

6 CIRCULATORY SYSTEM DISEASES

KEY FINDINGS – WAIKATO

Selected Risk Factors

Smoking

- One in five NZ European/Other are cigarette smokers, one in two Maori and one in three Pacific People.
- Smoking prevalence among Maori (males and females) has not changed since 1997.
- Maori women continue to have the highest smoking prevalence. The estimated age specific rate among Maori females age 15+ years in the Waikato DHB was 50.1 per 100,000 in 2002-2003 years when compared with non Maori females at 18.8 per 100,000 for the same period⁴⁰.
- In 2006, tobacco consumption was 1,016 cigarette equivalents per person aged 15 years and over, down slightly from 1,033 in 2005⁴¹.
- NZ tobacco consumption per adult ranked third lowest out of 13 selected OECD countries, similar to that of Australia but higher than Finland.

Obesity

- More than 50% of adults are overweight
- Higher percentages of Maori and Pacific children are overweight or obese compared to European, but in all ethnic groups there has been a significant increase in over all body weight.

Mortality

- Circulatory System related illnesses are the most common cause of mortality and hospitalisation across all ethnic groups in Waikato and nationally.
- CVD death rate is more than twice as high in Maori and Pacific men as in women
- Three major causes within this group were: Ischemic Heart Disease (IHD), acute myocardial infarction (AMI) and stroke.
- Across all ethnic groups, the volume of mortality and hospitalisation are highest among 65+ age groups.
- Mortality rates increased with increasingly low socio-economic deprivation among both Maori and non-Maori. Maori are

⁴⁰ Population Health Planning Resource 2007-2012, Population Health Services, Waikato DHB

⁴¹ The Social Report 2007, Cigarette smoking, Document available from:
www.socialreport.msd.govt.nz/health/cigarette-smoking.html

Circulatory System Diseases

disproportionately represented in the most deprived areas and therefore at higher risk of death from CVD compared to non-Maori.

- Mortality and hospitalisation to CVD of Maori and Asians were highest among 45-64 year olds, compared to people from other ethnic groups where mortality was the highest among the 65+ age groups.
- In Pacific People, death rates are higher than in Maori in hypertensive diseases, CVD and cardiomyopathy.

Hospitalisation

- People with diabetes have double the risk of myocardial infarction, and two-eight times greater risk of heart failure, than people without diabetes.⁴²
- Timely medical intervention for the acutely ill has been shown to improve quality of life and medical outcomes¹.
- Maori are hospitalised at a much younger age than the Other ethnic group. Waikato Maori aged 45-64 make up 50% of Maori hospitalisation with heart failure, followed by the 65+ age group at 36%.
- The Maori age specific rate of avoidable hospitalisation among 45-64 year olds for angina increased to 1046.6 per 100,000 and a similar increase was seen among people from Other ethnic groups at 339.99 per 100,000 in 2006.
- 65% of Maori hospitalisation is male.
- Approximately 56% of the hospitalisation among Maori is in quintile 5.
- Among people from Other ethnic groups, the volume of hospitalisation spread across quintiles 3, 4 and 5 at 21% to 33%.
- 91% of hospitalisation among people from Other ethnic groups was in 65+ age group.
- Other ethnicity hospitalisation was equally shared across the genders.
- Pacific People are hospitalised at an even younger age than Maori. In 2006, around 44% of the hospitalisation was in the 25-44 age group and 33% in the 45-64 age group.
- The prevalence of Pacific hospitalisation in 2006 by deprivation quintile was 22% in quintile 4, 33% in quintile 3 and 44% in quintile 5.

RECOMMENDATIONS FOR STRATEGIC CONVERSATION

The identification of major modifiable risk factors for CVD (hypertension, smoking, obesity, inactivity, and diabetes) is a prerequisite to the implementation of preventative interventions. Hence it is essential to continue to implement continuous improvements to the MoH and Waikato DHB led current strategic programmes to sustain lifestyle changes among children,

⁴² Cardiac Services Plan for the Midland Region, Jan Barber, February 2006

Circulatory System Diseases

individuals, and the broader population. Accomplishing these objectives will require individuals to change their behaviour and society to make substantial environmental changes.

1. Three key areas of focus: for projects\programmes addressing CVDs are:

- d. Ischemic Heart Disease
- e. Acute Myocardial Infarction
- f. Stroke

2. National Strategy: A comprehensive national policy that enforces inter-government agency health impact assessment is required to address the socioeconomic status and inequalities in CVD, as lifestyle interventions may partially address these problems. The policy changes need to focus on measures to raise Maori and Pacific family income and increase access to education, employment, housing and culturally competent health services.

3. Integrated Information System: Extend the electronic recording of patient information currently gathered in hospitals and the primary health care environment to include family history of cardiovascular disease (CVD), diabetes, obesity, hypertension and cigarette smoking, in order to design early intervention programmes that are specific to the target population group. An integrated information base and establishing dynamic links with the Primary Health Organisations (PHOs), would provide the foundation for developing patient specific early intervention programmes to minimise co-morbidity complications across the continuum of care. This information infrastructure sets the scene for end to end chronic care management.

4. Organised Stroke Services⁴³: Comparable national data for stroke, stroke services and stroke outcome are sparse relative to such data for CHD and diabetes. Hence the MoH recognises the lack of organised stroke services containing specialist staff not only to deliver services but also to facilitate the documentation and collection of relevant data. Waikato DHB is in the process of establishing the recommended framework and the work is expected to commence in May 2008. Implementation of organised stroke services need to span across personal health and disability sectors together with the primary sector in order to collectively work towards CVD prevention. Some of the key findings from the "Asian Health Chart Book 2006" which highlights the major differences in health outcomes and exposure to health hazards between the Chinese and Indian ethnic groups, with "Other Asians" generally falling between these two groups, need to be considered as an integral part of the organised service planning and implementation.

⁴³ ⁴³ Diabetes and Cardiovascular Diseases, Quality Improvement Plan, Ministry of Health, Wellington, Published in February 2008, Document available from: www.moh.govt.nz

6.1 Introduction - Cardiovascular Disease (CVD)

The circulatory system consists of heart and blood vessels. Together, these provide a continuous flow of blood to our body, supplying the tissues with oxygen and nutrients. Arteries carry blood away from the heart; veins return blood to the heart. Cardiovascular diseases (CVD or often referred as Circulatory system illnesses) are diseases affecting the heart and the blood vessels, such as acute myocardial infarction, ischemic heart disease and stroke. It is New Zealand's number one leading killer for both men and women across all racial and ethnic groups.

In spite of gradual improvement over the last three decades, cardiovascular disease remains one of the leading causes of death in New Zealand and around the world. Most heart attacks and strokes are preventable, yet more people die from CVD than any other cause. It is evident from research that systematic inequalities in the distribution of income, education, employment, housing and health services are the main determinants of CVD inequalities. Low socioeconomic status coupled with poor access to health services are the consequence of a lifetime exposure to disadvantages.

Some of the major risk factors for CVD are:

- Ageing
- Heredity
- Smoking
- High blood pressure
- Diabetes
- Abnormal blood cholesterol
- Physical inactivity
- Obesity
- Stress
- Socio-economic status

As there is limited specific information on the current incidence or prevalence rates of cardiovascular disease, the HNA 2008 statistical analysis for CVD is based on the mortality and hospitalisation data extracted from the national datasets and various research findings in the public domain.

