West Auckland Integrated Care Project
Locality and Cluster Level Analysis
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Foreword

A locality is defined as a geographic area that encompasses all people usually resident in the area. A locality approach aims to place local communities at the heart of health service planning and delivery, and better co-ordinate and integrate health services at the locality level. This report was commissioned as a contribution to the on-going locality planning work underway in West Auckland.

The West Auckland locality consists of a diverse population in terms of ethnicity, age, deprivation, and health need. In 2011 about 242,000 people lived in the West Auckland locality and the population is growing rapidly.
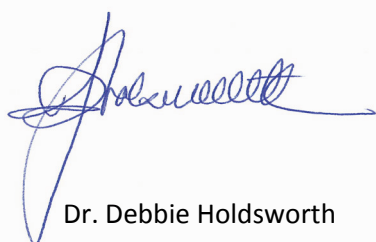
This locality and cluster profile makes a valuable contribution to an understanding of the particular health needs in and within West Auckland, and will be of use in informing health planning at the locality and the cluster level.

Three clusters of practices have been presented in this profile to provide an insight into the differences within the West Auckland locality itself.

The New Lynn cluster is the largest of the clusters and has the highest proportion of older people. The Massey cluster is the smallest with the highest proportion of children. The Henderson cluster has the largest proportion of Maori/Pacific population and across a number of measures is shown to have the highest health need of the three clusters.

The information provided in this profile serves to reinforce the focus on planning around child health, diabetes, and urgent care for the West Auckland locality. The methods established will certainly benefit future locality planning work.

Many thanks to Sam Martin and Dr Lifeng Zhou for bringing this report to completion and the resource that it provides in the on-going locality planning work in West Auckland.

Dr. Debbie Holdsworth

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Executive Summary

Introduction

This executive summary briefly describes the aims, methods, and content of this West Auckland locality and cluster analysis. It also includes a brief summary of the demography and health status of the West Auckland locality population and the populations of the three clusters within West Auckland; Henderson, Massey, and New Lynn.

Aims

The purpose of this locality and cluster analysis is to describe the health needs and population characteristics of the West Auckland locality and practice clusters. The report attempts to describe the health needs of these groups through looking at different aspects of the population groups of interest including demographics, social and economic factors, health status, disease and risk factor prevalence/incidence and utilisation of health services.

Methods

This report was written using routinely collected data and results from published national surveys and statistical reports. Most information was of a quantitative nature. Some detail is provided below outlining particular methods used in the analysis of the data:

Age Standardisation: Many rates presented below are age-standardised. The rates are age-standardised using the WHO standard population. By taking age-specific rates for each population and applying these to the same standard hypothetical population by age group a valid comparison between each population can be made which accounts for the difference in the populations' respective age structures.

Data Matching: For the cluster analysis the population of each cluster is determined by the aggregated enrolled populations of the general practices associated with each cluster. To determine each cluster's access of secondary services, PHO Enrolment data has then been linked with secondary services data by encrypted NHI. While practice registers will change over time, for the purposes of this analysis the cluster populations were determined by a snapshot of the enrolled population as at 2012 Quarter 1.

Summary of Findings:

Locality Level Summary

West Auckland includes Waitakere and Whau wards, and is made up of three local boards: Henderson & Massey, Waitakere Ranges and Whau. Whau is shared between Auckland District Health Board (DHB) and Waitemata DHB which accounts for 45% of the Whau population. The estimated population of West Auckland as at 30 June 2011 was 241,780, which was approximately 16% of the population in Auckland. According to Census 2006, West Auckland had a slightly younger population than Waitemata DHB as a whole, though they had similar age structures otherwise. West

Auckland was also diverse in ethnicity with higher proportions of Maori, Pacific and Asians ('Other': 57% in West Auckland and 71% in Waitemata DHB). More people lived in deprived areas in West Auckland than the DHB as a whole. West Auckland has historically grown and is projected to grow at a faster rate than the total DHB (37% vs. 32% over 20 years). This population is also ageing, with the 65+ population to increase from 9% of the total to 14% (cf. WDHB, 11% to 17%) from 2006 to 2026.

Regarding the health determinants, there is no data available at locality level except for smoking; therefore WDHB data has been used as a proxy. 19% of West Auckland adults (15+ years) smoked, according to Census 2006. Approximately 8% of the Waitemata DHB adult population took medication for high cholesterol in NZHS 06/07, while the rate was 14% for treating high blood pressure in this population. 6% of children and 21% of adults in Waitemata DHB were obese in the 2006/07 survey. 16% of Waitemata DHB adult population had hazardous drinking in the survey. Only 56% of Waitemata DHB adults had an adequate vegetable intake and 47% of the adults had regular physical activities.

Based on three years mortality data (2007-2009), the life expectancy at birth for West Auckland was 81 years, lower than 83 years for the DHB. There was also variation in life expectancy between ethnicities, with Maori/Pacific having the lowest figures (76 years for Maori and 77 years for Pacific). West Auckland had a higher PAM of 112 per 100,000 than Waitemata DHB (92 per 100,000). Coronary disease/cerebrovascular disease, suicide and diabetes were the top three conditions for adults. 4% and 5% of Waitemata DHB adults had diagnosed diabetes and diagnosed ischaemic heart disease in the 2006/07 survey. Close to 10% of the Waitemata DHB adult population took medications for asthma in the NZ Health Survey.

97% of the Waitemata children and 93% of the DHB's adults had a primary health care provider in the national health survey. About 94% of the Waitemata DHB population was enrolled with a primary health organisation (PHO) as of Quarter 1, 2012, while Asian had the lowest PHO enrolment rate (75%), with combined Maori/Pacific rate being 85%. West Auckland had a higher pharmaceutical utilisation than the DHB as a whole (7.6 scripts vs. 6.9 scripts per person); however, for laboratory use, the average was 5.2 laboratory tests per person for West Auckland while it was 5.4 for the DHB as a whole.

For secondary care services, the age standardised rate of PAH for West Auckland was much higher (3,915 per 100,000) than the WDHB total (3,151 per 100,000). The top three PAH conditions were angina/chest pain, cellulitis and myocardial infarction (data 2009-2011). The order of the top ten PAH conditions varied across ethnicities. Just like the PAH rate, West Auckland also had a higher ASH rate compared with Waitemata as a whole (2,891 per 100,000 vs. 2,242 per 100,000). The admission rates for CVD and diabetes as primary diagnoses were also higher for West Auckland adults than the DHB total (1,900 and 336 per 100,000 for West Auckland, vs. 1,563 and 228 per 100,000 for WDHB total). However, there was no significant difference of mental health admissions between the two. West Auckland had a higher rate of outpatient visits (medical/surgical FSAs and follow-ups) in 2010/11, and also with ED attendances (22.4% vs. 19.1%). The age standardised elective surgery rate was also higher for West Auckland than the DHB total (3,142 per 100,000 vs. 2,718 per 100,000).

The infant mortality rate for West Auckland was 3.9 per 100,000 live births for 2007-2009 (c.f. 3.1 per 100,000 live births for WDHB). West Auckland also had higher rates for SUDI and child mortality, child PAM and low birth weight, but the differences were not significant. Asian seemed to have a higher rate for low birth weight, which may be mainly associated with South Asian. About 93% of West Auckland children had immunisation at two years, though there was variation across ethnicities. Approximately 14% of WDHB children took medication for asthma in the 2006/07 survey. The age standardised rate for asthma admissions was higher for West Auckland (683 per 100,000),

compared with WDHB total (559 per 100,000). West Auckland children also had a higher age standardised rate for rheumatic fever admissions, but the difference was not significant. However, there was a slightly lower age standardised rate for injury admissions for West Auckland. West Auckland had higher child PAH and ASH rates than the WDHB total for 2009-2011 (4,639 and 3,377 per 100,000 for West Auckland 3,899 and 2,849 per 100,000 for WDHB total). Finally, the age standardised rate for dental caries and oral health admissions was higher for West Auckland as well (643 and 566 per 100,000 for West Auckland and WDHB total respectively).

Cluster Level Summary

There are three clusters in the West Auckland Integrated Care Project: Henderson (14 practices), Massey (7 practices) and New Lynn (22 practices). The enrolled populations as at Q1 2012 were 81911, 31087 and 105192 for Henderson, Massey and New Lynn respectively. New Lynn had the highest proportion of 65+ years old, while Massey the highest proportion of children (25%). Henderson cluster had the largest proportion of Maori/Pacific (34%) and Massey the smallest (18%). The Maori/Pacific population was also younger than the total across the three clusters (close to one third children). Massey cluster was the least deprived and Henderson the most deprived. Not surprisingly, Henderson had the highest proportion of 'high needs' (43%) and Massey the lowest (23%). Massey cluster has grown the fastest compared with Q1 2007 (15% from Q1 2007 to Q1 2012), and Henderson has had the largest increase in enrolment in absolute terms.

As for secondary care services, Henderson had the highest ASR PAH of the three clusters. The top three PAH conditions were angina and chest pain, cellulitis and myocardial infarction across the three clusters. Similar to ASR PAH, Henderson again had the largest ASR ASH. The top three ASH conditions were angina and chest pain, cellulitis and gastroenteritis & dehydration across the three clusters. Henderson cluster had the highest age standardised rates for CVD, diabetes and mental health admissions (as primary diagnosis) during 2009-2011. The cluster with the largest ASR for elective surgery was Henderson, while the other two clusters had quite similar rates. Henderson cluster had the largest ASR for emergency department attendances in 2009/10.

When we look at child health, similar to adult ASR PAH, Henderson had the highest rate for age standardised PAH for children. The order of the top ten PAH conditions for children varied across clusters, but the top five conditions were generally asthma, respiratory infections – acute bronchitis, gastroenteritis, cellulitis and respiratory infections – pneumonia. Maori/Pacific had higher proportions of ASH/PAH of total acute admissions across clusters. Just like ASR PAH, Henderson had the highest ASR ASH with Massey the lowest. The three clusters had similar ASR for asthma, but Henderson had the highest ASR for injury. Falls and exposure to inanimate mechanical forces were the top two categories of injury hospitalisations (approximately 45% and 24% respectively) during 2009-2011. The numbers for rheumatic fever admissions were too small to make any useful comparisons between the three clusters. Henderson had a slightly higher ASR for dental caries and oral health admissions, but the difference was not significant. Again, Henderson cluster had the highest ASR for ED attendances, followed by New Lynn.

Cluster Highlights

Henderson

81,900 people (14 practices) (38% of the 3 clusters)

Highest proportion of Maori/Pacific (34%)

Highest proportion 'High Needs' (43%)

Highest age-standardised PAH and ASH rate for adults and children

Top 3 ASH conditions: angina & chest pain, cellulitis, and gastroenteritis & dehydration

Highest age-standardised adult hospitalisation rate for CVD, Diabetes, and Mental Health

Highest rate of ED attendance for adults and children

Massey

31,100 people (7 practices) (14% of the 3 clusters)

Lowest proportion of Maori/Pacific (18%)

Highest proportion of children (0-14) (25%)

Smallest proportion 'High Needs' (23%)

Top 3 ASH conditions: angina & chest pain, cellulitis, and gastroenteritis & dehydration

Lowest age-standardised PAH and ASH rate for children

New Lynn

105,200 people (22 practices) (48% of the 3 clusters)

Proportion of Maori/Pacific (18%)

Highest proportion 65+ (12%)

Most deprived (20% Decile 9 & 10)

Top 3 ASH conditions: angina & chest pain, cellulitis, and gastroenteritis & dehydration

Highest age-standardised asthma hospitalisation rate for children

Acknowledgments

Abbreviations

ASH	Ambulatory Sensitive Hospitalisations
ARF	Acute Rheumatic Fever
ASR	Age-Standardised Rate
BMI	Body Mass Index
CI	Confidence Interval
COPD	Chronic Obstructive Pulmonary Disease
CORD	Chronic Obstructive Respiratory Disease
CVD	Cardiovascular Disease
DHB	District Health Board
ED	Emergency Department
GP	General Practitioner
HNA	Health Needs Assessment
ICD	International Classification of Disease
MoH	Ministry of Health
NHI	National Health Index
NMDS	National Minimum Data Set
NZ	New Zealand
NZDep	New Zealand Deprivation Index
NZHS	New Zealand Health Survey
PAH	Potentially Avoidable Hospitalisation
PAM	Potentially Avoidable Mortality
PHO	Primary Health Organisation
SNZ	Statistics New Zealand
SUDI	Sudden Unexpected Death in Infancy
WDHB	Waitemata District Health Board
WHO	World Health Organisation

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Locality Level Profile
1. Population Demographics

1.1 Boundaries of West Auckland Locality

There are three localities in Auckland: West Auckland, North Auckland and Central Auckland. The map below shows West Auckland's place in the context of the greater Auckland area. The West Auckland locality includes two wards: Waitakere and Whau. About half of the Whau ward is within the boundaries of ADHB and half within WDHB. Within these two wards there are three local boards: Henderson & Massey, Waitakere Ranges, and Whau. (See maps 1 – 3 below).

Map 1: Auckland Region by Local Board
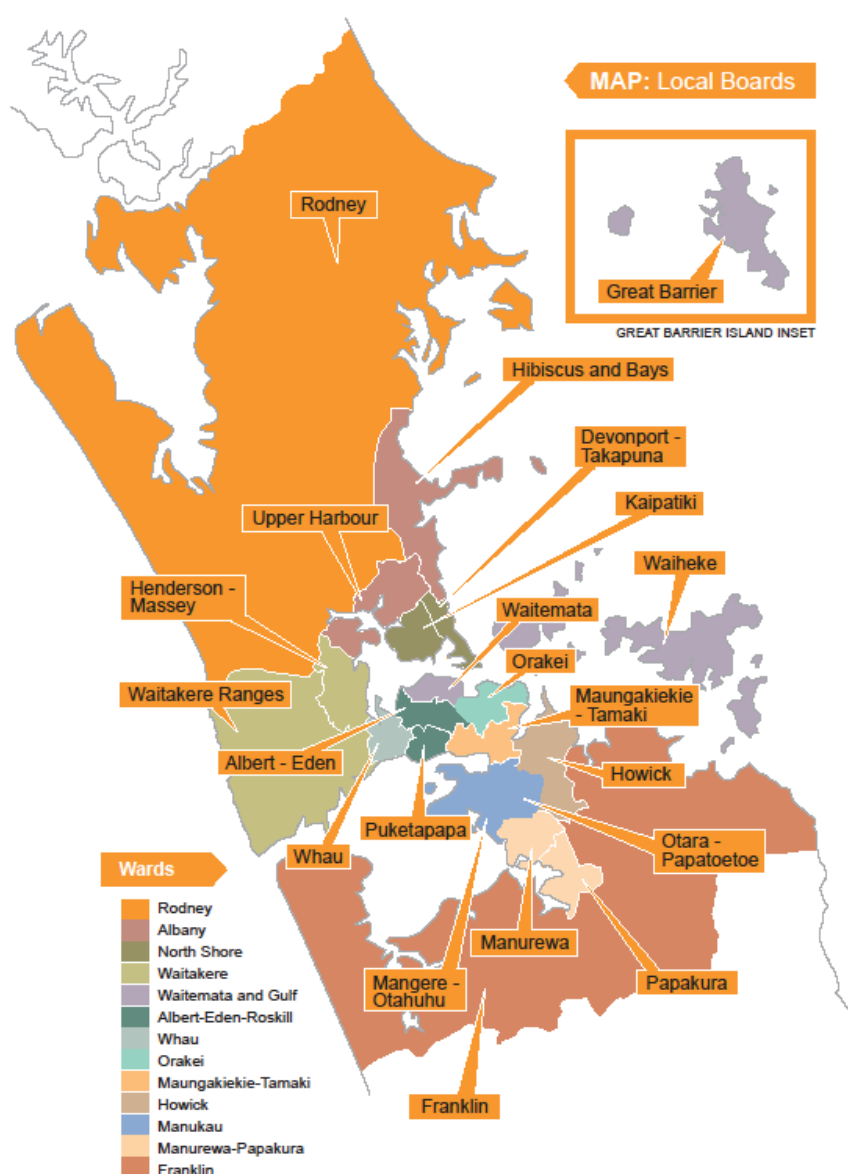
Map 2: Waitakere Ward
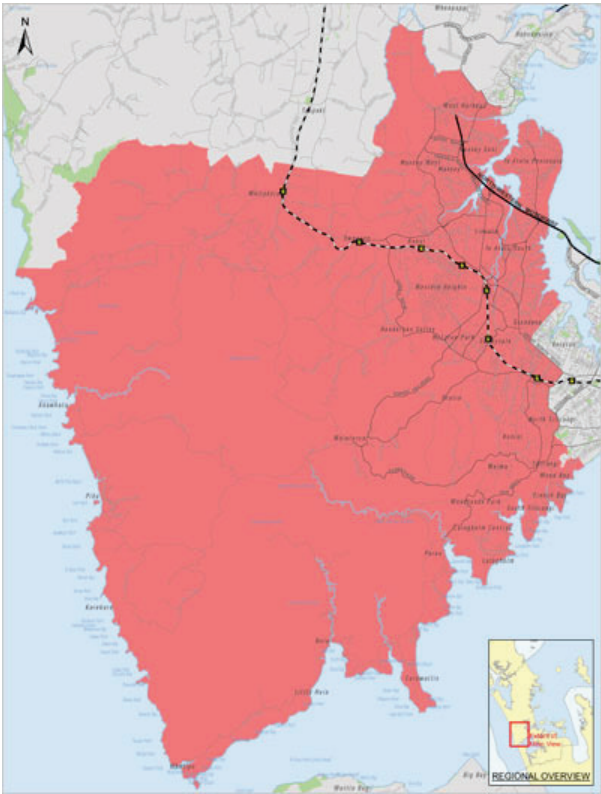
Source: Auckland Council, 2011

Map 3: Whau Ward
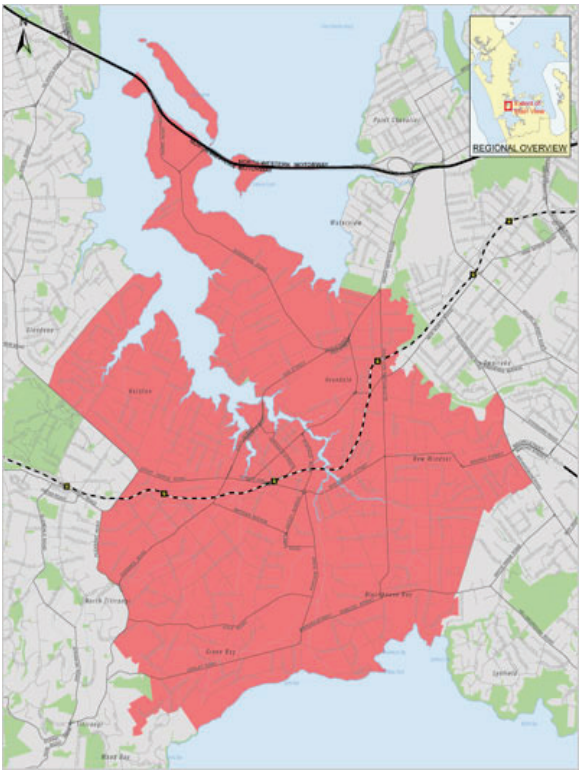
Source: Auckland Council, 2011

1.2 Population Estimate 2011

The estimated population of West Auckland at 30 June 2011 was 241,780 (Stats NZ, Estimated Subnational Population, 2011). This made West Auckland's population about 16% of the Auckland Region as a whole. 65% of the West Auckland population resided in the Waitakere Ward and 35% in the Whau Ward.

Table 1: Population Estimate 2011 by Age, West Auckland, Waitemata DHB, Auckland Region

Age	West Auckland	Waitemata DHB	Auckland Region
0-14	53,600	112,660	309,830
15-39	89,730	188,350	557,830
40-64	73,690	178,850	461,800
65+	24,680	65,780	156,630
Total	241,780	545,710	1,485,980

Source: Stats NZ, Estimated Subnational Population 2011

1.3 Population by Age and Gender – Census 2006

Census 2006 numbers showed West Auckland to have a child population (0-14) of about 50,000; this made up 23% of the total West Auckland population. The 65+ age group made up 10% of the total.

Note: The Census 2006 totals are clearly less than the 2011 estimates above on account of a five year difference. Also, population totals throughout the report may vary insignificantly. This is due to the rounding of numbers at low levels in line with StatsNZ confidentiality policies.

Table 2: West Auckland Locality by Age and Gender – Census 2006

Age	Male	Female	Total
0-14	25,215	24,021	49,221
15-24	15,618	15,375	30,978
25-44	31,521	34,716	66,186
45-64	21,576	23,094	44,652
65+	9,090	11,439	20,553
Total	103,071	108,591	211,677

Source: Stats NZ, Census 2006

Waitemata DHB as a whole had a similar age structure to West Auckland - West Auckland's population being proportionately slightly younger. Census 2006 numbers showed Waitemata DHB to have a child population (0-14) of about 105,000; this made up 22% of the total Waitemata DHB population. The 65+ age group made up 11% of the total.

Table 3: Waitemata DHB by Age and Gender – Census 2006

Age	Male	Female	Total
0-14	53,514	50,982	104,553
15-24	34,425	33,273	67,707
25-44	67,938	75,120	143,034
45-64	54,897	58,359	113,184
65+	23,481	29,409	53,001
Total	234,441	247,161	481,641

Source: Stats NZ, Census 2006

Table 4: West Auckland and WDHB - % Population by Age – Census 2006

Age	West Auckland	WDHB
0-14	23%	22%
15-24	15%	14%
25-44	31%	30%
45-64	21%	23%
65+	10%	11%
Total	100%	100%

Source: Stats NZ, Census 2006

Figure 1 below shows the similarities between the age structure of the West Auckland population and the Waitemata DHB population; West Auckland had a slightly younger population. However, these age structure differences vary widely by ethnicity.

Figure 1: West Auckland and WDHB – Population Structure Comparison – Census 2006
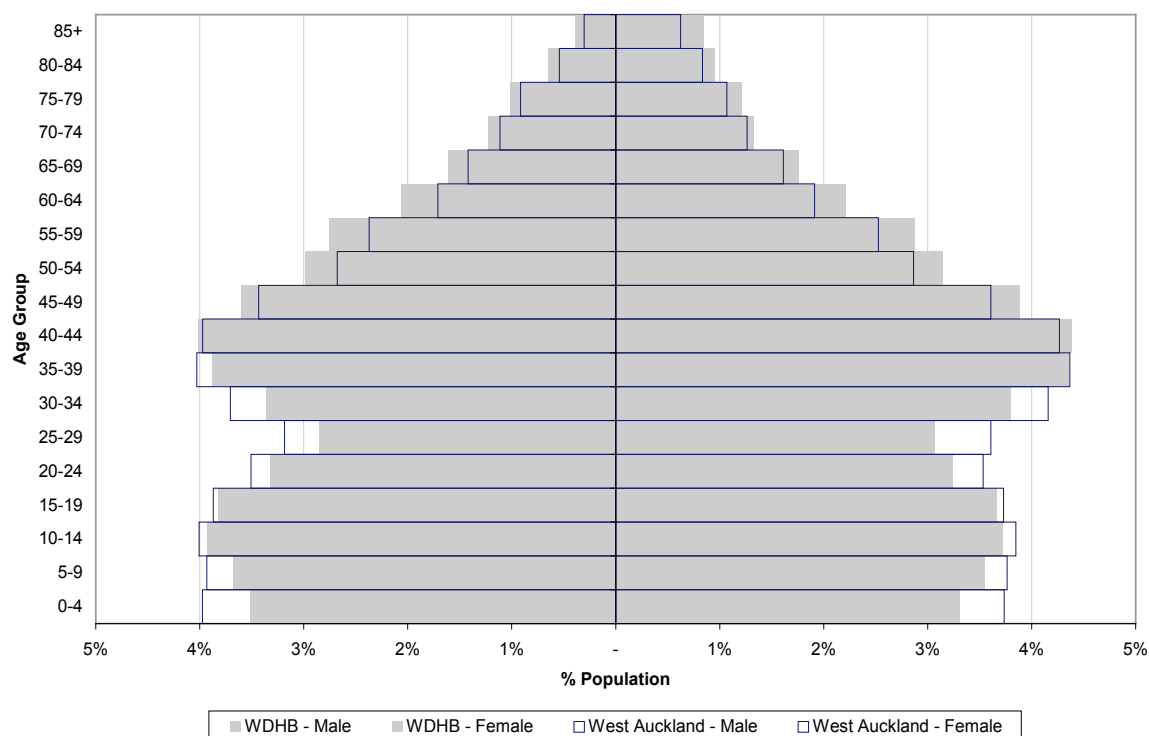
1.4 Population by Ethnicity and Age – Census 2006

Tables 5 and 6, as well as Figure 2, show West Auckland to have a greater proportion of Maori, Pacific, and Asian population as compared to the population of Waitemata DHB. (See Appendix 2 for an outline of the concept of "prioritised ethnicity"). A clearly evident feature of West Auckland's population is its ethnic diversity.

Table 5: West Auckland and WDHB, Population by Ethnicity (Prioritised) – Census 2006

Ethnicity	West Auckland	WDHB	% West Auckland	% WDHB
Maori	24,906	42,876	12%	9%
Pacific	29,361	30,426	14%	6%
Asian	37,278	66,261	18%	14%
Other	120,111	341,991	57%	71%
Total	211,659	481,602	100%	100%

Source: Stats NZ, Census 2006

Figure 2: West Auckland and WDHB, % Population by Ethnicity (Prioritised) – Census 2006
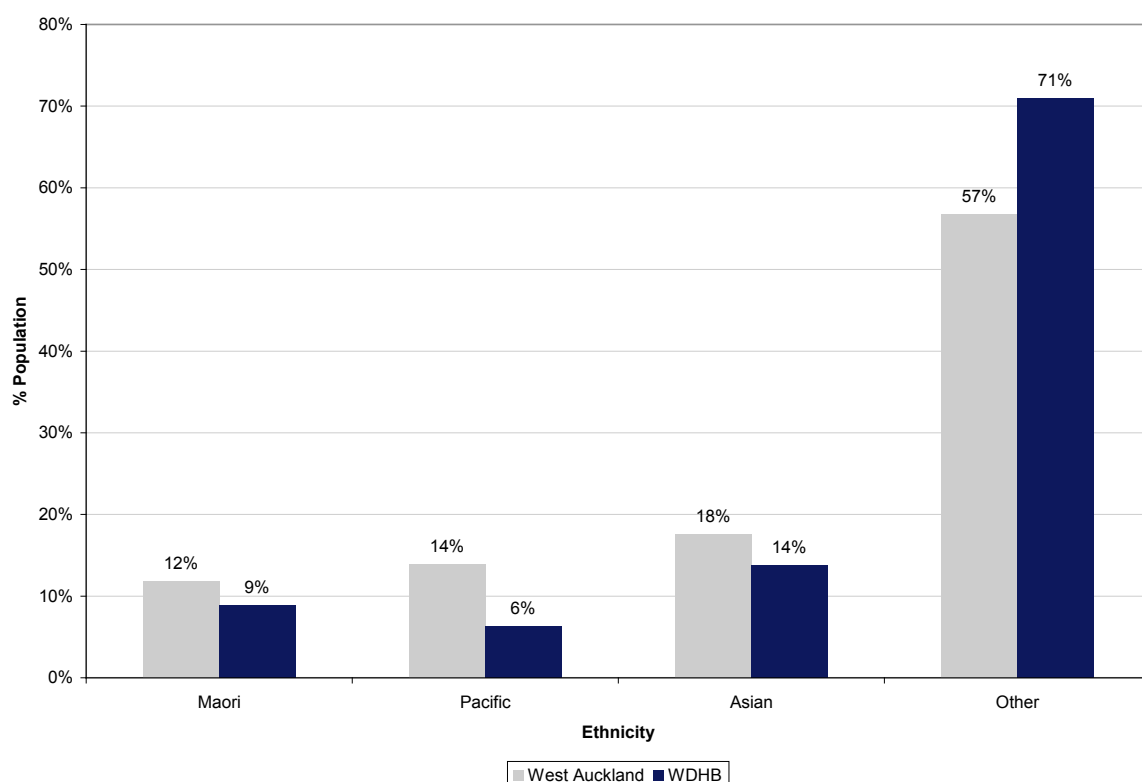
Maori and Pacific populations in West Auckland have a much larger proportion of children and smaller proportion of older adults when compared to "Other" ethnic groups. Similar age structure differences by ethnic group are seen in the Waitemata DHB population. (See Tables 6 to 9 below).

Table 6: West Auckland by Ethnicity (Prioritised) and Age – Census 2006

Age	Maori	Pacific	Asian	Other	Total
0-14	9,123	9,687	8,313	22,062	49,224
15-24	4,533	5,118	6,924	14,346	31,002
25-44	7,080	8,604	13,578	36,963	66,228
45-64	3,450	4,626	6,744	29,805	44,670
65+	696	1,290	1,710	16,629	20,529
Total	24,906	29,361	37,278	120,111	211,659

Source: Stats NZ, Census 2006

Table 7: West Auckland by Ethnicity (Prioritised) and Age % – Census 2006

Age	Maori	Pacific	Asian	Other	Total
0-14	37%	33%	22%	18%	23%
15-24	18%	17%	19%	12%	15%
25-44	28%	29%	36%	31%	31%
45-64	14%	16%	18%	25%	21%
65+	3%	4%	5%	14%	10%
Total	100%	100%	100%	100%	100%

Source: Stats NZ, Census 2006

Table 8: Waitemata DHB by Ethnicity (Prioritised) and Age – Census 2006

Age	Maori	Pacific	Asian	Other	Total
0-14	15,324	10,146	14,457	64,425	104,535
15-24	7,851	5,238	13,344	40,881	67,689
25-44	12,318	9,033	22,980	98,529	143,097
45-64	6,126	4,548	12,564	89,811	113,283
65+	1,065	1,041	2,688	47,412	52,944
Total	42,876	30,426	66,261	341,991	481,602

Source: Stats NZ, Census 2006

Table 9: Waitemata DHB by Ethnicity (Prioritised) and Age % – Census 2006

Age	Maori	Pacific	Asian	Other	Total
0-14	36%	33%	22%	19%	22%
15-24	18%	17%	20%	12%	14%
25-44	29%	30%	35%	29%	30%
45-64	14%	15%	19%	26%	24%
65+	2%	3%	4%	14%	11%
Total	100%	100%	100%	100%	100%

Source: Stats NZ, Census 2006

1.5 Population by Deprivation – Census 2006

The NZ Deprivation score provides a measure of relative socioeconomic deprivation for all areas in New Zealand. It is calculated by taking into account a variety of Census variables which reflect different dimensions of deprivation. The NZDep2006 score of 1 represents the least deprived areas and the score of 10 represents the most deprived areas. As this is a relative scale, by definition 10% of all mesh blocks (small geographical areas) in the country make up each NZDep2006 index score.

Figure 3 below shows that much of West Auckland's population lived in relatively deprived areas according to NZDep2006. About 65% of the population lived in the more deprived half of NZ areas (NZdep2006 scores 6 to 10). For Waitemata DHB the proportion was less; about 37% of the population lived in the most deprived half of areas.

Figure 3: West Auckland and WDHB, Proportion Population by NZDep2006 Decile - Census 2006

1.6
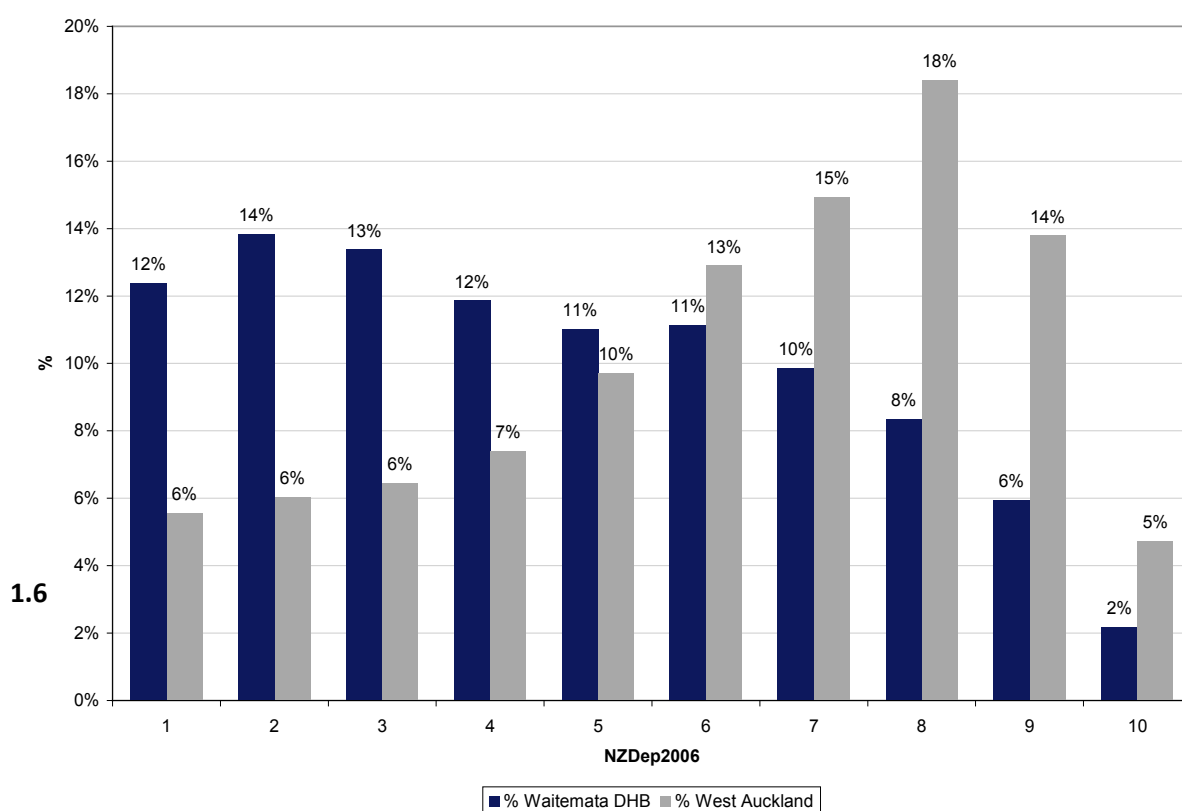
Population Growth and Projection

In the 10 years between 1996 and 2006 the West Auckland population grew by 25% (about 46,000 people). Looking ahead, current projections suggest that in the 20 years from 2006 to 2026 the West Auckland population will grow by a further 37% (about 87,000 people).

For the Waitemata DHB, in the 10 years between 1996 and 2006 the DHB's population grew by 23% (about 94,000 people). Looking ahead current projections suggest that in the 20 years from 2006 to 2026 the population will grow by a further 32% (about 160,000 people).

The comparison shows that West Auckland has historically grown, and is projected to continue to grow, at a faster rate than that of the WDHB population. (See Figure 4 below).

