

***Ambulatory Sensitive
Hospitalisations for Children
in
Counties Manukau Health
2020***

Counties Manukau Health

Disclaimer

Information within the report may be freely used provided the source is acknowledged. Every effort has been made to ensure that the information in this report is correct. Counties Manukau Health and the authors will not accept any responsibility for information which is incorrect, or any actions taken as a result of the information in this report.

Published in May 2022

By Counties Manukau Health
Private Bag 94052
South Auckland Mail Centre
Manukau City
New Zealand

ISBN 978-1-99-116660-9

Suggested citation:

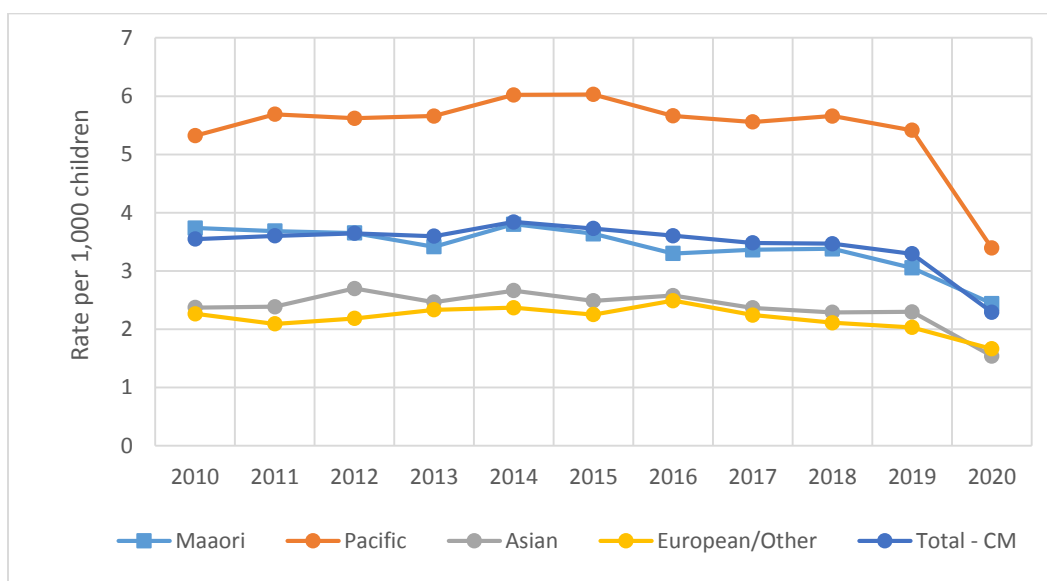
Singh, H, Papaconstantinou D, Anderson P, Ameratunga S, Jackson G (2022) Ambulatory Sensitive Hospitalisations in Counties Manukau Health 2020.

Double vowels are used rather than macrons where appropriate in Te Reo Maaori words in keeping with the Tainui convention, as mana whenua of the Counties Manukau district.

Executive Summary

This document provides a current profile on ambulatory sensitive hospitalisation (ASH) for child health in Counties Manukau (CM). While the operational definition for ASH remains the same as used in previous reports¹, care should be taken when interpreting changes over time due to the concurrent factors relating to specific health conditions, namely the global COVID-19 pandemic, and differential influences of access to care. In particular, the substantial changes in ASH admissions and rates are likely to have been strongly influenced by the impact of border closures and other infection prevention measures put in place in response to the pandemic, with differential impacts across ethnic groups from these measures depending on the cause of hospitalisation. The findings in this report should be interpreted with care in light of this.

Figure 1 Rate of ASH by ethnicity in children aged 0-14 years in CM Health, 2010 to 2020



Data source: NMDS, Ministry of Health, Estimated DHB populations (2021 version), Statistics New Zealand

The total ASH rate in CM Health decreased by 1.25 hospitalisation per 1,000 children from 2010 to 2020 (Figure 1). Children of all major ethnic categories used in this report experienced declines in rates of ASH, with significant reductions in 2020. On average, Pacific children had a 62% higher rate of ASH each year compared to Maaori from 2010 to 2019. They experienced the greatest decline (37%) from 2019 to 2020 compared with other major ethnic groups.

The ASH rate for the total CM Health population is similar to that of tamariki Maaori in the region. The rates for Pacific children are considerably higher, the rates for Asian and European/Other children are lower. From 2010 to 2019, the ASH rate for Maaori children decreased by an average of 2% per year, whereas, among Pacific children the ASH rate increased on average by 0.3% each year. Among Asian and European/Other ethnic groups, ASH rates

¹ Singh, H, Papaconstantinou D, Jackson G (2021) Ambulatory Sensitive Hospitalisations in Counties Manukau Health (2020 Update).

decreased each year by -0.9 and -0.98 %, respectively. While the latter categories comprise highly heterogeneous groups, the inequitably high ASH rates among Pacific and Maaori children require priority attention.

During the period 2010 to 2020, the rates of ASH in CM Health were lower than the rates for other Northern region district health boards and the average for New Zealand as a whole. The lower ASH rates in CM Health may be due to varying thresholds for admissions as there is no evidence indicating CM Health has better access and quality of primary care.

In general, the rates by condition for children aged 0-4 years were higher compared to 5-14 years old in CM Health. The rates relating to asthma, respiratory infections and pneumonia declined substantially in 2020 (compared to previous years covered in the report) across both age groups, an observation that has been attributed to interventions to counter the pandemic.

Contents

Executive Summary	3
Introduction:	6
Methods:	7
Results	8
Hospital admission numbers in CM Health	8
ASH rates in CM Health by ethnicity and age	10
ASH in the Northern Region.....	12
Rates of ASH by condition- CM Health	15
Respiratory Chapter	16
Dental Conditions	18
Dermatological conditions	19
Gastrointestinal conditions.....	20
Other	21
Appendices	27
Appendix 1: ASH Conditions in children vs adults	27
Appendix 2: CM Health number and rates of ASH	29
Appendix 3: Auckland DHB numbers and rates of ASH	31
Appendix 4: Waitemata DHB number and rates of ASH	33
Appendix 5: Northland DHB numbers and rates of ASH	35
Appendix 6: Ethnic-specific rates for total ASH in the Northern region.....	37
Appendix 7: Ethnic-specific rates of ASH by condition in children aged 0-4 years in CM Health.....	40
Appendix 8: Ethnic-specific rates of ASH by condition in children aged 5-14 years in CM Health.....	42
Appendix 9: Ethnic-specific rates of ASH by condition in children aged 0-4 years in Auckland DHB.....	44
Appendix 10: Ethnic-specific rates of ASH by condition in children aged 5-14 years in Auckland DHB.....	46
Appendix 11: Ethnic-specific rates of ASH by condition in children aged 0-4 years in Waitemata DHB	48
Appendix 12: Ethnic-specific rates of ASH by condition in children aged 5-14 years in Waitemata DHB	50
Appendix 13: Ethnic-specific rates of ASH by condition in children aged 0-4 years in Northland DHB.....	52
Appendix 14: Ethnic-specific rates of ASH by condition in children aged 5-14 years in Northland DHB.....	54

Introduction:

An Ambulatory Sensitive Hospitalisation (ASH) refers to an admission for a condition that may have been (potentially) prevented through prophylactic or therapeutic interventions deliverable in the primary care setting.²

ASH admissions, as a bucket of conditions, are used as a system level measure for access to, and quality of, primary care. At a community level, high ASH admission rates indicate systemic difficulties in accessing care in a timely fashion, poor care coordination or care continuity, or structural constraints of limited supply of primary care workers. However, specific factors (such as the introduction of a vaccine, a new clinical pathway) may impact on admissions for some ASH conditions. These changes may not be obvious unless each condition is considered individually.

This document includes an analysis of ASH admissions as a group as well as by individual condition. It is important to note that coding algorithms for ASH conditions has relied heavily on expert consensus. Hence, while ASH classification is intended to be broadly representative of hospitalisations that could be prevented by access to primary care, the list is not exhaustive and the extent to which a specific condition is actually preventable is hard to quantify.¹ For example, if a child experiences a rapidly progressing, circumferential limb cellulitis over a few hours, the child would need to be admitted to hospital despite presenting at primary care initially. Conversely, injuries are not included within the ASH group of conditions as although most injuries are preventable, these are arguably outside the scope of interventions implemented in primary care settings.

This report provides a current profile on ASH for CM Health child health population (children aged 0-14 years) to inform action to impact our “*Healthy Together*” health equity goal. In addition, an analysis for each of the northern DHBs is provided in the index to support the move towards more regional planning. Throughout the report, 2020 is an outlier given the dramatic reductions in hospitalisations which are attributable to the impact of border closures and other infection prevention measures put in place to response to the global COVID-19 pandemic.

² Jackson G, Tobias M. *Potentially avoidable hospitalisations in New Zealand, 1989-98*. Australian and New Zealand journal of public health, 25, no. 3 (2001), 212-221.

Methods:

In this analysis, the information on ASH events is drawn from the National Minimum Dataset (NMDS) from Ministry of Health. NMDS is New Zealand's national hospital discharge data collection and contains information submitted by public hospitals. Private hospital discharges for publicly funded events are also included. NMDS includes information on primary and additional diagnoses, procedures, length of stay and demographic information such as age, ethnicity and area of residence.³

Data drawn for this report were stratified by District Health Boards in the Northern region with a focus on CM Health, and restricted admissions among young people aged 0-14 years. Accordingly, the ASH conditions identified were those relevant to this age group, and did not include conditions such as myocardial infarction and stroke which are more common among adults. Appendix 1 lists the conditions considered avoidable for children and adults. The numerator is the number of ASH admissions for 0-14-year-old children and the denominator is the number of 0-14-year-old children residing in the relevant DHB area. Each admission is classified using the primary diagnoses field, based on ICD-10AM codes as per Ministry of Health criteria (Appendix 1). Hence, only acute admissions with a length of stay >3 hours are included in this report as per ASH definition.

The age-standardised rates indicate the rate per 1,000 people, standardised to the age structure of the 2021 estimated district health board (DHB) resident population sourced from Stats NZ by direct method. Age standardisation adjusts the rates of ASH to account for changes in the number of people and age structure in a population over time. It allows the comparison of rates from one year to another and by ethnicities. This is relevant considering the national target is equitable ASH rates for Maaori, Pacific and other New Zealanders.

This report includes a range of descriptive analysis, the patterns of change can be explained by a range of underlying factors, i.e. changes in access to services. The observed trends may be useful to support or provide wider context to consider for service planning and delivery. It is also important to note that while average changes over the 2010-2019 period are commented on, the changes from year to year were not necessarily linear, and may be influenced by small numbers of cases for some conditions.

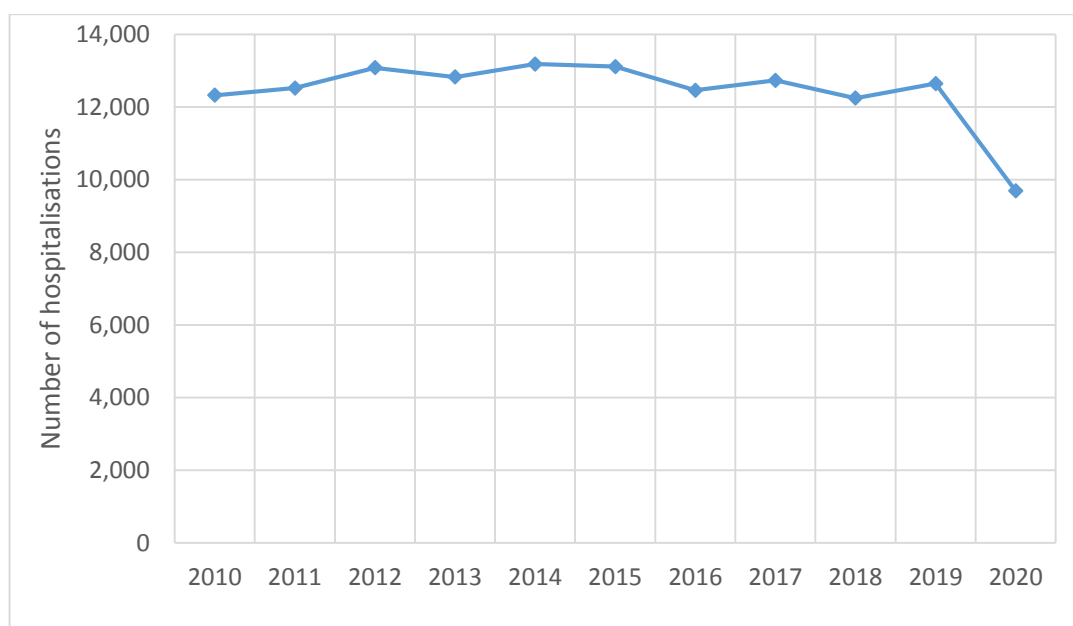
³ Craig E, Anderson P and Jackson C. *The Health Status of Children and Young People in Otago*. New Zealand Child and Youth Epidemiology Service. 2008.

Results

Hospital admission numbers in CM Health

In CM Health, the total number of hospitalisations, including ASH and non-ASH, on average increased by 0.3% per year from 2010 to 2019 to reach 12,647 before a steep fall to 9,697 in 2020. This represents a 23% decline in the number of hospitalisations from 2019 to 2020. Figure 2 shows the small but important increases and decreases in the number of hospitalisations each year with a significant reduction in 2020. Compared to the other northern DHBs, CM Health has the highest number of hospitalisations each year (Appendix 2-5). CM Health is followed by Waitematā, Auckland and lastly, Northland. However, this may be due to variation in population demographics and rates provide more insight.

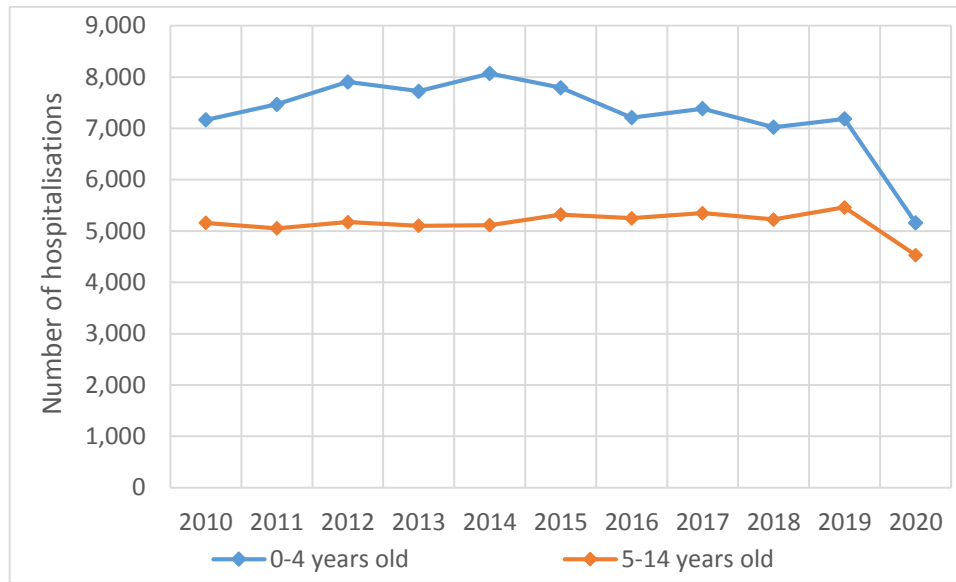
Figure 2 Total number of hospitalisations in CM Health in children (0-14 years old), 2010 to 2020



Data source: NMDS, Ministry of Health

The total number of hospitalisations by age in CM Health shows children aged 0-4-years account for a larger proportion of total hospitalisations compared to 5-14 years old children (Figure 3). Secondly, there had been a gradual increase in the number of hospitalisations in children aged 0-4 years from 7,167 in 2010 to 8,070 in 2014 before decreasing. The hospitalisations for 5-14-year-old children remained stable from 2010 to 2019. Other notable change includes the sharp decline in hospitalisations in 2020 in both age-groups.

