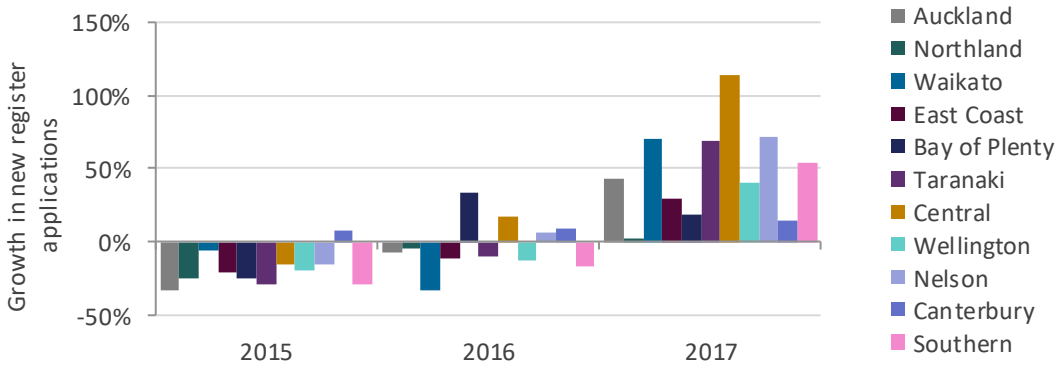


Figure 5.7 Growth in new register applications by region



Driven by the large number of new applications made over the year to 30 June 2017, the size of the register has increased substantially.

Table 5.1 displays some detail of how the register has changed from June 2016 to June 2017 at a regional level. We note:

- Central, Nelson, Taranaki and Waikato regions saw relatively high growth in register size which is consistent with higher application rates in the regions as outlined in Section 5.2. The number of households on the waitlist in these regions have more than doubled except for in the Waikato region.
- In the Central region, the size of the register is 2.5 times larger, increasing from 138 households to 345 households.
- 356 additional public housing properties were introduced in the Canterbury region over the year which has helped to ease demand pressures.
- Overall, the proportion of Priority A applications on the register has increased by 5%. This increase reflects a continued trend of a higher proportion new applications which are priority A, rather than a slowing of placements. The amount of change differs by region but the variation is potentially due to volatility rather than genuine differences in trends. Northland, Central and Southern regions showed the strongest increases last year but the proportion which are priority A this year has decreased. The proportion of applications which are priority A ranges from 64% in Waikato to 82% in Central.
- The number of applicants requiring three or more bedrooms is down slightly from June 2016.

Table 5.1 Change in the register June 2016 to June 2017[33]

	Jun 17						Jun 16		
	#		% A		3+ beds		#	% A	3+ beds
	Value	Change on 2016	Value	Change on 2016	Value	Change on 2016			
Northland	193	+30%	68%	-11%	22%	-8%	149	79%	30%
Waikato	387	+76%	64%	+6%	29%	+2%	220	57%	27%
East Coast	481	+78%	71%	+6%	23%	-3%	270	66%	27%
Bay of Plenty	465	+20%	72%	+6%	28%	-1%	389	66%	29%
Taranaki	178	+107%	79%	+10%	26%	+1%	86	69%	24%
Central	345	+150%	82%	-4%	20%	-6%	138	86%	26%
Wellington	668	+63%	69%	-2%	18%	-6%	411	71%	24%
Nelson	243	+119%	65%	+6%	19%	+3%	111	59%	15%
Canterbury	626	+17%	66%	-4%	11%	-3%	537	70%	14%
Southern	193	+77%	67%	-8%	15%	-0%	109	75%	15%
Auckland	2,696	+43%	70%	+9%	22%	-1%	1,882	60%	23%
National	**6,475**	**+51%**	**70%**	**+5%**	**21%**	**-2%**	**4,302**	**65%**	**23%**

Table 5.2 below summarises some key register metrics and how they differ by region. Note that the average duration of applications (the last column) is different to the "time to house" statistic reported by MSD. The average duration of applications is the average time applicants have been on the register as at 30 June 2017. There are a number of reasons why this measure might differ from MSD's statistic, including the fact that the people who remain longer on the register are less likely to be the high priority cases that are housed quickly.

There are significant regional differences in public housing dynamics. Auckland and Wellington have an above average number of public houses per capita, but higher durations mean that the register size is around the national average. In contrast, Waikato and Southern regions have low supply of public housing, consistent with lower demand.

Table 5.2 Register differences by region

Region	Population (2013)	PH per 1,000 pop.	New applns per 1,000 pop.	Reg. size @Jun17 per 1,000 pop	Avg dur (yrs) for active applns @Jun17
Northland	170,000	12.2	2.2	1.2	0.8
Waikato	440,000	8.9	1.6	1.0	0.7
East Coast	290,000	13.7	3.2	1.8	0.6
Bay of Plenty	210,000	13.6	3.6	2.3	0.8
Taranaki	120,000	15.9	3.6	1.7	0.5
Central	230,000	8.5	3.1	1.5	0.5
Wellington	500,000	16.3	2.6	1.4	0.6
Nelson	130,000	10.7	3.4	1.9	0.5
Canterbury	590,000	10.8	2.3	1.2	0.6
Southern	310,000	7.5	1.5	0.7	0.5
Auckland	1,570,000	18.9	2.8	1.7	0.9
Total	**4,550,000**	**14.2**	**2.6**	**1.5**	**0.7**

Section 4.4.2 introduced the concept of notional total lifetime housing payments as a way of measuring known unmet need of those on the register. It represents the additional cost of the hypothetical scenario

[33] We have changed the definition of active register application slightly in 2017, so the 51% increase in numbers on the register is not like for like. On a consistent basis the register size has grown by 39% over the year (from 4,667 to 6,475). The change in definition related to the treatment of applications closed (often temporarily) in the month of June.

where all applications on the register are placed into a public house matched to their needs today. The relative difference between the main lifetime housing payments estimate and the notional estimate is driven by:

- The placement of households into a public house today as opposed to when a house is expected to become available in reality
- The placement of households who are otherwise expected to exit the register without being placed.

Table 5.3 shows notional total lifetime housing payments by region for those currently on the register. It can be seen that:

- Known unmet need is highest for Auckland, Bay of Plenty and Wellington in both absolute and relative terms. These regions together account for 83% ($239m) of the total $289m of known unmet need of those on the register. Over the last year, Bay of Plenty had the longest median number of days to house of about 90 days.
- Known unmet need is smallest in Taranaki where the difference between the main and notional estimates is negligible. Over the last year, Taranaki had the shortest median number of days to house result of about 42 days.

Table 5.3 Notional total lifetime housing payments by region

Region	Main ($m)	Additional notional ($m)	Total ($m)	% additional
Northland	24	6	30	19%
Waikato	56	7	63	11%
Bay of Plenty	60	20	80	25%
East Coast	56	14	71	20%
Taranaki	21	0	21	0%
Central	37	10	47	21%
Wellington	90	39	129	30%
Nelson	28	5	32	14%
Canterbury	72	8	80	10%
Southern	23	1	23	4%
Auckland	482	179	661	27%
Total	**949**	**289**	**1238**	**23%**

5.5 Housing supply

Section 4.3.4 described how the size of the public housing portfolio changed over the year to 30 June 2017. Overall, there are now 884 more occupied public houses than a year ago. This subsection provides some further commentary on how house supply has changed at the regional level.

Auckland, Canterbury and Waikato were the only regions that saw increases in size of their public housing stock over 2017. Canterbury had the largest increase with 356 additional properties, which means a 6% growth in stock. This is a positive result given the continued increase in register application rates in the region. However, the number of additional houses is still relatively small compared to the current rate of almost 1,400 new applications per year. The Taranaki region had the largest relative reduction in size of its public housing stock with a decrease of 84 properties.

Placement rates into housing this year has been supported by better utilisation of the existing public housing stock with 744 less available but unoccupied properties. All regions saw a decline in unoccupied properties except for Canterbury which had no change. The Central, Taranaki and Wellington regions had

the largest reductions with the number of unoccupied properties now having more than halved from a year ago.