Figure 4: WDHB and West Auckland, Historic Population Growth and Population Projection
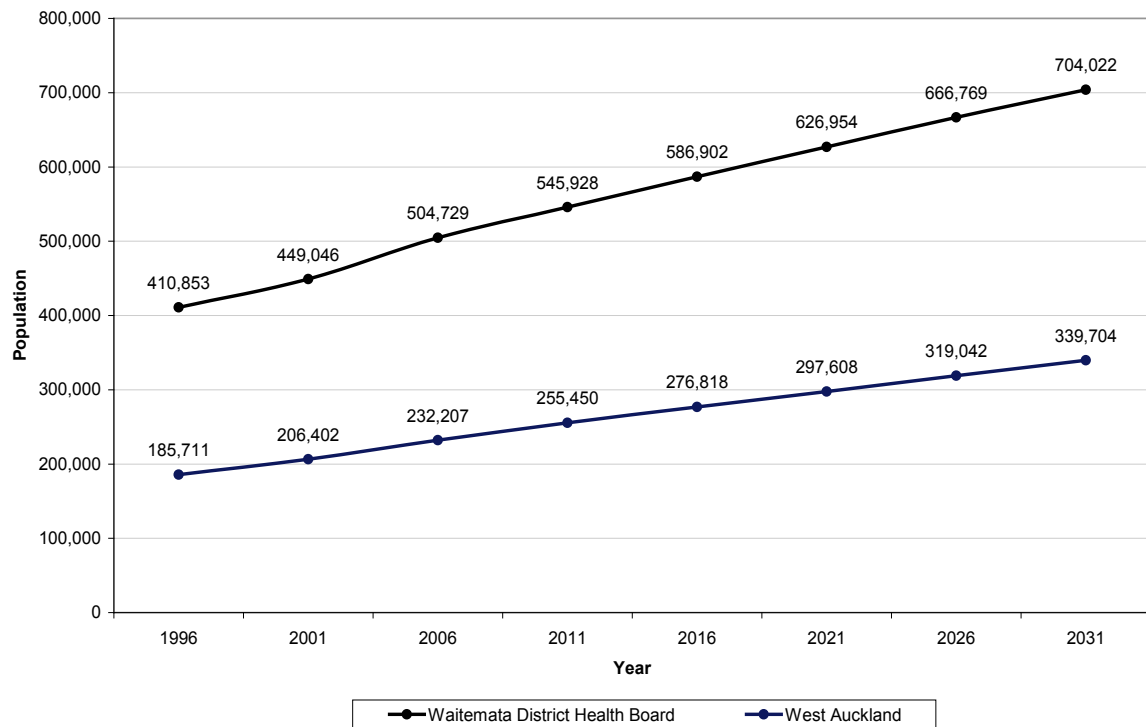
Importantly, current projections expect not only growth in West Auckland's total population but also aging. The 65+ population is expected to grow by about 22,000 people between 2006 and 2026; meaning the 65+ population of West Auckland would go from making up 9% of the total to 14% of the total. (See Figure 5 below)

Waitemata DHB's population is expected to face a similar change in age structure. The 65+ population is expected to grow by about 60,000 people between 2006 and 2026; meaning the 65+ population of Waitemata DHB would go from making up 11% of the total to 17% of the total. (See Figure 6 below)

Figure 5: West Auckland – Projected Age Structure Change – 2006-2026
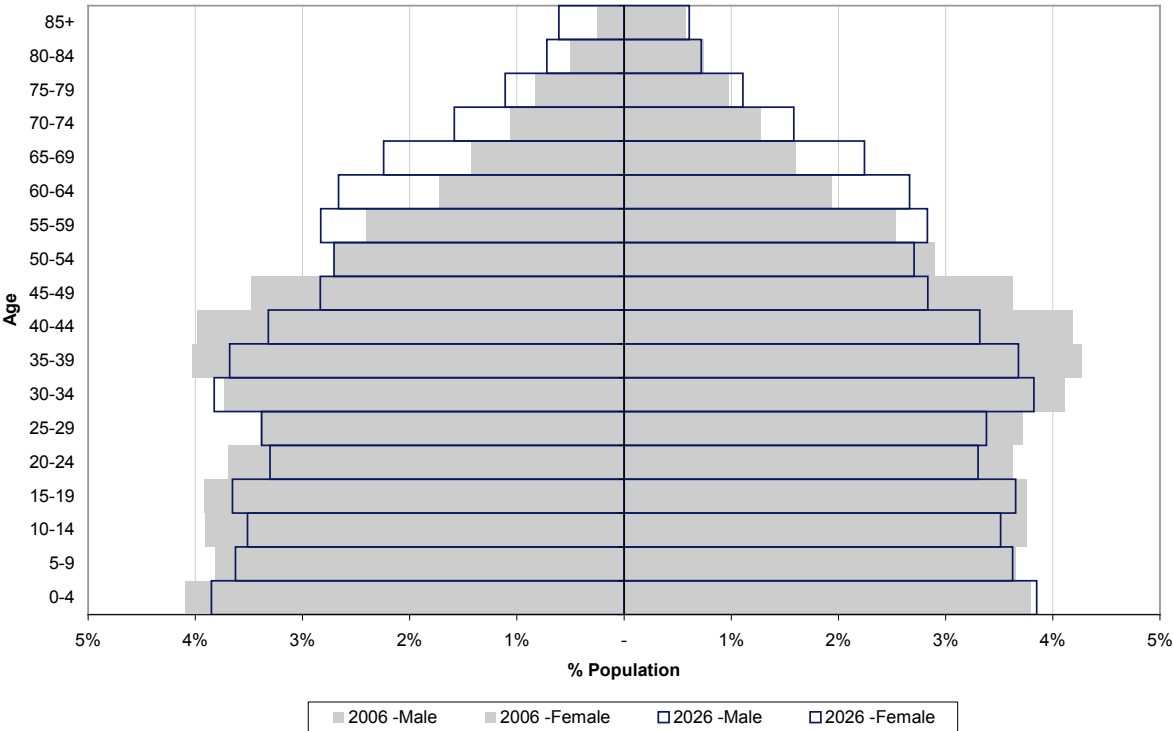
Figure 6: WDHB – Projected Age Structure Change – 2006-2026
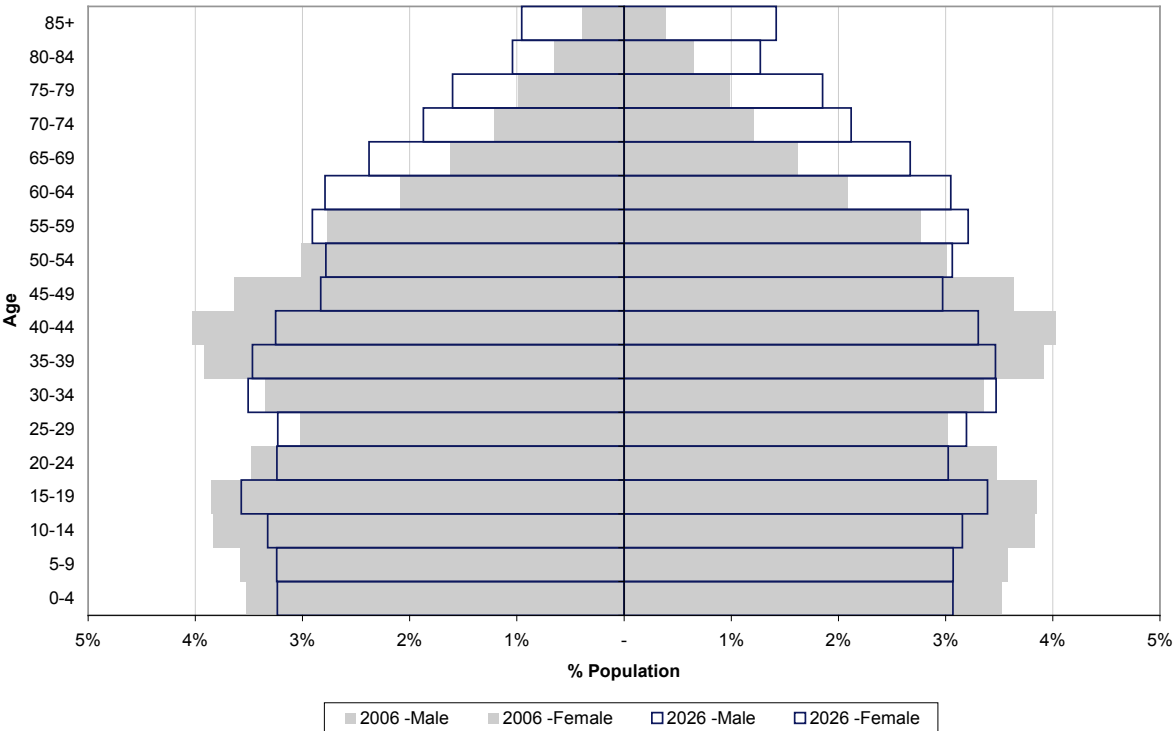
2 Health Determinants

Given that the New Zealand Health Survey 2006/07 data is not available by geographic identifiers because of confidentiality policies, the following picture of health determinants will be shown for Waitemata DHB as a whole only (with the one exception of smoking). This should at least give a general sense of the picture for West Auckland and surrounding areas. However, care should be taken in interpreting the numbers, especially given the information of the previous section which shows West Auckland to be both a more ethnically diverse and a more deprived population than Waitemata DHB's total. Given other results of the New Zealand Health Survey by ethnicity and NZDep2006 we would expect West Auckland's population to not fare as well as Waitemata's total in regards to a number of these health determinants measures. There may also be variations across ethnicities; however, these will not be included here as they have been included in the 2009 HNAs by Waitemata DHB (see Bibliography). Unless otherwise noted all measures are for the adult population (Age = 15+) and are unadjusted for differences in population structure.

2.1 Smoking

Census 2006 numbers show that of West Auckland adults (15+) 19% were regular smokers. This was a higher rate than that of the Waitemata DHB population where 16% of adults were regular smokers.

Table 10: West Auckland and WDHB Adult Smoking Status

Smoking Status	West Auckland	West Auckland %	WDHB	WDHB %
Regular Smoker	30,407	19%	60,180	16%
Ex-Smoker	27,557	17%	75,339	20%
Never Smoked Regularly	87,350	54%	210,348	56%
Not Elsewhere Included	17,084	11%	31,179	8%
Total	162,429	100%	377,058	100%

Source: Stats NZ, Census 2006

The New Zealand Health Survey revealed similar results for Waitemata's adult population and showed that a significantly smaller proportion of adults currently smoked as compared to the national rates.

Table 11: Prevalence of Adult Smokers, WDHB & NZ

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	15.3 (12.2–18.5)	58,000
New Zealand total	19.9 (18.9–20.8)	619,900

Source: 2006/07 NZHS

2.2 High Cholesterol and High Blood Pressure

About 8% of the Waitemata DHB adult population were noted to be taking medication for high cholesterol. This proportion was not significantly different than the proportion across New Zealand as a whole.

Table 12: % Adults Taking Medication for High Cholesterol, WDHB & NZ

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	8.3 (6.4–10.2)	31,600
New Zealand total	8.4 (7.7–9.0)	260,600

Source: 2006/07 NZHS

A higher proportion of WDHB adults were taking medication for high blood pressure; about 14%. Again this proportion was not significantly different from the proportion across New Zealand as a whole.

Table 13: % Adults Taking Medication for High Blood Pressure, WDHB & NZ

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	14.3 (11.8–16.8)	54,100
New Zealand total	13.6 (13.0–14.3)	425,500

Source: 2006/07 NZHS

2.3 Overweight and Obesity

Obesity in the New Zealand Health Survey was measured in line with international standard definitions defined by Body Mass Index cut-off points. The Survey provides the following definition of BMI:

"Body mass index (BMI) is a measure of weight adjusted for height, and is calculated by dividing weight in kilograms by height in metres squared (kg/m^2). BMI is used internationally to classify underweight, overweight and obesity. Since BMI does not distinguish between weight associated with muscle and weight associated with fat, it provides only a crude measure of body fatness in individuals. However, it does provide a good estimate of the proportion of the population with increased risk of health conditions associated with obesity (World Health Organization 2000)." (2006/07, NZHS)

The BMI cut-off points are different for adults (15+) and children. For children the cut-off points are age-specific. For children aged between 2 and 17, the BMI cut off points used were those developed by the International Obesity Taskforce (IOTF). These cut-off points define thinness, overweight and obesity and are sex and age-specific. (2006/07, NZHS)

Waitemata DHB had a significantly lower prevalence of obesity than the national total for both children and adults. The proportion of Waitemata DHB children defined as obese was about 6 % and for adults about 21%. (See Tables 14 and 15 below)

Table 14: % Children Obese, WDHB & NZ

Area	Prevalence (95% CI)	Number of children
Waitemata DHB	5.9 (3.4–8.3)	5,200
New Zealand total	8.3 (7.4–9.3)	61,700

Source: 2006/07 NZHS

Table 15: % Adults Obese, WDHB & NZ

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	20.5 (17.3–23.7)	77,600
New Zealand total	26.5 (25.5-27.5)	826,100

Source: 2006/07 NZHS

2.4 Alcohol Use

Hazardous drinking in the NZ Health Survey was defined by cut off points derived from the standard Alcohol Use Disorders Identification Test (AUDIT) questionnaire. This 10 question questionnaire was developed by the WHO and covers information such as the volume and frequency of alcohol consumed, alcohol-related problems, and abnormal drinking behaviour.

The prevalence of hazardous drinking amongst Waitemata adults was about 19% for the population of drinkers and 16% for the total adult population. These results were not significantly different from the New Zealand totals.

Table 16: % Adults Hazardous Drinkers, WDHB & NZ

Area	Prevalence for drinkers (95% CI)	Prevalence for total adults (95% CI)	Number of adults
Waitemata DHB	19.4 (15.8–22.9)	16.2 (13.2–19.2)	61,400
New Zealand total	21.1 (20.1–22.2)	17.7 (16.8–18.5)	551,300

Source: 2006/07 NZHS

2.5 Physical Activity

Being "regularly physically active" was defined in the NZ Health Survey as doing at least 30 minutes of physical activity per day on five or more days of the week. According to this measure about 47% of Waitemata DHB adults were regularly physically active. This was not significantly different from the New Zealand total.

Table 17: % Adults Regularly Physically Active, WDHB & NZ

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	46.7 (42.4–51.0)	176,900
New Zealand total	50.5 (49.2–51.9)	1,576,500

Source: 2006/07 NZHS

2.6 Fruit and Vegetable Consumption

Adequate vegetable intake was defined in the NZ Health Survey as an average intake of three or more servings of vegetables each day. According to this measure about 56% of Waitemata DHB adults had an adequate vegetable intake. This was a significantly lower prevalence than the New Zealand total.

Table 18: % Adults Adequate Vegetable Intake, WDHB & NZ

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	55.7 (51.1-60.3)	211,000
New Zealand total	64.1 (62.8-65.3)	1,999,300

Source: 2006/07 NZHS

Similarly, adequate fruit intake was defined in the NZ Health Survey as an average intake of the recommended two or more servings of fruit each day. The prevalence of adequate fruit intake for Waitemata DHB adults was about 62%. This was not significantly different from the New Zealand total prevalence.

Table 19: % Adults Adequate Fruit Intake, WDHB & NZ

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	61.6 (58.6–64.7)	233,500
New Zealand total	60.0 (58.8–61.3)	1,873,700

Source: 2006/07 NZHS

3 Health Outcomes

3.1 Life Expectancy

Life expectancy at birth is defined as the number of years a newborn would be expected to live based on today's pattern of death rates, the definition excludes stillbirths.

The life expectancy at birth for West Auckland, based on three years deaths from 2007 to 2009, was 81 years. Compared to this, the life expectancy at birth for the Waitemata DHB population as a whole over the same time period was 83 years.

The life expectancy for West Auckland males was about 79 and for females 83; both less than the corresponding Waitemata DHB life expectancies. (See Figure 7 below)

Figure 7: Life Expectancy at Birth – WDHB & West Auckland – 2007-2009 – By Sex
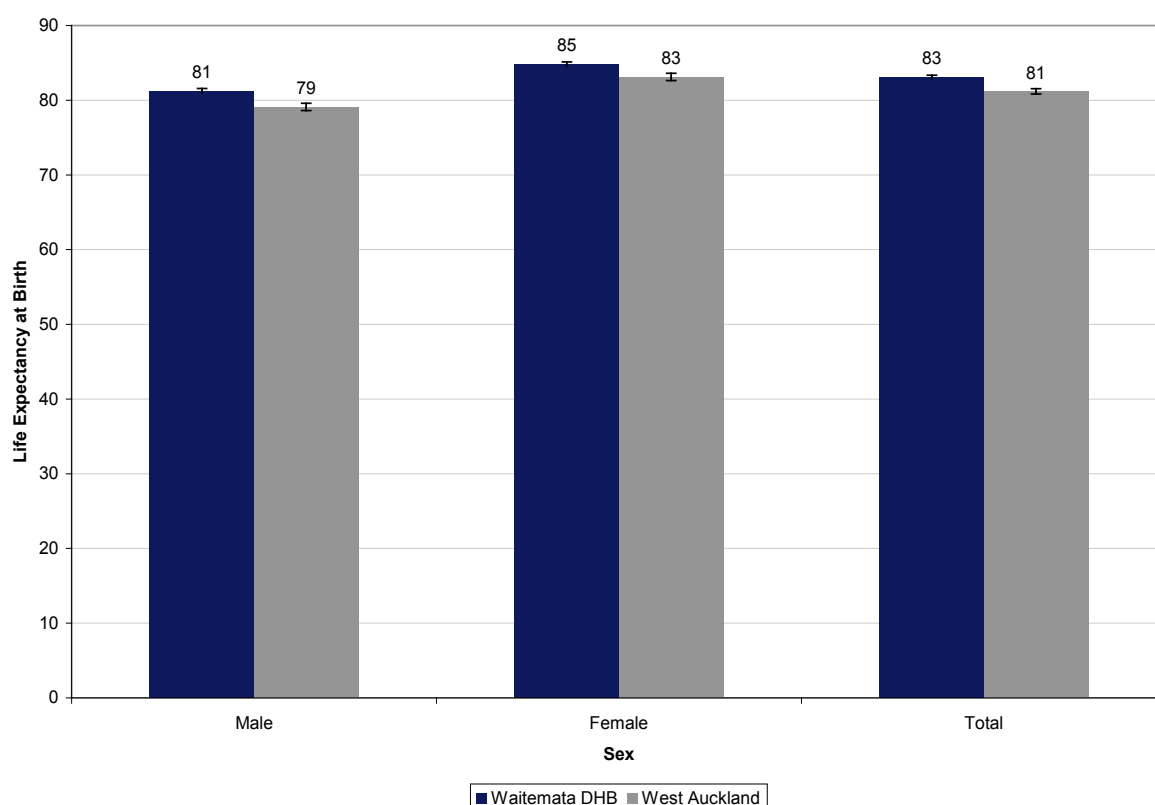
When looked at by ethnicity, both Maori and Pacific in West Auckland had lower life expectancies than the West Auckland total. Both the Maori and the Pacific population had a life expectancy of 76 years. The Asian population in West Auckland had a higher life expectancy than the total with a life expectancy of 84 (this could possibly be accounted for by the so-called "healthy migrant" effect).

Life expectancy by ethnicity was similar when comparing the Waitemata DHB total with West Auckland. However, the life expectancy of the DHB total for Asian was higher than that of West Auckland. (See Figures 8 and 9 below)

Figure 8: Life Expectancy at Birth – West Auckland, 2007-2009 – By Ethnicity
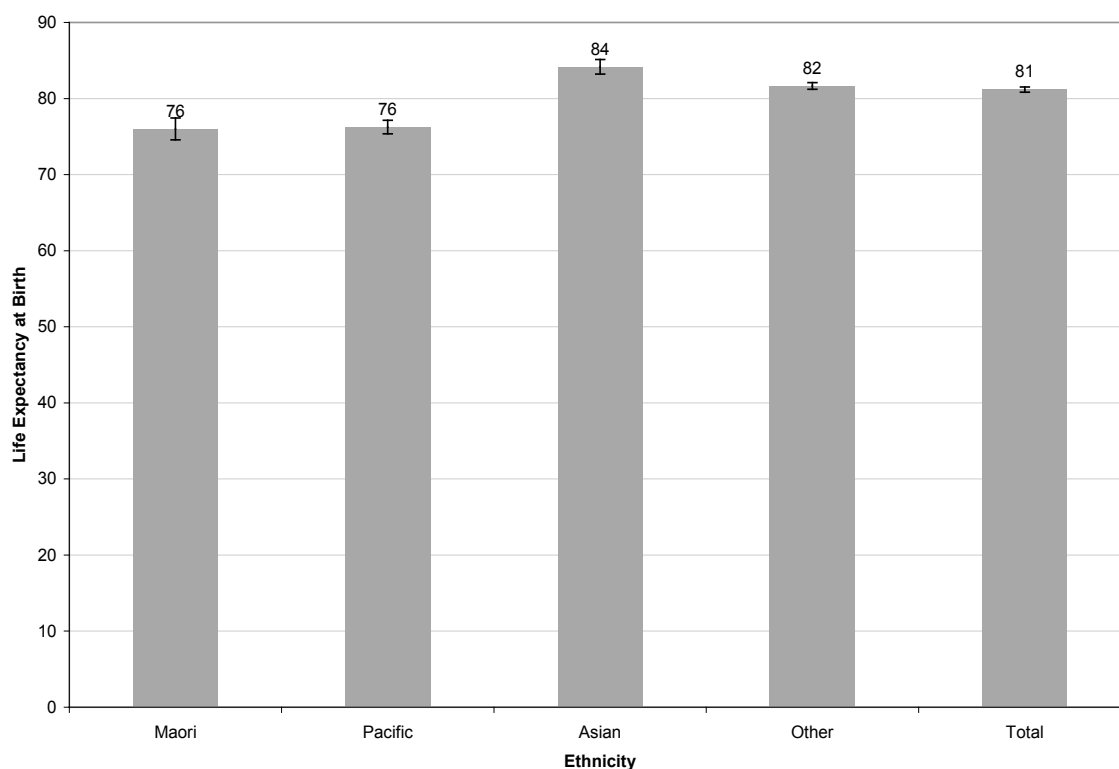
Figure 9: Life Expectancy at Birth – WDHB and West Auckland, 2007-2009 – By Ethnicity
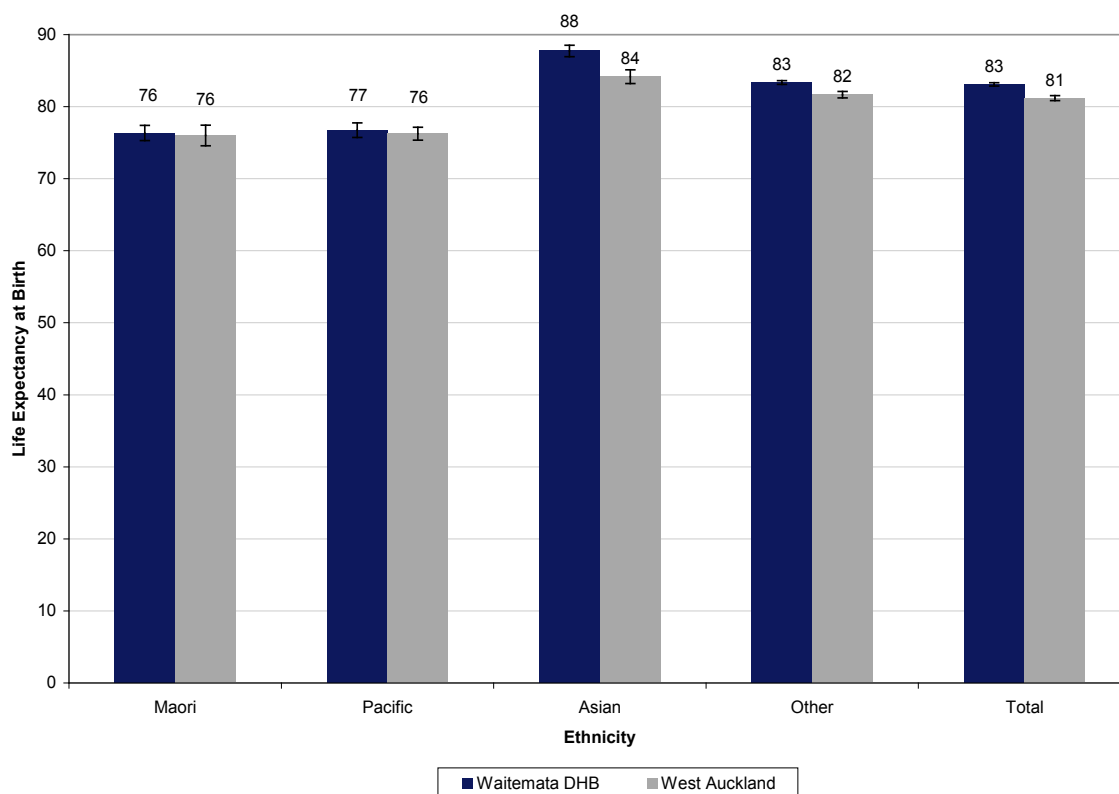
3.2 Potentially Avoidable Mortality

PAM is an indicator that seeks to show those deaths which occur from conditions determined to be either treatable or preventable (assuming current knowledge of health behaviour, health care, social and economic policy, and other factors). PAM numbers exclude deaths of people aged over 75 years as there is a high prevalence of multiple co-morbidities in this age group.

For the three years 2007-2009 there were 1,477 deaths of 15-74 year olds from the West Auckland population. Of these deaths, 42% (616) were considered potentially avoidable. This was the same proportion as seen among the Waitemata DHB population as a whole. However, Figure 10 shows that West Auckland had a higher PAM age standardised rate than that of Waitemata DHB; 112 per 100,000 compared with 92 per 100,000.

Figure 10: Adult (15-74 years) Age Standardised PAM Rate, WDHB and West Auckland, 2007-2009

Table 20 below shows the top 10 conditions which contributed to West Auckland Potentially Avoidable Mortality for adults.

Table 20: PAM by Condition (Top 10), 2007-2009 - West Auckland Adults (15-74)

PAM Condition	Deaths	% PAM
Coronary disease	142	23%
Suicide	80	13%
Diabetes	72	12%
Cerebrovascular diseases	71	12%
Cancer - Breast	59	10%
Road traffic accidents	34	6%
Cancer - Rectum	28	5%
Cancer - Stomach	23	4%
Valvular heart disease	21	3%
Cancer - Melanoma	19	3%
Other PAM	67	11%
PAM Total	616	100%

Figure 11 below shows the top 10 conditions which contributed to West Auckland PAM compared with how those same conditions were represented among Waitemata DHB's potentially avoidable deaths.

**Figure 11: % PAM by Condition (Top 10 West) – 2007-2009,
West Auckland compared with Waitemata Adults (15-74)**
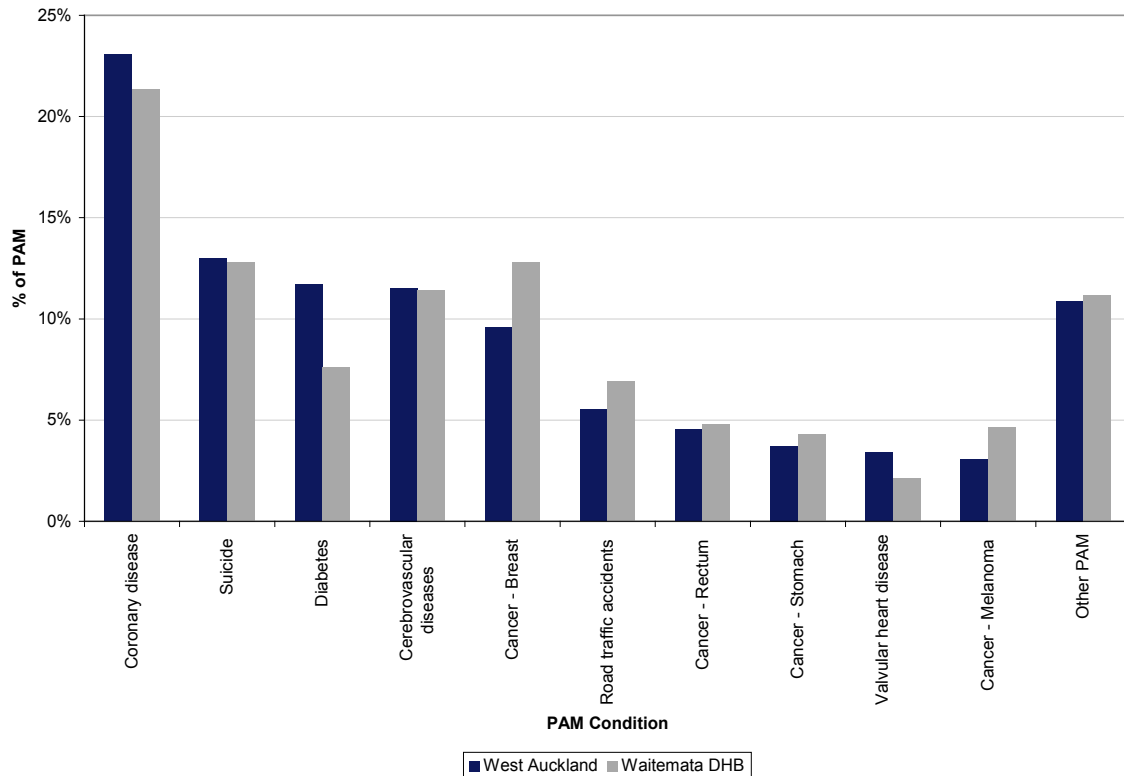
3.3 Prevalence of Diabetes

Similar to the Health Determinants section, given that New Zealand Health Survey 2006/07 data is not available by geographic identifiers because of confidentiality policies, the following picture of health determinants will be shown for Waitemata DHB as a whole only. Care should be taken in interpreting the numbers. Unless otherwise noted all measures are for the adult population (Age = 15+).

About 4% of the Waitemata DHB adult population had been diagnosed with diabetes. This proportion was not significantly different from the proportion across New Zealand as a whole.

Table 21: % Adults Diagnosed with Diabetes, WDHB & NZ – NZHS 06/07

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	4.0 (2.8–5.2)	15,200
New Zealand total	5.0 (4.6–5.5)	157,100

Source: 2006/07 NZHS

3.4 Prevalence of CVD

About 5% of the Waitemata DHB adult population had been diagnosed with Ischaemic Heart Disease (Angina or Heart Attack). Again, this proportion was not significantly different from the proportion across New Zealand as a whole.

Table 22: % Adults Diagnosed with Ischaemic Heart Disease, WDHB & NZ – NZHS 06/07

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	4.8 (3.3–6.3)	18,100
New Zealand total	5.2 (4.7–5.6)	161,000

Source: 2006/07 NZHS

3.5 Prevalence of Asthma

About 10% of the Waitemata DHB adult population were taking medication for asthma. This proportion also was not significantly different from the proportion across New Zealand as a whole.

Table 23: % Adults with Medicated Asthma, WDHB & NZ – NZHS 06/07

Area	Prevalence (95% CI)	Number of adults
Waitemata DHB	9.7 (7.5–11.9)	36,700
New Zealand total	11.2 (10.4–11.9)	348,400

Source: 2006/07 NZHS

4 Primary Care Services

4.1 PHO Enrolment and Utilisation Rate

Given some unreliability in the recording of domiciles it is hard to give a completely accurate impression of the PHO Enrolment rate among West Auckland's population. However, numbers for Waitemata DHB may provide some sort of guide. As of Quarter 1 2012 about 94% of Waitemata DHB's population was enrolled with a PHO.

According to the NZ Health Survey 2006/07, about 97% of the Waitemata DHB child population and 93% of the adult population had a primary health care provider that they went to first when needed. These proportions were not significantly different from the proportions across New Zealand as a whole.

Table 24: % Population with a Primary Health Care Provider, WDHB & NZ – NZHS 06/07

Area	Prevalence in children (95% CI)	Number of children	Prevalence in adults (95% CI)	Number of adults
Waitemata DHB	97.1 (95.0–98.5)	101,100	92.8 (91.0–94.5)	351,400
New Zealand	97.4 (96.8–98.0)	832,200	93.8 (93.3–94.3)	2,928,500

Source: 2006/07 NZHS

PHO Enrolment numbers for the first quarter of 2012 showed lower enrolment rates among Waitemata DHB's Asian and Maori/Pacific population compared to total enrolment rates. Similar rates could be expected among West Auckland's population by ethnicity.

Table 25: % Waitemata DHB Population enrolled with a PHO, by ethnicity, 2012 Q1

Ethnicity	% Population Enrolled
Maori & Pacific	85%
Asian	75%
Other	100%
Total	94%

Source: PHO Enrolment Database

4.2 Pharmaceutical Use

For the 2010/11 year annual script utilisation was about 8.2 scripts per person per year for the West Auckland population. As an age standardised rate West Auckland had a higher rate of script utilisation than the Waitemata DHB population as a whole: 7.6 scripts per person compared with 6.9 per person. (See Figure 12 below)

Figure 13 below shows where the burden of pharmaceutical use lies in terms of age compared to the structure of West Auckland's population. Proportionately it is among the older population that the majority of pharmaceutical use lies.

Figure 12: Age Standardised Pharmaceutical Script Utilisation Rate, WDHB and West Auckland, 2010/11
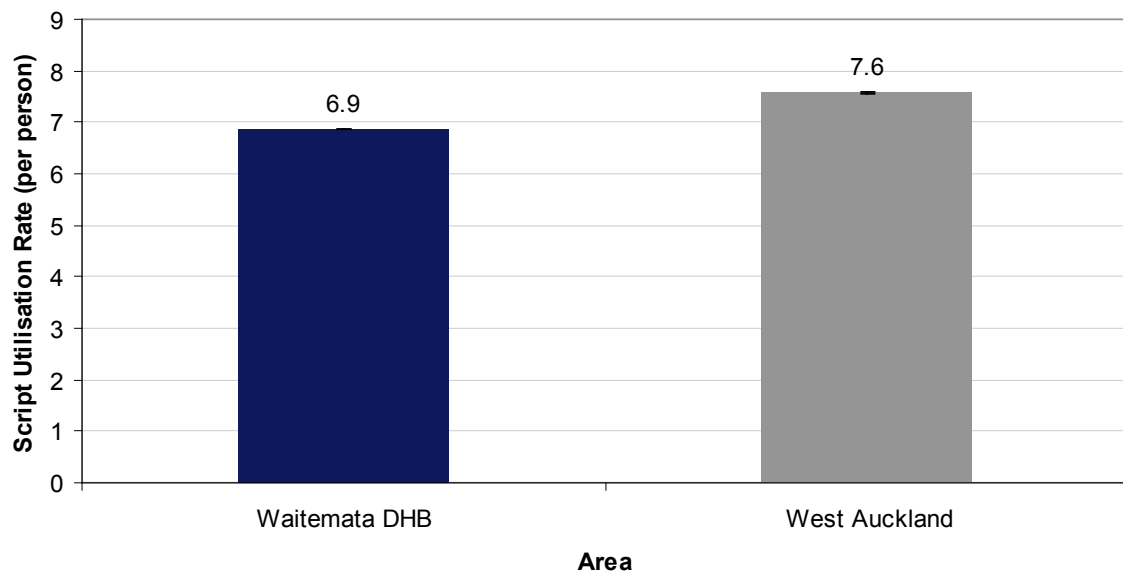
Figure 13: West Auckland Pharmaceutical Use (Scripts) and West Auckland population, 2010/11, proportion by Age
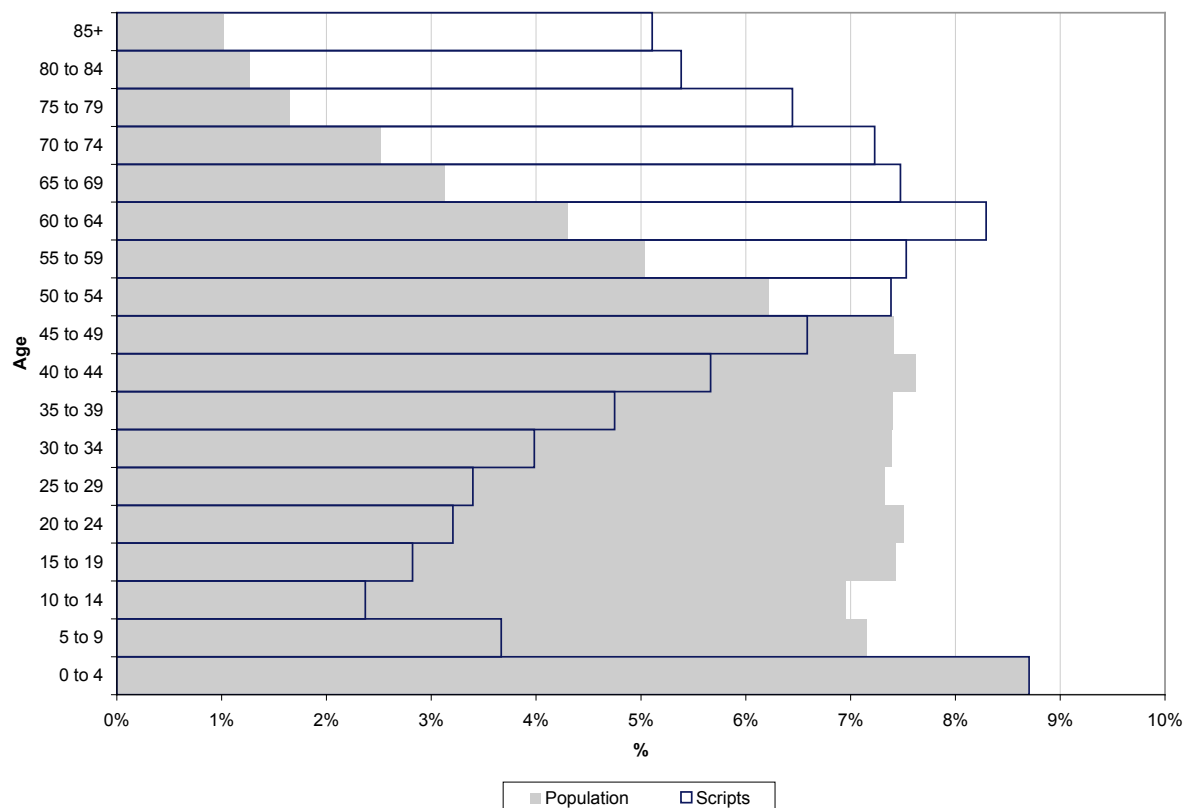
4.3 Lab Use

For the 2010/11 year annual community lab test utilisation was at about 5.6 tests per person per year for the West Auckland population. As an age standardised rate West Auckland and the Waitemata DHB population as a whole had very similar rates of use: 5.2 community lab tests per person for West Auckland compared with 5.4 per person for the Waitemata DHB total. (See Figure 14 below)

Figure 15 below shows where the burden of community lab test use lies in terms of age compared to the structure of West Auckland's population. Similar to pharmaceutical use, it is among the older population that the majority of lab test use lies.

