

ORAL HEALTH: SCHOOL DENTAL SERVICE DATA AND DENTAL CARIES ADMISSIONS

Introduction

In New Zealand the School Dental Service (established in 1921), is charged with providing basic preventative and restorative dental care for preschool, primary and intermediate aged school children, via its team of dental therapists.

While enrolment of preschool children is only 60% [194], enrolment of school age children is high [195]. Children are seen annually, unless deemed to be at high risk of dental disease, when 6-monthly visits are indicated. Children requiring dental care beyond the scope of the School Dental Service may be referred to a general dental practitioner, or if they require extensive treatment, to a hospital dental unit for treatment under general anaesthetic [196]. After Year 8 (Form 2), adolescents are eligible for dental care under the General Dental Benefit system up until the age of 18 years, with care being provided by private dentists working under contract with local DHBs [197].

The following section reviews the oral health status of children and young people using information from two separate sources. The first is School Dental Service data, which provides information on the proportion of children who were caries-free at 5 years, and the number who had decayed, missing or filled teeth (DMFT) at 12 years. A separate subsection considers the proportion of eligible young people accessing publicly funded dental services. The second data source is the National Minimum Dataset, which provides information on hospital admissions for dental caries in children and young people.

School Dental Service Data

Data Sources and Methods

Indicators

1. Proportion of Children Who Were Caries-Free at 5 Years

Numerator: Number of children aged 5 years whose deciduous teeth were caries-free on completion of treatment with the School Dental Service

Denominator: Total number of 5 year olds who were examined in the year

2. Mean DMFT at 12 Years

Numerator: Number of permanent teeth of children aged around 12 years that are decayed, missing (due to caries) or filled on completion of treatment in Year 8, prior to leaving the School Dental Service

Denominator: Total number of Year 8 children who were examined in the year

3. Proportion of Adolescents Using Publicly Funded Dental Services

Numerator: Total number of adolescents (13–18 years) using publicly funded dental services

Denominator: Total number of eligible adolescents (13–18 years)

Notes on Interpretation

Note 1: The data in this section was obtained from <http://www.moh.govt.nz/moh.nsf/indexmh/oralhealth-statistics>, with the Ministry of Health collating this information from the School Dental Service. Once children are enrolled with the Dental Service they are seen, assessed and have appropriate treatment prescribed. Upon completion of treatment, dental health status data are collected on 5 year olds and children in Year 8 (aged approximately 12 years).

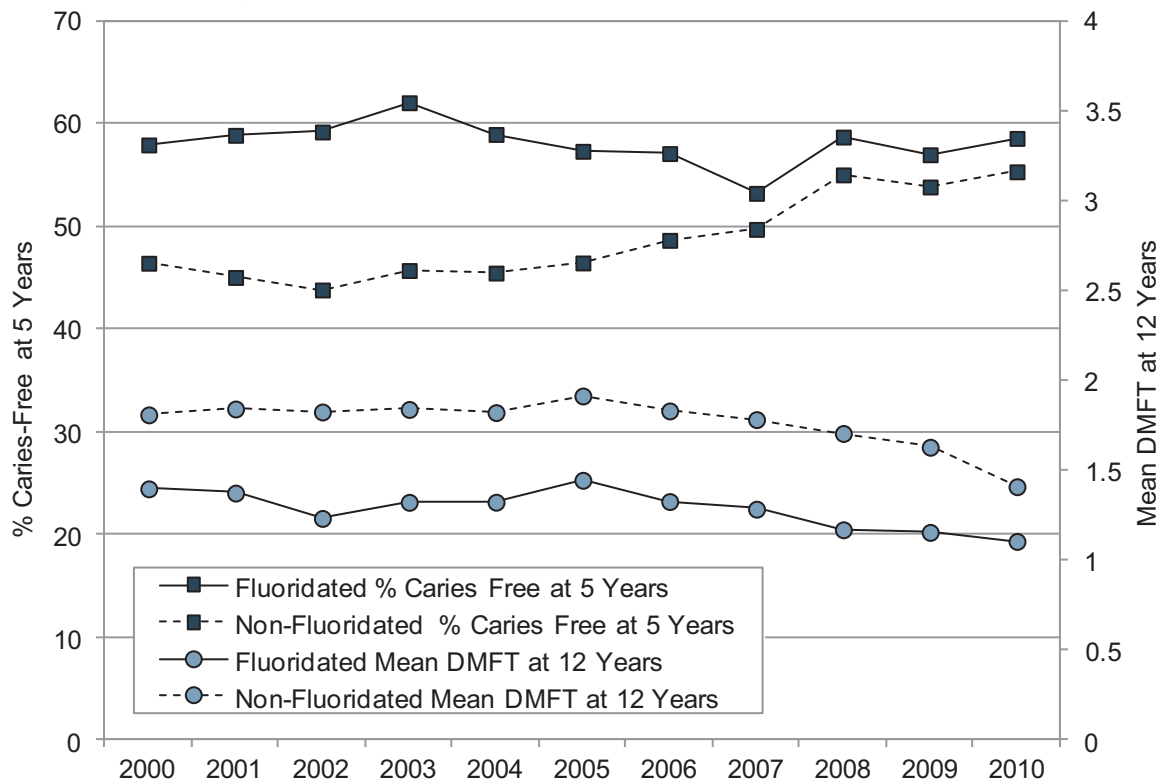
Note 2: In this section, fluoridation status refers to the water supply of the school which the student attended, rather than the fluoridation status of the area in which they resided.

Note 3: Tests of statistical significance have not been applied to the data in this section, and thus any associations described do not imply statistical significance or non-significance.



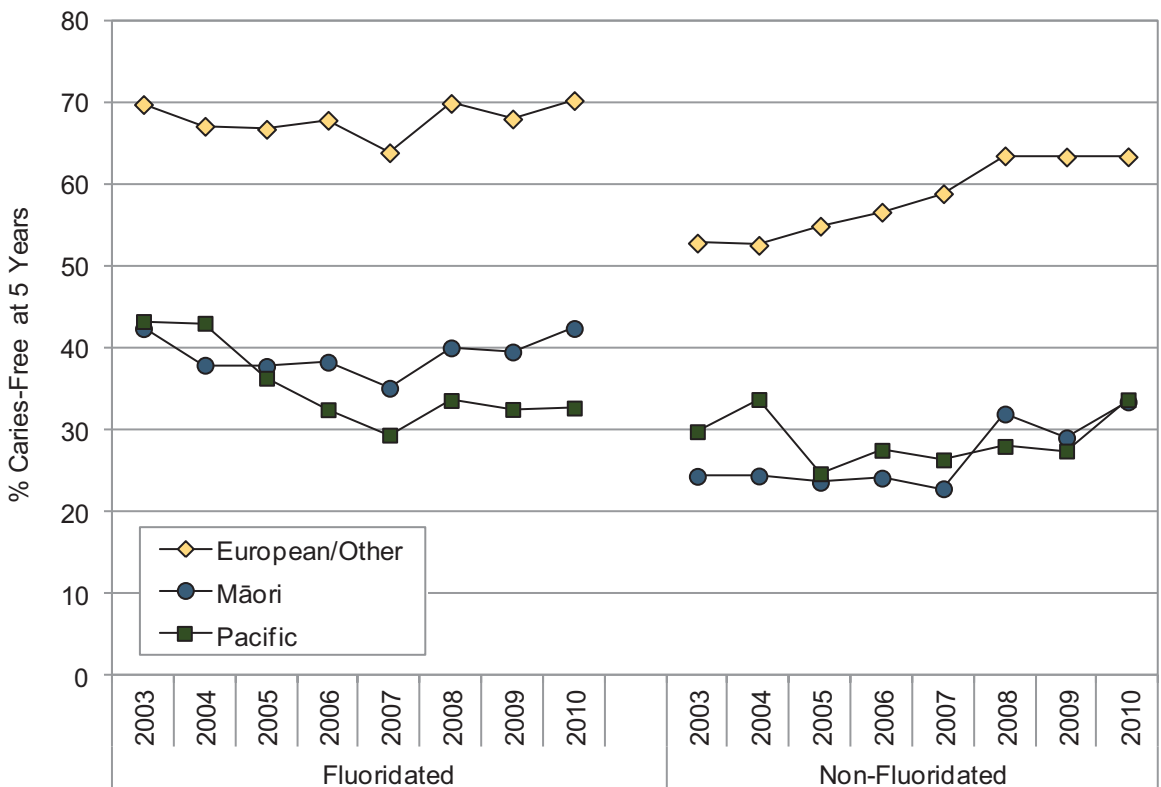
New Zealand Distribution and Trends

Figure 115. Percentage of Children Who Were Caries-Free at 5 Years and Mean DMFT Scores at 12 Years, New Zealand 2000–2010



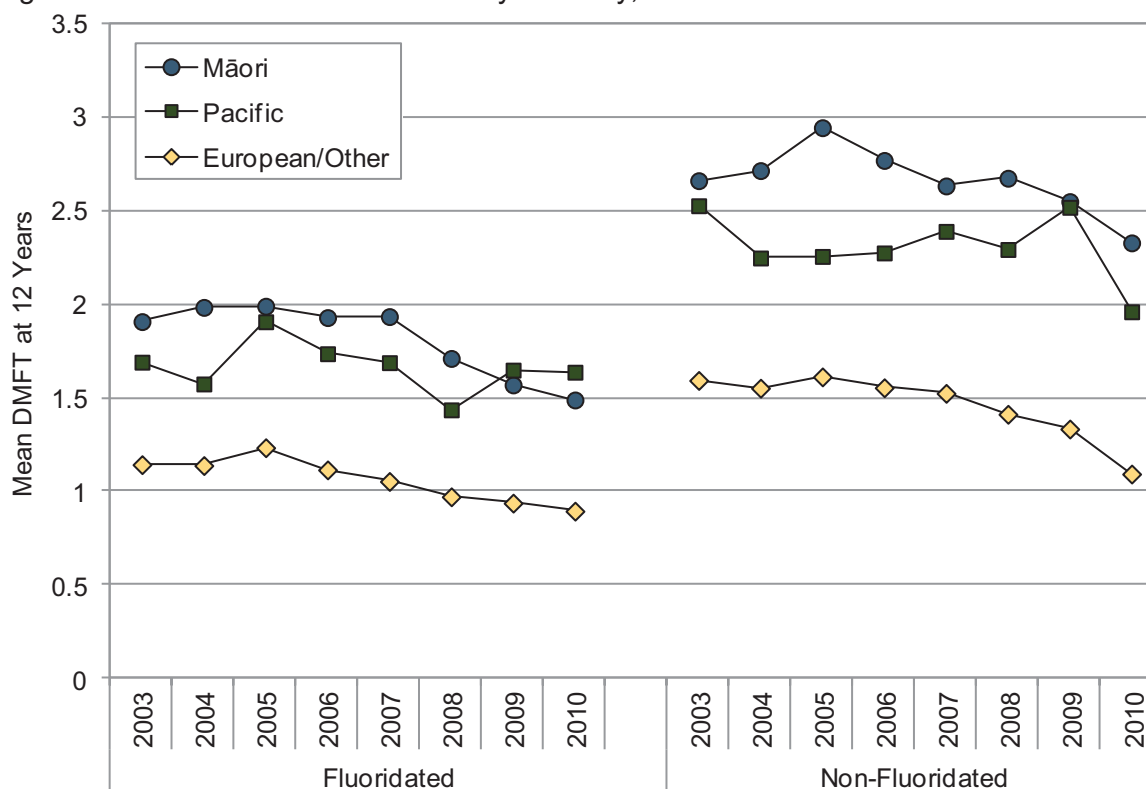
Source: School Dental Service via Ministry of Health

Figure 116. Percentage of Children Who Were Caries-Free at 5 Years by Ethnicity, New Zealand 2003–2010



Source: School Dental Service via Ministry of Health

Figure 117. Mean DMFT at 12 Years by Ethnicity, New Zealand 2003–2010



Source: School Dental Service via Ministry of Health

New Zealand Trends

In New Zealand during 2000–2010, the percentage of children who were caries-free at 5 years was consistently higher in areas with fluoridated school water supplies; while mean DMFT scores at 12 years were lower (**Figure 115**).

New Zealand Distribution by Ethnicity

In New Zealand during 2003–2010, a higher proportion of European/Other children, than Māori or Pacific children were caries-free at 5 years. For European/Other and Māori children, the proportion that were caries-free was higher in areas with fluoridated school water supplies throughout 2003–2010, while for Pacific children the proportion was higher for the majority of this period (**Figure 116**).

In New Zealand during 2003–2010, mean DMFT scores at 12 years were higher for Māori and Pacific children than for European/Other children. For each ethnic group, mean DMFT scores were higher for those with non-fluoridated school water supplies (**Figure 117**).

South Island Distribution and Trends

In the Southern DHB during 2010, 49.5% of 5 year olds examined by the School Dental Service had access to fluoridated water, as compared to 0.6% in Canterbury and 0% in Nelson Marlborough, South Canterbury and the West Coast. This proportion is based on the fluoridation status of their school water supply however, rather than the residential area in which they lived.

