HOUSEHOLD CROWDING

Introduction

Household crowding was identified as a health issue in New Zealand in the 1920s, when census data were used to identify the proportion of New Zealanders for whom the household composition challenged "health and decency" [49]. Evidence from recent research suggests that living in a crowded household in childhood may negatively affect aspects of health in adulthood [50].

In New Zealand, household crowding has been linked to meningococcal disease and acute rheumatic fever in children [51,52]. Internationally, research has suggested correlations between crowding and tuberculosis, respiratory infections, hepatitis B and other enteric disease, conjunctivitis, and poor mental health outcomes [53]. Proposed mechanisms for these associations include closer, more prolonged and increased frequency of contact between children and people with infectious diseases, and increased exposure to second-hand tobacco smoke [53].

Crowding is more common among low-income households, households in rental accommodation (particularly state owned rental accommodation), younger households, single parent households, households with more dependent children, and households that include two or more families [54]. Māori and Pacific people are more likely than NZ Europeans to live in rental properties, and home ownership declined more substantially for Māori and Pacific peoples than for NZ Europeans between 1991 and 2006 [55]. Research suggests that rental accommodation tends to be of lower quality than owner-occupied homes, and more likely to lack insulation and to be prone to damp and mould [56].

The following section uses data from the 2001, 2006, and 2013 Censuses to review the proportion of children living in crowded households (households requiring one or more extra bedrooms to meet the people-per-bedroom criteria below).

Data Source and Methods

Definition

The proportion of children aged 0–14 years living in crowded households, as defined by Statistics New Zealand, using the Canadian National Occupancy Standard

Data Source

Numerator: Census: The number of children aged 0–14 years living in households which required one or more additional bedrooms.

Denominator: Census: The total number of children aged 0–14 years living in households at the Census for whom crowding status was known.

Notes on Interpretation

Note 1: Information is for the usual resident population and relates to the household crowding status of individual children. Thus the number of children reported on will be greater than the number of households on Census night (e.g. two children from the same household will be counted twice in these statistics).

Note 2: The Canadian National Occupancy Standard (CNOS) definitions were developed in Canada in the 1980s to enable the calculation of person-to-bedroom ratios for households of differing sizes and compositions [57]. Using the CNOS, Statistics New Zealand defines household crowding as a deficit of at least one bedroom according to the standard of: no more than two people per bedroom; couples can share a room; children under 5 of either gender or under 18 years of the same gender can share a room; children aged 5 to 17 years should not share a room with a child under 5 of the opposite gender; single adults and unpaired children should have a separate room [57].

The CNOS was used in the 2001, 2006, and 2013 NZ censuses, and households were reported as having two plus, one or no bedrooms spare, or as requiring an additional one, or two plus bedrooms. Households needing one or two plus additional bedrooms are deemed to be crowded [57].

Note 3: The NZ Deprivation Index uses household crowding as one of the nine variables to create its Deprivation Scores. Household crowding can therefore be expected to exhibit a social gradient by NZDep. However, it is the degree of the crowding experienced by children in each NZDep decile which is likely to have the greatest impact on their housing related health outcomes.

New Zealand Distribution and Trends

Distribution by household bedroom requirements

At the 2013 Census, 16.6% of New Zealand children aged 0–14 years lived in households with two or more spare bedrooms, while 35.8% lived in households with one spare bedroom. A further 10.7% lived in households requiring one additional bedroom, while 5.1% lived in households requiring two or more additional bedrooms (**Figure 1**).

New Zealand Trends

The proportion of New Zealand children living in crowded households (i.e. households requiring one or more additional bedrooms) did not change markedly between Censuses. It was 16.2% in 2001, 16.4% in 2006 and 15.8% in 2013 (**Figure 2**).