6.2 CVD Mortality - Waikato

All Ethnic Groups

From 1998 to 2004, in the Waikato the total number deaths from cardiovascular diseases were 6610 (an annual average of 944 deaths). The leading causes were: Ischemic heart disease (ICD10 Codes I20-I25) at 55%, followed by Cerebrovascular disease at 24% and Other forms of heart disease at 11%.

Of the total mortality to Ischemic heart disease, around 52% was related to Chronic ischemic heart disease and 48% to acute myocardial infarction.

Circulatory System Diseases

Of the total mortality to cerebrovascular diseases, 46% of was related to stroke.

Table 43: Leading causes of mortality by disease groups

Leading Cause of Mortality By ICD10 Group	Breakdown by ICD10 Sub-Group	Number of Mortality 1998-2004	Percentage of Mortality
Ischemic Heart disease	Chronic Ischemic Heart Disease (IHD)	1865	51.5%
	Acute myocardial infarction	1732	47.8%
	<i>Remaining IHD</i>	23	0.6%
Mortality to IHD		3620	100.0%
Cerebrovascular disease	Stroke	732	46%
	Cerebral Infarction	254	16%
	Intracerebral Hemorrhage	196	12.30%
	Sequelae of Cerebrovascular Disease	184	11.50%
	<i>Remaining Cerebrovascular Disease</i>	228	14%
Mortality to Cerebrovascular Disease		1594	100%

This trend is consistent at the national, Midland regional and Waikato level, as shown below:

Table 44: CVD Leading Causes of CVD Mortality

Mortality 1998-2004	National		Midland		Waikato	
	No. of Mortality	% of Total Mortality to CVD - National	No. of Mortality - Midland	% of Total Mortality to CVD - Midland	Volume	% of Total Mortality to CVD - Waikato
I21 - Acute myocardial infarction	22302	28%	4761	29%	1732	26%
I25 - Chronic ischemic heart disease	20981	27%	4307	26%	1865	28%
I64 - Stroke, not specified as hemorrhage or infarction	8529	11%	1702	10%	732	11%
<i>Remaining Cardiovascular Mortality</i>	26591	34%	5569	35%	2281	35%
Total Mortality to CVD	78403	100%	16339	100%	6610	100%

From 1998 to 2004, 86% of mortality to CVD was in the 65+ age group and 12% in the 45-64 age group.

Table 45: Age Proportion of Leading Causes of CVD

Mortality 1998-2004 Leading Circulatory system Diseases	Life Age Group			Total
	25-44	45-64	65+	
I21 - Acute myocardial infarction	24	217	1491	1732
I25 - Chronic ischemic heart disease	33	296	1536	1865
I64 - Stroke, not specified as hemorrhage or infarction	1	15	716	732
Grand Total	58	528	3743	4329
Age Proportion of Mortality	1%	12%	86%	100%

Circulatory System Diseases

The deprivation profile of mortality was stable across NZ Deprivation quintiles 1 to 5, with minor fluctuations over the reporting periods.

The ethnic composition of mortality was highest among Other ethnic groups at 86%, Maori at 12% and Pacific People and Asian at around 1% each for 1998-2004.

Table 46: Leading Causes of CVD Mortality by Ethnic Composition

Circulatory System Diseases	Disease Categories	Maori	Other	Asians	Pacific People
Ischaemic heart disease	I21 - Acute myocardial infarction	206	1497	8	21
	I25 - Chronic ischemic heart disease	243	1577	18	27
Other forms of heart disease	I42 - Cardiomyopathy	55	50		1
	I50 Heart Failure	21	228	1	
Cerebrovascular diseases	I64 Stroke	40	690	6	2
	I63 - Cerebral infarction	27	220	2	5

6.2.1 Acute Myocardial Infarction - Waikato - All Ethnic Groups

Total mortality to acute myocardial infarction (AMI) was 1732 (43% female and 57% male) for 1998-2004. Although the volume was stable from 2001, there was slight increase in female and decrease in male mortality in 2003 and 2004. Most mortality was among people living in quintiles 4 and 5 at approximately 32% each for 2004. Approximately 87% of mortality in 2004 was of people in the 65+ age group. This trend was typical over the reporting years.

The age standardised rate of mortality to acute myocardial infarction halved from 197.98 in 1989 to 103.29 per 100,000 in 2004. The Waikato age standardised rate was slightly below the national rate.

6.2.2 Chronic Ischemic Heart Diseases - Waikato - All Ethnic Group

Total mortality to chronic Ischemic Heart Disease (IHD) was 1865 (809 female and 1056 male) for 1998-2004. The gender proportion was stable from 2001 to 2004.

The prevalence of mortality was comparable across quintiles 3, 4 and 5 at 25%, 26% and 35% respectively in 2004 with minor fluctuations over the reporting years.

Approximately 81% of the mortality was among 65+ age groups and this trend was stable from 1998 to 2004.

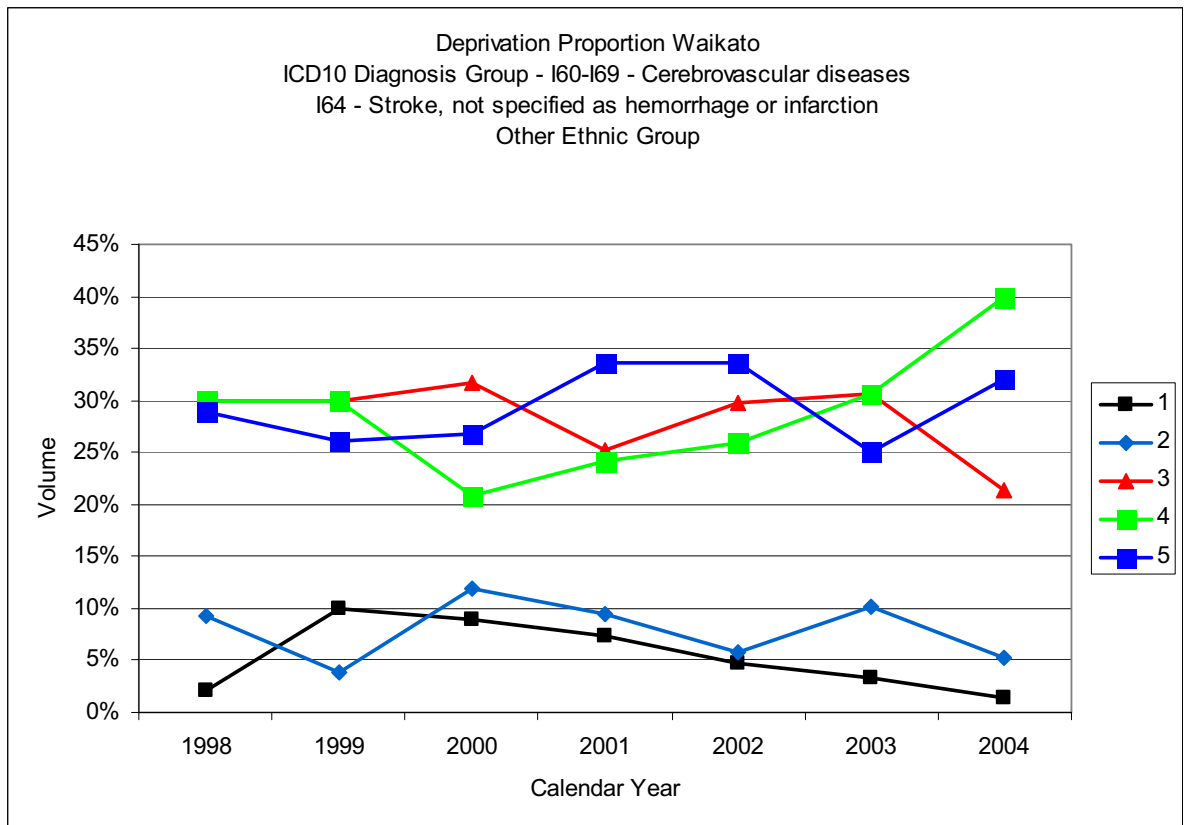
The age standardised rate of mortality was stable with no significant changes over the seven year period. The age standardised rate was 116.94 per 100,000 in 2003 and 2004 and the Waikato rate was slightly higher than the national rate of 105.28 per 100,000.

