

## **Appendix 1**

### **Sensitivity analysis**

The table below shows the effects of:

1. Changing the criteria for inclusion in the population (column 1). In the main analyses, children were included in the population if they were in the IDI spine AND had health or birth records.

Column 1 of the table below shows the results when the population was defined as children who were in the IDI spine OR had birth or health records.

2. Changing the overseas time cut-off for exclusion from the residential mobility and hospitalisation analyses (column 2, differences only apply to hospitalisation and meshblock change variables). In the main analyses, children were excluded if they had spent more than a year overseas. Column 2 of the table below shows the results if all children were included regardless of the amount of time spent overseas.

	Different population				Different overseas cut-off			
	OR (95% CI)				OR (95% CI)			
	N	VHT incomplete	Nurse checks incomplete	SDQ Teacher incomplete	N	VHT incomplete	Nurse checks incomplete	SDQ Teacher incomplete
<b>Sex</b>								
Male	136896	0.98 (1.01,0.96)	0.98 (1.00,0.96)	0.99 (1.01,0.98)	129834	0.98 (1.01,0.96)	0.98 (1.00,0.96)	1.00 (1.01,0.98)
Female	128967	-	-	-	122439	-	-	-
<b>Ethnicity</b>								
Māori	73092	0.76 (0.79,0.75)	0.74 (0.75,0.72)	0.81 (0.82,0.79)	71196	0.60 (0.61,0.58)	0.63 (0.64,0.61)	0.76 (0.78,0.75)
Pacific	39903	0.60 (0.62,0.59)	0.68 (0.69,0.66)	0.38 (0.39,0.37)	37857	0.58 (0.60,0.56)	0.67 (0.69,0.65)	0.37 (0.38,0.36)
Asian	33039	1.09 (1.12,1.04)	1.20 (1.23,1.16)	0.76 (0.78,0.75)	30825	1.30 (1.35,1.25)	1.39 (1.45,1.35)	0.78 (0.80,0.76)
European	180345	1.72 (1.75,1.69)	1.49 (1.52,1.47)	2.13 (2.17,2.13)	173232	1.67 (1.72,1.64)	1.41 (1.45,1.39)	2.13 (2.17,2.08)
	136896	0.98 (1.01,0.96)	0.98 (1.00,0.96)	0.99 (1.01,0.98)	129834	0.98 (1.01,0.96)	0.98 (1.00,0.96)	1.00 (1.01,0.98)
<b>Number of siblings at time of birth</b>								
0	123123	-	-	-	123126	-	-	-
1	70626	1.18 (1.22,1.15)	1.05 (1.09,1.03)	1.09 (1.11,1.06)	70629	1.18 (1.22,1.15)	1.05 (1.09,1.03)	1.09 (1.11,1.06)
2+	43527	0.71 (0.74,0.69)	0.68 (0.70,0.66)	0.78 (0.80,0.77)	43527	0.71 (0.74,0.69)	0.68 (0.70,0.66)	0.78 (0.80,0.77)
<b>Socioeconomic deprivation</b>								
NZDep quintile								
1 (least deprived)	52995	-	-	-	50517			
2	48081	0.89 (0.93,0.86)	0.92 (0.95,0.88)	0.89 (0.92,0.87)	46326	0.85 (0.89,0.81)	0.89 (0.93,0.86)	0.88 (0.91,0.86)

3	47283	0.82 (0.85,0.79)	0.85 (0.88,0.82)	0.89 (0.92,0.88)	45672	0.77 (0.80,0.74)	0.82 (0.85,0.79)	0.88 (0.91,0.86)
4	48720	0.72 (0.75,0.69)	0.79 (0.82,0.77)	0.81 (0.83,0.79)	47043	0.66 (0.69,0.64)	0.77 (0.79,0.74)	0.79 (0.81,0.78)
5 (most deprived)	64308	0.54 (0.56,0.53)	0.64 (0.66,0.62)	0.53 (0.54,0.52)	61854	0.50 (0.52,0.48)	0.62 (0.64,0.60)	0.52 (0.53,0.51)

