

AMBULATORY SENSITIVE HOSPITALISATIONS

Introduction

Ambulatory sensitive hospitalisations (ASH) are often used as a measure for assessing the performance of primary health care [97]. From 2007, the Ministry of Health identified reducing ASH among children aged 0–4 years in New Zealand as a priority [98]. The measure is not used to assess failure in individual cases however, but to identify conditions where a specific intervention could reduce groups of admissions [99]. Common conditions implicated in ASH among New Zealand children aged 0–4 years are gastroenteritis, respiratory infections, dental conditions and asthma [97]. Commonalities in these conditions are the abrupt nature of their onset and/or their infectious origin. The primary health care response to these conditions often needs to be swift if it is to avoid the need for admission to hospital. Acute conditions, therefore, place specific demands on primary health services which are different to the predominantly chronic conditions that constitute ASH among older people [30]. Cardiovascular disease, for example, requires interventions developed with the patient over time to avoid ASH. In New Zealand, childhood ASH peaks first around one year of age and then again around 4–7 years [97]. Rates for males are higher, as are those for Pacific children, and it is more prevalent among those who live in average to more deprived areas [97].

The following sections review ASH in children aged 0–4 years using information from the National Minimum Dataset. Factors that could assist the development of appropriate primary health care services and treatment to reduce ASH rates among children are reviewed in more detail in the in-depth topic commencing on **Page 117**.

Data Sources and Methods

Indicator

1. Ambulatory Sensitive Hospitalisations (ASH) in Children Aged 0–4 Years

Numerator: National Minimum Dataset: Acute and semi-acute hospital admissions for ambulatory sensitive conditions in children aged 0–4 years. Includes admissions with an ICD-10-AM primary diagnosis of Asthma (J45–46), Bronchiectasis (J47), Skin Infections (H000, H010, J340, L01–L04, L08, L980), Constipation (K590), Dental Caries/Other Dental Conditions (K02, K04, K05), Dermatitis and Eczema (L20–30), Gastroenteritis (A02–A09, R11, K529), Gastro-Oesophageal Reflux (K21), Nutritional Deficiency (D50–D53, E40–E46, E50–E56, E58–E61, E63–E64), Bacterial/Non-Viral Pneumonia (J13–J16, J18), Rheumatic Fever/Heart Disease (I00–I09), Otitis Media (H65–H67), Acute Upper Respiratory Tract Infections (excluding croup) (J00–J03, J06), Vaccine Preventable Diseases: Neonatal/Other Tetanus, Congenital Rubella; ≥6 months: Pertussis, Diphtheria, Hepatitis B; ≥16 months: Measles, Mumps, Rubella (A35, A36, A37, A80, B16, B180, B181 A33, A34, P350, B05, B06, B26, M014); >4 years: Urinary Tract Infections (N10, N12, N300, N390, N309, N136).

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

Notes on Interpretation

Note 1: Age Filters: The 0–4 year age group has been selected for this analysis as it aligns with the Ministry of Health's previous paediatric ASH Target (0–4 years). Neonatal admissions (0–28 days) have been excluded on the basis that issues arising in the neonatal period are likely to be heavily influenced by antenatal/perinatal factors, and as a consequence are likely to require different care pathways from conditions arising in the community (e.g. pneumonia in a very preterm infant). The only exceptions are neonatal tetanus and congenital rubella, which are potentially preventable by timely (maternal) access to immunisation. Further, age filters have also been applied to some vaccine preventable diseases (e.g. measles ≥16 months) on the basis that these conditions may not be (primary care) preventable, prior to the age at which immunisation for the relevant condition is due. Similarly, a >4 year age criteria has been applied to urinary tract infections, on the basis that younger children may require hospitalisation for further investigation.

Note 2: Admission Type Filters: An acute admission is an unplanned admission occurring on the day of presentation, while an arranged admission is a non-acute admission with an admission date <7 days after the decision was made that the admission was required. A waiting list admission is a planned admission, where the admission date is 7+ days after the decision was made that the admission was necessary. In this section, all analyses include acute and arranged (semi-acute) admissions only, with the exception of dental conditions, which also include waiting list admissions (as some DHBs routinely admit dental conditions from the waiting list, while others admit the majority as arranged admissions, potentially creating artefactual DHB differences if

the entire burden of dental morbidity is not captured). This restriction was applied in order to eliminate the large number of cases where the primary diagnosis was e.g. otitis media, but where the main reason for admission was for the insertion of grommets, as it was felt that the role primary care played in preventing acute admissions (e.g. for acute otitis media), was likely to differ from the one it played in ensuring children had access to waiting list procedures (e.g. for the insertion of grommets).

Note 3: *Emergency Department Filters*: In order to deal with the issue of inconsistent uploading of Emergency Department (ED) cases to the National Minimum Dataset (see **Appendix 3**), the Ministry of Health has traditionally applied a number of filters to its ASH analyses [100,101]. These filters exclude Accident and Emergency cases which meet the following criteria:

- The admission and discharge dates are the same AND,
- The patient was not discharged dead (i.e., discharge type not in 'DD') AND,
- The health specialty code is in ('M05', 'M06', 'M07', or 'M08').

While the NZ Child and Youth Epidemiology service does not recommend the use of such filters in the paediatric population (see **Appendix 3** for a discussion of these issues), in order to allow DHBs to assess the impact ED cases have on their ASH rates, all the analyses in this section are presented with both ED cases included and excluded. In contrast to the Ministry of Health filters described above however, all ED cases have either been totally included or excluded, not just those admitted and discharged on the same day (as in the paediatric population many presentations occur late in the evening, with children then being discharged in the early hours of the following day, potentially making their total length of stay similar to that of ED day cases).

For those DHBs without a dedicated paediatric emergency department, who assess the majority of their cases in a Paediatric Assessment Unit or on the Paediatric Ward, the ED included and excluded analyses may be identical. Local variations in the way health specialty codes are assigned to such cases may profoundly influence the differences seen between the ED included and excluded rates.

Note 4: 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 Distribution by Primary Diagnosis

In New Zealand during 2006–2010, gastroenteritis, acute upper respiratory infections and asthma were the most frequent causes of ASH in children 0–4 years when emergency department (ED) cases were included, while gastroenteritis, dental conditions and asthma were the most frequent causes when ED cases were excluded (**Table 37**).

New Zealand Trends

In New Zealand during 2000–2010 when ED cases were included, ASH rates in children 0–4 years gradually increased, whereas when ED cases were excluded, ASH rates were more static (**Figure 24**).