Figure 14: Age Standardised Community Lab Test Utilisation Rate, Waitemata DHB and West Auckland, 2010/11
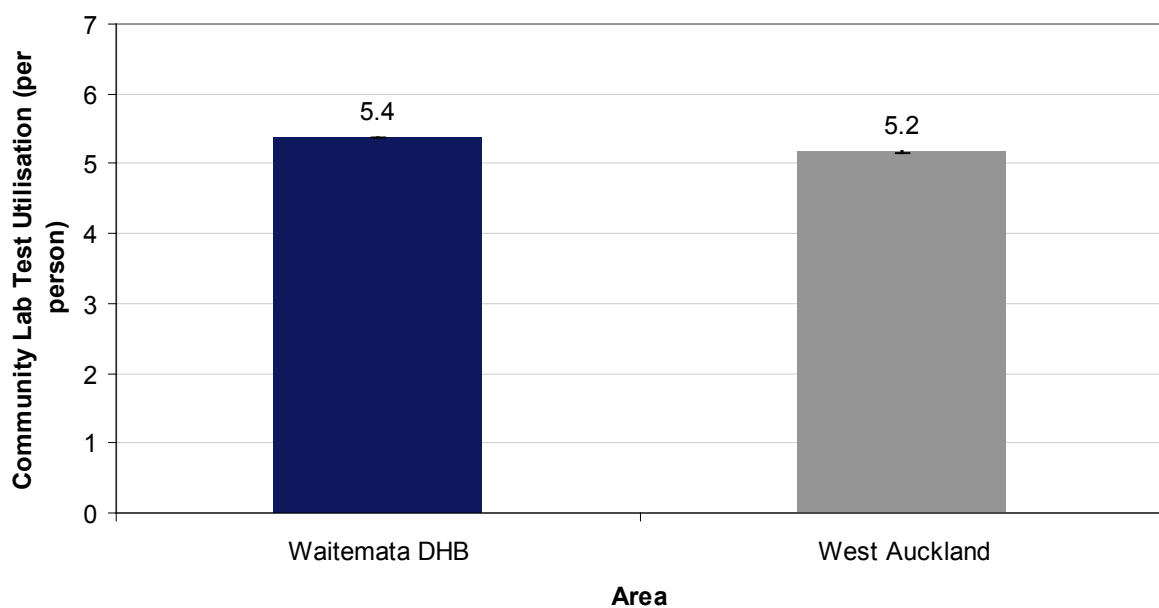
Figure 15: West Auckland Community Lab Test Use and West Auckland population, 2010/11, proportion by Age
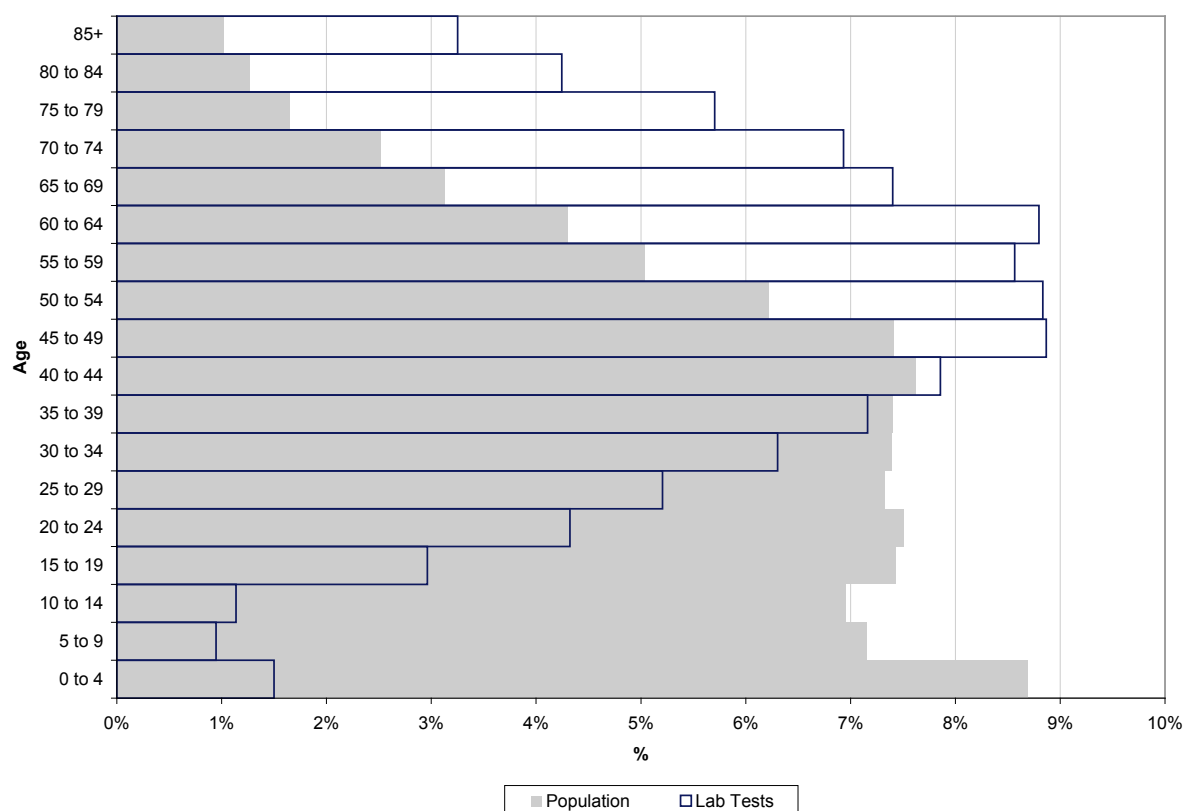
5 Secondary Care Services

5.1 Avoidable Hospitalisations – PAH and ASH

Potentially Avoidable Hospitalisations (PAH) are proxy indicators of 'non-fatal' avoidable health outcomes and are defined by the following three sub-categories:

> **Preventable hospitalisations (PH):** hospitalisations resulting from diseases preventable through population-based health promotion strategies.

> **Ambulatory-sensitive hospitalisations (ASH):** hospitalisations resulting from diseases sensitive to prophylactic or therapeutic interventions deliverable in a primary health care setting.

> **Injury-preventable hospitalisations (IP):** hospitalisations avoidable through injury prevention.

In adults (15 years +), an upper age threshold of 75 years is used when reporting on PAH and ASH indicators as there is a high level of co-morbidities from age 75 years up.

(Source: Perumal L. (2010). Health Needs Assessment of Middle Eastern, Latin American and African people living in the Auckland region. Auckland: Auckland District Health Board)

This analysis of PAH excludes 'Injury preventable hospitalisation' data, as different preventive strategies are needed to address them. Further, only acute admissions are counted in this analysis as potentially avoidable.

5.2 Potentially Avoidable Hospitalisations

Of all acute hospital admissions for the West Auckland population over the three years 2009 – 2011, 24% of acute adult admissions (15-74) were potentially avoidable (22,000 admissions out of a total of 94,000 acute admissions). This was a higher proportion than the corresponding one for the Waitemata DHB population as a whole of 22%.

Figure 16 shows that as an age-standardised rate, West Auckland had a much higher PAH rate than Waitemata DHB among adults.

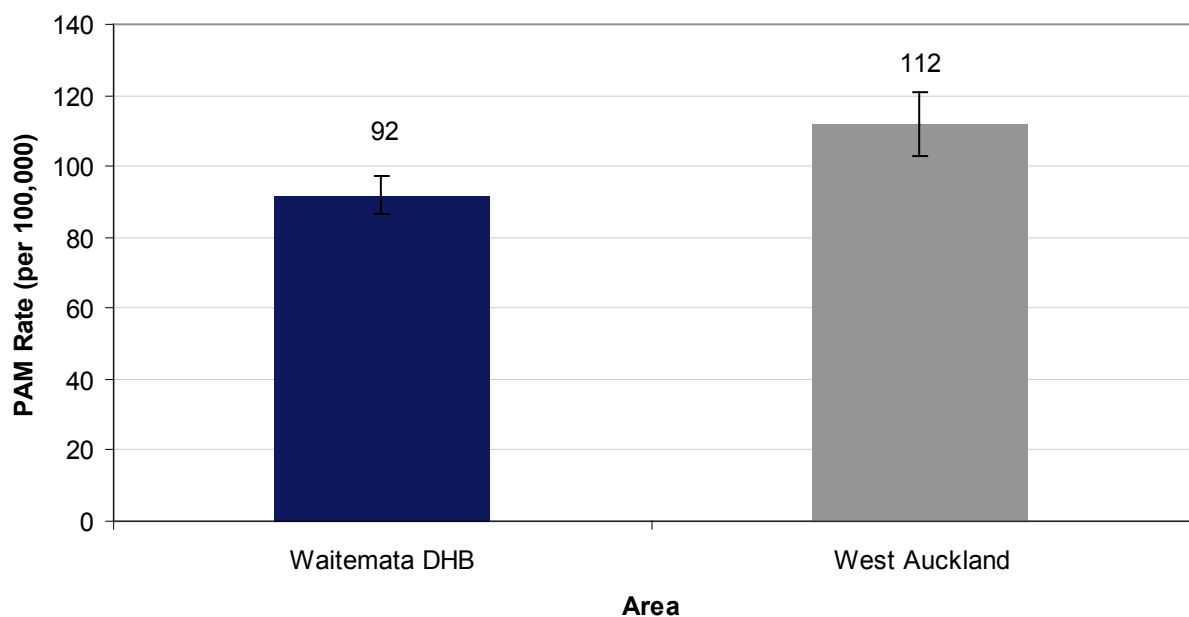**Figure 16: Adult (15-74 years) Age Standardised PAH Rate, WDHB and West Auckland, 2009-2011**
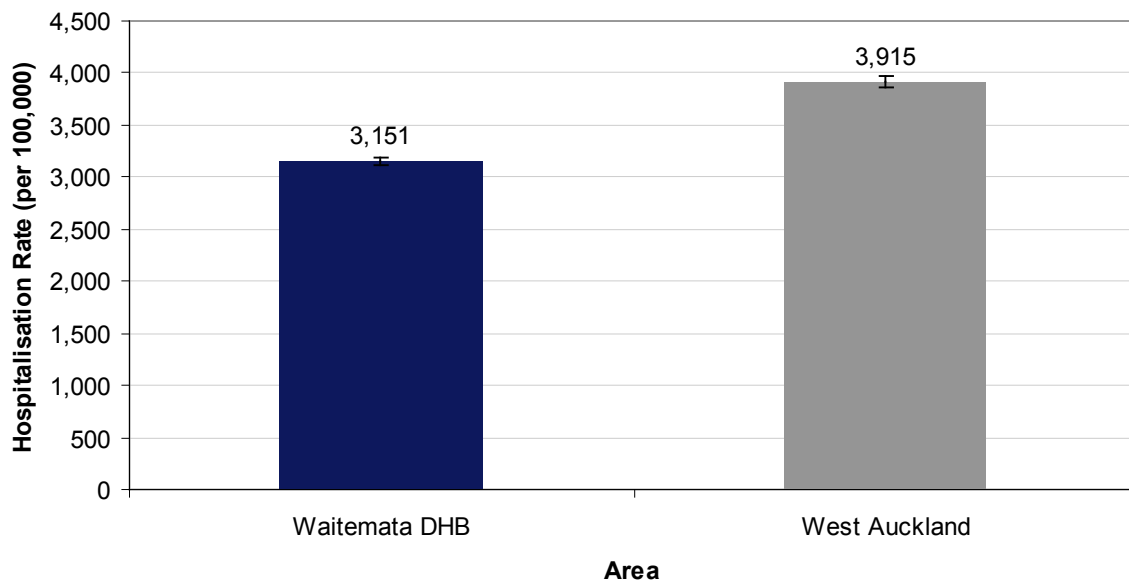
Table 26 below shows the top 10 conditions which contributed to West Auckland Potentially Avoidable Hospitalisations for adults.

Table 26: PAH by Category (top 10) – 2009-2011, West Auckland Adults (15-74)

PAH Category	Admissions	%	Crude Rate (per 100,000)
Angina and chest pain	4,396	20%	798
Cellulitis	2,183	10%	396
Myocardial infarction	1,755	8%	318
CORD	1,480	7%	269
Gastroenteritis	1,399	6%	254
Respiratory infections - Pneumonia	1,310	6%	238
Kidney/urinary infection	1,308	6%	237
Asthma	1,157	5%	210
Diabetes	1,056	5%	192
Epilepsy	766	3%	139
Other PAH	5,533	25%	1,004
Total PAH	22,343	100%	4,054

*Chronic Obstructive Respiratory Disease
Source: NMDS

Figure 17 below shows the top 10 conditions which contributed to West Auckland PAH compared with how those same conditions were represented among Waitemata DHB's potentially avoidable hospitalisations.

Figure 18 shows that West Auckland's Pacific population had the highest proportion of acute admissions considered as potentially avoidable (27%) and Asian the least (20%).

Figure 17: % PAH by Condition (Top 10 West) – 2009-2011, West Auckland compared with Waitemata Adults (15-74)
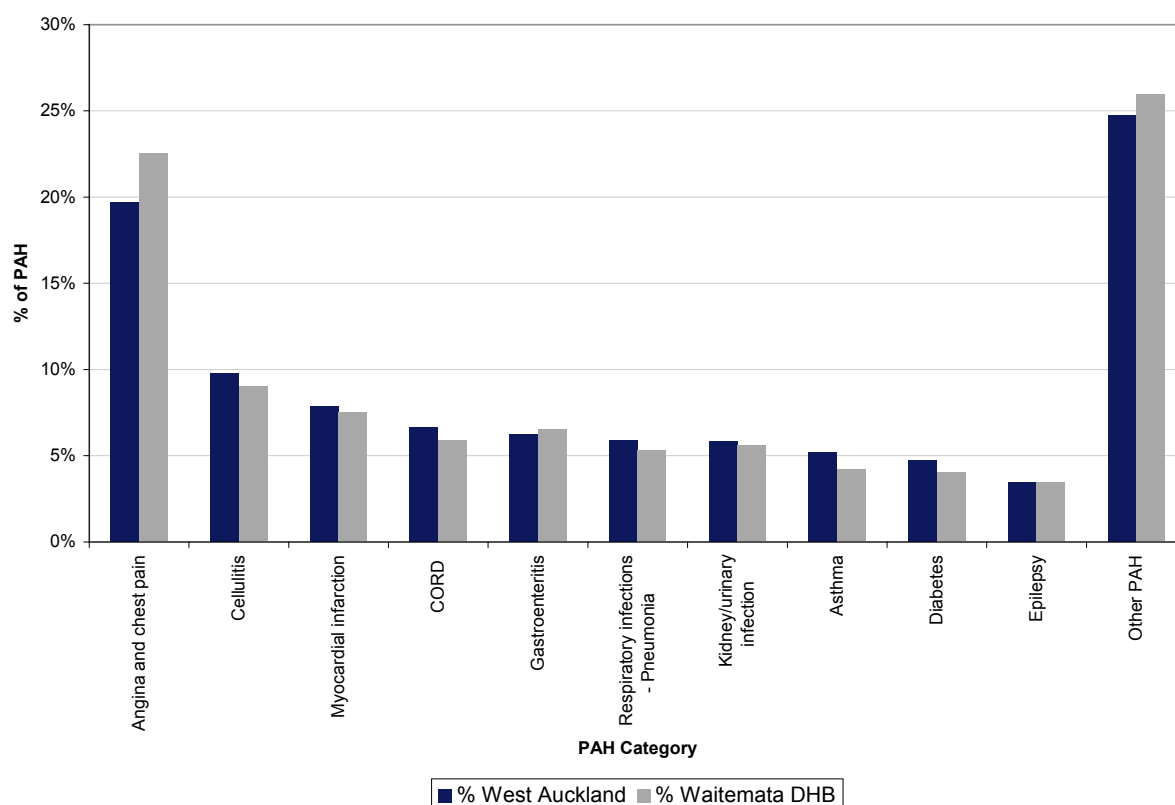
Figure 18: % Acute Admissions PAH – 2009-2011, West Auckland Adults (15-74) by Ethnicity
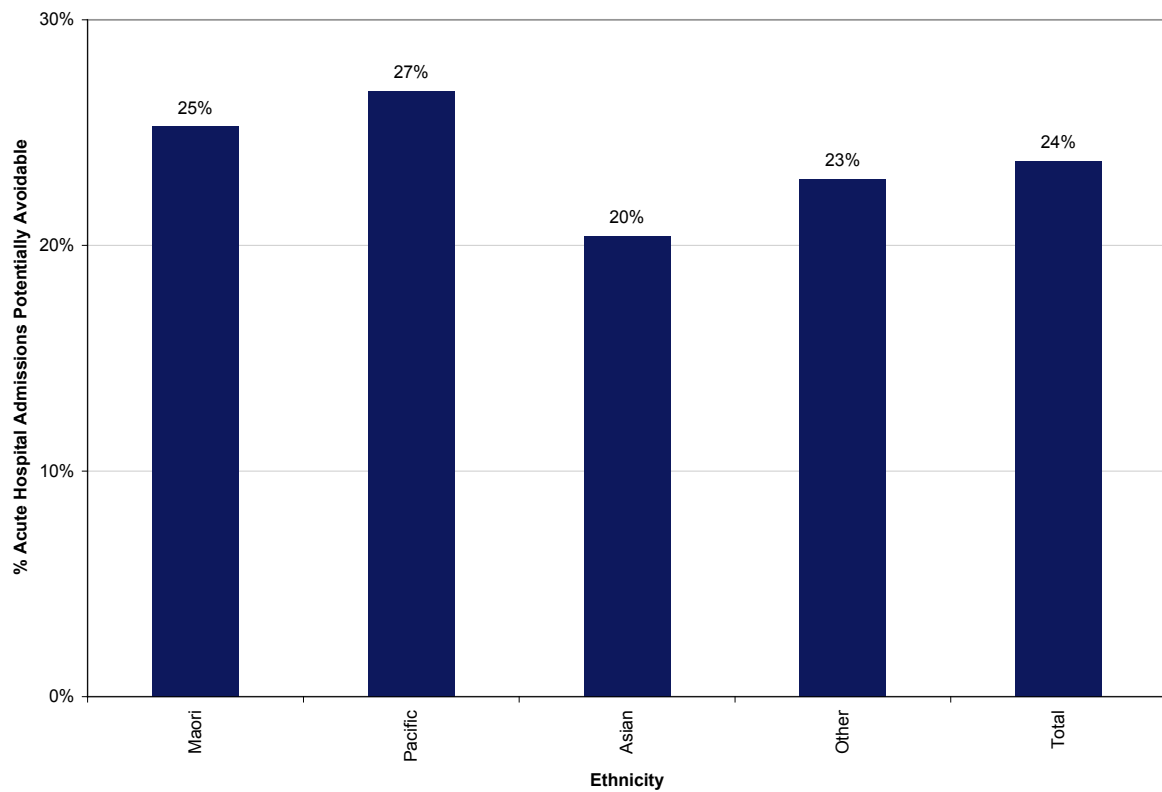
Tables 27 to 30 below show which conditions contributed most to Potentially Avoidable hospitalisations for West Auckland's population by ethnicity.

Table 27: PAH by Category (Top 10) – 2009-2011, West Auckland Adults (15-74) – Maori

PAH Category	Admissions	%
Angina and chest pain	522	14%
Cellulitis	460	12%
Asthma	304	8%
CORD	268	7%
Kidney/urinary infection	244	7%
Respiratory infections - Pneumonia	237	6%
Myocardial infarction	202	5%
Gastroenteritis	179	5%
Diabetes	167	5%
Epilepsy	158	4%
Other PAH	949	26%
Total PAH	3,690	100%

Table 28: PAH by Category (Top 10) – 2009-2011, West Auckland Adults (15-74) – Pacific

PAH Category	Admissions	%
Angina and chest pain	800	17%
Cellulitis	602	13%
Respiratory infections - Pneumonia	359	8%
Myocardial infarction	323	7%
Diabetes	323	7%
Asthma	303	6%
CORD	271	6%
Gastroenteritis	268	6%
Kidney/urinary infection	255	5%
Sexually transmitted diseases	198	4%
Other PAH	1,066	22%
Total PAH	4,768	100%

Table 29: PAH by Category (Top 10) – 2009-2011, West Auckland Adults (15-74) – Asian

PAH Category	Admissions	%
Angina and chest pain	624	26%
Cellulitis	108	5%
Respiratory infections - Pneumonia	101	4%
Myocardial infarction	201	8%
Diabetes	93	4%
Asthma	103	4%
CORD	48	2%
Gastroenteritis	189	8%
Kidney/urinary infection	171	7%
Sexually transmitted diseases	102	4%
Other PAH	630	27%
Total PAH	2,370	100%

PAH Category	Admissions	%
Angina and chest pain	2,451	21%
Myocardial infarction	1,030	9%
Cellulitis	1,014	9%
CORD	893	8%
Gastroenteritis	763	7%
Kidney/urinary infection	640	6%
Respiratory infections - Pneumonia	613	5%
Alcohol related conditions	497	4%
Diabetes	473	4%
Asthma	448	4%
Other PAH	2,700	23%
Total PAH	11,522	100%

Source: NMDS

5.3 Ambulatory Sensitive Hospitalisations

Of all acute hospital admissions for the West Auckland adult population (15-74) over the three years 2009 – 2011, 17% were ambulatory sensitive (16,000 admissions out of a total of 94,000 acute admissions). This was a higher proportion than the corresponding rate for the Waitemata DHB population as a whole of 15%.

Expressed as an age-standardised rate, West Auckland had a much higher ASH rate than Waitemata DHB among adults.

Figure 19: Adult (15-74 years) Age Standardised ASH Rate, WDHB and West Auckland, 2009-2011
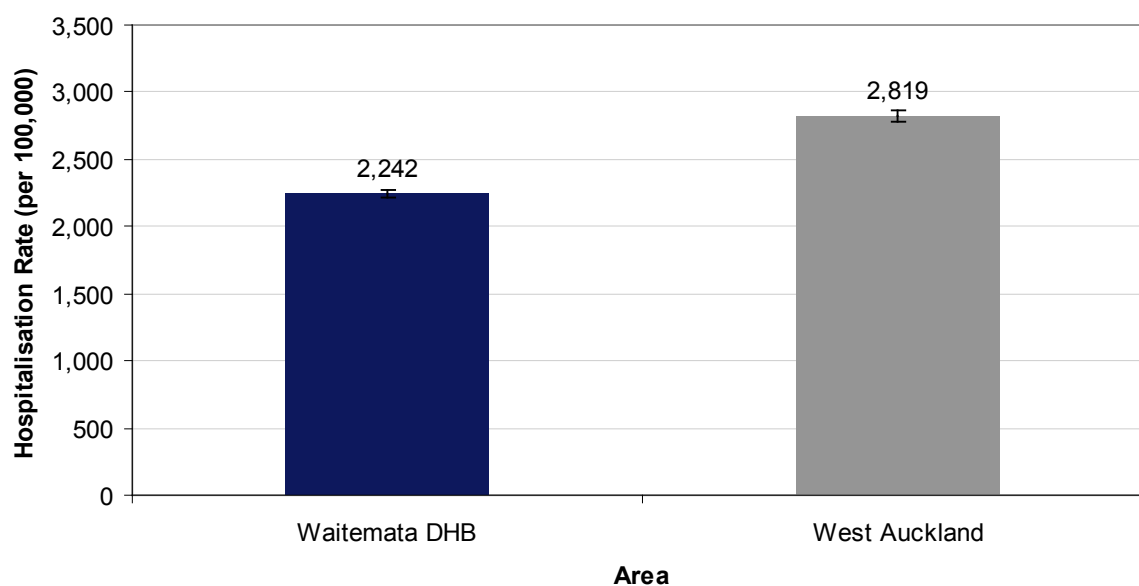
Table 31 shows the top 10 conditions which contributed to West Auckland Ambulatory Sensitive Hospitalisations for adults. (Important to note is that due to the fact that some ASH condition admissions are weighted, differences will be evident between ASH numbers and PAH numbers (e.g. For hospitalisation due to Angina and Chest Pain the ASH definition determines that only half of these are ambulatory sensitive). (See Appendix 5 for more detail)

Table 31: ASH by Category (Top 10) – 2009-2011, West Auckland Adults (15-74)

ASH Category	Admissions	%	Crude Rate (per 100,000)
Angina and chest pain	2,198	14%	399
Cellulitis	2,137	13%	388
Gastroenteritis/dehydration	1,653	10%	300
Kidney/urinary infection	1,322	8%	240
Respiratory infections - Pneumonia	1,310	8%	238
Asthma	1,157	7%	210
Diabetes	1,056	7%	192
Myocardial infarction	878	5%	159
Epilepsy	766	5%	139
Upper respiratory tract and ENT infections	638	4%	116
Other ASH	2,883	18%	523
Total ASH	15,997	100%	2,902

Figure 20 below shows the top 10 conditions which contributed to West Auckland ASH compared with how those same conditions were represented among Waitemata DHB's ASH.

**Figure 20: % ASH by Condition (Top 10 West) – 2009-2011,
West Auckland compared with Waitemata Adults (15-74)**
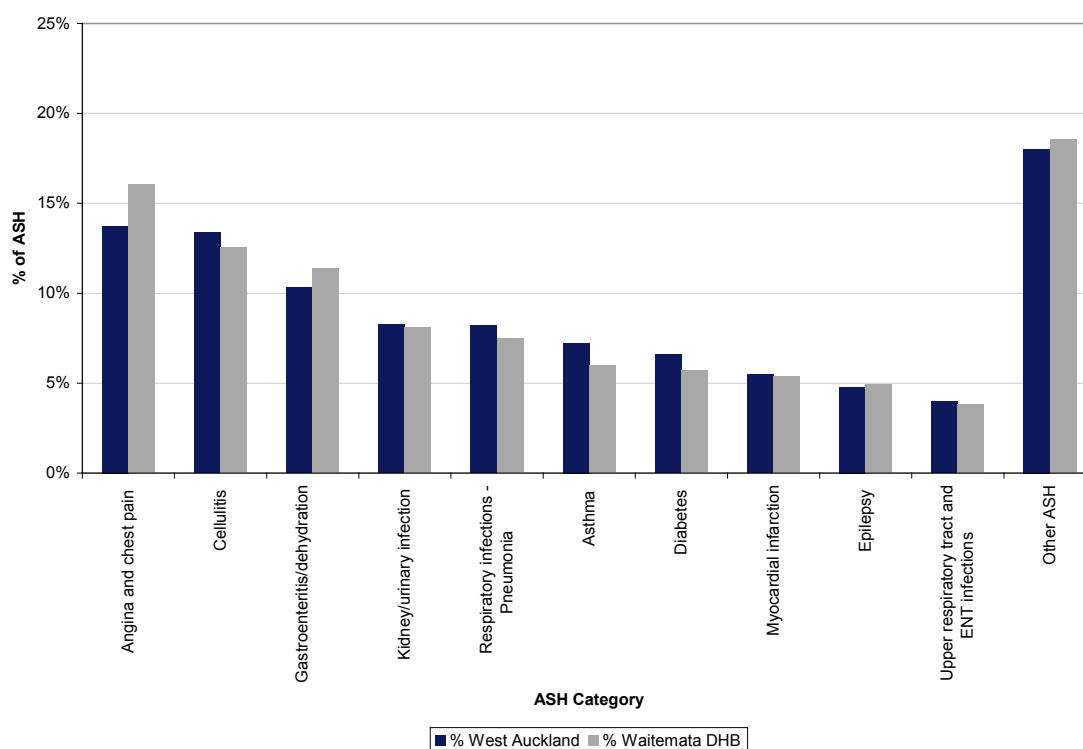
5.4 CVD Admissions

Over the three years 2009 – 2011, there were 12,400 hospital admissions with a CVD primary diagnosis from West Auckland's adult population (15+) (electives and acutes). Figure 21 shows that as an age-standardised rate West Auckland had a higher rate of CVD admissions than that of Waitemata DHB's adult population. Figure 22 below shows where the burden lies in terms of age.

Figure 21: Age Standardised CVD Admission Rate, WDHB and West Auckland, 2009-2011
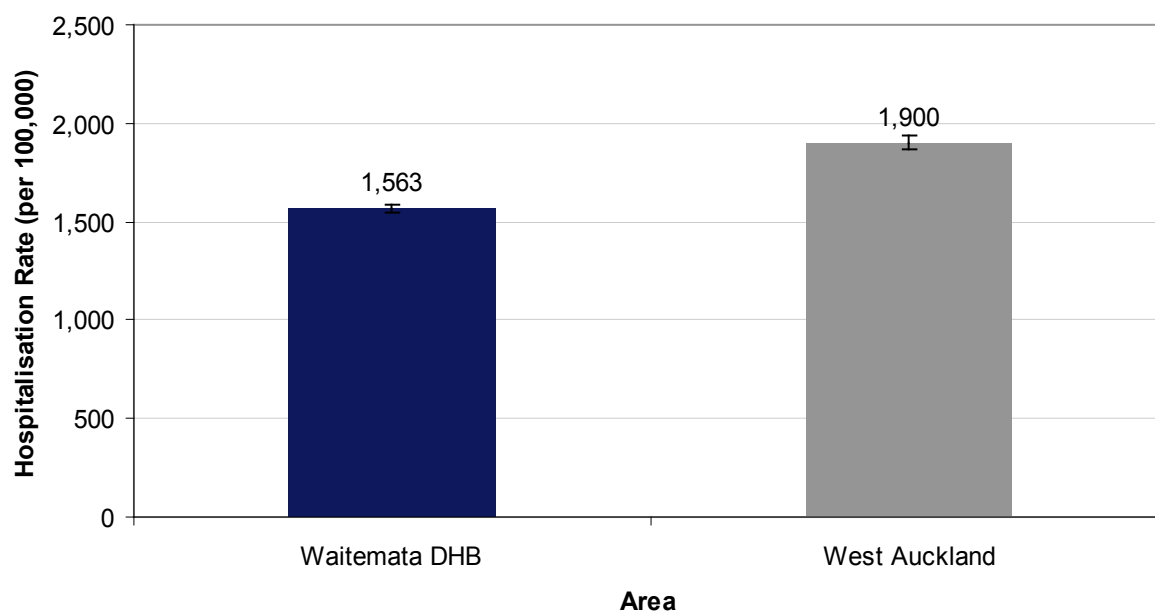
Figure 22: West Auckland CVD Admissions and West Auckland Population, 2009-2011, proportion by Age
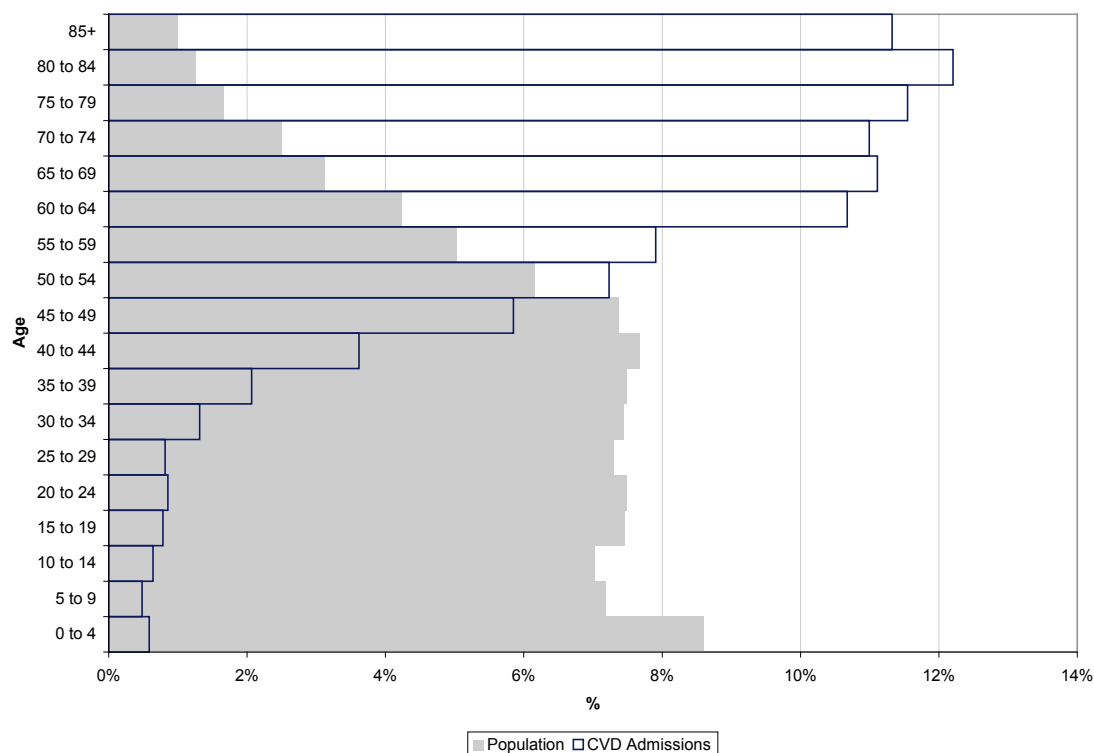
5.5 Diabetes Admissions

Over the three years 2009 – 2011, there were 2,300 hospital admissions with a diabetes primary diagnosis for West Auckland's adults (electives and acutes). Expressed as an age-standardised rate, West Auckland had a higher rate of diabetes admissions than that of Waitemata DHB's population as a whole. Figure 24 shows diabetes admissions to be primarily among older adults.