Mother highest qualification

No formal qualifications	27672	0.48 (0.51,0.46)	0.61 (0.63,0.58)	0.68 (0.70,0.66)	27675	0.48 (0.51,0.46)	0.61 (0.63,0.58)	0.68 (0.70,0.66)
Secondary school	67047	0.72 (0.75,0.69)	0.82 (0.85,0.79)	0.83 (0.85,0.81)	67047	0.72 (0.75,0.69)	0.82 (0.85,0.79)	0.83 (0.85,0.81)
Bachelors degree	41901	0.81 (0.85,0.78)	0.84 (0.87,0.81)	0.86 (0.88,0.84)	41901	0.81 (0.85,0.78)	0.84 (0.87,0.81)	0.86 (0.88,0.84)
Postgraduate degree	57570	-	-	-	57570	-	-	-

Father highest qualification

No formal qualification	26712	0.65 (0.68,0.61)	0.73 (0.76,0.70)	0.82 (0.85,0.79)	26712	0.65 (0.68,0.61)	0.73 (0.76,0.70)	0.82 (0.85,0.79)
Secondary school	51177	0.86 (0.91,0.82)	0.91 (0.94,0.88)	0.90 (0.93,0.88)	51177	0.86 (0.91,0.82)	0.91 (0.94,0.88)	0.90 (0.93,0.88)
Bachelors degree	47388	0.99 (1.04,0.94)	0.98 (1.02,0.94)	1.06 (1.10,1.04)	47388	0.99 (1.04,0.94)	0.98 (1.02,0.94)	1.06 (1.10,1.04)
Postgraduate degree	39450	-	-	-	39450	-	-	-

Member of household receives benefit income

No	159069	-	-	-	158679	-	-	-
Yes	51777	0.57 (0.59,0.55)	0.65 (0.66,0.63)	0.66 (0.67,0.65)	51720	0.56 (0.58,0.55)	0.64 (0.66,0.63)	0.66 (0.67,0.65)

Family circumstances

Age of mother at child's birth

<20	14313	0.48 (0.51,0.46)	0.56 (0.59,0.54)	0.64 (0.66,0.62)	14313	0.48 (0.51,0.46)	0.56 (0.59,0.54)	0.64 (0.66,0.62)
20-24	41889	0.63 (0.66,0.61)	0.69 (0.72,0.67)	0.75 (0.77,0.74)	41889	0.63 (0.66,0.61)	0.69 (0.72,0.67)	0.75 (0.77,0.74)
25-29	55800	0.83 (0.86,0.79)	0.88 (0.90,0.85)	0.88 (0.91,0.87)	55800	0.83 (0.86,0.79)	0.88 (0.90,0.85)	0.88 (0.91,0.87)
30-34	66297	-	-	-	66297	-	-	-
35+	58977	0.90 (0.93,0.87)	0.89 (0.92,0.86)	0.95 (0.97,0.93)	58974	0.90 (0.93,0.87)	0.89 (0.92,0.86)	0.95 (0.97,0.93)

Father on birth certificate

No	12612	0.56 (0.59,0.53)	0.61 (0.64,0.59)	0.60 (0.62,0.57)	12612	0.56 (0.59,0.53)	0.61 (0.64,0.59)	0.60 (0.62,0.57)
Yes	224664	-	-	-	224664	-	-	-

Mother speaks English

No	3483	0.81 (0.90,0.72)	1.00 (1.10,0.92)	0.56 (0.60,0.53)	3483	0.81 (0.90,0.72)	1.00 (1.10,0.92)	0.56 (0.60,0.53)
Yes	196248	-	-	-	196248	-	-	-