New Zealand Distribution by Age

In New Zealand during 2006–2010, ASH rates were highest in infants and one year olds, with rates then tapering off rapidly between one and two years, and then again between four and seven years of age. The exclusion of ED cases did not alter this overall pattern appreciably (**Figure 25**).

New Zealand Distribution by Ethnicity, NZDep Index Decile and Gender

In New Zealand during 2006–2010, ASH rates in children 0–4 years were *significantly* higher for males, for Pacific > Māori > Asian/Indian > European children, and those living in average-to-more deprived (NZDep decile 3–10) areas. Similar patterns were seen when ED cases were excluded, although admission rates for Asian/Indian were *significantly* lower than for European children (**Table 38**). Similar ethnic differences were seen during 2000–2010 (**Figure 26**).



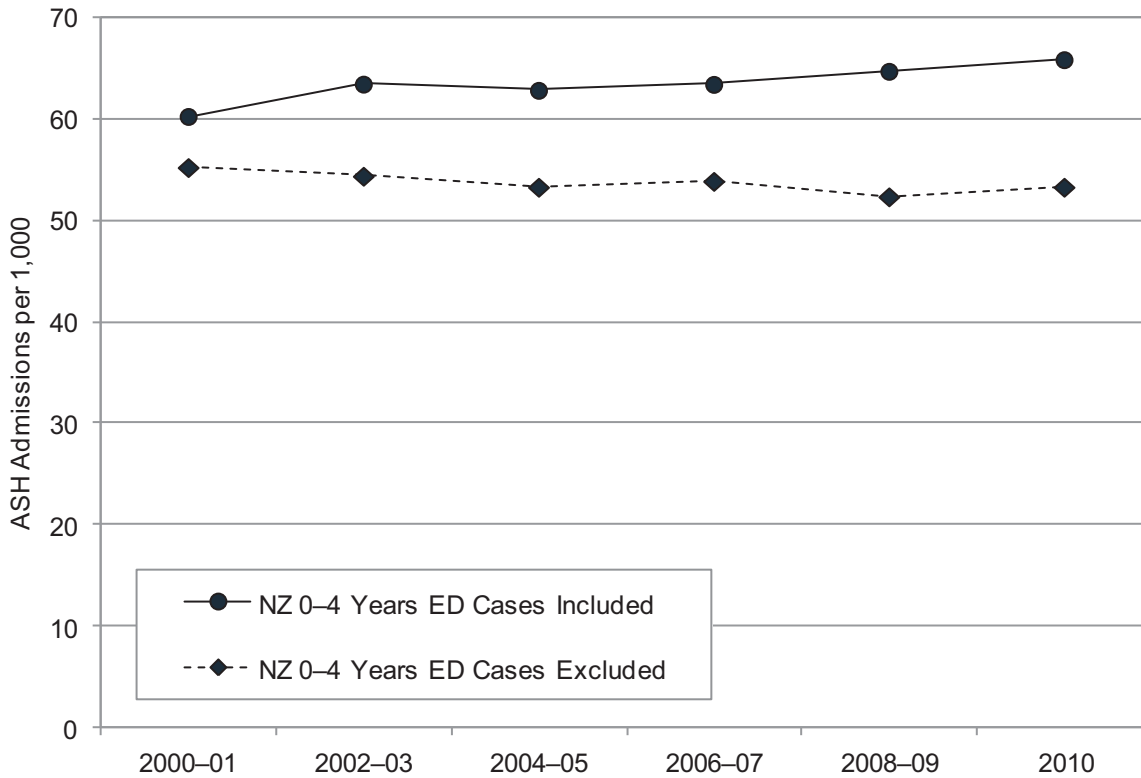
Table 37. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Primary Diagnosis, New Zealand 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
New Zealand Ambulatory Sensitive Hospitalisations 0–4 Years				
Emergency Department Cases Included				
Gastroenteritis	21,329	4,265.8	14.8	23.0
Acute Upper Respiratory Tract Infections	15,595	3,119.0	10.8	16.8
Asthma	15,511	3,102.2	10.8	16.7
Dental Conditions	13,261	2,652.2	9.21	14.3
Bacterial/Non-Viral Pneumonia	10,898	2,179.6	7.57	11.8
Skin Infections	7,743	1,548.6	5.38	8.4
Otitis Media	2,804	560.8	1.95	3.0
Dermatitis and Eczema	2,215	443.0	1.54	2.4
Constipation	1,523	304.6	1.06	1.6
Gastro-Oesophageal Reflux	1,353	270.6	0.94	1.5
Bronchiectasis	204	40.8	0.14	0.2
Nutritional Disorders	170	34.0	0.12	0.2
VPD ≥ 6 Months: DTP, Polio, HepB	77	15.4	0.05	0.1
VPD ≥ 16 Months: MMR	26	5.2	0.02	0.0
Rheumatic Fever/Heart Disease	19	3.8	0.01	0.0
New Zealand Total	92,728	18,545.6	64.4	100.0
Emergency Department Cases Excluded				
Gastroenteritis	15,415	3,083.0	10.7	20.2
Dental Conditions	13,228	2,645.6	9.19	17.3
Asthma	12,075	2,415.0	8.39	15.8
Acute Upper Respiratory Tract Infections	11,985	2,397.0	8.32	15.7
Bacterial/Non-Viral Pneumonia	9,223	1,844.6	6.41	12.1
Skin Infections	7,327	1,465.4	5.09	9.6
Otitis Media	2,249	449.8	1.56	2.9
Dermatitis and Eczema	2,060	412.0	1.43	2.7
Constipation	1,230	246.0	0.85	1.6
Gastro-Oesophageal Reflux	1,224	244.8	0.85	1.6
Bronchiectasis	200	40.0	0.14	0.3
Nutritional Disorders	157	31.4	0.11	0.2
VPD ≥ 6 Months: DTP, Polio, HepB	70	14.0	0.05	0.1
VPD ≥ 16 Months: MMR	21	4.2	0.01	0.0
Rheumatic Fever/Heart Disease	18	3.6	0.01	0.0
New Zealand Total	76,482	15,296.4	53.1	100.0

Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population

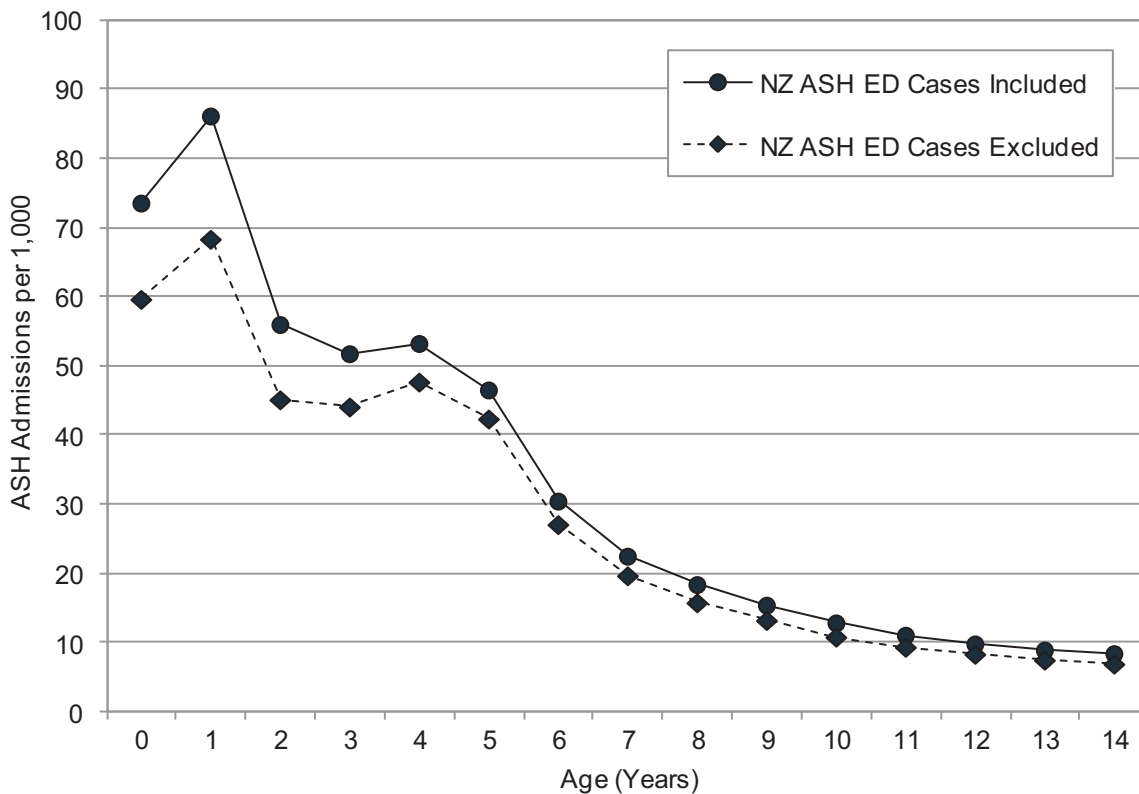


Figure 24. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years, New Zealand 2000–2010



Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population.

Figure 25. Ambulatory Sensitive Hospitalisations in Children Aged 0–14 Years by Age, New Zealand 2006–2010



Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population



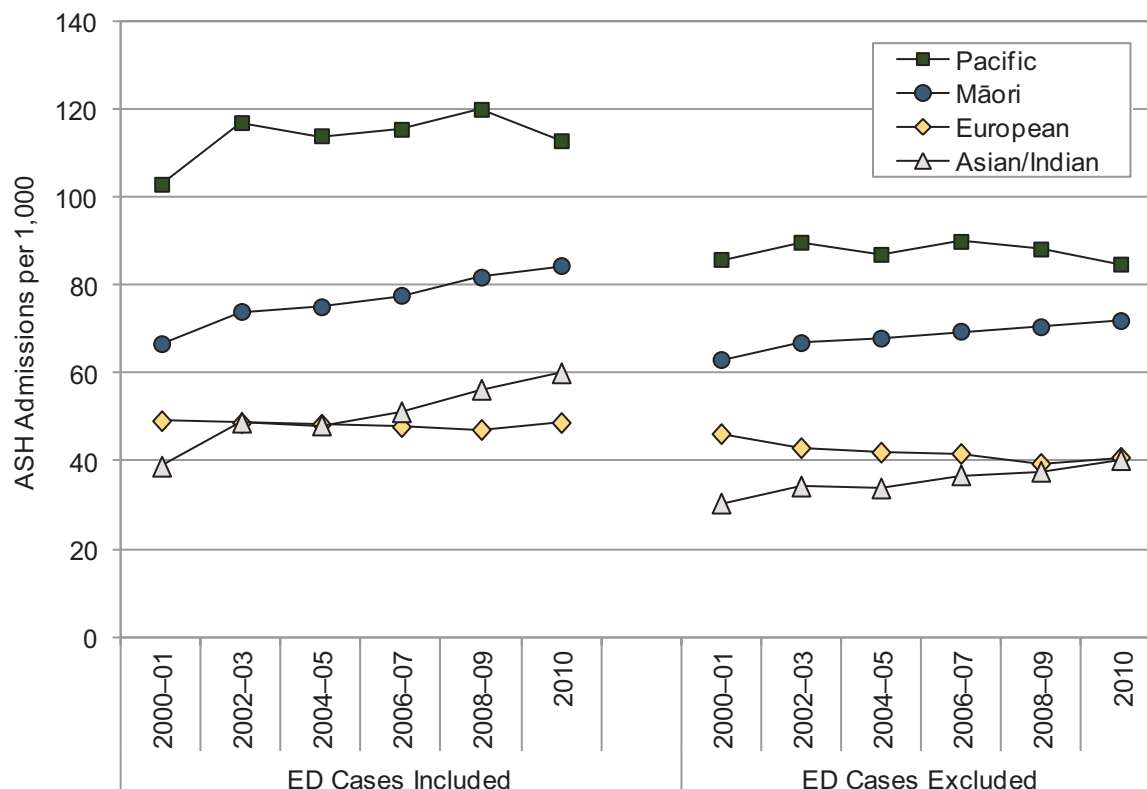
Table 38. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Ethnicity, NZ Deprivation Index Decile and Gender, New Zealand 2006–2010

Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
Ambulatory Sensitive Hospitalisations 0–4 Years							
Emergency Department Cases Included							
NZ Deprivation Index Decile				NZ Deprivation Index Quintile			
Decile 1	37.1	1.00		Decile 1–2	36.5	1.00	
Decile 2	35.9	0.97	0.93–1.01	Decile 3–4	44.2	1.21	1.18–1.24
Decile 3	41.9	1.13	1.09–1.17	Decile 5–6	57.2	1.57	1.53–1.61
Decile 4	46.3	1.25	1.20–1.29	Decile 7–8	72.5	1.98	1.94–2.03
Decile 5	53.6	1.44	1.39–1.50	Decile 9–10	97.2	2.66	2.60–2.72
Decile 6	60.2	1.62	1.57–1.68	Prioritised Ethnicity			
Decile 7	67.2	1.81	1.75–1.87	European	47.7	1.00	
Decile 8	76.9	2.07	2.01–2.14	Māori	80.7	1.69	1.67–1.72
Decile 9	90.9	2.45	2.37–2.53	Pacific	116.8	2.45	2.41–2.49
Decile 10	102.7	2.77	2.68–2.85	Asian/Indian	55.2	1.16	1.13–1.19
Gender							
Female	58.9	1.00					
Male	69.7	1.18	1.17–1.20				
Emergency Department Cases Excluded							
NZ Deprivation Index Decile				NZ Deprivation Index Quintile			
Decile 1	31.3	1.00		Decile 1–2	29.8	1.00	
Decile 2	28.1	0.90	0.86–0.94	Decile 3–4	35.6	1.20	1.16–1.23
Decile 3	33.3	1.06	1.02–1.11	Decile 5–6	46.7	1.57	1.53–1.61
Decile 4	37.7	1.20	1.15–1.25	Decile 7–8	60.6	2.04	1.98–2.09
Decile 5	43.4	1.38	1.33–1.44	Decile 9–10	80.8	2.71	2.65–2.78
Decile 6	49.5	1.58	1.52–1.64	Prioritised Ethnicity			
Decile 7	57.1	1.82	1.76–1.89	European	40.6	1.00	
Decile 8	63.5	2.03	1.95–2.10	Māori	70.4	1.73	1.71–1.76
Decile 9	75.0	2.39	2.31–2.48	Pacific	88.2	2.17	2.13–2.22
Decile 10	85.8	2.74	2.65–2.83	Asian/Indian	37.9	0.93	0.91–0.96
Gender							
Female	48.6	1.00					
Male	57.4	1.18	1.17–1.20				

Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Rate is per 1,000; Ethnicity is Level 1 Prioritised; Decile is NZDep2001



Figure 26. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Ethnicity, New Zealand 2000–2010



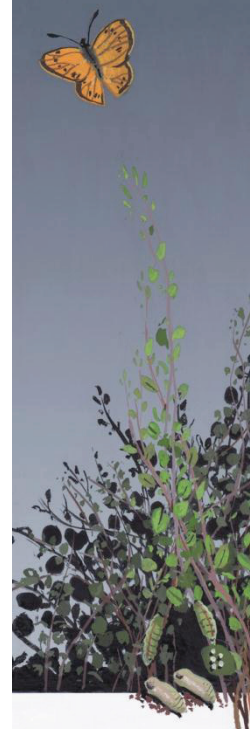
Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Ethnicity is Level 1 Prioritised

South Island Distribution and Trends

Table 39. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 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
Ambulatory Sensitive Hospital Admissions 0–4 Years					
Emergency Department Cases Included					
Nelson Marlborough	1,908	381.6	47.7	0.74	0.71–0.77
West Coast	529	105.8	55.0	0.85	0.79–0.93
Canterbury	8,721	1744.2	55.6	0.86	0.85–0.88
South Canterbury	622	124.4	42.3	0.66	0.61–0.71
Otago	2,208	441.6	43.6	0.68	0.65–0.71
Southland	2,460	492.0	70.0	1.09	1.05–1.13
New Zealand	92,728	18,545.6	64.4	1.00	
Emergency Department Cases Excluded					
Nelson Marlborough	1,888	377.6	47.2	0.89	0.85–0.93
West Coast	521	104.2	54.2	1.02	0.94–1.11
Canterbury	8,704	1740.8	55.5	1.05	1.02–1.07
South Canterbury	619	123.8	42.1	0.79	0.73–0.86
Otago	2,168	433.6	42.8	0.81	0.77–0.84
Southland	2,417	483.4	68.8	1.29	1.24–1.35
New Zealand	76,482	15,296.4	53.1	1.00	

Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only; Neonates excluded); Denominator: Statistics NZ Estimated Resident Population



South Island DHBs vs. New Zealand

During 2006–2010, ASH in children 0–4 years were *significantly* lower than the New Zealand rate in all of the South Island DHBs except Southland (where rates were *significantly* higher) when ED cases were included. While ASH were also *significantly* lower than the New Zealand rate in Nelson Marlborough, South Canterbury and Otago when ED cases were excluded, in the West Coast rates were similar to the New Zealand rate, while rates in Southland and Canterbury were *significantly* higher (although only marginally so in the case of Canterbury) (**Table 39**).

Table 40. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Primary Diagnosis, Nelson Marlborough 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
Nelson Marlborough ASH 0–4 Years				
Emergency Department Cases Included				
Gastroenteritis	400	80.0	10.0	21.0
Acute Upper Respiratory Tract Infections	395	79.0	9.88	20.7
Dental Conditions	388	77.6	9.70	20.3
Asthma	284	56.8	7.10	14.9
Bacterial/Non-Viral Pneumonia	171	34.2	4.28	9.0
Skin Infections	82	16.4	2.05	4.3
Otitis Media	63	12.6	1.58	3.3
Constipation	62	12.4	1.55	3.2
Dermatitis and Eczema	28	5.6	0.70	1.5
Gastro-Oesophageal Reflux	25	5.0	0.63	1.3
Nutritional Disorders	6	1.2	0.15	0.3
VPD ≥ 6 Months: DTP, Polio, HepB	3	0.6	0.08	0.2
Bronchiectasis	<3	s	s	s
Nelson Marlborough Total	1,908	381.6	47.7	100.0
Emergency Department Cases Excluded				
Gastroenteritis	393	78.6	9.83	20.8
Acute Upper Respiratory Tract Infections	389	77.8	9.73	20.6
Dental Conditions	388	77.6	9.70	20.6
Asthma	282	56.4	7.05	14.9
Bacterial/Non-Viral Pneumonia	168	33.6	4.20	8.9
Skin Infections	81	16.2	2.03	4.3
Otitis Media	63	12.6	1.58	3.3
Constipation	61	12.2	1.53	3.2
Dermatitis and Eczema	28	5.6	0.70	1.5
Gastro-Oesophageal Reflux	25	5.0	0.63	1.3
Nutritional Disorders	6	1.2	0.15	0.3
VPD ≥ 6 Months: DTP, Polio, HepB	3	0.6	0.08	0.2
Bronchiectasis	<3	s	s	s
Nelson Marlborough Total	1,888	377.6	47.2	100.0

Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population. Note: s: suppressed due to small numbers.

South Island Distribution by Primary Diagnosis

In the South Island DHBs during 2006–2010, gastroenteritis, acute upper respiratory infections, dental conditions and asthma were the most frequent causes of ASH in children 0–4 years, irrespective of whether ED cases were included or excluded (**Table 40** to **Table 45**).

