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Finding the best source of coverage for state social housing:

Comparing Kāinga Ora (Housing New Zealand) and census data

Census transformation

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Te Kāwanatanga o Aotearoa
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Disclaimer
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Purpose and summary

Purpose

Finding the best source of coverage for state social housing: Comparing Kāinga Ora (Housing New Zealand) and census data research paper explores the potential of administrative (admin) sources to provide census type information for estimating the dwelling stock of state social housing in New Zealand. We focus on understanding data from the 2013 and 2018 Censuses.

Housing New Zealand (HNZ) changed its name to Kāinga Ora in October 2019 when HNZ Corporation, Hobsonville Land Company (HLC), and Kiwibuild merged to become the Housing and Urban Development Authority, Kāinga Ora – Homes and Communities (Kāinga Ora, 2019a, McKenzie, 2023). 'Housing New Zealand' was used at the time of the 2013 and 2018 Censuses and is still used as a naming convention in Integrated Data Infrastructure (IDI) tables. For simplicity, we refer to this organisation and their data as Kāinga Ora throughout this paper, including the HNZ sector of landlord in census data.

Summary of key points

Potential for using Kāinga Ora data for census

This paper explores how Kāinga Ora data could supplement census data, or contribute to future development as part of an admin-based dwelling census. Kāinga Ora is the largest state social housing provider in New Zealand with over 60,000 houses, and therefore provides a key data source. Other social housing providers include, for example, community housing providers (CHPs) and local councils. In census data, social housing is part of the 'sector of landlord' variable where Kāinga Ora is one category. To better understand the usability of this admin data source we need to compare it with existing census data. This report focuses on coverage and extends previous research which compared Kāinga Ora and 2013 Census data for tenure of household, sector of landlord, number of bedrooms, and weekly rent paid (Bycroft et al, 2021).

Context for comparing census with admin data

A key assumption we made in this investigation is that Kāinga Ora has a record of all their dwellings and therefore we regarded this as the base dataset for the comparisons with an assumed 100 percent coverage of their stock. This assumption entails that as the agency responsible for management of Kāinga Ora properties, this dataset is the most reliable source for identifying their dwellings. The comparison with census, however, can be complicated due to changes over time in both sources. The changes in the census methodology and the use of admin data alongside statistical imputation led to an increase of Kāinga Ora dwellings from a large to a minimal undercount by 2018 as reported in the census quality assessments. In contrast, the changes in Kāinga Ora stock have shown the opposite movement in the same period, with the number of houses decreasing in 2018 compared with 2013. There has been, for example, property transfers where other CHPs have taken over the management of Kāinga Ora properties. In addition, census collects information on the dwellings that were occupied on census night which means if the residents are away then no information is collected. This distinction does not apply to admin data since the data exists for each month whether tenants are home or not. This context provided a starting point to our more in-depth investigations in understanding this subset of housing data.

Key results

The main findings from this coverage investigation are summarised below.

- Based on admin data, the number of 'available-occupied' Kāinga Ora houses fell between 2013 and 2018 (from 63,507 to 60,006 dwellings as at March).
- In contrast, based on census data, the number of Kāinga Ora rentals increased from 2013 (52,500 dwellings) to 2018 (63,105 dwellings). Instead of minimal undercount as reported in DataInfo+ metadata, the 2018 results in this paper indicate estimated overcoverage compared with the admin source.
- There are also some differences in the number of dwellings at regional level.

Overall, the use of admin data in the 2018 Census has improved the coverage of sector of landlord. In addition, the 2018 Census used statistical imputation for a wider number of variables than in previous censuses, including sector of landlord. This methodology is applied when there are missing responses (Stats NZ, 2019a), hence, statistical imputation is important to consider alongside the survey responses and admin data to get the full picture of the total census counts and how they relate to the numbers obtained from the admin data.

Our research suggests that some differences between Kāinga Ora and census data can be explained by missing information, misclassification, or differing concepts. If there is no information around landlord type, dwellings would be included in residual categories in census. Misclassification can arise when a census respondent ticks the wrong tenure or landlord type or does not respond at all. These gaps may lead to dwellings being assigned into a different category compared with admin data. Note that subject populations differ conceptually between census and admin data. Census collects attribute information (such as landlord type and tenure) for private occupied dwellings only. In the census, dwellings where residents were away, or were unoccupied as at census night, are excluded.

Results when comparing linked data

We investigated possible misclassification in census data based on the comparisons made with admin data by using the linked datasets in IDI which can be compared at the address-level. This linking enabled comparison of the census classification of tenure of household and sector of landlord with Kāinga Ora data. This analysis showed that:

- We were able to link 90 percent of all Kāinga Ora dwellings with respective Kāinga Ora dwellings in census in 2018 data, and 76 percent of all Kāinga Ora dwellings in 2013.
- Some of the remaining 10 percent (in 2018) and 24 percent (in 2013) of Kāinga Ora dwellings were found elsewhere in census indicating either:
    - evidence of misclassification in census with a mismatch of the tenure of household or sector of landlord information compared with admin data
    - linking issues which can occur when there is a problem with an address ID (such as incorrect information, or when there is more than one dwelling at an address)
    - both issues combined.

Overall, differences in coverage and classification can be due to a combination of reasons, such as insufficient information provided; non-response; response, processing, statistical imputation, and linking errors; or a dwelling being unoccupied.

Kāinga Ora data provides a good source of dwellings for this category of sector of landlord

Our analysis supports that Kāinga Ora provides an important source of data for this landlord category in the census context, for future censuses, and for other housing information needs. The importance of using and understanding the Kāinga Ora as a source is highlighted by the comparisons with past censuses where a key change for this variable was going from too few to too many properties. Based on the findings of this research, we recommend prioritising Kāinga Ora landlord information (from admin data) over the people's responses in the census forms to achieve better accuracy of data and to reduce coverage differences and risk of misclassification errors for this subset. We also note that additional considerations towards statistical imputation are required in this context. If Kāinga Ora data is used to determine the sector of landlord (for rental tenure), statistical imputation should be avoided for this category as we would have a complete set of Kāinga Ora dwellings and therefore adding imputation might lead to an overcount. Note the recommendation to prioritise the admin data for sector of landlord applies to Kāinga Ora dwellings only as we do not have complete datasets for other landlord categories. It is also important to note that this conclusion applies to the identification of this category of dwelling in census or other statistical collections.

For the context of 2023 Census, this recommendation differs from the high-level design principle which is to respect people's intended response as a first source of information. Our recommended approach is supported by a source which we regard (based on the assumptions of coverage, findings, and investigations supported by metadata) to be accurate for this small, yet important, subset of dwelling and household data.

Introduction

This section introduces the contextual information around census and the census transformation programme. It also looks at social housing information needs and what data is available.

Social housing is a small yet key subpopulation of rental dwellings in New Zealand, and it is of considerable policy interest. This is rental housing that is provided by public (that is, central and local government) agencies and organisations, such as Kāinga Ora. In the New Zealand context, this is often referred to as 'social housing' or 'public housing', and these terms have been used somewhat interchangeably. In general, social housing provides affordable housing for those in need. Many, yet not all, tenants are eligible to receive an income related rent (IRR) subsidy (Housing Shareholders Advisory Group, 2010; Johnson et al, 2018).

> In the international literature, social housing can be defined, for example, as "housing that is provided and managed by the state (i.e., public housing) or that of nonprofit entities such as housing associations and community housing providers" (International Encyclopedia of Human Geography, 2020).

Since 2014, Te Manatū Whakahiato Ora – Ministry of Social Development (MSD) has been administering the assessment of people's needs for social housing. To be eligible for being placed on the Social Housing Register there must be a serious housing need (Johnson et al, 2018; McKenzie, 2023). Tenants are assessed as being either category A (at risk) or category B (serious housing need). The number of households urgently requiring housing has been increasing (Stats NZ, 2020b) as can be seen in the changes over time on the MSD's Housing Register waiting list. In March 2023, this list included 24,081 applicants (see figure A1 in Appendix 1).

Besides the changes in number of households in need, there has also been changes in the way census data has been collected, as well as changes to social housing providers in the periods over the three most recent censuses (2013–2023). For example, Kāinga Ora housing stock can decrease if there are lease expirations, demolitions, sales, and property transfers that are commonly made for the CHPs (Tūāpapa Kura Kāinga – Ministry of Housing and Urban Development, HUD, n.d.b). This paper focuses on the housing stock by the biggest social housing provider in New Zealand, Kāinga Ora, and understanding the quality of information available from the census and admin data.

Census transformation in New Zealand

The census in New Zealand is a census of population and dwellings where information about the dwellings people live in, including social housing, is an important aspect. Stats NZ's Census transformation programme looks at the future direction of the New Zealand census, working towards a census based on administrative data supported by sample surveys. This work also underpins the use of administrative data in the 'combined' census model of the 2018 and 2023 Censuses, where the traditional full-field enumeration approach is supported by using administrative data when responses are missing.

Continuing to meet critical information needs must underpin decisions on the future of census. Investigations into the long-term direction for census are focused on developing an understanding of future census information requirements, and the ability of administrative data sources to meet those requirements.

About this paper

This paper is one of a series of investigations by the census transformation programme to identify and explore the potential of administrative data sources to provide census-type information. Links to related publications, which cover topics specific to housing, are available on Stats NZ's Census transformation programme webpage.

The previous census quality assessments from 2006, 2013, and 2018 have seen a change in the estimated counts of Kāinga Ora dwellings in census. These estimates have gone from large undercount to minimal undercount. These undercounts prompted a need for further investigation to understand the coverage and the accuracy of census data for this landlord as we have a comprehensive admin data source available. Understanding this data further could enable a richer use and understanding of it to inform future censuses and other related uses.

The 2018 Census was the first time that alternative sources (including admin data) were used to mitigate non-response in New Zealand's Census (Stats NZ, 2019a). As part of the census transformation programme, the preliminary results of the investigations based on 2013 Census context resulted in the use of Kāinga Ora data to supplement census responses in the 2018 Census. It is important to build a clear understanding of the quality of admin data, as the 2023 Census continues to use admin data in the combined model (Stats NZ, 2022e).

Various sources can provide information about social housing in New Zealand, including different surveys or admin data sources. Previous census transformation work identified data from Kāinga Ora (Housing New Zealand Corporation) as a potential source of census-type information for the social housing variables. Early research concluded that admin data could 'possibly' satisfy data needs around 'sector of landlord' (O'Byrne et al, 2014). Housing information overview by Bycroft et al (2021) included more detailed assessment of Kāinga Ora data around its coverage and quality for the available housing information attributes in the context of 2013 Census. At the time of this overview paper, tenancy bonds data was being looked at as another source for the sector of landlord information.

This paper expands the previous work by investigating the coverage of Kāinga Ora dwellings in census from 2013 to 2018 using the data available in Stats NZ's IDI. The IDI data used in this investigation are described in the Data sources section. Adding a comparison over time is an important extension of this work to understand the impact of using admin data to supplement census responses. Kāinga Ora was chosen as the specific data source given the dominance of this provider in the social housing sector. In this investigation the estimates of admin data coverage are experimental and are used only for comparing with the census information.

If Kāinga Ora data proves robust, in the future it may be possible to link tenants to other datasets in the IDI to provide further breakdowns by other characteristics. This expansion would enable researchers to use the data as a basis to explore topics such as life trajectories for people experiencing severe housing deprivation.

For clarity, it is important to define some terms used throughout this paper. Firstly, we start by the definition of social housing and how Kāinga Ora fits under that. The terms undercount and overcount of dwellings are typically used in the census context where the estimated counts either exceed or are lower than expected. Another term, coverage, has been used in the quality assessment framework context, where it has been used to describe representativity of the target population (Bycroft et al, 2021). These terms are related but are used here for different emphasis. Another important definition for this paper is misclassification, and what is meant by it. Finally, working with multiple datasets in the IDI requires combining the sources with a common

identification key (here, address ID). For the purposes of this paper, we define these terms in the boxed section below.

Social housing (or public housing) is part of the social support system in New Zealand that provides long-term tenancy security for those in need (HUD, n.d.a) for example by Kāinga Ora and different CHPs. While census includes Kāinga Ora as a 'sector of landlord' for the purposes of their classification, in this paper we refer to the broader international definition of social housing as a sector that provides accommodation for those in need. **Kāinga Ora** is a major **landlord** under this sector.

Estimated **undercount** and **overcount** have been used in Stats NZ's DataInfo+ metadata when talking about published official outputs from census data on Kāinga Ora landlord when compared with expectations based on aggregated counts of Kāinga Ora dwellings.

Undercoverage and **overcoverage** are used when talking about the sector of landlord information in census data in relation to how well it represents the Kāinga Ora stock; that is, undercoverage means the Kāinga Ora stock is higher than the number of rental dwellings under Kāinga Ora landlord reported in census, while the overcoverage is a reverse of that. This assessment is based on unit record Kāinga Ora dwelling stock available in IDI, and which allows in-depth comparisons. This definition refers to this specific subpopulation instead of the full dwelling population.

By **misclassification**, we mean a classification at the unit level where there is inconsistency between the sector of landlord categories (or household tenure) between sources keeping the Kāinga Ora data as a reference point.

Datasets about dwellings or houses in IDI include a common address ID (snz_idi_address_register_uid) key. This ID is created by the IDI system via the geocoding or 'linking' of address strings to a reference list of addresses. However, in this paper we use the word **linking** when we *join* the datasets together with these address IDs. These **linked datasets** allow us to do the dwelling (address level) comparisons. In some comparisons, the classification of the landlord and tenure matches in both sources for the same address ID. When they do not *match*, we consider this as evidence of misclassification.

Social housing information needs

Information about social housing is currently collected by Stats NZ in the census, through the sector of landlord question, and in some social surveys, such as the General Social Survey (GSS). The information is used to analyse the characteristics of households renting through different landlords. The classification of landlords includes private, and social (including central and local government housing) sectors (see Classifications and statistical standards section for detail).

In the 2013 Census, 'Local authority or city council' and 'HNZ'[1] were the two social housing categories. In 2018, two new categories were added to the census: 'Iwi, hapū, or Māori land trust' and 'Other community housing provider'. While the population in social housing is of high policy importance, there have been limitations in these data sources because of infrequent information, undercount or overcount (census), and small sample size (social surveys).