6.2.3 Mortality to Stroke - All Ethnic Groups

Total mortality to stroke was 732 (488 female and 244 male) from 1998 to 2004, a gender split of 67% of mortality in females and 33% in male. 94% of stroke mortality was among Other ethnic groups for the reporting years.

The proportion of mortality among deprivation quintile 3 (40% in 2004) trended up for the 1998-2004 period, quintile 5 also increased slightly (32% in 2004). Quintiles 1 and 2 both decreased for the same period.

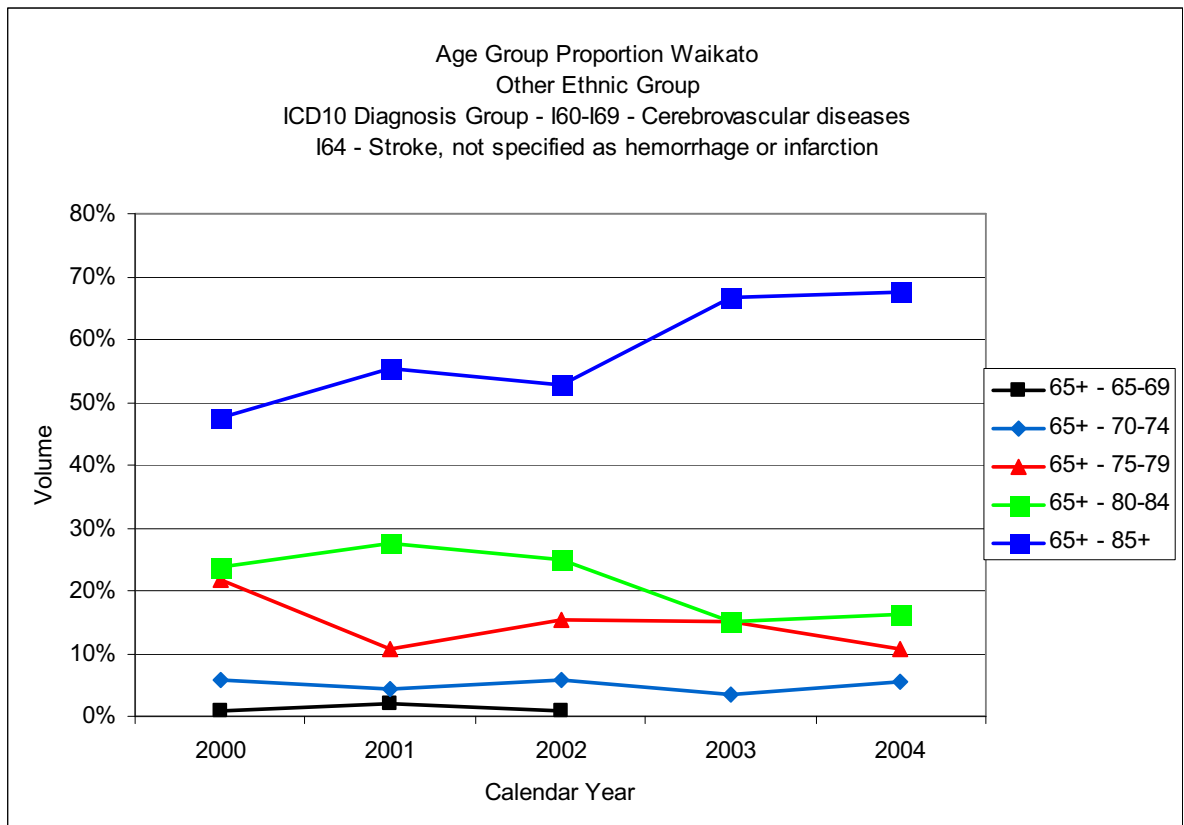
Graph 26: Deprivation Proportion of mortality to Stroke - Other ethnic group



Approximately 99% of mortality to stroke was in the 65+ age groups. The proportion of mortality in the 85+ age group increased from 40% in 1998 to 68% in 2004 reflecting a significant increase in the age of death from stroke.

Circulatory System Diseases

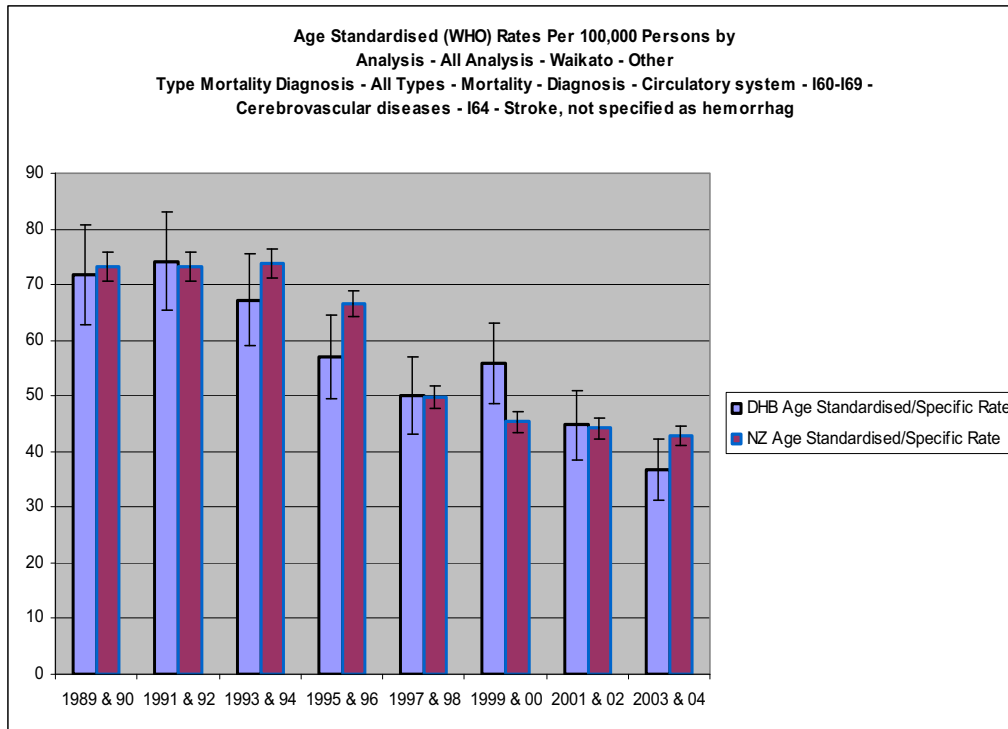
Graph 27: Age Proportion of mortality to Stroke - Other ethnic group



The age standardised rate of mortality related to stroke nearly halved over the seven year period at 36.73 per 100,000 in 2003 and 2004.