Figure 23: Age Standardised Diabetes Admission Rate, WDHB and West Auckland, 2009-2011
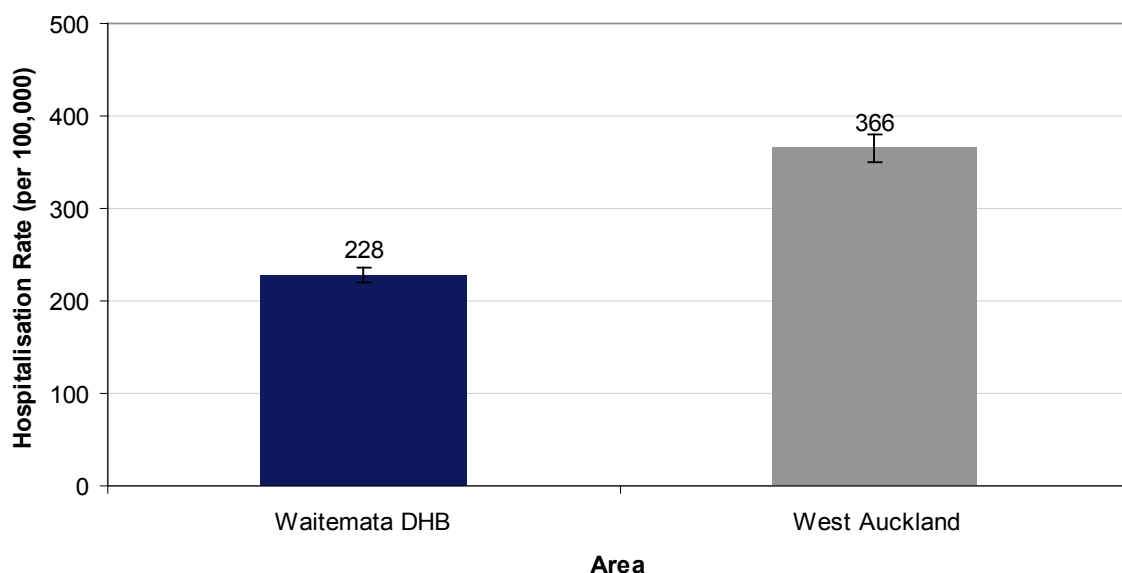
Figure 24: West Auckland Diabetes Admissions and West Auckland Population, 2009-2011, proportion by Age
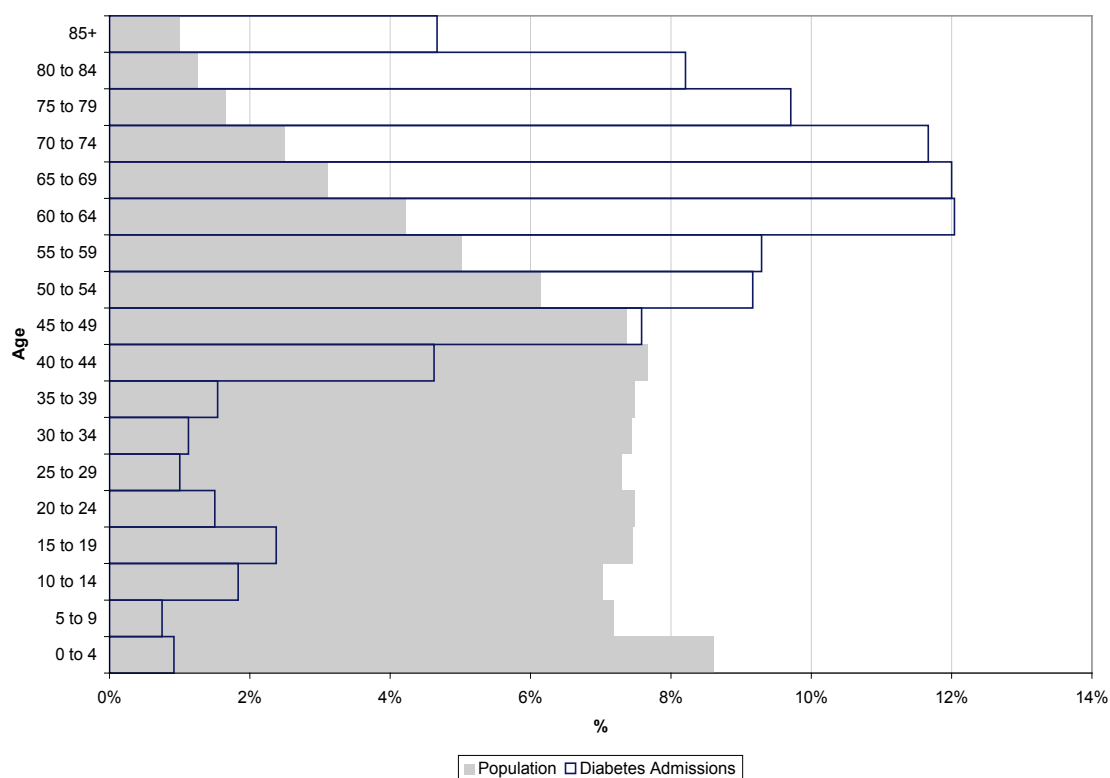
5.6 Mental Health Admissions

Over the three years 2009 – 2011, there were 2,300 mental health hospital admissions for West Auckland's adults. Expressed as an age-standardised rate, West Auckland had a rate of , mental health hospital admission about the same as Waitemata DHB as a whole. Figure 26 shows the ages between 15 and 50 as the most highly represented relative to the population as a whole.

Figure 25: Age Standardised Mental Health Admission Rate, WDHB and West Auckland, 2009-2011
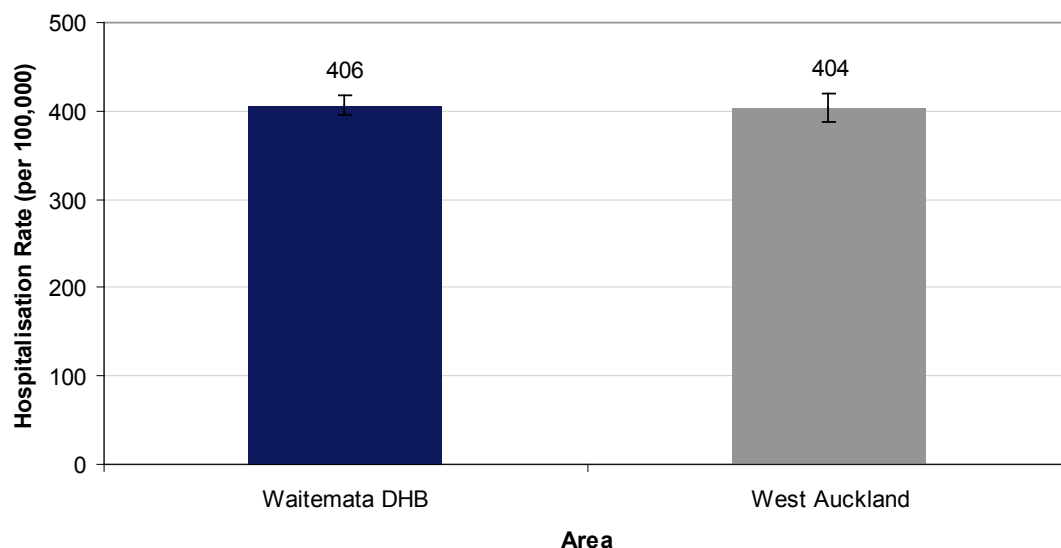
Figure 26: West Auckland Mental Health Admissions and West Auckland Population, 2009-2011, proportion by Age
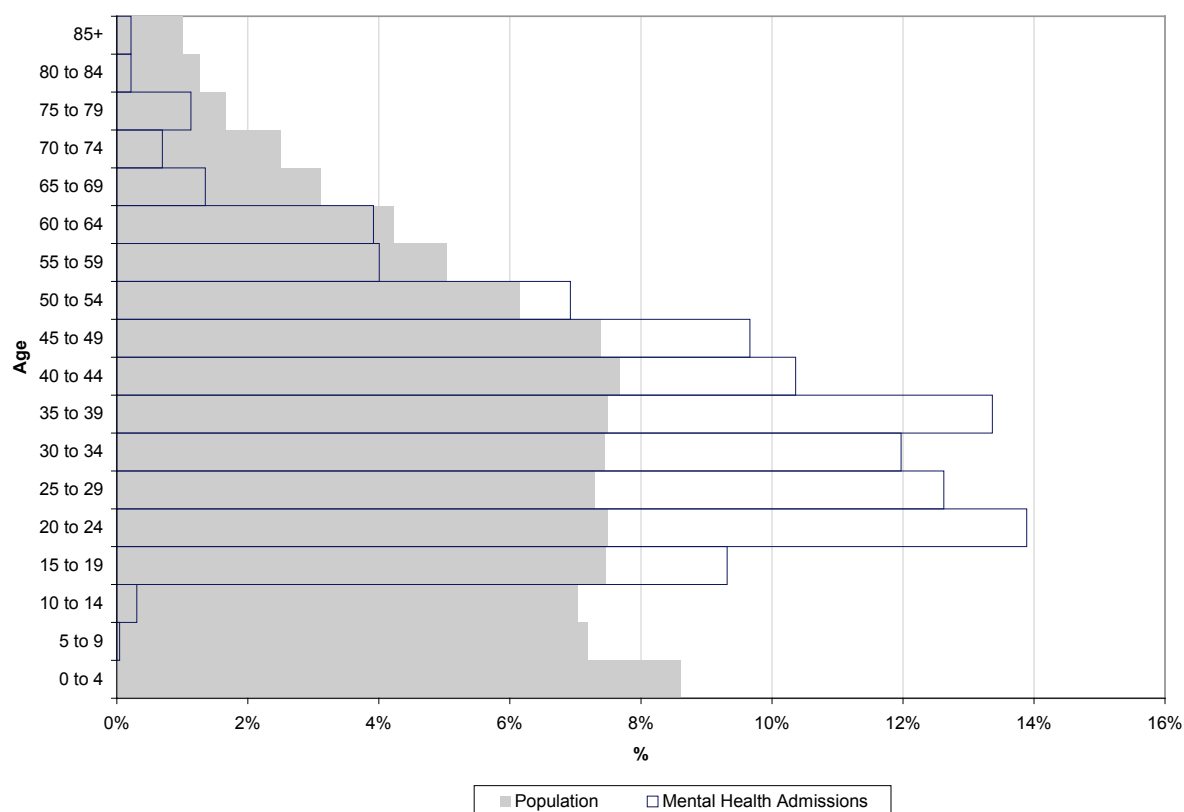
5.7 Outpatient Visits

For the purposes of comparison outpatient visits in this analysis have been restricted to Medical and Surgical First Specialist Assessments (FSAs) and Follow Ups.

For the one year 2010/11 there were 84,000 outpatient attendances for West Auckland's adult population (15+). Expressed as an age-standardised rate, West Auckland had a rate of outpatient attendance of 40,600 per 100,000. This was a rate higher than that for Waitemata DHB as a whole over this time period (35,600 outpatient attendances per 100,000).

Figure 27: Age Standardised Outpatient Attendance Rate, (Med/Surg FSAs and Follow Ups), WDHB and West Auckland Adults (15+), 2010/11
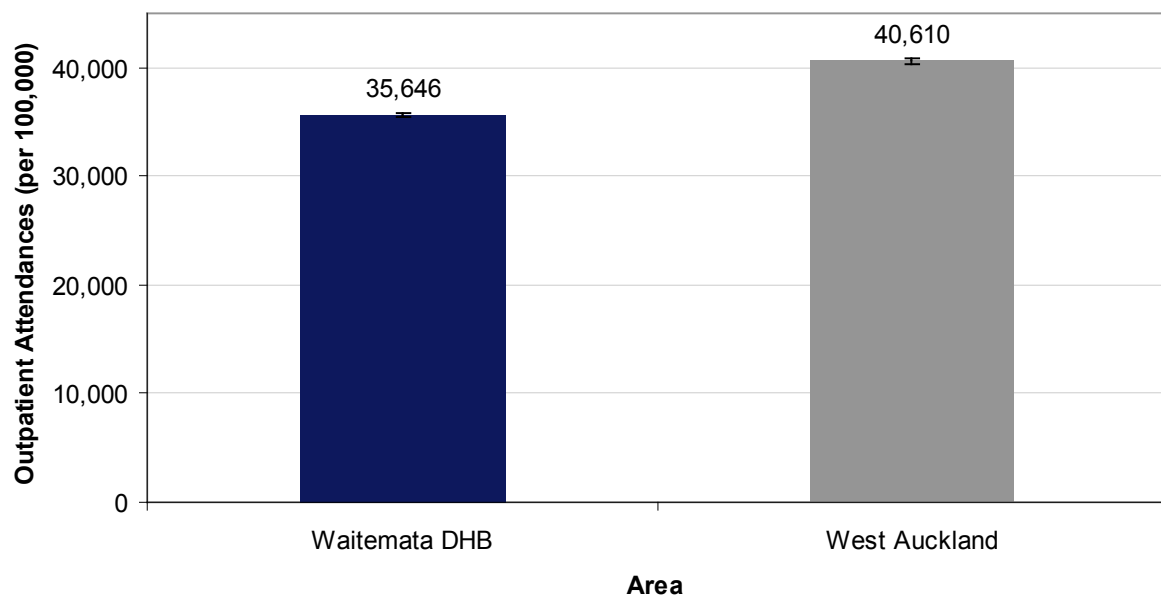
Figure 28 below shows where the burden of outpatient attendances lie in terms of age compared to the structure of West Auckland's population. The 50+ year old population accounted for an over-represented proportion of medical and surgical FSAs and Follow Ups.

Figure 28: West Auckland Outpatient Attendances and West Auckland Population, 2009-2011, proportion by Age
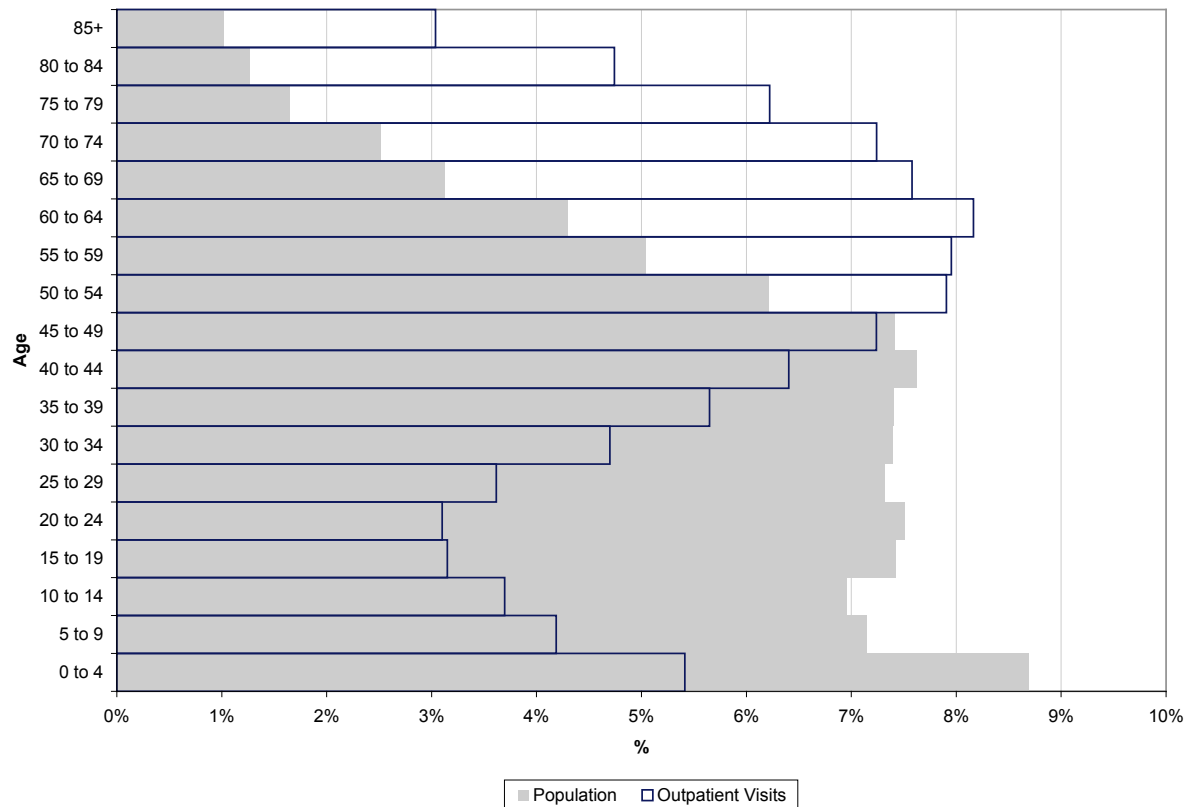
5.8 Emergency Department Attendances

For the one year 2010/11, there were 41,600 Emergency Department visits from West Auckland's adult (15+) population. Expressed as an age-standardised rate, West Auckland had a rate of ED attendance of 20,800 per 100,000 adults. This was a rate higher than that for Waitemata DHB as a whole over this time period (17,900 ED visits per 100,000). Figure 30 shows the 0-4 population as well over-represented in ED attendances relative to West Auckland's total population.

Figure 29: Age Standardised Emergency Department Visit Rate, WDHB and West Auckland, 2010/11
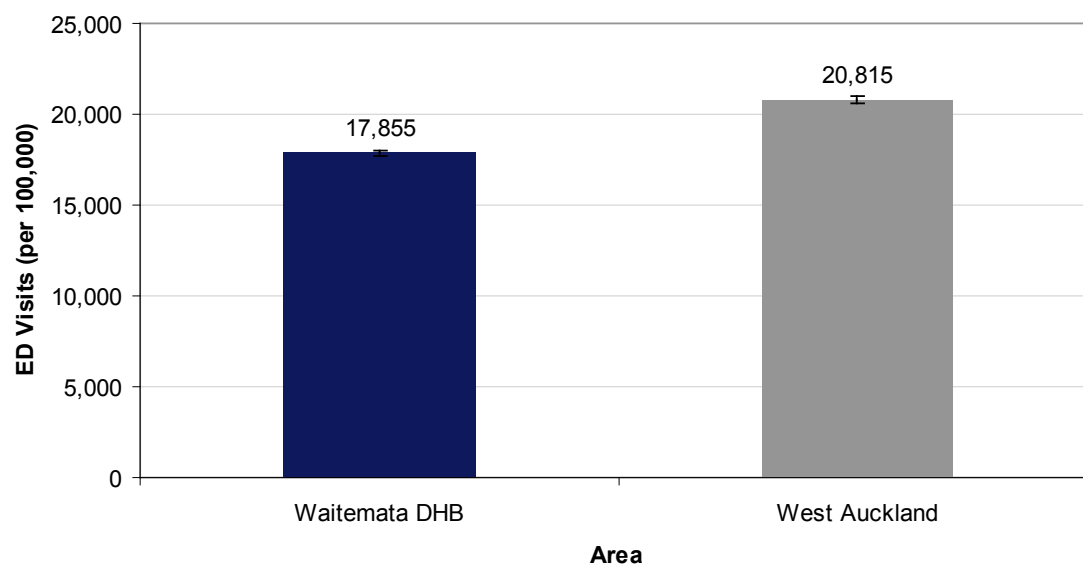
Figure 30: West Auckland ED Visits and West Auckland Population, 2009-2011, proportion by Age
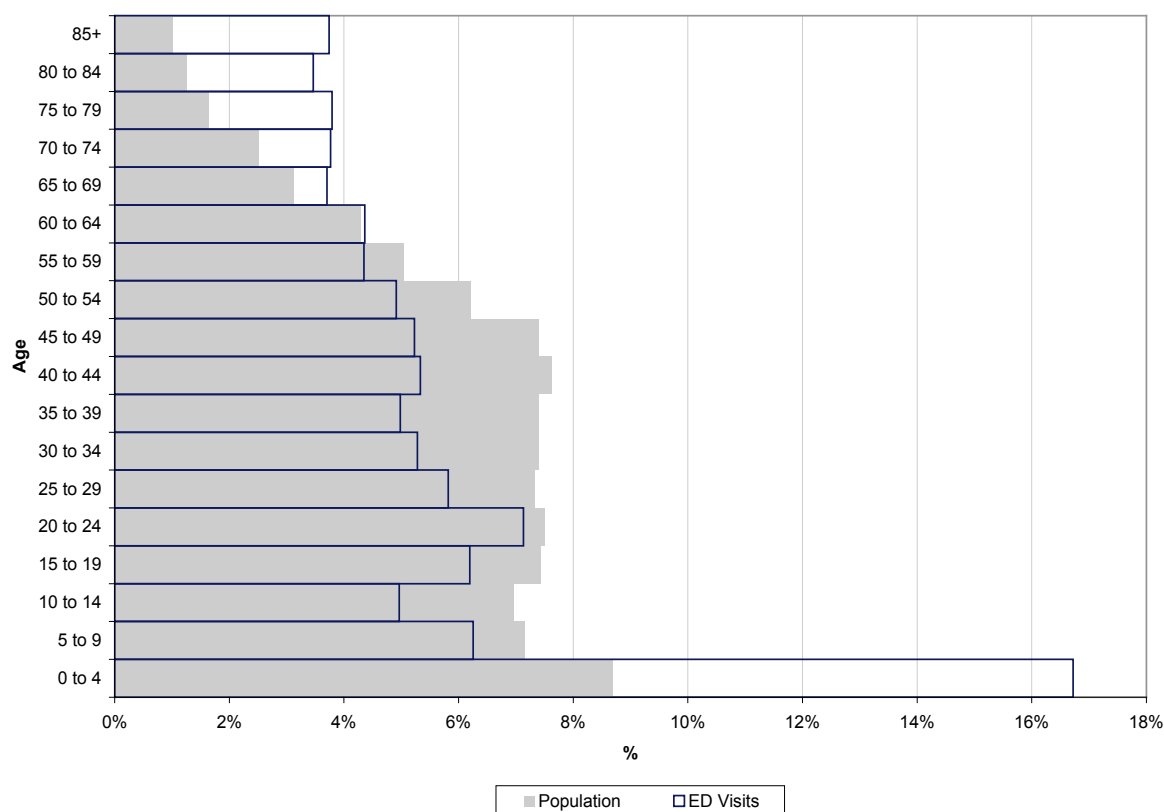
5.9 Elective Surgery

Over the three years 2009 – 2011, there were 19,500 elective hospital admissions to a surgical specialty from West Auckland's adult (15+) population. Expressed as an age-standardised rate, West Auckland had a higher rate of elective surgery than that of Waitemata DHB's population as a whole. Figure 32 below shows elective surgery admission primarily among older adults and young children.

Figure 31: Age Standardised Elective Surgery Admission Rate, WDHB and West Auckland, 2009-2011
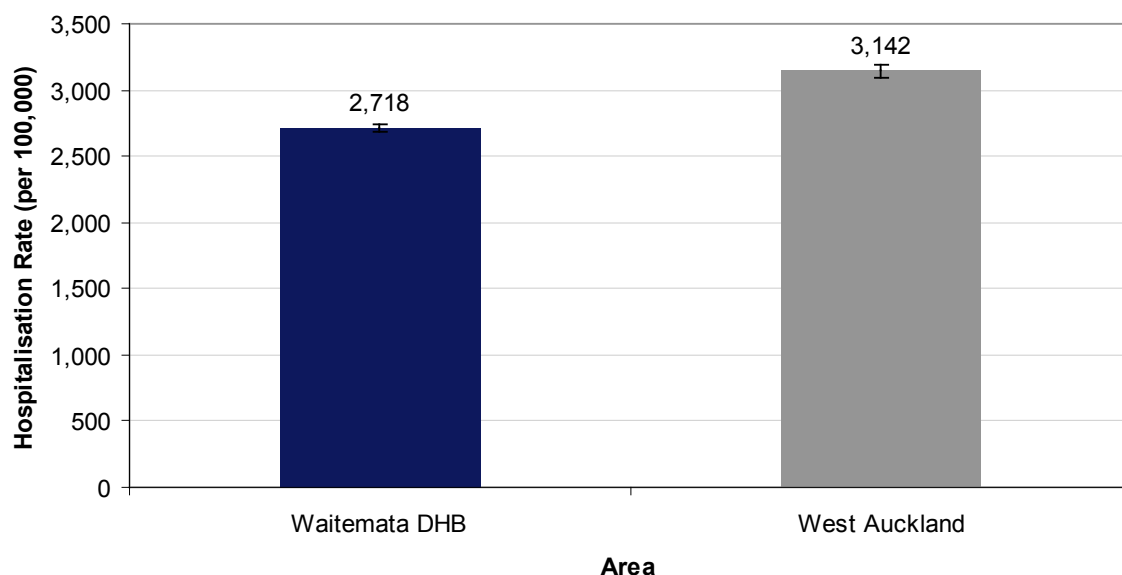
Figure 32: West Auckland Elective Surgery Admissions and West Auckland Population, 2009-2011, proportion by Age
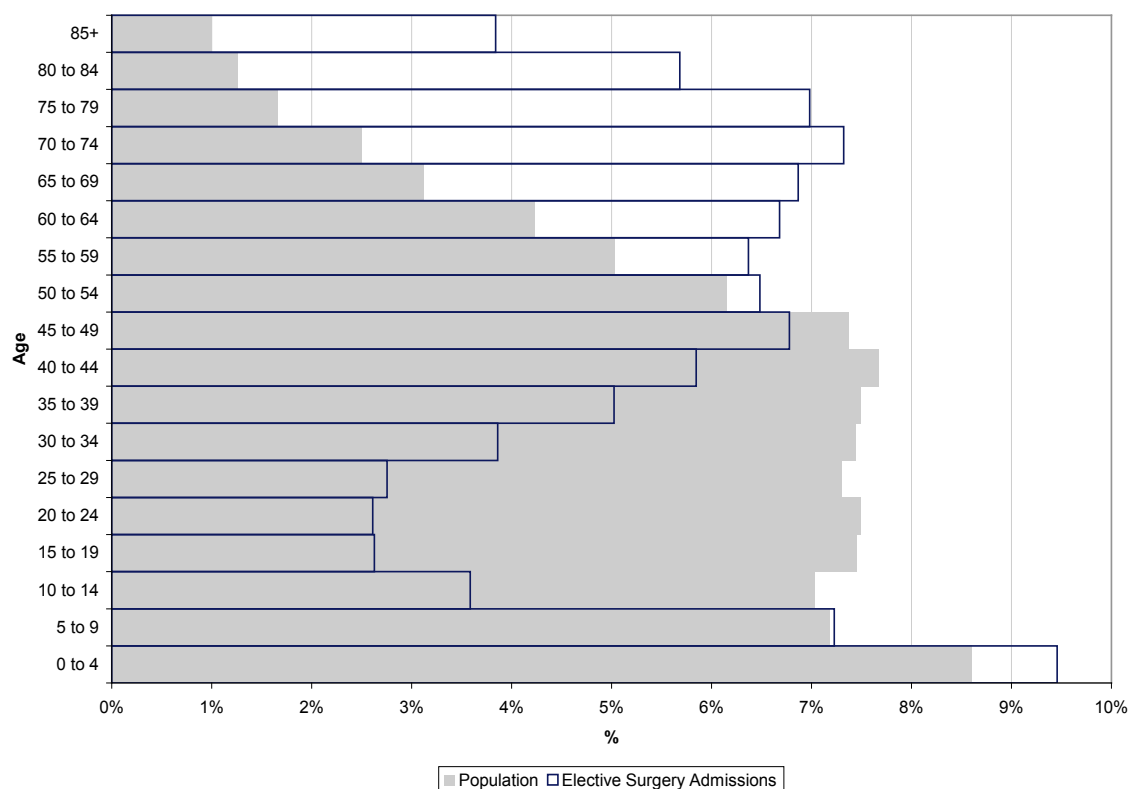
6 Child Health

6.1 Infant Mortality

Infant mortality is an important measure of social wellbeing. For the three years 2007-2009 there were 45 live born infants who died before one year of life from West Auckland.

For this period the infant mortality rate for West Auckland was 3.9 infant deaths per 1,000 live births. This was a higher infant mortality rate than that of Waitemata DHB as a whole for this period but the difference was not statistically significant. (See Figure 33 below)

Figure 33: Infant Mortality Rate (per 1,000 live births), WDHB and West Auckland, 2007-2009
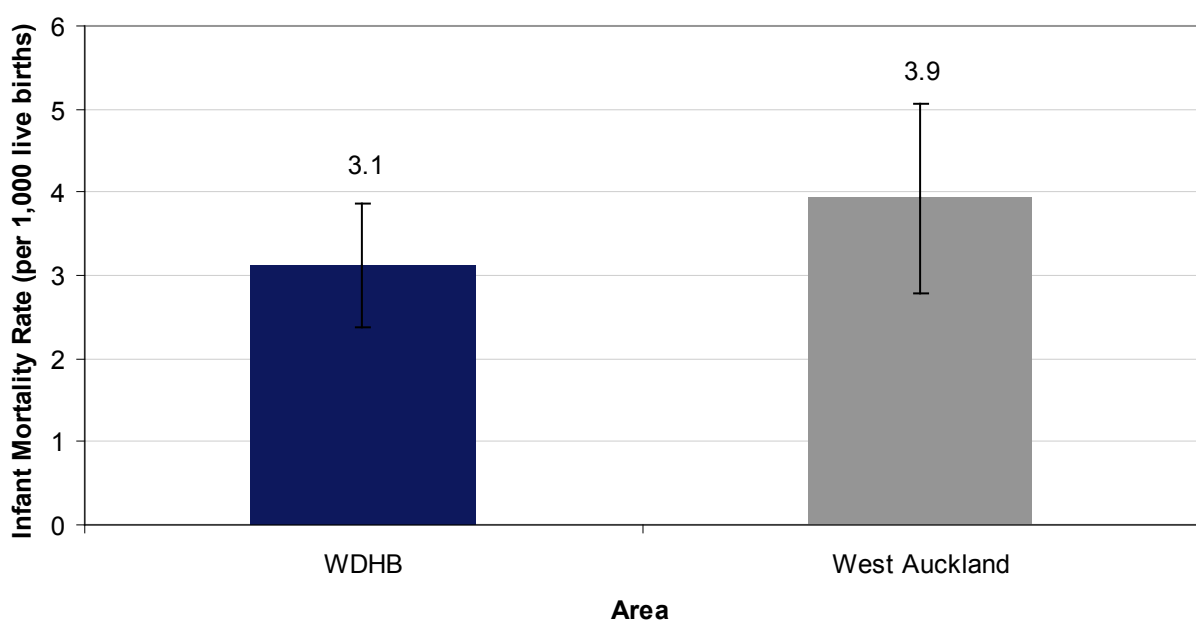
6.2 SUDI

Sudden Unexpected Death in Infancy (SUDI) accounts for all deaths of live born infants before one year of life where the cause of death is attributed to SIDS (Sudden Infant Death Syndrome), Accidental Suffocation / Strangulation in Bed, or death from Ill-Defined / Unspecified causes.

For the three years 2007-2009 there were 11 live born infants who died before one year of life in West Auckland with SUDI as the cause of death.

For this period the infant mortality rate with SUDI as cause of death for West Auckland was 1 per 1,000 live births. This was a similar SUDI mortality rate to that of Waitemata DHB as a whole; 0.6 SUDI deaths per 1,000 live births. (See Figure 34 below)

Maori had a higher SUDI rate but due to small numbers of SUDI no more analysis by ethnicity could be done.

Figure 34: SUDI Mortality Rate (per 1,000 live births), WDHB and West Auckland, 2007-2009
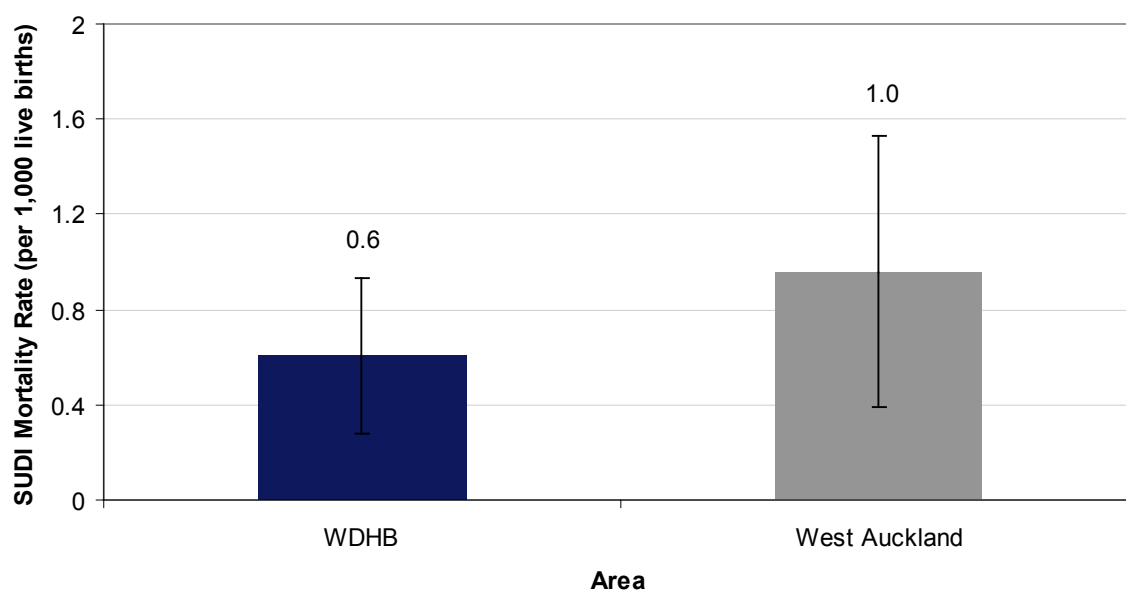
6.3 Child Mortality

For the three years 2007-2009 there were 73 child deaths (0-14 years old) from West Auckland's population.

Figure 35 shows that West Auckland had a higher age standardised rate of child mortality than that of Waitemata DHB (but this was not a statistically significant difference); 42 per 100,000 compared with 34 per 100,000 children.

Figure 35: Child Age Standardised Mortality Rate, WDHB and West Auckland, 2007-2009
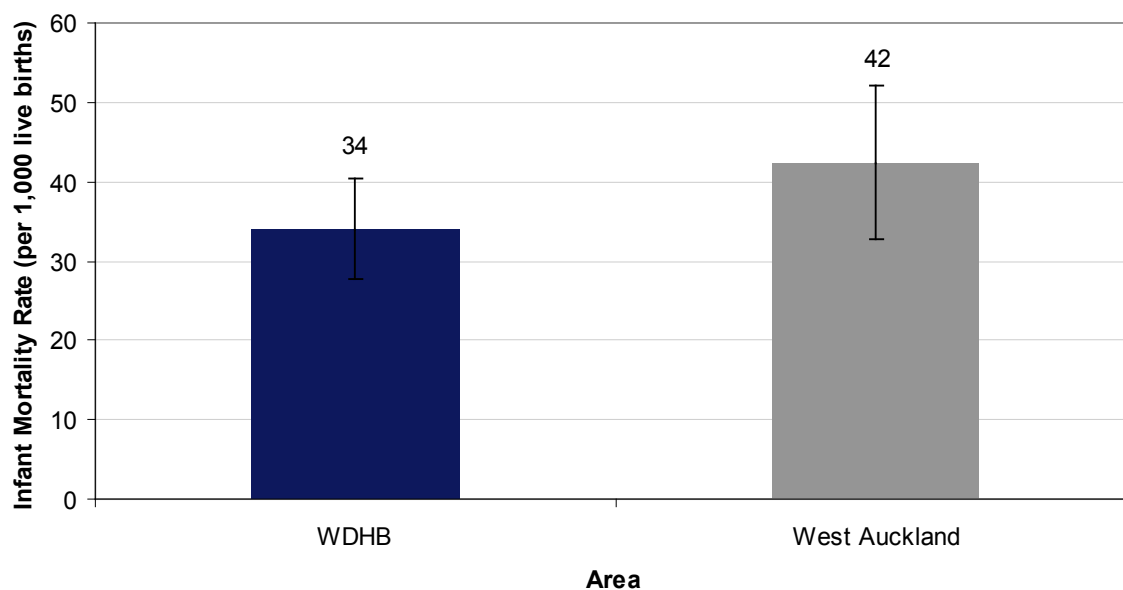
6.4 Child Potentially Avoidable Mortality

For the three years 2007-2009 there were 73 deaths of 0-14 year olds from the West Auckland population. Of these deaths 36% (26) were considered potentially avoidable. This was a slightly higher proportion than that seen among the Waitemata DHB child population as a whole where 31% of child deaths were considered potentially avoidable.

Figure 36 shows that West Auckland had a slightly higher PAM age standardised rate than that of Waitemata DHB; 15 per 100,000 compared with 10 per 100,000 children. However, this difference was not statistically significant.

Figure 36: Child Age Standardised PAM rate, WDHB and West Auckland, 2007-2009
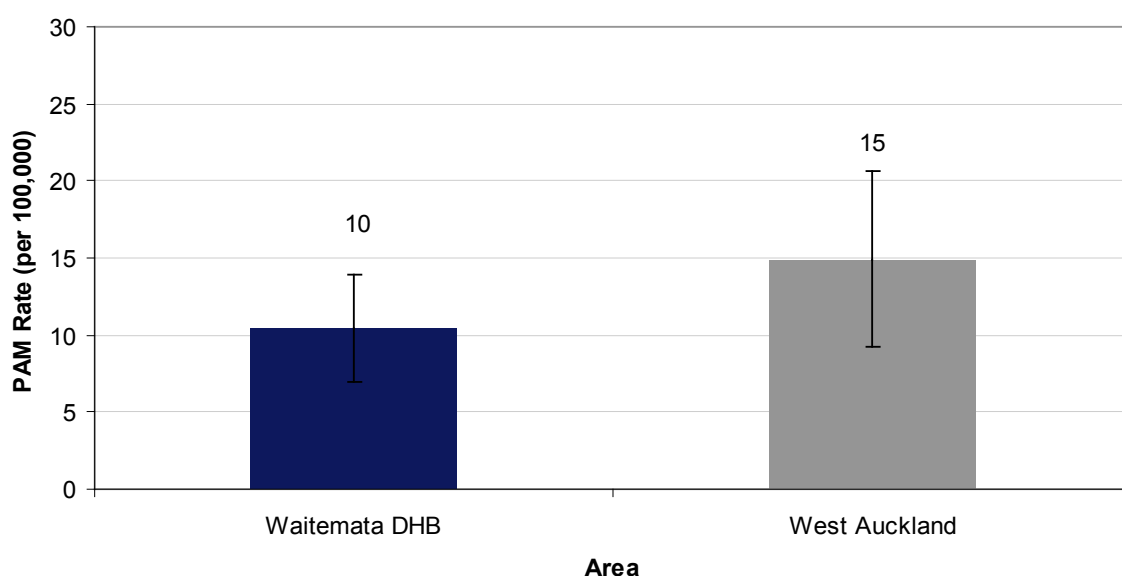
Table 32 below shows the top 5 conditions which contributed to West Auckland PAM for children.

