

How many is a crowd?

Which crowding index to use in the New Zealand context

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How do we measure crowding?

A number of measures are used internationally

Objective measures

- People per floor area
- People per room (most widespread, includes US)
- People per bedroom (UK, Canada, Australia and New Zealand) – includes Canadian National Occupancy Standard and British Bedroom Standard

These are all measures based on a combination of information about dwelling size and household size/composition

Subjective measures include self-reported crowding

Functional crowding – people may sleep together in one room, because of inability to heat or other reasons

Crowding concepts - Culture

- Ideas about crowding and room use can be culturally and context dependent. Eg traditional Japanese households may use living rooms as bedrooms at night - no real concept of separate bedrooms (Shulter et al, 2007)
- Crowding measures based on number of bedrooms don't take into account use of other living spaces for sleeping
- However, studies suggest that while perceptions of crowding may vary by ethnic group, crowding has negative consequences regardless of cultural context.
- Evidence suggests that for many families and households crowding may be a combination of cultural responsibility to accommodate kin, combined with low income and the New Zealand housing situation – with its often inadequate, small, and unaffordable housing.

Different ways of measuring crowding

- ⊙ We applied four different indexes to data from the New Zealand Census of Population and Dwellings:
- ⊙ Uses bedrooms and demographic data: Canadian National Occupancy Standard, British Bedroom Standard (people per bedroom), Equivalised crowding index (NZ)
- ⊙ Uses rooms: American crowding index (people per room)
- ⊙ We found issues with quality of rooms data, which made American crowding/ people per room index less reliable.

ACI category	CNOS category				
	Crowded	Severely crowded	No extra bedrooms required and none spare	One bedroom spare	Two or more bedrooms spare
	Percent				
Crowded	37.0	27.6	27.9	7.2	0.3
Severely crowded	30.6	42.8	26.5	0.1	0.0
Not crowded	2.9	0.4	21.1	34.8	40.7

Different ways of measuring crowding

INDEX	Based on ...	Uses couple status?	Ages when pairs of girls and boys can share	Ages when pairs of same sex children can share	Ages when own room required
American Index	rooms	no	n/a	n/a	n/a
British Bedroom Standard	bedrooms	yes	Under 10	10-20	21+
Canadian Index	bedrooms	yes	Under 5	5-17	18+
Equivalised Index	bedrooms	yes	Under 10	Under 10	10+

Variations in indexes

Scenario: Dwelling has 2 bedrooms, five total rooms. Household consists of 1 couple and 3 children (2 boys aged 11 and 15, plus a girl of 3):

- American Index: 5 people, 5 rooms –
not crowded
- UK Bedroom standard: 3 bedrooms needed -
crowded (requires 1 extra bedroom)
- Canadian Index: 3 bedrooms needed –
crowded (requires 1 extra bedroom)
- Equivalised Index: 4 bedrooms needed
crowded (requires 2 *extra* bedrooms)



Number of crowded households varied by index (2006 data)



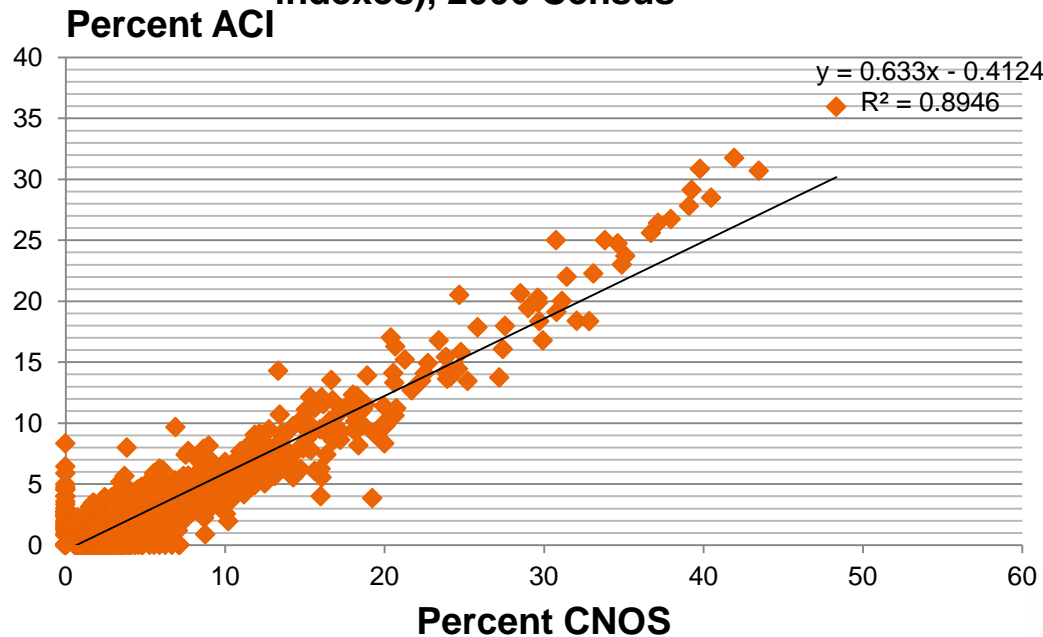
Index	Number of crowded households	Number of people in crowded households
American Index	37,500	228,800
UK Bedroom Standard	59,100	324,600
Canadian Index	71,900	389,600
Equivalised Index	95,400	516,900