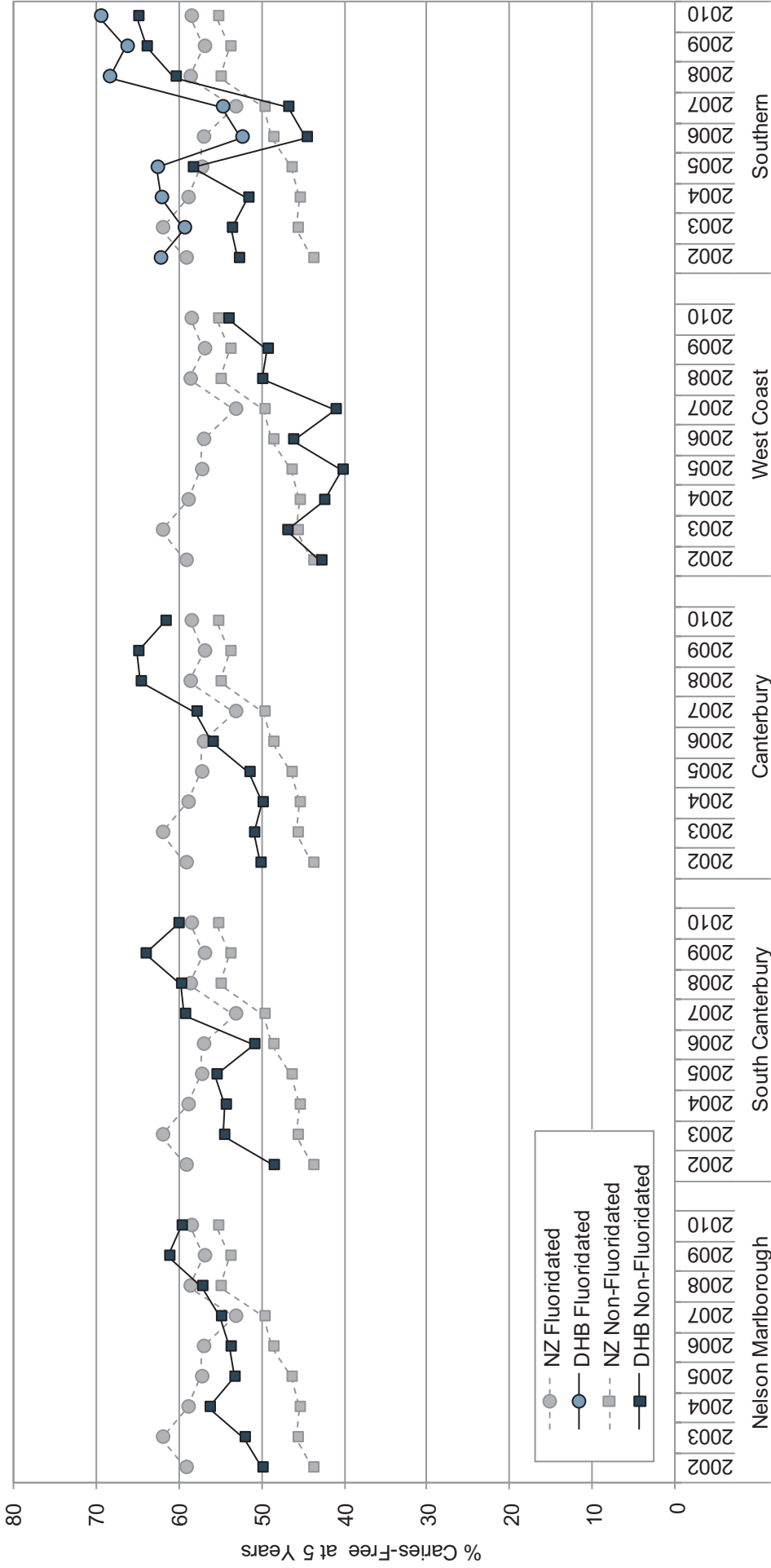
South Island Trends

Proportion Caries-Free at 5 Years

In each of the DHBs in the South Island during 2002–2010, the proportion of children who were caries-free at 5 years increased. In the Southern DHB, a higher proportion of children were caries-free in fluoridated, as compared to non-fluoridated areas (**Figure 118**).

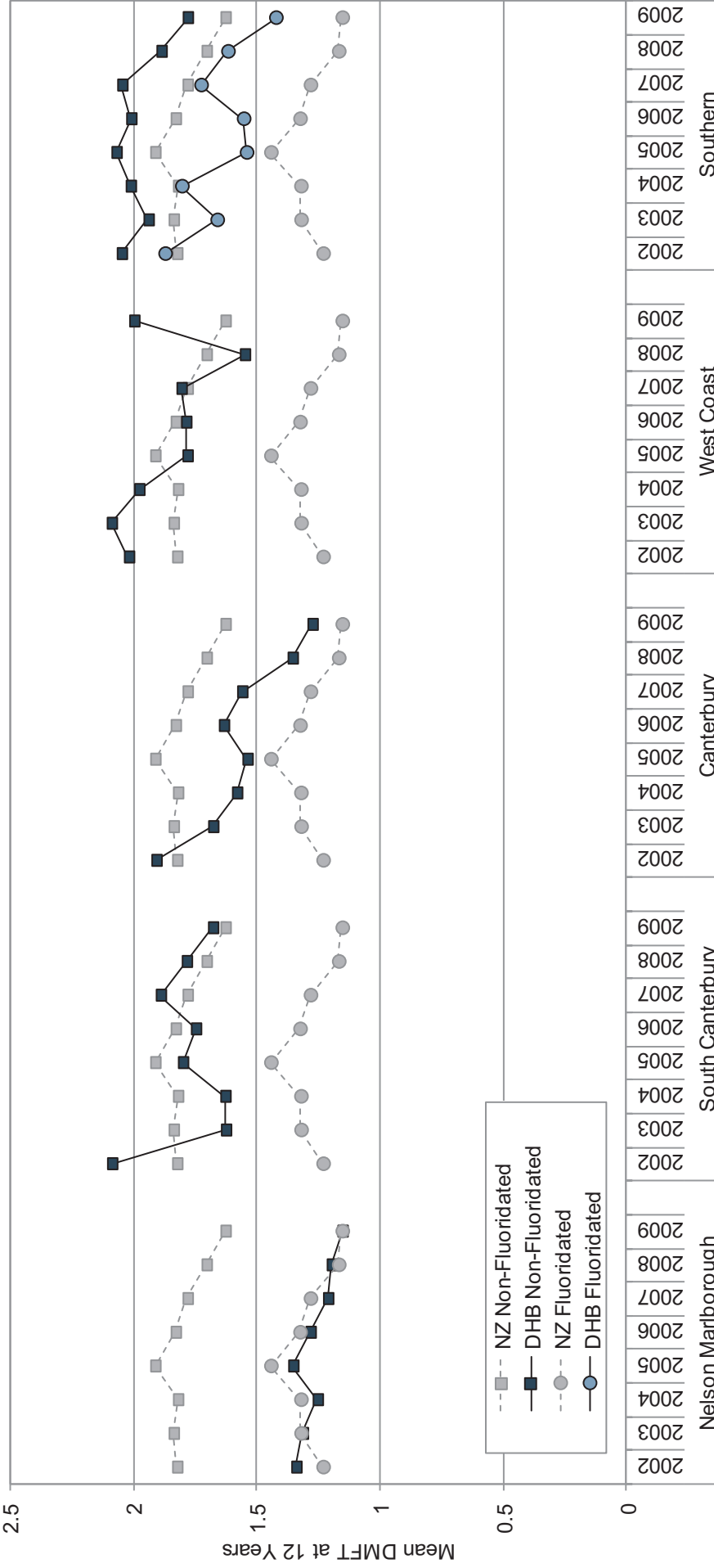


Figure 118. Percentage of Children Who Were Caries-Free at 5 Years, South Island DHBs vs. New Zealand 2002-2010



Source: School Dental Service via Ministry of Health

Figure 119. Mean DMFT at 12 Years, South Island DHBs vs. New Zealand 2002–2009



Source: School Dental Service via Ministry of Health

Mean DMFT at 12 Years

In the South Island DHBs during 2002–2009, mean DMFT scores at 12 years exhibited a general downward trend. In the Southern DHB, mean DMFT scores were higher for children in non-fluoridated, as compared to fluoridated, areas (Figure 119).

South Island Distribution by Ethnicity

Proportion Caries-Free at 5 Years

In Canterbury during 2003–2010, a higher proportion of European/Other > Māori > Pacific children were caries-free at 5 years, while in Nelson Marlborough, South Canterbury and the West Coast a higher proportion of European/Other than Māori children was caries-free (Figure 120). Similarly in Otago and Southland, a higher proportion of European/Other than Māori children was caries-free in both fluoridated and non-fluoridated areas (Figure 121).

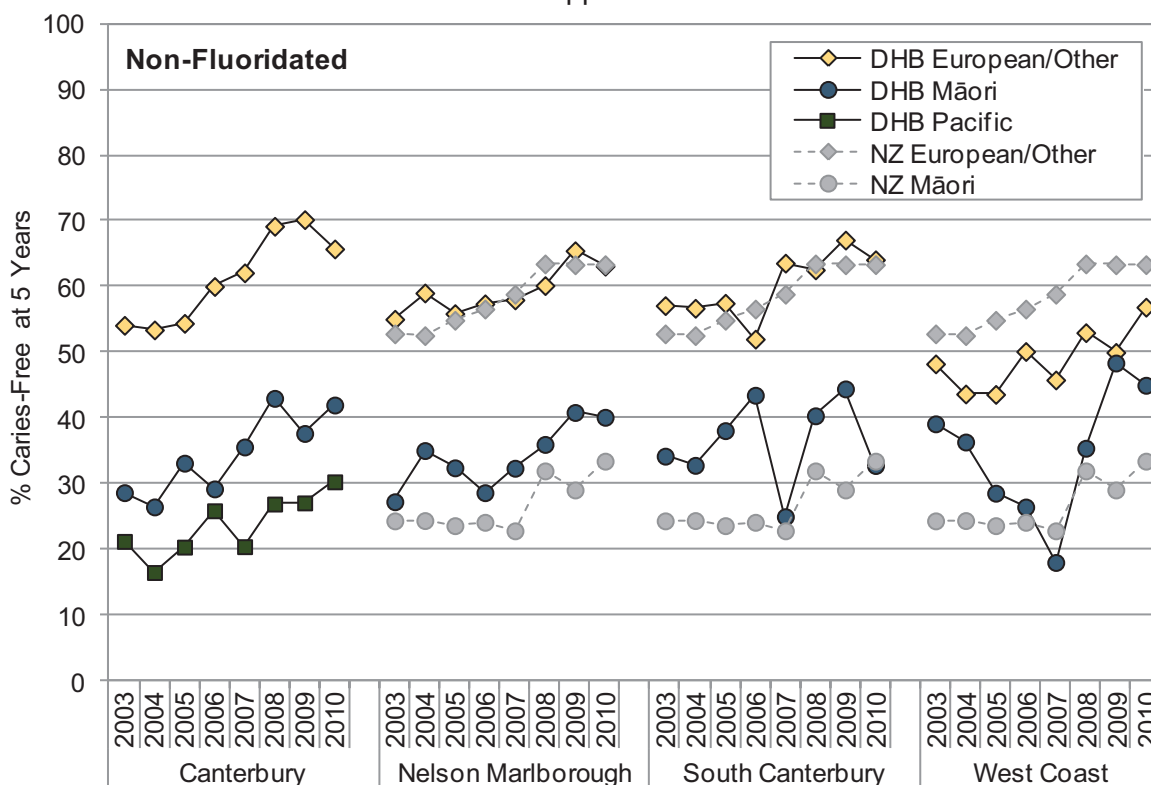
Mean DMFT at 12 Years

In Canterbury during 2003–2010, mean DMFT scores at 12 years were higher for Māori and Pacific children, than for European/Other children, while in Nelson Marlborough, South Canterbury and the West Coast, mean DMFT scores at 12 years were higher for Māori children than for European/Other children (Figure 122). Similarly, in Otago and Southland mean DMFT scores at 12 years were higher for Māori than for European/Other children in both fluoridated and non-fluoridated areas (Figure 123).

Proportion of Adolescents Using Publicly Funded Dental Services

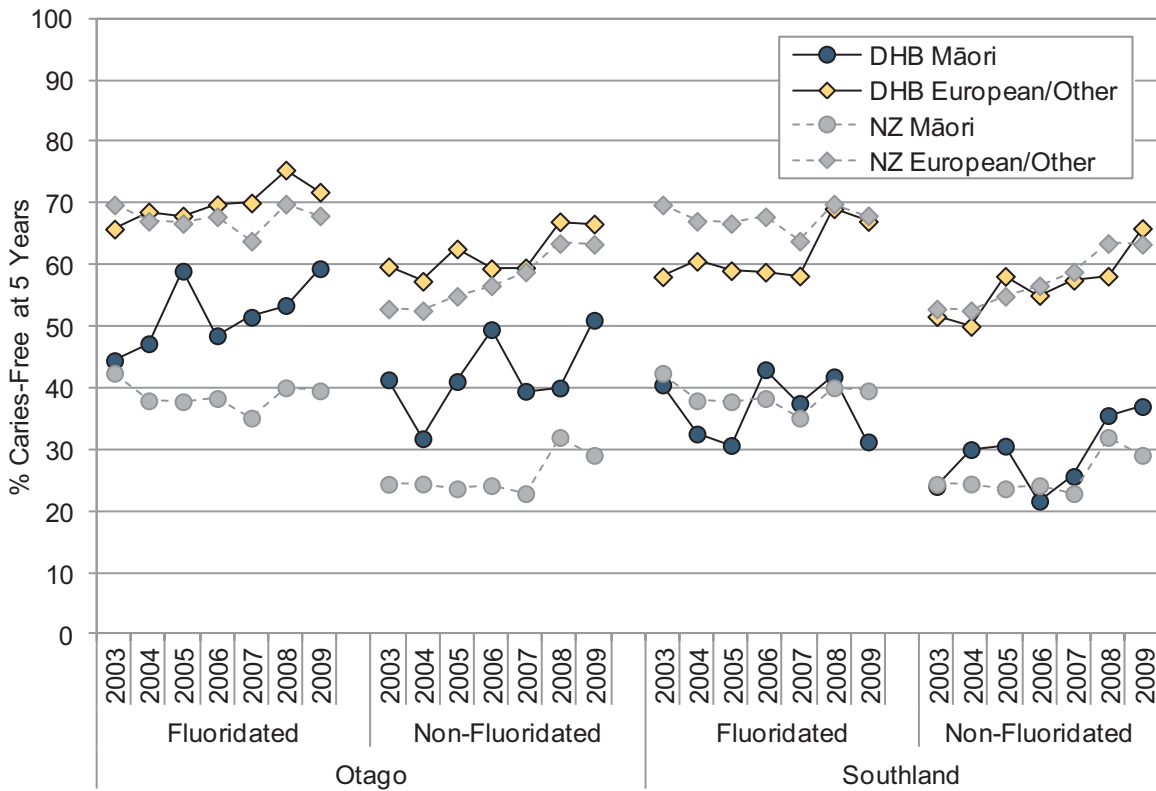
In Nelson Marlborough during 2009, 80.4% of eligible adolescents (aged ≈13–18 years) were reported as accessing publicly funded dental services, as compared to 76.5% in the West Coast, 67.1% in Canterbury, 88.1% in South Canterbury, 83.7% in Otago and 73.7% in Southland (Table 122). No information was available however on the frequency or type of service access by these young people.