Table 32: PAM by Condition (Top 5) – 2007-2009, West Auckland children

PAM Condition	Deaths	%
Complications of the perinatal period	20	77%
Road traffic accidents	3	12%
Suicide	1	4%
Cerebrovascular diseases	1	4%
Acute lymphocytic leukaemia	1	4%
Other PAM	0	0%
PAM Total	26	100%

Source: NZHIS, NZ Mortality Collection

6.5 Low Birth Weight

Low birth weight refers to babies born with a weight of less than 2.5kg. It is a predictor of neonatal morbidity and mortality. It has an associated increased risk of serious health problems. Low birth weight here is based on hospital births only (as recorded in NMDS).

Over the three years 2009-2011 there were about 700 births of babies classified as having low birth weight from the West Auckland population. This represented a low birth weight rate of 57 per 1,000 live hospital births. The rate for the Waitemata DHB population as a whole was very similar with 55 per 1,000 live hospital births. (See Figure 37 below)

By ethnicity there is variety in West Auckland's low birth weight rates as seen in Figure 38 below. Important to note is the fact that the overall Asian number is lead to be higher on account of higher low birth weight rates among South Asians in particular.

Figure 37: Low Birth Weight Rate (per 1,000 live hospital births), WDHB and West Auckland, 2009-2011
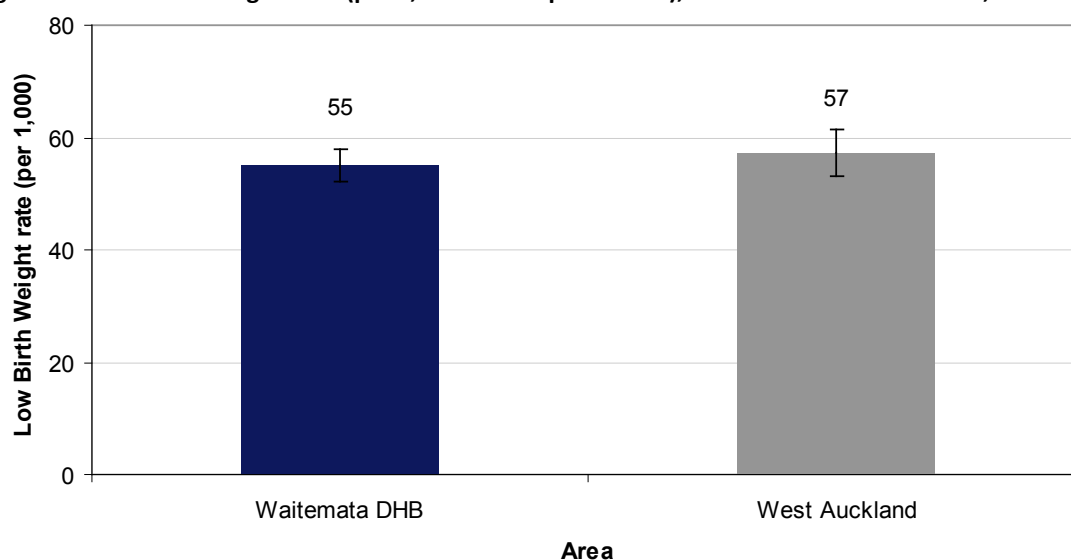
Figure 38: Low Birth Weight Rate (per 1,000 live hospital births), West Auckland by Ethnicity, 2009-2011
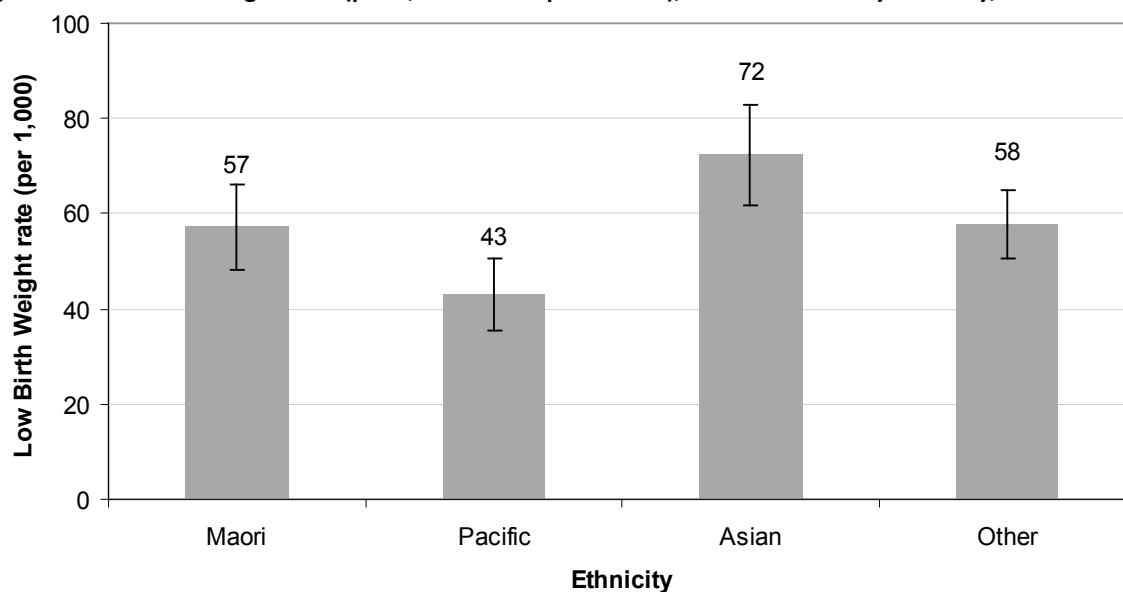
6.6 Immunisation

With unavailability of immunisation data at the locality level of West Auckland, the rates for Waitemata DHB below give some sort of guide to immunisation rates in the locality. Particularly important is the difference in immunisation rates evident between ethnicities.

The following tables show immunisation coverage for children who have reached the milestone ages (6 months, 12 months, 18 months, 24 months, 5 years) and who have completed their age appropriate immunisations.

When looked at by ethnicity among Waitemata DHB children, Maori children show lower rates of coverage at each age group while Asian children show higher rates of coverage at each milestone age than the comparable totals.

Table 33: Immunisation Coverage for WDHB Children by milestone age, 12/02/2012 – 11/05/2012

Milestone Age	No. Eligible	Fully Immunised for Age	%
6 Month	2,032	1,493	73%
12 Month	1,884	1,729	92%
18 Month	2,086	1,737	83%
24 Month	1,973	1,836	93%
5 Year	1,994	1,573	79%

Source: National Immunisation Register

Table 34: Immunisation Coverage for WDHB Children by milestone age, 12/02/2012 – 11/05/2012, ethnicity

Milestone Age	Maori	Pacific	Asian	Other	Total
6 Month	58%	67%	88%	75%	73%
12 Month	88%	96%	97%	90%	92%
18 Month	75%	86%	91%	83%	83%
24 Month	92%	97%	97%	91%	93%
5 Year	73%	81%	80%	80%	79%

Source: National Immunisation Register

6.7 Prevalence of Asthma

There is no reliable data for West Auckland measuring asthma prevalence. However, the WDHB rate from the New Zealand Health Survey will be suggestive. According to the NZHS 06/07, about 14% of the Waitemata DHB child population were taking medication for asthma. This proportion was not significantly different from the proportion across New Zealand as a whole.

Table 35: % Children with Medicated Asthma, WDHB & NZ – NZHS 06/07

DHB	Prevalence (95% CI)	Number of children
Waitemata	13.9 (9.3–18.5)	12500
New Zealand	14.8 (13.5–16.2)	109,900

Source: 2006/07 NZHS

6.8 Avoidable Hospitalisations – PAH and ASH

6.9 Potentially Avoidable Hospitalisations

Of all acute hospital admissions for the West Auckland child population (0-14) over the three years 2009 – 2011, 24% were potentially avoidable (8,500 admissions out of a total of 35,000 acute admissions). This was a higher proportion than the corresponding rate for the Waitemata DHB population as a whole of 21%.

Expressed as an age-standardised rate, West Auckland had a higher rate of Potentially Avoidable Hospitalisation than Waitemata DHB among children.

Figure 39: Child Age Standardised PAH Rate, WDHB and West Auckland, 2009-2011
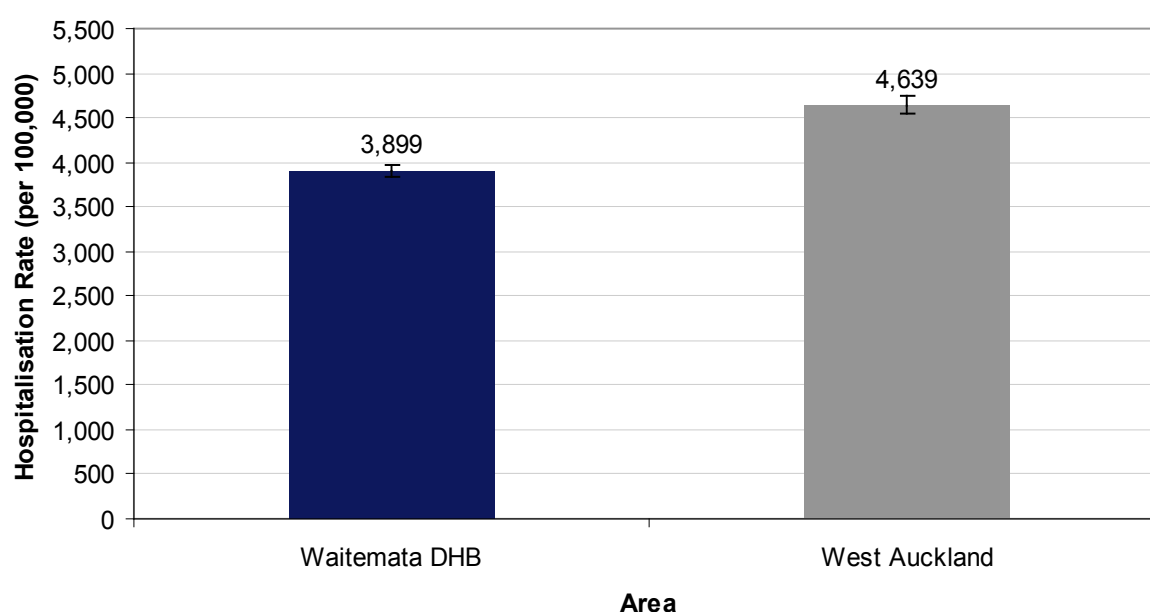
Table 36 below shows the top 10 conditions which contributed to PAH for West Auckland's children.

Table 36: PAH by Category (Top 10) – 2009-2011, West Auckland Children

PAH Category	Admissions	%
Respiratory infections - Acute bronchiolitis	1,456	17%
Asthma	1,219	14%
Gastroenteritis	1,179	14%
Cellulitis	1,021	12%
Respiratory infections - Pneumonia	926	11%
Respiratory infections - Other	712	8%
Epilepsy	531	6%
Kidney/urinary infection	383	5%
ENT infections	335	4%
Dental conditions	119	1%
Other PAH	592	7%
Total	8,473	100%

Source: NMDS

6.10 Ambulatory Sensitive Hospitalisations

Of all acute hospital admissions for the West Auckland child population over the three years 2009 – 2011, 18% were ambulatory sensitive (6,000 admissions out of a total of 35,000 acute admissions over three years). This was a higher proportion than the corresponding one for the Waitemata DHB population as a whole of 16%.

Expressed as an age-standardised rate, West Auckland had a higher rate of Ambulatory Sensitive Hospitalisation than Waitemata DHB among children.

Figure 40: Child Age Standardised ASH Rate, WDHB and West Auckland, 2009-2011
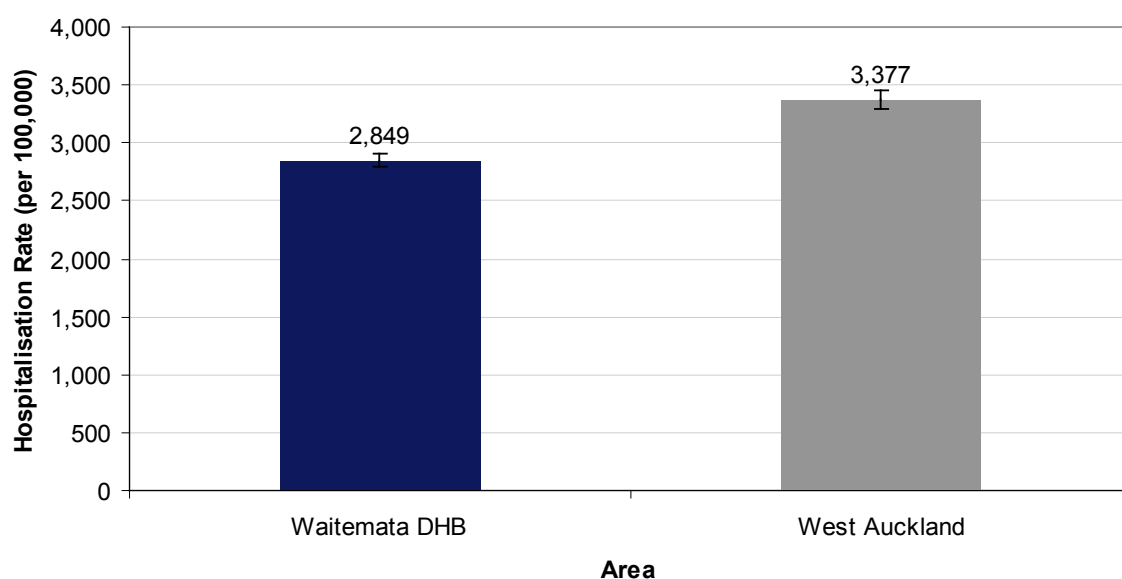
Table 37 below shows the top 10 conditions which contributed to ASH for West Auckland children.

Table 37: ASH by Category (Top 10) – 2009-2011, West Auckland Children

ASH Category	Admissions	%
Gastroenteritis/dehydration	1,311	22%
Asthma	1,219	20%
Cellulitis	997	16%
Respiratory infections - Pneumonia	926	15%
Upper respiratory tract and ENT infections	901	15%
Constipation	171	3%
Dermatitis & eczema	143	2%
Kidney/urinary infection	123	2%
Dental conditions	110	2%
GORD (Gastro-oesophageal reflux disease)	66	1%
Other ASH	125	2%
Total	6,092	100%

Source: NMDS

6.11 Asthma Admissions

Over the three years 2009-2011 there were 1,200 hospital admissions for West Auckland children with a primary diagnosis of asthma. This represented an age-standardised rate of 683 admissions per 100,000 children, a rate significantly higher than the Waitemata DHB rate of 559 admissions per 100,000 children. (See Figure 41)

These rates varied by ethnicity with both Maori and Pacific children having rates of asthma admission higher than the rest. (See Figure 42 below)

Figure 41: Child Age Standardised Rate – Asthma Admissions,
WDHB and West Auckland, 2009-2011
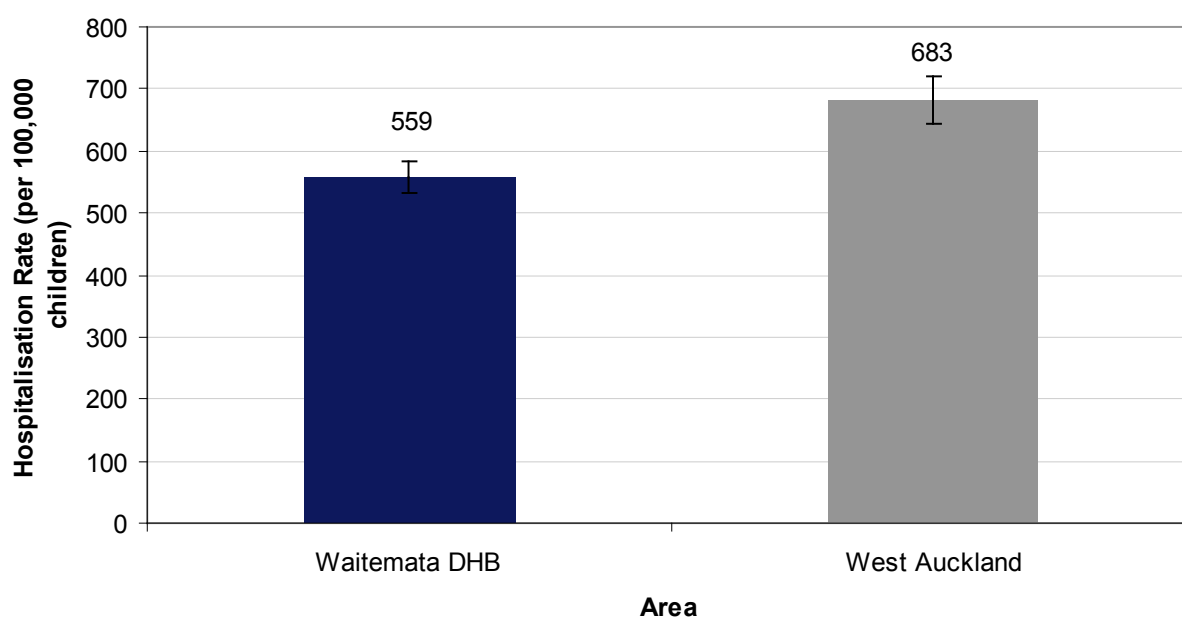
Figure 42: Child Age Standardised Rate – Asthma Admissions, West Auckland, 2009-2011 – by Ethnicity
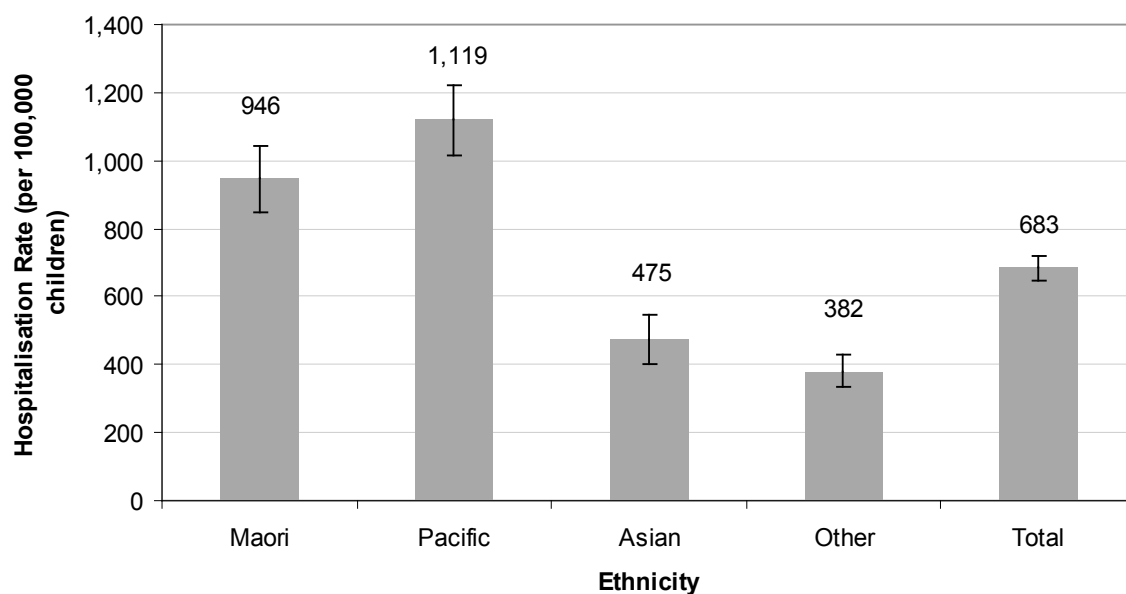
Figure 43 below shows where the burden of asthma admissions lies in terms of age compared to the structure of West Auckland's population. Clearly it is among the younger population that the majority of asthma admissions occur.

Figure 43: West Auckland Asthma Admissions and West Auckland Population, 2009-2011, proportion by Age
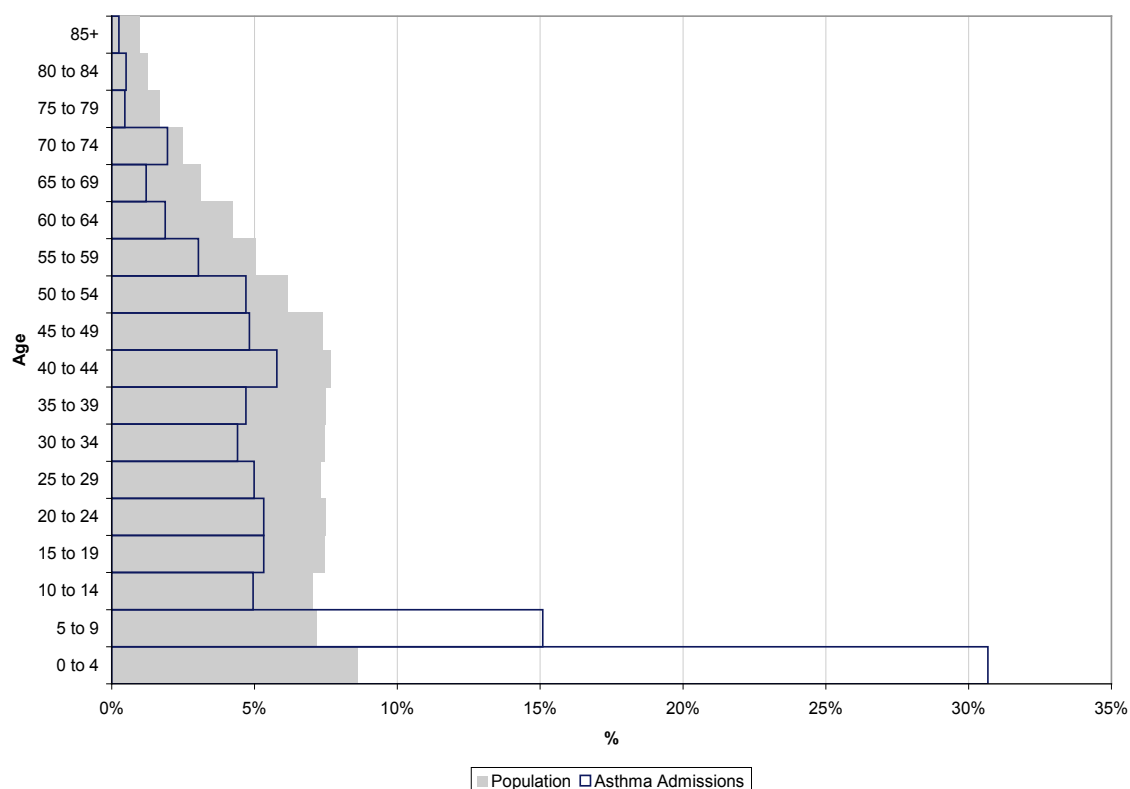
6.12 Rheumatic Fever Admissions

Over the three years 2009-2011 there were 48 hospital admissions for West Auckland children with a primary diagnosis of acute rheumatic fever. This represented an age-standardised rate of 29 admissions per 100,000 children, a rate higher (though not a statistically significant difference) than the Waitemata DHB rate of 18 admissions per 100,000 children. Figure 45 shows that it was among children that the majority or acute rheumatic fever admissions occur.

Figure 44: Child Age Standardised Rate – ARF Admissions, WDHB and West Auckland, 2009-2011
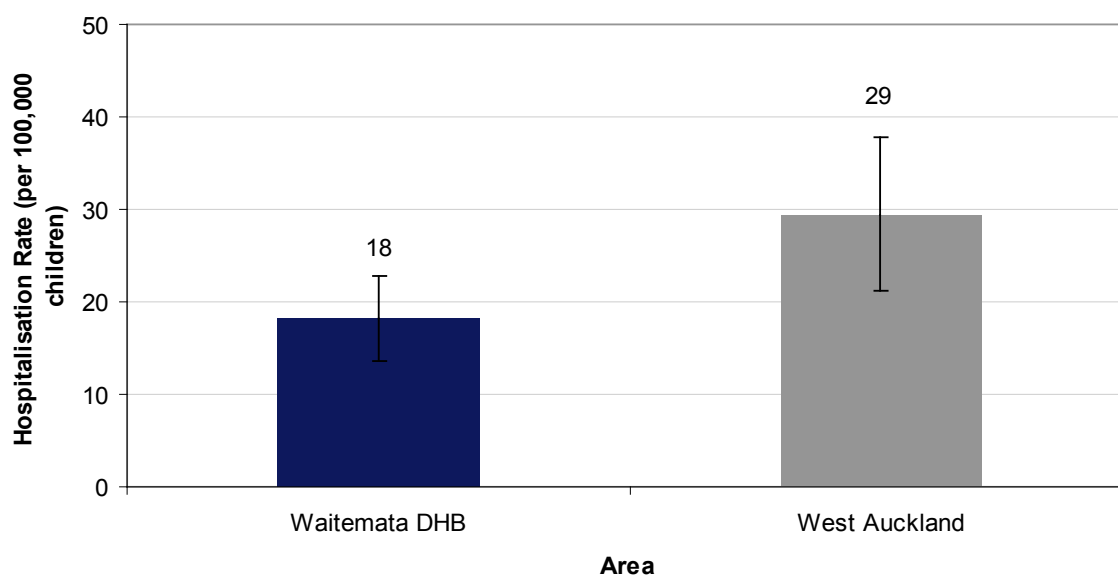
Figure 45: West Auckland ARF Admissions and West Auckland Population, 2009-2011, proportion by Age
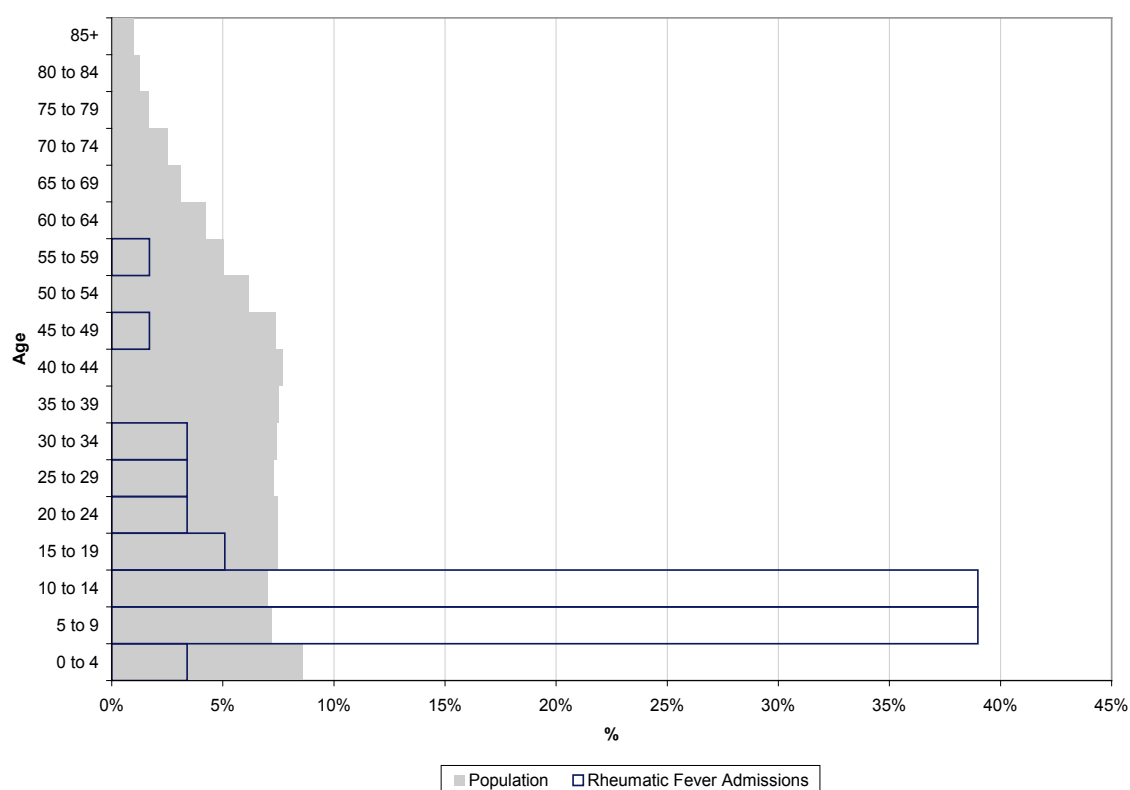
6.13 Injury Admissions

Over the three years 2009-2011 there were 3,900 hospital admissions for West Auckland children with an injury-related primary diagnosis. This represented an age-standardised rate of 2,291 admissions per 100,000 children, a rate slightly less than the Waitemata DHB rate of 2,411 admissions per 100,000 children. Figure 47 shows that injuries affect all age groups similarly.

**Figure 46: Child Age Standardised Rate – Injury Admissions,
WDHB and West Auckland, 2009-2011**
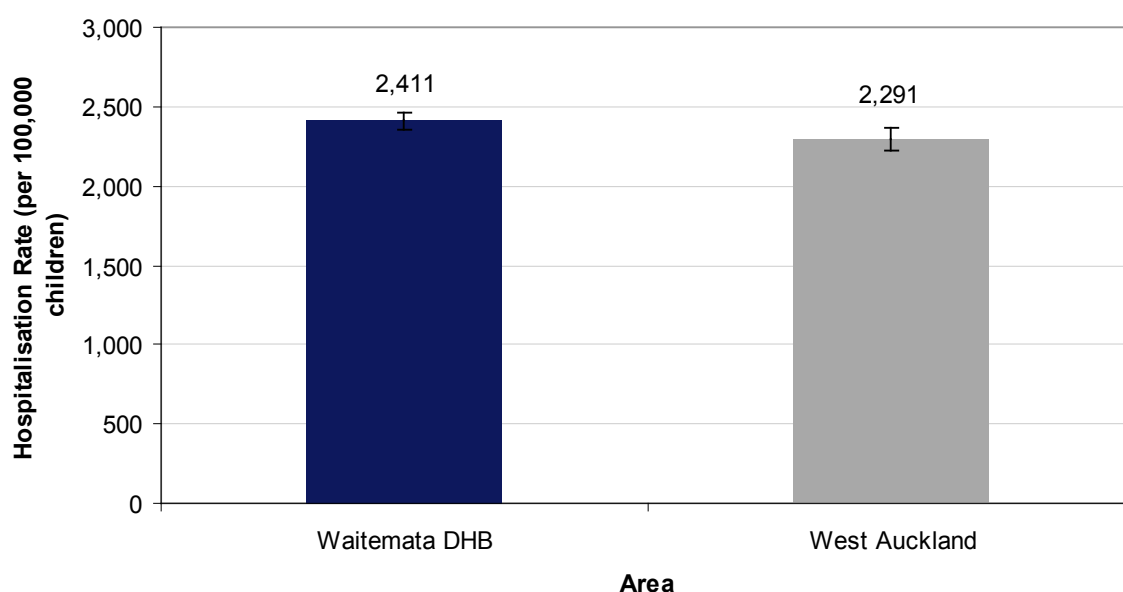
Figure 47: West Auckland Injury Admissions and West Auckland Population, 2009-2011, proportion by Age
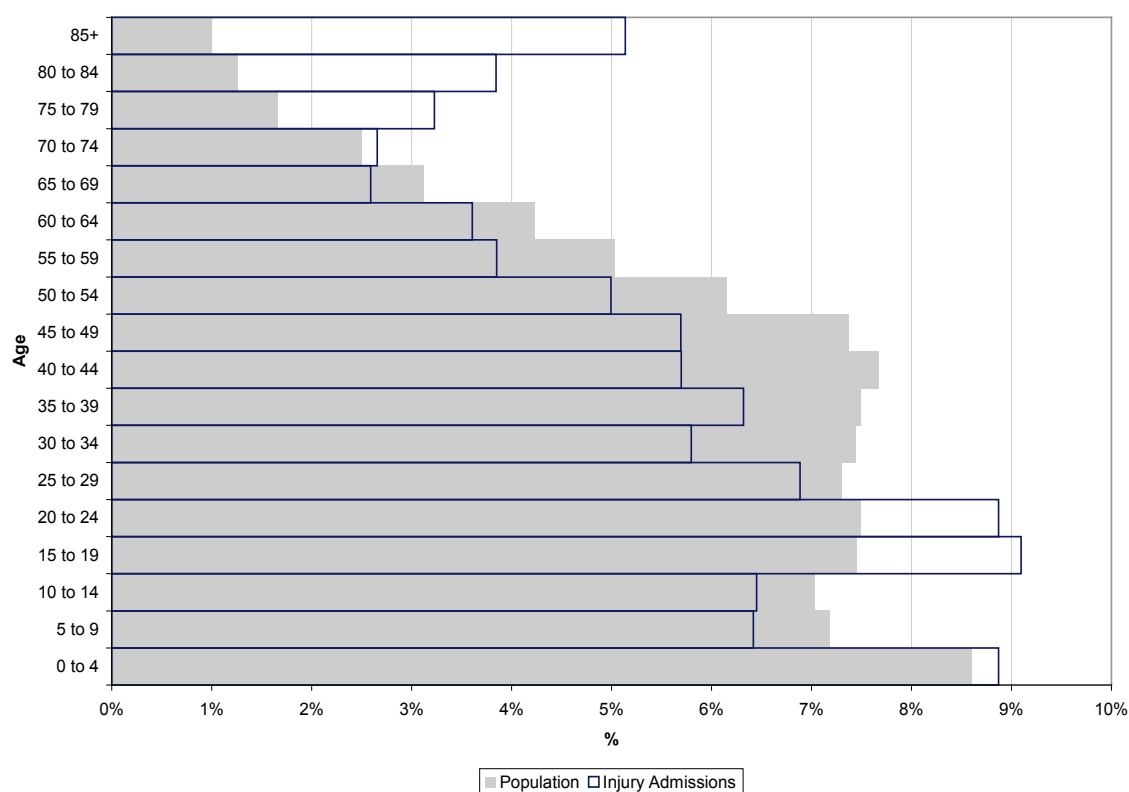
Table 38 below shows which categories of injury contributed towards the hospitalisation of West Auckland children. Falls accounted for almost half of all injury-related admissions.

Table 38: Injury Hospitalisations by Category (Top 20) – 2009-2011, West Auckland Children

Injury Category	Admissions	%
Falls	1,749	45%
Exposure to inanimate mechanical forces	947	24%
Exposure to animate mechanical forces	223	6%
Pedal cyclist injured in transport accident	202	5%
Accidental poisoning by and exposure to noxious substances	122	3%
Accidental exposure to other and unspecified factors	99	3%
Car occupant injured in transport accident	85	2%
Drugs, medicaments and biological substances causing adverse effects in therapeutic use	78	2%
Pedestrian injured in transport accident	77	2%
Overexertion, travel and privation	74	2%
Contact with heat and hot substances	62	2%
Assault	60	2%
Other land transport accidents	23	1%
Other accidental threats to breathing	23	1%
Intentional self-harm	21	1%
Event of undetermined intent	17	0.4%
Exposure to smoke, fire and flames	17	0.4%
Accidental drowning and submersion	14	0.4%
Motorcycle rider injured in transport accident	9	0.2%
Contact with venomous animals and plants	5	0.1%
Other Injuries	14	0.4%
Total Injury Admissions	3,921	100%

Source: NMDS

6.14 Oral Health

Over the three years 2009-2011 there were 1,100 hospital admissions for West Auckland children with a dental caries or oral health issue primary diagnosis. This represented an age-standardised rate of 643 admissions per 100,000 children, a rate slightly higher than the Waitemata DHB rate.