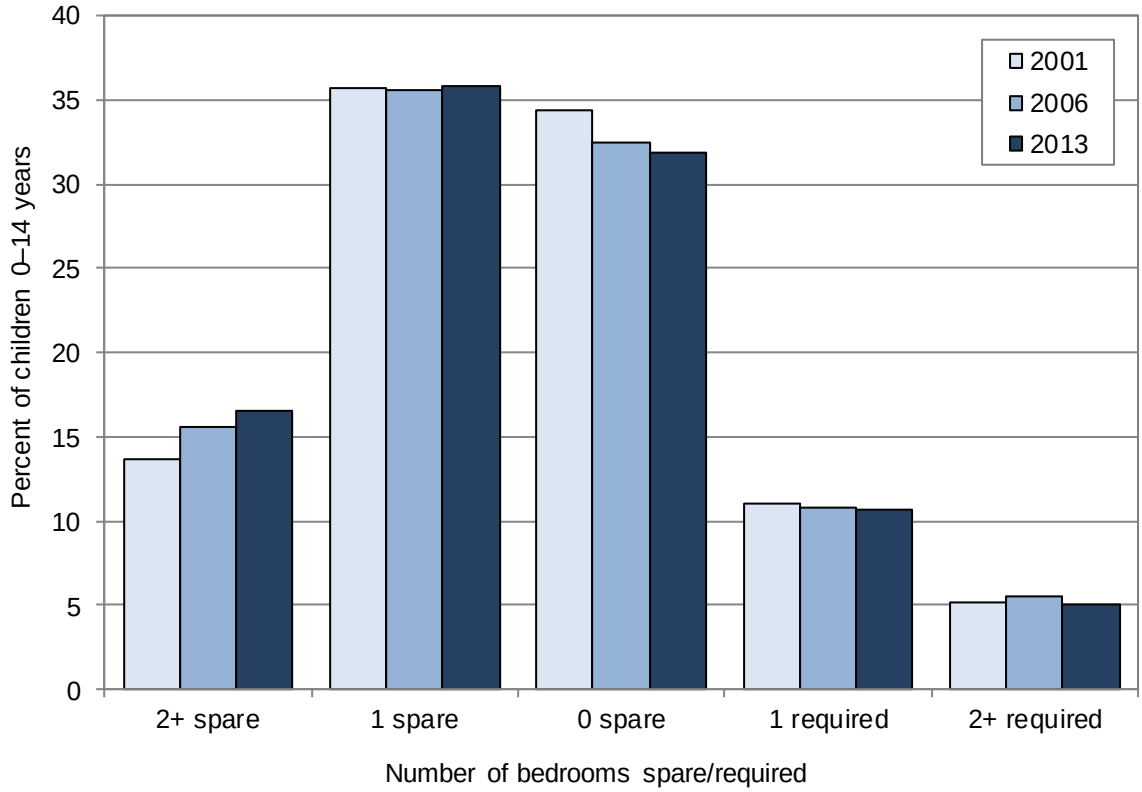
Distribution by Ethnicity

At the 2013 Census, 24.8% of Māori and 46.8% of Pacific children lived in crowded households, compared to 20.8% of Asian/Indian and 4.8% of European children. Household crowding rates for Pacific, Māori and Asian/Indian children were *significantly higher* than for European children (**Figure 2**, **Figure 4**, **Table 1**). Household crowding rates for children of all ethnic groups declined slightly between 2001 and 2013.

Distribution by NZ Deprivation Index Decile

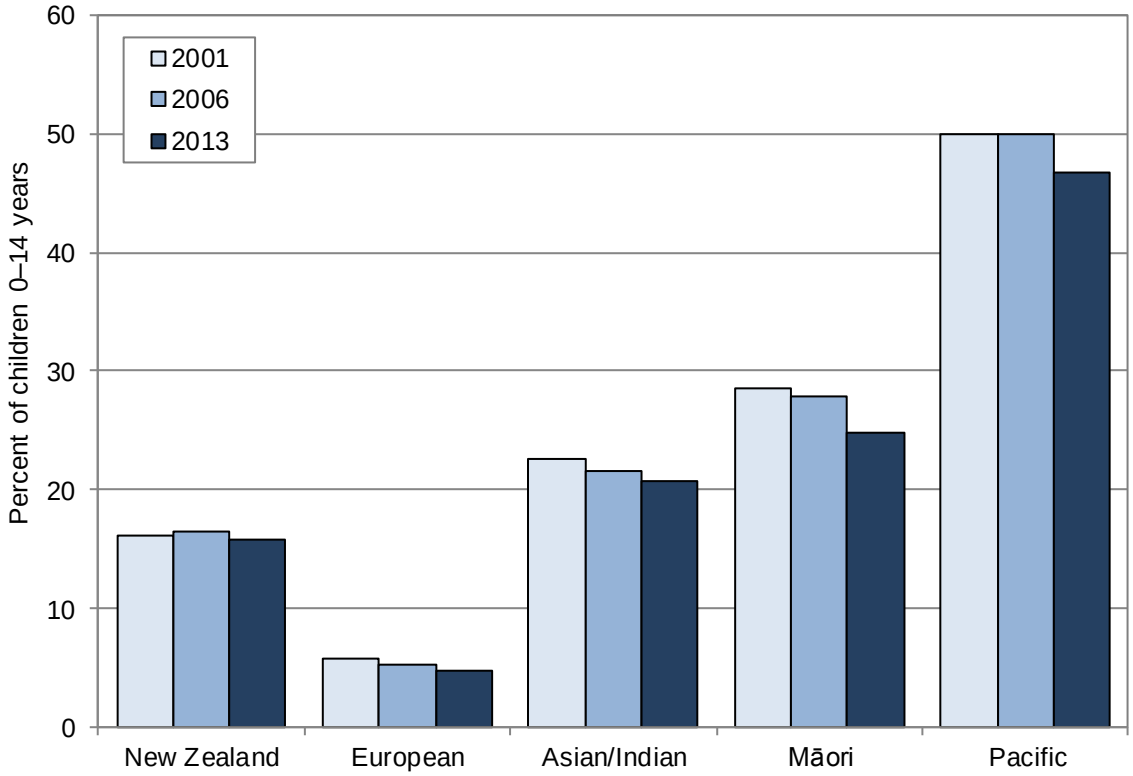
At the 2013 Census, the proportion of children living in crowded households increased with increasing deprivation, from 2.1% for those in the least deprived areas (NZDep decile 1) to 42.8% for those in the most deprived areas (NZDep decile 10). Crowding rates for children in the areas with the most deprived NZDep scores were over 20 times higher than for children in the least deprived areas (**Figure 3**, **Figure 4**, **Table 1**). See Note 3 in Methods box for further interpretation.