There is considerable interest in data around social housing, including Kāinga Ora housing (Chisholm et al, 2022; Russell et al, 2023; Smith & Davies, 2020). Robust and comprehensive statistics are needed by various users of the data such as central and local government, planners, developers, and

[1] Housing New Zealand (HNZ), the naming convention at the time for Kāinga Ora.

iwi, hapū, and Māori entities; as well as in research. 'Sector of landlord' has relevance in specific areas, such as affordability or tenure security. It is used as a benchmark against which housing administrative data is assessed and developed; to enable Kāinga Ora to assess whether it is meeting its social objectives as required by law; to analyse the characteristics of households who rent through different landlords; to identify iwi and Māori households to inform Māori housing policy; and to provide information for the consumers price index. Information on Stats NZ's Datainfo+, Sector of landlord (information about a variable and its quality), discuss these needs in a census context. Census housing variables are available for small geographic areas and for the households and individuals living in them. The census is unique in its ability to provide these breakdowns.

As listed above, housing statistics are an important source of information for iwi and Māori and there are demands on information around housing and related issues. Some example uses of housing information include the Housing Aotearoa report (Stats NZ, 2020b), MAIHI Ka Ora – the National Māori Housing Strategy (HUD, 2021), and Waitangi Tribunal Kaupapa inquiry (Wai 2750). See WAI 2750 Housing Kaupapa Inquiry and Wai 2750 Housing Policy and Services Kaupapa Inquiry links for more information.

MAIHI Ka Ora (HUD, 2021) notes the importance of delivering successful housing outcomes for Māori. The 2018 Census data showed that 50 percent of Māori lived in rental dwellings compared with 33 percent of the New Zealand population (HUD, 2021 p.41), and Māori and Pacific renters are more likely to be Kāinga Ora tenants than the total population (Stats NZ, 2020b). For iwi and Māori, high-quality information on how many homes and where social housing is located is crucial. Having better information for iwi and Māori who live in rented housing under this category of landlord is particularly important under the combined census model with the greater use of admin data. This contextual information helps to support the aim of meeting iwi and Māori data needs as Stats NZ is "committed to delivering better quality data with and for iwi, hapū, and Māori" as outlined in their statement of strategic intentions (Stats NZ, 2021b p.4).

Census housing information

Census is a key instrument for understanding social housing and other dwelling information in New Zealand. While the traditional census responses have been collected directly from people and households, the more recent approaches have been utilising admin data sources and applying combined models (Stats NZ, 2022e, 2019b).

Census housing information consists of a combination of all dwellings and dwellings under different categories, divided at a high-level into private and non-private dwellings (NPDs). The housing information includes:

- **all dwellings:** dwelling counts, dwelling type, occupancy status (occupied dwelling, unoccupied dwelling, dwelling under construction)
- **occupied private dwellings:** number of rooms and number of bedrooms, tenure of household, sector of landlord, weekly rent paid by households, fuel type used to heat dwelling, and housing quality (dampness or mould in the house, and access to basic amenities).

Information on dwelling characteristics is not collected for NPDs or unoccupied dwellings. However, as NPDs are excluded from almost all other surveys the census provides an opportunity to count these dwellings (Stats NZ, 2017). There is also a practical need to have data of all dwellings, including information around emergency and transitional housing which provide temporary short-term accommodation solutions for people (HUD, 2023; Laing et al, 2018; Work and Income, n.d.). However, these types of housing were ruled out of scope in this research paper although some of

Kāinga Ora or CHP properties may occasionally be used for transitional housing or emergency housing for the temporary need situations (Kāinga Ora, 2023b; Laing et al, 2018; McKenzie, 2023).

In the 2018 Census, there were also some changes in housing variables compared with previous censuses. New landlord types were added, along with the new questions about housing quality (Stats NZ, 2017). In addition, the methodology to determine dwelling occupancy status included use of admin data where these dwellings were classified as 'unoccupied – residents away' as explained in DataInfo+ Dwelling occupancy status (information about this variable and its quality).

Prior to our investigation, it has been identified that an undercount of Kāinga Ora dwellings had been an issue in 2013 and censuses preceding that as noted in Sector of landlord 2013 Census (information about this variable and its quality). The 2013 Census reported that:

> The figure for those renting from Housing New Zealand is estimated to be an undercount of about 18 percent, based on a comparison with Housing New Zealand's administrative records. This difference could be due to several factors, such as tenants being away on census night and poorer quality response to the census from these households. (Stats NZ, 2014, p. 15)

Other possible reasons for the undercount include processing and classification errors. The Kāinga Ora dwellings are part of the subject population of rental households, which includes only the dwellings where it is recorded that rental payments are made. If sector of landlord information was missing, the dwelling would not be included under that category which contributed to the undercount.

In the 2018 Census, data from Kāinga Ora was used as an administrative source to supplement non-response. The 2018 Census information by variable (sector of landlord) states that:

> The data on households renting from Housing New Zealand Corporation is more complete for 2018 due to the use of administrative data. There is minimal undercount of these households in the 2018 Census data (less than 1 percent). Previously the undercount of these households in the census was estimated to be 18 percent in 2013 and 25 percent in 2006, based on a comparison with aggregate Housing New Zealand Corporation data on the number of occupied dwellings.

In general, the differences between census and aggregated comparisons with Kāinga Ora data have been regarded as an undercount. The assessments of undercounts were based on a comparison between aggregate level of number of Kāinga Ora properties and the census counts, and were conducted as part of the census quality investigations at the time. These aggregate level assessments, while comparable, are not conceptually identical.

The key change was going from the undercount in 2013 to too many Kāinga Ora dwellings in 2018. This issue prompted our investigation. We focused on detailed comparisons at the unit-level to allow an assessment of quality for the purpose of using admin data for official statistics.

Other sources of social housing information

Other sources of social housing information include admin and survey data relating to Kāinga Ora properties in New Zealand.

Kāinga Ora is currently the largest social housing provider in New Zealand. As at March 2018, they had over 60,000 properties (Kāinga Ora, 2023a). Kāinga Ora publishes aggregate level Housing statistics on their managed stock and vacant properties. The unit record data is available in Stats NZ's IDI.

Stats NZ's General Social Survey includes questions around housing. Where people say they are living in rental housing, GSS asks about their landlord type including Kāinga Ora. As this is a sample survey, any analysis of this sub-category of Kāinga Ora landlord is limited due to sample size. This data is also available in the IDI.

There are some other sources that also include social housing information, such as tenancy bonds data from Tenancy Services, which is part of Ministry of Business, Innovation and Employment (MBIE). This data is also available in the IDI. However, while it has good information for other sector of landlords, it was considered as less suitable for investigation of Kāinga Ora landlord due to gaps in coverage (Bycroft et al, 2021). In addition, Kāinga Ora tenancies no longer require a bond from April 2019 (Kāinga Ora, 2020), hence, newer tenancies (under the Kāinga Ora landlord) will not be present in this data.

Housing data from these alternative sources may show differences from census data for several reasons. There could be differences in scope, coverage, and response rates; data being collected at different periods of time; alternative sources being sample surveys (subject to sampling errors); differences in question wordings, collection context, and collection mode. For Kāinga Ora, there have been changes over time which may affect responses people provide on census forms. These changes include some houses have been transferred to other providers. In addition, in 2014 MSD started to manage the housing needs application process, taking this function from Kāinga Ora and leaving Kāinga Ora to focus on providing homes and managing the housing stock. These changes might have impacted on tenants recalling who their landlord is with potential effects on their census responses. Appendix 5 provides more detail on these changes based on the McKenzie (2023) report.

Aims and research questions

The purpose of this paper is to examine the potential use of Kāinga Ora data to derive social housing statistics for this category of landlord. Stats NZ used this data to improve the count of Kāinga Ora dwellings in the 2018 Census; 2023 Census used a combined census model by design, including use of this data. Census transformation work contributes to this approach by providing research-based evidence.

The **aim** of this paper is to investigate the coverage of Kāinga Ora dwellings by comparing admin and census data across the 2013 and 2018 Censuses. The following **research questions** guided our work.

- Is it reasonable to assume that Kāinga Ora data is a complete or close-to-complete reference dataset for this sector of landlord sub-category, and does the source agency support this assumption?
- What is the coverage of Kāinga Ora dwelling information derived from census data?
- How does this information compare with Kāinga Ora admin data at the level of tenure classification and sector of landlord classification?
- How does census social housing data compare with Kāinga Ora data, and how has this changed between the 2013 and 2018 Censuses?

This paper provides reference information about the statistical concepts for the variables and describes how these are collected in census and through admin data collection processes. We present findings from analyses comparing Kāinga Ora data to census at an aggregate-level, and at a dwelling-level (address-level), using linked data in the IDI. Understanding this data further could enable a richer use and understanding of the potential of admin data to inform the 2023 Census and future censuses, and other housing information needs.

We have conducted coverage analysis at a national level, and at a subnational level. No other breakdowns have been used in this context, but previous research has looked at the quality of other variables in Kāinga Ora data, such as weekly rent and number of bedrooms (Bycroft et al, 2021).

Method

In this investigation, we evaluate the potential to derive census-type information for social housing dwellings from the Kāinga Ora administrative source using the following steps.

- We describe the formal statistical concepts relevant to housing used in official statistics. Statistical standards and classifications provide the concepts and definitions against which both census and administrative sources are compared.
- We describe the data sources: Kāinga Ora, and 2013 Census and 2018 Census, in the IDI.
- We compare the data sources at three levels:

    1. **Concepts and definitions** of census and Kāinga Ora data, leading to identification of important differences. These comparisons are guided by the descriptions of each data source.
    2. **Aggregate counts and estimates** to inform coverage of the Kāinga Ora dwellings, and are done with non-linked data (that is, sources compared not at unit level).
    3. **Dwelling-level information**, using linked data in the IDI, we compare the Kāinga Ora data with the same dwelling from the census responses to investigate classification similarities and differences.

Comparing the concepts, and aggregate and dwelling-level comparisons, helps us understand the quality of administrative data at its source. As with other census transformation research, we applied the quality framework to assess the accuracy of data sources (Bycroft et al, 2021; Stats NZ, 2016; Zhang, 2012) focusing on representation and measurement error (or agreement).

In the quality assessment framework, representation reflects the degree to which administrative data is available for the ideal target population and is mainly quantified through a coverage measure. Besides coverage, representation is also dependent on the correct identification of dwellings as a statistical unit (Bycroft et al, 2021) which means it is important to review how well the statistical units are defined and whether the proxy of address IDs represents these units. Next, comparing data at the unit level (dwelling/ address level) provides insight on agreement between sources. Using the linked datasets allows us to check the classification of dwellings by their tenure and sector of landlord. Where the sources differ, we define it as an indication for potential misclassification. While it is not always clear which source is more accurate, in this investigation we assume the Kāinga Ora data to be most accurate, as they hold admin records about their houses.

Administrative units or **statistical units** are defined by each data source. For the sector of landlord, census defines its target population as: 'Households in rented occupied private dwellings, that is, households that do not own their home or have it in a family trust and who are paying rent.' In this paper, we are looking at the households who rent from Kāinga Ora. However, the census field enumeration is designed around collection of data for **dwellings**. In Kāinga Ora data, the unit of interest is the **house** at a given address. In this analysis, we used the term **dwelling** for a unit as the research centres around the census context. Since there is no common dwelling ID between sources, we use address ID as a proxy for a dwelling. Our final target population is therefore all 'rented occupied private dwellings' where the landlord is Kāinga Ora.

The ability to integrate information with other sources by linking the same units also affects accuracy. This can result in two types of linkage errors: links may be missed and/or two dwellings may be wrongly linked. If the wrong dwellings are linked between the data sources, this may artificially inflate measurement errors because the wrong comparisons are being made. Another challenge in this context is the multiple dwellings with the same address ID which can make it harder to link the dwellings accurately. See also the section Integrating the datasets in the IDI in this paper.

Concepts and classifications

This section introduces the information of concepts and classifications for the variables of interest in this paper.

Stats NZ's Ariā (concept and classification management system) provides definitions for the key variables in this investigation. These concepts and classifications are designed as standards for use in official statistics collections, such as the census.

The key focus of this investigation is the social housing dwellings, as defined by the sector of landlord variable. We also consider the definition of households and tenure of household which define the census rental dwellings population. Weekly paid rent contributes to the derivation of tenure of household but is not discussed in this paper as the quality assessment for it has been covered elsewhere (Bycroft et al, 2021). The final definition included here is the occupancy status.

Household

In the census context, a household is defined as consisting of one person usually residing alone, or two or more people who usually reside together in a private dwelling. Households are classified according to the relationships between the people in the household. Household composition is based on how many and what type(s) of family nuclei are present in a household, and whether there are related or unrelated people present.

As noted by Gath and Bycroft (2018, p. 42): "a key concept in these statistical standards and in the census is that families and households are formed from people who live together in the same dwelling, and that the dwelling they share must be a private dwelling. One household occupies one private dwelling. However, not all dwellings have an associated household, because some dwellings are non-private, some are unoccupied, and some are occupied by visitors rather than usual residents."

This is useful to remember when comparing across different data sources with differing collection contexts.

Tenure of household

'Tenure of household' is a derived variable which classifies households in private dwellings according to whether the household rents, owns, or holds the dwelling in a family trust, and if payment is made by the household for the right to reside in the dwelling.

Classification

'Tenure of household' is a two-level hierarchical classification with eight categories at the highest level and 14 categories at the lowest level.

Private occupied dwellings can be divided into different categories based on their household tenure information. The categories at level 1 are:

- dwelling owned or partly owned
- dwelling not owned and not held in a family trust
- dwelling held in a family trust
- residual categories.

Rental dwellings belong under the category 'dwellings not owned and not held in a family trust' of household tenure, which is further split as follows:

- dwelling not owned and not held in a family trust, rental arrangements are not further defined (category 20)
- dwelling not owned and not held in a family trust, rent payments made (category 21)
- dwelling not owned and not held in a family trust, rent payments not made (category 22).

Only category 21 is classified as 'rented' in the outputs for the 2013 and 2018 Censuses.

Sector of landlord

For renting households, 'Sector of landlord' refers to the type of organisation or person from whom households rent or lease private occupied dwellings. It can be private sector (person, trust, or business), or state sector.

Classification

The standard classification of 'sector of landlord', as presented in table 1, is a flat classification with four categories in 2013 and six categories in 2018, including Kāinga Ora. In 2018 Census, two additional 'sector of landlord' categories were added to reflect changes in social housing composition: 'other community housing provider', and 'iwi, hapū or Māori land trust' (Stats NZ, 2017). In addition, both classification versions have a set of residual categories (not elsewhere included).