Figure 120. Percentage of Children Who Were Caries-Free at 5 Years by Ethnicity, South Island DHBs with Non-Fluoridated Water Supplies vs. New Zealand 2003–2010



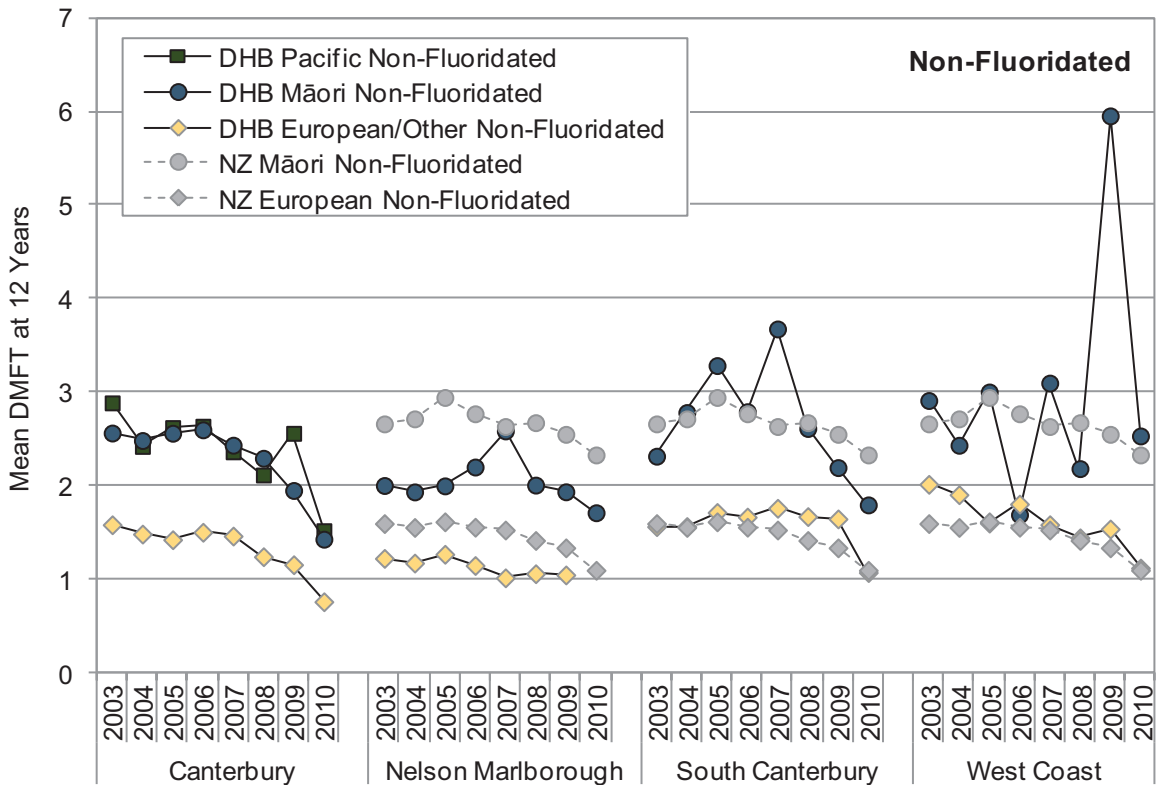
Source: School Dental Service via Ministry of Health

Figure 121. Percentage of Children Who Were Caries-Free at 5 Years by Ethnicity, South Island DHBs with Fluoridated and Non-Fluoridated Water Supplies vs. New Zealand 2003–2009



Source: School Dental Service via Ministry of Health

Figure 122. Mean DMFT at 12 Years by Ethnicity, South Island DHBs with Non-Fluoridated Water Supplies vs. New Zealand 2003–2010



Source: School Dental Service via Ministry of Health

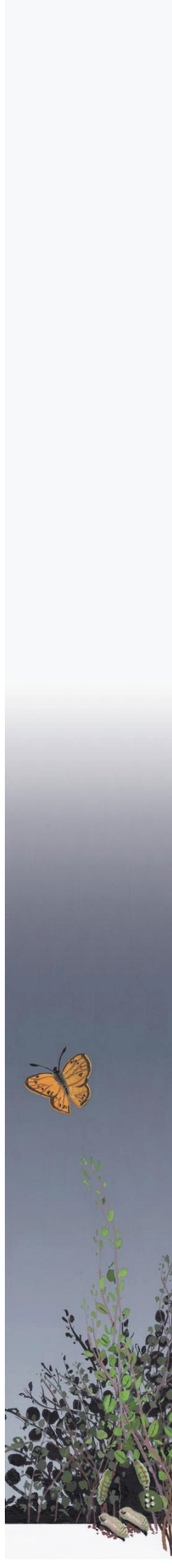
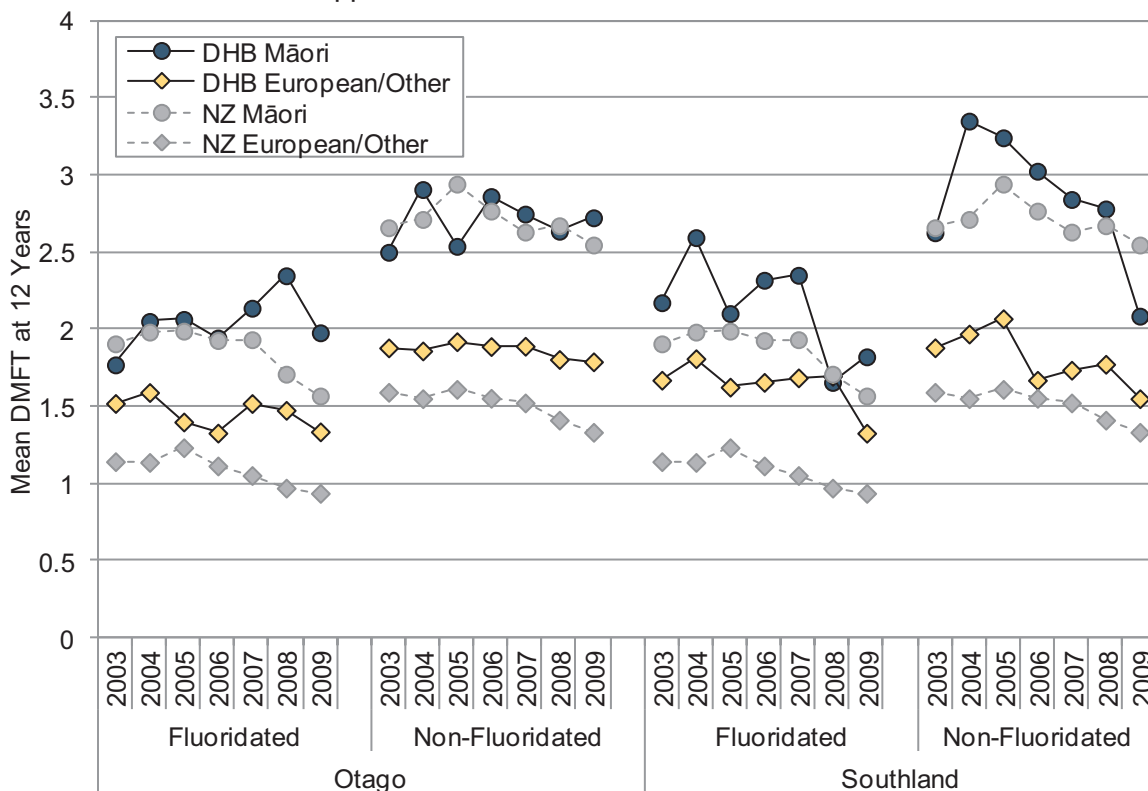


Figure 123. Mean DMFT at 12 Years by Ethnicity, South Island DHBs with Fluoridated and Non-Fluoridated Water Supplies vs. New Zealand 2003–2009



Source: School Dental Service via Ministry of Health

Table 122. Proportion of Adolescents Using Publicly Funded Dental Services, South Island DHBs vs. New Zealand 2004–2009

DHB	No. Eligible	% Using	No. Eligible	% Using	No. Eligible	% Using
	2004		2005		2006	
Nelson Marlborough	9,135	69.9	9,275	63.8	9,355	68.1
West Coast	2,090	64.5	2,120	65.3	2,195	57.3
Canterbury	28,655	68.8	29,095	69.9	29,335	67.2
South Canterbury	3,615	85.4	3,655	87.8	3,665	90.3
Otago	10,910	79.9	10,995	81.7	10,920	82.7
Southland	7,275	74.5	7,315	73.4	7,260	57.2
South Island	61,680	72.4	62,455	72.4	62,730	69.9
New Zealand	298,506	52.6	303,768	53.7	284,460	58.3
	2007		2008		2009	
Nelson Marlborough	9,400	70.2	8,915	75.1	8,685	80.4
West Coast	2,215	67.8	2,195	69.8	2,170	76.5
Canterbury	29,515	67.0	30,490	65.6	30,530	67.1
South Canterbury	3,630	87.7	3,760	84.3	3,575	88.1
Otago	10,850	76.9	10,855	82.6	10,725	83.7
Southland	7,190	63.6	6,985	64.7	6,865	73.3
South Island	62,800	70.0	63,200	71.0	62,550	74.0
New Zealand	285,275	58.7	286,770	60.5	283,645	65.4

Source: Ministry of Health

School Dental Service Data Summary

In New Zealand during 2000–2010, the percentage of children caries-free at 5 years was higher in areas with fluoridated school water supplies, while mean DMFT scores at 12 years were lower. During 2003–2010, a higher proportion of European/Other children, than Māori or Pacific children were caries-free at 5 years, while mean DMFT scores at 12 years were higher for Māori and Pacific children than for European/Other children.

In the Southern DHB during 2010, 49.5% of 5 year olds examined by the School Dental Service had access to fluoridated School water, as compared to 0.6% in Canterbury and 0% in Nelson Marlborough, South Canterbury and the West Coast. In all South Island DHBs during 2003–2010, a higher proportion of European/Other children than Māori children were caries-free at 5 years, while mean DMFT scores at 12 years were higher for Māori, than for European/Other children. In Nelson Marlborough during 2009, 80.4% of eligible adolescents (aged ≈13–18 years) were reported as accessing publicly funded dental services, as compared to 76.5% in the West Coast, 67.1% in Canterbury, 88.1% in South Canterbury, 83.7% in Otago and 73.7% in Southland. No information was available however on the frequency or type of service access for these young people.

Hospital Admissions for Dental Caries

Data Sources and Methods

Indicators

1. Hospital Admissions for Dental Caries in Children and Young People Aged 0-24 Years

Numerator: National Minimum Dataset: Hospital admissions (acute, semi acute and waiting list) for children and young people aged 0-24 years with a primary ICD-10-AM diagnosis of Dental Caries (K02). Other dental conditions assessed in some tables include: Disorders of Tooth Development/Eruption (K00), Embedded/Impacted Teeth (K01), Other Diseases of the Teeth Hard Tissue (K03), Diseases of the Pulp/Periapical Tissue (K04), Gingivitis/Periodontal Diseases (K05), Other Disorders of the Gingiva/Edentulous Alveolar Ridge (K06), Dentofacial Anomalies/Malocclusion (K07), Other Disorders of the Teeth/Supporting Structures (K08).

Denominator: Statistics NZ Estimated Resident Population (with linear extrapolation being used to calculate denominators between Census years).

Notes on Interpretation

Note 1: An acute admission is an unplanned admission occurring on the day of presentation, while a semi-acute admission (referred to in the NMDS as an arranged admission) is a non-acute admission with an admission date <7 days after the date the decision was made that the admission was necessary. A waiting list admission is a planned admission, where the admission date is 7+ days after the date the decision was made that the admission was necessary. In New Zealand, most DHBs admit children and young people with dental caries/other oral health problems, either from the waiting list, or on a semi-acute basis (as an arranged admission).

Note 2: **Appendix 3** outlines the limitations of the hospital admission data used. The reader is urged to review this Appendix before interpreting any trends based on hospital admission data.

Note 3: 95% confidence intervals have been provided for the rate ratios in this section and where appropriate, the terms *significant* or not *significant* have been used to communicate the significance of the observed associations. Tests of statistical significance have not been applied to other data in this section, and thus (unless the terms *significant* or non-*significant* are specifically used) the associations described do not imply statistical significance or non-significance (see **Appendix 2** for further discussion of this issue).

New Zealand Distribution and Trends

New Zealand Trends

In New Zealand during 2000–2010, hospital admissions for dental caries were higher for children aged 0–4 years > children aged 5–14 years > young people aged 15–24 years. While admissions increased for all three age groups during 2000–2010, in absolute terms, increases were greatest for those aged 5–14 and 0–4 years (**Figure 124**).

New Zealand Distribution by Age

In New Zealand during 2006–2010, hospital admissions for dental caries were infrequent in infants <1 year, but rose rapidly thereafter, to reach a peak at 4 years of age. Rates then decreased, with admissions being relatively infrequent after 14 years of age (**Figure 125**).