Circulatory System Diseases

Graph 28: Age standardised Rate of mortality to Stroke - Waikato Other ethnic group compared to New Zealand



The age specific rate of mortality among 65+ year olds in Waikato decreased considerably from 753.6 in 1989 and 1990 to 438.9 per 100,000 in 2003 and 2004. The Waikato age specific rate was below the national rate.

6.2.4 Ethnic Comparison of Mortality to Cardiovascular Diseases

The Table 47 below presents the comparative findings on three major causes of CVD mortality across the ethnic groups in the Waikato, from 1998 to 2004 years.

Table 47: Ethnic comparison of mortality related to cardiovascular diseases

Leading Causes of Mortality 1998	Ethnic Group	No. of Mortals	Age Proportion of Mortality 2004		Age Specific Rate of mortality 2003 & 2004 per 100,000 population				NZ Deprivation Quintiles		
					45-64 Years		65+ Years				
					45-64 Years	65+ Years	Waikato Rate	NZ Rate	Waikato Rate	NZ Rate	Quintile 3
Acute Myocardial Infarction	Maori	F80:M126	38%	59%	223.2	211.5	1107	1207.2	31%	14%	45%
	Other	F662:M843		90%	54.3	59.3	1061.3	1143.9	23%	35%	28%
	Pacific People	F7:M14	Low Volume Data								
Chronic Ischemic Heart Disease	Maori	F90:M153	45%	45%	320.2	206.9	1070.1	1083.4	12%	21%	64%
	Other	F708:M887		87%	71.4	62.1	1111.8	1052.1	28%	27%	29%
	Pacific People	F11:M16	Low Volume Data								
Cerebrovascular Disease Incl. Stroke	Maori	F76:M52	20%	67%	58.2	88.5	332.1	296.3	20%	20%	40%
	Other	F892:M539	6%	93%	37.2	28.1	79.8	121.2	28%	38%	26%
	Pacific People	F5:M10	Low Volume Data				289.9	392.8			

6.2.5 Ethnic comparison of Mortality to Acute Myocardial Infarction (AMI)

Some of the key findings are as follows:

- Among Waikato Māori, around 59% of the age proportion of mortality was in 65+ age groups, followed by 45-64 age groups at 38% for 2004.
- Among Other ethnic group, 90% of the mortality to AMI was in 65+ age groups for 2004 year.
- For both Maori and Other ethnic group, the mortality to AMI spread across the NZDeprivation quintiles 3 to 5.
- Waikato age standardised and age specific rates of mortality to AMI among Maori and Other ethnic groups, decreased at a reasonable level and there were no notable differences between the Waikato and the national rates.
- The overall number of mortality among Asians and Pacific People spread across the seven year reporting periods (1998-2004) and the low volume precludes any further detailed analysis.

6.2.6 Ethnic comparison of Mortality to Chronic Ischemic Heart Disease

The key findings are as follows:

- The age proportion of mortality among Waikato Maori to chronic ischemic heart disease was equally spread across 45-64 and 65+ age groups at 54% each in 2004.
- The proportion of mortality of Maori living in NZDeprivation quintile 5 increased slowly over the period, with corresponding decrease in all other quintiles.
- Waikato Maori aged 45-64 years are more than five times at risk of mortality (320.2 per 100,000 population in 2003 and 2004 years) to chronic ischemic heart disease when compared with Other ethnic group (71.4 per 100,000 population in 2003 and 2004 years).
- The age specific rate of mortality among Waikato Other ethnic group aged 65+ remained stable from 1999 to 2004 years at 1111.8 per 100,000 and the rate was comparable to Maori at 1070.1 per 100,000.
- Low volume mortality among Waikato Asians and Pacific People preclude in depth analysis.

6.2.7 Ethnic comparison of Mortality to Cerebrovascular Diseases

- From 1998 to 2004, of the total mortality to cerebrovascular diseases, 54% was related to stroke.
- Waikato Maori aged 25-44 years are ten times more at risk of mortality to cerebrovascular diseases (20.4 per 100,000 population in

Circulatory System Diseases

2003 and 2004) when compared with Other ethnic group at 2.4 per 100,000.

- Similarly, Waikato Maori aged 45-64 year are twice at risk of mortality to cerebrovascular diseases when compared with Other ethnic group. Among 65+ age groups, Maori are four times at risk of mortality when compared with Other ethnic group.
- Around 86% of mortality was among Other ethnic group, followed by Maori at 12% and Asians and Pacific People each at 1% for 1998-2004 years.

6.3 Comparison of Mortality to CVDs

6.3.1 National Comparison

At a national level the leading causes of mortality to circulatory system diseases were consistent with the trend discussed above in the Waikato. The top leading causes of mortality at a national level were: acute myocardial infarction, chronic ischemic heart disease and stroke.

6.3.2 Midland Regional Comparison

The analysis confirmed similar findings at the Midland regional level.

Table 48: Leading causes of mortality to CVD - Midland Region

Mortality - Cardiovascular diseases - 1998-2004	Ischemic Heart Diseases (Acute myocardial infarction & chronic ischemic heart diseases)			Cerebrovascular Diseases - Stroke, not specified as hemorrhage or infarction			Total
	Maori	Other	Pacific People	Maori	Other	Pacific People	
Midland Regions							
Bay of Plenty	663	4538	12	22	358		5593
Lakes	467	1870	36	19	176	2	2570
Tairāwhiti	429	1037	1	23	89		1579
Taranaki	209	3547	2	9	272		4039
Waikato	864	7540	76	40	690	2	9212
Grand Total	2632	18532	127	113	1585	4	22993

Circulatory System Diseases

6.3.3 Comparison of Mortality related to CVD - Territorial Local Authorities

Table 49: Leading Causes of mortality to CVDs by TLA and ethnic group

Mortality to Cardiovascular diseases- 1998-2004	Ischemic Heart Diseases (Acute myocardial infarction & chronic ischemic heart diseases)			I64 - Cerebrovascular Diseases - Stroke, not specified as hemorrhage or infarction			Total
	Territorial Authorities	Maori	Other	Pacific People	Maori	Other	
Hamilton City	104	983	13	8	187		1295
Hauraki District	23	236	2		55		316
Matamata-Piako District	16	338		3	92		449
Otorohanga District	21	48		4	10		83
Ruapehu District	31	71		8	24		134
South Waikato District	48	174	28	4	24	1	279
Thames-Coromandel District	36	356		3	75		470
Undefined	1	12			5		18
Waikato District	84	324	1	3	66		478
Waipa District	35	479	3	3	133	1	654
Waitomo District	50	79	1	4	19		153
Grand Total By Ethnicity	449	3100	48	40	690	2	4329

Overall Maori mortality rate for IHD is 4 times higher than that of non Maori. Waikato, South Waikato and Otorohanga districts have the highest Maori IHD mortality.