Figure 3 Total number of hospitalisations by age in CM Health, 2010 to 2020



Data source: NMDS, Ministry of Health

The green dots in Table 1 represent a negative percentage change (i.e. decrease in hospitalisations) from the previous year. The totals for Maaori, Pacific and Asian children per year on average changed by -1.21%, 0.48% and 7.12%, respectively, from 2010 to 2019. This is compared to the European and Other ethnic groups experiencing -2% per year change on average, from 2010 to 2019. The increase in hospitalisation for Asian children is attributable to increasing population as depicted by the decline in rates (Figure 3).

Table 1. Total number of hospitalisations by ethnicity and percentage change from the previous year in children, CM Health, 2010 to 2020

	Maaori		Pacific		Asian		NZ European/Other	
	Number	% Change year to year	Number	% Change	Number	% Change	Number	% Change
2010	3,373		4,929		1,242		2,782	
2011	3,202	● -5.1%	5,294	● 7.4%	1,363	● 9.7%	2,665	● -4.2%
2012	3,372	● 5.3%	5,503	● 3.9%	1,544	● 13.3%	2,663	● -0.1%
2013	3,374	● 0.1%	5,227	● -5.0%	1,497	● -3.0%	2,730	● 2.5%
2014	3,406	● 0.9%	5,285	● 1.1%	1,647	● 10.0%	2,847	● 4.3%
2015	3,192	● -6.3%	5,438	● 2.9%	1,794	● 8.9%	2,691	● -5.5%
2016	2,994	● -6.2%	4,880	● -10.3%	1,924	● 7.2%	2,664	● -1.0%
2017	3,140	● 4.9%	5,046	● 3.4%	1,960	● 1.9%	2,588	● -2.9%
2018	3,003	● -4.4%	4,936	● -2.2%	2,075	● 5.9%	2,233	● -13.7%
2019	2,997	● -0.2%	5,085	● 3.0%	2,287	● 10.2%	2,278	● 2.0%
2020	2,347	● -21.7%	3,461	● -31.9%	1,861	● -18.63%	2,028	● -11.0%

Data source: NMDS, Ministry of Health

Table 2 provides a breakdown of hospitalisations in CM Health by ASH and non-ASH. The number of ASH remained steady with an average change of -0.2% each year from 2010 to 2019, indicating minimal change in ASH overall. Although, non-ASH increased on average by 0.7% per year over the same period, this may be attributable to population growth given the downward trend in non-ASH rate (Appendix 2-5).

Table 2. Number of ASH and non-ASH in CM Health for children, 2010 to 2020

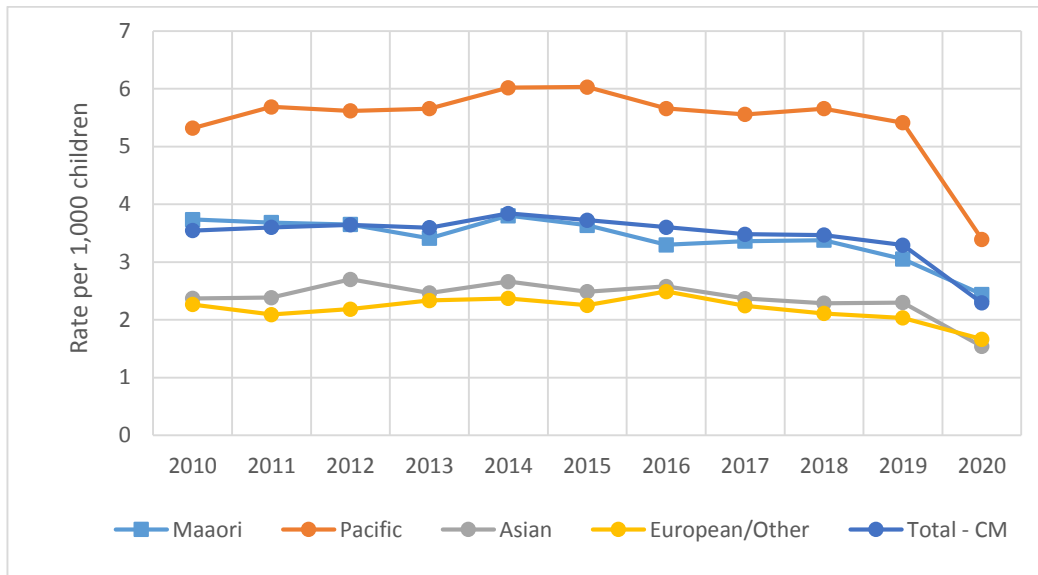
	ASH		Non-ASH	
	Number	% Change	Number	% Change
2010	4,383		7,943	
2011	4,498	● 2.62%	8,026	● 1.04%
2012	4,555	● 1.27%	8,527	● 6.24%
2013	4,437	● -2.59%	8,391	● -1.59%
2014	4,775	● 7.62%	8,410	● 0.23%
2015	4,650	● -2.62%	8,465	● 0.65%
2016	4,547	● -2.22%	7,915	● -6.50%
2017	4,430	● -2.57%	8,304	● 4.91%
2018	4,491	● 1.38%	7,756	● -6.60%
2019	4,296	● -4.34%	8,351	● 7.67%
2020	3,030	● -29.47%	6,667	● -20.17%

Data source: NMDS, Ministry of Health

ASH rates in CM Health by ethnicity and age

Historically, Pacific children aged 0-14 years have the highest rates of ASH in CM Health (Figure 4). Specifically, from 2010 to 2019, on average Pacific children had a 62% higher rate of ASH each year compared to Maaori. When compared to Asian and European/Other children, the rates were two times higher for Pacific children. The improvement in ASH rates for children across all ethnicities has been slow, but Pacific children experienced the greatest change in 2020 of 37% as reported in Table 3. The overall rate in CM Health is similar to Maaori due to the effect of high rates in Pacific and low rates in Asian and European/Other.

Figure 4. Rate of ASH in children aged 0-14 years old in CM Health by ethnicity, 2010 to 2020



Data source: NMDS, Ministry of Health, Estimated DHB populations (2021 version), Statistics New Zealand

Figure 4 supports Table 3 illustrating small improvements each year. From 2010 to 2019, on average the rate of ASH for Maaori children decreased by 2% per year. The rate of ASH for Pacific children increased on average by 0.3% each year. This is compared to Asian and European/Other ethnic groups where ASH rates decreased each year by -0.90 and -0.98 %, respectively. This highlights the inequitable differences and the minimal decline in rates for Pacific and Maaori children requires attention.

Table 3. Percentage change in rate of ASH from the previous year for children (0-14 years old) by ethnicity in CM Health, 2010 to 2020

	Maori	Pacific	Asian	European/Other
2010				
2011	● -1%	● 7%	● 1%	● -8%
2012	● -1%	● -1%	● 13%	● 4%
2013	● -6%	● 1%	● -9%	● 7%
2014	● 11%	● 6%	● 8%	● 1%
2015	● -4%	● 0%	● -7%	● -5%
2016	● -9%	● -6%	● 4%	● 11%
2017	● 2%	● -2%	● -8%	● -10%
2018	● 1%	● 2%	● -3%	● -6%
2019	● -10%	● -4%	● 0%	● -4%
2020	● -20%	● -37%	● -33%	● -17%

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Table 4 shows the rate of ASH for 0-4-year-old children is on average 3.5 times higher than the rates for 5-14 years old children. However, the trajectory for rates has been downwards for 0-4-year-old children since 2014. The rates trend for 5-14-year-old children remained flat from 2010 to 2019. Furthermore, the rates for both age-groups were comparable to national rates for children (Appendix 2-5).

Table 4 Rates of ASH per 1,000 children by age group in CM Health, 2010 to 2020

	0-4 years old	5-14 years old
2010	6.6	2.1
2011	6.9	2.0
2012	7.1	2.0
2013	7.1	1.9
2014	7.9	1.9
2015	7.4	2.0
2016	7.3	1.9
2017	6.8	1.9
2018	6.8	1.9
2019	6.3	1.9
2020	4.2	1.4

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

The conditions that are considered as ASH may explain the differences in rates for 0-4 and 5-14 years old age groups. For example, one of the largest contributors to ASH is asthma and upper and ENT respiratory infection, both of which are more likely to affect younger children by virtue of their age. These differences are described further in the section on rates of ASH by condition.

ASH in the Northern Region

As shown in Figure 5, CM Health has the highest number of ASH, followed by Waitematā, Auckland and Northland. However, 22% of CM Health population is children aged 0-14 years old, a relatively higher proportion compared to the other northern DHBs and nationally.⁴ Accounting for the age-structure, Figure 6 shows the age-standardised rates of ASH in CM Health are lower than Northland and Auckland DHB and close to Waitemata in the recent years. The rates for CM Health increased from 3.5 in 2010 to 3.8 per 1, 000 in 2014 and decreased in the following years (3.3 per 1,000 in 2019). The negative trajectory for CM Health is a positive and relatively close to Waitematā (lowest rate per 1,000 children). The general trend of rates of ASH in Auckland and Northland DHB suggest persisting inequities and possibly widening of socioeconomic status. Appendix 2-5 show the rates of non-ASH were lowest in Waitemata and highest in Auckland.

⁴ Lees J, Lee M, and Winnard D. *Demographic Profile: 2018 Census, Population of Counties Manukau*. Auckland: Counties Manukau Health, 2021

Figure 5. Number of ASH in children aged 0-14 years old by Northern region DHBs, 2010 to 2020

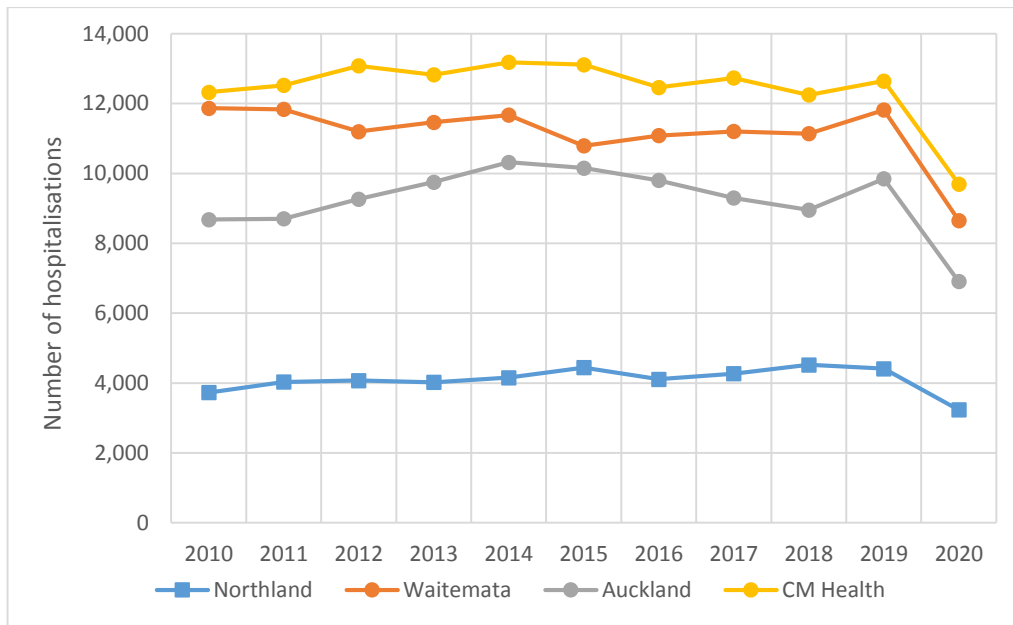
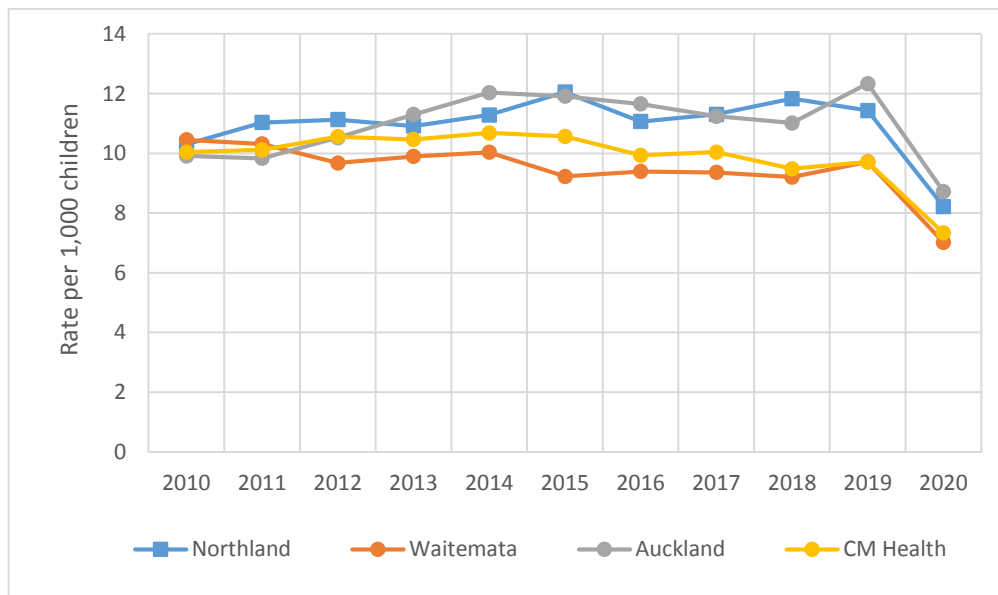


Figure 6. Rates of ASH in children aged 0-14 years old by northern region DHBs, 2010 to 2020



Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Table 5 shows the percentage change from the previous year with the green dots representing negative percentage changes. On average, the per year change from 2010 to 2019 was -0.8% for CM Health compared to Waitematā with a -1.1% change (the highest average per year change). All four of the DHBs included in Table 5 experienced a negative percentage change in 2020 compared to 2019 with the highest change once again in Waitematā. Other notable changes include the negative percentage changes in CM Health from 2015 to 2020.