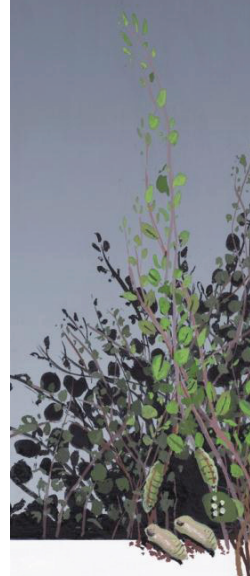
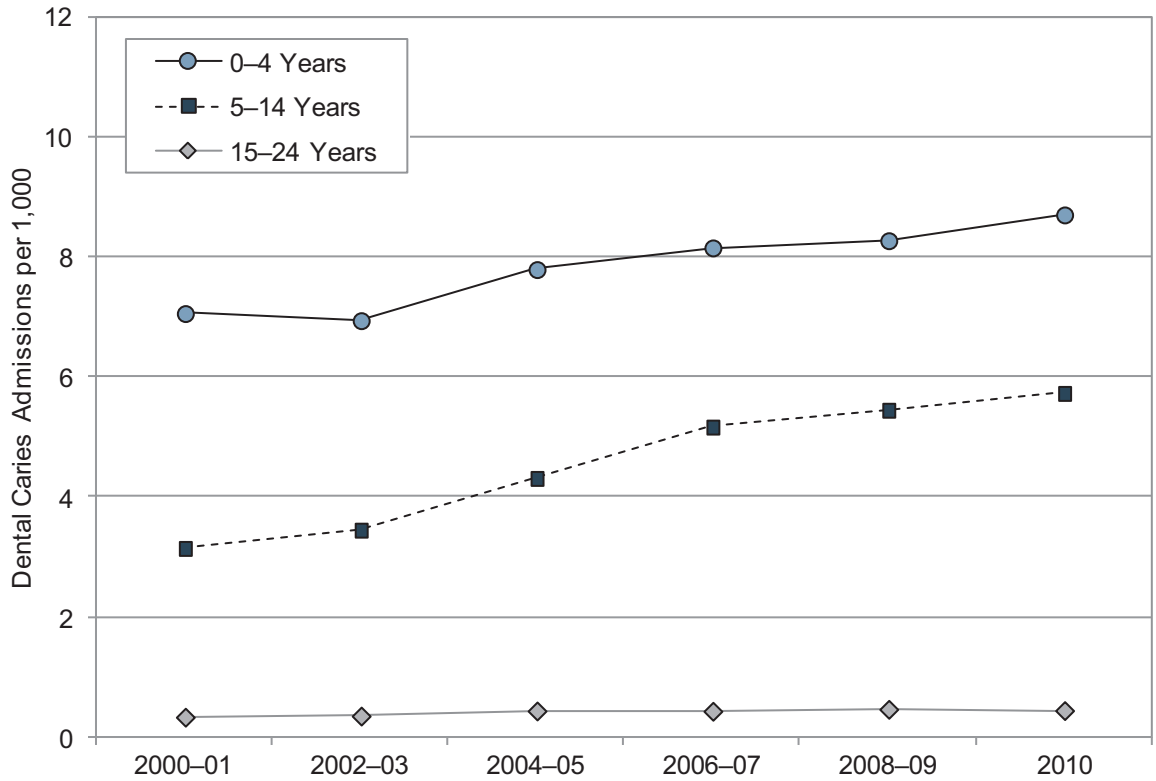
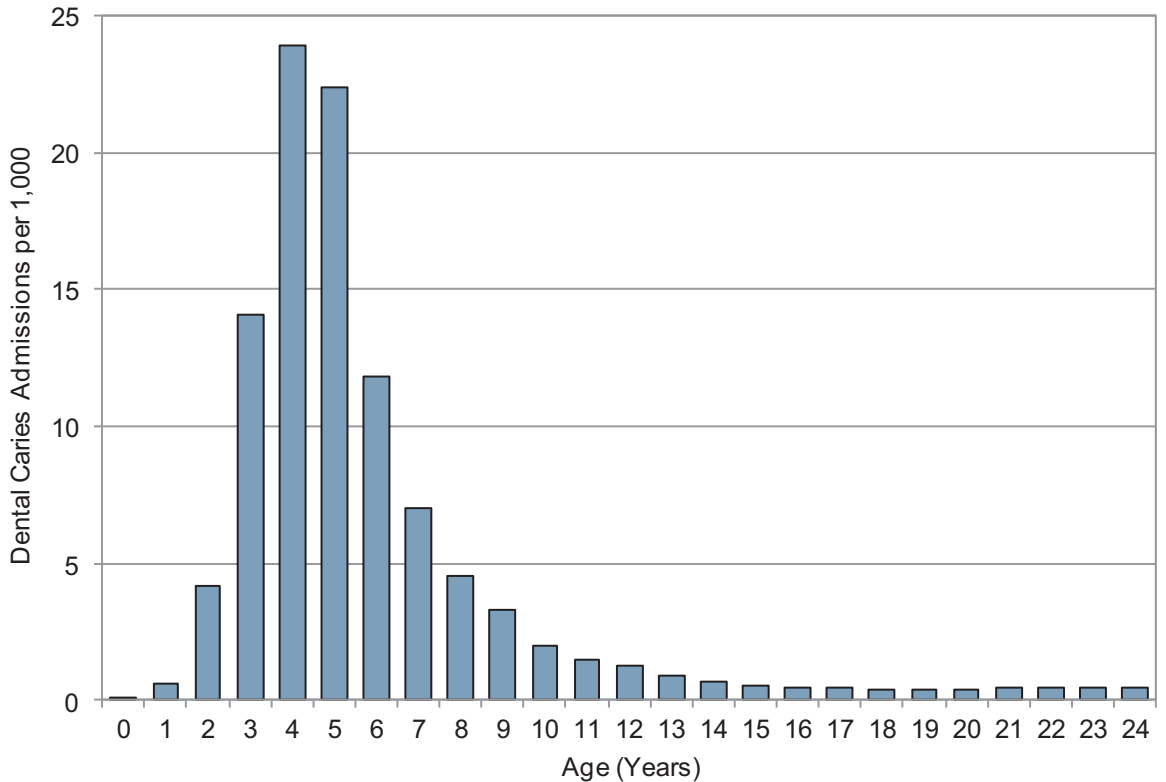


Figure 124. Hospital Admissions for Dental Caries in Children and Young People Aged 0–24 Years, New Zealand 2000–2010



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population

Figure 125. Hospital Admissions for Dental Caries in Children and Young People by Age, New Zealand 2006–2010



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population



New Zealand Distribution by Primary Diagnosis

In New Zealand during 2006–2010, dental caries, followed by diseases of the pulp and periapical tissue, were the leading reasons for a dental admission in children aged 0–4 and 5–14 years. In contrast, embedded/impacted teeth, followed by dental caries were the leading reasons for an admission in young people aged 15–24 years (**Table 123**).

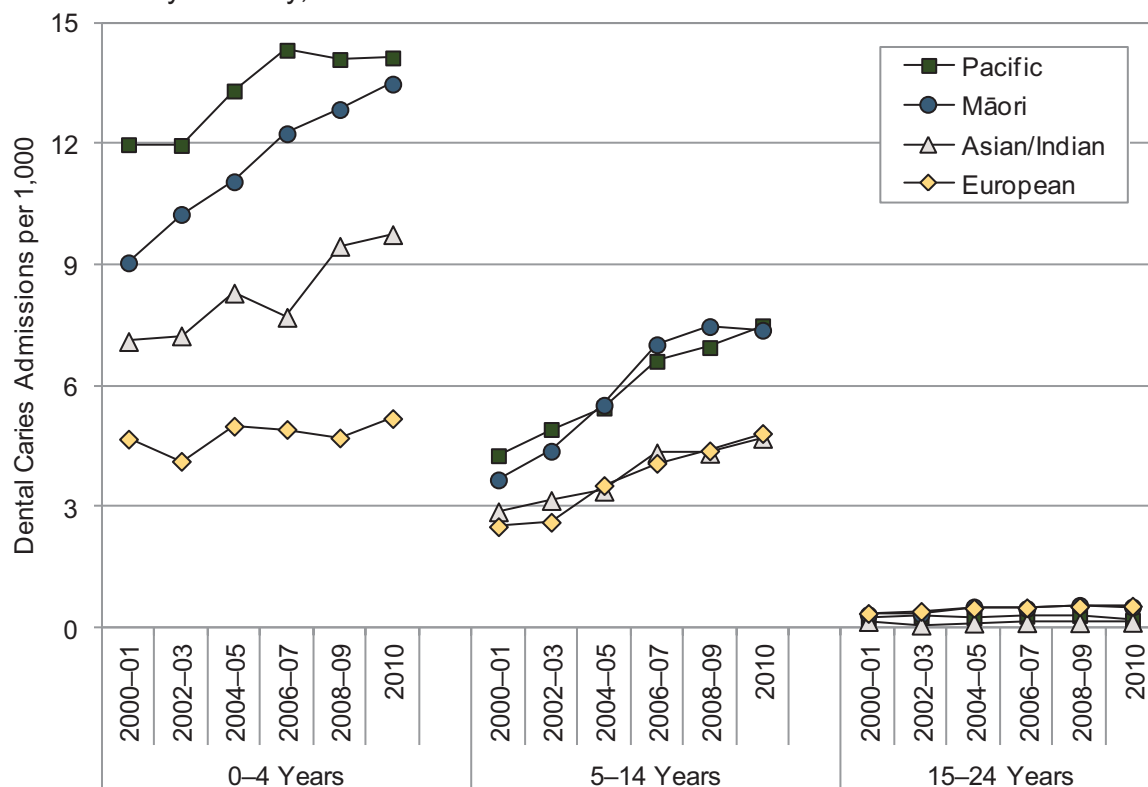
Table 123. Hospital Admissions for Dental Conditions in Children and Young People Aged 0–24 Years by Primary Diagnosis, New Zealand 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
New Zealand				
0–4 Years				
Dental Caries	11,965	2,393.0	8.31	88.3
Diseases Pulp/Periapical Tissue	1,241	248.2	0.86	9.2
Disorders Tooth Development/Eruption	121	24.2	0.08	0.9
Other Disorders Teeth/Supporting Structures	72	14.4	0.05	0.5
Gingivitis / Periodontal Diseases	55	11.0	0.04	0.4
Dentofacial Anomalies / Malocclusion	44	8.8	0.03	0.3
Embedded/Impacted Teeth	17	3.4	0.01	0.1
Other Disorders Gingiva/Edentulous Alveolar Ridge	16	3.2	0.01	0.1
Other Diseases Teeth Hard Tissue	15	3.0	0.01	0.1
Total 0–4 Years	13,546	2,709.2	9.41	100.0
5–14 Years				
Dental Caries	16,300	3,260.0	5.39	79.0
Diseases Pulp/Periapical Tissue	2,084	416.8	0.69	10.1
Disorders Tooth Development/Eruption	928	185.6	0.31	4.5
Embedded/Impacted Teeth	617	123.4	0.20	3.0
Dentofacial Anomalies / Malocclusion	268	53.6	0.09	1.3
Other Disorders Teeth/Supporting Structures	187	37.4	0.06	0.9
Other Diseases Teeth Hard Tissue	145	29.0	0.05	0.7
Gingivitis / Periodontal Diseases	72	14.4	0.02	0.3
Other Disorders Gingiva/Edentulous Alveolar Ridge	24	4.8	0.01	0.1
Total 5–14 Years	20,625	4,125.0	6.82	100.0
15–24 Years				
Embedded/Impacted Teeth	2,325	465.0	0.73	41.9
Dental Caries	1,415	283.0	0.45	25.5
Diseases Pulp/Periapical Tissue	569	113.8	0.18	10.3
Dentofacial Anomalies / Malocclusion	495	99.0	0.16	8.9
Gingivitis / Periodontal Diseases	294	58.8	0.09	5.3
Other Disorders Teeth/Supporting Structures	222	44.4	0.07	4.0
Disorders Tooth Development/Eruption	127	25.4	0.04	2.3
Other Diseases Teeth Hard Tissue	89	17.8	0.03	1.6
Other Disorders Gingiva/Edentulous Alveolar Ridge	15	3.0	<0.01	0.3
Total 15–24 Years	5,551	1,110.2	1.75	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population



Figure 126. Hospital Admissions for Dental Caries in Children and Young People Aged 0–24 Years by Ethnicity, New Zealand 2000–2010



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population. Note: Ethnicity is Level 1 Prioritised

Table 124. Hospital Admissions for Dental Caries in Children Aged 0–4 Years by Gender, Ethnicity and NZ Deprivation Index Decile, New Zealand 2006–2010

Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
New Zealand							
Dental Caries Admissions 0–4 Years							
NZ Deprivation Index Decile				NZ Deprivation Index Quintile			
Decile 1	3.64	1.00		Decile 1–2	3.90	1.00	
Decile 2	4.16	1.14	1.01–1.29	Decile 3–4	4.92	1.26	1.16–1.37
Decile 3	4.53	1.24	1.10–1.41	Decile 5–6	7.00	1.80	1.67–1.94
Decile 4	5.26	1.44	1.29–1.62	Decile 7–8	9.70	2.49	2.32–2.67
Decile 5	6.58	1.81	1.61–2.02	Decile 9–10	13.8	3.54	3.31–3.79
Decile 6	7.36	2.02	1.81–2.25	Prioritised Ethnicity			
Decile 7	8.89	2.44	2.20–2.71	European	4.89	1.00	
Decile 8	10.4	2.85	2.57–3.15	Māori	12.7	2.60	2.50–2.72
Decile 9	12.5	3.43	3.11–3.79	Pacific	14.2	2.90	2.75–3.06
Decile 10	14.9	4.09	3.71–4.51	Asian/Indian	8.87	1.81	1.70–1.94
Gender							
Female	8.08	1.00		Male	8.53	1.05	1.02–1.09

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population. Note: Rate is per 1,000; Ethnicity is Level 1 Prioritised; Decile is NZDep2001.



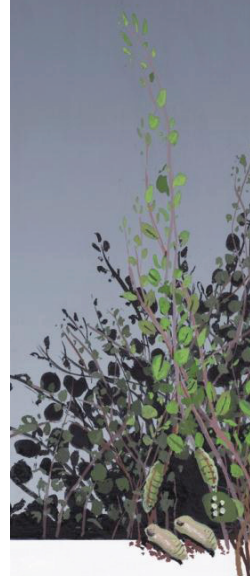
New Zealand Distribution by Ethnicity, NZDep Index Decile and Gender

In New Zealand during 2006–2010, hospital admissions for dental caries in children aged 0–4 years were *significantly* higher for males, Pacific > Māori > Asian/Indian > European children and those from average-to-more deprived (NZDep decile 2–10) areas (**Table 124**). Similarly, admissions for children aged 5–14 years were *significantly* higher for males, Māori and Pacific > Asian/Indian and European children and those from average-to-more deprived (NZDep decile 3–10) areas. In contrast, for young people aged 15–24 years, admissions were *significantly* higher for European and Māori > Pacific > Asian/Indian young people and those from more deprived (NZDep decile 5–10) areas (**Table 125**). Similar ethnic differences were seen during 2000–2010 (**Figure 126**).