6.4 Hospitalisation - Cardiovascular Disease (CVD)

The leading causes of hospitalisation for CVD from 2000 to 2006 were:

Table 50: Leading Causes of CVD - Hospitalisation

Leading Causes of Hospitalisation	2000	2001	2002	2003	2004	2005	2006	Total
I20 - Angina pectoris	1165	1088	919	809	779	781	720	6261
I21 - Acute myocardial infarction	602	797	784	831	858	847	851	5570
I50 - Heart failure	625	662	627	624	641	589	708	4476
I48 - Atrial fibrillation and flutter	436	572	550	536	518	538	599	3749
<i>Remaining CVD Hospitalisation</i>								17841
Grand Total CVD Hospitalisation								37896

Approximately 84% of hospitalisation from 2000 to 2006 was in Other ethnic groups, followed by Maori at 14% and Asians and Pacific People at 1% each.

Circulatory System Diseases

Table 51: Waikato DHB Hospitalisation for Cardiovascular Disease 2001-2006 by Ethnicity

Leading Causes of Hospitalisation for CVD - 2000-2006	Other (Excluding Asians)	Asians	Other (Incl. Asians) Total	Maori	Pacific People
I20 - Angina pectoris	5560	100	5660	558	43
I21 - Acute myocardial infarction	4865	68	4933	581	56
I50 - Heart failure	3373	47	3420	986	70
I48 - Atrial fibrillation and flutter	3152	26	3178	533	38
Remaining Hospitalisation	14704	240	14944	2667	230
Grand Total	31654	481	32135	5325	437

Among Waikato Maori and Pacific People, the top cause of hospitalisation was heart failure, followed by acute myocardial infarction, then angina pectoris and atrial fibrillation. Among Other and Asian ethnic groups the top cause was angina pectoris, followed by acute myocardial infarction, then heart failure and atrial fibrillation.

Total hospitalisation from these four causes was 20,056 (8,603 female and 11,453 male) over 2000 to 2006.

6.4.1 Angina Pectoris - Waikato - All Ethnic Groups

Angina pectoris is the medical term for chest pain that occurs when the heart doesn't get enough blood and oxygen and it signals risk of a heart attack. Angina pectoris is a common manifestation of coronary artery disease.

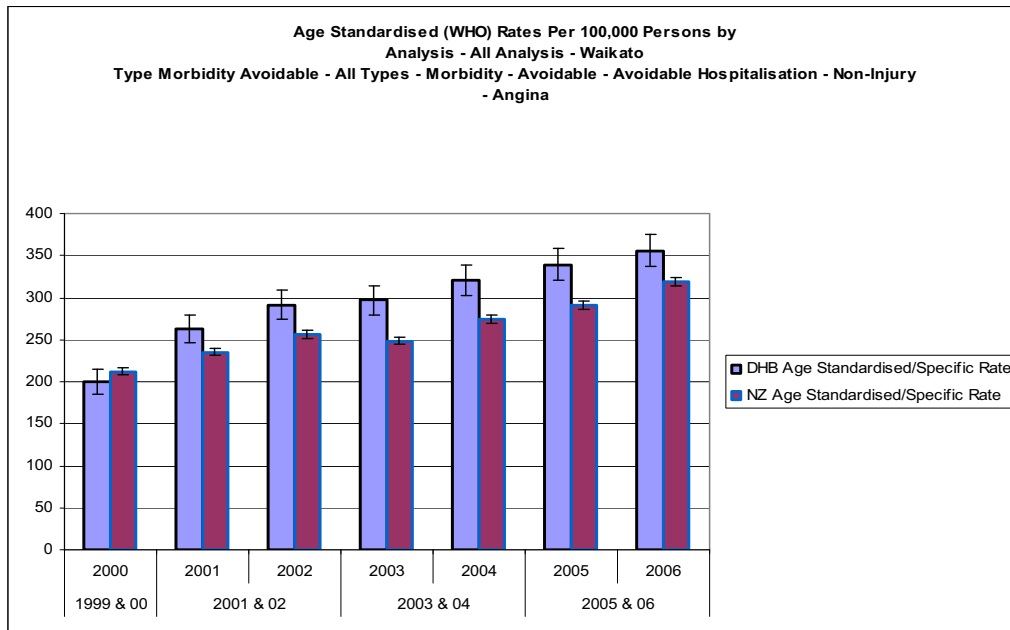
Total hospitalisation from 2000 to 2006 was 6261 (2545 female and 3716 male).

The gender proportion of hospitalisation was stable at around 42% female and 58% male over the reporting years, with minor fluctuations in 2002 and 2003. The prevalence of hospitalisation by deprivation quintile also was stable with most in deprivation quintiles 3, 4, and 5. From 1999 to 2006 there were no significant changes in the age proportions of hospitalisation. In 2006 around 63% of hospitalisation was in the 65+ age groups and 34% among the 45-64 age groups.

Overall in the Waikato, there was a 78% increase in the age standardised rate of hospitalisation for angina from 1999 to 2006. The age standardised rate for avoidable hospitalisation was 355.95 per 100,000 in 2006. The Waikato age standardised rate was higher than the national rate of 318.32 per 100,000 in 2006.

Circulatory System Diseases

Graph 29: Age standardised Angina avoidable hospitalisation rates, all ethnic groups, Waikato compared to New Zealand



6.4.2 Ethnic Comparison of Angina Pectoris

Table 52 presents a high level comparative analysis of hospitalisation for angina pectoris by ethnicity in 2000-2006 years.

Table 52: Hospitalisation for angina pectoris by ethnicity, 2000-2006

Ethnicity	No. Of hospitalisation by Gender 2000-2006	Age proportion of Hospitalisation 2006		Waikato Age Specific Rate per 100,000 population in 2006 Compared to NZ Rates				NZ Deprivation Quintile 1 to Quintile 5 - 2006		
				45-64 Years		65+ Years		Q3	Q4	Q5
		45-64 Years	65+ Years	Waikato Rate	NZ Rate	Waikato Rate	NZ Rate			
Maori	F297:M261	53%	40%	1046.6	1026.1	1066.7	984.4		25%	52%
Other	F2228:M3432	31%	66%	897.8	775.8	638.9	545.7	29%	31%	28%
Pacific People	F20:M23	50%	30%	991.7	1409.3	1282.1	1278.7		30%	50%

Some of the key findings are:

- Among Waikato Maori, the gender proportion of hospitalisation for angina reversed over the years. Female hospitalisation increased from 42% of the total in 1999 to 59% in 2006. During the same period, male hospitalisation decreased from 58% to 41%.
- In 2006, around 52% of hospitalisation was in the most deprived NZ Deprivation quintile 5, and there is an increasing trend to come from this quintile. Almost 75% of Māori admitted with angina live in quintile 4 and 5, compared with 50% of Other and 80% of Pacific admitted.