Table 41. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Primary Diagnosis, South Canterbury 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
South Canterbury ASH 0–4 Years				
Emergency Department Cases Included				
Gastroenteritis	202	40.4	13.7	32.5
Dental Conditions	125	25.0	8.50	20.1
Acute Upper Respiratory Tract Infections	102	20.4	6.94	16.4
Asthma	89	17.8	6.05	14.3
Bacterial/Non-Viral Pneumonia	36	7.2	2.45	5.8
Skin Infections	17	3.4	1.16	2.7
Otitis Media	14	2.8	0.95	2.3
Constipation	14	2.8	0.95	2.3
Dermatitis and Eczema	12	2.4	0.82	1.9
Gastro-Oesophageal Reflux	10	2.0	0.68	1.6
Nutritional Disorders	<3	s	s	s
South Canterbury Total	622	124.4	42.3	100.0
Emergency Department Cases Excluded				
Gastroenteritis	201	40.2	13.7	32.5
Dental Conditions	125	25.0	8.50	20.2
Acute Upper Respiratory Tract Infections	102	20.4	6.94	16.5
Asthma	89	17.8	6.05	14.4
Bacterial/Non-Viral Pneumonia	35	7.0	2.38	5.7
Skin Infections	17	3.4	1.16	2.7
Constipation	14	2.8	0.95	2.3
Otitis Media	13	2.6	0.88	2.1
Dermatitis and Eczema	12	2.4	0.82	1.9
Gastro-Oesophageal Reflux	10	2.0	0.68	1.6
Nutritional Disorders	<3	s	s	s
South Canterbury Total	619	123.8	42.1	100.0

Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population. Note: s: suppressed due to small numbers.

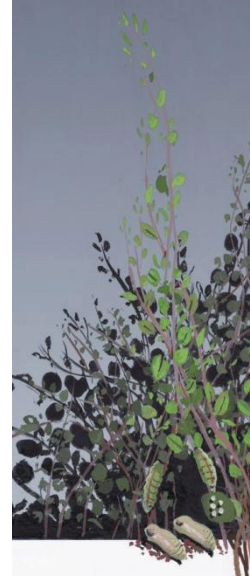


Table 42. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Primary Diagnosis, Canterbury 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
Canterbury ASH 0–4 Years				
Emergency Department Cases Included				
Acute Upper Respiratory Tract Infections	2,368	473.6	15.1	27.2
Gastroenteritis	2,076	415.2	13.2	23.8
Asthma	1,301	260.2	8.30	14.9
Dental Conditions	1,044	208.8	6.66	12.0
Bacterial/Non-Viral Pneumonia	581	116.2	3.71	6.7
Skin Infections	379	75.8	2.42	4.3
Gastro-Oesophageal Reflux	265	53.0	1.69	3.0
Otitis Media	248	49.6	1.58	2.8
Constipation	229	45.8	1.46	2.6
Dermatitis and Eczema	187	37.4	1.19	2.1
Nutritional Disorders	18	3.6	0.11	0.2
VPD ≥ 6 Months: DTP, Polio, HepB	11	2.2	0.07	0.1
Bronchiectasis	8	1.6	0.05	0.1
VPD ≥ 16 Months: MMR	5	1.0	0.03	0.1
Rheumatic Fever/Heart Disease	<3	s	s	s
Canterbury Total	8,721	1,744.2	55.6	100.0
Emergency Department Cases Excluded				
Acute Upper Respiratory Tract Infections	2,365	473.0	15.1	27.2
Gastroenteritis	2,075	415.0	13.2	23.8
Asthma	1,296	259.2	8.27	14.9
Dental Conditions	1,044	208.8	6.66	12.0
Bacterial/Non-Viral Pneumonia	577	115.4	3.68	6.6
Skin Infections	377	75.4	2.40	4.3
Gastro-Oesophageal Reflux	265	53.0	1.69	3.0
Otitis Media	247	49.4	1.58	2.8
Constipation	228	45.6	1.45	2.6
Dermatitis and Eczema	187	37.4	1.19	2.1
Nutritional Disorders	18	3.6	0.11	0.2
VPD ≥ 6 Months: DTP, Polio, HepB	11	2.2	0.07	0.1
Bronchiectasis	8	1.6	0.05	0.1
VPD ≥ 16 Months: MMR	5	1.0	0.03	0.1
Rheumatic Fever/Heart Disease	<3	s	s	s
Canterbury Total	8,704	1,740.8	55.5	100.0

Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population. Note: s: suppressed due to small numbers.



Table 43. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Primary Diagnosis, the West Coast 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
West Coast ASH 0–4 Years				
Emergency Department Cases Included				
Dental Conditions	140	28.0	14.6	26.5
Gastroenteritis	131	26.2	13.6	24.8
Acute Upper Respiratory Tract Infections	89	17.8	9.26	16.8
Asthma	80	16.0	8.32	15.1
Bacterial/Non-Viral Pneumonia	43	8.6	4.47	8.1
Otitis Media	14	2.8	1.46	2.6
Skin Infections	13	2.6	1.35	2.5
Gastro-Oesophageal Reflux	7	1.4	0.73	1.3
Constipation	6	1.2	0.62	1.1
Dermatitis and Eczema	5	1.0	0.52	0.9
VPD ≥ 6 Months: DTP, Polio, HepB	<3	s	s	s
West Coast Total	529	105.8	55.0	100.0
Emergency Department Cases Excluded				
Dental Conditions	140	28.0	14.6	26.9
Gastroenteritis	129	25.8	13.4	24.8
Acute Upper Respiratory Tract Infections	85	17.0	8.84	16.3
Asthma	79	15.8	8.22	15.2
Bacterial/Non-Viral Pneumonia	42	8.4	4.37	8.1
Otitis Media	14	2.8	1.46	2.7
Skin Infections	13	2.6	1.35	2.5
Gastro-Oesophageal Reflux	7	1.4	0.73	1.3
Constipation	6	1.2	0.62	1.2
Dermatitis and Eczema	5	1.0	0.52	1.0
VPD ≥ 6 Months: DTP, Polio, HepB	<3	s	s	s
West Coast Total	521	104.2	54.2	100.0

Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population. Note: s: suppressed due to small numbers.