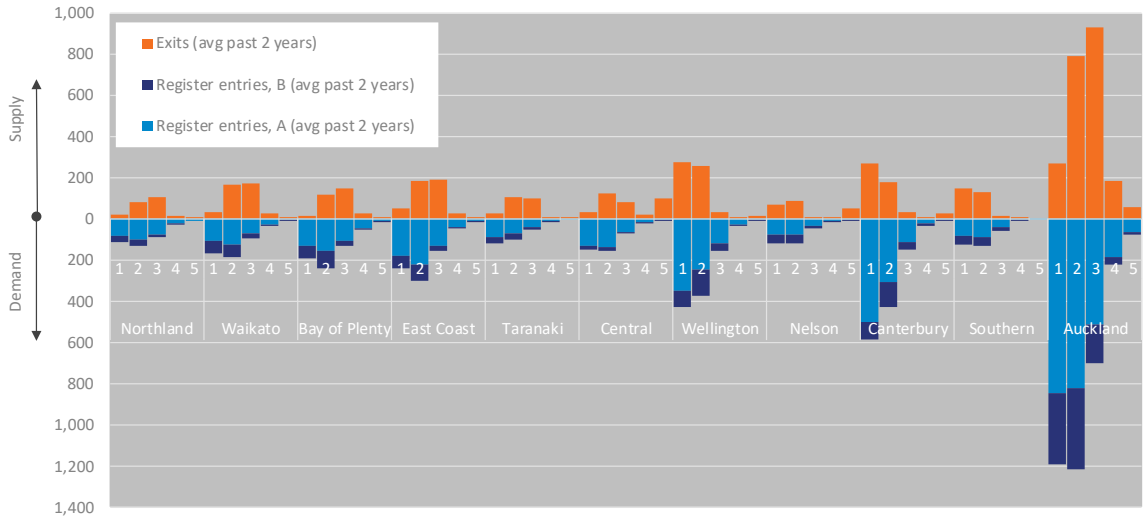
The representation of Community Housing Providers (CHPs) in the public housing system has increased from 5% to 7% of the portfolio in 2017. The most notable is the Bay of Plenty region where 41% of public housing tenancies are now managed by CHPs. This represents 71% of the overall change.

Table 5.4 Change in house supply by region

	June 2016			June 2017		
	Unoccupied	Occupied HNZ	Occupied CHP	Unoccupied	Occupied HNZ	Occupied CHP
Northland	54	2,071	5	45	2,054	2
Waikato	197	3,781	66	171	3,801	89
Bay of Plenty	116	2,771	30	77	1,665	1,165
East Coast	210	3,845	25	136	3,888	30
Taranaki	170	1,808	10	64	1,834	6
Central	120	1,945	7	50	1,975	14
Wellington	490	7,914	40	226	8,034	78
Nelson	104	1,386	12	63	1,396	24
Canterbury	278	5,858	130	278	6,018	326
Southern	123	2,327	7	81	2,320	22
Auckland	1,011	26,704	2,790	938	26,715	2,960
Total	**2,873**	**60,410**	**3,122**	**2,129**	**59,700**	**4,716**

When a current household exits a public housing place, the property becomes available for a new household to move into from the register. This natural flow represents the main component of housing supply each year. Ideally this supply would be well matched to the demand (register applications) in terms of size and location, however in reality exiting households will likely differ to those on the register. The figure below contrasts historical demand and supply from public housing exits over the past two years (but excludes new supply).

Figure 5.8 Historical supply from housing exits and demand, past two years. Register demand is split by priority



All regions show an:

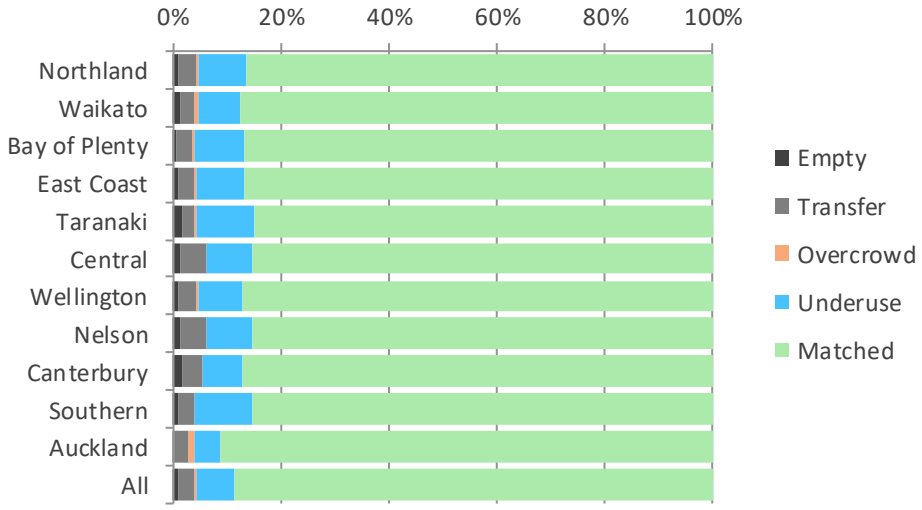
» Undersupply of 1-bedroom places; nationally demand is about two times higher than supply of current stock, and

» Oversupply of 3-bedroom places; nationally demand is about 70% of the level of current stock supply but this varies by region.

Overall, register applications were about 55% higher than the number of exits for the two years. Using this measure, the highest levels of undersupply were in Canterbury and Bay of Plenty. In Canterbury, supply from current household exits would have provided enough places for less than half of the accepted register applications. Northland, Wellington and East Coast have a slightly higher level of undersupply compared to the national average. Supply from current household exits would have provided places for 59% to 62% of register applicants. This is compared to the national average of 64%. Section 4.4.3 examined how well the current public housing portfolio matched the needs of those currently in public housing in terms of bedroom requirements. We reproduce the chart of near match rates by region in Figure 5.9 below.

While 89% of occupied houses meet the bedroom requirements of its tenants (within one bedroom), the match rate varies from 85% to 91% depending on region. Auckland has the highest match rate of 91% with only 5% of houses being underused. This is partly because those in need of housing support in the region tend to have larger households, with an average household size of 3.3. In comparison, Taranaki has a match rate of 85% with 11% of houses being underused. The average household size for those in housing in the region is 2.2.

Figure 5.9 Near match rates by region



6 SENSITIVITY AND SCENARIOS

Inside this chapter

6.1 Introduction and highlights

This section looks at the level of simulation variability present in our estimates of lifetime payments and how sensitive these estimates are to changes to the underlying projection assumptions.

Key results

- Averaging over multiple simulations for each individual, combined with the large cohort size means projected housing support payments have very little simulation error when reported in aggregate or by segment. Estimates for individuals show much more variation between simulations and these results should not be considered in isolation.
- Lifetime housing support estimates are extremely sensitive to assumed rental growth rates (relative to inflation). A one percentage point change in the assumed rate of growth changes the future lifetime housing support payments estimate by about 20%.

6.2 Simulation variability

Our projections involve simulating the quarterly pathway through housing and benefit support at an individual level, using characteristics known at the projection date. These pathways carry enormous variability. Given a group of individuals with similar characteristics, we would expect some of them to make heavy use of support from both the public housing system and benefit system, and others relatively little from either.

The simulation process adds variability to our results. We reduce this simulation error in our estimates by:

- Running 12 independent simulations for each individual and taking the average.
- Aggregating many individual results. In any single simulation some individuals will be higher than their true average, some lower, but these will tend to balance across the projection.

The simulation variability at a segment level is summarised in Table 6.1. We estimate the simulation error in our projection of total future housing support payments ($17.77 billion) to be ±$0.049 billion, to a 95% level of confidence. The simulation error at an aggregate level is very small (around 0.1%). The relative variability is larger for segments (as there is less aggregation benefit) and is largest for segments with fewer households, such as 'Primary aged over 65, IRRS <$150 with a child'. Even still, the simulation error remains a small portion of the segment-level projected payments.