Circulatory System Diseases

- 53% of Maori hospitalisation for angina was in the 45-64 age groups, compared with 31% of Other in 2006.
- The age specific rate of hospitalisation among 45-64 year old Waikato Maori increased to 1046.6 per 100,000 population in 2006 compared to 897.8 for Other. The national rate also increased over the same year. Similar increase was noticed in the age specific rate among 65+ age groups.
- The gender proportion of hospitalisation among Waikato Other ethnic group was stable for the reporting periods at approximately 40% female and 60% male.
- The prevalence of hospitalisation for angina in Other ethnic group spread equally across quintile 3 to 5 (quintile 3 at 29%, quintile 4 at 31% and quintile 5 at 28% in 2006).
- Waikato age specific rate of hospitalisation among Other ethnic group aged 45-64 increased considerably to 897.8 per 100,000 population and the Waikato rate was higher and increase more than the national rate from 2002 to 2006. The age specific rate among 65+ remained stable from 2004 to 2006.

6.4.3 Acute myocardial infarction - Waikato - All Ethnic Groups

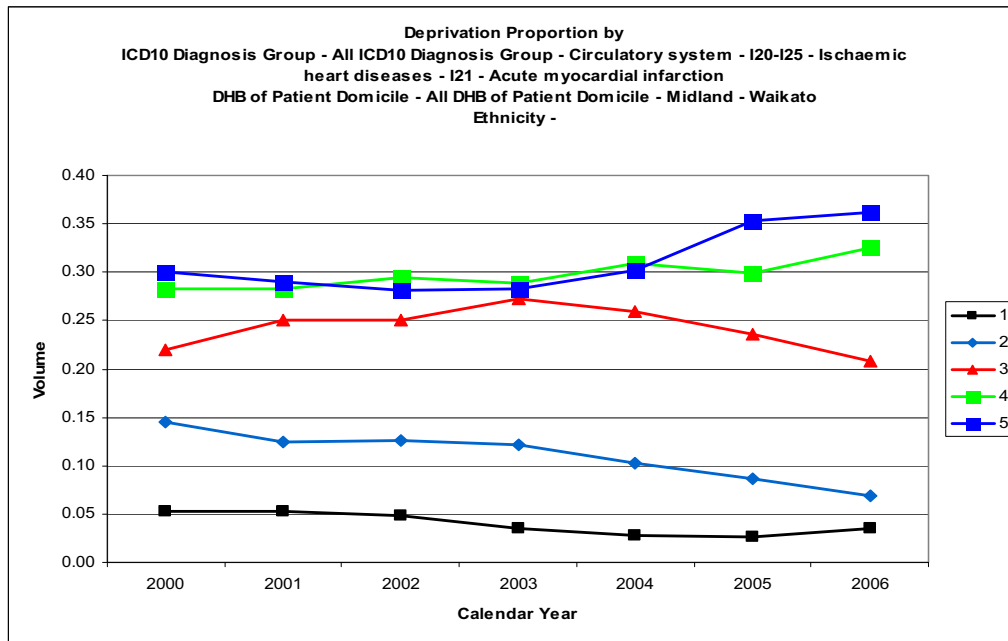
Total hospitalisation to acute myocardial infarction (AMI) was 5570 (2078 female and 3492 male) from 2000 to 2006. The hospitalisation trend for females showed a slight increase in 2006 after being stable since 2002. For males there was slight increase in hospitalisation in 2004 and 2005, followed by a decrease in 2006.

The gender proportion was stable from 2001 to 2005, (female just under 40% and male just over 60%). In 2006, the increase in female hospitalisations at the same time as a decrease in the male cohort moved the female gender proportion to just over 40%.

Over the seven years analysed, there has been an increasing trend of hospitalisation from quintiles 4 and 5.

Circulatory System Diseases

Graph 30: Proportion of Waikato DHB hospitalisations for acute myocardial infarction by deprivation quintile, 2000-2006



Consistently over the reporting period, 65% of hospitalisations were of people in the 65+ age groups, 31% in the 45-64 age groups, with the remainder under 45.

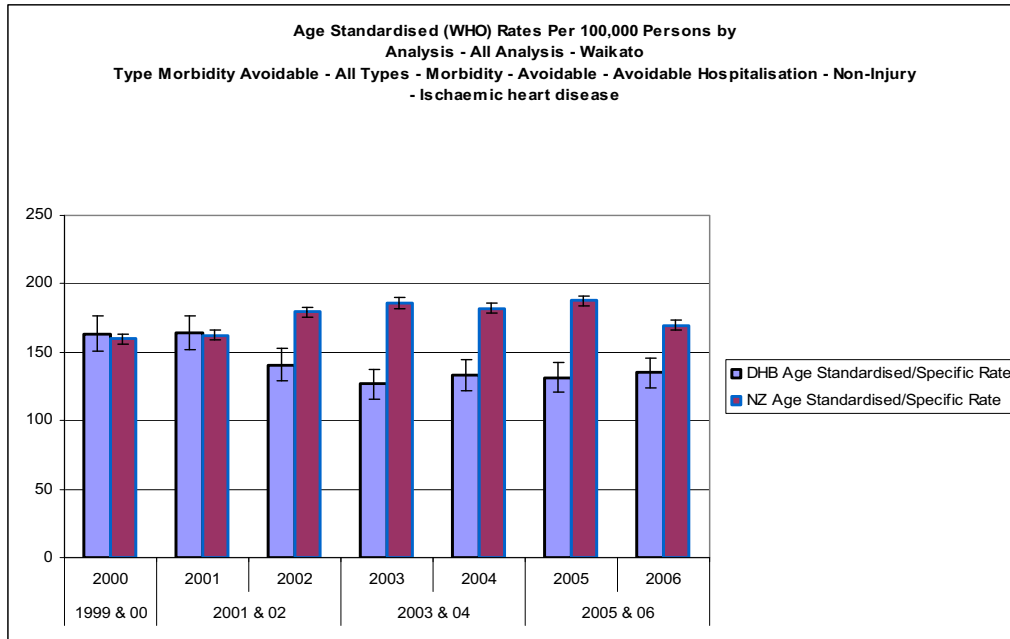
In the Waikato, acute myocardial infarction made up 80- 83% of avoidable hospitalisations for Ischaemic Heart Disease (IHD) from 2000-2006.

The age standardised rate for ischaemic heart disease in the Waikato was stable from 2003. The Waikato age standardised rate in 2006 was 135.19 per 100,000, well below the national rate of 169.57 per 100,000 for 2006.

Graph 31: Age standardised rate of avoidable hospitalisation for IHD - 2000-2006, Waikato compared to New Zealand

Circulatory System Diseases

Graph 32: Age standardised rate of avoidable hospitalisation for IHD - 2000-2006, Waikato compared to New Zealand



6.4.4 Ethnic Comparison - Acute myocardial infarction

The comparative analysis of hospitalisation for acute myocardial infarction across the ethnic group is shown in Table 53 below:

Table 53: Hospitalisation for acute myocardial infarction 2000-2006

Ethnicity	No. Of hospitalisation by Gender 2000-2006	Age proportion of Hospitalisation for 2006			Waikato Age Specific Rate per 100,000 population in 2006 Compared to NZ Rates				NZ Deprivation Quintile 1 to Quintile 5 - 2006		
		25-44 Years	45-64 Years	65+ Years	45-64 Years		65+ Years		Q3	Q4	Q5
					Waikato Rate	NZ Rate	Waikato Rate	NZ Rate			
Maori	F242:M339		52%	40%	589.3	772.7	1066.7	1261.7		29%	57%
Other	F1817:M3116		27%	70%	356.5	438.3	504.6	653.1	23%	33%	33%
Pacific People	F19:M37	36%		55%							

Some of the key findings are:

- Waikato Maori represent approximately 10% of the hospitalisation for acute myocardial infarction from 2000 to 2006 years.
- Among Maori, the annual male hospitalisation increased only slightly but female doubled, moving the gender proportion close to 50:50.
- The prevalence of hospitalisation among Maori was the highest in NZ Deprivation quintile 5 in 2006.
- Around 52% of Maori hospitalisation for myocardial infarction was in 45-64 age groups and the remainder among 65+ age group was stable with minor variations.
- Waikato Maori age standardised rate for Ischemic Heart Disease (IHD) fluctuated over the years, however, it has not increased in line

Circulatory System Diseases

with the national rate and was significantly lower than the national rate for 2005 and 2006 years.

