Indicator: Child exposure to second-hand smoke in New Zealand households

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Background

Of all environmental air pollution no other source produces as many toxic substances as tobacco smoke.[1] Second hand smoke (SHS) exposure is also a major risk factor for increased morbidity and mortality among children and non-smoking adults.[2-4] Children who live with smokers in the home are more likely to develop health problems than non-exposed children. These health outcomes include: increased risk of asthma aggravation, damage to lungs, acute lower respiratory illness, prevalence and severity of middle ear disease, development of behavioural and learning issues and sudden infant death syndrome.[2; 5]

Households with smokers who practice indoor smoking bans still have an increased level of SHS exposure compared to non-smoking households as measured by nicotine levels in children's hair.[6] Households with outdoor smoking policies also have increased levels of nicotine present in the air and on surfaces inside the home.[3]

International rates of child SHS exposure in the home vary widely depending on the type of exposure measured and the population in question. A review of multiple studies made a 'conservative' estimate of 50% exposure to environmental tobacco smoke among United States children.[7] There was evidence of large differences in exposure rates between regions and ethnic groups. This is reflective of variation in smoking rates between groups in the adult population of many developed countries.

New Zealand studies have also reported varying levels of child SHS exposure in the home over time and place and between groups. The 1996 Census found that 38 percent of homes with children present also housed at least one smoker.[8] Measuring exposure from adolescents perceived exposure a 2002 survey reported 44 percent of households as being 'smoky'[8] and in 2003 a similar student survey found 30 percent of students were exposed to SHS in the home.[9]

Table 1: Neighbourhood demographics by quintile of child SHS exposure in the home (2006 Census)

Children exposed to second-hand smoke in the home by CAU					
Quintiles of exposure (rate per 1,000 households)	Quintile 1 (0-233)	Quintile 2 (234-310)	Quintile 3 (311-379)	Quintile 4 (380-473)	Quintile 5 (474-1,000)
NZDep 2006, mean	2.7	3.8	5.4	7.0	8.8
%European, mean	71.2	73.2	69.2	67.4	56.2
%Maori, mean	5.4	8.5	12.3	18.0	27.9
%Pacific Peoples, mean	2.2	2.5	4.7	5.1	8.7
%Asian, mean	11.7	6.1	6.3	4.3	3.0

Variations in child SHS exposure and the social environment, 2006

Ranking census area units (CAUs) into quintile rates of child exposure to SHS in the home shows evidence of a positive association with neighbourhood deprivation. The average decile of deprivation among CAUs in the lowest exposure quintile is 2.7 compared to 8.8 in the highest exposure group (Table 1). This trend is mirrored by previously identified relationship between deprivation and adult smoking rates in New Zealand.[11]

There is also evidence of differences in child SHS exposure between the major ethnic groups in New Zealand. Table 1 shows that among CAUs in the lowest exposure quintiles there is a higher proportion of residents who identify as European and Asian. In contrast, there are higher proportions of Maori and Pacific Peoples in CAUs with the highest rate of child SHS exposure.

Table 2: Self-reported adolescent SHS exposure (2008 YIS)[12]

Student SHS exposure in the home, ratio of exposed: non-exposure				
School Decile	Ratio		Ethnicity	Ratio
1 (low deprivation)	1.8:1		Tongan	2.3:1
2	1.2:1		Cook Island Maori	1.8:1
3	1.2:1		Maori	1.6:1
4	0.9:1		Niuean	1.3:1
5	0.7:1		Other Pacific Island	1.0:1
6	1.0.:1		Samoan	0.8:1
7	0.6:1		Other Asian	0.7:1
8	0.4:1		Other European	0.6:1
9	0.4:1		Other	0.6:1
10 (high deprivation)	0.4:1		Chinese	0.4:1
			NZ European	0.4:1
			Indian	0.4:1

Self-reported adolescent SHS exposure, 2008

Using school decile as a proxy measure for deprivation, Table 2 shows that there is a marked difference in the ratio of exposed to non-exposed households when comparing the most deprived (1.8:1.0) and least deprived (0.4:1.0) students. There is wide variation by ethnic group also with Indian (0.4:1.0), NZ European (0.4:1.0) and Chinese (0.4:1.0) students all reporting relatively low SHS exposure while Tongan (2.3:1.0) students had the highest rate.

Geographic variations in SHS exposure, 2006

The geographic variation in household SHS exposure by District Health Board (DHB) is shown in Table 3. Tairawhiti and Lakes areas both have a large proportion of CAUs with high rates of child exposure to SHS in the home. Close to 75% of all CAUs within each DHB fall in the two quintiles of highest exposure (73.9% & 73.1% respectively). Both DHBs also have extremely low representation in the quintile of lowest exposure (4.35% and 5.97%). Over half of all neighbourhoods in DHB areas Auckland (65.79%), Capital Coast (62.26%), Canterbury (56.09%), and Waitemata (55.86%) are the three DHBs where over half of the CAUs are defined by the two quintiles of lowest exposure .