Table 1

Classification of sector of landlord categories in 2013 and 2018 Censuses

Classification categories	2013 Census	2018 Census
Private person, trust, or business	√	√
Local authority or city council	√	√
Kāinga Ora/Housing NZ(1)	√	√
Iwi, hapū, or Māori land trust	…	√
Other community housing provider	…	√
Other state-owned corporation or state-owned enterprise, or government department or ministry	√	√
Not elsewhere included	√	√
Don't know	√	√
Response unidentifiable	√	√
Not stated	√	√

1. In 2013, Kāinga Ora was known as Housing New Zealand Corporation.

Symbol: … not applicable

Source: Stats NZ (2014 – tables); Stats NZ: Ariā – Classifications: Census Sector of Landlord 2018

Occupancy status

The concepts of occupancy status differ between the census and admin data due to the differences in how data is collected (Stats NZ, 2019b).

In census, dwellings are classified as occupied and unoccupied on census night (and unoccupied dwellings are further classified as either residents away, or empty dwelling). The 2013 and 2018 Censuses use Dwelling Occupancy Status standard classification which is *de facto* occupancy concept that indicates whether the dwelling has occupants on **census night**, but not whether the dwelling is usually occupied. This is due to the requirement of completing the census dwelling form as at census night. In contrast, admin data applies a concept of 'usual occupancy' (Bycroft et al, 2021) where the dwelling is usually occupied but it does not require people to be present on census night.

Data sources

This section describes the data sources used in this investigation: the New Zealand Census of Population and Dwellings, and Kāinga Ora data. Specifically, we describe the population related to Kāinga Ora in each source. We also describe the construction of the linked Kāinga Ora–Census dataset, and the populations used in our analysis.

Datasets used in this investigation are accessed through Stats NZ's IDI using the June 2021 refresh.

New Zealand Census of Population and Dwellings

The New Zealand Census of Population and Dwellings is an official count of people and dwellings in New Zealand. It provides a snapshot every five years, with some exceptions. The most recent censuses are from March 2013, 2018, and 2023.

The census aims to count all dwellings in New Zealand on census night. Dwellings are classified as occupied and unoccupied, as well as distinguishing between private dwellings and non-private dwellings. This research paper focuses on occupied private dwellings where a key definition is around the occupancy status.

The 2023 Census continues to use the combined model where the responses are collected from the census forms and from the administrative data (Stats NZ, 2021a). The high-level design of this model states that the model "will continue to respect respondents' answers in the forms, with minimal-change methods implemented for data processing" (Stats NZ, 2021a p.28).

Dwelling type in census is all dwellings according to their structure and function, such as between private and non-private dwellings. As defined in the Dwelling type description, a **private dwelling** accommodates a person or a group of people and is not generally available for public use, and the main purpose of these dwellings is a place of habitation. Private dwellings may be considered part of housing stock (houses, flats, units, townhouses and apartments, independent self-care units in retirement complexes, dwellings within an NPD structure or complex, and those attached to a business or institution), or not part of housing stock (dwellings in a motor camp, mobile dwellings, improvised dwellings, places of habitation with no dwelling, and vehicles or vessels lived in).

Non-private dwellings provide short or long-term communal or transitory type accommodation. They are generally available to the public. The NPDs include backpackers, guest accommodation, hotels, motels, youth hostels; camps, communal staff quarters, hospitals, and institutional complexes; bed-and-breakfasts, farm stays, and home stays.

Housing information in the census

The census uses the statistical standard for tenure of household and sector of landlord information as described in the Concepts and classifications section. Rental dwellings are derived from the household tenure, sector of landlord, and rent information. Housing information is collected on the dwelling form that is filled in by a resident once for each private occupied dwelling (see the 2013 Census dwelling form and the 2018 Census dwelling form available in the Stats NZ's Store House).

A practical limitation of published census housing attributes is that they are only available for the dwellings occupied on census night (that is, people are at home at census time, and the dwelling is not 'empty'). Therefore, when comparing administrative records with census data, there is unlikely to be a perfect match. Furthermore, while census provides a point in time estimate, the information can be used to inform estimates and projections for other work which can cover other time points or longer time periods.

Table 2 shows that around 10 percent of private dwellings in the 2013 and 2018 Censuses were unoccupied. While the total number of unoccupied private dwellings have remained similar enough between the two censuses, there has been a shift between the size of different subcategories of unoccupied dwellings. In 2013, 44,079 (or 3 percent of all private dwellings) were classified as having residents away and the remaining 141,366 were considered empty. In 2018, the number of private dwellings with residents away more than doubled (to 97,449), and the number of empty private dwellings was 94,197. Any comparisons in these categories must be treated with caution and there is likely to be a combination of real-world effects (such as the effect of Canterbury earthquakes on the 2013 Census (Goodyear, 2014)) along with methodological changes to census collection (Stats NZ, 2019c).

Table 2

Occupied and unoccupied, and dwellings under construction
2013 Census and 2018 Census published outputs

Dwellings	2013 Census				2018 Census			
	Total	Private	Percent of private	Non private	Total	Private	Percent of private	Non private
	Count	Count	Percent	Count	Count	Count	Percent	Count
Total	…	1,757,160	100	…	1,886,517	1,871,934	100	14,583
Occupied	1,570,695	1,561,959	89	8,739	1,673,880	1,664,313	89	9,567
Unoccupied	…	185,445	11	…	196,506	191,649	10	4,860
Residents away	…	44,079	3	…	98,664	97,449	5	1,218
Empty	…	141,366	8	…	97,842	94,197	5	3,642
Under construction	…	9,753	<1	…	16,128	15,972	<1	159

Symbol: … not applicable

Source: Stats NZ: occupied dwellings, unoccupied dwellings, and dwellings under construction in NZ.Stat

The relevant census housing variables for the investigation are sector of landlord, and tenure of household. In census, these variables are included within the subject population of households in occupied private dwellings. Sector of landlord is only reported for the rental households that pay rent. These variables are Priority 2 level in the 2018 Census (referred to as a defining variable in the 2013 Census) which means they cover key subject populations that are important for policy development, evaluation, or monitoring. The weekly rent paid variable is also important in this context as it is used in census to help derive household tenure. Bycroft et al (2021) includes a comparison of weekly rent information between census and Kāinga Ora data.

Census quality ratings are used to assess a variable's fitness for use and outline possible practical concerns. These ratings are provided by Stats NZ, and for 2018 Census also by the External Data Quality Panel (EDQP) which was established to provide an independent assessment of the methods used in 2018 (2018 Census EDQP, 2020).

Tenure of household was given a quality rating of 'moderate to high' in 2013, and 'moderate' in 2018, both by Stats NZ and the EDQP. Sector of landlord was rated as 'high' quality in both censuses by Stats NZ, while EDQP did not assess this variable in 2018. These ratings are reported for the variable as a whole and no specific rating is available for the rental population with Kāinga Ora as their landlord, which is only a small subset of all landlords.

Table A1 (in appendix 1) summarises some key points on the quality assessment of data from the 2018 and 2013 Censuses for sector of landlord and household tenure, including the level of census non-response or no information which influences on the quality ratings.

2013 and 2018 differences

Census aims to count all dwellings in New Zealand. How Stats NZ has dealt with missing information has changed over the years. The 2013 Census created substitute dwellings when it was known this dwelling existed, but no forms had been received (Stats NZ, 2022d). However, it was not known whether these substitute dwellings were occupied or unoccupied on census night. There was also no further attribute information for these dwellings. In contrast, the 2018 Census used the 2013 data, admin data, and statistical imputation to reduce the total number of records with no information. The 2023 Census continues using the combined model (Stats NZ, 2022a).

In 2013, the non-response rate for the tenure variable was 5.1 percent, of which 4.0 percent were substitute records. The non-response rate for the sector of landlord, which is the subset of tenure of household of those classified as renting, was lower at 1.0 percent. It is not known how many of these 1.0 percent might have been Kāinga Ora rental households. 'Don't know' is a valid response category for landlord and is not classed as non-response.

In 2018, the use of admin data and statistical imputation meant that the no-information category was much lower for tenure of household (<0.1 percent), and for sector of landlord (0.2 percent).

As detailed in table 3, administrative data contributed overall:

- 2.7 percent of the tenure of household responses (out of a total of 1,653,792 households, table A3, appendix 1)
- 12.3 percent of the sector of landlord responses (out of a total of 527,058 households, table 4).

Kāinga Ora data was not a single contributing admin data source as MBIE's tenancy bond data was also used for the household tenure and sector of landlord information.

A further 2.9 percent and 8.2 percent of tenure of household and sector of landlord responses, respectively, came from statistical imputation. Statistical imputation is another method used to add a value in the dataset when there is non-response or the response is not useable (Stats NZ, 2019a).

Table 3

Different data source contributions on tenure of household and sector of landlord variables in 2018 Census		
Source	Tenure of household in occupied private dwellings	Sector of landlord in rented occupied private dwellings
	Percent	Percent
Response from 2018 Census	91.5	79.4
2013 Census data	2.9	0.0
Administrative data	2.7	12.3
Statistical imputation	2.9	8.2
No information	<0.1	0.2
Total	100	100
Source: Stats NZ DataInfo+ Tenure of household (information about this variable and its quality) and Sector of landlord (information about a variable and its quality)		

In 2013 there was a large undercount of Kāinga Ora dwellings (an estimated 18 percent). Undercount was also an issue in 2006 (at an estimated 25 percent). In 2018, on the other hand, undercount was much less of an issue for sector of landlord. As noted by EDQP:

> "The use of admin data to identify households who rent their home has improved. Likewise, the use of information on sector of landlord in the derivation for tenure of household is new to 2018 and will have improved the derivation of households in the 'do not own or hold in a family trust' category. These changes may have impacted on trends since 2013 at this level" (EDQP, 2019 p.107).

Variables used in this analysis include tenure of household, sector of landlord, address ID (snz_idi_address_register_uid), and geographies by regional council and urban/rural split. For details about coverage, quality, and other information for census housing data see metadata available in Datainfo+ (see table A1), 2013 Census QuickStats about housing (Stats NZ, 2014), and in IDI data dictionaries (Stats NZ, 2022b, 2023).

Kāinga Ora data

Kāinga Ora is a Crown agent that provides housing services for people in need. They focus on the management of state houses, and the tenancies of those living in them, to meet demand from the MSD's social housing register. Kāinga Ora own or manage more than 60,000 properties nationwide over the period 2013 to 2024 (as reported in Kāinga Ora's Housing statistics and Housing Statistics - Archive). A key assumption we made specific in this paper is that they have an exact record of all their properties. This assumption implies that there should be no undercoverage or overcoverage, and this data is the most accurate available. However, when dealing with any data source there is always a possibility of some errors or limitations in data meaning the assumption of complete coverage may not completely be validated.

The data available in the IDI has a record of Kāinga Ora houses and their tenants. In this investigation, data on tenants were out of scope.

Kāinga Ora corporation datasets

The housing data from Kāinga Ora is presented under different tables in the IDI, such as 'tenancy', 'houses', or 'household' snapshots. In this investigation, we used the 'houses snapshot' as the focus is on the dwelling stock and coverage. The admin reporting unit is a 'house', which can be understood to be the same concept as the statistical dwelling unit.

The 'houses snapshot' dataset provides the population of dwellings we are interested in, which is social housing from Kāinga Ora[2]. This data includes monthly snapshots from April 2000, as well as some records back to June 1993 (Stats NZ, 2022c). Each record is identified by a house ID. We used the snapshots from 31 March 2013 and 31 March 2018, which are the months of census dates: 5 March 2013 and 6 March 2018. The snapshots include information of data at that particular date. Any changes in the values in data that occurred within the month before the month end date are not captured in that dataset, meaning that the same house ID should not have two different statuses in a monthly snapshot. We chose these snapshots as they include the census dates. The dataset also includes variables on the address ID (snz_idi_address_register_uid), occupancy status (hnz_hs_occupancy_status_text), and the regional council and urban/rural geographies.

In this investigation, we focused on the 'usually occupied' houses at the time of the census. This approach is close but not the same than the one used in census (occupied at census night) as it is unknown if the tenants were present in the dwelling on census night.

Stats NZ (2022c) metadata provides details about coverage, quality, and other information of Kāinga Ora data in IDI.

Derivation of housing information from Kāinga Ora data (sector of landlord and tenure of household)

This section describes how we derive housing information from the Kāinga Ora (HNZ) data in the IDI. Houses present in these data are, by definition, rented from Kāinga Ora landlord.

Integrating the datasets in the IDI

The IDI is a large research database containing microdata about people and households in New Zealand. Data is gathered from a range of government agencies, Stats NZ surveys, and non-government organisations. Researchers can use the IDI to answer complex questions across subject areas to improve outcomes for New Zealanders. Read the latest information about the Integrated Data Infrastructure.

Much of the research conducted using the IDI uses the individual as the unit of analysis and relies on a system of person-level linkages between the contributing data sources. In contrast, in this investigation the unit of analysis is a dwelling. We treat all units as 'dwellings' including dwellings that households rent (in the census data), and houses (in the Kāinga Ora data). In the dwelling-level datasets these are linked through the address ID attached to the dwelling.

[2] There are some known cases of property transfers of Kāinga Ora stock over the years (see appendix 5). We have considered these transfers in this investigation by including some contextual information when reporting the results.

Address matching and issues when linking sources at the address-level

In the IDI processing, the raw address information is matched to an address in Stats NZ's statistical location register for each dwelling, which is then encrypted to an address ID that is available for researchers.

We assume that the Kāinga Ora house corresponds to the same dwelling in census data if their address IDs are the same. We then use address ID as proxy for dwelling, although it is not a perfect measure (Bycroft et al, 2021). Some issues include:

- The encrypted address ID available may not always be unique to the individual dwelling unit.
- Multiple dwellings can be associated with one address ID, so the ID does not represent just a single dwelling; or a dwelling could have more than one address. The difficulty of defining common population units in the dwellings data is discussed in Bycroft et al (2021).
- Errors in collection and processing of address data at source might lead to missing or incorrect address matching.
- If dwelling information exists, but has a missing address ID, the record cannot be used in the linked data as we are unable to link them to other data sources in IDI. This inability to link all dwellings in the data reduces our ability to investigate misclassification error.
- These issues can lead to incorrect linkages, which may affect the dwelling-level analysis.

In this investigation, similar to Miller et al (2018), we have not removed records with one-to-many or many-to-many matches.

Populations used in analysis

To obtain the most relevant comparison between the Kāinga Ora and census information, we use two different populations for different parts of our analyses. These populations are defined at the aggregate level and at the dwelling (address) level.