- Similar to Maori, the hospitalisation prevalence was highest among Other ethnic group living in NZDeprivation quintile 4 and 5.
- Around 70% of hospitalisation was in 65+ age groups and this did not change over the seven year reporting period.
- Waikato age standardised rate of hospitalisation for IHD among Other ethnic group was stable from 2004 to 2006 and the rate was lower than the national rate.
- Among Waikato Pacific People, around 36% of hospitalisation was in 25-44 age group, followed by 55% among 65+ age group for 2006 year.
- Due to low volume of hospitalisation among Asians and Pacific People, no further analysis was undertaken.

6.4.5 Heart Failure - Waikato - all ethnic groups

Total hospitalisation for heart failure in the Waikato was 4476 (2136 female and 2340 male) from 2000 to 2006. Volume increased in both genders.

Consistently over the period, 47% of hospitalisations were female and 53% male. Once again, most of the hospitalisations (88%) were people living in the lower socioeconomic areas, quintile 5 (39%), quintile 3 (21%) and quintile 4 (28%) in 2006.

Consistently, most people hospitalised for heart failure were in the 65+ age group (77%-81%).

The ethnic composition of hospitalisation for heart failure showed around 75% was among Other followed by Maori at 22%, Pacific People at 2% and Asians 1%.

Table 54 : Hospitalisation for Heart Failure 2000-2006, by ethnicity

Year	Maori	Asian	Other	Total Other	Pacific People	Total
2000	112	3	499	502	11	625
2001	152	8	491	499	11	662
2002	140	8	473	481	6	627
2003	123	4	487	491	10	624
2004	146	8	470	478	17	641
2005	144	7	432	439	6	589
2006	169	9	521	530	9	708
Grand Total	986	47	3373	3420	70	4476

6.4.6 National Comparison of hospitalisation to CVD

At a national level, the leading causes of hospitalisation for circulatory system related diseases were: Angina pectoris, acute myocardial infarction and heart

Circulatory System Diseases

failure. The trend in the Waikato discussed above is consistent with the national trends.

6.4.7 Comparison of Hospitalisation to CVD - Midland Region

The leading causes of hospitalisation in the Waikato were consistent across the Midland region, with ischemic heart disease at the top of circulatory system related hospitalisations.

Table 55: Midland region hospitalisation for cardiovascular disease

Midland Region DHBs	Hospitalisation for IHD (Angina pectoris & Acute myocardial infraction)				Other Forms of Heart diseases (Heart failure and atrial fibrillation & flutter)			
	Maori	Other	Pacific People	Total - Ischemic Heart Diseases	Maori	Other	Pacific People	Total Other forms of Heart Diseases
Bay of Plenty	1152	8292	31	9475	1383	4823	38	6244
Lakes	1207	4438	102	5747	776	1949	47	2772
Tairāwhiti	628	1272	15	1915	693	845	4	1542
Taranaki	482	5897	15	6394	369	3083	10	3462
Undefined	1			1		1		1
Waikato	1139	10593	99	11831	1519	6598	108	8225
Grand Total	4609	30492	262	35363	4740	17299	207	22246

6.4.8 Comparison of hospitalisation to CVD - Territorial Local Authorities

Table 56: Hospitalisation for IHD, 2000-2006 by territorial local authority

TLA Name	Hospitalisation for Ischemic Heart Diseases (Angina pectoris & Acute myocardial infraction)			Other Forms of Heart diseases (Heart failure and atrial fibrillation & flutter)		
	Maori	Other	Pacific People	Maori	Other	Pacific People
Hamilton City	312	3299	47	458	2291	44
Hauraki District	62	808		65	442	2
Matamata-Piako District	46	915	1	97	546	2
Otorohanga District	49	180	2	55	100	
Ruapehu District	108	381		119	219	2
South Waikato District	122	770	35	112	427	42
Thames-Coromandel District	89	1713	2	92	937	2
Waikato District	167	880	9	259	556	8
Waipa District	79	1354	2	111	881	6
Waitomo District	105	293	1	151	199	
Grand Total	1139	10593	99	1519	6598	108

Key findings by territorial authority are extracted from the report "Population Health Planning Resources 2007 - 2012"⁴⁴, and in this report the hospitalisation was for the period 2001-2006.

Key findings for ischemic heart diseases among the Territorial Authorities (TAs) are:

- Waitomo (146) and South Waikato (144) have the highest overall TA age standardised mortality rates.
- The highest Maori TA rates are seen in Otorohanga (308) and Waitomo (327) where the mortality rates are three times that seen in the non Maori population.
- The highest rate of hospitalisation for Maori was in Part Ruapehu (727), Waitomo (587), South Waikato (467) and Otorohanga (502), with the lowest in Matamata Piako (362) and Waikato (365).
- Overall and for Maori and non Maori the highest TA hospitalisation rates are seen in Part Ruapehu and Waitomo Districts. However the rates for Maori in all TAs are higher than Non Maori, in particular Part Ruapehu where the rate is double in Maori (527) compared to Non Maori (199).

⁴⁴ Population Health Services, Health Waikato, Waikato DHB

6.5 Prevention of CVD - A National Perspective

In this section the information from the report “Diabetes and Cardiovascular Disease, Quality Improvement Plan⁴⁵” was extracted to present a national perspective of the prevalence of CVD by ethnicity.

- Although, nationally, Maori appear to have inequitable access to Cardiovascular Risk Assessment (CVRS), several DHBs, (eg. Tairāwhiti) deliver equity of access to CVRA for Maori in their community.
- Whanganui, Tairāwhiti, Northland and Lakes DHBs that have population with relatively low life expectancy and greatest inequality in life expectancy are closely comparable with the national average in access to CVRA. This may be explained by differences in effective management of CVD risk factors (including smoking, diabetes, blood pressure and lipids) rather than by poor access to risk assessment.
- At a national level, the age standardised incidence of stroke is significantly higher in Maori and, especially, Pacific Peoples.
- Without more effective CVD risk management in the community, the absolute number of stroke events will rise as these populations gradually age, since the incidence of stroke is age related.
- In combination with worse outcomes after stroke for Maori and Pacific Peoples, it is predicted that a higher burden of stroke will fall on these communities unless there are more effective interventions based on prevention and treatment.
- Information about the impact of stroke on the growing Asian populations in New Zealand is dependent on the refinement of data-set collection.
- The risk of stroke increased markedly with age especially for Pacific People at younger ages (25-44 year olds).