**Housing**

Urban	224976	-	-	-	215775	-	-	-
Rural	36630	1.05 (1.09,1.01)	1.03 (1.06,1.00)	1.59 (1.61,1.54)	35838	0.93 (0.96,0.89)	0.95 (0.98,0.93)	1.54 (1.59,1.52)

Household size

2-4 people	121098	-	-	-	120852	-	-	-
5-7 people	77961	0.74 (0.76,0.71)	0.75 (0.76,0.72)	0.76 (0.77,0.75)	77808	0.74 (0.76,0.71)	0.74 (0.76,0.72)	0.76 (0.77,0.75)
8+ people	11784	0.42 (0.44,0.40)	0.51 (0.53,0.49)	0.36 (0.37,0.34)	11742	0.42 (0.44,0.40)	0.51 (0.53,0.49)	0.36 (0.37,0.34)

Own home	112581	-	-	-	112458	-	-	-
Rented home	94146	0.56 (0.57,0.54)	0.63 (0.65,0.62)	0.71 (0.72,0.69)	93840	0.56 (0.58,0.54)	0.64 (0.65,0.63)	0.71 (0.72,0.70)

Number of residence changes age 0-4

None	61761	-	-	-	62412	-	-	-
1	57459	2.86 (2.94,2.78)	2.13 (2.17,2.08)	1.33 (1.37,1.30)	47994	1.16 (1.22,1.12)	1.01 (1.04,0.98)	0.90 (0.92,0.88)
2	42891	2.86 (2.94,2.70)	2.00 (2.08,1.92)	1.25 (1.28,1.22)	31935	0.96 (1.00,0.92)	0.85 (0.88,0.81)	0.83 (0.85,0.81)
3	28653	2.33 (2.44,2.22)	1.67 (1.72,1.61)	1.15 (1.18,1.11)	20745	0.85 (0.90,0.81)	0.73 (0.76,0.70)	0.78 (0.81,0.76)
4	18810	2.04 (2.13,1.92)	1.41 (1.47,1.37)	1.08 (1.11,1.04)	32235	0.66 (0.68,0.63)	0.60 (0.62,0.58)	0.76 (0.79,0.75)
5+	30447	1.56 (1.61,1.49)	1.16 (1.20,1.12)	1.05 (1.09,1.03)	62412	1.37 (1.43,1.32)	1.18 (1.22,1.14)	0.99 (1.01,0.97)

Health status

Mother smoking status

Regular smoker	38457	0.56 (0.57,0.53)	0.63 (0.65,0.61)	0.78 (0.79,0.76)	38460	0.56 (0.57,0.53)	0.63 (0.65,0.61)	0.78 (0.79,0.76)
Ex smoker	45420	0.94 (0.98,0.90)	0.90 (0.93,0.88)	1.08 (1.10,1.05)	45420	0.94 (0.98,0.90)	0.90 (0.93,0.88)	1.08 (1.10,1.05)
Never smoked	111219	-	-	-	111219	-	-	-

Birthweight

<2500g	14049	0.57 (0.60,0.55)	0.73 (0.76,0.70)	0.87 (0.90,0.84)	14049	0.57 (0.60,0.55)	0.73 (0.76,0.70)	0.87 (0.90,0.84)
2500-4000g	187242	-	-	-	187239	-	-	-
>4000g	34746	1.01 (1.05,0.97)	0.96 (0.99,0.93)	1.04 (1.06,1.01)	34749	1.01 (1.05,0.97)	0.96 (0.99,0.93)	1.04 (1.06,1.01)

Gestation

<37 weeks	17922	0.60 (0.63,0.57)	0.76 (0.79,0.73)	0.88 (0.91,0.85)	17922	0.60 (0.63,0.57)	0.76 (0.79,0.73)	0.88 (0.91,0.85)
37-42 weeks	217128	-	-	-	217128	-	-	-
>42 weeks	1443	1.00 (1.19,0.85)	0.97 (1.11,0.84)	0.67 (0.75,0.61)	1443	1.00 (1.19,0.85)	0.97 (1.11,0.84)	0.67 (0.75,0.61)