Table 5. Percentage change in rates of ASH for children aged 0-14 years old from the previous year for Northern DHBs, 2010 to 2020

	Northland	Waitemata	Auckland	Counties Manukau
2010				
2011	● 9.40%	● -2.10%	● 1.90%	● 1.60%
2012	● -1.20%	● -6.40%	● 5.60%	● 1.20%
2013	● -4.10%	● -0.70%	● 4.30%	● -1.40%
2014	● 3.40%	● 2.30%	● 8.90%	● 6.90%
2015	● 3.60%	● -10.70%	● 0.60%	● -3.00%
2016	● -1.40%	● 6.40%	● -4.80%	● -3.30%
2017	● -0.20%	● -2.80%	● -3.90%	● -3.40%
2018	● 2.10%	● 1.90%	● 3.70%	● -0.40%
2019	● -3.00%	● 2.00%	● 3.20%	● -5.00%
2020	● -34.80%	● -41.20%	● -39.30%	● -30.50%

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Among Pacific children in the Northern Region, total ASH rates were highest among those living in the Auckland DHB followed by Waitematā, CM Health and Northland (Appendix 6). Among Maaori children, ASH rates were highest in Northland, followed by Auckland, Waitematā and CM Health. Although the rates for Pacific children in CM Health were comparable to national rates, Maaori, Asian and NZ European children in CM Health have lower rates than national rates (Appendix 6).

Erny et al⁵ and Payne et al⁶ report increasing deprivation is usually associated with higher health care utilisations including ASH. However, the current report found that CM Health (which has a population with higher levels of deprivation) had lower rates of ASH compared with Waitematā and Auckland (which have lower levels of deprivation). One of the explanations for lower rates in CM Health for these groups may be varying thresholds for admissions as there is no evidence indicating CM Health has better access and quality of primary care.

⁵ Erny-Albrecht, K, Oliver-Baxter J, and Bywood P. "Primary health care-based programmes targeting potentially avoidable hospitalisations in vulnerable groups with chronic disease." *Primary Health Care Research & Information Service policy issue review*. Adelaide: Primary Health Care Research & Information Service. 2016

⁶ Payne R, Abel G, Guthrie B and Mercer S. "The effect of physical multi-morbidity, mental health conditions and socioeconomic deprivation on unplanned admissions to hospital: a retrospective cohort study." *Cmaj* 185, no. 5 (2013), E221-E228.

Rates of ASH by condition- CM Health

ASH conditions are defined by a set of discharge codes (using primary diagnosis only) and are grouped into chapters. For example, conditions grouped into the respiratory chapter for children include asthma, pneumonia, lower respiratory infections and upper and ENT respiratory infections (Table 6). Asthma includes codes for asthma, status asthmaticus and wheeze in 0-4-year-old children (Appendix 1 lists the conditions and respective ICD codes). More information on the various diagnosis included in the ASH group of conditions can be found online at Nationwide Service Framework Library under Accountability.⁷ Lastly, summary tables for each DHB, by age, is available including both rates and numbers in appendices 2-5 and ethnic-specific rates by condition and age are included in appendices 7-14.

Table 6. List of ASH conditions by Chapter as per Ministry of Health

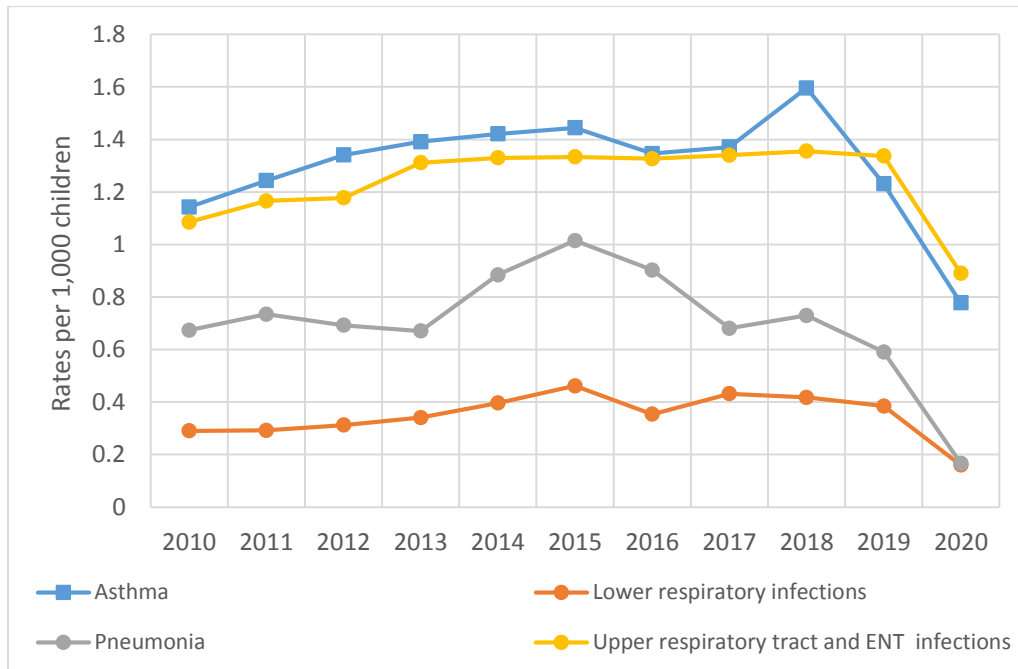
ASH Chapter	ASH Conditions			
Respiratory	Asthma	Pneumonia	Lower respiratory infections	Upper respiratory tract and ENT infections
Dental	Dental conditions			
Dermatological	Cellulitis	Dermatitis and eczema		
Gastrointestinal	Gastroenteritis/dehydration	Constipation	GORD (Gastro-oesophageal reflux disease)	Nutrition deficiency and anaemia
Cardiovascular	Rheumatic fever/heart disease			
Vaccine preventable diseases	Vaccine preventable MMR	Other vaccine preventable disease		
Other	Kidney/Urinary infection			

⁷ Nationwide Service Framework Library, *Ambulatory sensitive (avoidable) hospitalisations [website]*, <https://nsfl.health.govt.nz/accountability/performance-and-monitoring/data-quarterly-reports-and-reporting/ambulatory-sensitive> (accessed 16 August 2021).

Respiratory Chapter

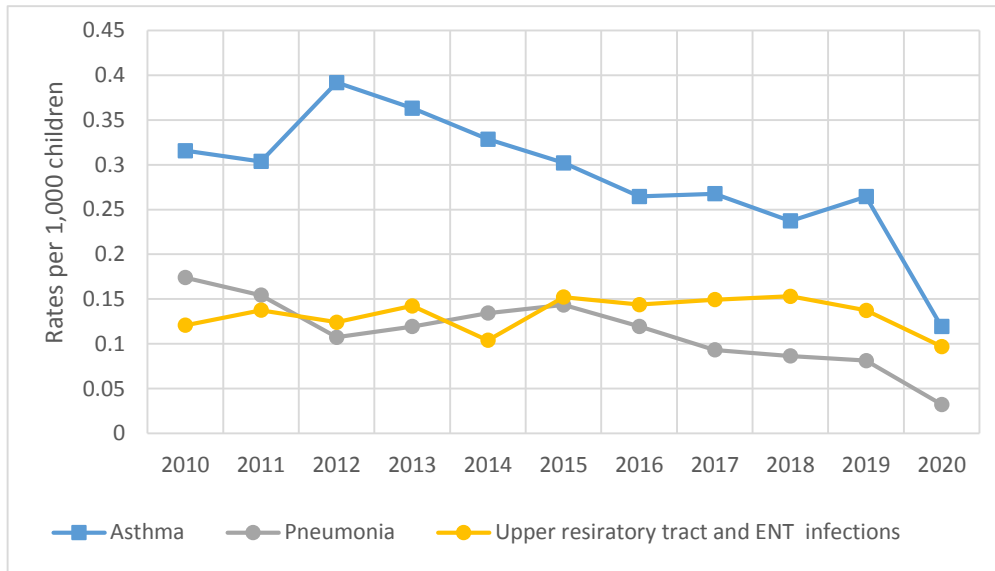
Figures 7 and 8 show the rate of respiratory conditions under the ASH respiratory chapter in 0-4-year-old children were higher compared to 5-14 year old. This difference is also evident in national trends. Notably, lower respiratory infections are examined as a distinct group only for the younger children. Asthma is the leading cause of ASH across both groups.

Figure 7 Rates of admissions for respiratory conditions under ASH for 0-4 year olds in CM Health, 2010 to 2020



Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand.

Figure 8 Rates of admissions for respiratory conditions under ASH for 5-14 year old children. CM Health, 2010 to 2020



Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand.

In children aged 0-4 years, the rates for asthma, lower respiratory tract infections and upper respiratory tract and ENT infections increased, on average, by 1.4%, 4.1% and 2.4% per year from 2010 to 2019. Whereas, the rate of pneumonia initially increased and subsequently decreased over the same period. Notably, all causes of respiratory ASH experienced a significant reduction in 2020 from 2019. Asthma, lower respiratory tract infections, pneumonia and upper respiratory and ENT infection rates decreased by 37%, 59%, 72% and 33%, respectively from 2019 to 2020 in CM Health.

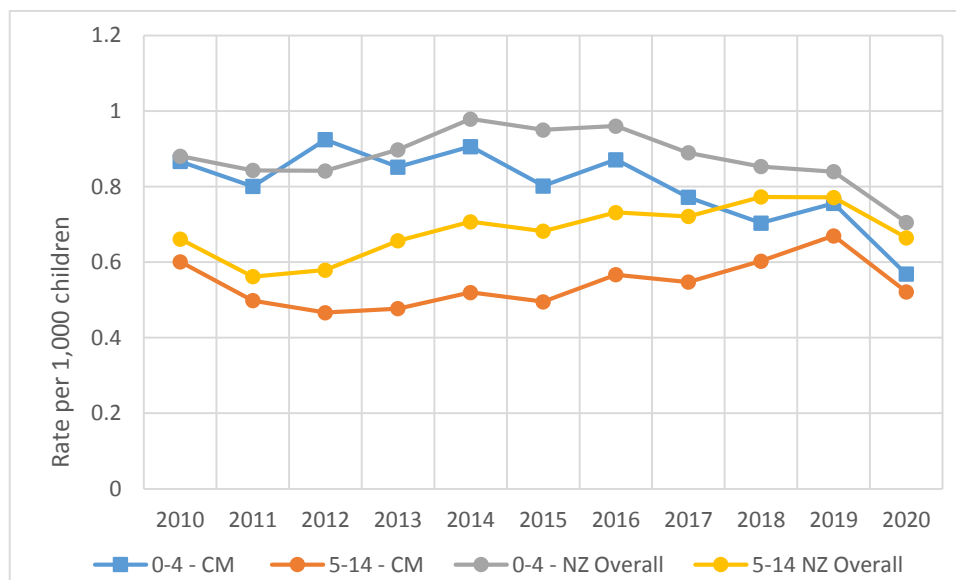
In children aged 5-14 years, the rates for asthma and pneumonia decreased by 1.2% and 7%, respectively, on average each year from 2010 to 2019. The upper respiratory tract and ENT infections on averaged increased by 3% each year over the same period. Similar to 0-4 years old children, the rates for all causes under respiratory ASH experienced a significant reduction in 2020 from 2019.

Compared to CM Health, the rates of asthma for 0-14 year olds were, on average, 61% higher in Auckland DHB and 5% lower in Waitematā. Similarly, the rates of pneumonia were 30% and 8% higher on average per year in Auckland and Waitematā, respectively in children aged 0-14 years. Specifically, lower respiratory infections in children aged 0-4 years old follows similar trends as pneumonia when CM Health is compared to Auckland and Waitematā. The rates for pneumonia in children aged 0-4 years old were higher in CM Health compared to national rates but the rates for other three conditions in this age group were comparable to national trends (Appendix 2-5).

Dental Conditions

Figure 9 shows the rate of ASH for dental conditions in children aged 0-4 and 5-14 years. The rates of hospitalisations for dental conditions have decreased for 0-4 year old children by 1% on average each year from 2010 to 2019. Whereas, the rates, on average each year, have increased by 1.7% for 5-14 year old children. Dental conditions is one the leading cause of ASH at 0.8 admissions per 1,000 children in CM Health including both age-groups. These rates are largely influenced by capacity for elective procedures. It is recognised there are long waiting lists for access to hospital treatment for dental issues and these rates under-estimate the true burden of dental disease in the community.

Figure 9. Rates of admissions for dental conditions in children stratified by age, CM Health and NZ, 2010 to 2020



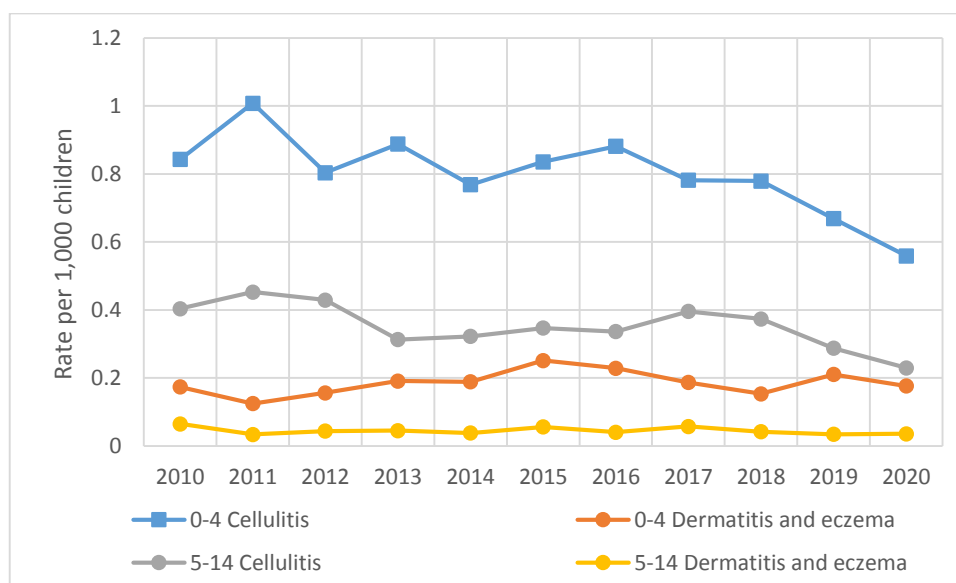
Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Compared to national trends, children from both age-groups have lower rates of dental admissions in CM Health (Figure 9). The rate of hospitalisations for dental conditions were consistently the highest in the Northland DHB, where 5-14 year olds have experienced a continual increase in the rates. Although, the rates for other DHBs in the Northern Region were similar but they have all slowly increased (Appendix 2-5).

Dermatological conditions

Figure 10 shows the overall trend for cellulitis admissions is decreasing from 2010 to 2020 for both age groups, however, the rates of dermatitis and eczema appears to be trending slightly up in children aged 0-4 years. The rates for cellulitis were higher compared to dermatitis and eczema across both groups. Children aged 0-4 years old on average have 56% and 75% higher rates of cellulitis and dermatitis and eczema, respectively per year on average compared to 5-14 years old children.

