COUNTIES MANUKAU DISTRICT HEALTH BOARD
A Community Partnership

Health Needs Assessment for Asian People in Counties Manukau

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Dr Geeta Gala
Public Health Medicine Registrar
Planning and Funding Team
CMDHB

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Executive summary

Introduction

The Asian people in Counties Manukau District Health Board (CMDHB) are a culturally diverse group with each ethnic group having its own language, customs, traditions and health issues. The aim of this report was to produce a selective Health Needs Assessment (HNA) of the Asian population, including the differences and inequalities in health status between the main Asian ethnic groups living in CMDHB.

Methods

Data in this report were collated from multiple sources, including the New Zealand Health Information Service, National Minimum Dataset, New Zealand Health Survey 2002-2003, Census 2006, and Lets Beat Diabetes Survey 2007. Most data was aggregated for 3 years (2004 -2006) and 'total response' ethnicity classification was used.

The definition of 'Asian' used in this report was that developed by Statistics New Zealand and was limited by the data collection methods within the health services. The ethnic groups included were Chinese, Indian, 'Other Asian', 'All Asian' and European. In some instances comparisons were also made with Maaori and Pacific ethnic groups. For most rates, age-standardisation and confidence intervals were provided.

Summary of key findings

The Asian people in CMDHB have increased significantly over the last decade; over 18% of the total Counties Manukau (CM) population indicate some Asian ethnicity. Approximately 83,000 people living in CM in 2006 had some Asian ethnicity (ie 'total response' ethnicity), comprising 33,000 Indians, 32,000 Chinese and 18,000 'Other Asians'. Over 20% of all Asians in New Zealand live in CM. The total Asian population in CM is projected to grow by more than 90% over the next 20 years.

The Asian population is relatively young with a bimodal distribution; 41% being under 24 years age and 33% between 30-49 years age. Three quarters of the Asian people live in Howick, Pakuranga, Manukau and Papatoetoe suburbs of CM. Approximately 65% moved into CM from other regions of New Zealand and from overseas. Asian people are highly educated but with slightly lower incomes and higher unemployment rates compared to Europeans. They are evenly distributed across the deprivation deciles overall, but there were inequalities in socio-economic determinants among the different Asian ethnic groups.

The Asian population as a whole fared better than Europeans on many indicators including: life expectancy, avoidable mortality and hospitalisation, child health and women's health indicators. No differences were shown in some indicators and they fared worse in indicators such as diabetes, cardiovascular disease (CVD), risk and protective factors (obesity, physical activity, and vegetable consumption), and health utilisation (primary care, cancer screening and Chronic Care Management (CCM) programmes in CM).

There was immense diversity of health status within the Asian population. Major differences were found in health outcomes, risk factors and health service utilisation among Asian ethnic groups. Indians did worse than Chinese on many indicators, which would result in the problem of 'averaging' if the broad category 'Asian' was considered. 'Other Asians' were generally intermediate between Indian and Chinese, but it was difficult to comment on this group because of small numbers. Further, this ethnic group comprised of several small diverse communities and the pitfall of 'averaging' could not be avoided in this group.

The main areas of concern for Indians were high rates of newborns with low birth weight (LBW), obesity, diabetes (type 2), and cardiovascular disease. They had high adult and child potentially avoidable hospitalisation (PAH) rates for many conditions; high surgical intervention rates; low prevalence of accessing primary care despite high Primary Health Organisation (PHO) enrolment; increased prevalence of risk factors such as high cholesterol, blood pressure and obesity; decreased prevalence of protective factors such as physical activity and vegetable consumption; lower average age at first and all deliveries, high percentage of assisted deliveries including caesareans, high percentage of deliveries complicated by pre-eclampsia and diabetes; and high termination of pregnancy rates in private setting.

The Chinese population in general fared better than Europeans on many health indicators: life expectancy, avoidable mortality and hospitalisation, surgical intervention rates, child and women's health. Low primary care utilisation, low physical activity, particularly in women, low uptake of cervical and breast screening, gestational diabetes, and high rates of termination of pregnancy in private setting were the key issues identified in Chinese population.

Although the Asian population as a whole fared better than Europeans in many health indicators, there were many inequalities between the Indian ethnic group and Europeans. No major differences were discerned for most of the health indicators analysed, between CM and 'All NZ' for both Asians and Europeans.

Conclusion

The Asian population has been the fastest growing ethnic group in CM and tremendous diversity exists with respect to health status, health risk and health service utilisation among different Asian ethnic groups.

The Asian population as a whole fared better than Europeans on many health indicators, particularly, life expectancy and avoidable mortality. However, there were many inequalities between Indians and Europeans. Indians had high utilisation of secondary health services, particularly in relation to diabetes and CVD but low utilisation of preventive and primary health services. Despite the low utilisation of health services, like primary care and cancer screening by the Chinese, their health was generally better than Indians and Europeans.

The inequalities between the Chinese and Indian population were often large, resulting in 'averaging' of the results when the 'Asian' broad category was considered. Recognising these differences and monitoring the health of Asian people at level 2 ethnicity would assist in identifying and improving their health needs.