Table 125. Hospital Admissions for Dental Caries in Children and Young People Aged 5–24 Years by Gender, Ethnicity and NZ Deprivation Index Decile, New Zealand 2006–2010

Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
New Zealand							
Dental Caries Admissions 5–14 Years							
NZ Deprivation Index Decile				NZ Deprivation Index Quintile			
Decile 1	3.09	1.00		Decile 1–2	3.07	1.00	
Decile 2	3.04	0.98	0.90–1.08	Decile 3–4	3.87	1.26	1.19–1.34
Decile 3	3.47	1.12	1.02–1.22	Decile 5–6	5.05	1.65	1.55–1.75
Decile 4	4.25	1.37	1.26–1.49	Decile 7–8	6.36	2.07	1.96–2.19
Decile 5	4.83	1.56	1.43–1.70	Decile 9–10	8.11	2.64	2.51–2.78
Decile 6	5.25	1.70	1.56–1.84	Prioritised Ethnicity			
Decile 7	5.99	1.94	1.79–2.10	European	4.35	1.00	
Decile 8	6.68	2.16	2.00–2.33	Māori	7.27	1.67	1.61–1.73
Decile 9	8.31	2.69	2.49–2.89	Pacific	6.93	1.59	1.52–1.67
Decile 10	7.94	2.57	2.39–2.76	Asian/Indian	4.41	1.02	0.96–1.08
Gender							
Female	5.23	1.00		Male	5.55	1.06	1.03–1.09
Dental Caries Admissions 15–24 Years							
NZ Deprivation Index Decile				NZ Deprivation Index Quintile			
Decile 1	0.28	1.00		Decile 1–2	0.28	1.00	
Decile 2	0.28	1.01	0.73–1.39	Decile 3–4	0.31	1.12	0.90–1.40
Decile 3	0.31	1.11	0.81–1.52	Decile 5–6	0.50	1.78	1.46–2.17
Decile 4	0.32	1.15	0.84–1.56	Decile 7–8	0.58	2.09	1.74–2.52
Decile 5	0.52	1.87	1.41–2.48	Decile 9–10	0.50	1.78	1.48–2.15
Decile 6	0.48	1.72	1.30–2.28	Prioritised Ethnicity			
Decile 7	0.65	2.34	1.79–3.06	European	0.52	1.00	
Decile 8	0.53	1.91	1.46–2.50	Māori	0.52	1.00	0.88–1.13
Decile 9	0.52	1.89	1.45–2.45	Pacific	0.28	0.53	0.42–0.68
Decile 10	0.46	1.67	1.27–2.20	Asian/Indian	0.13	0.25	0.20–0.32
Gender							
Female	0.44	1.00		Male	0.45	1.02	0.92–1.13

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population.
Note: Rate is per 1,000; Ethnicity is Level 1 Prioritised; Decile is NZDep2001.



South Island Distribution and Trends

South Island Distribution by Primary Diagnosis

During 2006–2010, dental caries was the leading reason for a dental admission in children aged 0–4 and 5–14 years in all South Island DHBs, while embedded/ impacted teeth or dental caries were the leading reasons for an admission in young people aged 15–24 years (Table 126–Table 131).

Table 126. Hospital Admissions for Dental Conditions in Children and Young People Aged 0–24 Years, Nelson Marlborough 2006–2010

Primary Diagnosis	Number: Total 2006–2010	Number: Annual Average	Rate per 1,000	Percent (%)
Nelson Marlborough				
0–4 Years				
Dental Caries	283	56.6	7.08	71.1
Diseases Pulp/Periapical Tissue	103	20.6	2.58	25.9
Other Disorders Teeth/Supporting Structures	4	0.8	0.10	1.0
Disorders Tooth Development/Eruption	4	0.8	0.10	1.0
Gingivitis / Periodontal Diseases	<3	s	s	s
Dentofacial Anomalies / Malocclusion	<3	s	s	s
Other Disorders Gingiva/Edentulous Alveolar Ridge	<3	s	s	s
Total 0–4 Years	398	79.6	9.95	100.0
5–14 Years				
Dental Caries	475	95.0	5.33	51.8
Diseases Pulp/Periapical Tissue	232	46.4	2.60	25.3
Disorders Tooth Development/Eruption	116	23.2	1.30	12.6
Dentofacial Anomalies / Malocclusion	36	7.2	0.40	3.9
Embedded/Impacted Teeth	23	4.6	0.26	2.5
Other Disorders Teeth/Supporting Structures	17	3.4	0.19	1.9
Other Diseases Teeth Hard Tissue	14	2.8	0.16	1.5
Gingivitis / Periodontal Diseases	3	0.6	0.03	0.3
Other Disorders Gingiva/Edentulous Alveolar Ridge	<3	s	s	s
Total 5–14 Years	917	183.4	10.29	100.0
15–24 Years				
Embedded/Impacted Teeth	78	15.6	0.99	28.0
Dental Caries	77	15.4	0.98	27.6
Gingivitis / Periodontal Diseases	41	8.2	0.52	14.7
Dentofacial Anomalies / Malocclusion	28	5.6	0.36	10.0
Diseases Pulp/Periapical Tissue	25	5.0	0.32	9.0
Disorders Tooth Development/Eruption	22	4.4	0.28	7.9
Other Disorders Teeth/Supporting Structures	5	1.0	0.06	1.8
Other Disorders Gingiva/Edentulous Alveolar Ridge	<3	s	s	s
Other Diseases Teeth Hard Tissue	<3	s	s	s
Total 15–24 Years	279	55.8	3.54	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population.
Note: s: suppressed due to small numbers.



Table 127. Hospital Admissions for Dental Conditions in Children and Young People Aged 0–24 Years, South Canterbury 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
South Canterbury				
0–4 Years				
Dental Caries	80	16.0	5.44	60.2
Diseases Pulp/Periapical Tissue	44	8.8	2.99	33.1
Disorders Tooth Development/Eruption	4	0.8	0.27	3.0
Other Disorders Teeth/Supporting Structures	<3	s	s	s
Other Disorders Gingiva/Edentulous Alveolar Ridge	<3	s	s	s
Other Diseases Teeth Hard Tissue	<3	s	s	s
Gingivitis / Periodontal Diseases	<3	s	s	s
Total 0–4 Years	133	26.6	9.04	100.0
5–14 Years				
Dental Caries	144	28.8	3.89	52.2
Diseases Pulp/Periapical Tissue	83	16.6	2.24	30.1
Disorders Tooth Development/Eruption	19	3.8	0.51	6.9
Dentofacial Anomalies / Malocclusion	8	1.6	0.22	2.9
Other Disorders Teeth/Supporting Structures	8	1.6	0.22	2.9
Embedded/Impacted Teeth	8	1.6	0.22	2.9
Other Diseases Teeth Hard Tissue	3	0.6	0.08	1.1
Gingivitis / Periodontal Diseases	<3	s	s	s
Other Disorders Gingiva/Edentulous Alveolar Ridge	<3	s	s	s
Total 5–14 Years	276	55.2	7.45	100.0
15–24 Years				
Embedded/Impacted Teeth	52	10.4	1.65	49.1
Dental Caries	34	6.8	1.08	32.1
Dentofacial Anomalies / Malocclusion	7	1.4	0.22	6.6
Diseases Pulp/Periapical Tissue	5	1.0	0.16	4.7
Other Disorders Teeth/Supporting Structures	3	0.6	0.10	2.8
Other Diseases Teeth Hard Tissue	3	0.6	0.10	2.8
Gingivitis / Periodontal Diseases	<3	s	s	s
Disorders Tooth Development/Eruption	<3	s	s	s
Total 15–24 Years	106	21.2	3.37	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population.
 Note: s: suppressed due to small numbers.

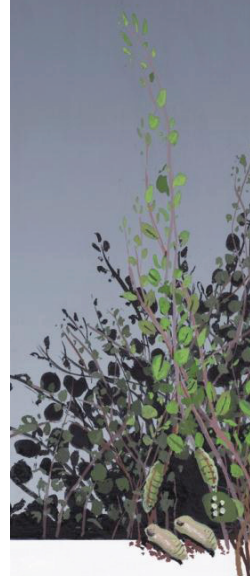


Table 128. Hospital Admissions for Dental Conditions in Children and Young People Aged 0–24 Years, Canterbury 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
Canterbury				
0–4 Years				
Dental Caries	1,034	206.8	6.59	98.3
Diseases Pulp/Periapical Tissue	10	2.0	0.06	1.0
Disorders Tooth Development/Eruption	4	0.8	0.03	0.4
Other Disorders Gingiva/Edentulous Alveolar Ridge	<3	s	s	s
Dentofacial Anomalies / Malocclusion	<3	s	s	s
Total 0–4 Years	1,052	210.4	6.71	100.0
5–14 Years				
Dental Caries	2,008	401.6	6.22	92.4
Embedded/Impacted Teeth	68	13.6	0.21	3.1
Disorders Tooth Development/Eruption	41	8.2	0.13	1.9
Diseases Pulp/Periapical Tissue	37	7.4	0.11	1.7
Dentofacial Anomalies / Malocclusion	11	2.2	0.03	0.5
Other Disorders Teeth/Supporting Structures	3	0.6	0.01	0.1
Other Diseases Teeth Hard Tissue	3	0.6	0.01	0.1
Other Disorders Gingiva/Edentulous Alveolar Ridge	<3	s	s	s
Gingivitis / Periodontal Diseases	<3	s	s	s
Total 5–14 Years	2,173	434.6	6.73	100.0
15–24 Years				
Embedded/Impacted Teeth	185	37.0	0.51	45.2
Dental Caries	131	26.2	0.36	32.0
Dentofacial Anomalies / Malocclusion	50	10.0	0.14	12.2
Diseases Pulp/Periapical Tissue	27	5.4	0.07	6.6
Gingivitis / Periodontal Diseases	7	1.4	0.02	1.7
Disorders Tooth Development/Eruption	5	1.0	0.01	1.2
Other Disorders Teeth/Supporting Structures	4	0.8	0.01	1.0
Total 15–24 Years	409	81.8	1.12	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population.

Note: s: suppressed due to small numbers.



Table 129. Hospital Admissions for Dental Conditions in Children and Young People Aged 0–24 Years, West Coast 2006–2010

Primary Diagnosis	Number: Total 2006–2010	Number: Annual Average	Rate per 1,000	Percent (%)
West Coast				
0–4 Years				
Dental Caries	125	25.0	13.0	88.0
Diseases Pulp/Periapical Tissue	15	3.0	1.56	10.6
Disorders Tooth Development/Eruption	<3	s	s	s
Total 0–4 Years	142	28.4	14.8	100.0
5–14 Years				
Dental Caries	107	21.4	4.88	79.9
Diseases Pulp/Periapical Tissue	16	3.2	0.73	11.9
Disorders Tooth Development/Eruption	6	1.2	0.27	4.5
Embedded/Impacted Teeth	3	0.6	0.14	2.2
Other Disorders Teeth/Supporting Structures	<3	s	s	s
Total 5–14 Years	134	26.8	6.11	100.0
15–24 Years				
Dental Caries	7	1.4	0.38	38.9
Embedded/Impacted Teeth	6	1.2	0.33	33.3
Diseases Pulp/Periapical Tissue	3	0.6	0.16	16.7
Dentofacial Anomalies / Malocclusion	<3	s	s	s
Total 15–24 Years	18	3.6	0.98	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population.
 Note: s: suppressed due to small numbers.



Table 130. Hospital Admissions for Dental Conditions in Children and Young People Aged 0–24 Years, Otago 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
Otago				
0–4 Years				
Dental Caries	121	24.2	2.39	65.1
Diseases Pulp/Periapical Tissue	53	10.6	1.05	28.5
Disorders Tooth Development/Eruption	8	1.6	0.16	4.3
Other Disorders Teeth/Supporting Structures	<3	s	s	s
Other Diseases Teeth Hard Tissue	<3	s	s	s
Total 0–4 Years	186	37.2	3.67	100.0
5–14 Years				
Dental Caries	236	47.2	2.15	49.9
Diseases Pulp/Periapical Tissue	125	25.0	1.14	26.4
Disorders Tooth Development/Eruption	43	8.6	0.39	9.1
Embedded/Impacted Teeth	33	6.6	0.30	7.0
Dentofacial Anomalies / Malocclusion	23	4.6	0.21	4.9
Other Disorders Teeth/Supporting Structures	7	1.4	0.06	1.5
Other Diseases Teeth Hard Tissue	5	1.0	0.05	1.1
Gingivitis / Periodontal Diseases	<3	s	s	s
Total 5–14 Years	473	94.6	4.31	100.0
15–24 Years				
Embedded/Impacted Teeth	153	30.6	0.90	41.8
Dentofacial Anomalies / Malocclusion	71	14.2	0.42	19.4
Dental Caries	68	13.6	0.40	18.6
Gingivitis / Periodontal Diseases	41	8.2	0.24	11.2
Diseases Pulp/Periapical Tissue	20	4.0	0.12	5.5
Disorders Tooth Development/Eruption	5	1.0	0.03	1.4
Other Disorders Teeth/Supporting Structures	3	0.6	0.02	0.8
Other Diseases Teeth Hard Tissue	3	0.6	0.02	0.8
Other Disorders Gingiva/Edentulous Alveolar Ridge	<3	s	s	s
Total 15–24 Years	366	73.2	2.15	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population.
Note: s: suppressed due to small numbers.