Figure 10 Rates of dermatological conditions in children stratified by age, CM Health, 2010 to 2020



Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

On average, each year the rate for cellulitis decreased by 1.7%, whereas, dermatitis and eczema increased by 3% per year for children aged 0-4 years from 2010 to 2019. The rate of cellulitis and dermatitis and eczema for 5-14 years old children on average decreased by 3% each, per year from 2010 to 2019. Notably, the rate for cellulitis decreased by 20% in 2020 from 2019 for 5-14 year olds, whereas the rate for dermatitis and eczema increased by 3.9%.

The general trend in rates of cellulitis is downwards across the four Northern Regional DHBs, with the lowest rates across both age groups observed in Northland DHB. The general trend in the rates of dermatitis and eczema in 0-4 years old children is declining over the ten years with the four DHBs experiencing spikes between 2013 and 2016. However, the rate of hospitalisations for 5-14 year olds for this condition were similar across the DHBs. When compared to national trends, the rates of cellulitis and dermatitis and eczema were consistently higher in both age groups for children domiciled in CM Health (Appendix 2-5).

Gastrointestinal conditions

Figures 11 and 12 show gastroenteritis/dehydration is the leading cause of ASH in the gastrointestinal chapter in both age-groups in children but is decreasing. Once again, the rates of ASH for both gastroenteritis and constipation were higher in children aged 0-4 years compared to 5-14 years old children. Although, gastrointestinal chapter includes GORD and nutritional deficiency and anaemia, due to low numbers and rates, been excluded from Figures 11 and 12. Appendices 2-5 and 7-14 include data on the two conditions.

Figure 11 Rates of gastrointestinal conditions in 0-4 year old children in CM Health, 2010 to 2020

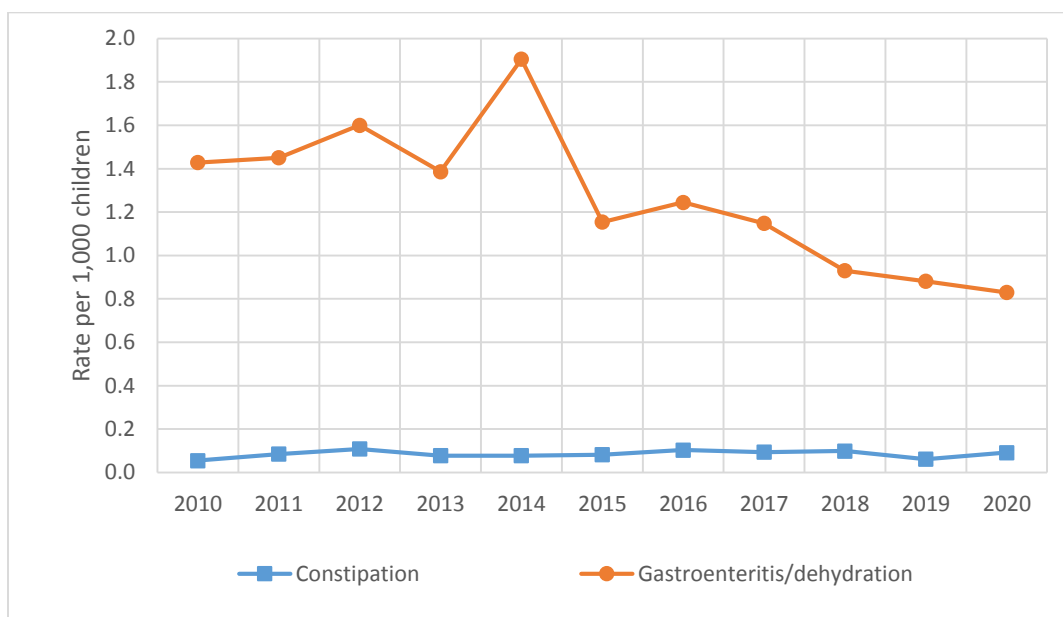
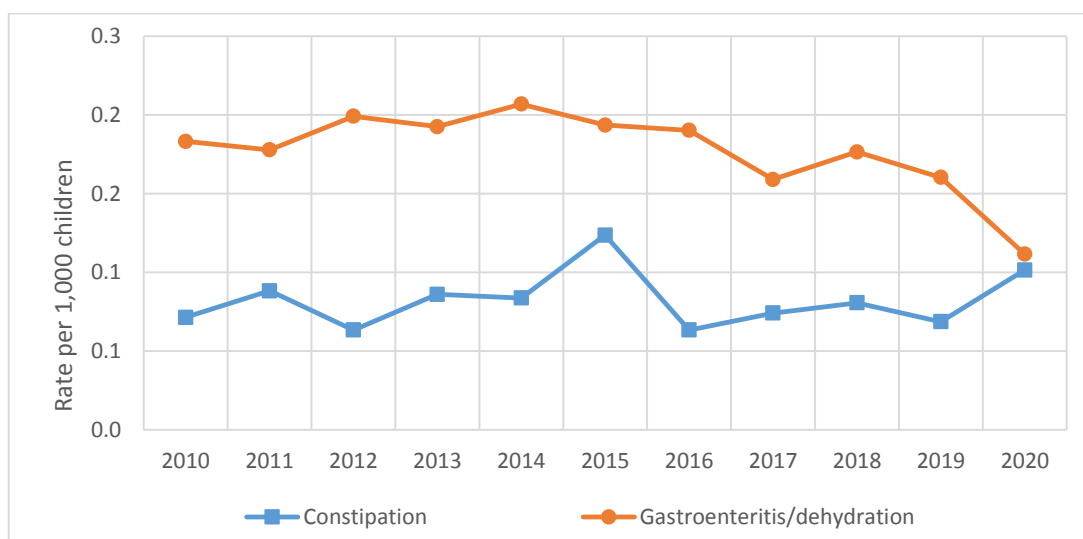


Figure 12 Rates of gastrointestinal conditions in 5-14 year old children in CM Health, 2010 to 2020



Note: Two different y-axis in figures 11 and 12

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

The rate of ASH for gastroenteritis/dehydration decreased by 3% per year from 2010 to 2019, for 0-4 year old children. The rate decreased further by 6.7% in 2020. The notable drop in rates of gastroenteritis/dehydration in 2014 for 0-4 years old children is largely attributable to the introduction of the Rotavirus vaccine. The rate of gastroenteritis/dehydration in 5-14-year-old children decreased by 1% per year on average from 2010 to 2019. The rate decreased further by 30% in 2020.

Admissions for constipation were low. In young children (0-4 years old), the average per year change for constipation was 5% increase from 2010 to 2019. However, the constipation plot line in figure 10 seems flat due to the scale of y-axis. From 2019 to 2020, the rate of constipation among young children increased by 49%. The average per year change for constipation in 5-14 year-old children was 4.2% from 2010 to 2019. Similar to 0-4-year-old children age group, the rate of constipation for 5-14-year-old children increased by 48%.

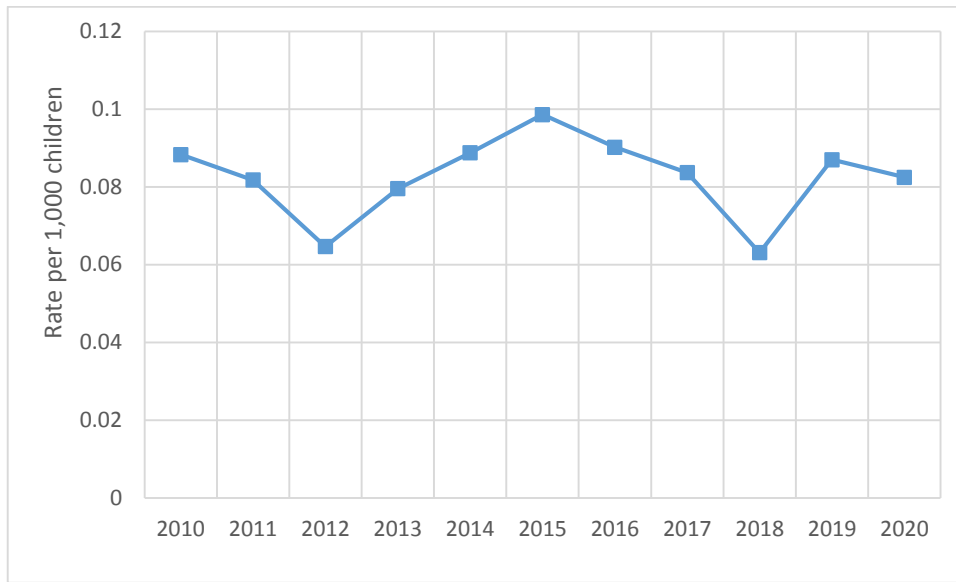
Across the northern region DHBs, ASH rates for gastroenteritis/dehydration in children (aged 0-14 years) generally have been decreasing. Notably, in the last few years, the admission rates for gastroenteritis/dehydration have been the lowest in CM Health (Appendix 2-5). The rates of constipation in 0-4 years old children have increased gradually in Auckland and Waitematā, while decreasing in CM Health. Similarly, Auckland and Northland DHBs have experienced an increase in admissions for constipation for 5-14 year olds, while, Waitematā and CM Health essentially remained steady. In children aged 0-4 years old, the rates of gastroenteritis were comparable with national trends but for constipation and gastroenteritis/dehydration in the older age group, the rates of admission are lower in CM Health (Appendix 2-5).

Other

Kidney/urinary infections

Figure 13 shows the rate of kidney/urinary infections for children aged 5-14 years old, as these are not considered amenable hospitalisations under ASH for young children. The rate on average increased by 3% per year from 2010 to 2019 before decreasing by 2.6% in 2020. Furthermore, the rate of kidney/urinary infections decreased initially before increasing since 2013.

Figure 13 Rates of kidney/urinary infection in children aged 5-14 years in CM Health, 2010 to 2020



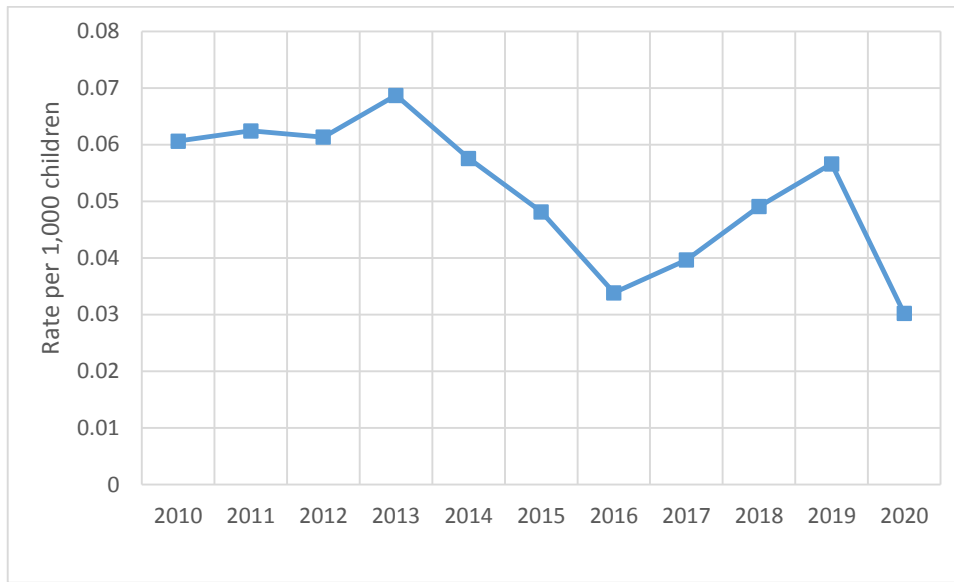
Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

In regards to kidney/urinary infections, Auckland DHB has the highest rate of hospitalisations, 1.4 times higher on average per year than CM Health (Appendix 2-5). Waitematā has 1.2 times higher rate of hospitalisations per year compared to CM Health. Of importance is that the rate of kidney/urinary infections were higher in the northern region DHBs compared to the national trends.

Acute rheumatic fever

In CM Health, the rates of rheumatic fever decreased on average by -1% per year from 2010 to 2019 and decreased significantly in 2020 by -47% from 2019 (Figure 14). Historically, CM Health has had the highest rates of rheumatic fever nationally with rates 3 and 3.8 times higher than Auckland and Waitemata DHB, respectively, and 2.8 times higher than the national average in children aged 0-14 years. Overall, the trend for acute rheumatic fever had been downwards in CM Health, especially between 2013-2016, closing the gap with other three regional DHBs, however, the rates gradually increased from 2016-2019 followed by a large decrease in 2020 (Appendix 2-5).

Figure 14. Rate of ASH for acute rheumatic fever in children, CM Health, 2010 to 2020



Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

One of the limitations of hospitalisation data is the well-recognised issues with coding. The current hospital admission data over estimates cases of rheumatic fever cases.⁸ The most reliable rheumatic fever is from Auckland Regional Public Health Service (ARPHS) which checks each case against the case definition and ensures that every case is only counted once. Table 7 shows the number of cases of acute rheumatic fever in CM Health as per Ministry of Health were higher by 13 cases on average per year compared to ARPHS.

Table 7. Number of cases of acute rheumatic fever in CM Health children, Ministry of Health and ARPHS, 2010 to 2020

	Number of cases (MoH)	ARPHS numbers	Difference
2010	68	57	11
2011	71	53	18
2012	70	62	8
2013	79	58	21
2014	67	43	24
2015	56	30	26
2016	41	35	6
2017	48	45	3
2018	62	65	-3
2019	72	49	23
2020	39	33	6

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

⁸ Lennon D, Te Aro Moxon PA, Leversha A, Jelleyman T, Reed P, Jackson C. *Is a rheumatic fever register the best surveillance tool to evaluate rheumatic fever control in the Auckland region?*. The New Zealand Medical Journal.;130(1460):48. 2017.

Vaccine preventable MMR disease

Table 8 show the number of hospitalisations that could have potentially been prevented by vaccination in CM Health. This section provides an analysis of the diagnosis codes as it is helpful to differentiate between the Mumps and Measles. In 2017 and 2018, all vaccine preventable hospitalisations in children were due to Mumps in CM Health. Notably, the significant increase in hospitalisations potentially preventable by MMR vaccination spiked in 2019 with 66 hospitalisations in children, the majority in the 0-4 year old group.

Table 8. The number of admissions considered potentially preventable by MMR vaccine in children, by age, CM Health, 2010 to 2020

	Measles		Mumps		MMR total
	0-4	5-14	0-4	5-14	0-14
2011	2	2			4
2012	2				2
2014	3	2		1	6
2017			1	9	10
2018			2	2	4
2019	55	11			66

Note: The missing years indicate zero admissions for measles and mumps in CM Health
Data source: NMDS, Ministry of Health.