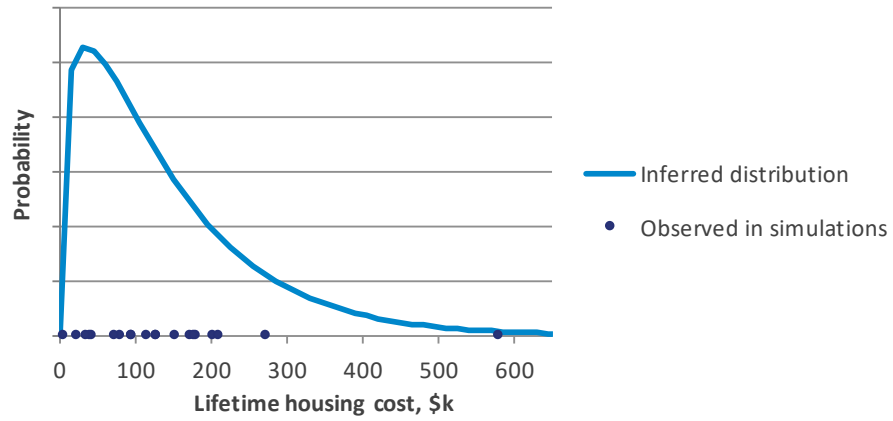
Table 6.1 Simulation variability by segment including coefficient of variation estimates[34]

Segment				Total proejected payments ($b)	Simulation 95% confidence interval ($b)	Coefficient of variation
On register	Priority A			0.73	(0.726, 0.738)	0.40%
	Priority B and other			0.25	(0.244, 0.250)	0.60%
IRRS recipients, primary aged < 65	Less close / IRRS > $150	Child in the household	Work obligated	2.79	(2.773, 2.799)	0.24%
			Not work obligated	2.86	(2.848, 2.869)	0.19%
			NOMB	2.75	(2.733, 2.764)	0.29%
		No child in the household	Work obligated	0.44	(0.437, 0.445)	0.48%
			Not work obligated	2.68	(2.669, 2.699)	0.29%
			NOMB	0.98	(0.971, 0.983)	0.31%
	Closer / IRRS ≤ $150	Child in the household	Work obligated	0.15	(0.146, 0.150)	0.71%
			Not work obligated	0.13	(0.129, 0.131)	0.48%
			NOMB	0.47	(0.461, 0.470)	0.50%
		No child in the household	Work obligated	0.04	(0.035, 0.037)	1.36%
			Not work obligated	0.19	(0.183, 0.187)	0.53%
			NOMB	0.22	(0.216, 0.220)	0.51%
IRRS recipients, primary aged 65+	Less close / IRRS > $150	Child in the household		0.36	(0.359, 0.364)	0.37%
		No child in the household		1.47	(1.458, 1.474)	0.27%
	Closer / IRRS ≤ $150	Child in the household		0.02	(0.016, 0.017)	1.90%
		No child in the household		0.14	(0.140, 0.143)	0.57%
Recent exit from housing	Receiving AS			0.30	(0.300, 0.309)	0.79%
	Not receiving AS	Aged <60		0.34	(0.334, 0.345)	0.84%
		Aged 60+		0.01	(0.008, 0.009)	4.16%
Recent exit from register	Receiving AS			0.37	(0.363, 0.369)	0.42%
	Not receiving AS			0.11	(0.108, 0.111)	0.84%
Total (excludes expenses)				**17.77**	**(17.722, 17.819)**	**0.14%**

While the variability in the aggregate level results is very small there is substantial variability in the underlying individual results. The coefficient of variation is about 100%, which means that actual future payments for an individual could easily be double (or half) the average forecast payments. To highlight this, Figure 6.1 shows the lifetime housing support payments for a hypothetical 40-year-old primary householder in Auckland. The 20 lifetime housing support estimates arising from each 2016 simulation are shown as dark blue dots, and we have inferred a distribution around this. While the average of future payments is about $140k, we can see significant variation. For similar individuals, we would expect to see actual lifetime payments under $50k about a quarter of the time, and higher than $300k about 10% of the time.

[34] As part the of the 2016 projection we ran 20 independent simulations to estimate of the coefficient of variation for each segment. The coefficient of variation is the standard deviation of the estimate divided by the estimate itself; it provides a relative measure of variability. We have used our 2016 estimates of single-simulation segment variability to derive coefficients of variation in this year's table. The extra simulations (20 versus 12) means the coefficients are slightly more robust using 2016 projections, but we have compared reasonableness to 2017 estimates.

Figure 6.1 Simulated lifetime cost for a single individual (40-year-old primary householder in Auckland) and inferred distribution



6.3 Sensitivity to assumptions

Our projections are sensitive to many key underlying assumptions. We illustrate this sensitivity in Table 6.2, where we summarise the results of various scenario tests performed.

Table 6.2 Sensitivity of projected housing support payments to changes in assumptions

Scenario	Total projected payments excl. expenses, $ billion	Change, $ billion	Change %
Base	17.8		
Increasing housing exit rates by 5%	17.6	-0.2	-1.2%
Decreasing exit rates by 5%	18.0	+0.2	+1.2%
Adding 1% to rental growth pa	21.5	+3.7	+21.0%
Subtracting 1% from rental growth pa	14.6	-3.2	-18.0%
Subtracting 1% from CPI and AWE inflation pa	18.3	+0.6	+3.1%
Adding 1% to CPI and AWE inflation pa	16.7	-1.1	-5.9%
Unemployment flat (rather than falling)	18.1	+0.3	+1.9%
Register applications 5% higher	17.9	+0.1	+0.6%
Register applications 5% lower	17.7	-0.1	-0.6%

Note: Increasing the housing exit rates by 5% means if household has a 3% chance of exiting next quarter in the base scenario, they have a 3% x 1.05 = 3.15% chance of exiting in the scenario. Similarly, a 3% x 0.95 = 2.85% chance in the decreased exit rate scenario.

Key observations include:

» The results are extremely sensitive to the assumed rental growth rates (relative to price inflation). If rent increases were one percentage point higher (so 4% becomes 5%, say), then we would estimate the total lifetime housing support payments to be 21% higher. There is a three-pronged effect that causes this result:
  - The increase in market rents directly increases IRRS payments, even if incomes grew at the same rates
  - The growth rate above CPI (and AWE) means that IRRS growth is higher than just rental growth; the proportion of rent paid by householders falls
  - The higher level of IRRS means tenants are further from the market which decreases exit rates and increases durations.

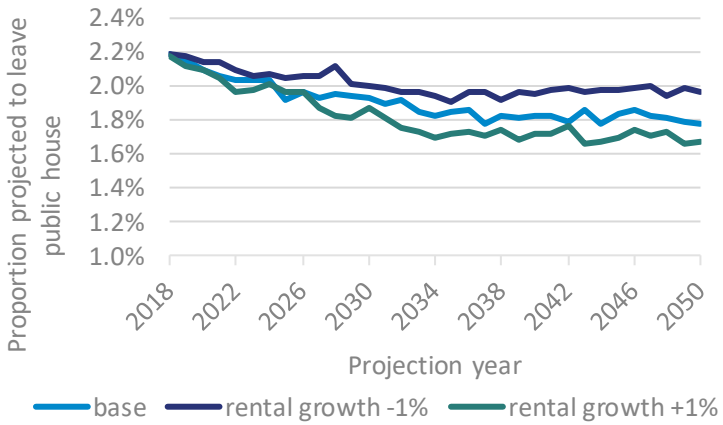
The effect is similarly large in the opposite direction; if long-term rental growth rates were 1% lower we would estimate total lifetime housing support payments to be 18% lower.

- The historical changes in exit rates for primary householders (see Figure 4.8) suggest that the ±5% change to rates tested here are a plausible variation. The impact on the projected housing support payments is relatively small, with the total increasing 1.2% when exit rates decrease. Increasing exit rates 5% gives a similar sized decrease of -1.2% in total projected housing support payments.
- Decreasing inflation (but keeping the rental growth rate assumptions constant) actually increases total projected housing support payments. Future AS and TAS payments decrease (these payment rates are tied to inflation, as with other benefit system payments) by 12%, but this is more than offset by increased IRRS payments. The increased gap between rental and income growth means a household's income grows slower relative to rent. As a result, IRRS increases and exit rates fall.
- Unemployment rates have a relatively small impact on the total lifetime cost estimate; for those already on the register or in housing, the modelled influence of unemployment rates is indirect. Higher unemployment rates mean a higher likelihood of benefit receipt which in turn influences projected housing support pathways.
- Changes to the number of register applications has a minor impact on the housing support payments for the projection cohort. For those who are already on the register, a change in the number of new register applications will change the time taken to be placed into a house. This change tends to be more than offset by the change in re-entry rates for those who have exited the public housing system. For example, an increase in the number of applications by 5% will increase total projected housing support payments by 0.6%. An increase in the number of applications means people on the register will be placed slower, reducing projected payments for those currently on the register by 1.2%. However, in this scenario those who have exited the public housing system will more likely reapply for public housing so projected payments for recent exits are expected to increase by 1.3%. Note that while projected payments for those on the register will decrease in this scenario, this is interpreted as a poor social outcome. The reduction is driven by a delay in placement which means the corresponding unmet need (value of additional notional future payments) is higher.