'Occupied' houses in the Kāinga Ora data

There are over 60,000 records of house_uids in the March 2013 and 2018 snapshots data available in the IDI with a distribution of different occupancy statuses as detailed in table A2 (appendix 1). Examples include occupied and vacant houses, and houses under renovation (Stats NZ, 2022c).

In this analysis, we selected those dwellings that were 'available-occupied' in the 'hnz_hs_occupancy_status_text' variable. Restricting the data into these categories was done to correspond to the 'usually occupied' definition used in census. This resulted in 63,507 dwellings in 2013 and 60,006 dwellings in 2018 (table A2). Other Kāinga Ora dwellings (that is, not 'available-occupied' by the occupancy status) were considered as additional interest in the analysis to understand possible classification differences compared with census.

There is not always well-defined best practice for deriving the census type information from the admin data sources (Bycroft et al, 2021; Miller et al, 2018); however, in this case the derivation is relatively clear.

Private occupied rental dwellings in 2013 Census and 2018 Census

There was a total of 1,561,956 private occupied dwellings in New Zealand counted by the 2013 Census. In 2018, these counts increased to 1,664,313 occupied private dwellings. See Table 2 above.

Private occupied dwellings can be divided into different categories based on their household tenure information. Only category 21 (Dwelling not owned and not held in a family trust, rent payments made) is classified as 'rented' in the census outputs.

In the 2013 Census published results there were 453,135 private occupied dwellings that were classified as rented. In 2018, the count of this same category was about 75,000 dwellings higher (527,853 dwellings). See table A3 in appendix 1 for more detail.

Table 4 reports the census rental dwellings by the sector of landlord. In 2013, a total of 52,503 dwellings had Kāinga Ora as the landlord, which was an undercount based on what was an expected count for this sub-category (Stats NZ DataInfo+: Sector of landlord 2013 Census (information about this variable and its quality)). In 2018, census counted 63,105 HNZ dwellings, which was an overcount when compared with Kāinga Ora data, see Sector of landlord (information about a variable and its quality) for detail. Overall, for both censuses, the relative size of the Kāinga Ora landlord sector has remained around 12 percent of total rental households (table 4).

This background is useful as we explore the other landlord and tenure categories in census trying to understand coverage and classification of the Kāinga Ora dwellings in census.

Table 4

Rental dwellings by sector of landlord in the 2013 Census and 2018 Census

Sector of landlord	2013 Census		2018 Census	
	Count	Percent of total rentals (stated)	Count	Percent of total rentals (stated)
Private Person, Trust or Business	355,554	83.7	440,025	83.5
Local Authority or City Council	11,307	2.7	11,190	2.1
Housing New Zealand Corporation(1)	52,503	12.4	63,105	12.0
Iwi, hapū, or Māori land trust	...	...	1,674	<1
Other community housing provider	...	...	6,393	1.2
Other State-Owned Corporation or State-Owned Enterprise or Government Department or Ministry	5,373	1.3	4,668	<1
Total households stated	424,737	100	527,058	100
Not elsewhere included(2)	28,398	...	795	...
Total rented dwellings (tenure of household)	453,135	...	527,853	...

1. Naming used in the 2013 and 2018 Censuses for the Kāinga Ora sector of landlord.

2. Consisting of Don't know, Response unidentifiable, and Not stated.

Symbol: ... not applicable

Source: Sector of landlord **2013**: Stats NZ (2014 – tables), **2018**: Stats NZ (2020a – tables); Rented dwellings **2013**: Stats NZ (2014 – tables), **2018**: Stats NZ (2020a – tables, NZ.Stat (stats.govt.nz).

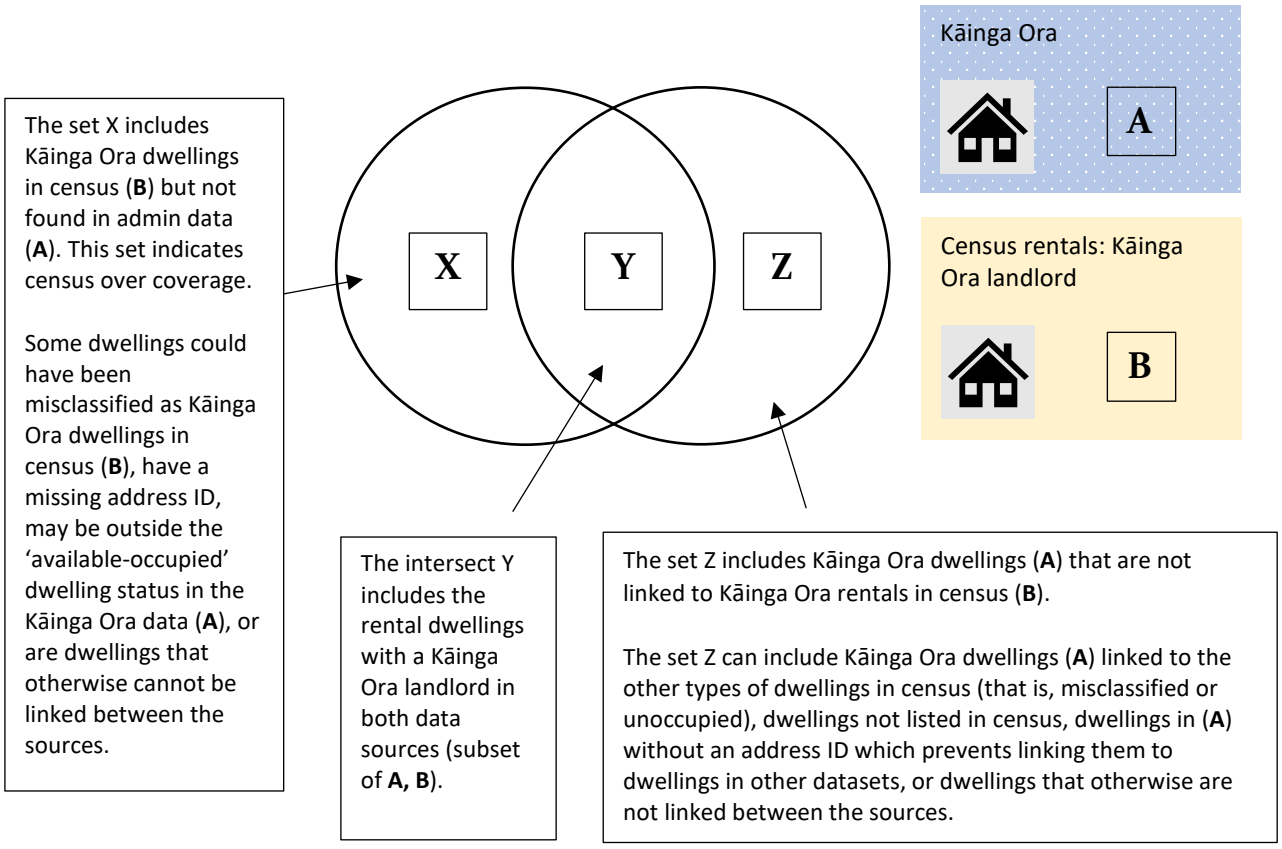
Dwelling level populations

The dwelling-level analyses in this investigation use the linked Kāinga Ora–census dataset. Aligned with previous work (Gath & Bycroft, 2018; Miller et al, 2018), we use an address ID as a proxy indicator of a dwelling although not all address IDs associate with just one dwelling.

Figure 1 shows a conceptual diagram of the linking of the Kāinga Ora data to census data. The dwelling-level comparisons (linked Kāinga Ora–census dataset) were made in two parts: 1) Kāinga Ora houses linked to census rental dwellings with a Kāinga Ora landlord, and 2) Kāinga Ora houses linked to other census landlords and dwellings, such as non-rentals or NPDs. It is important to note that the 2018 Census responses were supplemented by admin data which meant that some comparisons include admin data on both sides rather than purely comparison of census responses to admin data.

Figure 1

Linking Kāinga Ora houses to dwellings in census



Notes on figure 1: Linked data: only the dwellings associated with a non-missing address ID are available for linking.

Results

This section presents results from the comparison of coverage of Kāinga Ora rentals across admin data and the 2013 and 2018 Censuses. Following the standard approach for assessing admin data quality, we first look at the concepts and definitions against the statistical standards. Next, we assess the coverage of these dwellings at national and subnational levels, followed by the dwelling-level comparisons where we identify if the dwelling is misclassified (that is, different between sources).

The results in this paper are based on the IDI June 2021 refresh. All results have been randomly rounded to protect confidentiality.

Comparison of concepts and definitions

The census variables are designed to closely capture the statistical standard for tenure of household and sector of landlord. While the census form includes guide notes, it still relies on the respondents' correct understanding, recall, and willingness to respond.

In the definition of 'tenure of household', Kāinga Ora meets the statistical standard. Tenure of household refers to whether the household owns or holds the dwelling in a family trust. Where this is not the case, the standard identifies whether the household makes a payment (rent) for the right to reside in the dwelling. Therefore, the Kāinga Ora dataset, by definition, includes only rental dwellings.

In the definition of 'sector of landlord', Kāinga Ora also meets the statistical standard; that is, the type of organisation or person from whom households rent or lease private occupied dwellings. The statistical standard was designed to capture Kāinga Ora as a landlord type as it is a major social housing provider in New Zealand and the largest individual landlord category.

There are also differences in the collection mode and context in Kāinga Ora and census. Census is a self-completed form (either paper or online) unless admin data or statistical imputation is used; whereas the information in the Kāinga Ora data is provided by the source agency rather than the tenants.

Subject populations in 2013 and 2018

There are some differences in the subject populations (rental dwellings) between admin and census data, as well as between the 2013 and 2018 Censuses.

In Kāinga Ora data, a house is regarded as usually occupied when it is tenanted. We used the information of occupancy status (that is, available-occupied status) in Kāinga Ora data to derive the concept similar but not identical to the census night occupancy which requires people to be present at census night. Therefore, we can expect some differences between data sources due to conceptual differences.

In census, a dwelling is considered occupied if people are home at census night. If the dwelling is empty or the entire household is away overseas or elsewhere in New Zealand on census night, the dwelling will not be counted as an occupied dwelling. In these cases, no information will be provided by the household about the dwelling. This is largely why the census household count is lower than published estimates of dwellings and households, available from the Stats NZ Dwelling and household estimates: March 2021 quarter.

Furthermore, highlighting a difference between 2013 and 2018 Censuses, admin data was used in the latter if the response forms were missing and/or there were some missing answers in a form. Regarding the occupancy, in 2013, if respondents missed some or all questions on the dwelling form, but the collector (correctly) recorded the dwelling as occupied as at census night, it will be part of the occupied dwelling count but may still miss the sector of landlord information. In 2018, if the same thing occurred, the admin data together with statistical imputation could provide that missing information.

Finally, recording or processing errors are possible in both data sources. All together, these factors combined can contribute to data quality.

Composition of Kāinga Ora data in the 2018 Census dataset

Table 5 shows the composition of data sources contributing specifically to the Kāinga Ora sector of landlord variable. Admin data was used for 23 percent of the responses, which was just under 15,000 dwellings. Compared with all sectors (12.3 percent, table 3), the contribution by admin data was higher for Kāinga Ora. This shows the importance of this admin source in improving the accuracy of this population. Furthermore, the use of admin data reduced the need for statistical imputation for this population. In 2018, 5 percent of the Kāinga Ora subset was provided by statistical imputation which is lower than the overall level for all landlords (8.2 percent, table 3).

Table 5

Contributions of the different data sources on Kāinga Ora sector of landlord variable in 2018 Census

Data source	Kāinga Ora sector of landlord in 2018 Census	
	Count	Percent
Total Kāinga Ora in census	63,105	100
2018 Census form	45,150	72
Admin data	14,802	23
Statistical imputation	3,153	5
No information	S	S

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Symbol: S suppressed

Source: Stats NZ's IDI

Coverage of Kāinga Ora dwellings in census

This sub-section compares how well data from the 2013 and 2018 Censuses cover our target population: rented private dwellings from Kāinga Ora, using data in the IDI. We regard Kāinga Ora admin source as a full list of their dwellings that are 'usually occupied' around census night. This provides a base for comparisons of completeness of census data relative to the Kāinga Ora data.

Table 6 summarises the number of dwellings from Kāinga Ora based on the agency data and census data. The Kāinga Ora source contained 63,507 dwellings in 2013 and 60,006 dwellings in 2018. This decrease in the number of state houses between 2013 and 2018 occurred as a result of a

combination of sales and demolitions (Johnson et al, 2018) and property transfers (McKenzie 2023, appendix 5). The Government Housing Dashboard, by HUD, provides further information on changes in public and transitional housing in New Zealand.

In terms of coverage, we estimated 17 percent undercoverage for the 2013 Census compared with Kāinga Ora (table 6). This aligns with the reported undercount of 18 percent at the time of 2013 Census (Stats NZ, 2014). For 2018, we estimated a 5 percent overcoverage. The use of admin data to supplement responses resulted in a higher number of Kāinga Ora dwellings in the 2018 Census dataset than in 2013. This meant that the actual number of Kāinga Ora dwellings in census was higher than in admin data, and is one key finding of this research.

We would not expect the admin data sources to be completely aligned with census because of the differences in the way they are collected and measured. We would also expect the census count to be slightly lower as some people might be away on census night and there may be some non-response, resulting in no dwelling information being collected. Therefore, having 5 percent higher coverage indicates an issue in identification of the sector landlord. These differences may stem from a combination of factors such as inaccurate census responses, processing error, or perhaps a net over-imputation of Kāinga Ora.

Net over-imputation refers to the use of statistical imputation which is another source to fill in gaps due to missing values in data. Including Kāinga Ora as a donor for the sector of landlord in the imputation process should be highlighted here as a possible risk causing higher coverage and which could lead to overcount in the census outputs. This risk stems from the assumption that Kāinga Ora data is a full stock of their records, and this source is already used in the admin data process. As seen in table 5, the census form responses (45,150) and admin data records (14,802) together (59,952) are already close to what Kāinga Ora reports as at March 2018 (60,006) without statistical imputation. Hence based on research, we do not recommend using the imputation for this category of sector of landlord because of the completeness of the admin data source available.