6.6 CVD in Asian - A National Perspective

In this section of the HNA 2008, the information is extracted from the report “Asian Health Chart Book 2006⁴⁶”. This report presents data for three ethnic groups separately - Chinese, Indian and “Other Asian”, stratified by duration of residence. Data in this report were derived from multiple sources, including New Zealand Health Information Services, New Zealand Cancer Registry, Statistic New Zealand, National Screening Unit and New Zealand Health Survey. The data relate mostly to 2001-2003.

Cardiovascular Diseases

The age specific rates of hospitalisation among Asians are shown below:

⁴⁵ Ministry of Health, Wellington, Published in February 2008, Document available from: www.moh.govt.nz

⁴⁶ Public Health Intelligence Unit, Ministry of Health, Monitoring Report No. 4, Published in July 2006. The report is available from: www.moh.govt.nz

Circulatory System Diseases

Table 57 Asian hospitalisation and mortality - cardiovascular disease

	Chinese		Indian		Other Asian		Total population	
	Male	Female	Male	Female	Male	Female	Male	Female
Hospitalisation 25-44 years	151.3 (122.8-184.3)	111 (89.6-136.0)	859.2 (782.2-941.7)	290.4 (246.6-339.7)	343.9 (295.4-398.1)	162.2 (135.6-192.5)	559.5 (550.6-568.6)	358.7 (351.8-365.7)
Hospitalisation 45-64 years	978.4 (887.5-1076.1)	628.1 (561.3-700.7)	5508.7 (5232.4-5795.8)	2343 (2156.5-2541.3)	1689 (1523.2-1867.8)	824.7 (723.5-936.2)	3161.3 (3136.9-3185.9)	1724.7 (1706.9-1742.6)
Hospitalisation 65+ years	4255.6 (3918.0-4614.6)	3760.2 (3453.8-4086.4)	13846.2 (12840.7-14909.4)	10727.8 (9884.4-11623.9)	7272.7 (6421.8-8205.0)	5239.5 (4630.9-5905.8)	10997.4 (10931.8-11063.2)	8012.3 (7963-8061.8)
Mortality 45-64 years	99.2 (71.8-133.7)	15.7 (6.8-30.8)	210.9 (159.7-273.2)	84.5 (52.3-129.2)	138.1 (93.9-196.1)	51.8 (29.0-85.4)	226 (219.5-232.6)	91.9 (87.8-96.1)
Mortality 65+ years	915 (762.2-1089.5)	975.6 (822.8-1148.6)	1992.1 (1622.6-2420.6)	1455.5 (1155.9-1809.1)	1239.7 (904.2-1658.8)	1231.7 (946.5-1575.8)	2299.8 (2269.8-2330.0)	2129.6 (2104.3-2155.2)

Summary of findings are:

- The rates of hospitalisation for CVD among Indian across all age groups were significantly higher than Chinese and Other Asians.
- Among older people (65+ years), females have a higher CVD hospitalisation rate than males for all Asian ethnic groups (although this is not statistically significant for Other Asians).

Ischemic Heart Disease

Some of the key findings as outlined in Table 58 below are:

- For all age groups, IHD hospitalisation rates are significantly lower for Chinese and Other Asians than for Indians or the total New Zealand population (both sexes).
- Indian New Zealanders have significantly higher IHD hospitalisation rates than the all New Zealand average (except for 25-44 year old females, where the difference is not significant).

Table 58 Asian hospitalisation and mortality - ischemic heart disease

	Chinese		Indian		Other Asian		Total population	
	Male	Female	Male	Female	Male	Female	Male	Female
IHD hospitalisation (25-44 years)	30.9 (18.9-47.7)	3.6 (0.7-10.5)	594.1 (530.4-663.3)	59.6 (40.7-84.1)	123 (94.7-157)	26 (16.1-39.8)	189.8 (184.6-195.1)	56.9 (54.2-59.7)
IHD hospitalisation (45-64 years)	433.8 (374-500.5)	180 (145.1-220.8)	4217.5 (3976.2-4469.7)	1256 (1120.5-1403.4)	895.7 (776.2-1028.5)	307.1 (246.6-377.9)	1643.2 (1625.6-1660.9)	693.3 (682.1-704.7)
IHD hospitalisation (65+ years)	1735.7 (1522.6-1970.2)	1239.8 (1066.7-1433.1)	8264.3 (7491.8-9094.8)	5031.4 (4459.3-5656.6)	3719 (3118.1-4401.9)	1798.6 (1450-2205.9)	4547.3 (4505.2-4589.7)	2859.4 (2830-2889.1)
IHD mortality (45-64 years)	69.2 (46.7-98.8)	-	185 (137.3-243.9)	48.3 (25.0-84.4)	89.1 (54.4-137.6)	17.3 (5.6-40.3)	158.6 (153.1-164.1)	45.1 (42.2-48)
IHD mortality (65+ years)	406.7 (307.2-528.1)	365.9 (274.8-477.4)	1380.7 (1076.3-1744.4)	916.4 (682.4-1205.0)	826.4 (557.6-1179.8)	567 (379.7-814.2)	1401.5 (1378.2-1425.2)	1061.2 (1043.3-1079.3)

- In the 45-64 and 65+ age groups, IHD mortality is higher for Indian males and females than for the total population. However, the difference is statistically significant only for females aged 65+.
- Chinese people aged 45-64 and 65+ years have IHD mortality rates significantly lower than the total New Zealand population.

Circulatory System Diseases

- IHD mortality is significantly higher in Indians than in Chinese and Other Asians for most age-by-sex groups.

Stroke

The summary of findings by age group and ethnicity are:

Table 59 Asian hospitalisation and mortality - stroke

	Chinese		Indian		Other Asian		Total population	
	Male	Female	Male	Female	Male	Female	Male	Female
Stroke hospitalisation (45-64 years)	159.2 (123.9-201.5)	129.1 (99.9-164.3)	392.2 (321.1-474.3)	233.5 (177.3-301.8)	410 (330.5-502.8)	162.2 (119.2-215.7)	296.9 (289.5-304.5)	226.4 (220.0-233.0)
Stroke hospitalisation (65+ years)	1002.2 (842.0-1184.0)	948.5 (797.9-1119.3)	1814.6 (1462.8-2225.4)	1725.1 (1397.3-2106.6)	1432.5 (1069.9-1878.5)	1407.6 (1101.4-1772.7)	1587.5 (1562.6-1612.6)	1337.9 (1317.8-1358.2)
Stroke mortality (45-64 years)	23.1 (11.1-42.4)	9.8 (3.2-22.8)	-	20.1 (6.5-47)	26.7 (9.8-58.2)	-	26.6 (24.4-28.9)	24 (22.0-26.2)
Stroke mortality (65+ years)	377.6 (282.0-495.2)	426.8	473.4 (303.3-704.3)	413.3 (262.0-620.1)	220.4 (95.1-434.2)	469.2 (300.6-698.1)	480.5 (466.9-494.4)	622.6 (608.9-636.5)

- In the 45-64 age group, stroke hospitalisation is significantly higher for Other Asians and Indian males than for the total population.
- In 45-64 and 65+ age groups, stroke hospitalisation is lower for Chinese males and females than for Indian or Other Asian ethnic groups and the total New Zealand population.
- In the 65+ age group, stroke hospitalisation is significantly higher for Indian males and females and Other Asian females than for the total population.