Figure 1. Percentage of children aged 0–14 years by the number of bedrooms spare or required in their household, New Zealand at the 2001, 2006 and 2013 Censuses



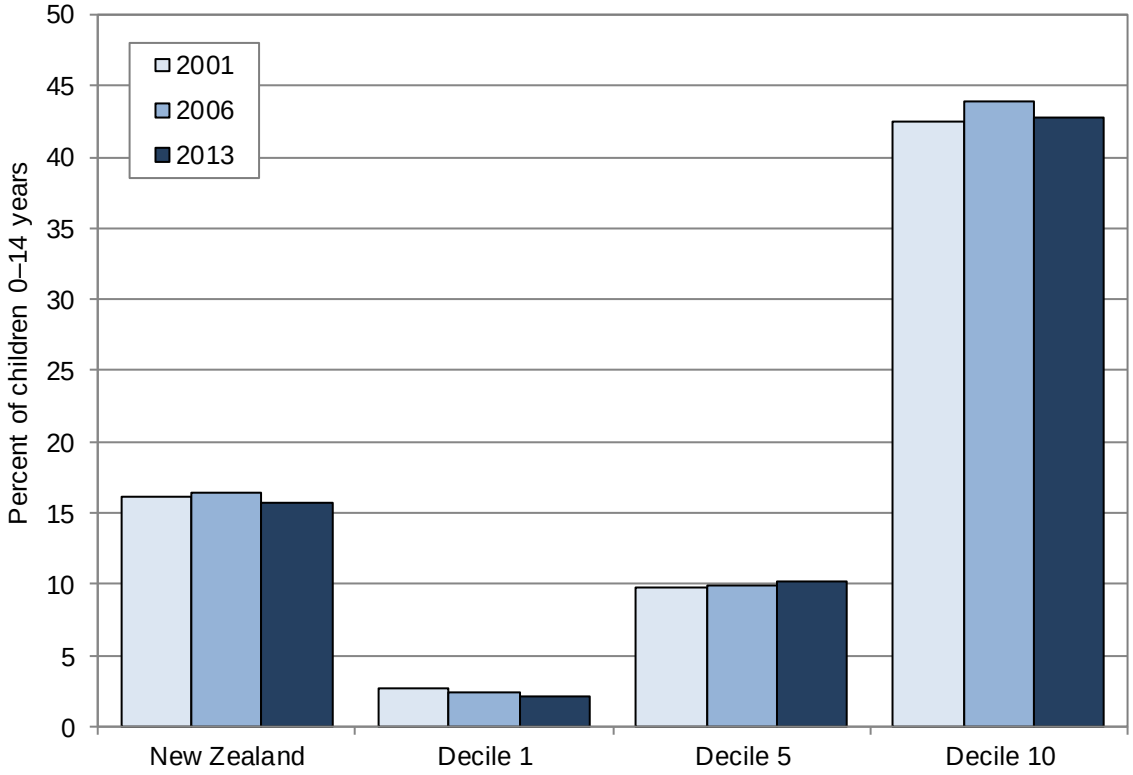
Source: Statistics New Zealand: Measure is the Canadian National Occupancy Standard

Figure 2. Percentage of children aged 0–14 years living in crowded households by ethnicity, New Zealand at the 2001, 2006 and 2013 Censuses



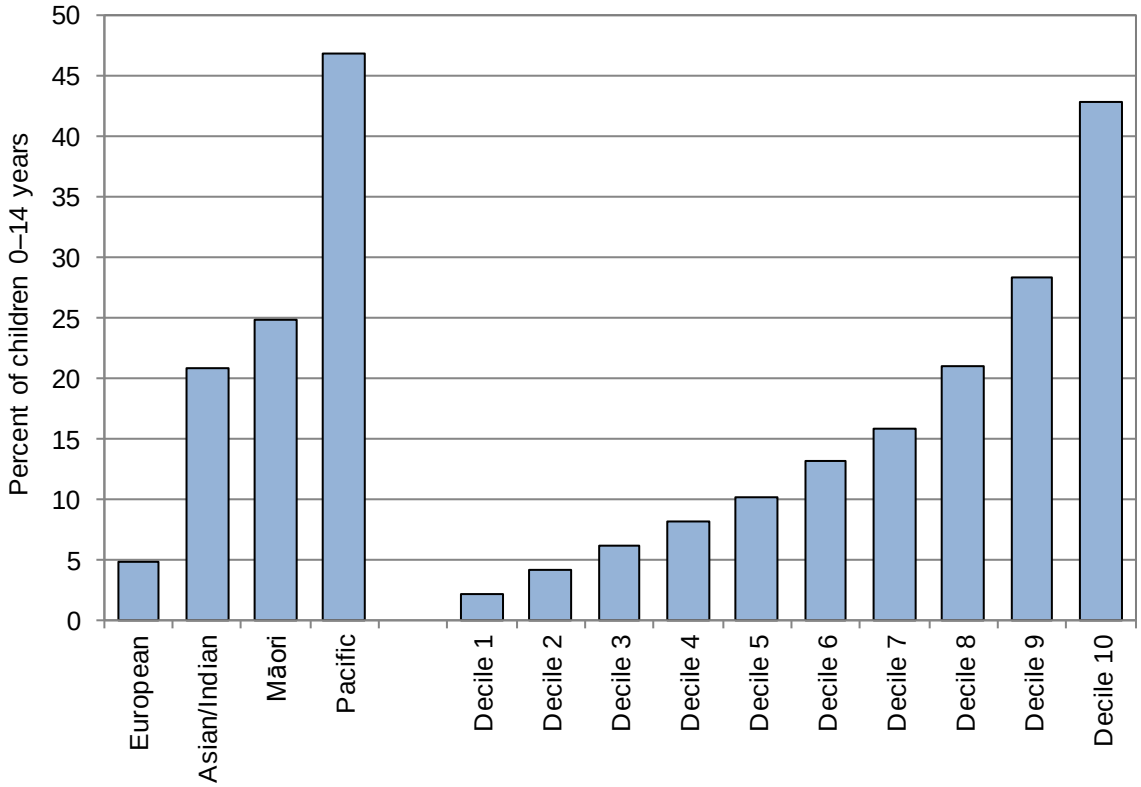
Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised

Figure 3. Percentage of children aged 0–14 years living in crowded households by NZ Deprivation Index decile, New Zealand at the 2001, 2006 and 2013 Censuses



Source: Statistics New Zealand; See Note 3 in Methods box for further interpretation

Figure 4. Percentage of children aged 0–14 years living in crowded households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



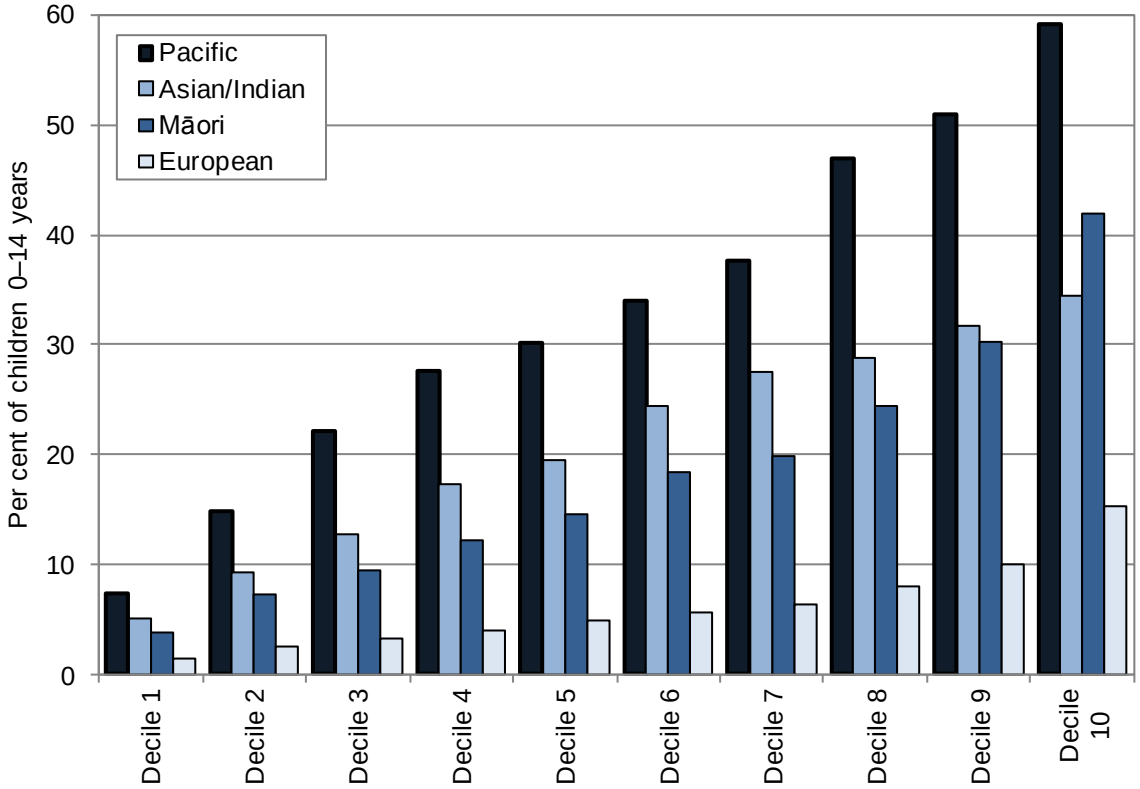
Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13; See Note 3 in Methods box for further interpretation.

Table 1. Children aged 0–14 years living in crowded households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census

	Number of children	Percent of children	Rate ratio	95% CI
Ethnicity				
Māori	47,724	24.8	5.21	5.13–5.29
Pacific	33,576	46.8	9.85	9.70–10.01
European	19,839	4.8	1.00	
Asian/Indian	17,919	20.8	4.37	4.29–4.46
NZ deprivation index decile				
Decile 1	1,806	2.1	1.00	
Decile 2	3,423	4.2	1.97	1.86–2.09
Decile 3	4,734	6.0	2.86	2.71–3.01
Decile 4	6,267	8.2	3.87	3.67–4.07
Decile 5	7,671	10.1	4.80	4.56–5.05
Decile 6	9,744	13.1	6.18	5.89–6.50
Decile 7	11,613	15.8	7.47	7.12–7.85
Decile 8	15,858	21.0	9.94	9.47–10.42
Decile 9	23,373	28.3	13.38	12.77–14.03
Decile 10	42,078	42.8	20.26	19.35–21.22

Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13; See Note 3 in Methods box for further interpretation

Figure 5. Percentage of children aged 0–14 years living in crowded households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13; See Note 3 in Methods box for further interpretation

Distribution by Ethnicity and NZ Deprivation Index Decile

At the 2013 Census, the proportion of children living in crowded households increased with increasing NZDep13 deprivation within each of New Zealand's largest ethnic groups. At each level of NZDep13 deprivation, the proportion of children living in crowded households was highest for Pacific children, followed by Māori and then European children. Asian/Indian children had higher exposures to household crowding than European children in each NZDep13 Index decile, as well as higher exposures than Māori children in NZDep13 deciles 1–8. In the most deprived areas (NZDep13 decile 10), however, Māori children had higher exposures to household crowding than Asian/Indian children (**Figure 5**).