Table 6

Number of dwellings with Kāinga Ora landlord
Kāinga Ora (admin) and census data in 2013 and 2018

Data source[1]	2013		2018	
	Count	Coverage as percent of Kāinga Ora dwellings	Count	Coverage as percent of Kāinga Ora dwellings
Kāinga Ora	63,507	100	60,006	100
Kāinga Ora in census	52,500	83	63,105	105

1. Data sources considered independently (that is, not linked).

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

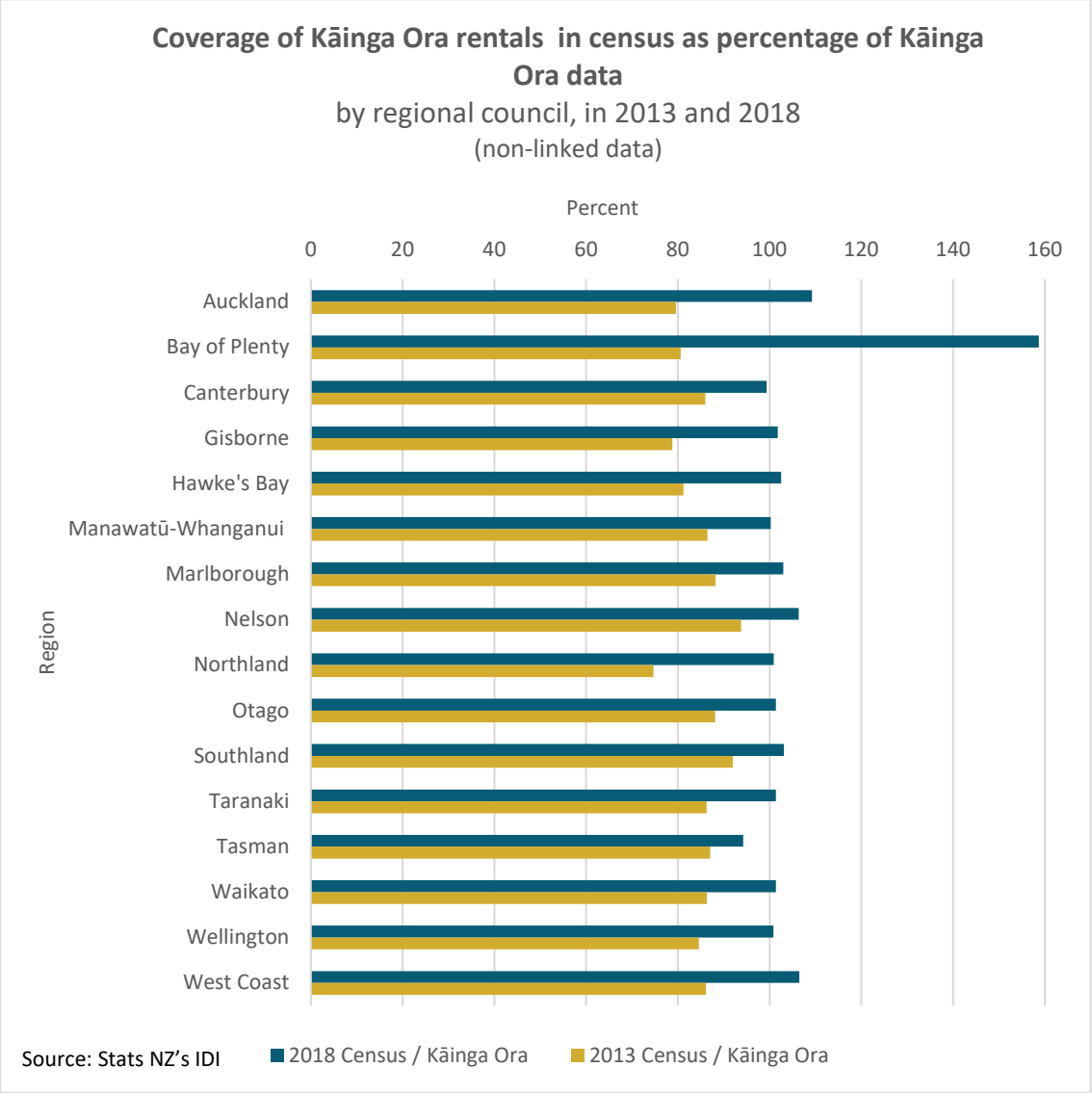
Regional variation in census coverage

We also looked at whether census coverage varied by region for both census years. As shown in figure 2, the coverage of Kāinga Ora dwellings in the 2013 Census (as a percentage of Kāinga Ora)

ranged from 75 to 94 percent throughout New Zealand. As an overall finding, census data is subject to undercoverage in all regions but how much depends on the region. The biggest differences were found in Northland, Gisborne, Auckland, Bay of Plenty, and Hawke's Bay; while Southland and Nelson were the most similar in terms of coverage (over 90 percent of Kāinga Ora stock).

The 2018 results differ from 2013. In 2018, the census coverage ranged from 94 to 159 percent of the Kāinga Ora stock. While census data from most regions was similar to the admin data stock (that is, around 100 percent), there was striking overcoverage in Bay of Plenty (159 percent) and some overcoverage in Auckland, Nelson, and West Coast (see figure 2). Bay of Plenty appeared to be firstly one of the regions with a smaller number of dwellings in total, and secondly a region where the drop in Kāinga Ora houses had been most notable with 55 percent less stock in 2018 compared with 2013 (Table A5 in appendix 3). Tauranga, in the Bay of Plenty region, is one of the areas where there has been a substantial transfer of Kāinga Ora properties to CHPs. Tauranga was selected as one of the first areas for these transfers because of stable demand for social housing and an active community housing sector (McKenzie, 2023). In Tauranga, a transfer of 370 Kāinga Ora properties and tenancies occurred between 2015 and 2016. This was followed by a sale of 1,124 Kāinga Ora state houses in 2017 to a registered CHP – Accessible Properties New Zealand Limited social housing provider. See McKenzie (2023), and appendix 5 for more information. While these transfers should not have immediate impacts on the tenants, it might have impacted on some tenants' recall of their landlord for their census responses.

Figure 2



Also in terms of coverage, as shown in table 7, we found that the highest proportion of overcoverage occurred in rural areas, especially in 2018. In 2013, the 'rural other' were also the only areas with an overcoverage (that is, values over 100 percent) in census relative to admin data. Within this context, it is important to note that the counts of dwellings in these rural areas were much lower in counts compared with the urban areas.

This paper has not explored the reason for this disparity across geographies in detail, but it is likely to be a combination of different factors, such as respondent error and changes in Kāinga Ora stock transfers.

Tables A4-A5 in appendix 3 provides further detail of the results (counts) by geographies.

Table 7

Number of Kāinga Ora dwellings by urban/rural split
Kāinga Ora and Census data in 2013 and 2018
Non-linked data

Urban/ Rural area	2013			2018		
	Kāinga Ora	Kāinga Ora in census		Kāinga Ora	Kāinga Ora in census	
	Count	Count	Coverage as percent of Kāinga Ora	Count	Count	Coverage as percent of Kāinga Ora
Large urban area	12,072	9,831	81	12,102	12,162	100
Major urban area	43,773	35,544	81	40,968	44,067	108
Medium urban area	2,994	2,697	90	3,000	3,105	104
Rural other	252	303	120	147	222	151
Rural settlement	300	294	98	261	318	122
Small urban area	3,456	2,934	85	3,048	3,231	106

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

Differences in classification at the dwelling-level

This section investigates the differences in classification of tenure of household and sector of landlord by comparing the datasets at the dwelling level using the linked datasets in IDI. A practical limitation is the need to use the address ID as a proxy for a dwelling, which may not be accurate in all cases.

Ability to link dwellings across datasets depends partly on availability of the non-missing data of address IDs in each source. Table 8 includes information on the number of missing address IDs per data source, which was low (2 percent or less) in both 2013 and 2018 contexts. This means the data on Kāinga Ora landlord have close to complete address ID information, and missing address IDs are unlikely to cause much of an impact on the dwelling level comparisons.

Another known issue with analysing datasets linked at dwelling level in the IDI is the need to use address as a proxy for a dwelling. To investigate this issue, we looked at the number of houses per address ID in each dataset (table 8). Overall, we found that neither census nor Kāinga Ora data are largely impacted by the issue. At most, around 1 percent (or less) of the total number of dwellings were sharing the address ID with another dwelling.

We did not investigate the opposite issue, where the dwelling might have more than one address. This issue could be investigated in the future.

Table 8

Number of dwellings by unique address ID
Kāinga Ora and census data, 2013 and 2018

Number of dwellings per address ID	2013		2018	
	Count	Percent of total	Count	Percent of total
Kāinga Ora				
1 dwelling	62,295	98	59,034	98
2 or more dwellings	552	<1	486	<1
Address ID Missing	657	1	483	<1
Total	63,507	100	60,006	100
Kāinga Ora in Census				
1 dwelling	51,177	97	62,949	100
2 or more dwellings	426	<1	156	<1
Address ID Missing	897	2	S	S
Total	52,500	100	63,105	100

Symbol: S suppressed

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

Linked datasets: is the information similar across sources?

For this investigation, table 9 provides the information on the dwelling level results (see also figures A2 and A3 in appendix 2) in the linked datasets when the information is similar across the sources and when it differs.

We start by comparing the results where the same address ID is classified as Kāinga Ora dwelling in both data sources. As shown in table 9, 76 percent of all Kāinga Ora dwellings (that is, 47,949 dwellings) in admin data were also identified as Kāinga Ora dwellings in the 2013 Census dataset. This increased to 90 percent of dwellings (that is, 54,042 dwellings) when compared with the Kāinga Ora dataset and 2018 Census data. This increase in the data available for dwelling level comparison was likely because 2018 Census used admin data to mitigate non-response. While the size of the 2018 linked dataset is larger than the 2013 linked dataset, it is important to remember the contextual information that the overall Kāinga Ora stock was smaller in 2018 and that the 2013 Census count had an undercoverage of 17 percent.

The next sub-section explores the classification differences by analysing the dataset where a Kāinga Ora dwelling was linked to a non-Kāinga Ora dwelling in census dataset via address ID (also shown in table 9).

Table 9

Comparing Kāinga Ora and Census data at aggregate level and dwelling level
2013 and 2018

Kāinga Ora dwellings	2013		2018	
	Count	Percentage of Kāinga Ora	Count	Percentage of Kāinga Ora
Linked data comparisons (address level)				
Linked data with similar information:				
Kāinga Ora – Kāinga Ora in census	47,949	76	54,042	90
Linked data with differing information:				
Kāinga Ora – other rentals in census (landlord differences)	1,716	3	870	1
Kāinga Ora – other private dwellings in census (tenure differences)	4,044	6	789	1
Kāinga Ora – unoccupied private dwellings in census[1]	…	…	2,712	5
Kāinga Ora – NPD in census	72	<1	21	<1
Not 'occupied-available' in Kāinga Ora – Kāinga Ora in census	312	<1	384	<1
Unlinked data[2]				
Kāinga Ora in census not linked to Kāinga Ora in admin	4,551	…	9,063	…
Kāinga Ora not linked to any census records	9,414	…	1,188	…
Total Kāinga Ora data	63,507	100	60,006	100
Total Kāinga Ora in census	52,500	83	63,105	105

1. Not included in the subject population of private occupied dwellings in census.

2. These aggregated counts are calculated from the rounded values as '*Total – Linked data with similar information' and 'Total – Sum of Linked data with differing information'. Due to the use of address ID proxy for a dwelling and the issue of possible shared addresses (see Table 8), dwellings may be counted in multiple categories.*

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Symbol: … not applicable

Source: Stats NZ's IDI

Classification of sector of landlord or tenure

We define that 'differences in classification' occur when census data does not agree with the Kāinga Ora data. In this case, it means either the tenure of household or the landlord is not the same.

In the dwelling level investigations, we found that some Kāinga Ora dwellings were linked to other sector of landlord or non-rental household tenure in census data. Table 9 includes these results, and figures A2 and A3 (appendix 2) provide visual illustration of the classification differences between admin data and census data. Tables A6–A8 (appendix 4) adds further detail of breakdowns on tenure of household, sector of landlord, and unoccupied dwellings.

In the 2013 context:

- In total, 4,551 (table 9) Kāinga Ora dwellings in census were not linked to houses in Kāinga Ora data.
- Most dwellings that were misclassified when compared with admin data were non-rental private dwellings (4,044 dwellings) in census. These included owned dwellings, dwellings in family trust, and dwellings not included elsewhere (such as, where rental status could not be determined). Most links to census dwellings were found in the census residual categories of tenure of household (table A6).
- 1,716 census rental dwellings were misclassified by sector of landlord when compared with admin data. Most commonly these dwellings were included under private person, trust, or business (663 dwellings) landlords, while the rest were a mix of other categories or where respondents did not know their landlord (table A7).
- There was also a small number of dwellings (72 or less than 1 percent) classified as non-private dwellings in the census data that were linked to Kāinga Ora dwellings (table 9).

In the 2018 context:

- In total, 9,063 (table 9) Kāinga Ora dwellings in census were not linked to houses in Kāinga Ora data. This is about twice as many dwellings compared with 2013. Overall, this indicates that some census values are not supported by the admin data.
- Approximately 1,600 dwellings were classified either as non-rental private dwellings, or rentals with another sector of landlord in census. Both groups were small – only 1 percent each of the base stock (table 9). Most links to census dwellings were found in the family trust category (table A6).
- Where Kāinga Ora houses in census were classified as another sector of landlord (870 dwellings), the most common landlords were private (49 percent of total, or 423 dwellings) and Other state-owned corporation or state-owned enterprise, or government department or ministry (32 percent of total) (table A7).
- Similar to 2013, the proportion misclassified as an NPD was small, less than 1 percent of the base stock (21 dwellings, table 9).
- Additionally, we found that 2,712 Kāinga Ora dwellings were included under unoccupied dwellings in census (table A8). We did not conduct the investigation of unoccupied dwellings in the 2013 context.

The investigation of classification differences can also be conducted the other way around. We looked at how many census HNZ rental dwellings are linked, by address ID, to those Kāinga Ora dwellings that were not ‘available-occupied’ on census night. The type of these ‘other’ categories in Kāinga Ora data are referred in table A2 (appendix 1).

We found 384 Kāinga Ora rentals in 2018 Census, and 312 Kāinga Ora rentals in 2013, that should not be available for tenancy on census night based on the usual occupancy definition in admin data (table 9). Since we are using *the end of the month* snapshot in IDI for the Kāinga Ora data, it is possible that some dwellings had a different occupancy status on census night (*earlier* in the month). Nevertheless, these results might indicate a possible source of overcoverage in census data. The occupancy status information in admin data should be considered if using the admin data to fill in gaps in census responses.

Reasons for differences in coverage and in classification

This investigation originated in response to a known issue of undercount of Kāinga Ora dwellings in the 2006 and 2013 Censuses. The early results of this investigation prompted the use of admin data to supplement non-response. As a result, in 2018 there was minimal undercount.