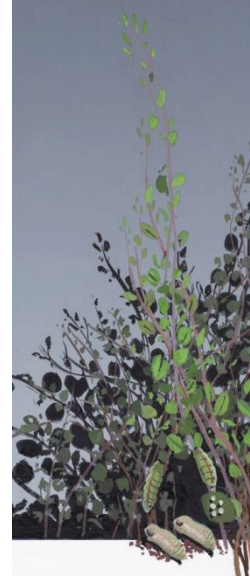


Table 44. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Primary Diagnosis, Otago 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
Otago ASH 0–4 Years				
Emergency Department Cases Included				
Acute Upper Respiratory Tract Infections	577	115.4	11.4	26.1
Gastroenteritis	562	112.4	11.1	25.5
Asthma	389	77.8	7.68	17.6
Dental Conditions	174	34.8	3.43	7.9
Bacterial/Non-Viral Pneumonia	160	32.0	3.16	7.2
Skin Infections	106	21.2	2.09	4.8
Otitis Media	99	19.8	1.95	4.5
Constipation	60	12.0	1.18	2.7
Gastro-Oesophageal Reflux	49	9.8	0.97	2.2
Dermatitis and Eczema	27	5.4	0.53	1.2
VPD ≥ 6 Months: DTP, Polio, HepB	3	0.6	0.06	0.1
Nutritional Disorders	<3	s	s	s
Bronchiectasis	<3	s	s	s
Otago Total	2,208	441.6	43.6	100.0
Emergency Department Cases Excluded				
Acute Upper Respiratory Tract Infections	561	112.2	11.1	25.9
Gastroenteritis	547	109.4	10.8	25.2
Asthma	386	77.2	7.62	17.8
Dental Conditions	174	34.8	3.43	8.0
Bacterial/Non-Viral Pneumonia	158	31.6	3.12	7.3
Skin Infections	104	20.8	2.05	4.8
Otitis Media	98	19.6	1.93	4.5
Constipation	59	11.8	1.16	2.7
Gastro-Oesophageal Reflux	49	9.8	0.97	2.3
Dermatitis and Eczema	27	5.4	0.53	1.2
VPD ≥ 6 Months: DTP, Polio, HepB	3	0.6	0.06	0.1
Nutritional Disorders	<3	s	s	s
Bronchiectasis	<3	s	s	s
Otago Total	2,168	433.6	42.8	100.0

Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population. Note: s: suppressed due to small numbers.



Table 45. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Primary Diagnosis, Southland 2006–2010

Primary Diagnosis	Number: Total 2006– 2010	Number: Annual Average	Rate per 1,000	Percent (%)
Southland ASH 0–4 Years				
Emergency Department Cases Included				
Dental Conditions	580	116.0	16.5	23.6
Gastroenteritis	560	112.0	15.9	22.8
Acute Upper Respiratory Tract Infections	443	88.6	12.6	18.0
Asthma	339	67.8	9.64	13.8
Bacterial/Non-Viral Pneumonia	150	30.0	4.27	6.1
Otitis Media	92	18.4	2.62	3.7
Skin Infections	85	17.0	2.42	3.5
Gastro-Oesophageal Reflux	82	16.4	2.33	3.3
Constipation	74	14.8	2.11	3.0
Dermatitis and Eczema	48	9.6	1.37	2.0
Nutritional Disorders	4	0.8	0.11	0.2
VPD ≥ 6 Months: DTP, Polio, HepB	3	0.6	0.09	0.1
Southland Total	2,460	492.0	70.0	100.0
Emergency Department Cases Excluded				
Dental Conditions	580	116.0	16.5	24.0
Gastroenteritis	545	109.0	15.5	22.5
Acute Upper Respiratory Tract Infections	433	86.6	12.3	17.9
Asthma	327	65.4	9.30	13.5
Bacterial/Non-Viral Pneumonia	150	30.0	4.27	6.2
Otitis Media	88	17.6	2.50	3.6
Skin Infections	85	17.0	2.42	3.5
Gastro-Oesophageal Reflux	82	16.4	2.33	3.4
Constipation	72	14.4	2.05	3.0
Dermatitis and Eczema	48	9.6	1.37	2.0
Nutritional Disorders	4	0.8	0.11	0.2
VPD ≥ 6 Months: DTP, Polio, HepB	3	0.6	0.09	0.1
Southland Total	2,417	483.4	68.8	100.0

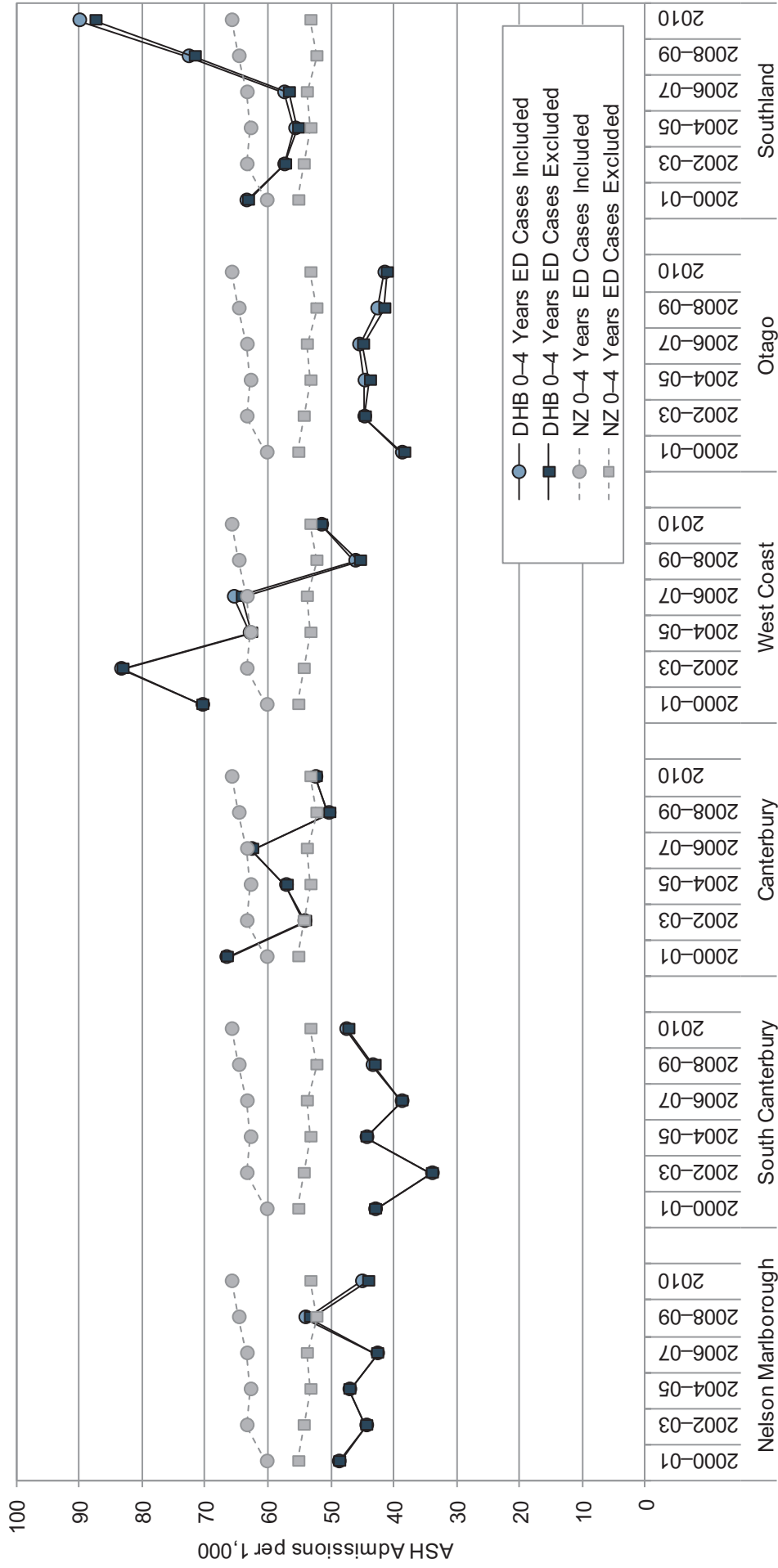
Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population