In addition to the change in projected housing support payments, it is also important to consider how unmet need changes for those on the register under the above scenarios. Scenarios which lead to longer durations for those in public housing means it is more difficult to place applications on the register without additional supply as less houses become vacant. As exit rates fall it becomes increasingly important to introduce additional supply to support the needs of those on the register.

Figure 6.2 shows projected tenancy exit rates under the scenarios where rental growth is 1% higher and 1% lower per year, compared to the base projection. Stronger rental growth is expected to reduce the number of public housing exits by about 6% after 20 years. This equates to roughly 300 less vacated public houses per year. In comparison, weaker rental growth means the private rental market becomes more affordable. Under the scenario where rental growth is 1% lower per year it is expected that an additional 9% of tenants will transition out of public housing after 20 years.

Figure 6.2 Projected household exit rates under different rental growth scenarios



Part C – Approach

7 OTHER COSTS

Inside this chapter

7.1 Introduction

The lifetime housing support payments estimate of $18.4 billion shown in Section 4.4.1 includes a $668m allowance for MSD expenses. This chapter describes these expenses and how we have estimated them.

7.2 Other MSD expenses

MSD incurs expenses in operating public housing system services and programs. These are in addition to the cost of IRRS and accommodation-related benefit payments. Specifically, the allowance covers expense items related to:

» Operating the public housing register and associated interventions
» Assessing eligibility and payment of IRRS.

The expense allowance has been determined based on permanent budgeted appropriations for the financial year ending 30 June 2018. These appropriations are shown in Table 7.1 below.

Table 7.1 Categorisation of appropriations included in current cohort expense calculation

Purpose	Appropriations	Budget 2017/18, $m
Operation of register, interventions, assessment & payment of IRRS	Services to Support People to Access Accommodation	43.3
	Services Related to the Provision of Social Housing	0.4
Products to support people to transition to independence	Housing Support Package	2.6

The total budget for these expense items is $46.3m. Some other expenses in the public housing system are already captured in the 2017 projection of benefit system costs, such as investigations of errors, fraud and abuse; we have not included these in the public housing expenses.

7.3 Expense loading

While the costs described in Section 7.2 are relatively fixed over time, a share of these costs is associated with current clients and the rest attributable to future entrants.

Our methodology for determining the total costs of administration and programs for current clients is to:

» Assume the total expense costs are fixed in real terms and are based on the 2017/18 budgeted appropriations
» Allocate expense costs to either current clients or future clients, weighted by expected IRRS payments
» Proportionally allocate these expenses into the various categories listed above, based on the expense budget information provided by MSD.

This gives an estimated $668m allowance for expenses for the current cohort.

The expense allowance has increased since the previous report. This is because the underlying appropriations have increased. The appropriation *Services to Support People to Access Accommodation* has increased by 20%. This is part of the government policy initiatives of delivering the Social Housing Reform Programme and additional IRRS funding.

7.4 Emergency housing expenses

There are further large appropriations related to emergency housing which we have not allowed for in our expense estimate. In particular, the provision *Provision of Emergency Housing Places* and *Emergency Housing Services* are budgeted at $49m for 2017/18. We have excluded these expenses as a significant portion of it likely relates to people outside of the current cohort. The lifetime housing cost results in this report relate to tenants already in public housing, applicants on the register and recent exits from the register or a public house; expenses included mirror the activities for these groups and relate to managing these tenancies, applications and providing other support and interventions for these clients.

We have not been able to incorporate household-level data related to emergency housing use as part of this report. This would potentially be a useful addition to future analysis, as it improves the understanding of alternative housing pathways. Inclusion of these pathways would provide an opportunity to recognise future payments related to emergency housing support in our estimates.

8 METHOD

Inside this chapter

8.1 Introduction

This chapter summarises how we carried out this projection of the New Zealand public housing system. A more extensive description of the approach can be found in the baseline 2015 public housing report, and further technical details are also available in the appendices to this report.

At its most basic level, the projection approach involves the following steps:

1. Identifying the number of New Zealanders who have interacted with the public housing or benefit systems over 2016/17.
2. Predicting the number of new applicants (who aren't already included in the projection) to the housing register for every year through to the end of the projection.
3. Predicting the housing and benefit system state in each projection quarter for all these clients.
4. Estimating payments to these clients for each projection quarter. These are initially estimated in 30 June 2016 dollar values, but subsequently adjusted to allow for inflation from that date to the date of payment. Housing payments modelled include all IRRS, AS and TAS payments.
5. Discounting the inflated payments to allow for investment return.
6. Adding an amount to cover MSD expenses.
7. Running additional analyses for items such as estimates of notional lifetime housing payments and scenario testing.

8.2 Data and data quality

8.2.1 Data supplied

Individual client level datasets have been provided relating to public housing tenancies and register applications, benefit receipt, previous use of child protection (CP) and youth justice (YJ) and criminal convictions history for both benefit system and public housing clients.

To protect the privacy of individuals, original social welfare numbers (SWNs) were not supplied in any datasets. The client identification numbers used for matching datasets were separately created by MSD. Other personal information such as names and addresses were not supplied, only a general geographical area was given. A full list of files provided is in Appendix D.

Household and individual level housing data

Responsibility for the management of public housing data (tenancies, register applications, houses) moved from Housing New Zealand (HNZ) to MSD in August 2015. Records provided by HNZ up to this date were detailed in the 2015 report. MSD provided updated records covering the period from August 2015 to June 2017 via the following datasets:

» **Monthly register snapshots**:

- Data at a household level, showing the status of both new and transfer applications. This provided the application date, reasons for application, household size, type and current location of the applicant household, housing requirements such as number of bedrooms and preferred locations, and SAS scores measuring need.
- Data at an individual level, showing all applicants on new or transfer applications. This provided demographic information (age, gender and ethnicity) for household members as well as their relationship to the primary applicant.

» **Monthly tenancy snapshots**:

- Data at a household level, providing information on the size, type and weekly income of the tenant household, the current public house and date of entry, and details of income-related rent and subsidies that make up the market rent of the house. The data also distinguishes between HNZ and CHP providers.
- Data at an individual level, providing information on the age, gender and ethnicity of each household member as well as information regarding their relationship to the primary householder and whether they are a signatory.

» **Tenancy exits:** Data at a household level, for households leaving public housing this provides a reason group for leaving.

» **Monthly property snapshot:** The snapshot provides information regarding location, characteristics, rent and occupancy status. Supplied for HNZ properties only.

» **Extra evidence items**: Public housing spell information for tenants missing from the main tenancy snapshots after the data migration. Approximate age was also provided. These tenants are mostly children with some additional occupants not in receipt of benefits.

» **Tenancy reviews**: Data at a household level, for households that have undergone tenancy reviews this provides the start and end dates of the review as well as the status and outcome (if complete).

Public housing identities were matched by MSD. This involved:

» A mapping of public housing identities to benefit system identities

» A migration file that examined identities moving from HNZ to MSD systems, at both a household and individual level.

We used a combination of these to link individuals and households across the 2015 data migration. Reliability and difficulties associated with the public housing data are discussed below in Section 8.2.2 and we discuss our approach to data cleaning further in Section 8.2.5.

Other housing information

We have also been provided with:

» A supply forecast spreadsheet, indicating planned public housing purchases and developments.
» A summary of MSD administration and programme expenses relating to the public housing reform programme.
» Other background documents for data reconciliation and descriptions of the public housing system.
» Treasury forecasts for future discount and inflation rates.