Results from our investigation align with the undercount in 2013 Census. The 2018 context, however, show census to have some overcoverage, in contrast to minimal undercount, when compared with Kāinga Ora records of their stock. We also found that coverage varied by region, and that there were some differences on the classification of rental tenure of household and sector of Kāinga Ora landlord. We outline some possible reasons that could help explain these differences in coverage and classification when comparing census data with Kāinga Ora data of their housing stock.

In census data:

- Using admin data increased counts of sector of landlord and tenure of household in 2018 Census. A higher proportion of admin data was used to supplement Kāinga Ora landlord compared with the overall use of admin data for all categories in sector of landlord.
- People's responses in census were used as first source of information, hence, even if admin data disagreed, the response in census would remain.
    - some dwellings that should have been Kāinga Ora housing based on admin data were classified as something else in census data. Missing these dwellings reduced the overall count of Kāinga Ora housing in census.
    - some dwellings that should not be Kāinga Ora housing based on admin data were classified as Kāinga Ora in census. This contributed to an overcoverage in census data as shown in our analysis.
- There is no tenure information for the dwellings classified as unoccupied and they are not counted in the census subject population. Our results show that some of these unoccupied dwellings in 2018 were Kāinga Ora rentals based on admin data.
- The use of statistical imputation has contributed to the net overcount of Kāinga Ora rentals. As table 5 shows, the census form responses and admin data records together are already close (without statistical imputation) to the number of houses Kāinga Ora recorded in March 2018.

In Kāinga Ora data:

- Housing stock has reduced from 2013 to 2018. This means the comparisons with census data over time start at a different baseline.
- We used a selection of dwellings that had 'available-occupied' status. It is possible some of these dwellings fell under the unoccupied dwellings on census night, hence, were not part of the census subject population we used in comparisons.
- a monthly snapshot is recorded at the end of the month rather than specifically on census night which may have led to some incorrect selections of 'usually occupied' houses.

In census and Kāinga Ora data sources:

- Reporting or processing errors are possible; for example, when responding to census, people may not know or may not be willing to share their landlord or rental status which means that dwelling could not be placed in correct tenure/sector of landlord classification.
- Linkage errors and missing or incorrect address information when linking data sources.

- Definition of statistical unit seems less of an issue to cause representation error as both sources use a dwelling/house unit; yet errors are possible due to the use of address ID proxy for the unit.
- Address IDs that are shared over two or more dwellings can be measured in more than one category in different subsets of data between admin source and census (for example, as a Kāinga Ora rental and some other). This can lead to incorrect comparisons of dwellings and classifications. However, for this sector of landlord this issue of non-unique address IDs was minimal.
- Both coverage and change in the number of Kāinga Ora stock over time can vary by region. Further analysis would be needed to understand if the magnitude of misclassification issues are subject to the location.

Regardless of these differences, the overall rate of linked data (where both sources have the same Kāinga Ora dwelling by address) is as high as 90 percent of the Kāinga Ora stock in 2018. This supports the use of this administrative data source in the census context as sources largely agree, despite some regional variation. In addition, as this paper has shown, in 2018, there was a small overcount of Kāinga Ora dwellings as the result of both misclassification issues and the use of statistical imputation. We suggest that Kāinga Ora landlord should not be used as donor in the imputation process to mitigate the risk of leading to overcounts for this category in census outputs.

Conclusion

This paper continues the census transformation series investigating admin data potential to provide census-type information on different social and economic attributes. It builds on the previous research on housing variables (Bycroft et al, 2021) and focuses on housing rented from Kāinga Ora (Housing New Zealand) which is the largest social housing provider in New Zealand. To answer the research questions we made two comparisons: one looking at coverage between Kāinga Ora and census data over time (2013 vs 2018), and another focusing on the classification to see whether tenure of household and sector of landlord in census are different to admin data. The coverage analysis was conducted at both national and regional levels.

In this investigation, we assume that Kāinga Ora data has full coverage of their dwellings (that is, 100 percent), and it is used to provide the basis for comparison. Admin sources are originally collected for different purposes by agencies than if used primarily for statistical purposes (O'Byrne et al, 2014). This means some contextual differences can exist, such as around the definition of occupancy, and we can expect some differences in the comparisons. For example, the definition of occupancy in admin data differs slightly from the census occupancy status as the admin data concept of 'usually occupied' does not require residents to be present in a dwelling on a particular (census) night. One research question focused on the assumption around completeness of Kāinga Ora houses dataset. We consider Kāinga Ora to be an authoritative data source for their housing stock based on this and the previous investigations about its concepts and coverage.

Based on the results of this research, our recommendations for the use of Kāinga Ora dataset in statistical purposes are noted below.

- Keep using Kāinga Ora data in the census context as an assumed high-quality source of housing stock.
- Kāinga Ora data should be used as the first source to indicate whether the dwelling is in rental tenure under this landlord. This recommendation covers situations where the census response:
    - is not stated (or other residual category, such as don't know)
    - is under a rental tenure but not listed as Kāinga Ora landlord
    - where the sector of landlord is listed in census as Kāinga Ora but there is strong evidence (including accuracy of linking) that it is not supported by admin data (that is, removing the census response of Kāinga Ora if it is clearly incorrect)
    - is under the subject population of occupied private dwellings.
- This recommendation **should only be applied** when dwellings are not shared by multiple addresses, and vice versa, to ensure higher accuracy. The use of address proxy for a dwelling unit is a known issue in linked admin data, although the impact is smaller for this subset of dwellings as shown by this research.
- Changing this sector of landlord information could have flow-on effects on the tenure of household in cases where this may affect the subject population (that is, when it does align with the rental tenure). We do not recommend changing the census subject population of rental households which are not included in private (usually) occupied dwellings.
- An additional method to mitigate item non-response in census is statistical imputation. We recommend not to include Kāinga Ora as a sector of landlord for statistical imputation for the rental tenure dwellings if Kāinga Ora is used as an administrative source for the landlord information. With such a high coverage of this admin source (assumed to be close to complete), avoiding statistical imputation would reduce a risk of flow-on misclassification and overcount effects in census data. This recommendation does not concern any other sector of landlord categories.

- Limit the Kāinga Ora houses dataset to 'available-occupied' dwellings by status to correspond to the census definition of dwelling occupancy ('usually occupied'), as done in this research.

For the 2023 Census context, our recommendation outlines the preference of using Kāinga Ora data as basis for the sector landlord information. However, this recommendation is not consistent with the high-level design in the combined census model principles which assumes the respect of respondents' intentions and using their responses in forms as the default value (Stats NZ, 2022a). The current practice is that census response is used as is, and admin data is only used to supplement the data when no information is available. Using Kāinga Ora as the first source would hence differ from the usual practice but there are some sound reasons for this variation. As shown by this research, the technical aspects and the availability of a high-quality source for the sector of landlord support this recommendation.

Next, we outline some benefits as well as limitations if this recommendation would be implemented in practice for improving the quality of 2023 Census data, starting with **benefits:**

- The most compelling reason is the assumption that Kāinga Ora source has complete coverage of their stock. No other admin data sources for sector of landlord have that same accuracy. For example, tenancy bond data do not have complete coverage of sector of landlords since not all rental properties require a bond (such as Kāinga Ora since 2019).
- The driver for this recommendation is the consideration that it will lead to better-quality data. We would not recommend applying this same approach for any other sector of landlord at this stage.
- In some cases, landlord can be a hard question for respondents to recall or that they may not be willing to respond. The benefit of using Kāinga Ora before census responses would be the reduction of the errors that surveys are generally prone to and would emphasise the high-quality information for this landlord – which is a small, yet important, subpopulation of dwellings and households.
- Sector of landlord is an objective question which can be alternatively sourced, in contrast to some other questions in census which are more identity based, such as ethnicity.
- The differences between census and admin data have generally been considered as undercount about the sector of landlord variable in census. Our research also suggests some of these differences can be explained by misclassification where dwellings have been included elsewhere in census records (such as non-rental tenure). Some of these dwellings are classified as unoccupied (such as residents away), or are otherwise misclassified when compared with admin data.
- In admin data, a person is not required to be present in a dwelling on census night to be classified as occupied, which differs from the concept of census night occupancy.
- If the sector of landlord information can be improved at the unit level (here address level), then aggregated information up to any other higher level of geography would also be at high level of accuracy.

While technically a sound approach, using Kāinga Ora as a first source does carry some **limitations and/or risks** to be aware of, such as:

- This recommendation does not meet the principle of respecting respondents' answers.
- Currently, census only collects sector of landlord information for the subject population of occupied dwellings. The use of admin data means it would be possible to provide information for unoccupied dwellings in the census. The recommendation that we have

provided here could be used in future considerations if an admin-first approach in census data is used.
- When integrating data sources with addresses, there is always a risk of linking error.
- Using address proxy for dwellings introduces some uncertainty in linking the dwellings in order to compare information. However, the analysis reported in this paper showed minimal risk in this subpopulation based on the small proportion of many-to-many address links, and missing address IDs as part of our quality assessment.
- While we assume that Kāinga Ora data has complete record of the stock, some of the attribute information are not at this level of quality. We do not recommend prioritising other attribute information before census responses (for example, weekly rent or number of bedrooms), and to maintain the admin data use in those cases only for the non-response mitigation.
- It is good to be aware of some challenges when admin data sources are compared with census data, such as there is no common dwelling ID between the two different collections. A general recommendation is to be aware of the use of address proxy for a dwelling and its limitations, as well as other possible limitations of admin data. Another thing to note is that the census night (early in the month) does not exactly align with the dates of the admin data snapshot (end of the month). In this study we used the March snapshot but the alternative of a February snapshot (closer to the census night), which could also be investigated in further research.

Understanding the quality of admin data is important for both the use of Kāinga Ora data to supplement census responses, and in the context of the development of future censuses. This is of particular importance due to the past undercount of Kāinga Ora houses in census prior to 2018, and as guidance needed for the future. The successful supplementation of census responses with Kāinga Ora data in 2018 showed the usefulness of this approach and the benefit of the admin data research. Stats NZ (2023) options have previously indicated using Kāinga Ora as primary source is amongst the possible improvements that were considered in 2023 Census planning. This current research paper adds the comparison over time, and the results support this suggestion. While the paper provides a recommendation to move on admin data use first before census responses (that is, moving away from the high-level principle in 2023 Census design), this is only a **recommendation to consider** this approach. Practically implementing this recommendation for census data may need to consider other factors as well.

Further analytical work could look at whether prioritising this recommendation would lead to a more accurate overall count of the Kāinga Ora sector in the 2023 Census data, especially in the regions where we found inconsistencies. This analysis of regional variation would provide deeper understanding of the impacts of not applying the high-level principle in this case. Furthermore, there have been known changes in Kāinga Ora stock between the 2013 and 2018 Censuses (see appendix 5) which reflect some of the coverage results in this investigation. These changes continue beyond 2018. One caveat is that some houses might be owned by Kāinga Ora but managed by different CHPs. There is the potential to impact on the tenants' responses in census and this difference could be explored in future research.

Disaggregated analysis by other census type variables would extend the information about tenants and their characteristics. This disaggregation could provide deeper insights into the housing situation for some subpopulation groups as well as the regional differences that were highlighted in this paper. More investigation is warranted to better understand how well we can link people and households into the dwellings from admin data.

In future, it could also be useful to investigate if there are other accessible admin data sources that could be used for other categories of social housing. The Kāinga Ora data source could also have

other applications beyond the sector of landlord and tenure of household information, such as contributor, or a comparison point for the list of dwellings in New Zealand in the context of frame and/or register development. The benefit of this source is the timely information provided by Kāinga Ora dwelling stock. However, future work could include collaborating with the source agency, to better understand admin data quality.

The evidence of this research shows Kāinga Ora is the best source for this category of sector of landlord in census, and use of Kāinga Ora data will improve social housing data quality. For this Kāinga Ora category, there is very limited data from other admin sources, such as tenancy bonds which has its limitations. More widely, no other sector of landlord has a complete source from admin data (Bycroft et al, 2021). There is also a need to increase understanding of admin data quality long-term. Each source of data may have strengths and weaknesses, both as a whole and by variable, and thoroughly understanding quality of sources independently and in combination is integral to the further use of admin data. Overall, Kāinga Ora data is a useful source in the census context in New Zealand. However, it is only one part of the sector of landlord classification and the full question in the census about who people are renting from cannot be replaced.

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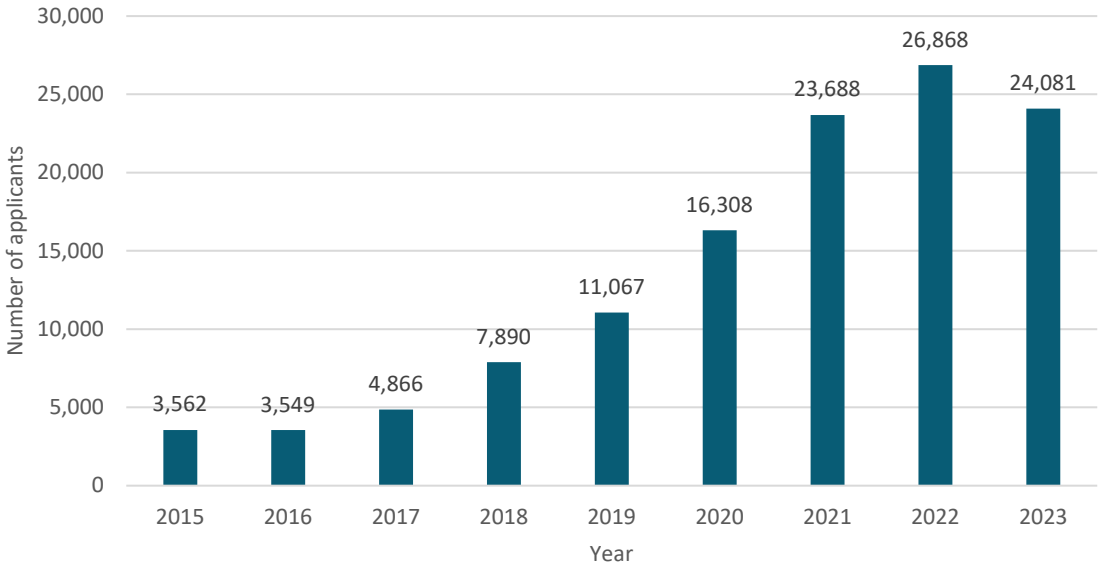
Appendix 1: Background information about datasets

This appendix includes background for social housing needs, quality ratings in census, occupancy status of Kāinga Ora dwelling stock, and tenure of household information in census data.