Child referred for disability support assessment

No	261408	-	-	-	247875	-	-	-
Yes	4473	0.46 (0.50,0.43)	0.46 (0.49,0.43)	0.61 (0.65,0.57)	4401	0.34 (0.37,0.32)	0.38 (0.40,0.36)	0.56 (0.60,0.53)

Number of quarters enrolled with GP age 0-4

0-3	25407	0.16 (0.17,0.16)	0.23 (0.24,0.22)	0.41 (0.42,0.39)	16215	0.16 (0.17,0.16)	0.20 (0.21,0.19)	0.42 (0.44,0.41)
4-7	41286	0.74 (0.77,0.72)	0.81 (0.83,0.78)	0.91 (0.93,0.89)	42645	0.53 (0.55,0.51)	0.54 (0.55,0.52)	0.83 (0.85,0.81)
8-11	90621	0.95 (0.98,0.92)	0.97 (1.00,0.94)	0.99 (1.01,0.97)	95298	0.76 (0.79,0.74)	0.78 (0.80,0.76)	0.98 (1.00,1.00)
12+	93174	-	-	-	-	-	-	-

Number of hospital admissions age 0-4

None	104382	-	-	-	108081	-	-	-
1 to 2	104280	2.17 (2.22,2.13)	1.75 (1.82,1.72)	1.35 (1.37,1.32)	111288	1.32 (1.35,1.28)	1.23 (1.27,1.20)	1.14 (1.16,1.12)
3 to 5	21528	1.85 (1.92,1.79)	1.64 (1.72,1.59)	1.32 (1.35,1.27)	22668	1.06 (1.11,1.01)	1.11 (1.15,1.06)	1.09 (1.11,1.05)
6+	9834	1.23 (1.32,1.18)	1.19 (1.25,1.14)	1.12 (1.16,1.08)	10242	0.73 (0.77,0.69)	0.82 (0.86,0.78)	0.94 (0.98,0.91)

Total days in hospital age 0-4

None	134751	-	-	-	141108	-	-	-
1 to 9	96537	1.92 (1.96,1.85)	1.59 (1.61,1.54)	1.27 (1.30,1.25)	102060	1.23 (1.27,1.20)	1.16 (1.19,1.14)	1.11 (1.12,1.09)
10 to 19	5022	1.28 (1.41,1.19)	1.22 (1.32,1.14)	0.98 (1.03,0.93)	5268	0.83 (0.91,0.77)	0.90 (0.96,0.84)	0.85 (0.90,0.81)
20+	3714	0.81 (0.88,0.75)	0.84 (0.91,0.78)	0.82 (0.88,0.77)	3843	0.53 (0.58,0.49)	0.63 (0.67,0.58)	0.72 (0.77,0.68)

Total number of ED visits age 0-4

None	205911	-	-	-	215601	-	-	-
1 to 2	31854	1.20 (1.37,1.06)	0.96 (1.06,0.87)	0.63 (0.69,0.58)	34218	0.99 (1.02,0.95)	0.93 (0.95,0.90)	0.69 (0.71,0.68)
3+	2262	0.98 (1.01,0.96)	0.98 (1.00,0.96)	0.99 (1.01,0.98)	2457	0.85 (0.95,0.75)	0.76 (0.85,0.69)	0.58 (0.63,0.54)

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## Appendix 2

### Percentage of children completing each component of B4SC, by year

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	% of children completing check			
B4 School check	2011/12	2012/13	2013/14	2014/15
Vision	86.8	88.7	90.7	91.8
Hearing	86.8	88.6	90.6	91.8
Dental	79.4	82.1	86.7	88.4
Growth	79.4	82.1	86.7	88.4
Immunisation	79.1	81.9	86.3	87.9
PEDS	79.4	82.1	86.6	88.4
SDQP	79.3	81.9	86.5	88.2
SDQT	52.9	56.5	59.8	61.4

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