Historical rent information was taken from MBIE's website[35]. We used territorial authority level synthetic lower quartile rates in our analysis. Economic forecasts were generally taken from the Treasury where available, as discussed in Section 4.2.

Benefit system data

Our projection model combines public housing and benefit system pathways, so MSD also supplied data on the benefit system. This was used, with the public housing data, to construct a combined longitudinal series for modelling. The benefit system datasets are detailed in the 2017 benefit system report, and covered:

- Benefit system payments up to 30 June 2017 but extracted as at 31 July 2017. This includes the type of benefit received.
- Demographic information such as education level and ethnicity for benefit system clients.
- Benefit rates, Treasury forecasts for population and unemployment.

Other data

MSD also provided datasets on usage of child protection (CP) and youth justice (YJ) services, criminal convictions history, and secondary schooling for both benefit system and public housing clients. This is the first year in which secondary schooling information from the Ministry of Education has been provided. The datasets provided covered clients who have left a New Zealand school since 2008 (currently age up to about age 25) and were used to attach educational attainment at school to clients up to age 25. More details are provided are detailed in the 2017 Benefit system report.

Matching between systems

To link the public housing, benefit system, Corrections, CP and YJ and Ministry of Education information, MSD provided a match between anonymous identities across these five systems. Such matching processes have the potential for false positives (people matched when they are in fact different) and false negatives (people not matched when they are in fact the same). Rates of mismatch are difficult to estimate, but may carry consequences:

- For Corrections, CP/YJ and Education they will tend to dilute the signal associated with criminal convictions, CP/YJ history and Educational attainment slightly, but the presence of mismatches should not affect the main conclusions related to these variables and does not affect the overall projection results.
- The impact of poor matching between public housing and benefit system data will be greater. The projected pathways through the public housing system rely on current benefit system status and how that is simultaneously projected to evolve.

In some instances, more than one anonymous CP/YJ or Corrections identities has been matched to a single anonymous MSD client. Allowing these identities to be the same person would create unlikely overlapping Corrections spells, or unlikely age-time relationships. Therefore, in consultation with MSD, we have only allowed one match per person. This affects about 3% of Corrections records and less than 1% of CYF records.

[35] http://www.mbie.govt.nz/info-services/housing-property/sector-information-and-statistics/rental-bond-data

8.2.2 Reliability of data

The 2015 public housing report noted several issues with the public housing data relating to the combination of data from several legacy systems. These issues remain for data prior to August 2015 which we have still used for modelling in 2017. We briefly repeat them here:

- Missing household relationships between 2009 and 2012.
- Secondary matching fields that suggest a material failure in benefit system-housing identity matching, particularly for the pre-2009 data.
- Only partial agreement between register entry and exit files and active register snapshots.
- Duplicate records for both individuals and public housing properties.
- Non-primary householders exiting at three times the previous historical rate in the September 2012 quarter following a system change.
- Missing values, including age, ethnicity, property location and IRRS level.
- Material differences in age and ethnicity variables across benefit system and housing datasets where ID matches have been made.

In addition to the above, the data migration to MSD in August 2015 led to further disruption in the longitudinal series and new data issues. Over the last year the data shows steady dynamics, however issues relating to migration period remain. These were described in the 2016 report and we briefly repeat them here:

- Significant changes to some households; some people who were believed to be in houses prior to the transfer are no longer on the system, while others not on the previous data have been added. Total numbers of people in housing has remained broadly constant over the switch, and some of the change may be due to the identity matching process rather than a genuinely different person on system.
- Difficulty fully matching HNZ tenants to HNZ properties.
- Missing or unreliable records, particularly for the first three months of the switchover. Individuals and their roles within a household, rent and subsidy information were all affected.
- Missing ages for a relatively small number of individuals and significant changes in age for a slightly larger number.
- Material changes to dynamics. Clients, particularly non-signatory clients, appeared to be exiting public housing at faster rates than in the old system. This is likely to be partly due to different recording practices.
- More complex register entries, with duplicates and additional sub-states. This made comparisons to previous register statistics more difficult. There were also difficulties reconciling which applications were the transfers indicator and current housing status of applicants.

For all data issues, we have taken steps to try to minimise errors across the longitudinal series.

The main consequence of the data issues is that the longitudinal view of the datasets is incomplete; some people have too little housing history because they have not consistently been identified over time. This has led to increased weight being placed on trends seen in the last few years. Another consequence is that dynamics for non-primary householders are less reliable than that of primary householders.

Future improvements in data quality are possible, with more careful cleaning of the longitudinal series. This may materially alter results – we would have to restate old results on the new basis to properly attribute change.

Benefit system data

The benefit system data is of higher quality; the consistency with previously supplied data is good. As with previous years, we found small differences, affecting less than 0.5% of records. Fuller discussion of benefit system data quality can be found in our 2017 benefit system report.

Other system data

The expanded approach to identity mapping to combine public housing, benefit system, Corrections, and CP and YJ, and Ministry of Education data has led to different matches compared to those provided previously for the 2016 benefit system and housing system projections. While this will impact individual level projections the match rates are similar and so the aggregated results should not be significantly impacted.

Conclusion

Overall, we believe that the dataset, after cleaning, is fit-for-purpose; it is possible to estimate overall dynamics and long-term trends. Aggregate summaries are broadly consistent with other statistics produced by the government.

Note that while we make significant efforts to check and improve the quality of data used in our analysis, we do not take ultimate responsibility for the accuracy and completeness of the data. Our reliance on the data provided is further discussed in Chapter 9.

8.2.3 Missing values

The public housing data has a number of fields that have a material percentage of missing entries:

- Current territorial authority of register applicant
- Location of public housing property
- Relationship to primary householder (particularly between 2009 and 2012)
- Signatory flag
- Ethnicity
- Other variables to a lesser extent: gender, age.

A number of variables from the benefit system data also have a significant percentage of missing values:

- Ethnicity
- District
- Incapacity (type and number)
- Education and qualifications.

We have imputed missing ethnicity, region (at a TA/Local Board level), incapacity, education and gender variables using the distribution for non-missing cases across various strata.

Where clients are not matched to Ministry of Education data (all those over age 25 and over half of those under 25), the education and qualifications field are of particularly poor quality. The high rate of imputation tends to dilute the effect of different education levels; differences in results by education reported are likely to be larger than estimated.

We have attempted to infer other missing housing related variables from surrounding data and by linking datasets. We have not modelled or projected a small number of clients where we cannot establish age; age is too pivotal a predictor for both housing and benefit trajectories.

8.2.4 Missing eligibility fields

The benefit payment data files contain an eligibility field to distinguish between some benefit subtypes. About 50,000 payment spells since the reform dates (0.4% of the total) had a missing eligibility field. This has been inferred using surrounding payments.

8.2.5 Cleaning

The main data quality issues were discussed above in Section 8.2.2 above. To address these, the main data cleaning steps included (but were not limited to):

- Reconciliation of housing snapshots with entry and exit data, filling in snapshot data where needed.
- Inferring missing higher-level location fields from postcode or suburb, or by interpolation.
- Filling in missing or unreliable fields by copying information backwards and forwards in the time series, where possible.
- Removing duplicate observations and filling in observations where they appear to be temporarily missing.
- Ensuring a single primary householder at any time, including cases of no primary and more than one.
- Identifying pairs of individual IDs which (based on household ID, age and the time series) appear to be the same person, and consolidating as a single individual.
- Tidying up inconsistencies in the relationship field and assigning signatory status to partners.
- Cleaning ethnicity, gender and age fields using matched welfare information.
- Checking the implied household size (number of individuals linked to a particular public housing property) against the corresponding "household size" field.
- Un-matching a small number of public housing - benefit system matched identities where the match gave implausible ages and dynamic combinations.
- Un-matching a small number of duplicate household matches across the data migration.