Table 131. Hospital Admissions for Dental Conditions in Children and Young People Aged 0–24 Years, Southland 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
Southland				
0–4 Years				
Dental Caries	552	110.4	15.7	93.2
Diseases Pulp/Periapical Tissue	28	5.6	0.80	4.7
Disorders Tooth Development/Eruption	6	1.2	0.17	1.0
Other Disorders Teeth/Supporting Structures	<3	s	s	s
Embedded/Impacted Teeth	<3	s	s	s
Dentofacial Anomalies / Malocclusion	<3	s	s	s
Other Diseases Teeth Hard Tissue	<3	s	s	s
Total 0–4 Years	592	118.4	16.8	100.0
5–14 Years				
Dental Caries	887	177.4	12.0	89.1
Disorders Tooth Development/Eruption	43	8.6	0.58	4.3
Diseases Pulp/Periapical Tissue	40	8.0	0.54	4.0
Dentofacial Anomalies / Malocclusion	9	1.8	0.12	0.9
Embedded/Impacted Teeth	5	1.0	0.07	0.5
Other Diseases Teeth Hard Tissue	4	0.8	0.05	0.4
Gingivitis / Periodontal Diseases	3	0.6	0.04	0.3
Other Disorders Gingiva/Edentulous Alveolar Ridge	3	0.6	0.04	0.3
Other Disorders Teeth/Supporting Structures	<3	s	s	s
Total 5–14 Years	995	199.0	13.5	100.0
15–24 Years				
Dental Caries	105	21.0	1.44	45.3
Embedded/Impacted Teeth	67	13.4	0.92	28.9
Dentofacial Anomalies / Malocclusion	26	5.2	0.36	11.2
Diseases Pulp/Periapical Tissue	12	2.4	0.16	5.2
Gingivitis / Periodontal Diseases	11	2.2	0.15	4.7
Other Diseases Teeth Hard Tissue	5	1.0	0.07	2.2
Disorders Tooth Development/Eruption	4	0.8	0.06	1.7
Other Disorders Teeth/Supporting Structures	<3	s	s	s
Total 15–24 Years	232	46.4	3.19	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population.
Note: s: suppressed due to small numbers.

South Island DHBs vs. New Zealand

In Southland during 2006–2010, hospital admissions for dental caries in children aged 0–4 and 5–14 years and young people aged 15–24 years were *significantly* higher than the New Zealand rate. In all of the other South Island DHBs however, no consistent patterns were seen, with admissions in some age groups being *significantly* higher than the New Zealand rate, while in others rates were similar or *significantly* lower (**Table 132**).



Table 132. Hospital Admissions for Dental Caries in Children and Young People Aged 0–24 Years, South Island DHBs vs. New Zealand 2006–2010

DHB	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Rate Ratio	95% CI
Dental Caries					
0–4 Years					
Nelson Marlborough	283	56.6	7.08	0.85	0.76–0.96
West Coast	125	25.0	13.0	1.56	1.31–1.86
Canterbury	1,034	206.8	6.59	0.79	0.74–0.85
South Canterbury	80	16.0	5.44	0.65	0.53–0.82
Otago	121	24.2	2.39	0.29	0.24–0.34
Southland	552	110.4	15.7	1.89	1.74–2.06
New Zealand	11,965	2,393.0	8.31	1.00	
5–14 Years					
Nelson Marlborough	475	95.0	5.33	0.99	0.90–1.08
West Coast	107	21.4	4.88	0.91	0.75–1.09
Canterbury	2,008	401.6	6.22	1.15	1.10–1.21
South Canterbury	144	28.8	3.89	0.72	0.61–0.85
Otago	236	47.2	2.15	0.40	0.35–0.45
Southland	887	177.4	12.0	2.23	2.09–2.39
New Zealand	16,300	3,260.0	5.39	1.00	
15–24 Years					
Nelson Marlborough	77	15.4	0.98	2.19	1.74–2.75
West Coast	7	1.4	0.38	0.86	0.41–1.80
Canterbury	131	26.2	0.36	0.80	0.67–0.96
South Canterbury	34	6.8	1.08	2.42	1.72–3.40
Otago	68	13.6	0.40	0.90	0.70–1.14
Southland	105	21.0	1.44	3.23	2.65–3.94
New Zealand	1,415	283.0	0.45	1.00	

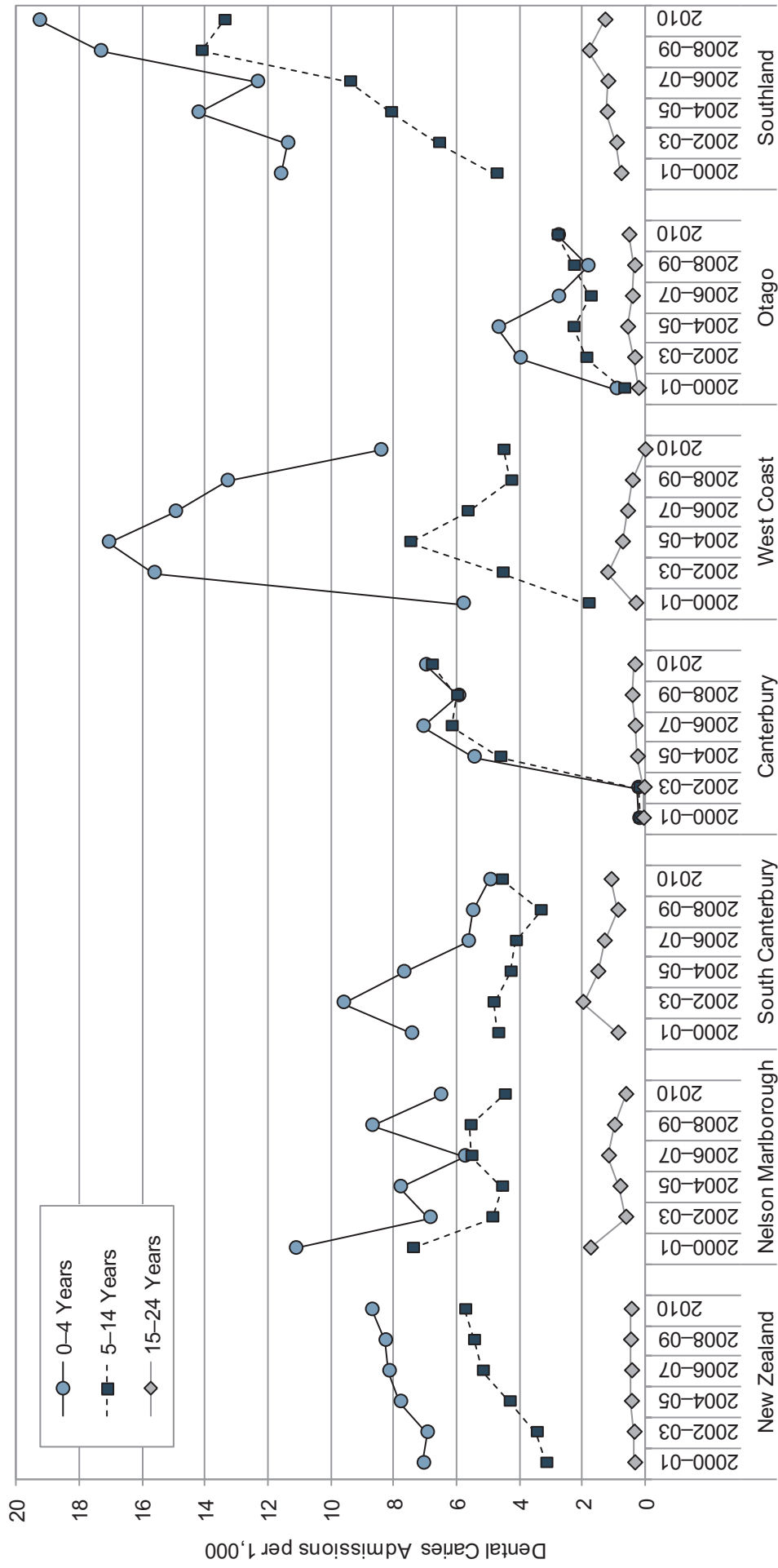
Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population

South Island Trends

During 2000–2010, while there was considerable year to year variation, hospital admissions for dental caries in children and young people in Nelson Marlborough and South Canterbury exhibited a general downward trend. In Canterbury, admissions increased during the mid-2000s in all three age groups, with rates then becoming relatively static from 2006–07 onwards, while in the West Coast, admissions in children increased during the mid-2000s, reached a peak in 2004–05 and then declined. Admissions in young people followed a similar pattern, with rates peaking in 2002–03. In Southland, admissions increased in both children and young people, with the largest absolute increases being in children 0–4 and 5–14 years. While admissions also increased in Otago children aged 5–14 years, the rate of increase was less marked than in Southland. For Otago children aged 0–4 years, admissions increased during the early 2000s, reached a peak in 2004–05 and then declined (**Figure 127**).

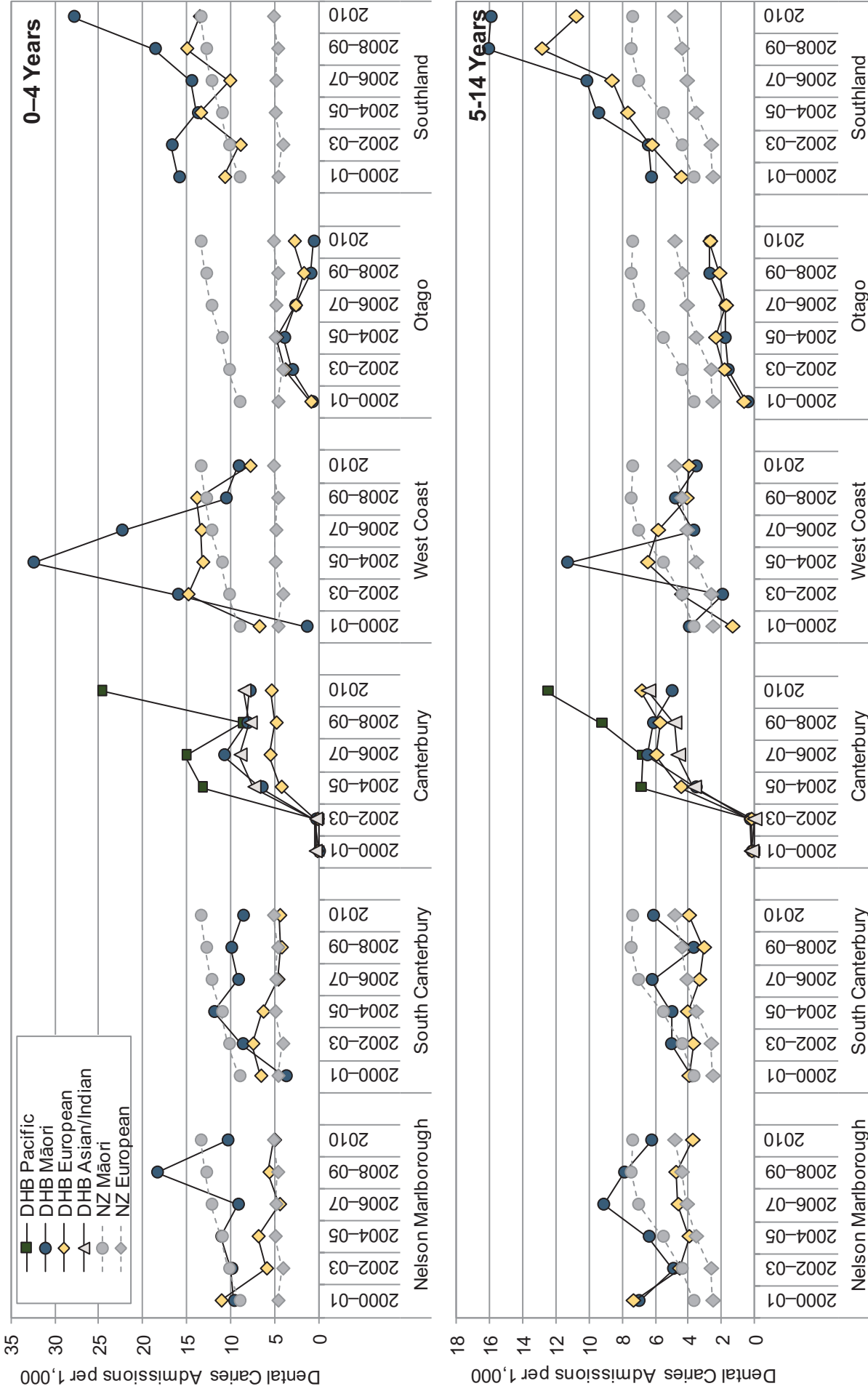


Figure 127. Hospital Admissions for Dental Caries in Children and Young People Aged 0-24 Years, South Island DHBs vs. New Zealand 2000-2010



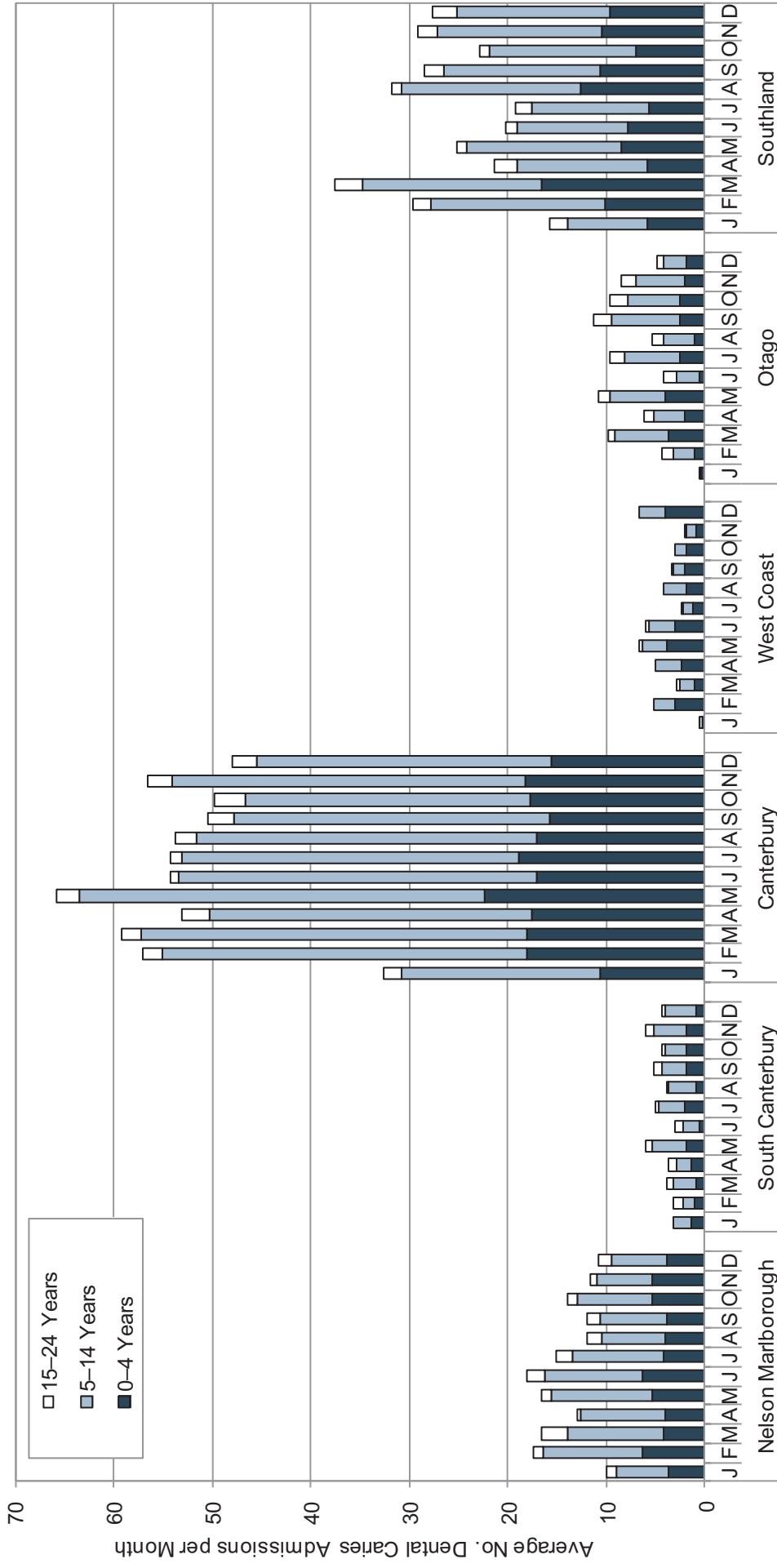
Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population