Distribution by Territorial Local Authority

At the 2013 Census, the proportion of children living in crowded households varied by Territorial Local Authority with the proportion ranging from 4.0% in Selwyn District to 29.1% in Opotiki District. The largest number of children living in crowded households (n=61,272) resided in the Auckland Region (**Table 2, Table 3**).

Table 2. Number and proportion of North Island children aged 0–14 years living in crowded households by Territorial Local Authority, New Zealand at the 2013 Census

Territorial Local Authority	Number of children	Percent of children	Rate ratio	95% CI	Territorial Local Authority	Number of children	Percent of children	Rate ratio	95% CI
North Island children 0–14 years living in crowded households									
Far North District	2,757	25.1	1.59	1.54–1.64	Hastings District	2,862	18.8	1.19	1.15–1.23
Whangarei District	2,214	14.7	0.93	0.90–0.97	Napier City	1,548	14.4	0.91	0.87–0.95
Kaipara District	474	13.5	0.85	0.78–0.93	Central Hawke's Bay District	225	9.2	0.58	0.52–0.66
Auckland	61,272	22.3	1.42	1.40–1.43	New Plymouth District	1,254	8.8	0.56	0.53–0.59
Thames-Coromandel District	495	12.4	0.79	0.72–0.85	Stratford District	120	6.5	0.42	0.35–0.49
Hauraki District	417	12.7	0.81	0.74–0.88	South Taranaki District	582	10.5	0.67	0.62–0.72
Waikato District	1,989	14.2	0.90	0.87–0.94	Ruapehu District	519	20.8	1.32	1.22–1.42
Matamata-Piako District	786	12.2	0.77	0.72–0.83	Wanganui District	1,071	13.6	0.86	0.81–0.91
Hamilton City	4,599	16.2	1.03	1.00–1.06	Rangitikei District	381	13.8	0.87	0.80–0.96
Waipa District	660	7.1	0.45	0.42–0.48	Manawatu District	420	7.7	0.49	0.45–0.54
Otorohanga District	231	11.6	0.74	0.65–0.83	Palmerston North City	1,668	11.1	0.71	0.68–0.74
South Waikato District	936	19.5	1.24	1.17–1.31	Tararua District	279	8.2	0.52	0.46–0.58
Waitomo District	426	21.7	1.38	1.27–1.50	Horowhenua District	894	16.7	1.06	1.00–1.12
Taupo District	933	14.4	0.91	0.86–0.97	Kapiti Coast District	723	8.5	0.54	0.50–0.58
Western Bay of Plenty District	1,143	14.1	0.89	0.85–0.94	Porirua City	2,511	21.8	1.38	1.33–1.43
Tauranga City	2,460	11.0	0.70	0.67–0.73	Upper Hutt City	786	10.2	0.65	0.61–0.69
Rotorua District	2,493	18.3	1.16	1.12–1.20	Lower Hutt City	3,276	16.8	1.07	1.03–1.10
Whakatane District	1,515	21.8	1.38	1.32–1.45	Wellington City	3,039	9.8	0.62	0.60–0.64
Kawerau District	396	27.4	1.74	1.60–1.89	Masterton District	471	10.9	0.69	0.64–0.75
Opotiki District	486	29.1	1.84	1.71–1.99	Carterton District	105	6.8	0.43	0.36–0.52
Gisborne District	2,301	23.6	1.50	1.44–1.55	South Wairarapa District	114	6.5	0.41	0.35–0.49
Wairoa District	462	26.5	1.68	1.55–1.81	New Zealand	126,603	15.8	1.00	

Source: Statistics New Zealand

Table 3. Number and proportion of South Island children aged 0–14 years living in crowded households by Territorial Local Authority, New Zealand at the 2013 Census

Territorial Local Authority	Number of children	Percent of children	Rate ratio	95% CI
South Island children 0–14 years living in crowded households				
Tasman District	597	6.7	0.42	0.39–0.46
Nelson City	750	9.0	0.57	0.53–0.61
Marlborough District	594	8.1	0.52	0.48–0.56
Kaikoura District	54	9.6	0.61	0.47–0.78
Buller District	177	9.9	0.63	0.55–0.72
Grey District	144	6.6	0.42	0.36–0.49
Westland District	102	7.3	0.46	0.38–0.56
Hurunui District	132	6.4	0.40	0.34–0.48
Waimakariri District	666	6.9	0.44	0.41–0.47
Christchurch City	6,240	11.1	0.70	0.69–0.72
Selwyn District	378	4.0	0.25	0.23–0.28
Ashburton District	540	8.9	0.56	0.52–0.61
Timaru District	483	6.4	0.41	0.37–0.44
Mackenzie District	33	4.5	0.28	0.20–0.40
Waimate District	75	6.1	0.38	0.31–0.48
Chatham Islands Territory	9	9.1	0.58	0.31–1.07
Waitaki District	318	8.9	0.57	0.51–0.63
Central Otago District	141	4.8	0.31	0.26–0.36
Queenstown-Lakes District	261	5.4	0.34	0.30–0.38
Dunedin City	1,140	6.3	0.40	0.38–0.42
Clutha District	177	5.4	0.34	0.30–0.40
Gore District	129	5.7	0.36	0.31–0.43
Invercargill City	819	8.5	0.54	0.51–0.58
New Zealand	126,603	15.8	1.00	

Source: Statistics New Zealand

South Island DHBs Distribution and Trends

South Island DHBs Distribution

In the South Island at the 2013 Census, the proportion of children who lived in crowded households ranged from 6.2% in South Canterbury to 9.5% in Canterbury. Household crowding rates in the five South Island DHBs were all *significantly lower* than the New Zealand rate (**Table 4**).