8.3 Projection model parameters and scope

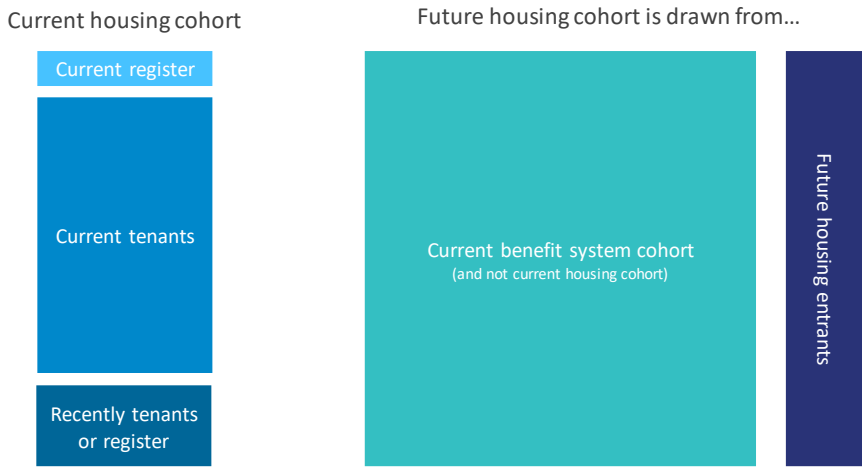
8.3.1 Public housing system population and projection definitions

Our projection takes a cohort with their characteristics as at the reporting date and projects their quarterly pathway forward in time using transition and payment models. This is a single simulation, which we repeat multiple times to get an 'average' value for each individual.

It is useful to distinguish between people who are participants of the public housing system, and those who will be in the future. There are three distinct subgroups as depicted in Figure 8.1 and listed below:

- **Current housing cohort:** About 160,000 adults who have interacted with public housing in the 12 months to 30 June 2017.
- **Current benefit system cohort (who aren't also in housing):** About 500,000 clients who have interacted with the (working-age) benefit system but are not already in the current housing cohort. Over the first 10 years this group represents about 60% of future housing clients.
- **Future housing entrants**: About 1,000 new register applicants enter the projection each quarter to simulate the entry of people not in the two cohorts above. This number increases slowly over the projection. These people are notional, in the sense that they do not have known IDs and their characteristics are based on the distribution of similar entrants in the past.

Figure 8.1 Schematic of projection population



8.3.2 Future payments in scope

We attempt to estimate future lifetime public housing costs. While further details on scope are given in Appendix E, the main components of are:

- **Income related rent subsidy:** For those in public housing, the amount the Government pays towards the market rent of a property.
- **Accommodation supplement:** A benefit paid by Work & Income for eligible clients (those in public housing are ineligible).
- **Temporary accommodation supplement:** Another benefit paid by Work & Income. Over 90% of TAS is related to housing so it has been treated similarly to AS.

Other costs in scope are administrative expenses incurred by MSD.

8.3.3 Length of projection

Lifetime housing cost includes payments from the reporting date until death. However, this is not clear cut as we do not always have death events recorded. For clients over 65 we have used cessation of NZ Super benefits as a proxy for death to build a mortality model. For clients under 65 death events are not allowed for explicitly, however the transition models allow for them implicitly. We cap the projection at age 100 (plus an adjustment for longevity), this means once a client reaches age 100 we assume they exit housing support and do no return. In all, the main projection runs for about 100 years.

8.3.4 Attribution of IRRS payments

The projection is individual level, but we sum the results by household to obtain a household level lifetime cost estimate. We have allocated IRRS evenly across signatories in the household, but future housing support to current non-signatories is included. So, if a non-signatory leaves a current household and re-enters public housing as a signatory in a new household, this will contribute to the lifetime cost estimate of the initial household. There are alternatives for attaching IRRS payments to household members. We believe our current approach is a reasonable basis for operational intervention, as the income for signatories is the main determinant of the level of IRRS support.

8.3.5 Other parameters

The projection has been conducted as at 30 June 2017, with a one-month delay before data extraction to allow data to mature; for example, adjustments due to abatement against earned income. Valuations are gross of tax for consistency with Crown accounts, and to better reflect the associated costs from MSD's perspective.

8.3.6 Reconciling Taylor Fry and MSD numbers

There are a few reasons why our numbers may not reconcile exactly to published MSD statistics:

- **Number of register applications**: There are two ways in which our model simplifies register movements. First, we view a person as still on the register if they have been on the register for a consecutive quarter. This understates the number of applications as some people withdraw and reapply. Second, we class an application by someone in housing for some part of the quarter as a transfer application; in reality, some people exit housing during the quarter and apply while not in a public housing place. Further, we use a broader definition than MSD statistics; among other things, we include applications that have accepted a provisional offer but not been placed. We have reconciled our numbers to those used by MSD.
- **Number of public housing places available:** There is some difficulty in reconciling the exact number of public housing places available at the reporting date as timing of exits, repairs, purchases and sales are dynamic in nature. We have adopted values based on the individual level data, which is relatively close to the HNZ management numbers reported at the same date.

8.4 Modelling the public housing system

This section briefly summarises the approach to modelling the public housing system. A more extensive description can be found in the appendices, as well as the baseline 2015 public housing valuation report.

8.4.1 Overview of the projection model structure

In the broadest of terms, the projection methodology is as follows:

- Finding the **number** of current clients, who have interacted with the public housing or benefit systems over 2016/17.
- Predicting the **number** of new applicants to the register, for every year through to the end of the projection, who aren't already included in the projection.
- Predicting the **housing state** and **benefit state** in each projection quarter for all these clients.
- Estimating **payments** to these clients, for each projection quarter. These are initially estimated in 30 June 2017 dollar values, but subsequently adjusted to allow for **inflation** from that date to the date of payment.
- Estimating the future lifetime cost by:
  - Discounting these inflated payments to allow for investment return
  - Adding an amount for other MSD expenses

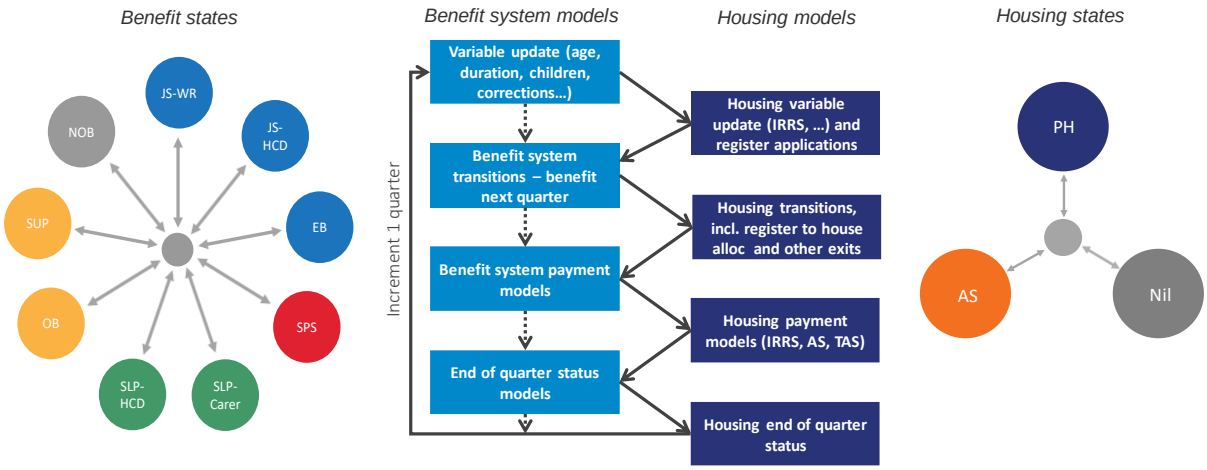
Each client is assumed to be in a single benefit 'state' and a single housing 'state' each quarter. We define three housing states:

- PH: If the person is in a public housing place for any part of the quarter
- AS: If the person is not in a public housing place for any part of the quarter and receives AS
- Neither: If the person is not in a public housing place for any part of the quarter nor receives AS

Because clients can be on the register while in any of these three housing states we overlay register status onto these three states.

In addition to the three housing states above, there are nine possible benefit states, corresponding to seven main benefit types, supplementary-only beneficiaries and those not receiving benefits (NOB). Figure 8.2 depicts both the housing and benefit states.

Figure 8.2 Benefit states (left), housing states (right) and the projection steps that determine them (centre)



With the combined benefit system – housing system projection, the housing transition models depend on an individuals' benefit status, both in the current and the subsequent quarter. For example, if a client is not receiving any benefits (main or supplementary) in the next quarter then they cannot move to the AS housing state. The ordering in which the benefit system transition, housing transition and payment models are run is indicated in the figure above.