Figure A1



Source: Ministry of Social Development (MSD): Social Housing Register – Archive. Retrieved 4 December 2023 from https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/statistics/housing/archive/index.html

Table A1

Quality ratings of the tenure of household and sector of landlord
2013 Census and 2018 Census

	2013 Census		2018 Census	
	Tenure of household	Sector of landlord	Tenure of household	Sector of landlord
Subject population: Households in…	… private occupied dwellings	… rented private occupied dwellings	… occupied private dwellings	… rented occupied private dwellings
Census non-response/no-information[1]	5.1 percent	1.0 percent	<0.1 percent	0.2 percent
Quality rating by Stats NZ	Moderate/ High[2]	High	Moderate	High
Quality rating by EDQP[3]	…	…	Moderate	…
Datainfo+ information on variable and its quality	Tenure of household	Sector of landlord	Tenure of household	Sector of landlord

1. Non-response in 2013; no-information in 2018 due to census non-response, no alternative sources, or no imputation.
2. Includes Kāinga Ora category specific notes about undercount.
3. 'Quality rating by EDQP' has been sourced from EDQP (2019); all other information in this table have been sourced from Stats NZ Datainfo+.

Symbol: … not applicable (in 2013); not assessed (in 2018)

Sources: Stats NZ, EDQP (2019)

Table A2

Occupancy status in the Kāinga Ora data in 2013 and 2018

Occupancy status of a house	March 2013 snapshot	March 2018 snapshot
	Count	Count
'Available-occupied'	63,507	60,006
Total 'not Available-occupied'[1]	4,083	1,512

1. Total 'not Available-occupied' houses includes different sub-categories of: 'Available-', 'Available-void', 'Pending-', 'Pending-occupied', 'Pending-void', 'Unavailable-closed', 'Unavailable-occupied', 'Unavailable void', 'Under disposal-closed', 'Under disposal-occupied', and 'Under disposal-void'.

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

Table A3

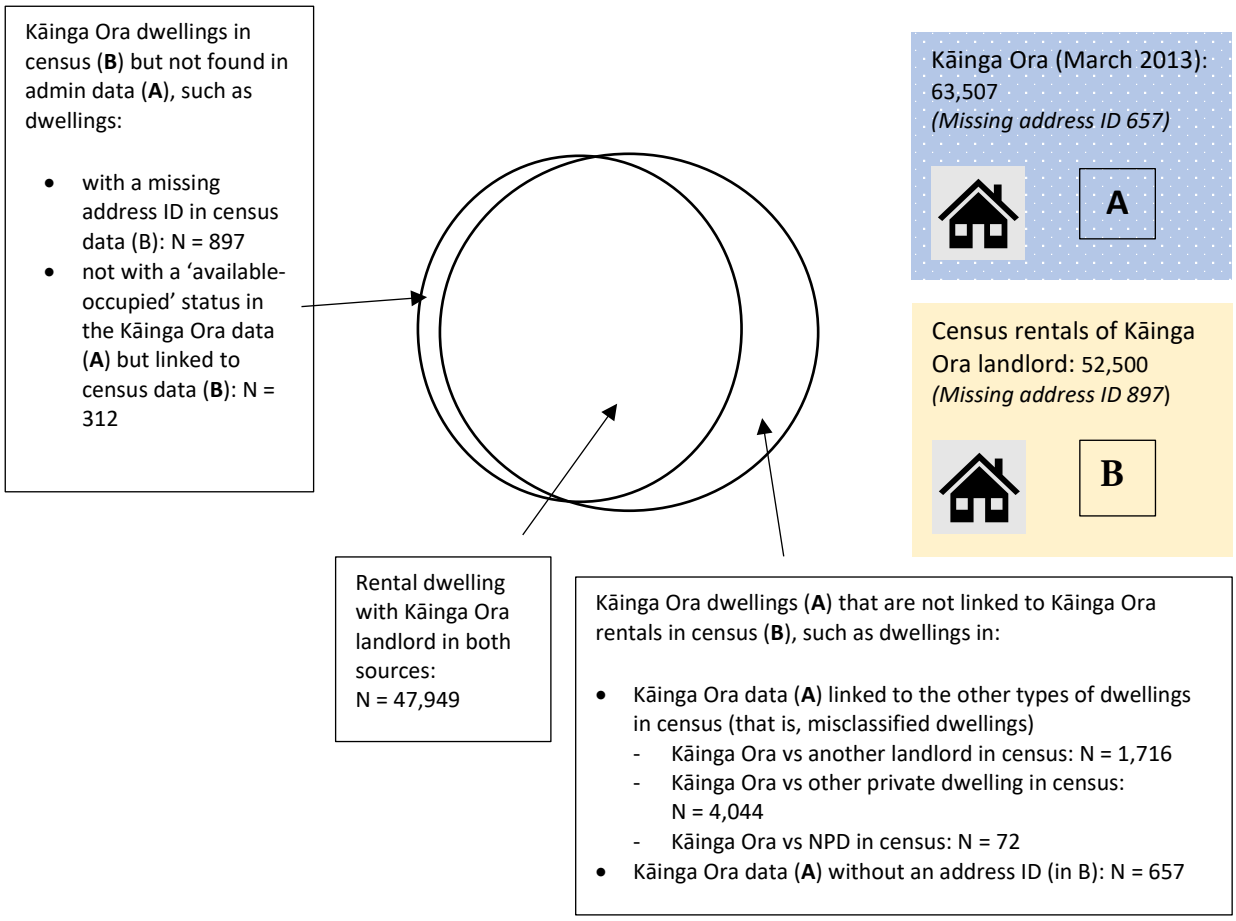
Tenure of household in the 2013 Census and 2018 Census		
Dwellings by tenure type	2013 Census	2018 Census
	Count	Count
Total households in dwellings owned or partly owned	725,448	847,377
Dwelling not owned and not held in a family trust	512,109	586,131
rent payments made (category 21)	453,135	527,853
rent payments not made (category 22)	53,889	56,472
rental arrangements not further defined (category 20)	5,088	1,806
Total households in dwellings held in a family trust	215,280	219,555
Total households stated	1,452,837	1,653,060
Not elsewhere included	97,050	726
Total households	1,549,890	1,653,792

Source: **2013**: Stats NZ (2014 – tables), **2018**: Stats NZ (2020a – tables, NZ.Stat (stats.govt.nz).

Appendix 2: Conceptual models of linking housing sources

Figure A2

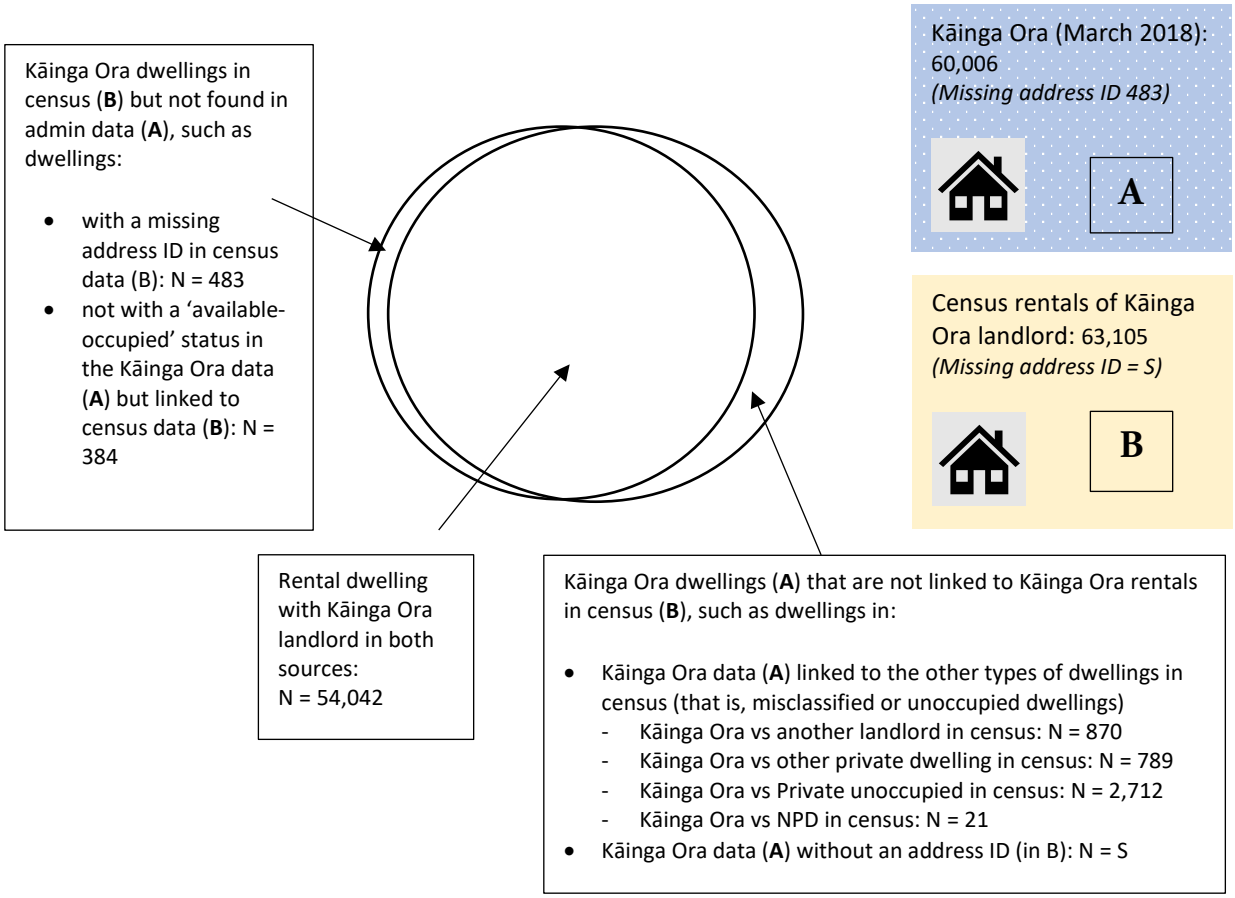
Linking Kāinga Ora houses between admin data and 2013 Census



Notes on figure A2
Linked data: Only the dwellings associated with a non-missing address ID are available for linking.
Due to the use of address ID proxy for a dwelling and the issue of possible shared addresses (see table 8), dwellings may be counted in multiple categories.
This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables
Symbol: N number of records
Source: Stats NZ's IDI[1]

Figure A3

Linking Kāinga Ora houses between admin data and 2018 Census



Notes on figure A3
Linked data: Only the dwellings associated with a non-missing address ID are available for linking.
Due to the use of address ID proxy for a dwelling and the issue of possible shared addresses (see table 8), dwellings may be counted in multiple categories.
This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables
Symbols: N number of records; S suppressed
Source: Stats NZ's IDI[1]

Appendix 3: Results for coverage by geographies

This appendix presents the counts underlying figures 3 and 4 (coverage by region and by urban/rural split) as well as the change from 2013 to 2018 by regions.

Table A4

Number of Kāinga Ora houses by regional council
Kāinga Ora and Census data in 2013 and 2018
Non-linked data

Regional council	2013			2018		
	Kāinga Ora	Kāinga Ora in census		Kāinga Ora	Kāinga Ora in census	
	Count	Count	Coverage as percent of Kāinga Ora	Count	Count	Coverage as percent of Kāinga Ora
Auckland region	29,172	23,211	80	26,520	28,962	109
Bay of Plenty region	2,610	2,103	81	1,437	2,280	159
Canterbury region	5,877	5,052	86	6,591	6,549	99
Gisborne region	1,146	903	79	1,203	1,224	102
Hawke's Bay region	2,685	2,181	81	2,667	2,733	102
Manawatū-Whanganui region	2,526	2,184	86	2,394	2,400	100
Marlborough region	381	336	88	399	411	103
Nelson region	531	498	94	519	552	106
Northland region	2,121	1,584	75	2,040	2,058	101
Otago region	1,593	1,404	88	1,542	1,563	101
Southland region	411	378	92	384	396	103
Taranaki region	1,137	981	86	1,077	1,092	101
Tasman region	162	141	87	156	147	94
Waikato region	4,143	3,576	86	4,188	4,245	101
Wellington region	8,058	6,816	85	8,127	8,196	101
West Coast region	303	261	86	279	297	106

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

Table A5

Change in number of Kāinga Ora houses between 2013 and 2018 by regional council

Kāinga Ora and Census

Non-linked data

Regional council	Kāinga Ora			Kāinga Ora in census		
	2013	2018	Change from 2013 to 2018	2013	2018	Change from 2013 to 2018
	Count	Count	2018 as percent of 2013	Count	Count	2018 as percent of 2013
Auckland region	29,172	26,520	91	23,211	28,962	125
Bay of Plenty region	2,610	1,437	55	2,103	2,280	108
Canterbury region	5,877	6,591	112	5,052	6,549	130
Gisborne region	1,146	1,203	105	903	1,224	136
Hawke's Bay region	2,685	2,667	99	2,181	2,733	125
Manawatū-Whanganui region	2,526	2,394	95	2,184	2,400	110
Marlborough region	381	399	105	336	411	122
Nelson region	531	519	98	498	552	111
Northland region	2,121	2,040	96	1,584	2,058	130
Otago region	1,593	1,542	97	1,404	1,563	111
Southland region	411	384	93	378	396	105
Taranaki region	1,137	1,077	95	981	1,092	111
Tasman region	162	156	96	141	147	104
Waikato region	4,143	4,188	101	3,576	4,245	119
Wellington region	8,058	8,127	101	6,816	8,196	120
West Coast region	303	279	92	261	297	114

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

Appendix 4: Results from linked data comparisons

This appendix includes linked data comparisons between Kāinga Ora admin source and census (other) rentals, other private dwellings and unoccupied dwelling with detailed breakdowns.

Table A6

Linked dwellings between Kāinga Ora and other private dwellings in census by tenure of household
2013 and 2018

Tenure of household	2013		2018	
	Count	Percent	Count	Percent
Linked data: Kāinga Ora – other private dwellings in census (total)	4,044	100	789	100
Other private categories in census				
Total owned[1]	423	10	204	26
Not owned/in trust, rental status unknown	171	4	42	5
Not owned/in trust, provided rent-free	198	5	186	24
Total in family trust[2]	231	6	357	45
Response unidentifiable	939	23	…	…
Not stated	2,085	52	…	…

1. Includes 'Owned, mortgage status unknown', 'Owned with mortgage', 'Owned without mortgage'.

2. Includes 'In family trust, mortgage status unknown', 'In family trust with mortgage', 'In family trust without mortgage'."