Figure 128. Hospital Admissions for Dental Caries in Children Aged 0–14 Years by Ethnicity, South Island DHBs vs. New Zealand 2000–2010



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population. Note: Ethnicity is Level 1 Prioritised

Figure 129. Average Number of Hospital Admissions for Dental Caries in Children and Young People Aged 0–24 Years by Month, the South Island DHBs 2006–2010



Source: National Minimum Dataset

South Island Distribution by Ethnicity

In Canterbury during 2000–2010, hospital admissions for dental caries in children 0–4 years were generally higher for Pacific > Māori and Asian/Indian > European children, while at 5–14 years rates were generally higher for Pacific children than for other ethnic groups. In Nelson Marlborough, South Canterbury and Southland, admissions were generally higher for Māori than for European children, while in the West Coast and Otago, no consistent ethnic differences were evident at 0–4 or 5–14 years. Small numbers precluded an analysis of ethnic differences for young people 15–24 years (**Figure 128**).

South Island Distribution by Season

In the South Island during 2006–2010, there were no consistent seasonal variations in hospital admissions for dental caries in children and young people (**Figure 129**).

Summary Hospital Admissions for Dental Caries

In New Zealand during 2006–2010, dental caries, followed by diseases of the pulp and periapical tissue, were the leading reasons for a dental admission in children 0–4 and 5–14 years. In contrast, embedded/impacted teeth, followed by dental caries were the leading reasons in young people 15–24 years. For dental caries, admissions were infrequent in infants <1 year, but rose rapidly thereafter, to reach a peak at 4 years of age. Rates then decreased, with admissions being relatively infrequent after 14 years of age.

Dental caries admissions in children 0–4 years were *significantly* higher for males, Pacific > Māori > Asian/Indian > European children and those from average-to-more deprived (NZDep decile 2–10) areas. Similarly, admissions for children 5–14 years were *significantly* higher for males, Māori and Pacific > Asian/Indian and European children and those from average-to-more deprived (NZDep decile 3–10) areas. In contrast, for young people 15–24 years, admissions were *significantly* higher for European and Māori > Pacific > Asian/Indian young people and those from more deprived (NZDep decile 5–10) areas.

During 2006–2010, dental caries was the leading reason for a dental admission in children aged 0–4 and 5–14 years in all South Island DHBs, while embedded/ impacted teeth or dental caries were the leading reasons for an admission in young people aged 15–24 years. In Southland, hospital admissions for dental caries in children aged 0–4 and 5–14 years and young people aged 15–24 years were *significantly* higher than the New Zealand rate. In all of the other South Island DHBs however, no consistent patterns were seen, with admissions in some age groups being *significantly* higher than the New Zealand rate, while in others rates were similar or *significantly* lower.

Local Policy Documents and Evidence-Based Reviews Relevant to Oral Health in Children and Young People

In New Zealand, there are a number of policy documents which provide guidance to the health sector on the establishment of optimal oral health services, the identification of those most at risk of poor oral health, and the roles the Ministry of Health and DHBs are expected to play in improving oral health outcomes for children and young people. In addition, there are a large number of reviews in the international literature which consider the effectiveness of particular interventions in the prevention and management of dental caries in this age group. These publications are briefly summarised in **Table 133**.



Table 133. Local Policy Documents and Evidence-Based Reviews Relevant to Oral Health Issues in Children and Young People

Ministry of Health Policy Documents
<p>New Zealand Guidelines Group. 2009. Guidelines for the Use of Fluorides. Wellington: Ministry of Health. http://www.moh.govt.nz/moh.nsf/pagesmh/9664/\$File/guidelines-for-the-use-of-fluoride-nov09.pdf</p> <p>These guidelines, aimed at oral healthcare providers, specifically address the use of topical fluoride treatments i.e. fluoride containing toothpastes, varnishes, mouthrinse, gels and foams. They provide an evidence-based summary of New Zealand and overseas research to inform best practice use of fluoride.</p>
<p>Ministry of Health. 2008. Early Childhood Oral Health: A toolkit for District Health Boards, primary health care and public health providers and for oral health services relating to infant and preschool oral health. Wellington: Ministry of Health. http://www.moh.govt.nz/moh.nsf/pagesmh/7385/\$File/early-childhood-oral-health-a-toolkit-feb08.pdf</p> <p>The objective of this toolkit for policy makers, funders, managers, clinical leaders and clinicians is to suggest a strategy of identifying children at greatest risk and targeting finite resources to those with the greatest need in order to reduce inequalities (while still maintaining universal access for all infants and pre-school children.) It recommends that Well Child/Tamariki Ora and other non-oral health providers conduct an enrolment and risk assessment process for all children at between 9 and 12 months of age and facilitate early contact with an oral health provider for examination and preventive and treatment services (if necessary) for those identified at highest risk of early childhood caries. This will require the development of a risk assessment tool ("Lift the Lip") and training for non-oral health providers.</p>
<p>Ministry of Health. 2008. Promoting Oral Health: A toolkit to assist the development, planning, implementation and evaluation of oral health promotion in New Zealand. Wellington: Ministry of Health. http://www.moh.govt.nz/moh.nsf/pagesmh/7384/\$File/promoting-oralhealth-a-toolkit-jan08.doc</p> <p>This toolkit, written for policy makers, planners and funders, oral health professionals and other interested persons, is a practical guide for the design, delivery and implementation of oral health promotion programmes. It does not include a review of the evidence for oral health promotion interventions.</p>
<p>Ministry of Health. 2006. Business Case Guidelines for Investment in Child and Adolescent Oral Health Services. Wellington: Ministry of Health. http://www.moh.govt.nz/moh.nsf/pagesmh/5016/\$File/guidelines-investment-child-adolescent-oral-health.pdf</p> <p>These guidelines were developed for DHBs to assist them with service planning and the preparation of business cases for submission to the Ministry of Health. They followed the Government's decision to embark on a substantial upgrade of community-based oral health facilities for the delivery of child and adolescent oral health services.</p>
<p>Ministry of Health. 2006. Community Oral Health Service: Facility Guideline. Wellington: Ministry of Health. http://www.moh.govt.nz/moh.nsf/pagesmh/5015/\$File/community-oral-health-facility-guideline.pdf</p> <p>The purpose of this guideline is to assist DHBs with planning new community oral health facilities. It covers planning, operational policies, facility location, functional areas and design, support areas, infection control, health & safety, building services & environmental design, mobile units, equipment and information and communication technology.</p>
<p>Ministry of Health. 2006. Good Oral Health for All, for Life: The Strategic Vision for Oral Health in New Zealand. Wellington: Ministry of Health. http://www.moh.govt.nz/moh.nsf/pagesmh/5117/\$File/good-oral-health-strategic-vision-2006.pdf</p> <p>This publication outlines the Government's strategic vision for oral health in New Zealand. There are four key priority groups including children and adolescents and there are seven key action areas in the vision: reorienting child and adolescent oral health services, reducing inequalities in access and outcomes, promoting oral health, forging links with primary care, building the oral health workforce, developing oral health policy, and research, monitoring and evaluation.</p>
<p>Ministry of Health. 2004. Child and Youth Health Toolkit. Wellington: Ministry of Health. http://www.moh.govt.nz/moh.nsf/pagesmh/5411/\$File/childand youthhealthtoolkit.pdf</p> <p>Chapter 12 of this publication, aimed at DHB funders and planners, doctors, nurses, managers, primary health organisations, community providers, DHB boards, and other groups and individuals wanting to improve child and youth health, provides guidance on the child oral health indicators and what needs to be done to improve child oral health.</p>

International Guidelines

Scottish Intercollegiate Guidelines Network. 2005. **Prevention and management of dental decay in the pre-school child: A national clinical guideline.** <http://www.sign.ac.uk/pdf/sign83.pdf>

These guidelines aim to support evidence-based best practice in the prevention and management of dental decay in the pre-school child. Effective preventive measures relating to diet include promoting breastfeeding, discouraging bottle feeding of fruit juice and other drinks containing free sugars, restricting foods and drinks containing free sugars to mealtimes only, encouraging eating cheese as a snack food, and choosing confectionary and beverages containing sugar substitutes rather than those containing sugars. Tooth brushing with fluoride toothpaste should be encouraged at least twice a day but pre-school children should use only a smear or small pea-sized amount of a fluoride toothpaste containing only 1000ppmF. Tooth brushing should commence as soon as the primary teeth erupt and children should spit rather than rinse after brushing. Either manual or electric toothbrushes are effective for applying fluoride toothpaste. Dental or dietary health promotion is not of value as a community prevention approach in isolation. Environmental and/or policy change such as changes to school meals appear to be the most effective means of improving children's dietary intake. The use of fluoride toothpaste should be promoted but fluoride supplements are not recommended as a public health measure. It is important that those who provide oral health advice, including teachers, nurses, midwives and community workers are consistent with each other and with dental professionals in the advice they provide.

National Institute for Clinical Excellence. 2004. **Dental recall: Recall interval between routine dental examinations.** London: National Institute for Clinical Excellence. <http://www.nice.org.uk/nicemedia/live/10952/29486/29486.pdf>

Since the inception of the NHS it had been customary to provide six-monthly dental check-ups however following the publication of the Department of Health's strategy document *NHS Dentistry: Options for Change* (2002) dentists and their patients now discuss the patient's care needs and determine an appropriate recall interval based on an assessment of disease levels and risk of dental disease. This publication assists dentists (who provide the dental care for children in the U.K.) in the decision making process. The recommendations are accompanied by a grading scheme (as used by the Scottish Intercollegiate Guidelines Network.) There is no discussion of the research evidence or any references.

Scottish Intercollegiate Guidelines Network. 2000. **Preventing Dental Caries in Children at High Caries Risk: Targeted prevention of dental caries in the permanent teeth of 6-16 year olds presenting for dental care.**

Edinburgh: Scottish Intercollegiate Guidelines Network. <http://www.sign.ac.uk/pdf/sign47.pdf>

This guideline is primarily aimed at dentists but section 5 contains information for non-dental professionals. Issues discussed include dry mouth due to some drugs such as tricyclic antidepressants and some medical conditions e.g. Sjogren/Sicca syndrome, diabetes, ectodermal dysplasia, (dry mouth increases the risk of dental caries), the need for sugar free medicines, counselling those who do not see a dentist regularly to overcome their barriers to seeking dental care, medically compromised individuals for whom dental care may be more hazardous including those with cardiac disease, immunosuppression (including HIV), haemophilia and other bleeding disorders, and disability, and the need for patients wearing orthodontic appliances to have regular dental care.

Systematic and Other Reviews from the International Literature

Rogers J G. 2011. **Evidence-based oral health promotion resource.** Melbourne: Prevention and Population Health Branch, Government of Victoria, Department of Health. . [http://docs.health.vic.gov.au/docs/doc/1A32DFB77FEFBE9CCA25789900125529/\\$FILE/Final%20Oral%20Health%20Resource%20May%202011%20web%20version.pdf](http://docs.health.vic.gov.au/docs/doc/1A32DFB77FEFBE9CCA25789900125529/$FILE/Final%20Oral%20Health%20Resource%20May%202011%20web%20version.pdf)

This publication is based on a systematic search of the literature for interventions to promote oral health. The key research questions were: 1) What are effective oral health promotion strategies for the Victorian population? 2) What innovative oral health promotion strategies show promise for the Victorian population? 3) What information and research gaps exist? The evidence for interventions is presented in sections for seven priority groups and settings. Section 5 relates to pregnant women, babies and young children, section 6 to children and adolescents and school settings, section 8 to Aboriginal and Torres Strait Islander people, section 9 to culturally and linguistically diverse communities, and section 10 to people with special needs. The strength of the evidence for interventions (i.e. their level of effectiveness) is indicated by a number on a seven point scale and the strength of the evidence (i.e. its quality) is graded according to the criteria of the National Health and Medical Research Council. In addition to interventions, programmes implemented in various parts of Victoria are also discussed in the report. Effective oral health promotion interventions for pregnant women, babies and young children are: targeted home visits by health workers, targeted fluoride varnish programs, targeted supervised tooth brushing and healthy food and drink policies in childhood settings, targeted provision of fluoride toothpaste and toothbrushes via mailing, home visits or clinics, integration of oral health into well child visits (including "lift the lip" screening), community action multi-strategy programmes and community-based preventive programmes for expectant and new mothers. For school-aged children interventions are: targeted school-based tooth brushing and fluoride mouth-rinsing programmes, school-based oral health education, orally healthy school policies including integration of oral health promotion into the school curriculum, community school and clinic based programmes and targeted chewing gum programmes.

Deacon SA, Glenny A-M, Deery C, et al. 2010. **Different powered toothbrushes for plaque control and gingival health.** Cochrane Database of Systematic Reviews 2010(12) Art. No.: CD004971.
DOI:10.1002/14651858.CD004971.pub2.