Table 4. Number and proportion of children 0–14 years living in crowded households, South Island DHBs vs. New Zealand at the 2013 Census

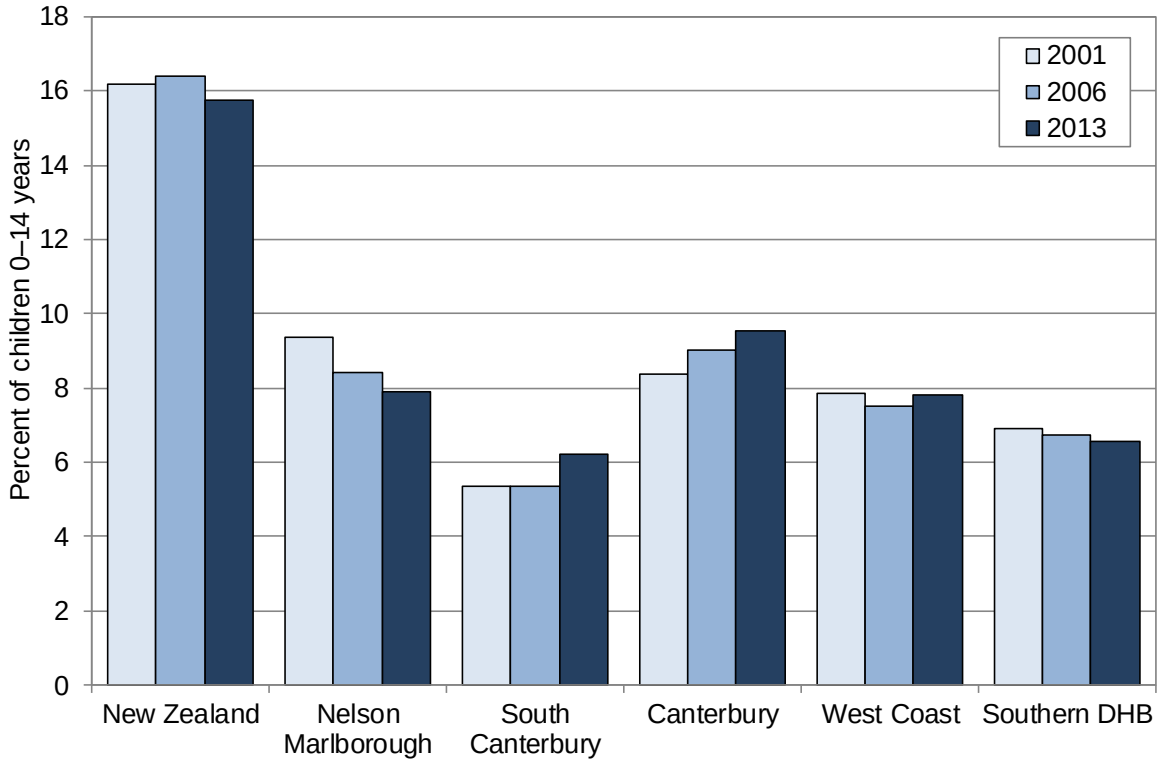
DHB/Area	Number of children	Percent of children	Rate ratio	95% CI
Children 0–14 years living in crowded households				
Nelson Marlborough	1,938	7.9	0.50	0.48–0.52
South Canterbury	591	6.2	0.39	0.37–0.43
Canterbury	8,010	9.5	0.60	0.59–0.62
West Coast	420	7.8	0.50	0.45–0.54
Southern	3,333	6.6	0.42	0.40–0.43
New Zealand	126,600	15.8	1.00	

Source: Statistics New Zealand

South Island DHBs Trends

In South Canterbury and in Canterbury, the proportion of children living in crowded households was higher in 2013 than it was in 2001, while in the remaining Midland DHBs crowding rates were lower in 2013 than in 2001 (**Figure 6**).

Figure 6. Percentage of children aged 0–14 years living in crowded households, South Island DHBs vs. New Zealand at the 2001, 2006, and 2013 Censuses