DHBs in the Northern Region also recorded hospitalisations due to measles and mumps (as shown in Tables 9 and 10). Compared to the New Zealand total, CM Health accounted for more than half of the hospitalisations in children (0-14 year olds) for measles. Similarly, CM Health accounted for more than half of the hospitalisations in children for mumps in 2017.

Table 9. The number of admissions for measles in children by age for the Northern Region and Total NZ, 2010 to 2020

	0-4 years old					5-14 year old				
	Northland	Waitematā	Auckland	CM	Total New Zealand	Northland	Waitematā	Auckland	CM	Total New Zealand
2010		1			1					
2011		4	3	2	13		8	5	2	20
2012	1		2	2	5		1			1
2013					1					1
2014			1	3	8		1	1	2	11
2016					3					2
2017					1					
2018					2					1
2019	3	18	6	55	96	2	7	4	11	29
2020					1					

Table 10 The number of admissions for mumps in children by age for the Northern Region and Total NZ, 2010 to 2020

	0-4 years old					5-14 years old				
	Northland	Waitematā	Auckland	CM	Total New Zealand	Northland	Waitematā	Auckland	CM	Total New Zealand
2010	3			3	6					
2011				1	1		2		4	6
2012				3	3		1		1	2
2013										
2014						1	1	1	3	6
2015		1		2	3				2	2
2016		1		2	3				3	3
2017			1	4	5	3	4	9	20	36
2018			2	3	5	1		2	3	6
2019						1			3	4

Data source: NMDS, Ministry of Health.

Other vaccine preventable disease

In CM Health, the number of other vaccine preventable disease have remained low or absent in both age groups of children although Pertussis (whooping cough) accounts for a large proportion of hospitalisations in 0-4 years old children (as shown in Table 11).

Table 11 Number of ASH for other vaccine preventable diseases in children, CM Health, 2010 to 2020

	Chronic viral hepatitis	Diphtheria	Sepsis due to Streptococcus pneumonia		Pertussis (Whooping cough)		Other vaccine preventable disease total (non measles/non mumps)
	00-04	05-14	00-04	05-14	00-04	05-14	
2010					1		1
2011	2		1		2		5
2012			1		8	2	11
2013				1	1	1	3
2014			1		1	1	3
2015		1	2		2	1	6
2016				1	1		2
2017			1		2		3
2018			1		4	1	6
2019			1			1	2
2020				2			2

Data source: NMDS, Ministry of Health

Appendices

Appendix 1: ASH Conditions in children vs adults

ASH Chapter	ASH Condition (Diagnosis code)		
	<u>Adults (15+)</u>	<u>Children 0-4</u>	<u>Children 5-14</u>
<u>Cardiovascular</u>	Angina and chest pain (R0-72,73,74, I20)		
	Congestive heart failure (I50, J81)		
	Hypertensive heart disease (I10-15, I674)		
	Myocardial infarction (I21-23, I241)		
	Other ischemic heart disease (I-240,248, 249, I25)		
	Rheumatic fever/heart disease (I-00-09)	Rheumatic fever/heart disease (I-00-09)	Rheumatic fever/heart disease (I-00-09)
<u>Dental conditions</u>	Dental conditions (K0-2,4,5)	Dental conditions (K0-2,4,5)	Dental conditions (K0-2,4,5)
<u>Dermatological</u>	Cellulitis (L0-1-4, 8, H000, H010, J340, L980)	Cellulitis (L0-1-4, 8, H000, H010, J340, L980)	Cellulitis (L0-1-4, 8, H000, H010, J340, L980)
	Dermatitis and eczema (L20-L30)	Dermatitis and eczema (L20-L30)	Dermatitis and eczema (L20-L30)
<u>Gastrointestinal</u>	Constipation (K590)	Constipation (K590)	Constipation (K590)
	Gastroenteritis/dehydration (A02-09, R11, K529)	Gastroenteritis/dehydration (A02-09, R11, K529)	Gastroenteritis/dehydration (A02-09, R11, K529)
	Gastro-oesophageal reflux disease (K21)	Gastro-oesophageal reflux disease (K21)	Gastro-oesophageal reflux disease (K21)
	Nutrition deficiency anaemia (D50-D53, E40-E46, E50-E61, E63, M833)	Nutrition deficiency anaemia (D50-D53, E40-E46, E50-E61, E63)	Nutrition deficiency anaemia (D50-D53, E40-E46, E50-E61, E63)

	Peptic ulcer (K25-K28)		
<u>Respiratory</u>	Asthma (J45, J46)	Asthma (including wheeze) (R062)	Asthma (J45, J46)
	Bronchiectasis (J47)		
	COPD (J44)		
		Lower respiratory infections (J22)	
	Pneumonia (J13-J16, J18)	Pneumonia (J13-J16, J18)	Pneumonia (J13-J16, J18)
	Upper and ENT respiratory infections (J00-J06, H65-H67)	Upper and ENT respiratory infections (J00-J06, H65-H67)	Upper and ENT respiratory infections (J00-J06, H65-H67)
<u>Vaccine preventable disease</u>		Vaccine preventable MMR (B05, B06, B26, P350)	Vaccine preventable MMR (B05, B06, B26, P350)
		Other vaccine preventable disease (A33-A37, A80, B16, B18, A403)	Other vaccine preventable disease (A33-A37, A80, B16, B18, A403)
<u>Other</u>	Cervical cancer (C53)		
	Diabetes (E10-E14, E162)		
	Epilepsy (G40, G41, O15, R,560, R568)		
	Kidney/urinary infection (N10, N12, N136, N309, N390)		Kidney/urinary infection (N10, N12, N136, N309, N390)
	Sexually transmitted infections (A50-A60, A63, A64, M023, N341)		
	Stroke (I61, I63-I66)		

Source: Nationwide Service Framework Library⁹

⁹ Nationwide Service Framework Library, *Ambulatory sensitive (avoidable) hospitalisations [website]*, <https://nsfl.health.govt.nz/accountability/performance-and-monitoring/data-quarterly-reports-and-reporting/ambulatory-sensitive> (accessed 1st April 2022).

Appendix 2: CM Health number and rates of ASH

Table 12 Number of hospitalisations for ASH conditions by year for children aged 0-4 years in CM Health

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	480	528	567	575	588	598	559	572	676	521	332
Cellulitis	354	428	340	367	318	346	366	326	330	283	238
Constipation	23	36	46	32	32	34	43	39	42	26	39
Dental conditions	364	340	391	352	375	332	362	322	298	320	242
Dermatitis and eczema	73	53	66	79	78	104	95	78	65	89	75
Gastroenteritis/dehydration	600	616	677	573	788	478	517	479	394	373	353
GORD (Gastro-oesophageal reflux disease)	12	22	26	18	17	25	19	10	15	11	21
Lower respiratory infections	122	124	132	141	164	191	147	180	177	163	69
Nutrition deficiency and anaemia	7	7	6	7	8	8	12	4	13	9	14
Other vaccine preventable disease	1	5	9	1	2	4	1	3	5	1	
Pneumonia	283	312	293	277	366	420	375	284	309	250	72
Rheumatic fever/heart disease	1					1		1		1	1
Upper and ENT respiratory infections	456	495	498	542	550	552	551	559	574	566	383
Vaccine preventable MMR		2	2		3			1	2	55	
Non-ASH	4,391	4,502	4,854	4,761	4,781	4,702	4,165	4,527	4,123	4,517	3,340
Total Hospitalisations	7,167	7,470	7,907	7,725	8,070	7,795	7,212	7,385	7,023	7,185	5,179

Table 13 Number of hospitalisations for ASH conditions by year for children aged 5-14 years in CM Health

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	243	234	303	283	259	242	217	224	203	231	108
Cellulitis	311	349	332	244	254	278	276	331	320	251	206
Constipation	55	68	49	67	66	99	52	62	69	60	91
Dental conditions	463	384	361	372	410	397	465	458	516	585	467
Dermatitis and eczema	50	26	34	35	30	45	33	48	36	30	32
Gastroenteritis/dehydration	141	137	154	150	163	155	156	133	151	140	100
GORD (Gastro-oesophageal reflux disease)	2	1	1	2	2	2	1	1		10	5
Kidney/urinary infection	68	63	50	62	70	79	74	70	54	76	75
Nutrition deficiency and anaemia	5	3	4	8	3	6	6	8	7	8	9
Other vaccine preventable disease			2	2	1	2	1		1	1	2
Pneumonia	134	119	83	93	106	115	98	78	74	71	29
Rheumatic fever/heart disease	68	71	70	79	67	56	41	48	62	72	40
Upper and ENT respiratory infections	93	106	96	111	82	122	118	125	131	120	87
Vaccine preventable MMR		2			3			9	2	11	
Non-ASH	3,526	3,491	3,636	3,595	3,599	3,722	3,712	3,754	3,599	3,796	3,324
Total Hospitalisations	5,159	5,054	5,175	5,103	5,115	5,320	5,250	5,349	5,225	5,462	4,575

Source: NMDS, Ministry of Health

Table 14 Rate /1,000 for ASH conditions by year for children aged 0-4 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.1	1.2	1.3	1.4	1.4	1.4	1.3	1.4	1.6	1.2	0.8
Cellulitis	0.8	1.0	0.8	0.9	0.8	0.8	0.9	0.8	0.8	0.7	0.6
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.9	0.8	0.9	0.9	0.9	0.8	0.9	0.8	0.7	0.8	0.6
Dermatitis and eczema	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Gastroenteritis/dehydration	1.4	1.5	1.6	1.4	1.9	1.2	1.2	1.1	0.9	0.9	0.8
GORD (Gastro-oesophageal reflux disease)	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.2
Non-ASH	10.5	10.6	11.5	11.5	11.6	11.4	10.0	10.9	9.7	10.7	7.8
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.7	0.7	0.7	0.7	0.9	1.0	0.9	0.7	0.7	0.6	0.2
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Upper and ENT respiratory infections	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.3	0.9
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0

Table 15 Rate of ASH/1,000 by condition, by year for children aged 5-14 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.1
Cellulitis	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.2
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.7	0.5
Dermatitis and eczema	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	4.6	4.5	4.7	4.6	4.6	4.6	4.5	4.5	4.2	4.3	3.7
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Rheumatic fever/heart disease	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0
Upper and ENT respiratory infections	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 3: Auckland DHB numbers and rates of ASH

Table 16 Number of hospitalisations for ASH conditions by year for children aged 0-4 years in Auckland DHB

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	448	559	731	729	704	735	669	613	749	668	343
Cellulitis	176	196	204	199	186	200	189	167	180	145	103
Constipation	30	32	40	44	41	51	51	38	35	53	38
Dental conditions	192	189	158	165	187	166	213	178	160	171	100
Dermatitis and eczema	40	44	35	38	59	72	36	31	29	47	42
Gastroenteritis/dehydration	532	444	508	449	581	424	400	330	278	363	266
GORD (Gastro-oesophageal reflux disease)	14	15	21	21	22	17	20	18	11	11	13
Lower respiratory infections	33	69	69	62	77	92	68	88	89	97	26
Nutrition deficiency and anaemia	4	3	9	6	5	7	5	5	5	7	10
Other vaccine preventable disease	3	3	6		3	1	1	3	2	4	
Pneumonia	334	298	215	215	300	315	280	259	215	217	76
Rheumatic fever/heart disease	1				1	1			1		
Upper and ENT respiratory infections	277	315	286	312	395	442	337	337	326	356	228
Vaccine preventable MMR		3	2		1	1	1			6	
Non-ASH	3,093	3,059	3,194	3,394	3,462	3,479	3,353	2,965	2,761	3,298	2,270
Total Hospitalisations	5,177	5,229	5,478	5,634	6,024	6,003	5,623	5,032	4,841	5,443	3,515

Table 17. Number of hospitalisations for ASH conditions by year for children aged 5-14 years in Auckland DHB

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	241	198	227	234	213	240	206	202	225	225	118
Cellulitis	186	193	192	263	194	172	189	198	219	181	135
Constipation	49	68	65	60	56	74	80	65	63	61	70
Dental conditions	199	191	221	236	245	243	258	300	297	309	205
Dermatitis and eczema	20	19	16	15	20	18	23	29	21	13	10
Gastroenteritis/dehydration	124	121	143	165	165	145	164	146	157	157	95
GORD (Gastro-oesophageal reflux disease)	4	3	1	1	3	1	1	1	4	4	3
Kidney/urinary infection	44	42	57	45	47	42	56	47	51	58	48
Nutrition deficiency and anaemia	3		1	3	3	7	7	3	9	7	9
Other vaccine preventable disease	1	1	1	2					2		
Pneumonia	92	98	75	49	96	105	99	86	80	68	39
Rheumatic fever/heart disease	9	16	7	26	14	15	19	17	19	13	10
Upper and ENT respiratory infections	44	64	74	83	91	106	86	93	88	103	42
Vaccine preventable MMR		7	1		2			4		4	
Non-ASH	2,485	2,451	2,709	2,937	3,147	2,982	2,990	3,077	2,879	3,204	2,608
Total Hospitalisations	3,501	3,472	3,790	4,119	4,296	4,150	4,178	4,268	4,114	4,407	3,392

Source: NMDS, Ministry of Health

Table 18. Rate of ASH/1,000 by conditions by year for children aged 0-4 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.4	1.8	2.3	2.4	2.4	2.5	2.4	2.2	2.8	2.6	1.4
Cellulitis	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.6	0.4
Constipation	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2
Dental conditions	0.6	0.6	0.5	0.5	0.6	0.6	0.8	0.7	0.6	0.7	0.4
Dermatitis and eczema	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2
Gastroenteritis/dehydration	1.7	1.4	1.6	1.5	2.0	1.5	1.4	1.2	1.0	1.4	1.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Lower respiratory infections	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.4	0.1
Non-ASH	9.9	9.7	10.3	11.3	11.7	12.0	11.9	10.8	10.4	12.9	9.0
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	1.1	0.9	0.7	0.7	1.0	1.1	1.0	0.9	0.8	0.8	0.3
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Upper and ENT respiratory infections	0.9	1.0	0.9	1.0	1.3	1.5	1.2	1.2	1.2	1.4	0.9
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 19. Rate of ASH/1,000 by conditions by year for children aged 5-14 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2
Cellulitis	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.3	0.2
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.6	0.4
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	4.8	4.7	5.1	5.5	5.9	5.5	5.5	5.6	5.3	5.9	4.8
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Upper and ENT respiratory infections	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 4: Waitemata DHB number and rates of ASH

Table 20 Number of hospitalisations for ASH conditions by year for children aged 0-4 years in Waitematā DHB