This review, which included 17 trials, 10 of which received funding from the manufacturer of one of the toothbrushes in the trial, aimed to compare powered toothbrushes with different modes of action in relation to 1) removal of plaque, 2) health of the gingivae (gums) and 3) adverse effects. It found that no mode of action was consistently superior across all outcomes and time periods studied. There was some evidence, from seven trials of up to 3 months duration that rotation oscillation brushes reduce plaque and gingivitis more than side to side brushes but the difference was small.

Marinho VC. 2009. **Cochrane reviews of randomized trials of fluoride therapies for preventing dental caries.** European Archives of Paediatric Dentistry: Official Journal of European Academy of Paediatric Dentistry 10(3)183-91.

This article summarises seven Cochrane reviews evaluating the effectiveness of four topical fluoride treatments (toothpastes, gels, varnishes and mouth rinses) in preventing dental caries in adolescents and children, two Cochrane reviews evaluating other fluoride modalities (slow-release devices, milk), one comparing fluoride varnishes versus sealants in occlusal surfaces and one evaluating fluorides for white spot lesions in orthodontic patients. The seven reviews on topical fluoride treatments indicate that they are all of clear and similar effectiveness and that additional caries reduction can be expected when another topical fluoride is combined with fluoride toothpaste. There is insufficient evidence for the effectiveness of slow release fluoride devices and fluoridated milk. It is also uncertain whether there is any difference between different modes of delivering fluoride to orthodontic patients. Fissure sealants seem to be more effective than fluoride varnish for preventing occlusal caries however the size of the difference is unclear. The author concludes that "The benefits of topical fluorides are firmly established based on a sizeable body of evidence from randomized controlled trials. The size of the reductions in caries increment in both the permanent and the primary dentitions emphasizes the importance of including topical fluoride delivered through toothpastes, rinses, gels or varnishes in any caries preventive program" and she highlights areas where further research is needed.

Department of Health (U.K.), British Association for the Study of Community Dentistry. 2009. **Delivering Better Oral Health An evidence-based toolkit for prevention.** London Department of Health.
http://www.dh.gov.uk/dr_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_102982.pdf

This publication provides practical, evidence-based guidance to assist dental practitioners to promote oral health and prevent oral disease in their patients. Each piece of advice or suggested intervention is accompanied by an evidence grade indicating the strength of the evidence on which it is based. Sections in the guidelines cover summary guidance for the prevention of caries in children and adults and the prevention of periodontal disease and oral cancer, principles of tooth brushing, increasing fluoride availability, healthy eating advice, identifying sugar-free medicines, improving periodontal health, stopping smoking, alcohol misuse, and prevention of erosion.

Ahovuo-Saloranta A, Hiiri A, Nordblad A, et al. 2008. **Pit and fissure sealants for preventing dental decay in the permanent teeth of children and adolescents.** Cochrane Database of Systematic Reviews 2008(4) Art. No.: CD001830. DOI:10.1002/14651858.CD001830.pub3.

This review included 16 RCTs or quasi-RCTs comparing sealants with no sealants or resin based sealants / composites with other sealants. Three of these 16 trials used a parallel group design and the others were split mouth studies in which two interventions were randomly allocated to pairs of teeth in the same child. In meta-analyses based on six studies comparing resin sealants with no sealant the reductions in caries ranged from 87% at 12 months (RR 0.13, 95% CI 0.09-0.20) to 60% (RR 0.40, 95% CI 0.31-0.51) at 48-54 months. The results from the studies which compared different sealant materials were conflicting. The authors concluded that sealing can be recommended to prevent caries of the occlusal surfaces of permanent molars and that the benefits are obvious where the risk of caries is high but that there is a lack of data on the benefits of sealing at different levels of caries risk.

Australian Government National Health and Medical Research Council. 2007. **A systematic review of the efficacy and safety of fluoridation Part A: Review Methodology And Results.** Canberra: Australian Government. http://www.nhmrc.gov.au/files/nhmrc/publications/attachments/eh41_1.pdf

This systematic review considers the evidence relating to the efficacy and safety of fluoride interventions particularly those which are delivered as part of a widespread public health initiative. The findings are used to answer a series of questions under the headings of benefits, harms, cancer and other adverse effects. The evidence strongly supported water fluoridation and there was some low level evidence for the benefits of milk fluoridation. There was no evidence for the benefits of salt fluoridation. There was consistent level I (best) evidence for the benefits of topical fluoride agents in reducing caries in children and that some combinations of topical fluoride agents are more effective than single agents. There was consistent level III/IV evidence that water fluoridation (and, in one study each only, milk fluoridation and salt fluoridation) leads to dental fluorosis although the majority of dental fluorosis was mild and of no aesthetic concern. There was no good evidence that topical fluorides lead to fluorosis of aesthetic concern but one study showed that fluoride toothpaste may be associated with "any fluorosis". The authors of three existing systematic reviews agreed that water fluoridation had little effect on bone fracture risk. There was no evidence on the effect of milk or salt fluoridation or topical fluorides on fracture risk or on cancer risk or on risk of other adverse effects. Regarding water fluoridation and the risk of cancer, a 2000 systematic review concluded that there was no clear association between it and cancer incidence or mortality either for "all cause" cancer or for osteosarcoma. Of four later studies investigating this issue, one case-control study suggested water fluoridation was associated with an increased risk of osteosarcoma in young males (but not females) however co-investigators noted in a Letter to the Editor (in the same journal issue that published the study) that they were unable to replicate these results in the wider study the osteosarcoma study was part of, so caution was needed. Two systematic reviews and three fair to poor original studies did not provide evidence sufficient to reach a conclusion about other possible negative effects of water fluoridation.

Watt RG. 2005. **Strategies and approaches in oral disease prevention and health promotion**. Bull World Health Organ 83(9) 711-8. http://www.scielo.org/scielo.php?pid=s0042-96862005000900018&script=sci_arttext&lng=en

This publication includes a useful table summarising the evidence base for various oral health interventions including water fluoridation, topical fluorides, fissure sealants, dental health education, periodontal health and screening for oral cancer. Two systematic reviews of low to moderate quality studies suggested that water fluoridation produces about a 14% reduction in caries and that the effect is greatest on the primary dentition. The findings of the Cochrane reviews on topical fluorides led to estimates that specific reductions in caries rates were 24% for fluoride toothpaste, 26% for mouth rinses, 28% for gels and 46% for varnishes with an overall estimate of benefit for topical fluorides of 26% in permanent dentition and 33% in primary dentition. The one Cochrane review on fissure sealants (see below) found that the level of caries reduction was dependant on the baseline caries rate and that caries reductions ranging from 86% at 12 months to 57% at 48 months were achieved. Five effectiveness reviews on dental education found that it was generally ineffective and that study design and evaluation quality was generally poor. Interventions studied included school-based tooth brushing campaigns, dietary interventions and mass media campaigns. While education may result in short term improvements in oral health knowledge there is little effect on long term behaviour or clinical outcomes.

Kay E, Locker D. 1998. **A systematic review of the effectiveness of health promotion aimed at improving oral health**. Community Dent Health 15(3) 132-44.

This review examined the effectiveness of oral health promotion on caries, oral hygiene, and oral health-related knowledge, attitudes and behaviours. The authors state that the available evidence allows very few conclusions to be drawn about the effectiveness of oral health promotion but that oral health promotion which leads to the use of fluoride is effective for reducing caries and chairside oral health promotion has been more consistently shown to be effective than other methods. Mass media education campaigns have not been demonstrated to be effective and the quality of research evaluating oral health promotion needs improving.

Centre for Reviews and Dissemination. 2011. **A systematic review of the effectiveness of health promotion aimed at improving oral health** (Structured abstract). Database of Abstracts of Reviews of Effects. 2011;2011(4).

In their commentary on the above review the CRD stated that this was an average review based on a reasonable literature search but that the review authors did not explain the validity assessment they performed or relate it to the results presented. For this reason it was difficult to interpret the reliability of each of the studies included in the review. The commentary states "Given the heterogeneity in the studies in terms of intervention, design, populations and outcomes, it does not appear to have been appropriate to have pooled the results, especially as heterogeneity was not formally assessed. The pooled results should, therefore, be interpreted with extreme caution". Overall, the CRD considers that "the authors' conclusions appear to be supported by the results presented.

Robinson PG, Deacon SA, Deery C, et al. 2005. **Manual versus powered toothbrushing for oral health**. Cochrane Database of Systematic Reviews 2005(2) Art. No.: CD002281. DOI:10.1002/14651858.CD002281.pub2.

This review included 42 RCTs, with a total of 3855 participants, comparing manual with powered toothbrushes. 67% of the trials were funded by toothbrush manufacturers, with funding for the remainder unclear. In the short term brushes with a rotation oscillation action reduced plaque and reduced gingivitis more than manual toothbrushes (11% vs. 6%) but the clinical significance is unclear. The trials were too short to assess the effects on destructive periodontal disease.

Two other reviews considered aspects of oral health care, but found insufficient evidence to draw firm conclusions:

Pereira-Cenci T, Cenci MS, Fedorowicz Z, et al. 2009. **Antibacterial agents in composite restorations for the prevention of dental caries**. Cochrane Database of Systematic Reviews 2009(3) Art. No.: CD007819. DOI: 10.1002/14651858.CD007819.pub2.

Beirne P, Clarkson JE, Worthington HV. 2007. **Recall intervals for oral health in primary care patients**. Cochrane Database of Systematic Reviews 2007(4) Art. No.: CD004346. DOI: 10.1002/14651858.CD004346.pub3.

Other Relevant Publications

Ministry of Health. 2011. **Evaluation of the Māori Oral Health Providers Project**. Wellington: Ministry of Health. [http://www.moh.govt.nz/moh.nsf/pagesmh/10686/\\$File/evaluation-Māori-oral-health-providers.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/10686/$File/evaluation-Māori-oral-health-providers.pdf)

In 2007 five Māori health providers received Ministry of Health funding to purchase facilities in order to deliver oral health services. They then signed contracts with DHBs for the support and delivery of new oral health services and/or the maintenance and expansion of existing services. This publication reports on the evaluation of this project. Overall, the project enhanced the ability of Māori health providers to deliver oral health services within their communities and DHBs gained greater understanding of Māori health providers' capabilities and capacity.

Ministry of Health. 2010. **Our Oral Health: Key findings of the 2009 New Zealand Oral Health Survey**. Wellington: Ministry of Health. [http://www.moh.govt.nz/moh.nsf/pagesmh/10514/\\$File/our-oral-health-2010.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/10514/$File/our-oral-health-2010.pdf)

This publication reports on the clinical and self-reported results of the 2009 nationwide survey of New Zealand adults and children in the course of which 4906 people were interviewed and 3196 people received a dental examination. Key findings included that, while dental decay is still the most prevalent chronic disease in New Zealand, the oral health of New Zealanders has improved over time and, among children the proportion of 12-13 year olds who are caries-free increased from 29% in 1988 to 51% in 2009. Māori and Pacific children and young people had poorer access than other children and these groups had worse oral health outcomes, as did those in areas of high socio-economic deprivation.

Murdoch Children's Research Institute. 2009. **Maternal and Child Oral Health - Systematic Review and Analysis: a report for the New Zealand Ministry of Health.** Wellington: Ministry of Health.

[http://www.moh.govt.nz/moh.nsf/pagesmh/9418/\\$File/maternal-infant-oral-healthv2-aug09.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/9418/$File/maternal-infant-oral-healthv2-aug09.pdf)

This report reviewed the evidence concerning the impact of the oral health of pre-and post-natal women on the oral health of their children. Early childhood caries has its origins in the first year so interventions need to occur early, possibly before birth. The report addresses the evidence in five key areas and concludes with recommendations for the Ministry: further good quality NZ research, routine surveillance of the <5 age group to provide a baseline for measuring progress, community based, targeted interventions for oral health promotion aimed at socially disadvantaged women and those from high risk populations, and integrating oral health promotion with existing services such as Well Child / Tamariki Ora services or primary health services. It emphasises that any proposed oral health promotion programme needs to include an evaluation plan, incorporate significant community involvement, and be culturally appropriate and that there may be a place for home visiting. The core of any intervention should be primary prevention by tooth brushing with fluoride toothpaste and the provision of primary dental care. If the programme is to include identification of dental treatment needs then this should be provided as part of a comprehensive prevention and health promotion strategy, with direct links between screening and treatment providers. Appendices include summaries of the relevant research.

DHBNZ. 2006. **National School Dental Service Review Final Report**, December 2004. Wellington: Ministry of Health.

[http://www.moh.govt.nz/moh.nsf/pagesmh/4754/\\$File/dhbnz-national-school-dental-service-review-final-report.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/4754/$File/dhbnz-national-school-dental-service-review-final-report.pdf)

In 2004, the Ministry of Health commissioned District Health Boards to undertake a review of school dental services in their regions. Project management for the review was provided by DHBNZ who summarised the reports into one document. This report provides a summary of the key points raised by the DHBs and the various ideas for future service configurations, acknowledging that different DHBs serve different populations with different service needs.

Mauri Ora Associates. 2004. **Review of Māori Child Oral Health Services.** Wellington: Ministry of Health.

[http://www.moh.govt.nz/moh.nsf/pagesmh/4755/\\$File/review-of-Māori-child-oral-health.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/4755/$File/review-of-Māori-child-oral-health.pdf)

This is the report of a review commissioned by the Ministry of Health and produced by Mauri Ora Associates who reviewed 16 Māori providers to evaluate their operations and experiences. It discusses the ways services are being delivered and provides twelve recommendations for reducing inequalities.

National Health Committee. 2003. **Improving Child Oral Health and Reducing Child Oral Health Inequalities.**

Wellington: National Advisory Committee on Health and Disability.

<http://www.nhc.health.govt.nz/sites/www.nhc.health.govt.nz/files/documents/publications/chldoralhth.pdf>

This report to the Minister of Health from the Public Health Advisory Committee (PHAC) provides advice on how to improve child oral health and reduce oral health inequalities. The PHAC identified seven areas where they believed chances or improvements could be made: influencing socioeconomic determinants; improving Māori oral health; encouraging fluoridation; reorienting oral health services; developing a responsive and skilled workforce; obtaining better information about child oral health and inequalities, and using child oral health as an indicator of health inequalities. Each of these areas is discussed in detail and recommendations are made regarding appropriate action.