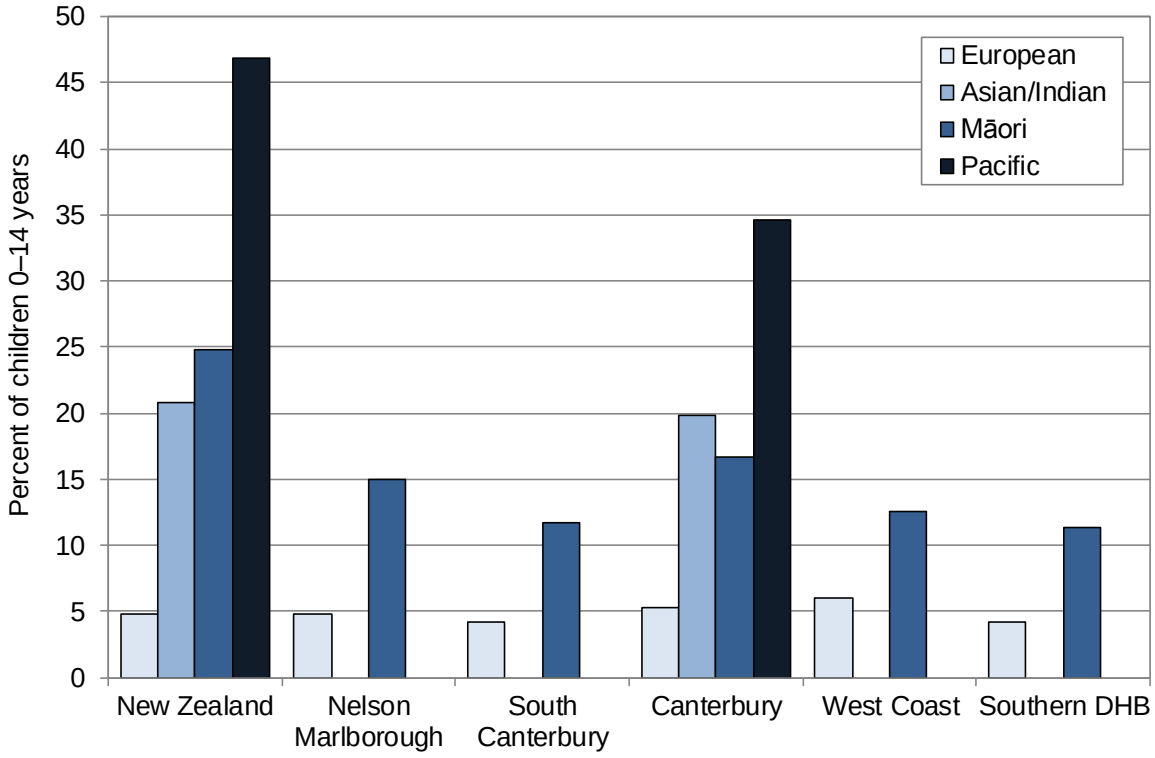


Source: Statistics New Zealand

Distribution by Ethnicity

In the Canterbury, a higher proportion of Pacific > Asian/Indian > Māori > European children lived in crowded households at the 2013 Census, while in the remaining South Island DHBs a higher proportion of Māori than European children lived in crowded households (**Figure 7**).

Figure 7. Percentage of children aged 0–14 years living in crowded households by ethnicity, South Island DHBs vs. New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised

Local Policy Documents and Evidence Based Reviews Relevant to household crowding

Table 5 (below) provides an overview of New Zealand policy documents and evidence-based reviews that consider the relationship between household crowding and health. As interventions to provide healthy housing are usually multi-faceted the publications cover issues broader than crowding alone. Two case studies of specific interventions are included.

Table 5. Local policy documents and evidence based reviews relevant to household crowding

Ministry of Social Development documents
Ministry of Social Development. 2014. **Annual Report 2013/2014**. Wellington: Ministry of Social Development http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/corporate/annual-report/2014/annual-report-2013-2014.pdf From April 2014 the Ministry of Social Development is responsible for assessing social housing needs, including managing the social housing waitlist. This change to the provision of social housing aims to improve the social housing market and ensure provision to those most in need. The transfer of the housing assessment role from Housing New Zealand provides tenants with a more comprehensive needs assessment including issues such as employment, income or other social services that co-exist with housing needs for more than 80% of state housing tenants.
Evidence-based medicine reviews
Baker M, et al. 2013. **Infectious diseases attributable to household crowding in New Zealand: A systematic review and burden of disease estimate**. Wellington: He Kainga Oranga/ Housing and Health Research Programme, University of Otago. http://www.healthyhousing.org.nz/wp-content/uploads/2010/01/HH-Crowding-ID-Burden-25-May-2013.pdf This systematic review and meta-analysis investigated the relationship between household crowding and close contact infectious diseases (IDs). There were 345 studies included in a narrative synthesis and 82 of these studies were included in a meta-analysis which found a statistically significant increased risk for 9 out of 10 close contact infectious diseases (IDs) associated with crowded housing. This association persisted when effects of age and socioeconomic status were taken into account. A burden of disease analysis estimated that 1,343 hospitalisations for specified IDs (10% of all hospital admissions for these diseases) can be attributed to household crowding. More than half the included studies focused on children, especially children aged 0–6 years, who are overrepresented in exposure to household crowding and may also be disproportionately affected by such exposure. The authors conclude that crowding reduction interventions, including policies to improve housing affordability, have the potential to improve child health and to significantly reduce hospital admissions for IDs.
Thomson H, et al. 2013. **Housing improvements for health and associated socio-economic outcomes**. Cochrane database of systematic reviews http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008657.pub2/pdf This systematic review assessed change in any health outcome following interventions which involved a physical improvement to the fabric of a house. Thirty-nine studies reporting quantitative or qualitative data were included in the narrative synthesis. Studies with a focus on improving warmth for people with chronic respiratory disease were most likely to report health improvement. Improving warmth was also associated with an increase in usable space within the home, which increased privacy and improved social relationships, and was associated with reduced absences from work or school due to illness. The authors conclude that the best available evidence indicates that housing which is an appropriate size for the householders and is affordable to heat is linked to improved health and may promote improved social relationships within and beyond the household.
Other relevant New Zealand publications
New Zealand Productivity Commission. 2012. **Housing affordability inquiry**. Wellington: The New Zealand Productivity Commission. http://www.productivity.govt.nz/sites/default/files/Final%20Housing%20Affordability%20Report_0_0.pdf The Productivity Commission undertook an inquiry into housing affordability in New Zealand. Within a wide-ranging and comprehensive report, the Commission notes that housing stability and continuity are often essential for addressing the needs of families requiring social assistance. Community organisations advised the Commission that higher rental costs in the private rental market had led to a marked increase in overcrowding. The Commission recommended an increased role for the community sector in provision of social housing, with the proviso that there must be support to increase the supply of affordable housing and reduce the risk of inadequate housing alternatives for households in need who are not eligible for state housing. The Commission also noted that the social and cultural resources of whānau and communities are essential to enable Māori to find appropriate housing solutions.
Housing New Zealand Corporation. 2013. **Statement of intent 2013–2016**. Wellington: New Zealand Government. http://www.hnzc.co.nz/our-publications/statement-of-intent/statement-of-intent-2013-2016/statement-of-intent_2013-16.pdf Housing New Zealand is the Crown agency currently responsible for providing housing to those most in need. Housing New Zealand will trial the Housing Warrant of Fitness system developed by the government on its properties (see http://www.hnzc.co.nz/news/february-2014/housing-new-zealand-is-trialling-a-new-wof-scheme/?searchterm=warrant%20of%20fitness) to ensure minimum standards for dry, safe homes are met. The Housing New Zealand Project 324&5 will deliver up to 3,000 new bedrooms to 2,000 properties over two years from 2013 to improve health and education outcomes for tenants with larger families. Details of the Government's Social Housing Reform Programme are being developed in the 2013/2014 year and may impact on the future budget, operations and performance targets of Housing New Zealand.