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	436	508	554	562	427	467	554	471	632	621	282
Cellulitis	239	259	236	217	181	157	246	202	197	194	97
Constipation	46	59	38	54	61	51	34	54	29	41	46
Dental conditions	213	238	212	209	241	195	174	209	153	179	139
Dermatitis and eczema	36	53	39	58	43	60	68	33	39	47	45
Gastroenteritis/dehydration	672	492	603	467	601	347	423	396	376	486	251
GORD (Gastro-oesophageal reflux disease)	24	35	38	17	14	15	14	12	9	21	15
Lower respiratory infections	100	119	114	134	140	122	172	158	132	132	55
Nutrition deficiency and anaemia	5	3	8	2	10	7	8	3	4	10	12
Other vaccine preventable disease	4	1	5	4	5		1	1		2	1
Pneumonia	350	355	312	308	348	318	257	247	285	268	66
Rheumatic fever/heart disease		2									3
Upper and ENT respiratory infections	392	364	309	332	316	365	345	434	458	422	247
Vaccine preventable MMR	4	4								18	
Non-ASH	3,927	4,041	3,703	3,837	3,942	3,736	3,722	3,708	3,600	3,945	3,051
Total Hospitalisations	6,448	6,533	6,171	6,201	6,329	5,840	6,018	5,928	5,914	6,386	4,310

Table 21. Number of hospitalisations for ASH conditions by year for children aged 5-14 years in Waitematā DHB

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	267	242	250	204	176	172	165	148	185	186	94
Cellulitis	273	283	240	233	243	233	235	234	252	196	150
Constipation	76	80	71	72	91	81	74	87	74	79	87
Dental conditions	331	272	251	321	327	320	396	390	334	357	329
Dermatitis and eczema	17	16	14	19	24	21	21	24	13	23	23
Gastroenteritis/dehydration	147	165	157	168	159	128	153	165	181	203	127
GORD (Gastro-oesophageal reflux disease)	2	3	4	2	5	2	1	1	2	5	6
Kidney/urinary infection	80	65	78	66	88	78	67	60	58	42	74
Nutrition deficiency and anaemia	5	2	5	4	7	7	4	7	10	6	7
Other vaccine preventable disease	2		7	1				3		2	
Pneumonia	123	145	88	106	134	117	89	136	105	99	29
Rheumatic fever/heart disease	18	15	18	13	27	12	19	7	11	24	24
Upper and ENT respiratory infections	89	128	77	97	97	101	95	70	121	91	43
Vaccine preventable MMR		8	1		2			3	1	8	
Non-ASH	3,992	3,877	3,767	3,960	3,963	3,680	3,750	3,943	3,879	4,111	3,352
Total Hospitalisations	5,422	5,301	5,028	5,266	5,343	4,952	5,069	5,278	5,226	5,432	4,345

Source: NMDS, Ministry of Health

Table 22 Rate of ASH/1,000 by conditions by year for children aged 0-4 years in Waitematā DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.1	1.3	1.4	1.4	1.1	1.2	1.4	1.2	1.6	1.6	0.7
Cellulitis	0.6	0.7	0.6	0.5	0.5	0.4	0.6	0.5	0.5	0.5	0.2
Constipation	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.6	0.6	0.5	0.5	0.6	0.5	0.4	0.5	0.4	0.5	0.3
Dermatitis and eczema	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
Gastroenteritis/dehydration	1.7	1.3	1.5	1.2	1.5	0.9	1.1	1.0	0.9	1.2	0.6
GORD (Gastro-oesophageal reflux disease)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Lower respiratory infections	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.1
Non-ASH	10.2	10.3	9.3	9.7	10.0	9.5	9.4	9.3	9.0	9.9	7.7
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.9	0.9	0.8	0.8	0.9	0.8	0.7	0.6	0.7	0.7	0.2
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Upper and ENT respiratory infections	1.0	0.9	0.8	0.8	0.8	0.9	0.9	1.1	1.1	1.1	0.6
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 23. Rate of ASH per 1,000 for ASH conditions by year for children aged 5-14 years in Waitematā DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Cellulitis	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.5	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	5.5	5.3	5.2	5.4	5.3	4.9	4.9	5.0	4.9	5.1	4.0
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.0
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Upper and ENT respiratory infections	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 5: Northland DHB numbers and rates of ASH

Table 24 Number of hospitalisations for ASH conditions by year for children aged 0-4 years in Northland DHB

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	133	146	159	120	184	167	188	155	172	190	108
Cellulitis	68	114	83	71	54	73	59	64	68	53	39
Constipation	11	9	12	14	19	14	20	9	15	10	16
Dental conditions	157	163	191	212	206	226	230	202	185	200	147
Dermatitis and eczema	25	18	20	25	29	41	31	17	26	17	21
Gastroenteritis/dehydration	135	165	148	142	139	94	95	110	111	122	82
GORD (Gastro-oesophageal reflux disease)	5	11	11	7	4	5	8	5	7	5	9
Lower respiratory infections	75	48	75	61	64	52	80	62	83	51	20
Nutrition deficiency and anaemia	2		2	1		2		1	1	3	1
Other vaccine preventable disease		4	2	3	1	3	1		4	4	
Pneumonia	112	104	80	77	86	114	91	110	75	93	20
Upper and ENT respiratory infections	123	133	145	116	140	146	136	145	175	120	91
Vaccine preventable MMR			1							3	
Non-ASH	1,349	1,396	1,426	1,401	1,482	1,547	1,316	1,419	1,515	1,569	1,066
Total Hospitalisations	2,195	2,311	2,355	2,250	2,408	2,484	2,255	2,299	2,437	2,440	1,620

Table 25. Number of hospitalisations for ASH conditions by year for children aged 5-14 years in Northland DHB

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	89	77	80	72	75	76	53	83	100	78	48
Cellulitis	75	75	61	69	45	55	49	50	39	53	30
Constipation	17	19	16	35	18	29	25	27	27	28	29
Dental conditions	180	226	239	233	222	257	298	296	293	354	293
Dermatitis and eczema	5	8	9	9	15	9	5	9	11	4	4
Gastroenteritis/dehydration	30	38	36	41	43	47	49	50	61	44	28
GORD (Gastro-oesophageal reflux disease)	1						1		1		
Kidney/urinary infection	27	21	9	21	22	18	20	21	18	20	17
Nutrition deficiency and anaemia	1		1		2	3	1	2	3	6	1
Other vaccine preventable disease	1	1	1	2				1	1		
Pneumonia	29	36	32	33	42	38	31	50	41	51	11
Rheumatic fever/heart disease	16	26	24	18	22	10	4	13	11	13	5
Upper and ENT respiratory infections	32	50	41	41	36	47	38	49	56	31	14
Vaccine preventable MMR										2	
Non-ASH	1,029	1,143	1,166	1,199	1,203	1,369	1,279	1,318	1,420	1,285	1,132
Total Hospitalisations	1,532	1,720	1,715	1,773	1,745	1,958	1,853	1,969	2,082	1,969	1,612

Source: NMDS, Ministry of Health

Table 26. Rate of ASH/1000 by condition, by year, for children aged 0-4 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.1	1.2	1.3	1.0	1.5	1.4	1.6	1.3	1.4	1.6	0.9
Cellulitis	0.6	0.9	0.7	0.6	0.4	0.6	0.5	0.5	0.6	0.4	0.3
Constipation	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1
Dental conditions	1.3	1.3	1.6	1.7	1.7	1.9	1.9	1.7	1.5	1.7	1.2
Dermatitis and eczema	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.1	0.2	0.1	0.2
Gastroenteritis/dehydration	1.1	1.4	1.2	1.2	1.1	0.8	0.8	0.9	0.9	1.0	0.7
GORD (Gastro-oesophageal reflux disease)	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1
Lower respiratory infections	0.6	0.4	0.6	0.5	0.5	0.4	0.7	0.5	0.7	0.4	0.2
Non-ASH	11.3	11.5	11.9	11.5	12.2	12.9	11.0	11.8	12.5	12.9	8.7
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.9	0.9	0.7	0.6	0.7	0.9	0.8	0.9	0.6	0.8	0.2
Upper and ENT respiratory infections	1.0	1.1	1.2	1.0	1.2	1.2	1.1	1.2	1.4	1.0	0.7
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 27. Rate of ASH/1000 by condition, by year for children aged 5-14 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.2
Cellulitis	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.8	0.9	1.0	1.0	0.9	1.0	1.2	1.1	1.1	1.3	1.1
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	4.3	4.8	4.8	4.9	5.0	5.6	5.1	5.1	5.4	4.8	4.1
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.0
Rheumatic fever/heart disease	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0
Upper and ENT respiratory infections	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 6: Ethnic-specific rates for total ASH in the Northern region

Table 28 Total rate of ASH per 1,000 children by ethnicity in CM Health aged 0-14 years (rounded to 2dp)

	Maaori	Pacific	Asian	European/Other
2010	3.74	5.32	2.37	2.27
2011	3.69	5.69	2.38	2.09
2012	3.65	5.62	2.70	2.18
2013	3.41	5.66	2.46	2.34
2014	3.80	6.02	2.66	2.37
2015	3.64	6.03	2.49	2.25
2016	3.30	5.66	2.58	2.49
2017	3.36	5.56	2.37	2.24
2018	3.38	5.66	2.29	2.11
2019	3.05	5.41	2.30	2.03
2020	2.44	3.39	1.54	1.66

Table 29 Total rate of ASH per 1,000 children by ethnicity in Auckland aged 0-14 years (rounded to 2dp)

	Maaori	Pacific	Asian	European/Other
2010	3.86	6.28	3.16	2.32
2011	3.97	6.81	2.91	2.35
2012	4.54	6.36	3.40	2.56
2013	3.98	7.07	3.78	2.60
2014	4.27	7.36	4.14	2.98
2015	4.86	7.56	4.15	2.80
2016	4.39	7.37	3.92	2.68
2017	4.22	7.33	3.56	2.60
2018	4.22	7.98	3.45	2.76
2019	4.73	7.45	3.92	2.75
2020	2.91	4.83	2.13	1.73

Table 30 Total rate of ASH per 1,000 children by ethnicity in Waitemata aged 0-14 years (rounded to 2dp)

	Maaori	Pacific	Asian	European/Other
2010	4.48	6.59	3.16	2.50
2011	4.31	6.87	2.95	2.44
2012	4.03	5.92	2.56	2.46
2013	3.69	5.65	2.97	2.47
2014	3.39	5.52	3.14	2.67
2015	3.29	5.55	2.60	2.24
2016	3.62	6.21	2.62	2.34
2017	3.46	5.74	2.89	2.20
2018	3.51	6.05	2.64	2.35
2019	3.96	5.90	2.66	2.32
2020	2.15	3.34	1.44	1.54

Table 31 Total rate of ASH per 1,000 children by ethnicity in Northland aged 0-14 years (rounded to 2dp)

	Maaori	Pacific	Asian	European/Other
2010	4.49	3.89	3.95	2.74
2011	4.97	4.96	3.80	2.88
2012	4.95	4.80	3.12	2.81
2013	4.75	2.94	4.64	2.67
2014	4.92	2.95	3.65	2.76
2015	4.93	4.55	3.19	2.96
2016	4.56	4.27	3.93	3.29
2017	4.57	4.48	4.19	3.20
2018	4.80	5.44	2.68	3.15
2019	4.64	3.70	3.62	3.09
2020	3.09	3.18	2.20	1.92

Table 32 Total rate of ASH per 1,000 children by ethnicity in New Zealand aged 0-14 years (rounded to 2dp)

	Maaori	Pacific	Asian	European/Other
2010	4.10	5.85	3.01	2.78
2011	4.04	6.15	2.83	2.66
2012	4.07	5.91	3.09	2.72
2013	3.95	6.03	3.21	2.69
2014	4.08	6.35	3.41	2.92
2015	4.06	6.30	3.15	2.73
2016	3.90	6.12	3.17	2.84
2017	3.85	5.97	3.13	2.82
2018	4.39	6.23	3.10	2.86
2019	4.20	5.96	3.00	2.70
2020	2.93	3.81	1.91	1.90

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 7: Ethnic-specific rates of ASH by condition in children aged 0-4 years in CM Health

Table 33 Rate of ASH/1000 by condition, by year for Maaori children aged 0-4 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.4	1.5	1.4	1.5	1.6	1.7	1.2	1.4	1.6	1.3	1.1
Cellulitis	1.2	1.4	0.8	1.0	1.0	0.7	1.0	1.0	1.0	0.6	0.7
Constipation	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.0	0.1
Dental conditions	0.8	0.8	0.8	1.0	0.7	0.6	0.8	0.6	0.6	0.8	0.6
Dermatitis and eczema	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.1	0.1	0.3	0.2
Gastroenteritis/dehydration	1.0	1.3	1.1	1.1	1.5	1.0	0.8	0.9	0.7	0.6	0.7
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.5	0.6	0.3	0.1
Non-ASH	11.4	10.9	12.2	13.1	12.6	11.5	9.9	11.2	10.7	11.2	8.0
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.6	0.6	0.5	0.6	0.7	0.9	0.8	0.6	0.8	0.5	0.1
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	6.7	7.1	6.3	6.9	7.5	6.8	6.4	6.4	6.6	5.7	4.5
Upper and ENT respiratory infections	1.0	0.9	0.9	1.1	1.1	1.0	1.0	1.1	1.1	1.0	0.8
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0

Table 34 Rate of ASH/1000 by condition, by year for Pacific children aged 0-4 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.8	1.9	2.0	2.1	2.2	2.4	2.3	2.4	2.7	1.9	1.3
Cellulitis	1.4	1.9	1.7	1.8	1.4	1.8	1.8	1.4	1.5	1.5	1.0
Constipation	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	1.3	1.1	1.5	1.3	1.7	1.5	1.3	1.3	1.2	1.1	0.8
Dermatitis and eczema	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.4	0.3	0.4	0.3
Gastroenteritis/dehydration	1.8	2.0	2.1	1.9	2.6	1.5	1.6	1.6	1.2	1.4	0.8
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.4	0.5	0.5	0.5	0.6	0.8	0.5	0.8	0.7	0.7	0.3
Non-ASH	14.9	15.8	17.4	16.5	16.3	17.1	14.2	15.3	13.5	15.8	10.2
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	1.3	1.5	1.4	1.3	1.8	2.0	1.7	1.3	1.5	1.2	0.3
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	10.1	11.2	11.7	11.4	12.9	12.8	11.9	11.3	11.4	10.9	6.5
Upper and ENT respiratory infections	1.8	1.9	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.3	1.5
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0