The most important transitions are those out of and into public housing. Future lifetime cost is estimated by a combination of eleven separate payment models. Further models simulate, among other things, register applications and IRRS level evolution for those in public housing. A complete list of models and further details can be found in Appendix F.

8.4.2 Key methodology changes in 2017

Each year we enhance the projection methodology to add new detail, carefully quarantining the effects of methodology changes from performance-related experience (see Section 4.4). The most important changes this year are described below.

Available housing stock in the first quarter

When a household exits a public housing place often becomes available immediately afterwards that is, within the same quarter as the exit occurred. In the projection model a person's housing status only updates each quarter and if a person is simulated to be in public housing for 1 day in the quarter their housing state for the quarter is PH (Public Housing). This means, in the projection a house becoming available within the quarter depends on the simulated housing state of its tenants for the following quarter. The set-up of the projection code had previously meant we were making houses available the following quarter rather than the quarter of exit. This meant the number of register households placed in the first quarter of the projection was understated by about 500. This timing misalignment did not significantly affect long-term projections, but created biases in the short-run estimates.

This year we have restructured the projection code to correct this, adding an extra loop through the register once tenancy status for the subsequent quarter has been simulated. About three-quarters of the houses vacated during a quarter are made available to the to register applicants within that quarter in the projection, consistent with historical rates.

Children becoming adults while in households

Our scope for calculating future housing payments does not include future payments attributable to children and younger teenagers in public housing. However, these people have implications on the expected household costs in the future, and may also affect the expected duration in public housing.

Consider, for example, a household at June 2016 with a child age 15.5. Our household lifetime housing cost at June 2016 does not include future support for the child. At June 2017 the child is 16.5 and their projected future support is included in the household lifetime housing cost.

This year we have altered the projection model to simulate these children aging into adults in the household. This allowed us to improve the throughput analysis of expected and actual lifetime cost at the projection date. Note that while this captures the evolution of the household better it does not change the scope or reporting of results.

8.4.3 Modelling variables

Numerous modelling variables are used to predict the housing transitions and payments described above. These are listed in Appendix F and include:

- Household information (including register households)
- Region, at a Territorial Authority (Local Board in Auckland) level
- Private market rents
- Public housing and AS history variables
- Quarter and the corresponding unemployment rate (at a national and regional level)
- Individual demographics
- Benefit history
- Family-related variables
- Health and disability-related variables
- Criminal convictions history
- Child protection and youth justice history

8.4.4 Housing portfolio and availability

In the main projection we assume:

- The number of properties for every number of bedrooms in a territorial authority (or Auckland Board) is largely fixed. At the start of the projection this includes occupied housing and a smaller number of unoccupied but available properties.
- The number of unavailable properties remains constant.
- Additional supply is added, based on HNZ and CHP intentions over the next four years. These numbers are shown in Table 8.1 below. In cases where the exact territorial authority or the number of bedrooms is unknown, we assume a distribution of bedrooms consistent with the existing portfolio.

Table 8.1 Housing places at the reporting date and assumed net changes over the next four years

	Occupied		Available	Unavailable	New Supply	Assumed total supply (occupied + available)
	HNZ	CHP	HNZ	HNZ	HNZ + CHP	
At June 2017	59,700	4,716	540	1,382		64,956
2017/18					544	65,500
2018/19					996	66,496
2019/20					359	66,855
2020/21					200	67,055
Later					0	67,055

Whenever a primary householder exits a property, this property is ‘added’ back to the available portfolio. Most of the time this property will be reused within the quarter (about 73% of the time, based on historical data), but sometimes it will become available in the subsequent quarter. This allows for the

time between exit and placing a new household; a property that becomes available late in a quarter has little chance of being filled before quarter end.

The approach ignores the dynamics of housing disrepair, this was judged a reasonable simplification; over time we expect that the number of houses made unavailable for repair should balance the number of houses made available after repair.

8.4.5 Future housing entrants

In 2017/18 we expect about 15% of register applications per quarter to come from people who are not in the starting cohort. That is, they have not interacted with the benefit system or public housing system in the 2016/17 year. Similarly, there will be entrants in 2018/19 who were not in the starting cohort and not added in 2017/18. We refer to these as future housing entrants.

Our approach to adding these applications to the projection is:

- To create a high level aggregate estimate for total applications per quarter.
- To estimate the proportion of these that are attributable to the 'known' cohort (either the initial cohort, or as a future entrant in a previous projection quarter). We are able to estimate this plausibly for about 10 years, using historical data.
- We extrapolate this percentage beyond 10 years.
- We use the percentage to estimate the number of outside applications. This is then converted to the number of individuals, using historical household compositions.

8.5 Notional projection results and idealised purchasing

8.5.1 Notional lifetime housing payments

We have defined the total notional lifetime housing payments as the total main lifetime housing cost plus:

- The additional future lifetime payments if those on the register were placed in a public housing place at the projection date
- The addition (or reduction) in future lifetime payments if those on the transfer were moved to a public housing place of the required size and desired location at the reporting date
- The additional future lifetime payments associated with placing those in an overcrowded public housing place in a bigger public housing place at the reporting date
- The reduction in future lifetime payments associated with placing those in an underused public housing place in a smaller public housing place at the reporting date.

To measure these notional payments, we create a modified notional cohort for projection in which we implement the four changes listed above. This gives the total notional lifetime housing payments, and the change relative to the main projection for the altered households is the additional notional lifetime housing payments.

8.5.2 Idealised purchasing

We have previously provided the Department the functionality for idealised purchasing runs; these assume properties can be quickly bought and sold in response to the needs of those on register and give a guide as to 'optimal' purchasing behaviour given assumptions about new demand. For idealised purchasing projections, we do not retain a public housing place's location and size at exit; instead we add the public housing place to a pool of available housing, and note a 'sell' for the original public housing place. When a client is allocated to a public housing place we remove a public housing place from the pool and note a 'buy' for the size and location (based on their register preference).

8.6 Model checking and validation

There are many checks performed on the models to ensure their appropriateness. These relate to the:

- Individual models used, which are generalised linear model diagnostics statistics and plots
- Analysis of model changes from 2016 to 2017
- Detailed cohort-level analysis of differences in projection patterns
- Testing of models against historical data
- Sensitivity testing as detailed in Chapter 0

These allow us to ensure the reasonableness of the projections and to better understand the limitations of the model.

8.7 Compliance with actuarial and accounting standards

There are currently no accounting or actuarial professional standards strictly applicable to the valuation of social benefit or public housing liabilities. However, in general we carried out the valuation in accordance with standards applicable to the valuation of accident compensation liabilities.

As such, we have generally complied with the New Zealand Society of Actuaries Professional Standard No. 30 entitled "Valuations of general insurance claims". We have also attempted to comply with International Financial Reporting Standards (IFRS). Specifically, estimates of liability incorporate an allowance for future inflation, investment return and administration expenses on a basis specified by the Standards.

However, we have not estimated nor incorporated a prudential margin as is sometimes required by such standards. In our opinion, this seems unwarranted given the use to which the valuation will be put.

It is worth noting that in October 2013 the International Actuarial Association has published an International Standard of Actuarial Practice 2 (ISAP 2) "Financial Analysis of Social Security Programs".

9 RELIANCES AND LIMITATIONS

Inside this chapter

9.1 Introduction

This chapter notes the reliances and limitations associated with this report. While there are standard reliances and limitations that usually accompany a valuation of this type (see 9.4), this valuation has limitations that extend beyond these. These relate to limitations in data, simplifications in modelling and the uncertainty of undertaking relatively new valuations. These are important – fully addressing them could materially affect absolute level of lifetime housing payments (although the conclusions regarding relative differences between households with different risk factors, or change over time, are less likely to be impacted).

9.2 Data limitations

The quality of the housing data was mixed, as discussed in Section 8.2.2. Some of the data issues may materially affect the results, and are flagged again below for completeness.