McDonald A. 2014. **Linking housing and health in the Hutt Valley: Housing coordinator pilot evaluation**. Wellington: Regional Public Health. http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps_pid=IE20943570&dps_custom_att_1=ilsdb

This evaluation of the Housing Co-ordinator pilot study (HCP) initiated by a DHB demonstrates a practical approach to improving health outcomes. With their consent, a public health nurse with expertise in housing (the Housing Co-ordinator, HC) visited the homes of selected children and adults admitted to hospital with health conditions that can be linked to cold, damp or crowded housing after they were discharged from hospital. Twenty-eight households were recruited over 16 weeks and 17 visits completed (the HC was unable to contact 7 households after discharge and 4 opted out). The HC provided a housing, health and social assessment with referral to housing, health or social agencies as necessary, for services such as insulation, smoking cessation, budgeting, and income support. Public Health staff, hospital staff and external providers were all supportive of the HCP, and participants who had a co-ordinator visit liked the approach of the programme and appreciated referrals to services. Challenges to be addressed include having broader and simpler criteria for eligibility and better processes to follow-up on service provision following referral.

Pene G, et al. 2009. Pacific families now and in the future: living the Tokelauan way in New Zealand Wellington. http://www.familiescommission.org.nz/sites/default/files/downloads/living-the-tokelauan-way.pdf

This report includes a case study that investigated the experiences of a three-generational Tokelauan extended family who were selected to move from a conventional state house to a purpose-built extended-family dwelling. Crowding was a particular problem in the original house, exacerbated by excessive cold which led the family to heat and live in only one room. With more room and greater warmth in the new dwelling the husband of the family was able to return to work after five years of unemployment due to poor health, the children had space to do homework and got better grades at school, and the family were more socially engaged and able to offer hospitality to wider family and friends. The authors conclude that properly designed social housing can improve the health and social wellbeing of family members.

James B & Saville-Smith K. 2010. **Children's Housing Futures**. Wellington: Centre for Housing Research Aotearoa New Zealand. http://www.chranz.co.nz/pdfs/childrens-housing-futures-report.pdf

This research report examines the housing futures of New Zealand's children, with a view to improving New Zealand's capacity to address the housing needs of children now and into the future. The report consists of: a description of socio-demographic housing trends; a literature review on key housing issues affecting children, housing solutions workshops with key stakeholders; and identification of key priorities and recommendations. The exposure of children to unaffordable housing, houses in poor condition, crowding and insecure tenure; and the strong trend towards children to be housed in the rental market, are identified as key issues. Five key priorities are recommended: developing housing policy that treats children's housing needs as seriously as adult housing needs; developing policy and cross-sectoral services that integrate housing aware child services with child-centred housing delivery, including a standardised housing needs assessment tool; improving the quality and security of the rental market; transforming the housing stock by actively pursuing child wellbeing outcomes, for example retrofitting insulation; diversifying tenure shared ownership and non-speculative housing and housing provision and recruiting a range of different providers into the housing market. Several research priorities are identified.

Other relevant publications

Ormandy D. 2014. **Housing and child health**. Paediatrics and Child Health (United Kingdom), 24(3), 115–17.

Ormandy reviews and summarises the serious threats to children's health associated with unhealthy housing conditions. Crowded housing and frequent moves from one dwelling to another have a negative impact on children's mental and physical health including risk of physical injury, and likelihood of school underachievement. Ormandy sees the protection of families with young children from being forced to live in crowded conditions or to move frequently as a priority for policy. The introduction of the Housing Health and Safety Rating System (HHSRS) in England and Wales provides new possibilities for closer co-operation between housing and health sectors within local authorities to remove or reduce hazards to health in the home environment. Children are particularly vulnerable to hazards such as excess cold, damp and mould growth, and fall hazards.

Website

He Kainga Oranga is the Housing and Health research programme based at the University of Otago, Wellington and is a comprehensive repository for New Zealand research about the associations between housing and health http://www.healthyhousing.org.nz/

Note: The publications listed above were identified using the search methodology outlines in Appendix 1