Table 35 Rate of ASH/1000 by condition, by year for Asian children aged 0-4 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.7	0.7	0.8	0.9	0.8	0.8	0.9	0.9	1.1	0.9	0.4
Cellulitis	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2
Constipation	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Dental conditions	0.9	1.1	0.8	0.6	0.6	0.6	0.8	0.7	0.5	0.7	0.4
Dermatitis and eczema	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Gastroenteritis/dehydration	1.4	1.1	2.0	1.4	2.0	1.0	1.3	1.0	0.9	0.8	0.8
GORD (Gastro-oesophageal reflux disease)	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.2	0.2	0.3	0.1
Non-ASH	5.7	6.5	6.8	6.5	6.7	6.8	6.5	7.0	6.2	6.4	5.0
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.3	0.3	0.5	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.1
Total ASH	4.4	4.6	5.5	4.8	5.4	4.8	5.3	4.8	4.6	4.3	3.0
Upper and ENT respiratory infections	0.7	0.8	0.9	1.0	1.0	1.2	1.1	1.2	1.1	0.9	0.7
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 36 Rate of ASH/1000 by condition, by year for European/Other children aged 0-4 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.5	0.6	0.9	0.9	0.8	0.7	0.8	0.6	0.7	0.7	0.3
Cellulitis	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.2
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Dental conditions	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4
Dermatitis and eczema	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Gastroenteritis/dehydration	1.5	1.2	1.2	1.1	1.5	1.1	1.2	1.0	0.9	0.6	1.1
GORD (Gastro-oesophageal reflux disease)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Lower respiratory infections	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.1
Non-ASH	7.6	7.2	7.3	8.1	9.0	8.6	8.7	9.4	8.2	9.2	8.8
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.4	0.2	0.2	0.3	0.3	0.4	0.6	0.4	0.3	0.3	0.2
Total ASH	4.0	3.8	4.3	4.5	4.8	4.4	5.0	4.1	3.9	3.5	3.2
Upper and ENT respiratory infections	0.6	0.8	0.7	0.9	0.9	0.8	1.1	0.7	0.8	1.0	0.6
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 8: Ethnic-specific rates of ASH by condition in children aged 5-14 years in CM Health

Table 37 Rate of ASH/1000 by condition, by year for Maaori children aged 5-14 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	0.4	0.6	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.2
Cellulitis	0.5	0.6	0.6	0.2	0.4	0.3	0.4	0.4	0.5	0.3	0.3
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Dental conditions	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.7	0.5
Dermatitis and eczema	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Gastroenteritis/dehydration	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	5.1	4.6	5.1	5.2	4.9	4.5	4.7	4.6	4.2	4.3	3.8
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0
Rheumatic fever/heart disease	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Total ASH	2.3	2.1	2.4	1.8	2.1	2.2	1.9	1.9	1.8	1.8	1.5
Upper and ENT respiratory infections	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 38 Rate of ASH/1000 by condition, by year for Pacific children aged 5-14 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	0.4	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.2
Cellulitis	0.7	0.8	0.7	0.7	0.6	0.7	0.6	0.7	0.7	0.5	0.4
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.8	0.6	0.5	0.6	0.6	0.6	0.8	0.7	0.9	1.0	0.7
Dermatitis and eczema	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	5.3	5.4	5.5	5.3	5.0	5.3	5.1	5.4	5.1	5.0	4.0
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Rheumatic fever/heart disease	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.1
Total ASH	3.1	3.1	2.8	3.0	2.8	2.9	2.7	2.8	2.9	2.8	2.0
Upper and ENT respiratory infections	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 39 Rate of ASH/1000 by condition, by year for Asian children aged 5-14 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1
Cellulitis	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Constipation	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1
Dental conditions	0.4	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.4
Dermatitis and eczema	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Non-ASH	2.8	2.8	3.1	2.8	2.9	3.4	3.3	2.8	2.9	3.4	2.8
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.3	1.4	0.9
Upper and ENT respiratory infections	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 40 Rate of ASH/1000 by condition, by year for European/Other children aged 5-14 years in CM Health (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1
Cellulitis	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.4
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1
Non-ASH	4.5	4.6	4.6	4.6	5.0	4.9	4.7	4.8	4.3	4.5	4.2
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	1.5	1.3	1.3	1.4	1.3	1.3	1.4	1.4	1.3	1.4	1.0
Upper and ENT respiratory infections	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 9: Ethnic-specific rates of ASH by condition in children aged 0-4 years in Auckland DHB

Table 41 Rate of ASH/1000 by condition, by year for Maaori children aged 0-4 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.8	2.2	2.4	2.1	2.8	2.8	2.5	2.6	3.2	3.4	1.8
Cellulitis	0.8	1.0	1.0	1.0	0.8	1.1	1.2	0.9	0.9	0.5	0.4
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.0	0.2
Dental conditions	0.8	0.7	0.7	0.5	0.8	0.8	0.7	0.8	0.7	0.7	0.5
Dermatitis and eczema	0.4	0.2	0.2	0.1	0.3	0.4	0.3	0.1	0.2	0.2	0.2
Gastroenteritis/dehydration	1.6	1.2	1.7	1.3	1.3	1.4	1.1	0.9	0.6	1.2	1.0
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0
Lower respiratory infections	0.1	0.2	0.3	0.2	0.5	0.4	0.4	0.4	0.2	0.5	0.2
Non-ASH	12.6	12.0	11.6	10.9	12.4	13.0	12.5	12.8	12.2	16.7	9.1
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Pneumonia	0.8	0.9	0.7	0.7	1.0	1.2	1.0	1.0	0.8	0.9	0.2
Total ASH	7.0	7.7	8.1	7.0	9.0	9.7	8.3	8.0	7.6	9.0	5.4
Upper and ENT respiratory infections	0.7	1.2	0.8	0.9	1.2	1.4	0.8	1.0	0.9	1.6	0.8
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 42 Rate of ASH/1000 by condition, by year for Pacific children aged 0-4 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	3.0	3.2	4.2	4.4	4.6	4.7	4.2	3.7	5.8	4.9	3.2
Cellulitis	1.5	1.6	1.8	1.8	1.5	1.8	1.7	1.7	1.5	1.4	1.2
Constipation	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2
Dental conditions	1.2	1.2	1.0	1.2	1.1	1.2	1.7	1.4	1.3	1.5	1.0
Dermatitis and eczema	0.2	0.3	0.2	0.2	0.5	0.6	0.3	0.4	0.3	0.6	0.4
Gastroenteritis/dehydration	2.4	2.2	1.9	2.2	2.5	1.5	1.9	1.5	1.8	1.8	1.3
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.2	0.5	0.4	0.4	0.5	0.7	0.6	0.4	0.9	1.0	0.3
Non-ASH	16.0	15.2	17.0	17.4	17.6	18.9	17.5	16.7	16.6	20.4	12.2
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	2.7	2.5	1.4	1.8	2.4	2.5	2.3	2.3	2.3	2.0	0.8
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	12.8	13.4	12.7	13.9	15.3	15.8	15.1	13.9	16.1	16.0	9.9
Upper and ENT respiratory infections	1.4	1.7	1.5	1.7	2.0	2.6	2.0	2.3	2.1	2.5	1.4
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0

Table 43 Rate of ASH/1000 by condition, by year for Asian children aged 0-4 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.4	1.8	2.5	2.6	2.1	2.6	2.6	2.4	2.2	2.1	1.0
Cellulitis	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.3	0.4	0.4	0.2
Constipation	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.1
Dental conditions	0.6	0.7	0.5	0.6	0.6	0.6	0.9	0.7	0.7	0.7	0.3
Dermatitis and eczema	0.1	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1
Gastroenteritis/dehydration	1.9	1.5	2.1	1.7	2.6	2.0	1.7	1.4	0.9	1.6	1.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0
Lower respiratory infections	0.0	0.2	0.1	0.1	0.2	0.3	0.1	0.3	0.2	0.2	0.0
Non-ASH	7.4	7.4	8.0	9.1	9.7	11.6	11.7	9.4	8.2	10.5	7.3
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.8	0.4	0.4	0.4	0.9	0.8	0.7	0.6	0.5	0.8	0.2
Total ASH	6.4	6.0	7.0	7.4	8.7	8.9	8.0	7.1	6.6	7.6	4.2
Upper and ENT respiratory infections	1.0	0.8	0.8	1.1	1.6	1.7	1.3	1.1	1.4	1.3	1.0
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 44 Rate of ASH/1000 by condition, by year for European/Other children aged 0-4 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.8	1.0	1.5	1.6	1.5	1.6	1.5	1.5	2.0	1.7	0.7
Cellulitis	0.3	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.5	0.4	0.3
Constipation	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2
Dental conditions	0.3	0.3	0.3	0.3	0.4	0.2	0.3	0.3	0.2	0.2	0.2
Dermatitis and eczema	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Gastroenteritis/dehydration	1.3	1.1	1.3	1.1	1.6	1.2	1.2	1.1	1.0	1.1	0.9
GORD (Gastro-oesophageal reflux disease)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Lower respiratory infections	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.3	0.1
Non-ASH	7.9	8.0	8.4	10.2	10.4	9.3	9.7	8.9	9.2	10.5	9.3
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.6	0.6	0.5	0.4	0.6	0.7	0.7	0.6	0.5	0.4	0.3
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	4.3	4.5	5.1	5.0	5.9	5.6	5.2	5.2	5.5	5.4	3.4
Upper and ENT respiratory infections	0.7	0.7	0.8	0.8	1.0	1.1	0.9	1.0	0.8	0.9	0.7
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 10: Ethnic-specific rates of ASH by condition in children aged 5-14 years in Auckland DHB

Table 45 Rate of ASH/1000 by condition, by year for Maaori children aged 5-14 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.5	0.5	0.6	0.6	0.3	0.5	0.5	0.5	0.6	0.5	0.3
Cellulitis	0.6	0.3	0.7	0.6	0.4	0.4	0.5	0.5	0.4	0.5	0.4
Constipation	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1
Dental conditions	0.5	0.4	0.7	0.6	0.6	0.8	0.6	0.7	0.6	0.7	0.5
Dermatitis and eczema	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.3	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
Non-ASH	5.1	5.4	5.4	5.6	6.5	6.4	5.8	6.0	5.6	6.3	5.1
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.1
Rheumatic fever/heart disease	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0
Total ASH	2.4	2.2	2.9	2.5	2.1	2.6	2.6	2.5	2.6	2.7	1.8
Upper and ENT respiratory infections	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 46 Rate of ASH/1000 by condition, by year for Pacific children aged 5-14 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.9	0.7	0.8	0.9	0.8	1.0	0.8	0.8	0.8	0.7	0.4
Cellulitis	0.8	0.9	0.8	1.0	0.7	0.6	0.7	0.9	0.9	0.7	0.5
Constipation	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2
Dental conditions	0.5	0.6	0.5	0.7	0.7	0.6	0.7	1.0	1.1	0.8	0.6
Dermatitis and eczema	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0
Gastroenteritis/dehydration	0.2	0.3	0.3	0.4	0.3	0.2	0.4	0.3	0.3	0.3	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2
Non-ASH	6.2	5.6	6.1	6.4	6.9	6.4	6.3	7.1	6.4	6.6	5.4
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.4	0.4	0.3	0.2	0.3	0.4	0.4	0.3	0.1	0.2	0.1
Rheumatic fever/heart disease	0.1	0.1	0.0	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1
Total ASH	3.2	3.7	3.4	3.9	3.6	3.7	3.8	4.2	4.1	3.4	2.5
Upper and ENT respiratory infections	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.2
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 47 Rate of ASH/1000 by condition, by year for Asian children aged 5-14 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.2
Cellulitis	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.1	0.1
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.3	0.4	0.4	0.6	0.4	0.4	0.6	0.6	0.5	0.7	0.5
Dermatitis and eczema	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0
Gastroenteritis/dehydration	0.3	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0
Non-ASH	3.1	3.0	3.5	3.8	4.3	4.1	4.0	4.3	4.1	4.7	3.4
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	1.7	1.5	1.7	2.1	2.0	2.0	2.0	1.9	2.1	2.2	1.2
Upper and ENT respiratory infections	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 48 Rate of ASH/1000 by condition, by year for European/Other children aged 5-14 years in Auckland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.1
Cellulitis	0.2	0.2	0.2	0.4	0.3	0.2	0.3	0.2	0.3	0.3	0.2
Constipation	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
Non-ASH	4.9	4.9	5.5	6.1	6.2	5.7	6.0	5.8	5.6	6.3	5.5
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	1.4	1.4	1.4	1.5	1.7	1.5	1.5	1.4	1.5	1.5	1.0
Upper and ENT respiratory infections	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 11: Ethnic-specific rates of ASH by condition in children aged 0-4 years in Waitemata DHB

Table 49 Rate of ASH/1000 by condition, by year for Maaori children aged 0-4 years in Waitemata DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	2.1	1.9	1.8	1.8	1.2	1.3	1.8	1.8	2.3	2.7	1.1
Cellulitis	1.2	1.4	0.9	1.0	0.6	0.7	0.9	0.8	0.8	0.7	0.3
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
Dental conditions	0.7	0.5	0.9	0.8	0.7	0.8	0.6	0.6	0.4	0.6	0.4
Dermatitis and eczema	0.2	0.2	0.2	0.1	0.1	0.1	0.4	0.2	0.2	0.2	0.2
Gastroenteritis/dehydration	1.8	1.2	1.3	1.0	1.2	0.6	1.1	0.8	0.8	1.1	0.4
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.3	0.4	0.3	0.4	0.3	0.2	0.5	0.4	0.4	0.5	0.2
Non-ASH	12.3	11.8	11.0	10.5	9.8	10.3	9.5	10.4	9.6	11.1	7.1
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.9	1.0	1.2	0.7	1.0	0.9	0.8	0.6	0.8	0.7	0.1
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	8.6	7.8	7.8	6.6	5.7	5.8	6.9	6.3	6.8	7.7	3.4
Upper and ENT respiratory infections	1.3	1.0	1.0	0.7	0.5	0.9	0.8	0.8	1.0	1.1	0.4
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0

Table 50 Rate of ASH/1000 by condition, by year for Pacific children aged 0-4 years in Waitemata DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	2.4	3.0	2.9	3.2	2.4	2.8	3.1	2.7	3.1	2.7	2.0
Cellulitis	1.9	1.9	1.6	1.8	1.5	1.0	1.9	1.5	1.5	1.7	0.7
Constipation	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2
Dental conditions	1.0	1.2	1.0	1.0	1.1	0.8	1.0	1.1	1.0	1.1	0.7
Dermatitis and eczema	0.2	0.2	0.3	0.4	0.2	0.5	0.7	0.1	0.3	0.5	0.4
Gastroenteritis/dehydration	2.1	1.4	1.7	1.2	1.9	0.9	1.3	1.1	1.4	1.8	1.1
GORD (Gastro-oesophageal reflux disease)	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.6	0.5	0.7	0.8	0.8	0.7	1.2	1.1	0.7	0.8	0.3
Non-ASH	16.7	16.2	15.5	14.7	14.3	16.4	14.7	14.9	14.7	17.0	11.1
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	2.6	2.8	1.9	2.3	2.0	2.2	1.5	1.7	2.2	1.6	0.4
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	12.5	13.2	11.5	11.8	11.4	10.8	12.1	11.7	12.7	12.4	6.6
Upper and ENT respiratory infections	1.5	1.9	1.3	1.0	1.3	1.7	1.3	2.2	2.4	1.8	0.9
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0