South Island Trends

Amongst the South Island DHBs during 2000–2010, ED included and excluded ASH rates in children 0–4 years differed very little, potentially suggesting that the way the South Island DHBs are managing/coding their ED cases differs from a number of other DHBs in New Zealand. In Nelson Marlborough, South Canterbury and Otago ASH rates were relatively static, while in Canterbury and the West Coast rates exhibited a fluctuating downward trend. In contrast, rates in Southland decreased during the early 2000s, but rapidly increased again after 2006–07 (**Figure 27**).

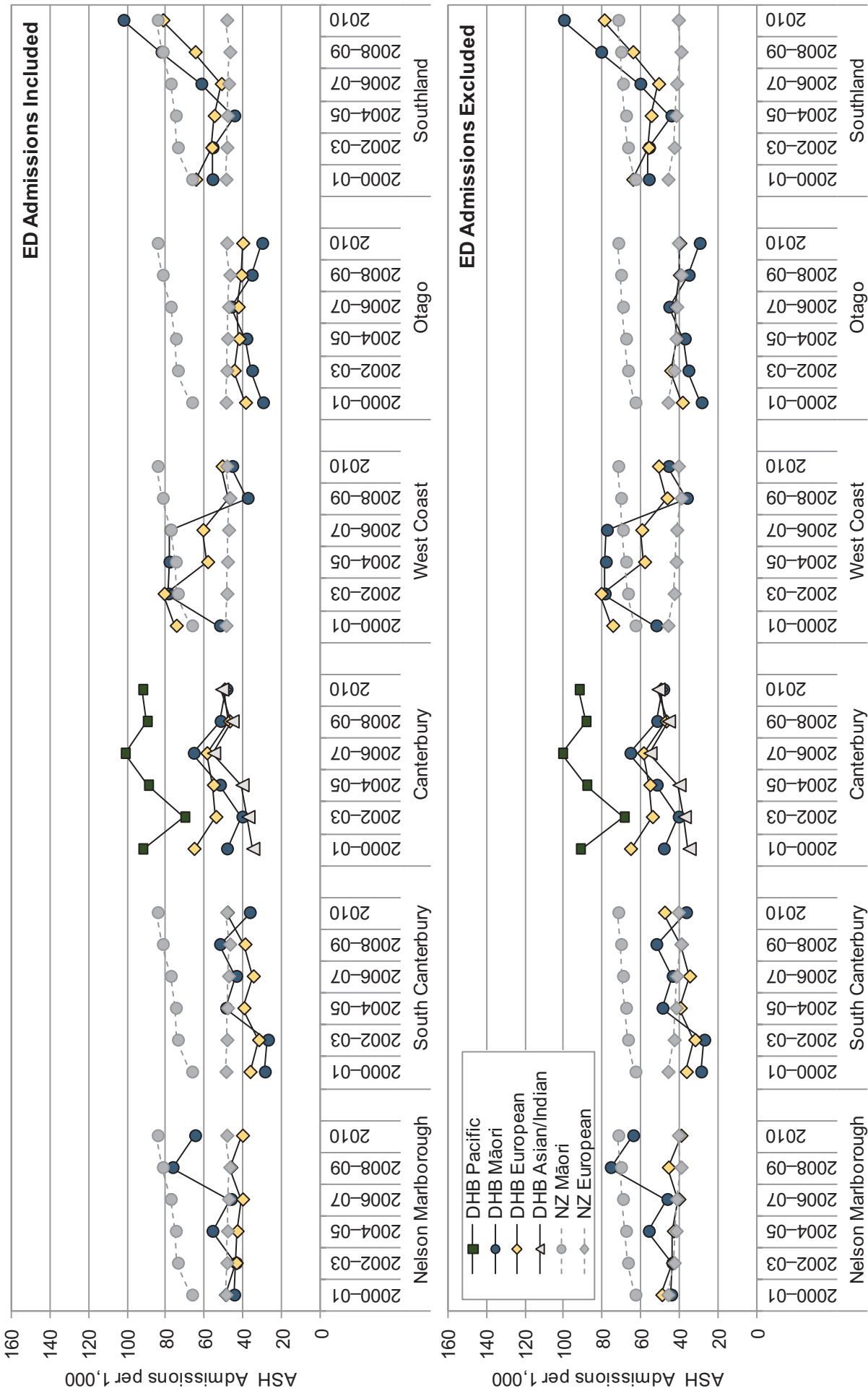


Figure 27. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years, South Island DHBs vs. New Zealand DHBs 2000–2010