But characteristics similar

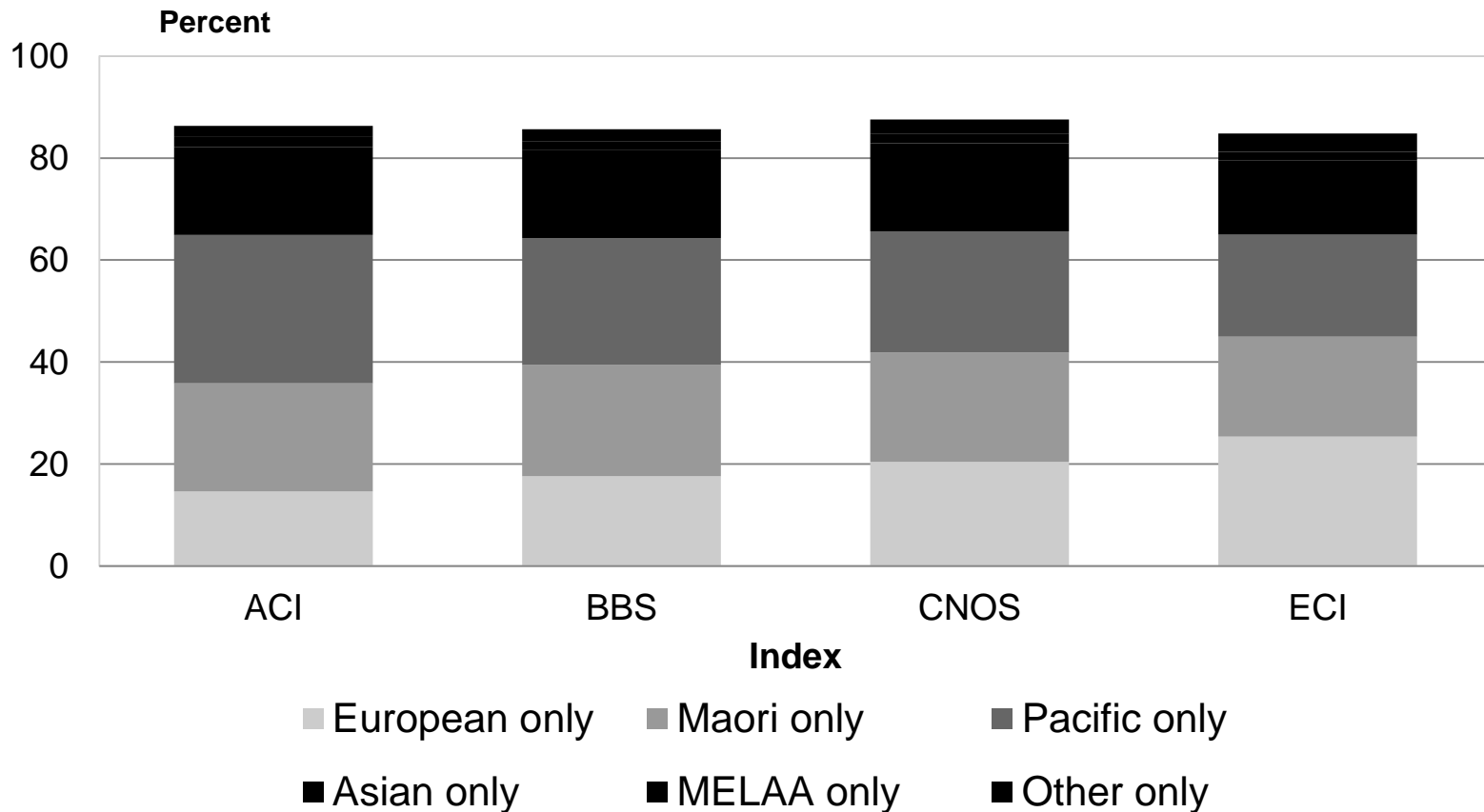
2006 Census					
Characteristic	Total households	Household crowding definition			
		ACI	BBS	CNOS	ECI
Number of households	1,454,175	37,488	59,091	71,871	95,394
Percent of households	100.0	2.7	4.2	5.2	6.9
Average household size	2.7	6.1	5.5	5.4	5.4
Percentage of multi-family households	2.8	26.2	23.3	21.2	17.4
Received government income support ⁽¹⁾	23.5	56.6	62.5	61.5	57.0
Tenure: Percentage owning (3)	66.9	34.9	33.5	34.8	39.4
Renting households: percentage renting privately	81.8	60.2	64.7	65.9	66.4
Renting households: percentage renting through HNZC (4)	13.5	37.0	32.5	31.4	30.9
Median JEAH income (5)	\$46,100	\$32,100	\$34,400	\$34,400	\$34,000