Symbol: … not available

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

Table A7

Linked dwellings between Kāinga Ora and other rental dwellings in census by sector of landlord
2013 and 2018

Sector of landlord	2013		2018	
	Count	Percent of total	Count	Percent of total
Linked data: Kāinga Ora – other rentals in census (total)	1,716	100	870	100
Sector of landlord categories in census				
Private person, trust or business	663	39	423	49
Local authority or city council	60	3	93	11
Iwi, hapū, or Māori land trust	…	…	24	3
Other community housing provider	…	…	45	5
Other state-owned corporation or state-owned enterprise, or government department or ministry	102	6	282	32
Don't know	492	29	…	…
Response unidentifiable	108	6	…	…
Not stated	291	17	…	…

Symbol: … not available

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

Table A8

Linked dwellings between Kāinga Ora data and unoccupied private dwellings in 2018 Census

Occupancy status	2018 Census	
	Count	Percent
Linked data: Kāinga Ora – Unoccupied Private dwellings in census (total)	2,712	100
Census unoccupancy		
Residents away	2,226	82
Empty dwelling	486	18

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values for the same data may vary in different tables.

Source: Stats NZ's IDI

Appendix 5: Timeline of changes related to Kāinga Ora

This appendix reviews the history of the social housing sector, focusing on changes related to Kāinga Ora stock, based on McKenzie's (2023) chronology throughout the text and table A9.

We have included this appendix because these changes can impact on the way some people reply to their census question around their landlord. As MSD now manages the application process, this could affect a tenant's awareness of who their landlord is. Some properties have been transferred to other groups like community housing providers, which could also provide a source of confusion for tenants.

In July 2001, Housing New Zealand Corporation was established as a Crown entity as part of the Housing Corporation Amendment Act 2001. This entity was responsible for delivering state housing assistance, and advice on housing and housing policy. HNZ functionalities have changed over time as well as changing their name to Kāinga Ora in 2019. In the periods between 2013 and 2018 (that is, the census years) there has been structural changes in the social housing sector, such as who assesses the housing needs and who provides the houses, IRRS eligibility, and introductions of new legislations, as well as new agencies, ministry, and authorities.

The period between 2011 and 2020 has been summarised as a time for 'social investment and investing for social wellbeing' (McKenzie, 2023). In 2010, the Government initiated a Social Reform Programme where one objective was to move to a more diverse list of social housing providers. This diversification has led to some changes in the HNZ housing stock overtime. In May 2013, the Government announced another reform around social housing, including extension of the income-related rent subsidised to approved CHPs and the renewable tenancies (tenancy reviews) for all social housing tenants (prior to this, these functions were only available to HNZ tenants); regulation of the CHPs; and introducing variation in the size of the HNZ homes (typically these have been three-bedroom homes) subject to location and needs. From April 2014, assessments of housing needs have been managed by the MSD, which meant a separation between housing providers (HNZ, CHP) and housing needs.

Diversification of the housing stock and housing providers over the years has meant that the several HNZ properties have been transferred (including ownership and tenancy management) to other providers, typically CHPs. Many of these transfers were conducted between the two censuses (2013 and 2018) investigated in this research paper, such as Tamaki transfer of 2,800 properties in 2016, the proposed Tauranga transfers of 370 properties in 2015–2017, proposed transfers in Invercargill in 2016, and the sale of 1,124 (HNZ) state houses in Tauranga in 2016. Besides HNZ, some councils have also transferred some of their social housing or pensioner units to CHPs, such as Christchurch in 2016, and Auckland in 2017. In 2017, there was a change with the Government ceasing the sale of state houses which stopped a transfer of 2,500 properties in Christchurch. Overall, these property transfers should have no immediate impact on the tenants, however, it is possible that in some cases it may cause uncertainty about the change of landlord.

After the 2018 Census, a new Public Housing Plan was released. This plan aimed to secure more public housing in New Zealand by 2022, including those belonging to HNZ (later Kāinga Ora). This was also the direction set in the updated Public Housing Plan in 2021. There have also been some changes in the operations after the 2018 Census, such as the introduction of the new ministry (HUD) which became the 'regulatory authority for social housing' while MSD continued to be appointed as the 'social housing agency' managing the housing needs and housing register. Furthermore, the new HUD ministry would advise on housing issues (homelessness; affordable, warm, safe, and dry rental housing in the private and public market; support for first home buyers), and monitor HNZ (McKenzie, 2023, p. 780).

Specific to Kāinga Ora, the main changes have been around removing the collection of bonds in 2019 and the change of the name in 2019 when HNZ was merged with some other agencies. This establishment was supported by the Kāinga Ora–Homes and Communities Act 2019 which set their operating principles, including partnering and engaging with Māori. This legislation also stopped the Government's ability to sell state houses in the future. In this more recent era, there are now examples of increasing social housing such as in Nelson where 142 council social housing properties were transferred to Kāinga Ora in 2021 or the increase in social housing in Northcote Auckland by 2021 (announced in 2016). Yet some property transfers still occur away from Kāinga Ora, such as the transfer of over 900 state houses to a new local iwi CHP in Porirua with a planned partnership of 25 years starting in 2020 (Kāinga Ora 2019b; McKenzie, 2023).

After the 2018 Census, a new era of crisis management was introduced. In March 2020, the Government initiated support for the COVID-19 response effort. While this response may not have been directly related to Kāinga Ora housing stock, the era had a general impact on people's wellbeing, including the need for temporary accommodation and emergency housing.

More recently, post-2023 Census, some council-owned and managed social housing units might have continued to be transferred to different CHPs across New Zealand, such as in Porirua and Wellington, which continues the trend moving the social housing management and tenancies to CHPs. In the Wellington case, for example, this change was aimed to create more funding and better support for tenants, and the ability to apply IRRS.

Table A9

Selected points in the history of social housing sector in New Zealand

Date		Item
2001	July	HNZ Corporation was established as a Crown entity (p. 357)
2010	February	The Social Housing Reform Programme initiated (pp. 613, 742)
2013	March	2013 Census collection
	May	The Government announced a reform of social housing provision including different elements, such as IRRS extended to approved CHPs and moving the housing needs assessments and waiting list to the MSD (both taking effect in 2014), tenancy reviews for all social housing tenants (also starting in 2014); regulation of CHPs and standards for social housing; providing diversity of number of bedrooms in the HNZ homes (project was discontinued in 2015). (pp. 612-613, 647)
2014	April	As part of the social housing reform, MSD took over some functions from HNZ Corporation, such as housing need assessments and referrals (p. 647)
		IIRS was extended to registered CHP providers (but not local housing providers) subject to the MSD assessments. By 30 June 2014, the MSD was working with 20 community housing providers. (p. 649)
	August	The Wairarapa Community Enterprise Trust House was the first CHP being fully registered as a social landlord which meant they were able to offer IRRS for their new tenants. (p. 665)
2015	April	The MSD released its first set of social housing purchasing intentions with information of housing demands in different areas. HNZ Corporation and CHPs were able to use this information towards how they may contract with MSD in the context of diversification of the social housing sector. (p. 687)
		Announcement of 2,800 HNZ Corporation property transfers in Tamaki (Auckland) to a CHP to encourage regeneration of the area. The transfer was completed on March 2016, and had no immediate impact to tenants although they did receive a new landlord (no longer HNZ). (pp. 687, 722)
	May	Announcement of proposed 370 (Tauranga) and 1,250 (Invercargill) HNZ house transfers to CHPs. These were the first regions chosen for the CHP transfers to better integrate housing support services and tenants. The transfer would not affect existing tenants, and would take 9 to 12 months to complete including consultation with local Iwi and hāpu. (p. 688)

		The social housing legislation (the Housing Corporation Act 1974) amendment to remove the HNZ Corporation's role in providing policy advice. (p. 691)
2016	February	The Social Housing Reform (Transactions Mandate) legislation which amended the Housing Act 1955, the Housing Corporation Act 1974 and the Housing Restructuring and Tenancy Matters Act 1992. This amendment ensured transparency in the HNZ property transfers to the community housing sector. (pp. 719-720)
	August	Announcement of 1,124 HNZ State houses sales in Tauranga to Accessible Properties CHP coming in action in 2017 as part of the Social housing reform programme. The transfer would not impact on the existing tenants' eligibility for social housing. (p. 742)
	September	A large-scale Northcote (Auckland) Housing Development was announced to increase the number HNZ houses from 300 to 400 and to sell 600-800 properties. The redevelopment was expected to be fully completed by 2021. (p. 746)
	October	Ōtautahi Community Housing Trust (Christchurch) took over management of 2,300 social housing units from the City Council. The Trust was approved an CHP, including access to IRRS. This access did not change rents for the existing tenants. (p. 747)
	November	Additional funding for Emergency Housing initiative over four year period (starting in 2016) was announced. This included building of 40 new HNZ homes and purchasing a motel by HNZ in Auckland. The initiative aimed to create an additional 1,400 emergency housing places (600 in Auckland and 800 elsewhere in New Zealand) adding to over 3,000 places already funded earlier in July 2016. (pp. 748-749)
	December	The MSD updated their Social Housing Purchasing Strategy. (p. 752)
2017	March	The ownership and management of 1,138 HNZ properties in Tauranga were transferred to Accessible Properties Limited (CHP). (pp. 754-755)
	July	Management transfer of 1,452 Auckland Council's pensioner houses to Haumaru Housing (CHP). Earlier in March 2003, the Auckland City Council had sold 1,542 pensioner housing units to HNZ Corporation. (p. 761)
	December	The Government announced ending the State house sales. The announcement stopped the transfer of 2,500 state houses in Christchurch aimed to be completed by mid-2018. HNZ Corporation continues to modernise its housing stock by adding new homes where most needed and selling houses that are not fit for purpose. (p. 770)
2018	March	2018 Census collection
	August	The 2018-2022 Public Housing Plan replaced the 2016 Social Housing Purchasing Strategy. This plan aimed to secure around 6,400 additional public housing places across New Zealand by June 2022, including 4,480 houses from HNZ Corporation. HNZ would remain the primary provider of public housing, providing around 70 percent of places in New Zealand. (pp. 787-788)
	September	The Government announced new social objectives for the HNZ Corporation that would be protected by legislation, such as to provide good quality, warm, dry, and healthy rental housing for those who need it most – amongst other objectives. Removal of the word 'Corporation' from the HNZ name indicated this change of focus. (pp. 789-790)
	October	The new ministry HUD became operational (as announced in June 2018). (pp. 780, 791)
	November	The Government announced that it will establish a new Crown Agency Housing and Urban Development Authority (HUDA) in 2019. HUDA would lead a range of projects throughout New Zealand, in partnership with local government, Iwi and the private sector; and be a public housing landlord. (p. 793)
2019	April	HNZ no longer collects a bond from new tenants; new tenants were still obligated under the Residential Tenancies Act 1986. (p. 808)
	October	Kāinga Ora – Homes and Communities was established as a Crown entity. This new agency brought together HNZ, Hobsonville Land Company, (development subsidiary), and HUD's KiwiBuild Unit. (pp. 793, 817-818)
		The Kāinga Ora – Homes and Communities Act 2019 established the set of operating principles: providing good quality, warm, dry and healthy rental housing; supporting tenants; working with community providers; managing housing stock; and identifying and protecting Māori interests in land as well as partnering and engaging with Māori – amongst other principles. The legislation also removed the ability of a future Government to sell off state houses and the requirement for state housing to return a dividend to the Crown. (pp. 793, 817-818)
2020	February	Aotearoa/New Zealand Homelessness Action Plan was released by the Government. This plan set a framework and guidelines to meet the vision of "homelessness in New Zealand is prevented where possible, or it is rare, brief and non-recurring". The short- and long-term

		actions focused on areas of prevention (eg, partnering with Māori or Oranga Tamariki), supply (providers), support, and system enabling. (pp. 825-826)
	March	Covid-19 response initiated (pp. 829-837)
	August	Changes to the Residential Tenancies Amendment Act 2020, including removing 'no-cause' 90-day termination notices. The changes also confirmed that the Residential Tenancies Act 1986 does not apply to transitional housing or emergency housing. (p. 855)
	October	Over 900 Kāinga Ora houses in Porirua were transferred to an Iwi CHP. This partnership involved property and tenancy management for 25 years. (p.856). See also Kāinga Ora (2019b)
2021	January	The new Public Housing Plan 2021-2024 (superseding the 2018 Public Housing Plan) was released with intentions to add more public and transitional housing (6,000 and 2,000 places, respectively) by 2024. The plan included a better collaboration between the HUD, Kāinga Ora, iwi and Māori, Local Government and the construction industry. (pp. 858-859)
	March	Nelson City Council sold 142 social housing properties to Kāinga Ora with the transfer taking place on 19 March 2021 and leading to a change of landlord (as communicated in November 2020). (p. 862)
	July	Suspension of the public housing tenancy reviews (started in March 2020) was extended to February 2022. Part of sustaining tenancies, including Kāinga Ora tenants, was removing the 90-day notice, and ending the tenancy reviews. This suspension was later extended to March 2024. (p. 874)
	September	HUD released MAIHI Ka Ora: National Māori Housing Strategy 2021 – 2051. See also (HUD, 2021).
		The 2021 Government Policy Statement on Housing and Urban Development (GPS-HUD) was established. This statement is required under the Kāinga Ora – Homes and Communities Act 2019. The GPS-HUD areas of focus include: building of more affordable homes, meeting housing needs, home before assets, enabling and supporting, and planning. Kāinga Ora was required to give effect to the GPS-HUD. (pp. 876-877)
2023	Around March	2023 Census collection
	March	Kāinga Ora pilot of a mixed-tenure development including development of 276 units which some of would be rented to non-public housing tenants and others to the public housing tenants. The pilot would run until June 2026. (p. 907)
	May	26 Porirua City Council social (pensioner) housing units were sold to a local Iwi CHP. In 2023, the number of housing units managed by councils or similar organisations had more than halved from 2016 levels, decreasing from 14,000 units to around 6,500. (p. 911)
	August, May	Wellington City Council social housing transferred to a CHP, where the council had owned or managed approximately 1,950 tenancies. The council remained the owner of the majority of the properties which were leased to Te Toi Mahana CHP (for a period of 30-35 years), including tenancy management and maintenance. The change also allowed access to more funding as the new CHP tenants could be eligible for the IRRS. (p. 911, 919)

Note: CHP – Community housing providers; HNZ – Housing New Zealand; HUD – Ministry of Housing and Urban Development; IIRS – income-related rent subsidy; MSD – Ministry of Social Development

Source: McKenzie (2023)