Figure 48: Child Age Standardised Rate – Dental Caries and Oral Health Admissions, WDHB and West Auckland, 2009-2011
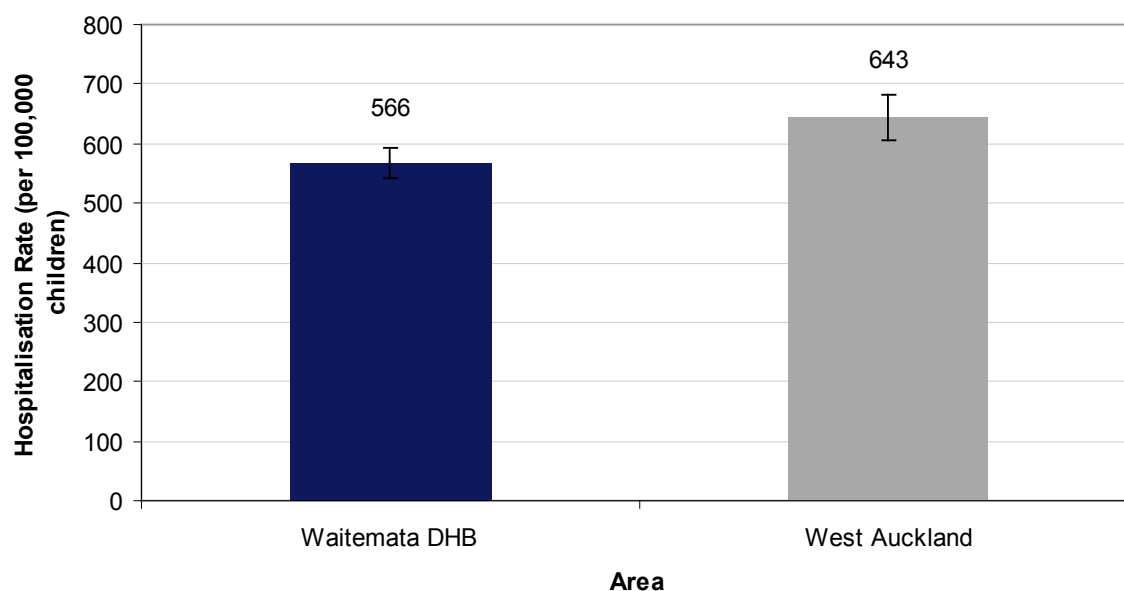
Figure 49: West Auckland Dental Caries and Oral Health Admissions and West Auckland Population, 2009-2011, proportion by Age
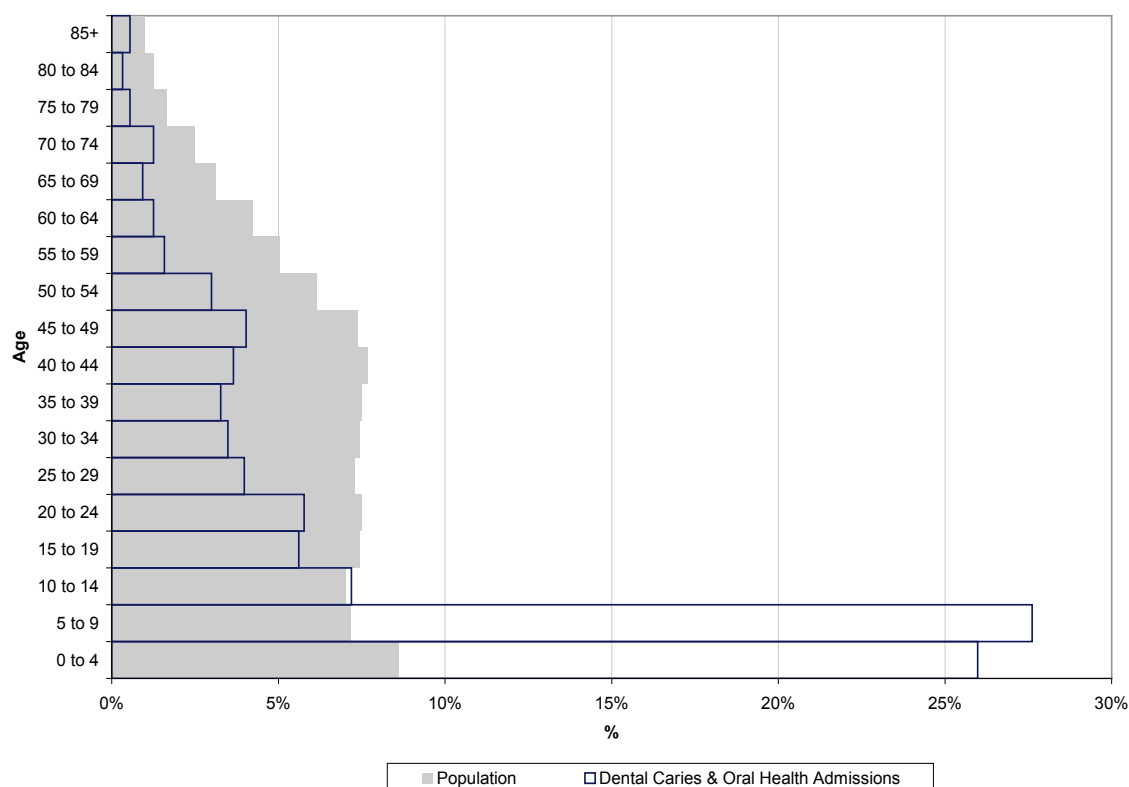
6.15 Emergency Department Attendances

For the one year 2010/11, there were 16,000 Emergency Department visits from West Auckland's child (0-14) population. Expressed as an age-standardised rate, West Auckland had a rate of 26,900 ED attendances per 100,000 children. This was a rate higher than that for Waitemata DHB as a whole over this time period (22,400 ED visits per 100,000).

Figure 50: Age Standardised Emergency Department Visit Rate, WDHB and West Auckland, 2010/11, Children (0-14)
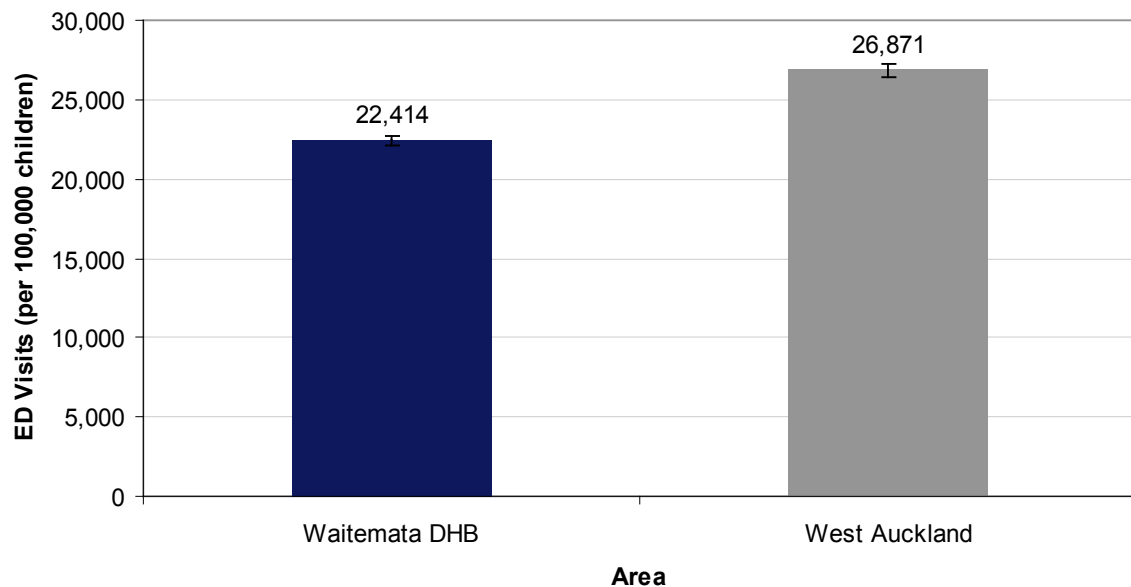
Cluster Level Profile

7 Definition of Clusters

For the purpose of this report three "Clusters" will be compared – Henderson, Massey, and New Lynn. These clusters are defined by the enrolled patient populations of the following Practices:

Table 39: Clusters by Practice

Cluster	Practices	
Henderson	Family Practice + Medical Centre	Swanson Medical Centre
	Henderson Medical Centre	T L Care Limited
	Lincoln Rd Medical Centre	Te Atatu South Medical Centre
	Palomino Medical Centre	Valley Medical Centre
	Peninsula Medical Centre	Waitakere Union Health Centre
	Ranui Medical Centre	West Fono Health Trust
	Ratanui Medical Centre	Whanau Centre (Wai Health)
Massey	Hobsonville Medical Centre	Upper Harbour Medical Centre
	Luckens Road Medical Centre	West Harbour Medical Centre
	Massey Medical Centre	Westgate Medical Centre
	Royal Heights Medical Centre	
New Lynn	Avondale Family Doctor	Kinross Medical Centre
	Avondale Family Health Centre	Lynnmall Medical Centre
	Avondale Health Centre	McLaren Park Med Centre
	Avondale Medical Centre	New Lynn Medical Centre
	Blockhouse Bay Medical Centre	New Windsor Road Surgery
	Donovan Street Medical Centre	Pacific Horizon Healthcare
	Glenavon Doctors Surgery	Rosebank Road Medical Services
	Golf Road Medical Centre	The Doctors Ltd. (New Lynn)
	Green Bay Medical Centre	Titirangi Family Healthcare
	Integrated Medical - Dr Doering	Titirangi Medical Centre
	Kelston Medical Centre	Westview Medical Centre

8 Enrolled Population Demographics

8.1 Population by Age and Gender

The tables and population pyramids below show the age structures of each of the three Clusters. Data is taken from the PHO Enrolment Database for 2012 Quarter 1. New Lynn had the highest proportion of 65+ population and Massey the highest proportion of children (0-14). The age structures of the three clusters were however quite similar.

Table 40: Clusters by Age, 2012 Q1

Age	Henderson	Massey	New Lynn
0-14	19,597	7,639	23,681
15-24	12,187	4,415	14,455
25-44	22,773	8,834	29,034
45-64	18,863	7,503	25,820
65+	8,491	2,696	12,202
Total	81,911	31,087	105,192

Source: PHO Enrolment Database

Table 41: Clusters by Age %, 2012 Q1

Age	Henderson	Massey	New Lynn
0-14	24%	25%	23%
15-24	15%	14%	14%
25-44	28%	28%	28%
45-64	23%	24%	25%
65+	10%	9%	12%
Total	100%	100%	100%

Source: PHO Enrolment Database

Figure 51: Henderson Cluster Population Structure, 2012 Q1
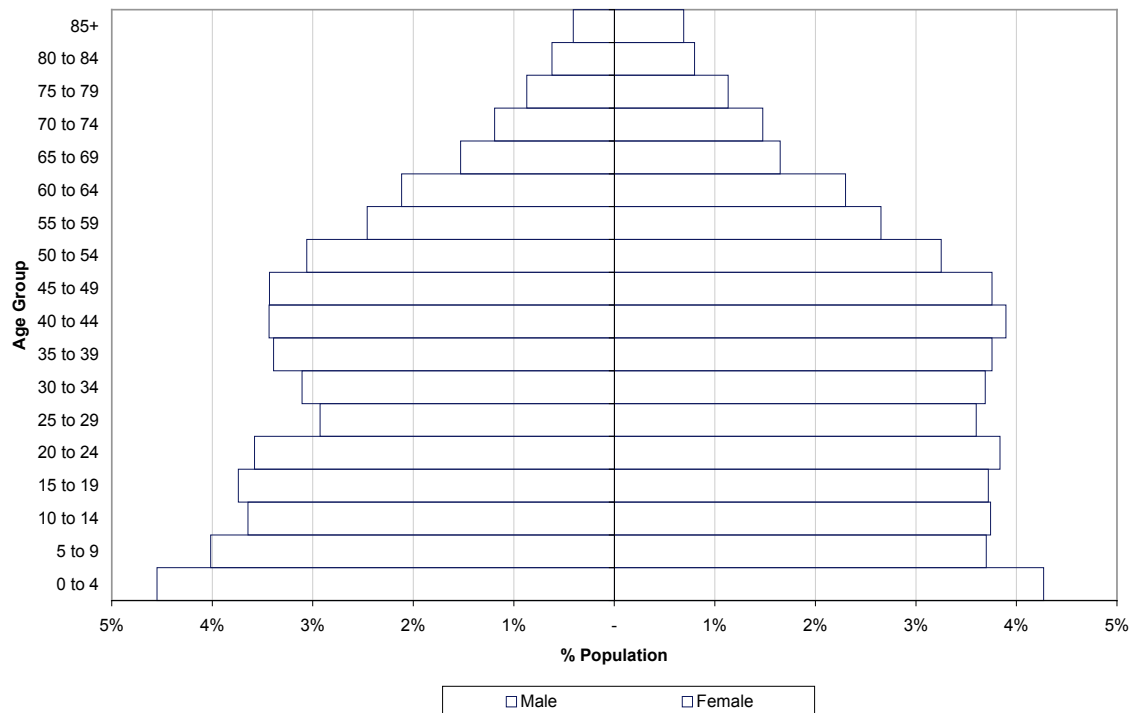
Figure 52: Massey Cluster Population Structure, 2012 Q1
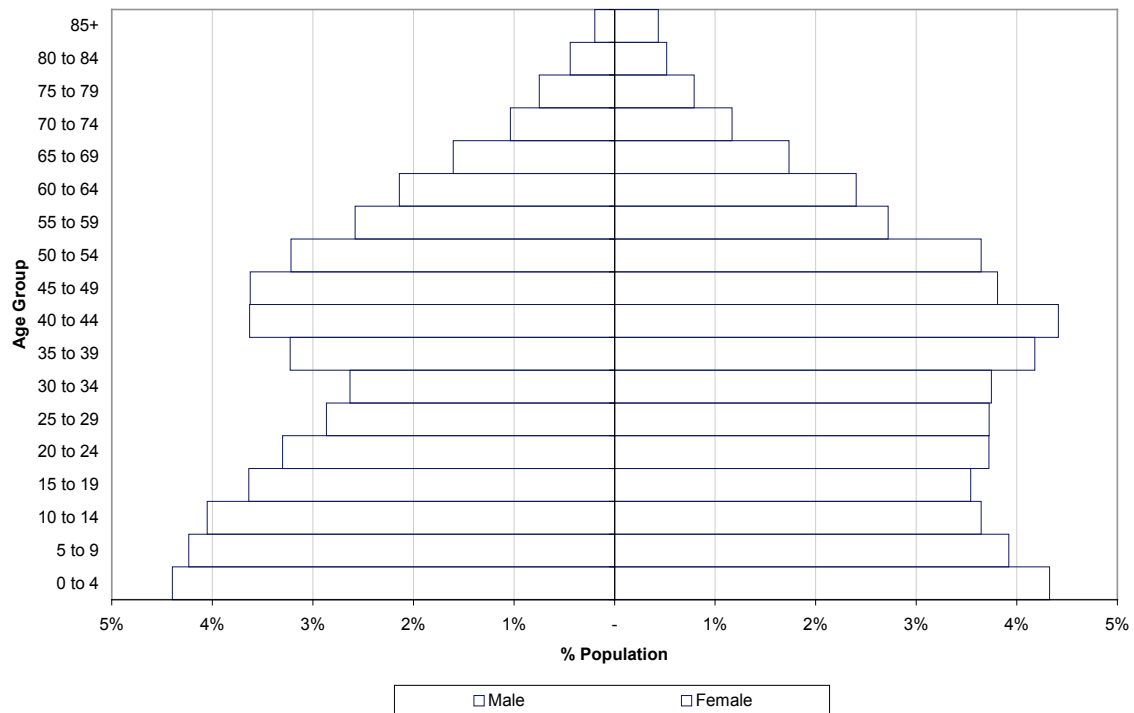
Figure 53: New Lynn Cluster Population Structure, 2012 Q1
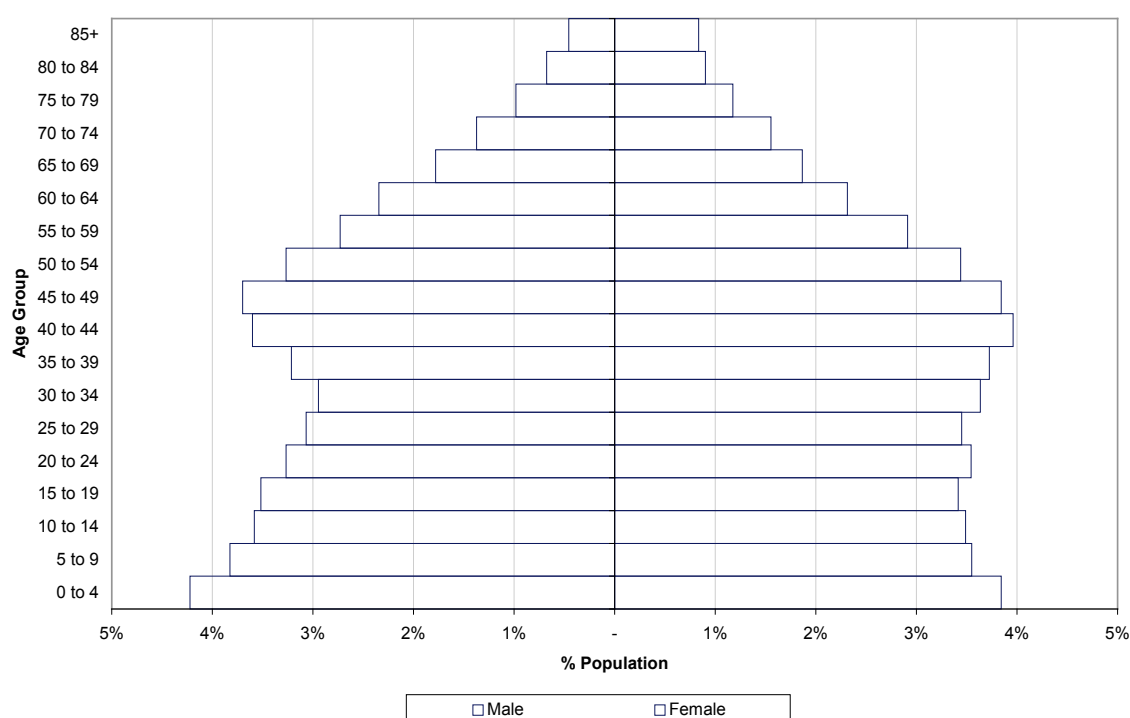
8.2 Population by Age and Ethnicity

Given some concerns over PHO Enrolment ethnicity data the following ethnicity breakdowns include Maori and Pacific as one group. There are noticeable differences between the three Clusters when broken down by ethnicity. The Henderson Cluster has the largest Maori/Pacific population and Massey the smallest. Both Henderson and New Lynn have a similar proportion of Asian population. (See Tables 42 and 43 and Figure 54 below)

Table 42: Clusters by Ethnicity, 2012 Q1

Ethnicity	Henderson	Massey	New Lynn
Maori/Pacific	27,936	5,574	27,511
Asian	13,121	3,039	16,753
Other	40,854	22,474	60,928
Total	81,911	31,087	105,192

Source: PHO Enrolment Database

Table 43: Clusters by Ethnicity %, 2012 Q1

Ethnicity	Henderson	Massey	New Lynn
Maori/Pacific	34%	18%	26%
Asian	16%	10%	16%
Other	50%	72%	58%
Total	100%	100%	100%

Source: PHO Enrolment Database

Figure 54: Henderson, Massey, New Lynn, % Population by Ethnicity, 2012 Q1
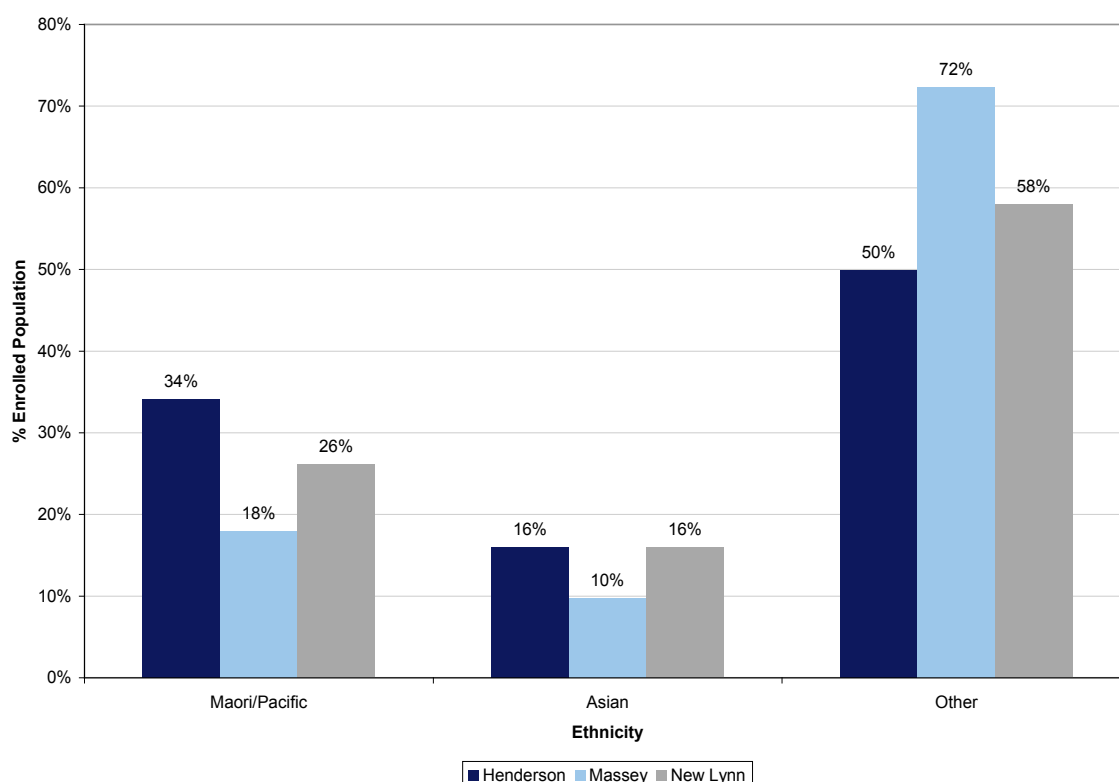
Tables 44 to 49 show the age structures of each cluster by ethnic group. Across all three Clusters the Maori/Pacific population was proportionately younger than the Total. For all three Clusters the Maori/Pacific population was made up of close to one third children (0-14).

Table 44: Henderson Cluster by Ethnicity and Age, 2012 Q1

Age	Maori/Pacific	Asian	Other	Total
0-14	9,116	3,126	7,355	19,597
15-24	5,180	1,698	5,309	12,187
25-44	7,551	4,341	10,881	22,773
45-64	4,840	3,044	10,979	18,863
65+	1,249	912	6,330	8,491
Total	27,936	13,121	40,854	81,911

Source: PHO Enrolment Database

Table 45: Massey Cluster by Ethnicity and Age, 2012 Q1

Age	Maori/Pacific	Asian	Other	Total
0-14	1,991	718	4,930	7,639
15-24	1,061	414	2,940	4,415
25-44	1,526	972	6,336	8,834
45-64	853	790	5,860	7,503
65+	143	145	2,408	2,696
Total	5,574	3,039	22,474	31,087

Source: PHO Enrolment Database

Table 46: New Lynn Cluster by Ethnicity and Age, 2012 Q1

Age	Maori/Pacific	Asian	Other	Total
0-14	8,789	3,609	11,283	23,681
15-24	5,051	1,965	7,439	14,455
25-44	7,444	5,592	15,998	29,034
45-64	4,871	4,129	16,820	25,820
65+	1,356	1,458	9,388	12,202
Total	27,511	16,753	60,928	105,192

Source: PHO Enrolment Database

Table 47: Henderson Cluster by Ethnicity and Age %, 2012 Q1

Age	Maori/Pacific	Asian	Other	Total
0-14	33%	24%	18%	24%
15-24	19%	13%	13%	15%
25-44	27%	33%	27%	28%
45-64	17%	23%	27%	23%
65+	4%	7%	15%	10%
Total	100%	100%	100%	100%

Source: PHO Enrolment Database

Table 48: Massey Cluster by Ethnicity and Age %, 2012 Q1

Age	Maori/Pacific	Asian	Other	Total
0-14	36%	24%	22%	25%
15-24	19%	14%	13%	14%
25-44	27%	32%	28%	28%
45-64	15%	26%	26%	24%
65+	3%	5%	11%	9%
Total	100%	100%	100%	100%

Source: PHO Enrolment Database

Table 49: New Lynn Cluster by Ethnicity and Age %, 2012 Q1

Age	Maori/Pacific	Asian	Other	Total
0-14	32%	22%	19%	23%
15-24	18%	12%	12%	14%
25-44	27%	33%	26%	28%
45-64	18%	25%	28%	25%
65+	5%	9%	15%	12%
Total	100%	100%	100%	100%

Source: PHO Enrolment Database

The population pyramids below (Figures 55 – 57) serve to highlight the difference between the population structure of Maori/Pacific compared with the rest of the enrolled population by Cluster.

Figure 55: Henderson Cluster Population Structure, 2012 Q1
Maori/Pacific compared with Other (incl. Asian)
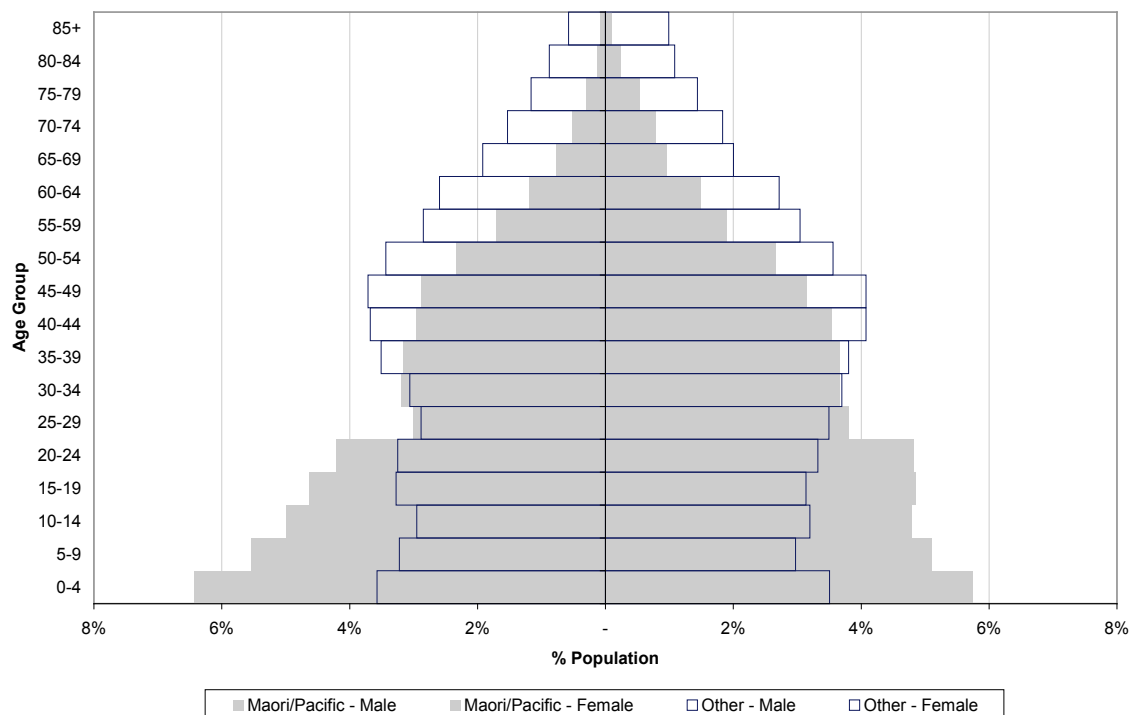
Figure 56: Massey Cluster Population Structure, 2012 Q1
Maori/Pacific compared with Other (incl. Asian)
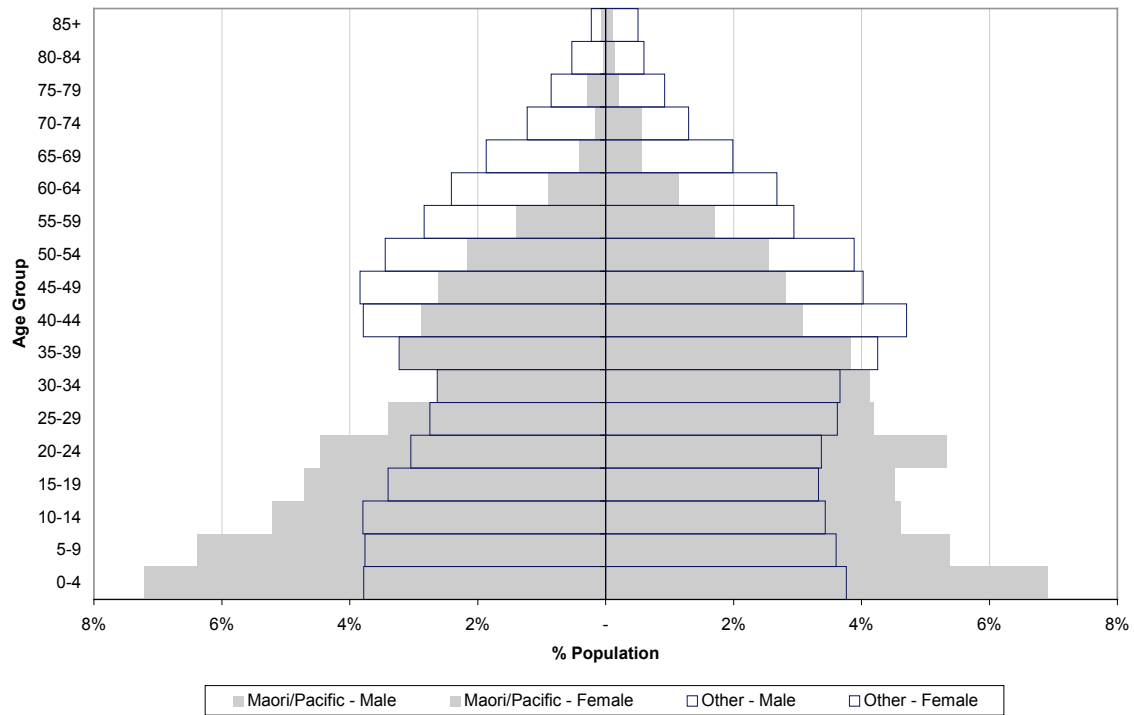
Figure 57: New Lynn Cluster Population Structure, 2012 Q1
Maori/Pacific compared with Other (incl. Asian)
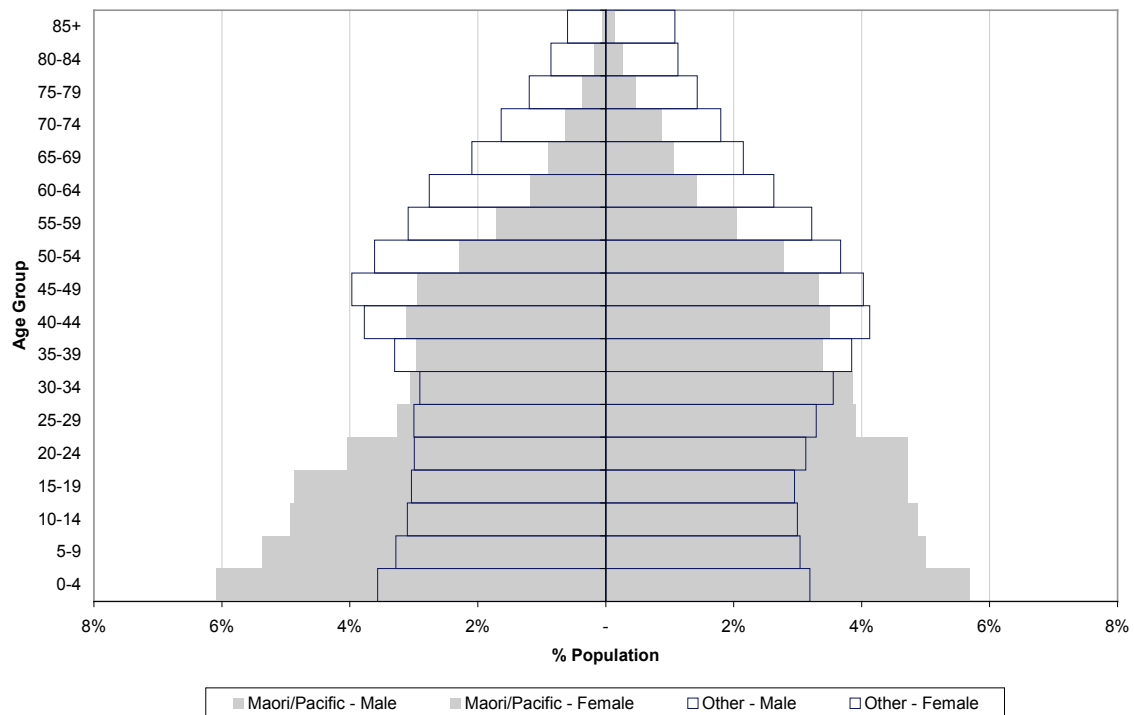
8.3 Population by Deprivation

Deprivation numbers for PHO Enrolment Data are far from complete, with close to 20% of enrolled patients not having an NZDep2006 decile assigned to them because of data issues. For this reason, the following numbers should be seen only as a rough guide. Population with an unassigned NZDep score have been excluded so that the following proportions can give a general picture of the differences in deprivation across the three Clusters.

Figures 58 to 60 below show the Massey Cluster to be noticeably less deprived than New Lynn and Henderson's population. The Henderson Cluster is seen to be the most deprived.