Similar geographic distributions

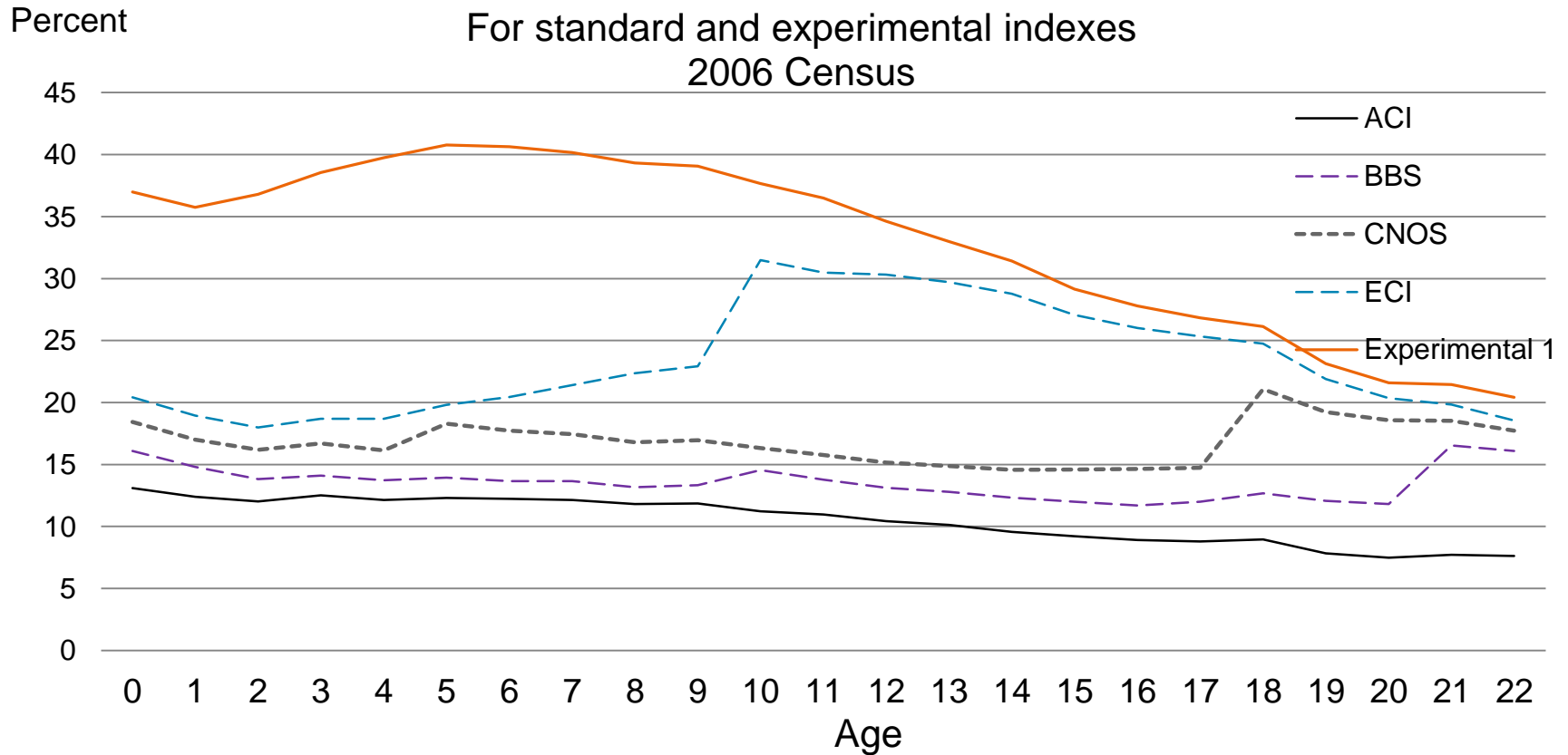
Correlation between percentages of households that were crowded by area unit (ACI and CNOS indexes), 2006 Census