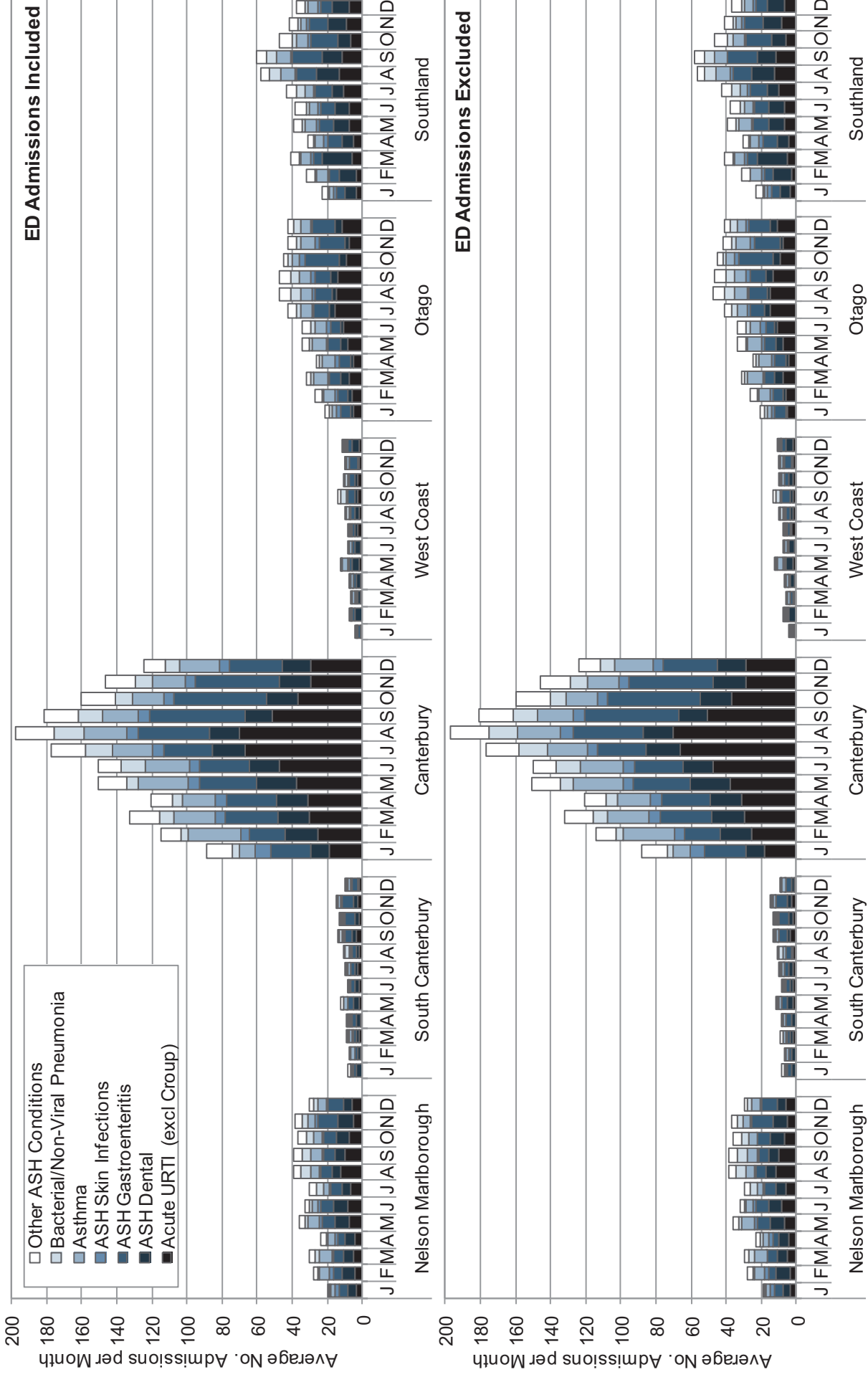
Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only; Neonates excluded); Denominator: Statistics NZ Estimated Resident Population

Figure 28. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Ethnicity, South Island DHBs vs. New Zealand 2000–2010



Source: Numerator: National Minimum Dataset (Acute and semi-acute admissions only, Neonates excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Ethnicity is Level 1 Prioritised

Figure 29. Ambulatory Sensitive Hospitalisations in Children Aged 0–4 Years by Month, the South Island DHBs 2006–2010



Source: National Minimum Dataset (Acute and semi -acute admissions only, Neonates excluded)

South Island Distribution by Ethnicity

In Canterbury during 2000–2010, ASH rates in children 0–4 years were higher for Pacific children than for children of other ethnic groups. While ASH rates were higher for Māori children than for European children in Nelson Marlborough and Southland during the mid-late 2000s, ethnic differences in South Canterbury, the West Coast and Otago were less consistent (**Figure 28**). Note: The differences seen between Māori and European children in most South Island DHBs were much smaller than those seen elsewhere in the country. It remains unclear however, whether this reflects better health outcomes for Māori children in the South Island, or the possibility that coding issues are resulting in Māori children being undercounted in the hospital admission dataset.

South Island Distribution by Season

In Canterbury, Otago and Southland during 2006–2010, ASH in children 0–4 years were generally higher in winter and spring, although in Nelson Marlborough, South Canterbury and the West Coast seasonal variations were less evident (**Figure 29**).

Summary

In New Zealand during 2006–2010, gastroenteritis, acute upper respiratory infections and asthma were the most frequent causes of ambulatory sensitive hospitalisations (ASH) in children 0–4 years when emergency department (ED) cases were included, while gastroenteritis, dental conditions and asthma were the most frequent causes when ED cases were excluded. When broken down by age ASH rates were highest in infants and one year olds, with rates then tapering off rapidly between one and two years, and then again between four and seven years of age. ASH rates were also *significantly* higher for males, Pacific > Māori > Asian/Indian > European children and those from average-to-more deprived (NZDep decile 3–10) areas. Similar patterns were seen when ED cases were excluded, although admission rates for Asian/Indian were *significantly* lower than for European children.

Amongst the South Island DHBs during 2000–2010, ED included and excluded ASH rates in children 0–4 years differed very little, potentially suggesting that the way the South Island DHBs are managing/coding their ED cases differs from some other DHBs. In Nelson Marlborough, South Canterbury and Otago ASH rates were relatively static, while in Canterbury and the West Coast rates exhibited a fluctuating downward trend. In contrast, rates in Southland decreased during the early 2000s, but rapidly increased again after 2006–07. In Canterbury, ASH rates were higher for Pacific children than for children of other ethnic groups. While ASH rates were higher for Māori children than for European children in Nelson Marlborough and Southland during the mid-late 2000s, ethnic differences in South Canterbury, the West Coast and Otago were less consistent. In Canterbury, Otago and Southland during 2006–2010, ASH were generally higher in winter and spring, although in Nelson Marlborough, South Canterbury and the West Coast seasonal variations were less evident .

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention and Management of Ambulatory Sensitive Hospitalisations

The in-depth topic commencing on **Page 117** reviews the literature with a view to identifying effective approaches to improve the responsiveness of primary care to children and/or reduce ambulatory sensitive hospitalisations in this age group.