Figure 58: Henderson Cluster Population % by NZDep2006 Decile, 2012 Q1
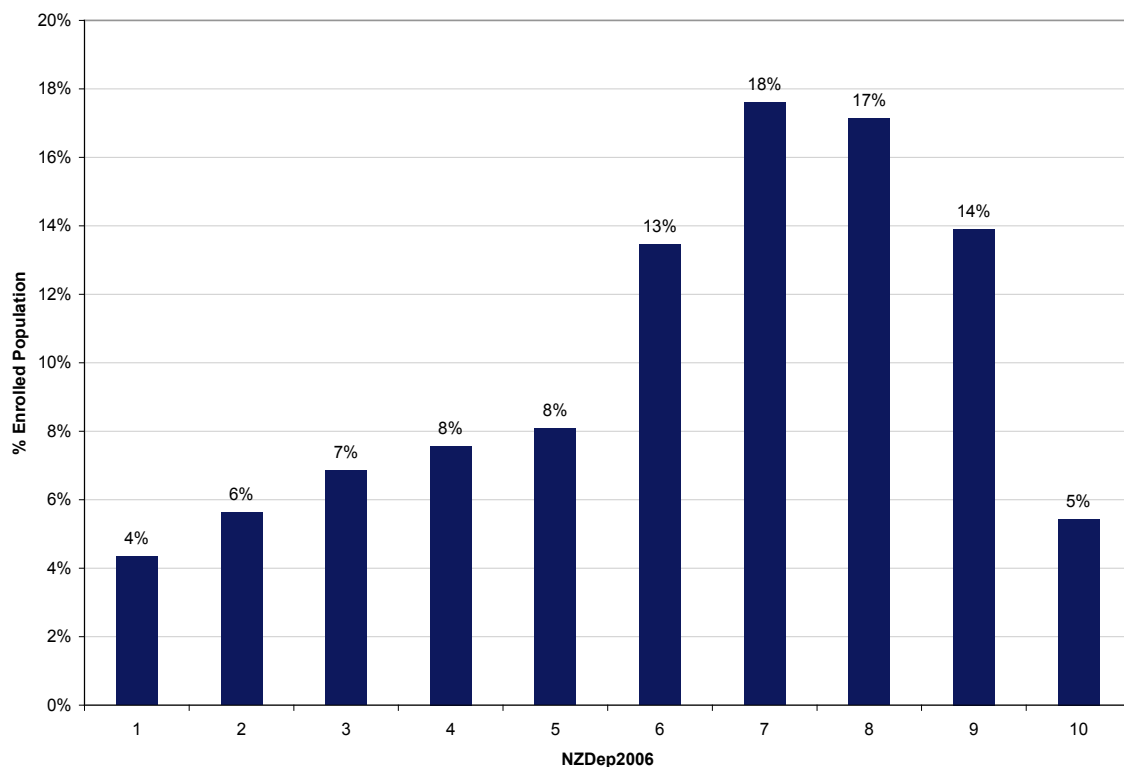
Figure 59: Massey Cluster Population % by NZDep2006 Decile, 2012 Q1
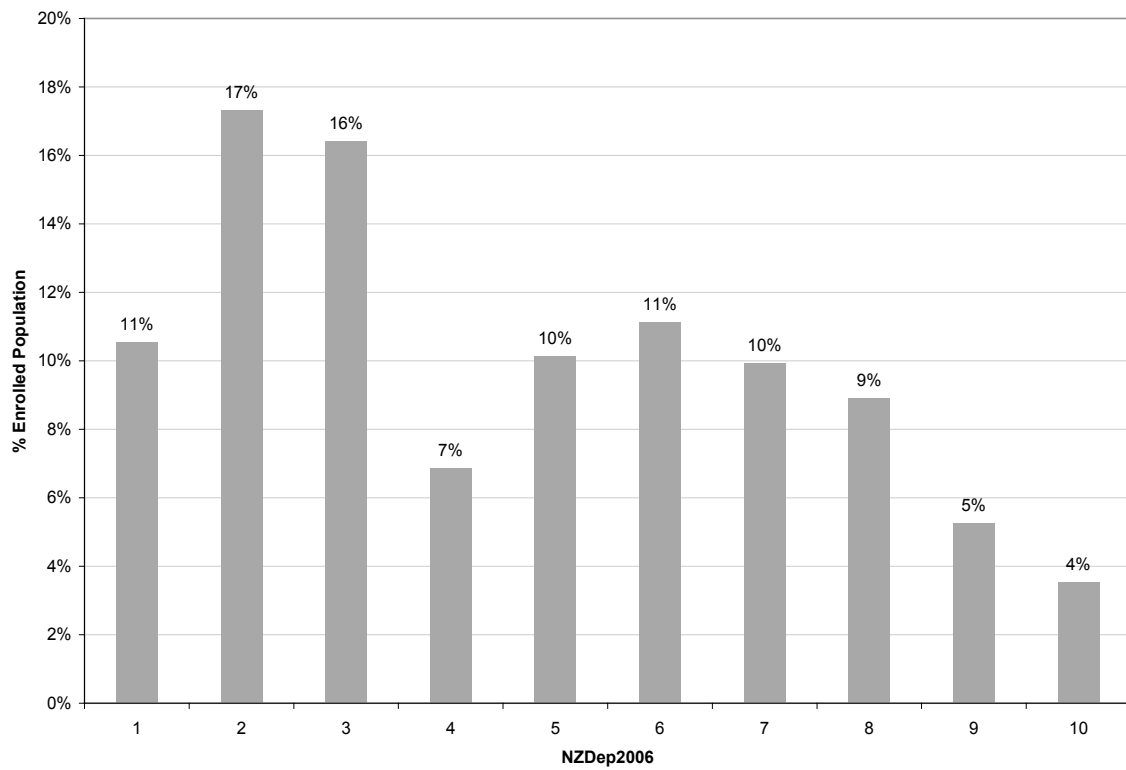
Figure 60: New Lynn Cluster Population % by NZDep2006 Decile, 2012 Q1
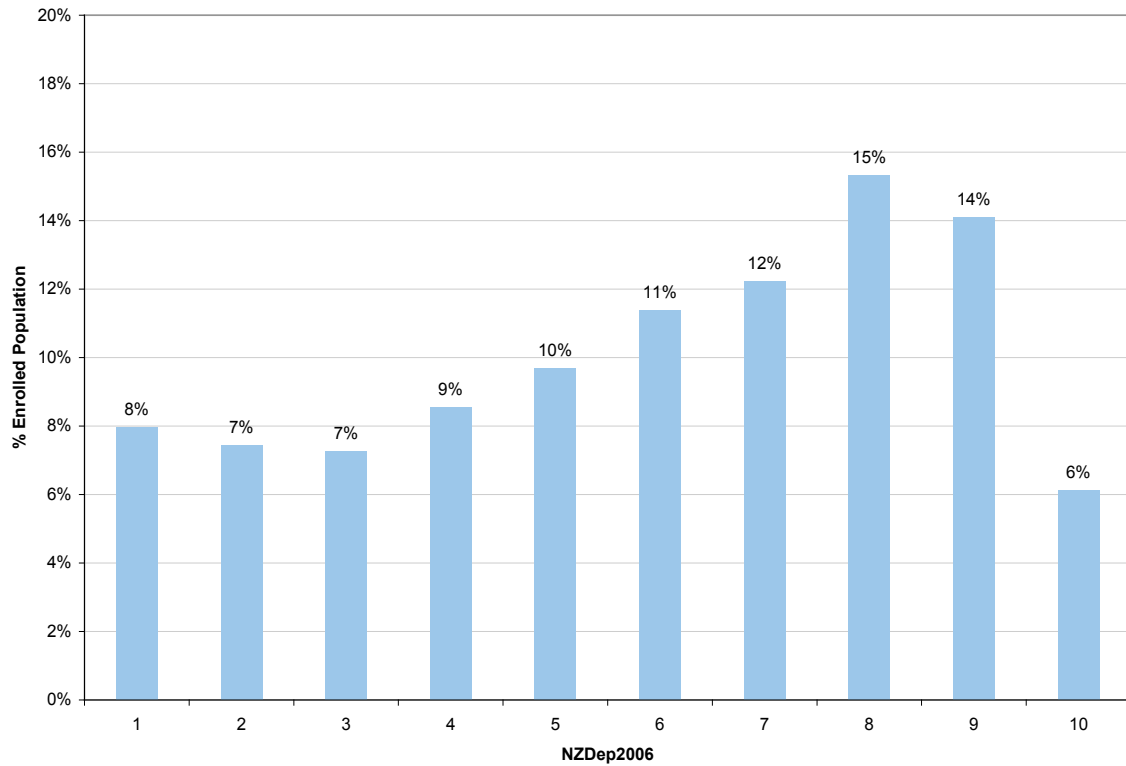
8.4 High Needs Population

For the purposes of comparing enrolled populations "High Needs" is a common definition used. "High needs" is defined as any enrolled Maori, Pacific, or NZDep Quintile 5 population.

Given this definition, the Henderson Cluster had the largest proportion of "High Needs" patients with a proportion of 43% and Massey the lowest (23%).

Figure 61: % Population High Needs, Q1 2007 - Q1 2012
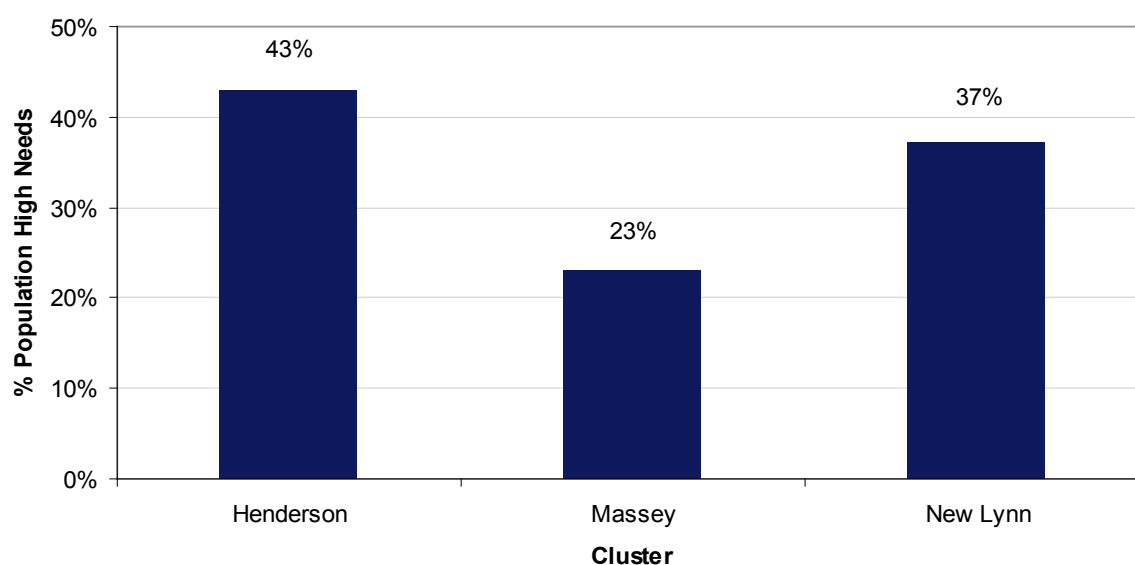
8.5 Population Growth

Over the last five years the Clusters' enrolled populations have grown at varying rates. The Massey Cluster has grown the fastest proportionately, but is of a much smaller size than Henderson and New Lynn. The Henderson Cluster has also grown significantly in the last 5 years. (See Table 50 and Figure 62 below)

Table 50: Cluster Population Change, Q1 2007 - Q1 2012

Cluster	2007 Q1	2012 Q1	Growth 2007-2012	% Growth
Henderson	68,971	75,628	6,657	10%
Massey	27,045	31,087	4,042	15%
New Lynn	88,697	92,611	3,914	4%

Source: PHO Enrolment Database

Figure 62: Cluster Population Change, PHO Enrolment Data, Q1 2007 - Q1 2012
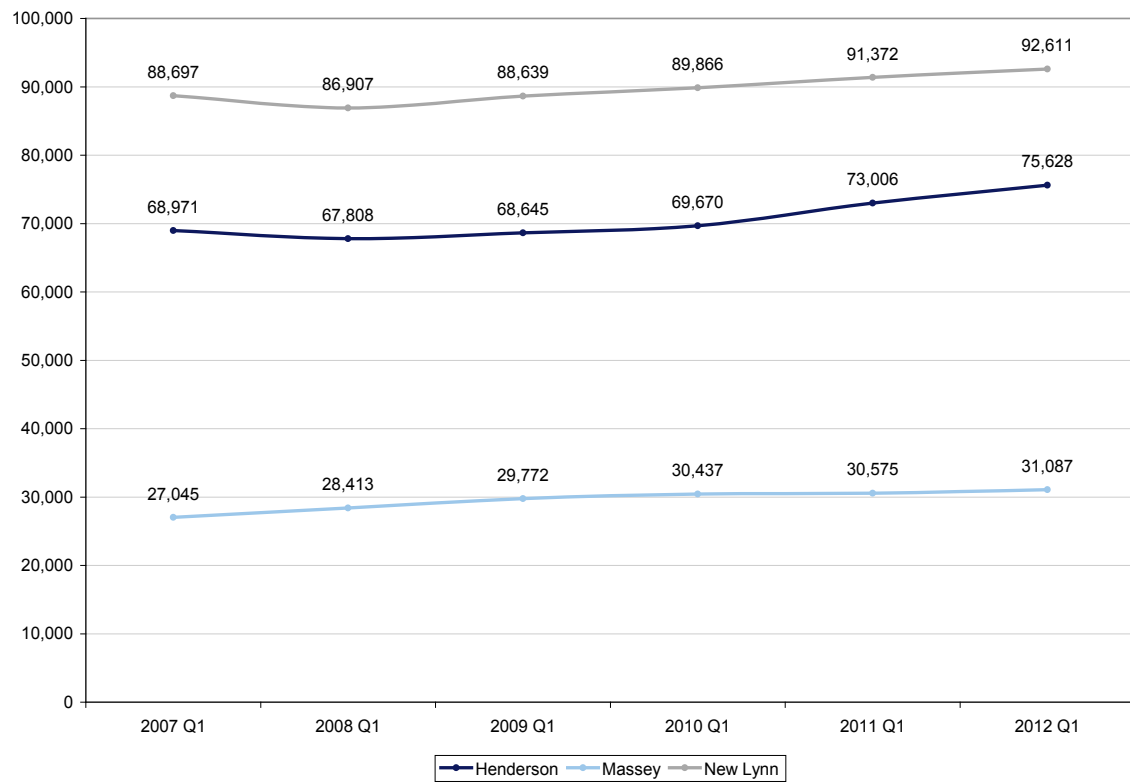
9 Secondary Care Services (Adults)

9.1 Avoidable Hospitalisations – PAH and ASH

For explanations/definitions of PAH and ASH see the Avoidable Hospitalisation section in the Locality analysis.

9.2 Potentially Avoidable Hospitalisations

Table 51 shows that of all acute adult hospital admissions (15-74) for the Henderson Cluster over the three years 2009 – 2011, 24% were potentially avoidable. For the Massey Cluster 21% were potentially avoidable and 23% for the New Lynn Cluster.

Table 51: PAH and Total Acute Admissions, 2009-2011, by Cluster (15-74)

Cluster	PAH	Total Acute Admissions	%
Henderson	7,626	31,424	24%
Massey	2,344	10,954	21%
New Lynn	8,203	36,274	23%
Total	17,435	78,652	23%

Source: NMDS

When looked at by ethnicity there were noticeable differences in the proportion of acute admissions that were deemed potentially avoidable. Maori and Pacific had a higher proportion of potentially avoidable hospitalisation (Ethnicity here is taken from NMDS rather than the PHO Enrolment Database).

Table 52: % Acute Admissions PAH, 2009-2011, by Ethnicity and Cluster (15-74)

Cluster	Maori	Pacific	Asian	Other
Henderson	25%	29%	19%	23%
Massey	20%	27%	20%	21%
New Lynn	25%	24%	20%	22%
Total	25%	26%	20%	22%

Source: NMDS

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of Potentially Avoidable Hospitalisation of the three clusters.

Figure 63: Adult (15-74 years) Age Standardised PAH Rate, Henderson, Massey, New Lynn - 2009-2011
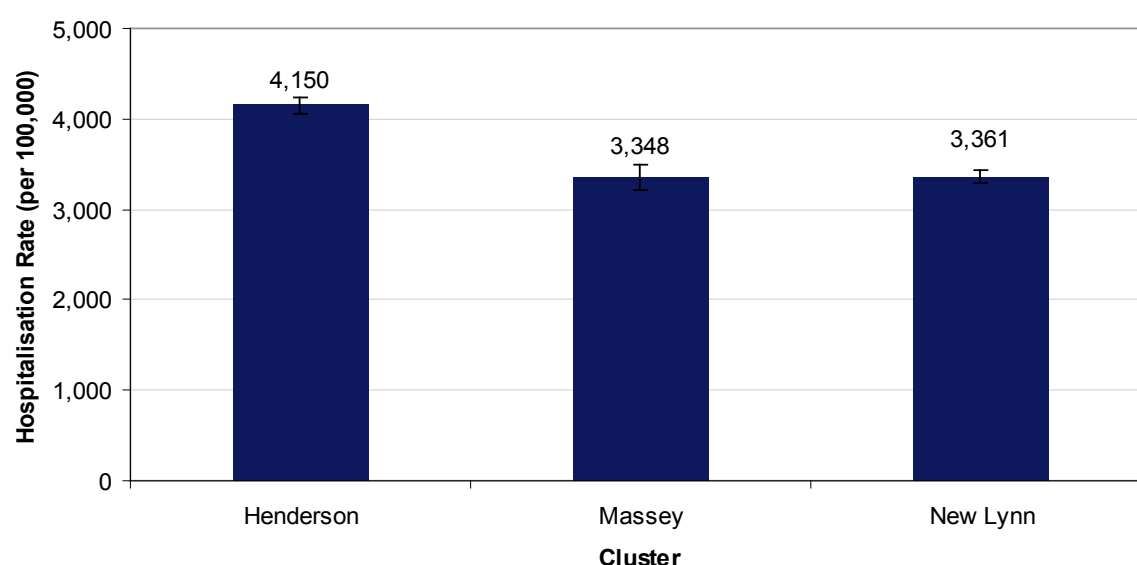
Tables 53-55 below show the top 10 conditions which contributed to Potentially Avoidable Hospitalisations for adults by Cluster.

Table 53: PAH by Category (Top 10) – 2009-2011, Henderson Cluster Adults (15-74)

PAH Category	Admissions	%
Angina and chest pain	1,672	22%
Cellulitis	828	11%
Myocardial infarction	632	8%
Kidney/urinary infection	477	6%
Gastroenteritis	453	6%
CORD	452	6%
Respiratory infections - Pneumonia	422	6%
Asthma	402	5%
Diabetes	399	5%
Sexually transmitted diseases	285	4%
Other PAH	1,604	21%
Total PAH	7,626	100%

Source: NMDS

Table 54: PAH by Category (Top 10) – 2009-2011, Massey Cluster Adults (15-74)

PAH Category	Admissions	%
Angina and chest pain	557	24%
Cellulitis	199	8%
Myocardial infarction	184	8%
Gastroenteritis	150	6%
Respiratory infections - Pneumonia	142	6%
Kidney/urinary infection	137	6%
CORD	137	6%
Asthma	117	5%
Epilepsy	99	4%
Sexually transmitted diseases	90	4%
Other PAH	532	23%
Total PAH	2,344	100%

Source: NMDS

Table 55: PAH by Category (Top 10) – 2009-2011, New Lynn Cluster Adults (15-74)

PAH Category	Admissions	%
Angina and chest pain	1,636	20%
Cellulitis	824	10%
Myocardial infarction	624	8%
Gastroenteritis	565	7%
Kidney/urinary infection	509	6%
CORD	497	6%
Respiratory infections - Pneumonia	457	6%
Asthma	424	5%
Diabetes	383	5%
Sexually transmitted diseases	321	4%
Other PAH	1,963	24%
Total PAH	8,203	100%

Source: NMDS

9.3 Ambulatory Sensitive Hospitalisations

Of all acute adult hospital admissions (15-74) for the Henderson Cluster over the three years 2009 – 2011, 18% were ambulatory sensitive. For the Massey Cluster 15% were ambulatory sensitive and 17% for the New Lynn Cluster.

Table 56: ASH and Total Acute Admissions, 2009-2011, by Cluster Adults (15-74)

Cluster	ASH	Total Acute Admissions	%
Henderson	5,557	31,424	18%
Massey	1,684	10,954	15%
New Lynn	5,988	36,274	17%
Total	13,229	78,652	17%

Source: NMDS

Table 57 below shows that by ethnicity there were noticeable differences in the proportion of acute admissions deemed as ambulatory sensitive. Maori and Pacific had a higher proportion of ambulatory sensitive admissions for all clusters (Ethnicity here is taken from NMDS rather than the PHO Enrolment Database).

Table 57: % Acute Admissions ASH, 2009-2011, by Ethnicity and Cluster (15-74)

Cluster	Maori	Pacific	Asian	Other
Henderson	20%	21%	14%	16%
Massey	15%	20%	13%	15%
New Lynn	18%	19%	14%	16%
Total	19%	20%	14%	16%

Source: NMDS

Figure 64 shows that as an age-standardised rate the Henderson Cluster had the highest rate of Ambulatory Sensitive Hospitalisation of the three clusters for adults.

Figure 64: Adult (15-74 years) Age Standardised ASH Rate, Henderson, Massey, New Lynn - 2009-2011
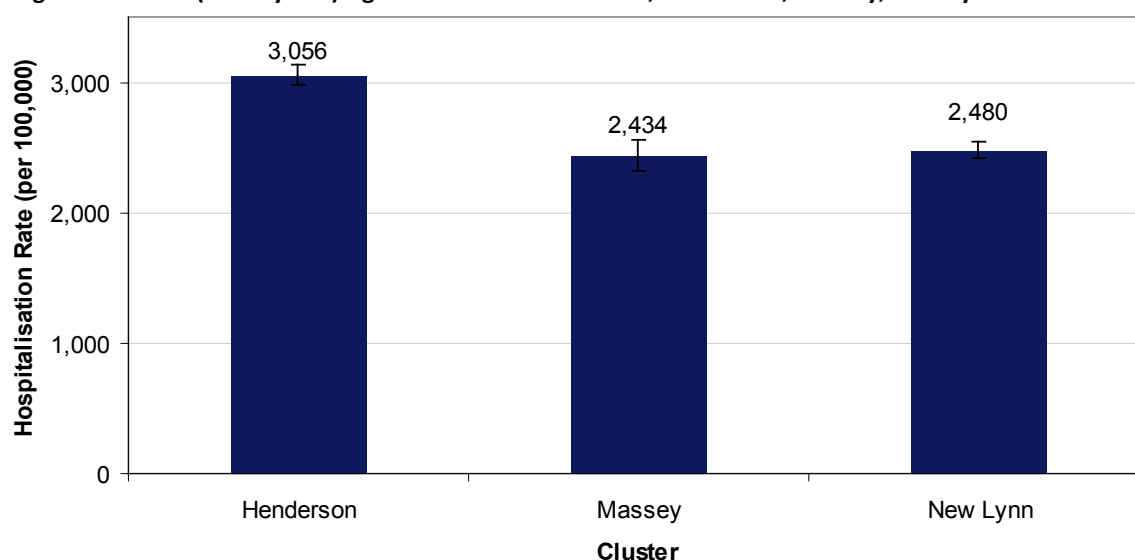
Tables 58 to 60 below show the top 10 conditions which contributed to Ambulatory Sensitive Hospitalisations for adults by Cluster.

Table 58: ASH by Category (Top 10) – 2009-2011, Henderson Cluster Adults (15-74)

ASH Category	Admissions	%
Angina and chest pain	836	15%
Cellulitis	810	15%
Gastroenteritis/dehydration	524	9%
Kidney/urinary infection	480	9%
Respiratory infections - Pneumonia	422	8%
Asthma	402	7%
Diabetes	399	7%
Myocardial infarction	316	6%
Epilepsy	252	5%
Upper respiratory tract and ENT infections	217	4%
Other ASH	899	16%
Total ASH	5,557	100%

Source: NMDS

Table 59: ASH by Category (Top 10) – 2009-2011, Massey Cluster Adults (15-74)

ASH Category	Admissions	%
Angina and chest pain	279	17%
Cellulitis	198	12%
Gastroenteritis/dehydration	179	11%
Respiratory infections - Pneumonia	142	8%
Kidney/urinary infection	138	8%
Asthma	117	7%
Epilepsy	99	6%
Myocardial infarction	92	5%
Diabetes	86	5%
Upper respiratory tract and ENT infections	73	4%
Other ASH	281	17%
Total ASH	1,684	100%

Source: NMDS

Table 60: ASH by Category (Top 10) – 2009-2011, New Lynn Cluster Adults (15-74)

ASH Category	Admissions	%
Angina and chest pain	818	14%
Cellulitis	809	14%
Gastroenteritis/dehydration	653	11%
Kidney/urinary infection	517	9%
Respiratory infections - Pneumonia	457	8%
Asthma	424	7%
Diabetes	383	6%
Myocardial infarction	312	5%
Upper respiratory tract and ENT infections	270	5%
Epilepsy	265	4%
Other ASH	1,080	18%
Total ASH	5,988	100%

Source: NMDS

9.4 CVD Admissions

Over the three years 2009 – 2011 there were 3,800 adult (15+) hospital admissions with a CVD primary diagnosis from the Henderson Cluster. From the Massey Cluster there were 1,100 and from the New Lynn Cluster there were 4,500.

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of CVD admissions for adults of the three clusters. (See Figure 65 below)

**Figure 65: Adult (15+) Age Standardised CVD Admission Rate,
Henderson, Massey, New Lynn - 2009-2011**
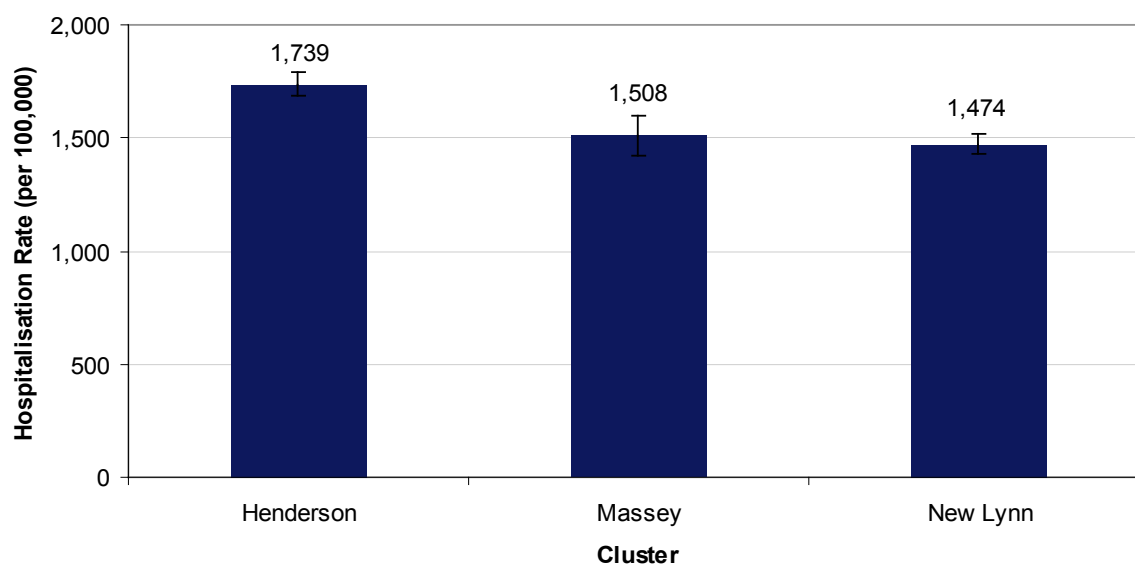
9.5 Diabetes Admissions

Over the three years 2009 – 2011 there were 800 adult (15+) hospital admissions with a diabetes primary diagnosis from the Henderson Cluster. From the Massey Cluster there were 150 and from the New Lynn Cluster there were 850.

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of diabetes admissions for adults and the Massey Cluster the lowest.

**Figure 66: Adult (15+) Age Standardised Diabetes Admission Rate,
Henderson, Massey, New Lynn - 2009-2011**
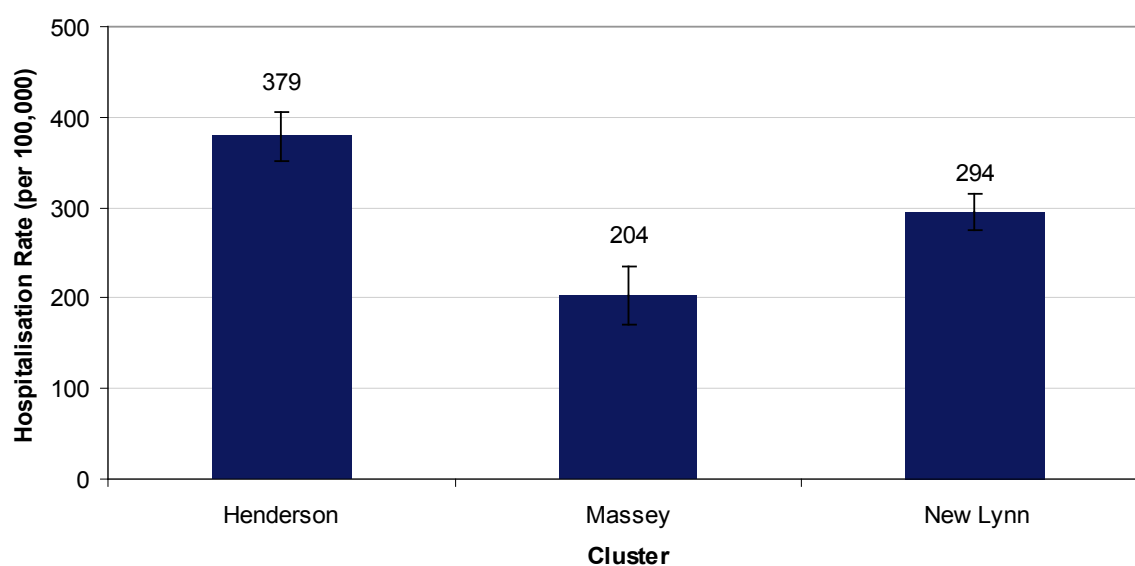
9.6 Mental Health Admissions

Over the three years 2009 – 2011 there were 900 adult (15+) Mental Health hospital admissions from the Henderson Cluster. From the Massey Cluster there were 150 and from the New Lynn Cluster there were 800.

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of Mental Health admissions for adults and the Massey Cluster the lowest.

Figure 67: Adult (15+) Age Standardised Mental Health Admission Rate, Henderson, Massey, New Lynn - 2009-2011
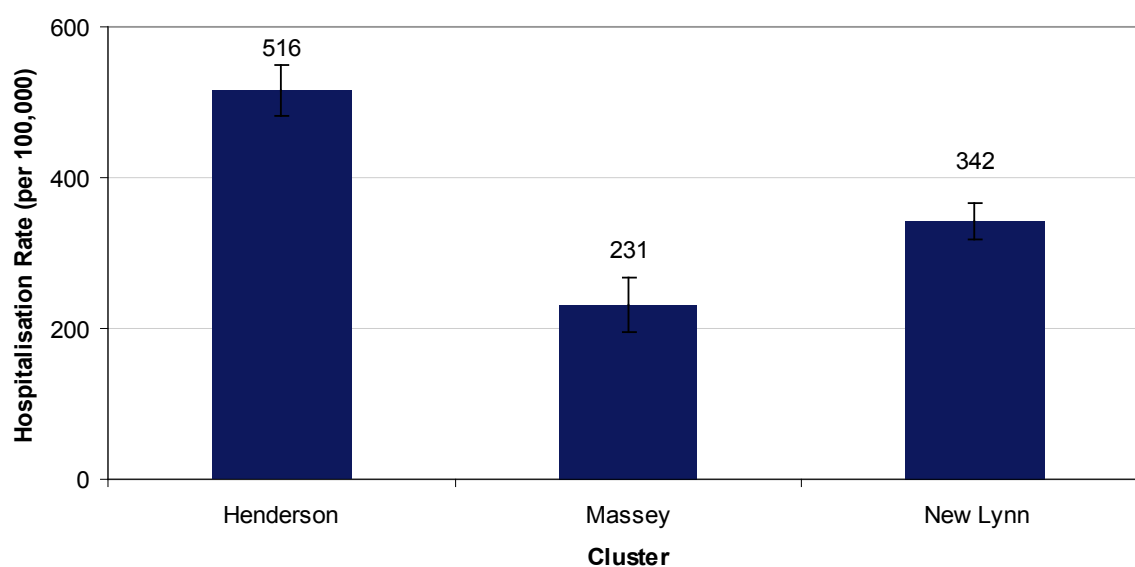
9.7 Elective Surgery

Over the three years 2009 – 2011 there were 6,700 adult (15+) elective hospital admissions to a surgical specialty from the Henderson Cluster. From the Massey Cluster there were 2,250 and from the New Lynn Cluster there were 8,500.

Expressed as an age-standardised rate, the Henderson Cluster had a slightly higher rate of Elective Surgery admissions than the others (however this was not a statistically significant difference). The Massey and New Lynn rates were largely the same.

Figure 68: Adult (15+) Age Standardised Elective Surgery Admission Rate, Henderson, Massey, New Lynn - 2009-2011
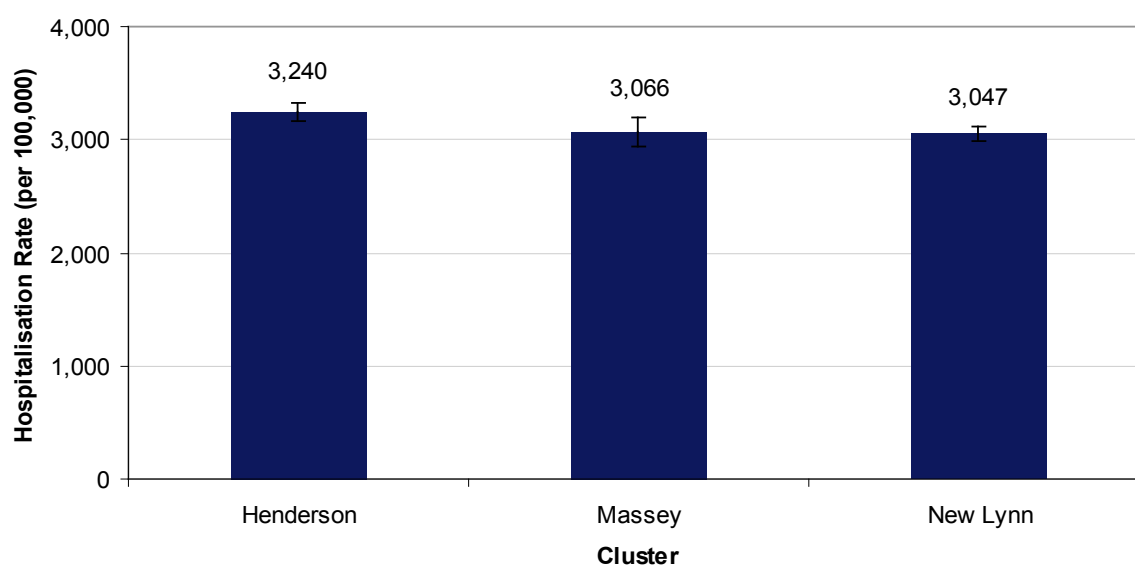
9.8 Emergency Department Attendances

For the financial year 2009/10 there were 13,700 adult (15+) Emergency Department attendances from the Henderson Cluster. From the Massey Cluster there were 4,000 and from the New Lynn Cluster there were 14,300.

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of ED attendance.

Figure 69: Adult (15+) Age Standardised ED Attendance Rate, Henderson, Massey, New Lynn - 2009/10
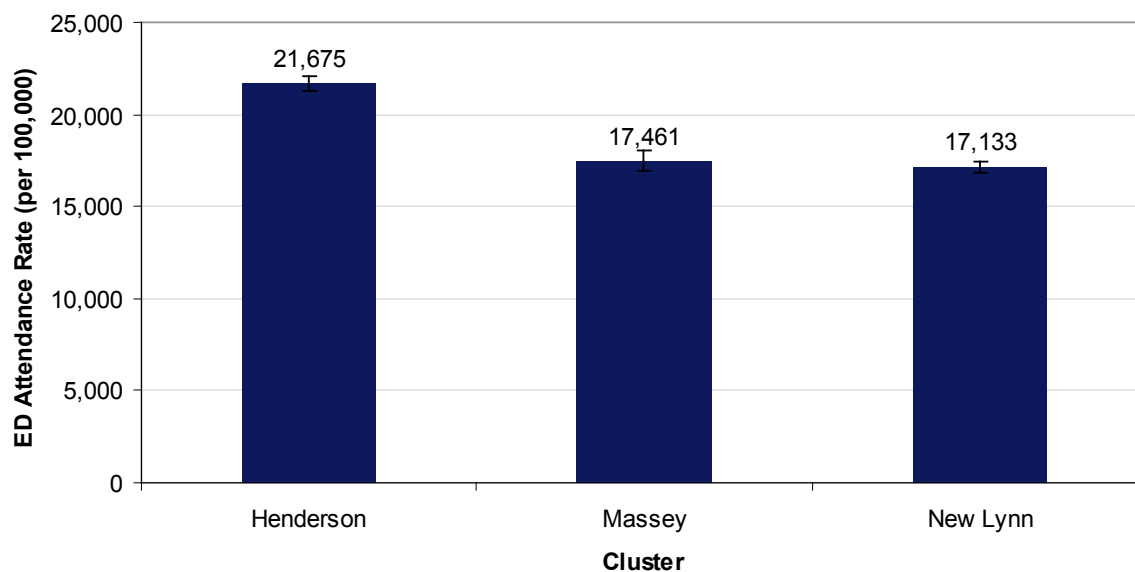
10 Child Health

10.1 Avoidable Hospitalisations – PAH and ASH

10.2 Potentially Avoidable Hospitalisations

Table 61 shows that of all acute child hospital admissions (0-14) for the Henderson Cluster over the three years 2009 – 2011, 25% were potentially avoidable. For the Massey Cluster 20% were potentially avoidable and 23% for the New Lynn Cluster.

Table 61: Child PAH and Total Acute Admissions, 2009-2011, by Cluster

Cluster	PAH	Total Acute Admissions	% Acute Admissions PAH
Henderson	3,300	12,280	27%
Massey	912	4,140	22%
New Lynn	3,393	13,317	25%
Total	7,605	29,737	26%

Source: NMDS

When looked at by ethnicity there were noticeable differences in the proportion of acute admissions that were deemed potentially avoidable for children. Maori and Pacific had a much higher proportion of potentially avoidable admissions (Ethnicity here is taken from NMDS rather than the PHO Enrolment Database).

Table 62: Child % Acute Admissions PAH, 2009-2011, by Ethnicity and Cluster

Cluster	Maori	Pacific	Asian	Other
Henderson	30%	35%	20%	19%
Massey	26%	33%	21%	18%
New Lynn	30%	34%	22%	18%
Total	30%	35%	21%	18%

Source: NMDS

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of Potentially Avoidable Hospitalisation for children of the three clusters and Massey the lowest.