Proportion of people crowded by ethnicity (single response, level 1) and index, 2006 Census

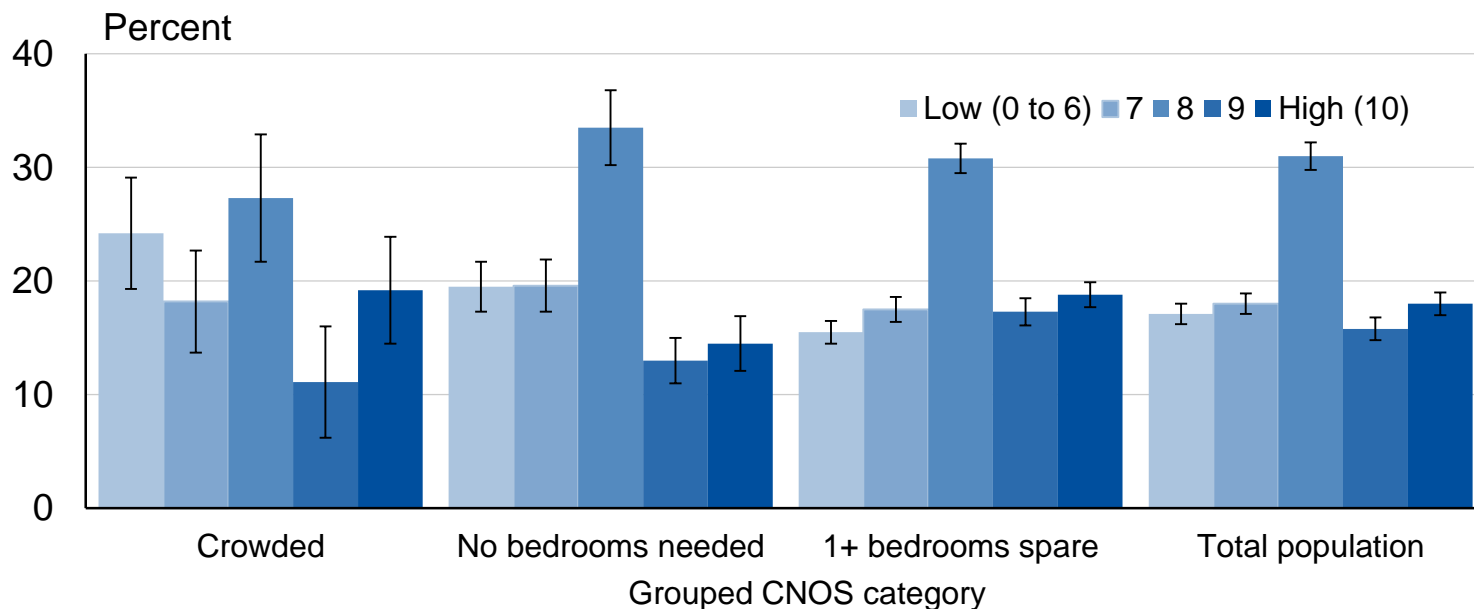


Age distribution of crowding by index for people 22 years and under



Crowding associated with poverty and lower life satisfaction

Life satisfaction rating by grouped CNOS category
2016 General Social Survey



Note: Error bars show the variability within the estimate. As crowded households are a small proportion of all households, there is greater variability around that estimate.

In conclusion

- While no index was perfect CNOS seemed to fit best with New Zealand's context:
 - Separating male and female children once they hit puberty – earlier age of puberty now with around 1 in 6 girls showing signs of puberty by age of 8.
 - 18 most commonly accepted age of adulthood – an 18-year-old is “legally independent of parents, could work for the minimum wage immediately, vote and stand in local and general elections, buy and use alcohol and cigarettes, enter contracts, and open cheque and credit accounts”(Te Ara, ‘defining childhood
- May not fit all cultural expectations of use of space but there are strong links between crowding and infectious disease