Table 51 Rate of ASH/1000 by condition, by year for Asian children aged 0-4 years in Waitemata DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.1	1.1	1.3	1.3	1.1	1.0	1.2	1.0	1.3	1.4	0.5
Cellulitis	0.3	0.3	0.3	0.2	0.4	0.3	0.4	0.4	0.3	0.3	0.1
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.1	0.1
Dental conditions	0.7	0.9	0.5	0.5	0.8	0.4	0.4	0.6	0.4	0.4	0.3
Dermatitis and eczema	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Gastroenteritis/dehydration	1.6	1.2	1.4	1.2	1.5	1.0	1.1	1.1	0.9	1.2	0.6
GORD (Gastro-oesophageal reflux disease)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.3	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.2	0.2	0.1
Non-ASH	8.4	7.1	6.5	8.2	8.6	8.2	7.7	8.1	6.9	7.7	5.7
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.6	0.7	0.5	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.2
Total ASH	6.2	5.8	5.2	5.6	6.0	5.2	5.2	5.3	4.9	5.3	2.6
Upper and ENT respiratory infections	1.1	0.7	0.7	1.1	0.9	1.1	0.8	1.0	1.0	0.9	0.5
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 52 Rate of ASH/1000 by condition, by year for European/Other children aged 0-4 years in Waitemata DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.5	0.8	1.0	1.0	0.8	0.9	1.0	0.7	1.2	1.0	0.4
Cellulitis	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.2
Constipation	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.2	0.3	0.2
Dermatitis and eczema	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	1.7	1.2	1.6	1.2	1.6	0.9	1.0	1.0	0.9	1.2	0.7
GORD (Gastro-oesophageal reflux disease)	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1
Lower respiratory infections	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1
Non-ASH	8.5	9.5	8.4	8.9	9.7	8.4	9.2	8.4	8.9	9.5	8.6
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.6	0.5	0.5	0.5	0.7	0.5	0.4	0.4	0.4	0.5	0.1
Total ASH	4.6	4.5	4.9	4.7	5.1	4.1	4.4	4.2	4.4	4.7	2.7
Upper and ENT respiratory infections	0.8	0.8	0.6	0.8	0.7	0.7	0.8	1.0	1.0	1.0	0.7
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 12: Ethnic-specific rates of ASH by condition in children aged 5-14 years in Waitemata DHB

Table 53 Rate of ASH/1000 by condition, by year for Maaori children aged 5-14 years in Waitemata DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.6	0.6	0.5	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.2
Cellulitis	0.5	0.6	0.5	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.2
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.5	0.6	0.6
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	6.0	5.6	5.1	5.8	5.2	5.3	5.1	4.8	4.6	4.7	3.9
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.2	0.3	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.0
Rheumatic fever/heart disease	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1
Total ASH	2.6	2.7	2.3	2.3	2.3	2.1	2.1	2.1	2.0	2.2	1.6
Upper and ENT respiratory infections	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 54 Rate of ASH/1000 by condition, by year for Pacific children aged 5-14 years in Waitemata DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.8	0.6	0.7	0.5	0.4	0.5	0.5	0.4	0.6	0.5	0.3
Cellulitis	1.2	1.1	0.9	0.6	0.7	0.8	0.9	0.8	0.7	0.6	0.4
Constipation	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Dental conditions	0.6	0.5	0.4	0.6	0.4	0.6	0.9	0.7	0.7	0.7	0.5
Dermatitis and eczema	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Gastroenteritis/dehydration	0.2	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1
Non-ASH	7.3	6.7	6.8	6.3	5.9	5.9	5.1	5.4	5.5	5.6	4.0
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.3	0.5	0.2	0.3	0.2	0.4	0.3	0.2	0.2	0.2	0.0
Rheumatic fever/heart disease	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.1
Total ASH	3.8	3.9	3.4	2.8	2.8	3.1	3.5	2.9	3.0	2.9	1.8
Upper and ENT respiratory infections	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 55 Rate of ASH/1000 by condition, by year for Asian children aged 5-14 years in Waitemata DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	0.3	0.3	0.4	0.2	0.2	0.2	0.1	0.2	0.2	0.1
Cellulitis	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Dental conditions	0.6	0.4	0.4	0.4	0.5	0.4	0.6	0.6	0.4	0.4	0.3
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0
Non-ASH	3.4	3.6	3.3	4.0	3.7	3.6	3.4	3.7	3.4	3.6	2.7
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.3	0.2	0.2	0.0
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	1.7	1.7	1.4	1.7	1.8	1.4	1.4	1.8	1.6	1.4	0.9
Upper and ENT respiratory infections	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 56 Rate of ASH/1000 by condition, by year for European/Other children aged 5-14 years in Waitemata DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1
Cellulitis	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Dental conditions	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	5.6	5.5	5.4	5.5	5.8	5.0	5.3	5.6	5.5	5.8	4.8
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	1.6	1.5	1.4	1.5	1.6	1.4	1.4	1.3	1.4	1.3	1.1
Upper and ENT respiratory infections	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 13: Ethnic-specific rates of ASH by condition in children aged 0-4 years in Northland DHB

Table 57 Rate of ASH/1000 by condition, by year for Maaori children aged 0-4 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	1.4	1.6	1.7	1.3	2.2	1.9	2.1	1.6	1.9	2.0	1.0
Cellulitis	0.9	1.4	1.0	0.8	0.7	0.9	0.5	0.7	0.8	0.7	0.5
Constipation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	1.8	1.8	2.2	2.5	2.4	2.6	2.6	2.1	2.1	2.3	1.6
Dermatitis and eczema	0.3	0.2	0.3	0.4	0.4	0.5	0.4	0.2	0.2	0.2	0.3
Gastroenteritis/dehydration	0.8	1.3	1.2	1.1	1.1	0.8	0.6	0.9	0.8	0.8	0.7
GORD (Gastro-oesophageal reflux disease)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lower respiratory infections	0.9	0.6	0.8	0.7	0.5	0.6	0.7	0.6	0.8	0.5	0.2
Non-ASH	13.3	12.6	13.8	12.8	14.1	14.4	11.6	12.2	13.3	14.9	9.3
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Pneumonia	1.1	1.0	0.8	0.7	1.0	1.1	0.8	1.1	0.7	0.8	0.2
Total ASH	8.5	9.3	9.3	8.5	9.6	9.7	8.9	8.4	8.9	8.4	5.4
Upper and ENT respiratory infections	1.2	1.2	1.3	0.9	1.3	1.3	1.1	1.2	1.5	0.9	0.9
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 58 Rate of ASH/1000 by condition, by year for Pacific children aged 0-4 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	2.6	1.4	1.5	1.5	2.0	1.9	3.0	4.4	1.5	1.2
Cellulitis	0.8	1.1	1.1	0.3	0.0	0.6	0.9	0.6	1.8	0.3	0.3
Constipation	0.0	0.0	0.0	0.0	0.6	0.0	0.3	0.0	0.3	0.0	0.0
Dental conditions	2.4	0.4	1.1	0.9	0.9	2.0	2.8	1.5	0.6	1.8	1.6
Dermatitis and eczema	0.0	0.4	0.4	0.0	0.0	0.0	0.9	0.6	0.9	0.3	0.9
Gastroenteritis/dehydration	0.4	1.1	2.5	0.6	0.3	0.9	0.6	0.9	1.2	2.1	1.2
Lower respiratory infections	0.8	0.4	1.1	0.3	0.3	0.6	0.0	0.6	0.6	0.9	0.0
Non-ASH	11.2	9.6	7.5	13.6	8.2	10.9	11.2	11.5	16.8	13.6	11.9
Pneumonia	1.6	1.5	1.1	1.5	1.2	1.4	0.3	0.3	0.0	0.3	0.0
Total ASH	8.0	8.1	10.0	6.4	5.6	8.9	9.7	8.5	11.8	7.6	5.6
Upper and ENT respiratory infections	1.6	0.7	1.4	1.2	0.9	1.4	1.9	0.9	2.1	0.3	0.3

Table 59 Rate of ASH/1000 by condition, by year for Asian children aged 0-4 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	0.3	0.9	0.9	2.2	0.7	0.4	0.2	0.5	1.8	1.0
Cellulitis	0.0	1.0	0.0	0.3	0.0	0.0	0.4	0.6	0.0	0.3	0.0
Constipation	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.1	0.2
Dental conditions	0.4	0.7	1.2	2.4	1.4	1.0	1.1	2.0	0.3	0.9	0.5
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.6	0.5	0.0	0.0	0.2	0.0	0.1
Gastroenteritis/dehydration	1.2	1.7	0.6	1.2	0.3	0.7	0.2	1.6	1.5	1.0	0.6
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.2	0.0	0.0
Lower respiratory infections	0.4	0.3	0.9	1.5	0.3	0.2	0.9	0.0	0.8	0.3	0.0
Non-ASH	4.2	10.0	7.2	6.2	11.4	5.7	8.0	12.4	10.8	9.1	5.6
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.2	0.0	0.0	0.0
Pneumonia	1.2	0.7	0.3	0.3	0.6	0.5	1.3	0.2	0.3	1.0	0.1
Total ASH	4.6	5.7	5.9	7.4	5.8	6.0	6.4	6.1	5.8	7.2	3.2
Upper and ENT respiratory infections	1.2	1.0	1.9	0.6	0.6	1.7	1.6	1.0	1.5	1.6	0.6

Table 60 Rate of ASH/1000 by condition, by year for European/Other children aged 0-4 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.8	0.6	0.8	0.5	0.6	0.6	0.9	0.8	0.6	0.8	0.6
Cellulitis	0.2	0.3	0.4	0.3	0.2	0.3	0.5	0.2	0.2	0.1	0.1
Constipation	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Dental conditions	0.7	0.8	0.7	0.7	0.8	0.8	0.8	1.0	0.9	0.8	0.7
Dermatitis and eczema	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
Gastroenteritis/dehydration	1.6	1.4	1.3	1.4	1.3	0.8	1.2	0.9	1.1	1.2	0.6
GORD (Gastro-oesophageal reflux disease)	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Lower respiratory infections	0.3	0.2	0.4	0.2	0.5	0.2	0.6	0.4	0.5	0.3	0.2
Non-ASH	9.3	10.3	9.8	10.0	9.9	11.4	10.3	11.1	11.2	10.5	8.2
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.7	0.7	0.5	0.5	0.3	0.7	0.6	0.8	0.6	0.7	0.1
Total ASH	5.4	5.3	5.5	4.9	5.2	5.0	6.2	5.6	5.6	5.3	3.3
Upper and ENT respiratory infections	0.8	1.0	1.1	1.0	1.0	1.1	1.1	1.2	1.2	1.1	0.6
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand

Appendix 14: Ethnic-specific rates of ASH by condition in children aged 5-14 years in Northland DHB

Table 61 Rate of ASH/1000 by condition, by year for Maaori children aged 5-14 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.5	0.4	0.4	0.4	0.4	0.4	0.2	0.4	0.4	0.3	0.2
Cellulitis	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Constipation	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
Dental conditions	1.0	1.3	1.3	1.3	1.2	1.3	1.6	1.4	1.4	1.6	1.2
Dermatitis and eczema	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Non-ASH	4.6	4.8	4.8	4.7	4.7	5.0	4.3	5.0	4.9	4.8	4.0
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.0
Rheumatic fever/heart disease	0.1	0.2	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.0
Total ASH	2.6	2.9	2.9	3.0	2.7	2.7	2.5	2.8	2.9	2.9	2.0
Upper and ENT respiratory infections	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1

Table 62 Rate of ASH/1000 by condition, by year for Pacific children aged 5-14 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.2	0.5	0.3	0.0	0.5	0.0	0.0	0.0	0.4	0.1	0.1
Cellulitis	0.7	0.7	0.7	0.0	0.0	0.3	0.0	0.4	0.0	0.2	0.0
Constipation	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.1	0.1	0.0
Dental conditions	0.5	1.0	0.5	0.8	0.8	0.7	0.8	1.1	1.3	1.0	1.8
Dermatitis and eczema	0.0	0.2	0.2	0.0	0.2	0.0	0.0	0.1	0.1	0.0	0.0
Gastroenteritis/dehydration	0.0	0.2	0.3	0.3	0.0	0.2	0.0	0.0	0.4	0.0	0.0
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Kidney/urinary infection	0.5	0.2	0.0	0.0	0.2	0.5	0.3	0.4	0.0	0.1	0.1
Non-ASH	2.8	4.0	1.8	3.0	3.9	4.8	3.2	1.7	2.3	4.3	2.4
Pneumonia	0.0	0.2	0.2	0.0	0.0	0.2	0.2	0.1	0.0	0.1	0.0
Rheumatic fever/heart disease	0.0	0.3	0.0	0.2	0.0	0.0	0.2	0.1	0.1	0.0	0.0
Total ASH	1.9	3.4	2.3	1.3	1.7	2.5	1.7	2.6	2.6	1.9	2.0
Upper and ENT respiratory infections	0.0	0.2	0.2	0.0	0.0	0.3	0.0	0.1	0.0	0.1	0.0

Table 63 Rate of ASH/1000 by condition, by year for Asian children aged 5-14 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.4	0.0	0.2	1.0	0.2	0.3	0.4	0.4	0.2	0.2	0.2
Cellulitis	0.2	0.0	0.5	0.5	0.2	0.1	0.1	0.6	0.0	0.1	0.0
Constipation	0.0	0.0	0.2	0.2	0.2	0.0	0.3	0.3	0.0	0.0	0.3
Dental conditions	1.5	0.9	0.7	1.3	1.1	1.0	1.1	0.6	0.6	1.0	1.2
Dermatitis and eczema	0.0	0.7	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.0	0.3	0.6	0.3	0.4	0.5	0.1	0.3	0.0
Kidney/urinary infection	1.1	1.1	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0
Non-ASH	2.9	5.1	1.4	1.7	2.9	1.9	3.8	2.4	2.6	2.7	2.0
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0
Pneumonia	0.4	0.0	0.0	0.2	0.3	0.1	0.1	0.3	0.0	0.2	0.0
Total ASH	3.6	2.9	1.8	3.5	2.6	2.2	2.7	3.6	1.3	2.0	1.7
Upper and ENT respiratory infections	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.2	0.1	0.0

Table 64 Rate of ASH/1000 by condition, by year for European/Other children aged 5-14 years in Northland DHB (rounded to 1dp)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asthma	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.1
Cellulitis	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1
Constipation	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dental conditions	0.5	0.6	0.7	0.6	0.5	0.8	0.7	0.8	0.8	0.9	0.8
Dermatitis and eczema	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gastroenteritis/dehydration	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.1
GORD (Gastro-oesophageal reflux disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kidney/urinary infection	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Non-ASH	4.2	4.7	5.2	5.5	5.5	6.5	6.3	5.6	6.4	5.0	4.6
Nutrition deficiency and anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other vaccine preventable disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pneumonia	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.0
Rheumatic fever/heart disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ASH	1.5	1.8	1.6	1.7	1.6	2.0	2.0	2.1	2.1	2.1	1.3
Upper and ENT respiratory infections	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.0
Vaccine preventable MMR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data source: NMDS, Ministry of Health, Estimated populations by DHB (2021 version), Statistics New Zealand