Figure 70: Child Age Standardised PAH Rate, Henderson, Massey, New Lynn - 2009-2011
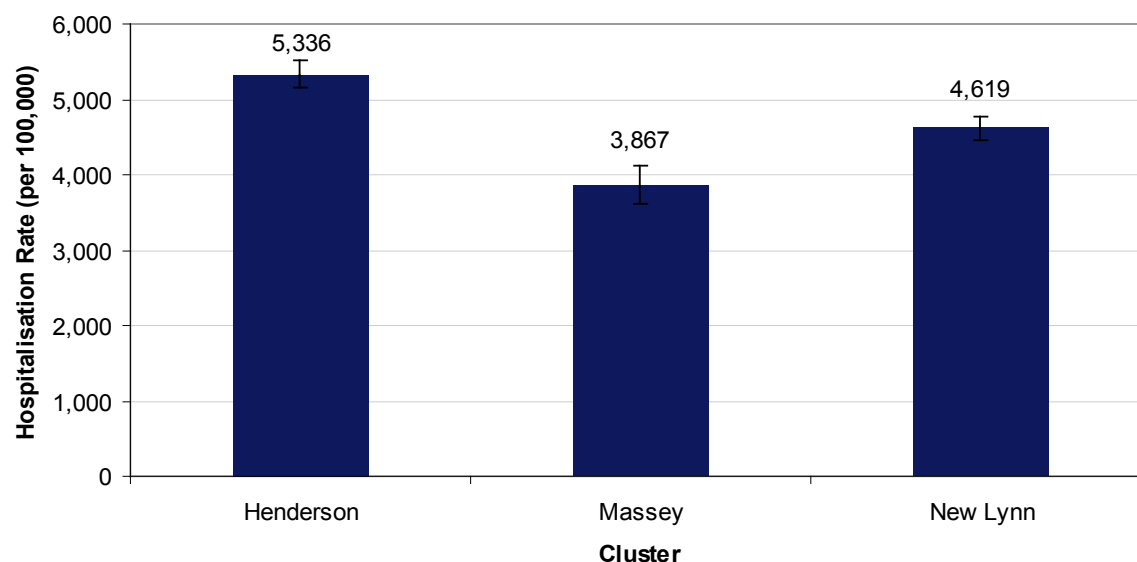
Tables 63 to 65 below show the top 10 conditions which contributed to Potentially Avoidable Hospitalisations for children by Cluster.

Table 63: PAH by Category (Top 10) – 2009-2011, Henderson Cluster Children

PAH Category	Admissions	%
Respiratory infections - Acute bronchiolitis	629	19%
Gastroenteritis	451	14%
Asthma	423	13%
Cellulitis	407	12%
Respiratory infections - Pneumonia	344	10%
Respiratory infections - Other	263	8%
Epilepsy	227	7%
Kidney/urinary infection	137	4%
ENT infections	132	4%
Dental conditions	54	2%
Other PAH	233	7%
Total PAH	3,300	100%

Source: NMDS

Table 64: PAH by Category (Top 10) – 2009-2011, Massey Cluster Children

PAH Category	Admissions	%
Asthma	156	17%
Gastroenteritis	140	15%
Respiratory infections - Acute bronchiolitis	129	14%
Respiratory infections - Pneumonia	93	10%
Respiratory infections - Other	91	10%
Cellulitis	79	9%
Epilepsy	69	8%
Kidney/urinary infection	46	5%
ENT infections	36	4%
Diabetes	13	1%
Other PAH	60	7%
Total PAH	912	100%

Source: NMDS

Table 65: PAH by Category (Top 10) – 2009-2011, New Lynn Cluster Children

PAH Category	Admissions	%
Asthma	533	16%
Respiratory infections - Acute bronchiolitis	528	16%
Gastroenteritis	503	15%
Cellulitis	404	12%
Respiratory infections - Pneumonia	376	11%
Respiratory infections - Other	271	8%
Epilepsy	226	7%
Kidney/urinary infection	156	5%
ENT infections	123	4%
Dental conditions	50	1%
Other PAH	223	7%
Total PAH	3,393	100%

Source: NMDS

10.3 Ambulatory Sensitive Hospitalisations

Of all acute child hospital admissions (0-14) for the Henderson Cluster over the three years 2009 – 2011, 19% were ambulatory sensitive. For the Massey Cluster 16% were ambulatory sensitive and 19% for the New Lynn Cluster.

Table 66: Child ASH and Total Acute Admissions, 2009-2011, by Cluster

Cluster	ASH	Total Acute Admissions	% Acute Admissions ASH
Henderson	2,312	12,280	19%
Massey	650	4,140	16%
New Lynn	2,502	13,317	19%
Total	5,464	29,737	18%

Source: NMDS

Table 67 below shows that by ethnicity there were differences in the proportion of acute admissions deemed ambulatory sensitive for children. Maori and Pacific had higher proportions of ambulatory sensitive admissions for all clusters (Ethnicity here is taken from NMDS rather than the PHO Enrolment Database).

Table 67: Child % Acute Admissions ASH, 2009-2011, by Ethnicity and Cluster

Cluster	Maori	Pacific	Asian	Other
Henderson	20%	24%	16%	14%
Massey	17%	21%	20%	13%
New Lynn	22%	23%	19%	14%
Total	20%	23%	18%	14%

Source: NMDS

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of Ambulatory Sensitive Hospitalisation of the three clusters for children and Massey the lowest.

Figure 71: Child Age Standardised ASH Rate, Henderson, Massey, New Lynn - 2009-2011
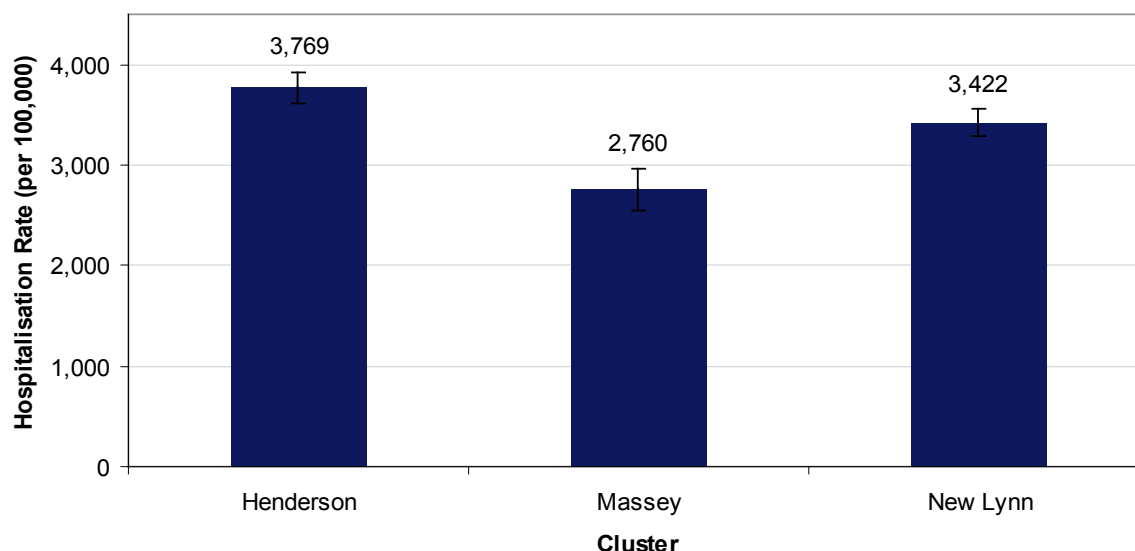
Tables 30-32 below show the top 10 conditions which contributed to Ambulatory Sensitive Hospitalisations for children by Cluster.

Table 68: ASH by Category (Top 10) – 2009-2011, Henderson Cluster Children

ASH Category	Admissions	%
Gastroenteritis/dehydration	493	21%
Asthma	423	18%
Cellulitis	399	17%
Respiratory infections - Pneumonia	344	15%
Upper respiratory tract and ENT infections	339	15%
Constipation	75	3%
Dermatitis & eczema	62	3%
Kidney/urinary infection	54	2%
Dental conditions	49	2%
Bronchiectasis	24	1%
Other ASH	50	2%
Total ASH	2,312	100%

Source: NMDS

Table 69: ASH by Category (Top 10) – 2009-2011, Massey Cluster Children

ASH Category	Admissions	%
Gastroenteritis/dehydration	169	26%
Asthma	156	24%
Upper respiratory tract and ENT infections	108	17%
Respiratory infections - Pneumonia	93	14%
Cellulitis	72	11%
GORD (Gastro-oesophageal reflux disease)	13	2%
Dermatitis & eczema	13	2%
Constipation	9	1%
Kidney/urinary infection	7	1%
Dental conditions	7	1%
Other ASH	3	1%
Total ASH	650	100%

Source: NMDS

Table 70: ASH by Category (Top 10) – 2009-2011, New Lynn Cluster Children

ASH Category	Admissions	%
Gastroenteritis/dehydration	559	22%
Asthma	533	21%
Cellulitis	396	16%
Respiratory infections - Pneumonia	376	15%
Upper respiratory tract and ENT infections	339	14%
Constipation	76	3%
Dermatitis & eczema	60	2%
Dental conditions	48	2%
Kidney/urinary infection	46	2%
GORD (Gastro-oesophageal reflux disease)	24	1%
Other ASH	45	2%
Total ASH	2,502	100%

Source: NMDS

10.4 Asthma Admissions

Over the three years 2009 – 2011 there were 400 child (0-14) hospital admissions with a primary diagnosis of asthma from the Henderson Cluster. From the Massey Cluster there were 150 and from the New Lynn Cluster there were 500.

Expressed as an age-standardised rate, the New Lynn Cluster had the highest rate of asthma admissions for children of the three clusters. However, the rate differences were not statistically significant.

Figure 72: Child Age Standardised Asthma Admission Rate, Henderson, Massey, New Lynn - 2009-2011
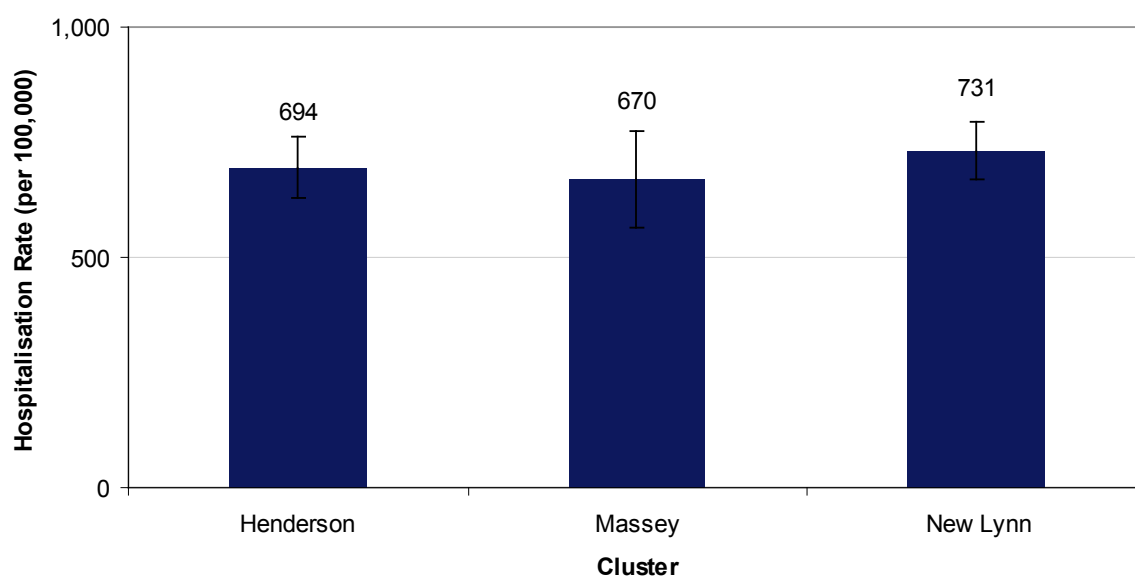
10.5 Rheumatic Fever Admissions

Over the three years 2009 – 2011 there were 16 child (0-14) hospital admissions with a primary diagnosis of acute rheumatic fever from the Henderson Cluster. From the Massey Cluster there was only 1 and from the New Lynn Cluster there were 18.

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of acute rheumatic fever admissions for children of the three clusters. However, the numbers were too small to show significant differences.

Figure 73: Child Age Standardised Rheumatic Fever Admission Rate, Henderson, Massey, New Lynn - 2009-2011
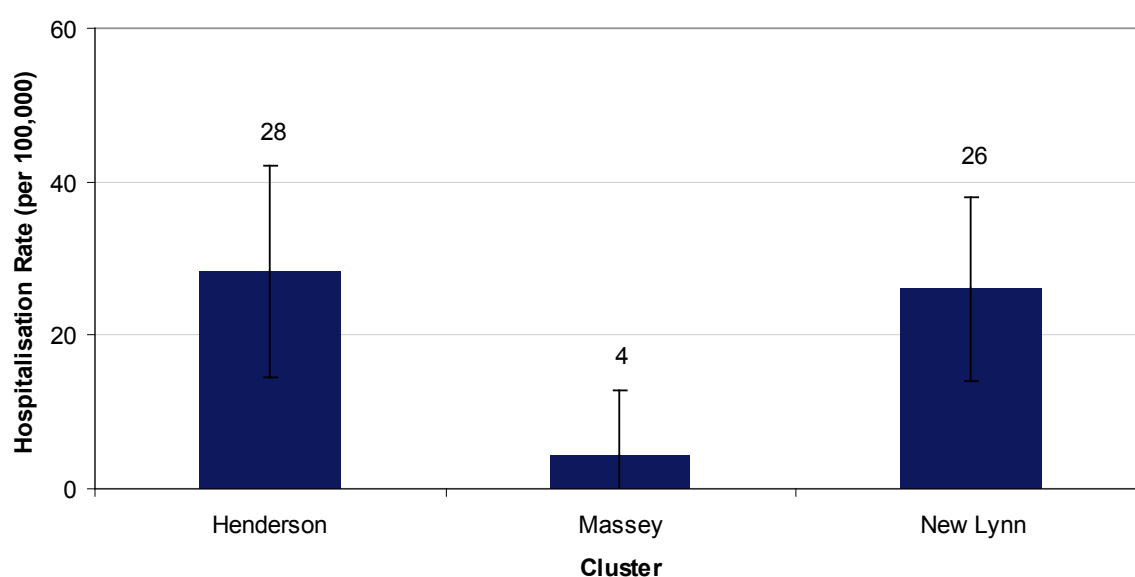
10.6 Injury Admissions

Over the three years 2009 – 2011 there were 1,500 child (0-14) hospital admissions with an injury-related primary diagnosis from the Henderson Cluster. From the Massey Cluster there were 500 and from the New Lynn Cluster there were 1,500.

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of injury admissions for children of the three clusters.

Figure 74: Child Age Standardised Injury Admission Rate, Henderson, Massey, New Lynn - 2009-2011
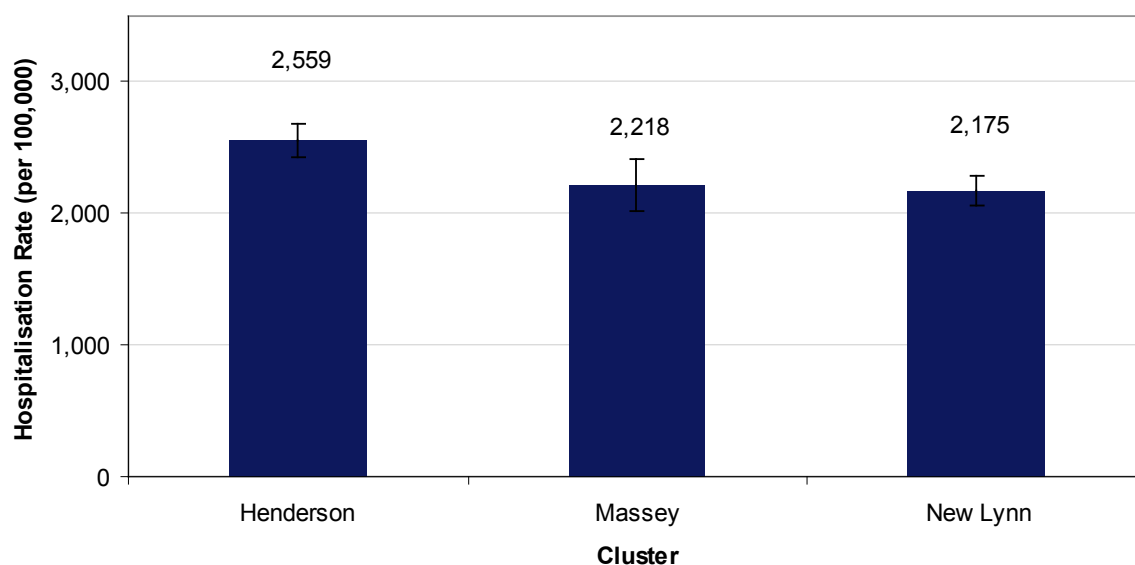
Tables 71 to 73 below show which categories of injury contributed towards the hospitalisation of children from each of the Clusters. Falls accounted for almost half of all injury-related admissions for all three of the clusters.

Table 71: Injury Hospitalisations by Category (Top 20) – 2009-2011, Henderson Cluster Children

Injury Category	Admissions	%
Falls	676	45%
Exposure to inanimate mechanical forces	347	23%
Exposure to animate mechanical forces	86	6%
Pedal cyclist injured in transport accident	82	5%
Accidental poisoning by and exposure to noxious substances	36	2%
Car occupant injured in transport accident	36	2%
Overexertion, travel and privation	34	2%
Accidental exposure to other and unspecified factors	33	2%
Drugs, medicaments and biological substances causing adverse effects in therapeutic use	31	2%
Contact with heat and hot substances	31	2%
Assault	31	2%
Pedestrian injured in transport accident	30	2%
Other land transport accidents	8	1%
Intentional self-harm	8	1%
Exposure to smoke, fire and flames	8	1%
Event of undetermined intent	6	0%
Other accidental threats to breathing	4	0%
While engaged in other activity	4	0%
Motorcycle rider injured in transport accident	3	0%
Accidental drowning and submersion	3	0%
Other Injuries	9	1%
Total Injury Admissions	1,506	100%

Source: NMDS

Table 72: Injury Hospitalisations by Category (Top 20) – 2009-2011, Massey Cluster Children

Injury Category	Admissions	%
Falls	223	44%
Exposure to inanimate mechanical forces	122	24%
Exposure to animate mechanical forces	33	6%
Pedal cyclist injured in transport accident	29	6%
Accidental poisoning by and exposure to noxious substances	17	3%
Accidental exposure to other and unspecified factors	17	3%
Car occupant injured in transport accident	10	2%
Drugs, medicaments and biological substances causing adverse effects in therapeutic use	10	2%
Pedestrian injured in transport accident	9	2%
Overexertion, travel and privation	8	2%
Other land transport accidents	5	1%
Other accidental threats to breathing	5	1%
Intentional self-harm	4	1%
Motorcycle rider injured in transport accident	4	1%
Assault	3	1%
Exposure to smoke, fire and flames	3	0.6%
Event of undetermined intent	3	0.6%
Contact with heat and hot substances	1	0.2%
Accidental drowning and submersion	1	0.2%
While engaged in sports or leisure	1	0.2%
Total Injury Admissions	508	100%

Source: NMDS

Table 73: Injury Hospitalisations by Category (Top 20) – 2009-2011, New Lynn Cluster Children

Injury Category	Admissions	%
Falls	715	47%
Exposure to inanimate mechanical forces	378	25%
Exposure to animate mechanical forces	84	6%
Pedal cyclist injured in transport accident	66	4%
Accidental poisoning by and exposure to noxious substances	64	4%
Accidental exposure to other and unspecified factors	39	3%
Drugs, medicaments and biological substances causing adverse effects in therapeutic use	34	2%
Overexertion, travel and privation	27	2%
Car occupant injured in transport accident	24	2%
Pedestrian injured in transport accident	24	2%
Contact with heat and hot substances	21	1%
Intentional self-harm	14	1%
Assault	14	1%
Other land transport accidents	13	1%
Other accidental threats to breathing	8	1%
Exposure to smoke, fire and flames	6	0.4%
Event of undetermined intent	6	0.4%
Accidental drowning and submersion	3	0.2%
Contact with venomous animals and plants	3	0.2%
Motorcycle rider injured in transport accident	2	0.1%
Other Injuries	6	0.4%
Total Injury Admissions	1,551	100%

Source: NMDS

10.7 Oral Health Admissions

Over the three years 2009 – 2011 there were 400 child (0-14) hospital admissions for West Auckland children with a dental caries or oral health issue primary diagnosis from the Henderson Cluster. From the Massey Cluster there were 150 and from the New Lynn Cluster there were 500.

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of oral health admissions for children of the three clusters. However, the differences were not significantly different.

Figure 75: Child Age Standardised Dental Caries and Oral Health Admission Rate, Henderson, Massey, New Lynn - 2009-2011
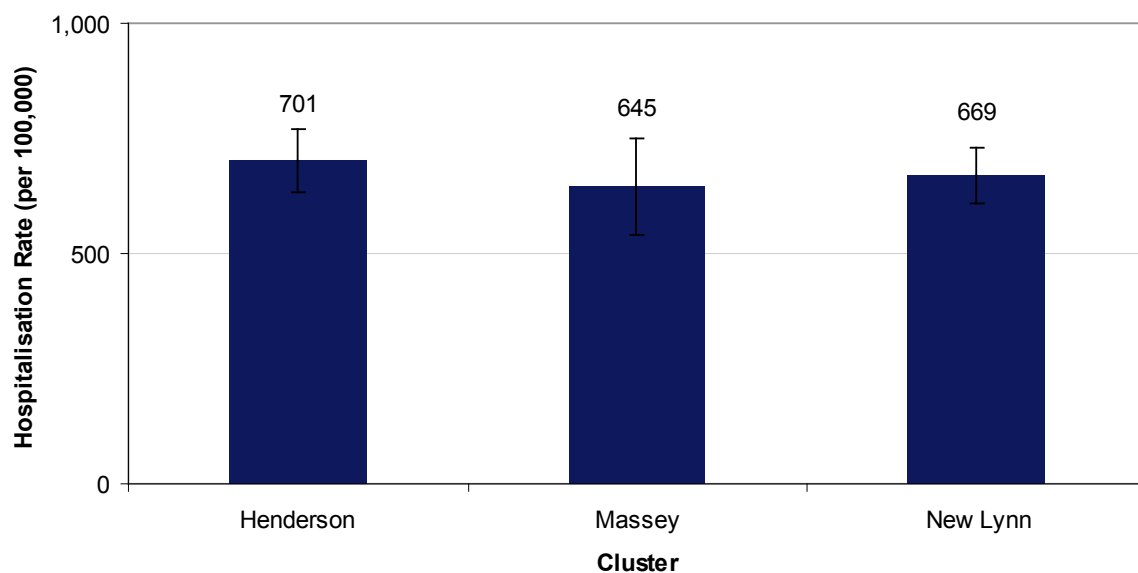
10.8 Emergency Department Attendances

For the financial year 2009/10 there were 5,000 child (0-14) Emergency Department attendances from the Henderson Cluster. From the Massey Cluster there were 1,300 and from the New Lynn Cluster there were 5,300. (Note: more recent year data was not available due to data availability issues).

Expressed as an age-standardised rate, the Henderson Cluster had the highest rate of ED attendance for children.

Figure 76: Child Age Standardised ED Attendance Rate, Henderson, Massey, New Lynn - 2009/10
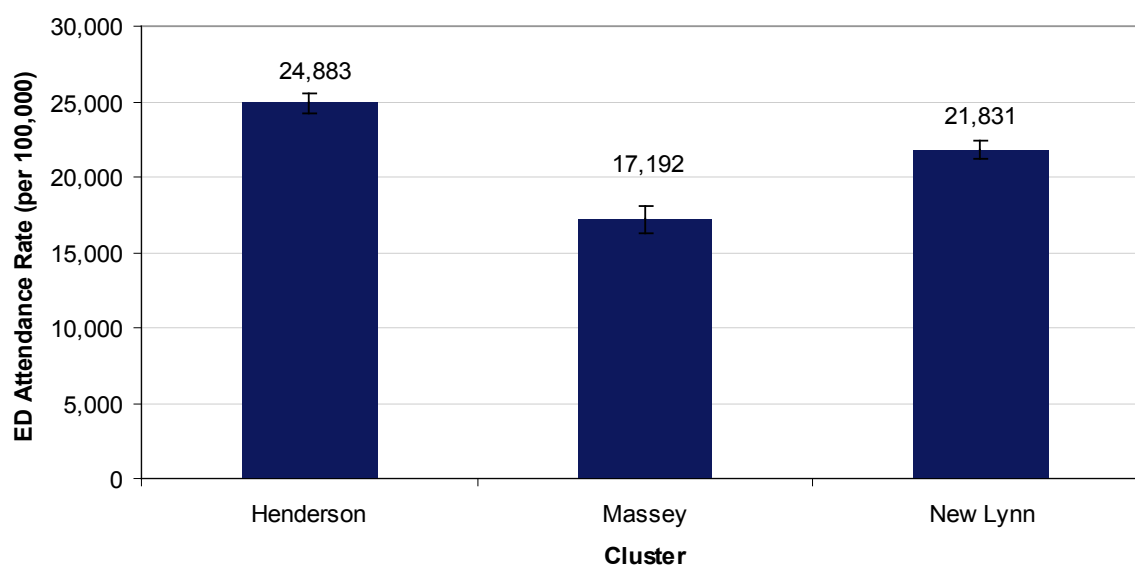
Appendices

These appendices contain information on data sources and definitions used throughout this report.

Appendix 1 - WHO Standard Population

WHO World Standard Population Distribution (%), based on world average population between 2000 and 2025.

Age Group	%	Per 100,000
0-4	8.86	8860
05-09	8.69	8690
10-14	8.6	8600
15-19	8.47	8470
20-24	8.22	8220
25-29	7.93	7930
30-34	7.61	7610
35-39	7.15	7150
40-44	6.59	6590
45-49	6.04	6040
50-54	5.37	5370
55-59	4.55	4550
60-64	3.72	3720
65-69	2.96	2960
70-74	2.21	2210
75-79	1.52	1520
80-84	0.91	910
85-89	0.44	440
90-94	0.15	150
95-99	0.04	40
100+	0.005	5

Appendix 2 - Ethnicity

Throughout this report prioritised ethnicity is used. In the 'prioritised' method, each respondent is allocated to a single ethnic group using the priority system. At level 1 the system places Maori first then Pacific peoples, then Asian peoples and finally other peoples. For example a person who selects (when asked their ethnicity) both Maori and European would only be included in the Maori grouping.

Prioritisation for Level 2 ethnicity
The table below shows priority order of each ethnic group.

Priority Order	Ethnic group code (L2)	Ethnic group code description
1	21	Maori
2	35	Tokelauan
3	36	Fijian
4	34	Niuean
5	33	Tongan
6	32	Cook Island Maori
7	31	Samoan
8	37	Other Pacific Island
9	30	Pacific Island NFD*
10	41	South East Asian
11	43	Indian
12	42	Chinese
13	44	Other Asian
14	40	Asian NFD
15	52	Latin American / Hispanic
16	53	African
17	51	Middle Eastern
18	54	Other
19	12	Other European
20	10	European NFD
21	11	NZ European

Note: NFD = Not Further Defined

Appendix 3 - Potentially Avoidable Mortality (PAM) indicators and their ICD 10 Codes

PAM Group categories	Condition description	ICD-10 Diagnosis Codes
Infections	Pulmonary tuberculosis	A15
	Meningococcal disease	A39
	Pneumococcal disease	J13, A40.3, G00.1
	HIV/AIDS	B20-B24
Cancers	Stomach	C16
	Rectum	C19-C21
	Melanoma	C43
	Female breast	C50
	Cervix	C53
	Testis	C62
	Prostate	C61
	Thyroid	C73
	Bone & cartilage	C40-C41
	Hodgkin's disease	C81
	Acute lymphocytic leukaemia	C91.0
Maternal & newborn	Complications of pregnancy	O01-O99
	Complications of the perinatal period	P02-P94
	Congenital heart disease (subset)	Q21
Chronic disorders	Diabetes	E10-E14
	Valvular heart disease	I01, I05-I09, I33-I37
	Hypertensive diseases	I10-I15
	Coronary disease	I20-I25
	Heart failure	I50
	Cerebrovascular diseases	I60-I69
	Renal failure	N17-N18
	Pulmonary embolism	I26
	COPD	J42
	Asthma	J45-J46
	Peptic ulcer disease	K25-K26
	Cholelithiasis	K80
Injuries	Suicide	X60 –X84
	Road traffic accidents	V01-V79, V87, V89, V99
	Falls (Fracture Neck of Femur)	S72
	Burns	T20-T31
	Adverse health care events (subset)	T80-T88

Appendix 4 - Potentially Avoidable Hospitalisation (PAH) indicators and their ICD 10 Codes

PAH Categories	ICD-10 Diagnosis Codes
Alcohol related conditions	F10, I426, K290, K70
Angina and chest pain	I20, R072-R074
Asthma	J45-J46
Breast cancer	C50
Cellulitis	H000, H010, H050, J340, K122, L01-L04, L08, L980
Cervical cancer	C53
Colo-rectal cancer	C18-C21
Congestive heart failure	I50, J81
CORD	J40-J44, J47
Dehydration	E86, E870
Dental conditions	K00-K06, K08
Diabetes	E10-E14, E162
ENT infections	H65-H67, H70, J01-J03
Epilepsy	G40-G41, O15, R560, R568
Failure to thrive	R62, R633, P923
Gangrene	R02
Gastroenteritis	A01-A09
Hepatitis and liver cancer	B15-B19, C220, C221, C229, P353
HIV /AIDS	B20-B24
Hypertensive disease	I10-I15, I674
Immunisation preventable - Hib	A413, A492, B9631, B9639, G000
Immunisation preventable - MMR	B05, B06,B26, M014, P350
Immunisation preventable - Other	A33-A35, A36, A80
Immunisation preventable - Whooping cough	A37
Kidney/urinary infection	N10, N12, N136, N390
Legionnaires' disease	A481, A482
Lung cancer	C33-C34
Meningococcal infection	A39,M010,M030
Myocardial infarction	I21-I23;I241
Nutrition	D50-D53, E40-E46, E50-E64, M833
Obstructed hernia	K400, K401, K403, K404, K410, K411, K413, K414, K420, K421, K430, K431, K440, K441, K450, K451, K460, K461
Oral cancers	C01-C06, C09, C10
Other infections	A23, A26, A28, A32, A38, A46, B50-B54, P23, P351, P352, P358, P359, P36, P371-P379
Other ischaemic heart disease	I240, I248,I249, I25
Peptic ulcer	K25-K28
Respiratory infections - Acute bronchiolitis	J21
Respiratory infections - Other	J00, J06, J10-J11, J20
Respiratory infections - Pneumonia	J13-J16, J18
Rheumatic fever/heart disease	I00-I09
Ruptured appendix	K350, K351
Sexually transmitted diseases	A50-A59,A60, A63, A64, I980, M023, M031, M730, M731, N290, N341, N70-N77, O00
Skin cancers	C00, C43, C44
Stroke	I61, I63-I66
Thyroid disease	E00-E05, E890
Tuberculosis	A150-A199,B900-B909, M011, P370

Appendix 5 - Ambulatory Sensitive Hospitalisation (ASH) indicators and their ICD 10 Codes

Condition	ICD 10 Diagnosis Codes	Age group	ASH Weight
Angina and chest pain	I20, R072-R074	A	0.5
Asthma	J45-J46	B	1
Bronchiectasis	J47	C	1
Cellulitis	H000, H010, J340, L01-L04, L08, L980	B	1
Cervical cancer	C53	A	1
Congestive heart failure	I50, J81	A	1
Constipation	K590	B	1
Dental conditions	K02, K04, K05	B	1
Dermatitis & eczema	L20-L30	B	1
Diabetes	E10-E14, E162	A	1
Epilepsy	G40-G41, O15, R560, R568	A	1
Gastroenteritis/dehydration	A02-A09, R11	B	1
GORD (Gastro-oesophageal reflux disease)	K21	B	1
Hypertensive disease	I10-I15, I674	A	1
Kidney/urinary infection	N10, N12, N136, N309, N390	F	1
Myocardial infarction	I21-I23; I241	A	0.5
Nutrition Deficiency and Anaemia	D50-D53, E40-E46, E50-E64, M833*	B	1
Other ischaemic heart disease	I240, I248,I249, I25	A	0.5
Peptic ulcer	K25-K28	A	1
Respiratory infections - Pneumonia	J13-J16, J18	B	1
Rheumatic fever/heart disease	I00-I02,I05-I09	B	1
Sexually transmitted Infections	A50-A59,A60, A63, A64, I980, M023, M031, M730, M731, N290, N341	A	1
Stroke	I61, I63-I66	A	0.5
Upper respiratory tract and ENT infections	J00-J04, J06, H65-H67	B	1
Vaccine-preventable disease - Meningitis, Whooping Cough, Hep B, Pneumococcal disease, Other	A33-A37, A403, A80, B16, B18	D	1
Vaccine-preventable disease - MMR	B05, B06,B26, M014, P350**	E	1

Age Group
A >= 15 yrs
B all ages
C < 15 yrs
6mth <= D < 15 yr
15mth <= E < 15 yr

Appendix 6 - Data Sources

Hospitalisation data

Data on the morbidity of various diseases and conditions are primarily based on all discharges from public hospitals. This is known as the National Minimum Data Set (NMDS). Day cases are included in this data but attendances at outpatient clinics or emergency departments (which don't lead to an admission) are not included. Analysis of hospitalisation data focuses on the number of episodes of care rather than the number of individual people. Hospital data include patients who die in hospital after formal admission.

A general issue when using hospitalisation rates for outcome measures is that reductions in such rates can reflect either a real decrease in incidence, improved primary health care (thus reducing the need for hospital care), or a decrease in access to (or provision of) hospital services. The relative importance of these factors is hard to quantify.

Outpatient and ED data

The National Non-Admitted Patient Data Collection (NNPAC) was introduced in July 2006 and provides nationally consistent data on non-admitted patient activity. Information about use of outpatient clinics and emergency departments was drawn from this source.

Mortality data

The mortality statistics maintained by NZHIS are based on death certificates completed by medical practitioners, post-mortem reports, coroners' certificates, and death registration forms completed by funeral directors. Supplementary data are obtained from a variety of other sources (such as public hospitals and the National Cancer Registry). Mortality data for 3 years was used in an attempt to ensure sufficient numbers for analysis.

The 2006/07 New Zealand Health Survey

This face-to-face survey was completed over a one year period between 2006 and 2007. It had a sample size of 12,488 adults (15 years and older) and 4,921 children (0-14 years). Approximately 1,200 adults were sampled in the Waitemata district. The response rate was 68% for adults and 71% for children.

The survey provides information on:
- Selected health risk behaviours (smoking, physical activity and alcohol use).
- The health status of New Zealanders, including their self-reported physical and mental health status, and the prevalence of selected conditions including diabetes.
- The utilisation of health services.
- A number of demographic characteristics such as age, gender, ethnicity, and income.

Where estimates are provided for Waitemata populations they may be either direct survey estimates or synthetic estimates. Since the sample sizes for the overall Waitemata population were reasonably large direct estimates can be calculated using only the respondents from Waitemata

District. However, for ethnic specific estimates, sample sizes were too small so estimates were derived by the Health & Disability Intelligence Unit (HDIU), Ministry of Health from a statistical regression model. These estimates were only available for adults.

Census and demographic data

A New Zealand Census of Population and Dwellings is held every five years. Every person in the country on census night, including visitors to the country, must fill out an individual census form. The last Census was carried out in March 2006.

The New Zealand Census collects limited health information but contains much social and economic information that is useful in describing the factors that determine health. In addition, the Census forms the basis for determining Waitemata's and New Zealand's denominator populations. Projections of population sizes for the years after 2006 and estimates of population sizes up to 2011 have been made. Projections are made on the basis of assumptions about a number of factors including migration, fertility, and mortality. However, it is worth noting that projections cannot be guaranteed to be completely accurate.

Birth registrations

This includes all live and still births registrations from Births, Deaths, and Marriages.

PHO Enrolment data

The PHO Enrolment database is a national collection of publicly funded primary health information for patients enrolled with a PHO. Unit record data is collected and stored. The collection was established in 2005.

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