Table 3: CAUs clustered by quintiles of child exposure to SHS in the home, 2006 District Health Boards

Proportion CAU's stratified by quintiles of child exposure to SHS in the home					
	Quintile 1 (low SHS exposure)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (high SHS exposure)
Northland	3.4	12.6	20.7	31.0	32.2
Waitemata	33.1	22.8	26.2	12.4	5.5
Auckland	54.4	11.4	18.4	2.6	13.6
Counties	18.3	20.6	15.3	14.5	31.3
Waikato	10.2	18.0	24.6	22.8	24.6
Lakes	6.0	10.5	10.5	20.9	52.2
Bay of Plenty	4.7	18.8	17.7	22.4	36.5
Tairawhiti	4.4	13.0	8.7	21.7	52.2
Taranaki	7.6	18.2	22.7	30.3	21.2
Hawke's Bay	8.8	15.0	17.5	23.8	35.0
Whanganui	6.8	13.6	13.6	29.6	36.4
Mid Central	6.7	17.3	21.3	24.0	30.7
Hutt Valley	20.3	17.2	18.8	18.8	25.0
Capital Coast	42.1	20.6	13.1	2.8	21.5
Wairarapa	4.6	18.2	18.2	31.8	27.3
Nelson Marlborough	16.7	27.8	19.4	16.7	19.4
West Coast	1.8	16.4	18.2	16.4	47.3
Canterbury	26.5	29.6	13.8	19.1	11.1
South Canterbury	8.8	14.7	14.7	23.5	38.2
Otago	17.5	15.8	20.0	22.5	24.2
Southland	11.8	15.3	18.8	14.1	40.0

Notes:

Rates of child SHS exposure from the 2006 Census have been calculated using the equation $\frac{\#\ households\ with\ at\ least\ one\ smoker\ and\ one\ child\ present}{\#\ households\ with\ at\ least\ one\ child\ present}$

Overall only 1697 of 1919 CAUs had sufficient data for analysis, this precluded the use of territorial unit level analysis due to high numbers of missing CAUs within some wider areas.

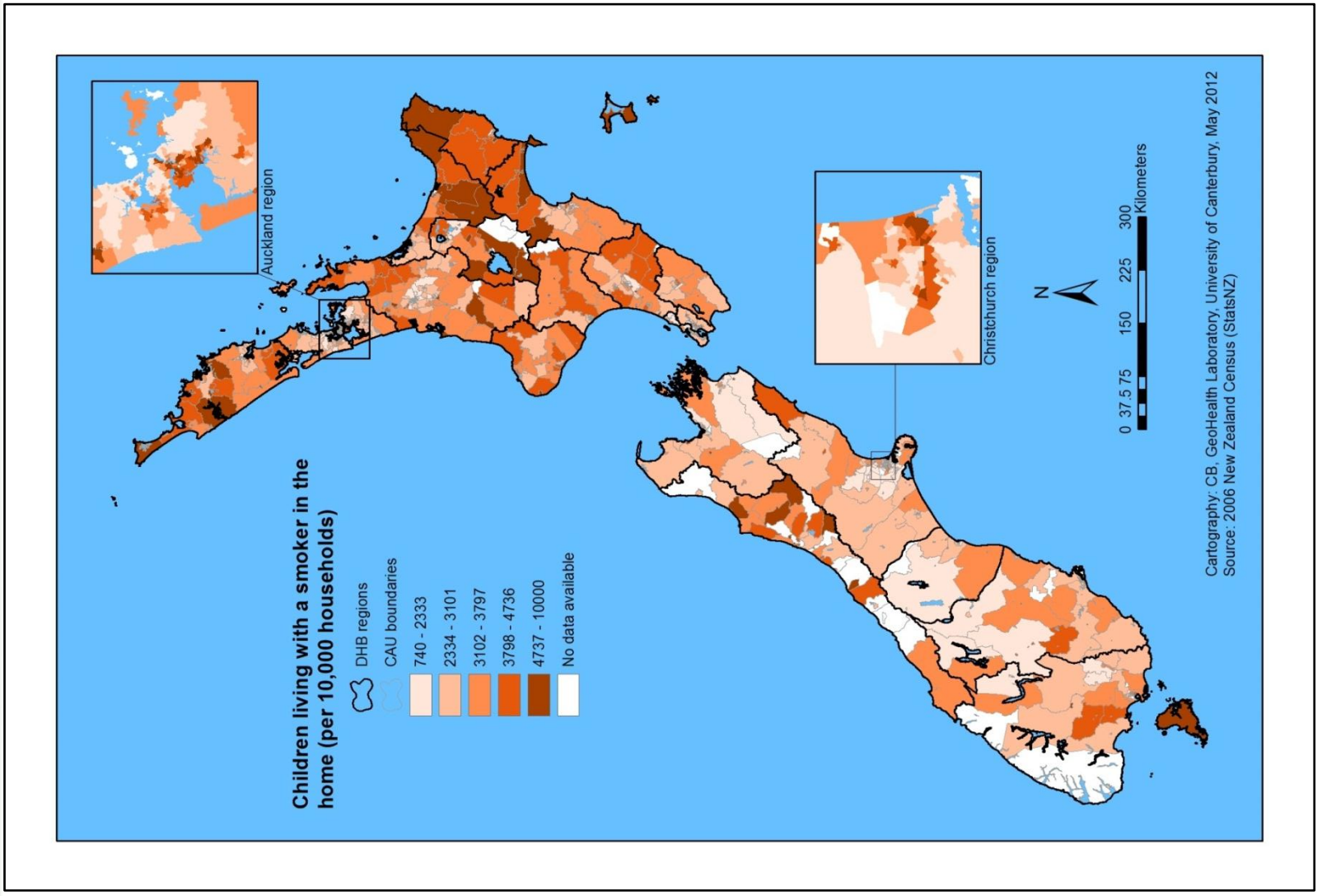

Figure 1: Children exposed to SHS in the home by CAU and DHB, 2006

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