9.2.1 Step changes in the data and missing fields

The individual and household level data has been sourced from HNZ and MSD and required extraction from four different databases (the most recent MSD system, the most recent HNZ system plus two legacy HNZ databases). There were inherent limitations to the data associated with this change points. For instance:

- At August 2012 (one of the system changes) a significant number of non-primary householders erroneously appear to exit.
- Relationship data is missing for much of 2009 through 2012.
- We do not have a clean field for indicating non-primary signatories.
- There are significant changes to the exit rate for non-primaries following the August 2015 system change.
- Some tenants and applicants disappear and reappear around the time of the migration, which makes the September 2015 quarter somewhat unreliable.

To the extent that these issues might be resolved in the future, the resulting analysis and projections could be affected.

9.2.2 Combining welfare and housing datasets

The matching of client identities between public housing and benefit systems is imperfect and affects the longitudinal history of current clients. This history is important in predicting future transitions, so may have material impacts on the projections for some client groups. Some housing clients will have missing benefit system history, and vice versa.

9.3 Modelling simplifications

All models are a simplification of reality. While sophisticated, our approach does simplify some important household dynamics. These might materially affect the results, and future improvements to address them would be accompanied with an analysis of change.

9.3.1 Pseudo households for future entries

Current households are treated properly as a unit – the housing state transitions of one householder will affect the transitions of another. However future households are not linked together. This potentially biases the projection results.

9.3.2 Household evolution

We have simplified the evolution of households within public housing. We have not explicitly allowed for the aging of children (for instance, the number of bedrooms needed falls once children are adults), nor the changing size and composition of notional households. We have not allowed for direct entry of adults into public housing; we always assume they enter via the register.

9.3.3 Sensitivity to assumptions

Sensitivity to assumptions was discussed in detail in Section 0 and the impact of certain scenarios on total lifetime housing payments estimates detailed. Suffice to say, some assumptions are very significant in driving overall results, and we cannot offer any certainty in how economic parameters will evolve over time.

9.3.4 Future public housing system changes

Our projection is a baseline simulation that assumes the dynamics of the current policy arrangements continue indefinitely. Future policy and operational changes will influence these forecasts; our valuations are intended to measure these changes as they occur, rather than attempting to anticipate them.

9.4 General limitations

The estimation of the liability is subject to influences whose effects cannot be determined with complete accuracy. Consequently, it is a virtual certainty that the ultimate liabilities will depart from any estimate, but the extent of this departure is subject to uncertainty. If potential outcomes and their relative likelihoods were expressed as a probability distribution, we would consider our liability estimates to be the mean of that distribution. In particular, the estimates provided in this report contain no deliberate bias towards over or under estimation.

10 GLOSSARY

The following tables give definitions for common acronyms and terms used in this report.

Table 10.1 Acronyms for public housing status, segments and their determination

Term	Definition
Basis of segment definitions	
AS	Accommodation Supplement (and related assistance) – a payment to help with accommodation costs. Not available to signatory householders in a public housing place.
BEN	Receiving a Main Benefit, this includes Jobseeker support, Sole Parent Support, Supported Living Payment, Young Parent Payment and Youth Payment.
IRR	Income-related rent – IRR is calculated based on a client's assessable income and their household type. Public housing providers (HNZC and CHPs) then charge this rate as rent to the client (market rent = IRR + IRRS). If the calculated rate of IRR is higher than the market rent for the property, the housing provider will charge no more than the market rate as rent for the property.
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 market rent of the property. Market Rent = IRR + IRRS.
JS	Jobseeker Support – a new benefit type introduced July 2013 (replaced Unemployment Benefit and Sickness Benefit, and partially replaces Domestic Purposes benefit). We sometimes refer to people receiving JS as Jobseekers.
MR	Market Renter –clients who are paying market rent and residing in a property managed by Housing New Zealand or a Community Housing Provider.
Neither	Not in a public housing place and not receiving Accommodation Supplement. Sometimes referred to as NIL.
NOMB	Not on main benefits (in a given calendar quarter); such a client might still potentially be receiving supplementary benefits.
NZ Super	NZ Superannuation – A non means tested payment to New Zealanders aged over 65 who meet the residency requirements, also includes the Veterans Pension.
Recent exit	Recent housing or register exit – a client who is currently not in a public housing place or on the register but has been in the last 12 months.
Recent housing exit	A client who is currently not in a public housing place but has been in the last 12 months. They were more recently in public housing than on the register unless both occurred in the same quarter, in which case public housing is prioritised.
Recent register exit	A client who is currently not on the register but has been in the last 12 months. They were more recently on the register than in public housing.
REG	Register – refers to the public housing register, used to manage applications for public housing.
PH	Public Housing – clients are considered in public housing if they reside in a property managed by Housing New Zealand or a Community Housing Provider, they may be paying income- related rent or market rent.
SLP	Supported Living Payment – a new benefit type introduced July 2013 (replaced Invalid's Benefit and Domestic Purposes Benefit – Care of the Sick and Infirm).
SPS	Sole Parent Support – a new benefit type introduced July 2013 (partially replaced Domestic Purposes benefit). We sometimes refer to people receiving SPS as Sole Parents, or SP.
Work obligated	Clients are assumed to be work obligated if they are in receipt of a JS-work ready benefit (including EB) or in receipt of SPS and their youngest child is at least 3 years old.

Term	Definition
Basis of segment definitions	
Not work-obligated	Clients are assumed to not have work obligations if they are in receipt of a JS-HCD benefit, in receipt of SPS and their youngest child is under 3 years old or in receipt of a SLP benefit.
YP/YPP	Youth Payment/Young Parent Payment.

Table 10.2 Further acronyms for benefit types and benefit system segments

Term	Definition
Tier 1 benefits (main benefits); and basis of segment definitions	
EB	Emergency benefit (included in Jobseeker Support benefit).
HCD	Health condition, disability (sub-set of both Jobseeker Support and Supported Living Payment beneficiaries with reduced work obligations).
NOB	Not on benefits (in a given calendar quarter).
SUP	Clients receiving supplementary benefits (Tier 2 or 3), but no main benefit.
WR	Work-ready (sub-set of Jobseeker Support beneficiaries with work obligations).

Table 10.3 Other common terms and acronyms used in the report

Term	Definition
Average household lifetime payments	The average inflated and discounted total lifetime future housing payments for each household.
ABP	Average benefit paid per quarter to clients in receipt of a benefit that quarter.
Average lifetime payments	The inflated and discounted total future payments projected for an individual or a household.
Board	Community Board or Local Board – geographical sub-grouping of Territorial Local Authorities.
CHP	Community Housing Provider – a housing provider (other than Housing New Zealand) that provides social rental housing and/or affordable rental housing.
CYF	Child Youth and Family.
CP	Child protection.
Future lifetime housing payments	The inflated and discounted total future payments projected for an individual or a household.
HH	Household – grouping of people who either share a tenancy or an application to the register.
HNZ	Housing New Zealand – the Crown agent that provides housing services for people in need.
Housing state	Current public housing status of a client. This is determined by whether a client is in public housing place, on the register for a public housing place and/or receiving Accommodation Supplement.
Market Rent	The average level of rent being paid for similar properties in the same area. Market Rent = IRR + IRRS.
Primary	A primary householder is the key contact for a public housing tenancy or register application. They are always considered a signatory.
Qtr	Quarter of the year – unit of measurement of time.
Region	A geographical grouping by MSD of New Zealand into 11 regions.
Register dynamics	Refers to the way a client moves through the register system. It includes the application, needs assessment outcome, time spent on the register and register exit to housing or otherwise.
Relative exposure	This term is used on figures throughout the report. It is generally used to mean the number of clients in a given group compared to the total.
Signatory	A signatory in in a household is a person whose income is included in the household income calculation but is not a nominated primary householder. The IRR is often set at 25% of the combined income of signatories.
System/benefit system	Refers to the NZ benefit system as administered by MSD. Implicitly applied only to those benefits within scope of the projection – i.e. the main benefits and supplementary/hardship assistance listed above.
TAS	Temporary Additional Support – a payment to help clients meet essential living costs.
Tenant	Clients are sometimes referred to as tenants where they reside a property managed by Housing New Zealand or a Community Housing Provider, they may be paying income-related rent or market rent.
Territorial authority	Territorial authority, a geographical grouping of New Zealand into 68 territorial authorities each with a local government.
YJ	Youth justice.