Recommendations

The following recommendations were made to the Counties Manukau District Health Board (CMDHB) Chief Funding and Planning Officer:

1. Priority should be given to reduce the health inequalities in Indians

   - A strategic approach is needed to address and reduce the high rates of low birth weight, obesity, diabetes and cardiovascular disease in this ethnic group
   - CMDHB's service development and health gain priority areas should also target Indian people in the interventions such as, Let's Beat Diabetes, Youth Health Plan, Chronic Diseases Plan, Primary Care Plan, Child Health Plan
   - Awareness of the above conditions and the risk factors should be raised in the Indian community through community organisations, PHO's and use of appropriate media
   - 'Lets Beat Diabetes' five year plan needs to acknowledge Indian as high risk group. Development of community leadership and action should be supported, to empower this community to slow the progression of diabetes
   - CCM Diabetes and CVD programmes should include Indians in their high risk groups and encourage their enrolment within the programmes
   - Look for interventions at community level that have been shown to be effective in addressing the increased risk of cardiovascular disease in the Indian communities. CMDHB should advocate to include Indians as a priority group in the 'Healthy Eating - Healthy Action' (HEHA) Implementation Plan 2004-2010

2. Improve primary care access and preventive services for Chinese people

   - The advantage in health of Chinese people is likely to regress with acculturation and as the 'selection' effect wanes. Efforts should be made to monitor the health of this population, learn the positive aspects and encourage health promotion messages in a culturally appropriate manner
   - Information regarding health system in New Zealand, primary care and cancer screening should be disseminated in a culturally consist manner to improve access

3. Reliable data collection of Asian as an entire group and sub-group

   - Reliable data collection as entire group and sub groups is essential to better understand the diversity and particular health issues of this population. CMDHB should advocate for consistency in ethnicity classification at national, District Health Board (DHB), PHO and Non Governmental Organisation (NGO) level

- Data and information need to be gathered about best practices and lessons learned from health promotion activities and health interventions, particularly at the community level and disseminated widely

4. Future work and research

- Further analysis of health indicators such as mental illness, cancer and infectious diseases, not addressed by this HNA should be conducted

- Further research into effects of migration and differences between first and second generation Asians is required to understand the effects of acculturation and migrant needs

- Further research is required at community and national level to understand the risk factors of CVD in Indians. Community engagement is necessary to design interventions to address these risk factors and for health promotion in a culturally appropriate manner

Limitations

- The HNA was planned over a short time frame of 4 months. It was difficult to obtain data for many health indicators in this time frame. Data on cancer, mental illness, accidents and infectious disease were not included.

- Detailed ethnicity data was unavailable for Asians over many indicators such as, oral health, cervical screening, and mental health. The 2002/03 New Zealand health survey does not routinely analyse the Asian population at level 2 ethnicity. However, these findings were discussed in the Asian Health Chart Book at a national level and would have similar implications for the Asian people in CM.

- Asians are a diverse group. Although sub-grouping has enabled researchers to make some meaningful conclusions for the Chinese and Indian people, even within these groups significant diversity exists – example Indian migrating from Fiji versus those from India versus those born in NZ. The 'Other Asian' - comprised of several small diverse communities also has the problem of 'averaging'. Furthermore, the relatively small numbers for this population can result in large confidence intervals and skewed data for many of the health indicators.

- The indicators did not take into consideration the duration of residence in New Zealand. This will overlook the impacts of migration, acculturation and settlement on health status.

- No community engagement was undertaken.

Comparing 'All Asian' versus European

The Asian population as a whole were compared against Europeans and the findings grouped under: 'Fared worse (or more at risk) than Europeans', 'Fared better than Europeans' and 'Similar to Europeans 'sub headings. Findings were from CM and both genders unless mentioned otherwise.

'Fared worse than Europeans'

- Greater proportion of migrant population
- Approximately 17% had English as language barrier
- 5% unemployment rates against 3% in Europeans
- High proportion with low incomes and low proportion with high incomes
- Higher adult hospitalisation rates for angina and stroke
- Higher adult hospitalisation rates for asthma and congestive cardiac failure (CCF) in 'All Asian' men
- Higher intervention rates for cataract extraction
- Lower percentage enrolled with CCM CVD programme
- Lower rates of breast and cervical cancer screening
- Lower prevalence of primary care access and PHO enrolment
- Lower prevalence of physical activity and recommended vegetable intake
- Higher LBW, infant mortality rate (IMR) and child mortality (0-14 years) from all causes
- Higher hospitalisation rates for gastroenteritis in boys and girls, for asthma in boys and for dental conditions in Asian girls
- Higher gestational diabetes and higher termination of pregnancy rates in private sector

'Fared better than Europeans'

- Higher life expectancy
- Lower adult all cause mortality and mortality for ischemic heart disease (IHD)
- Lower adult potentially avoidable hospitalisation (PAH) rates overall, and particularly from cellulitis and pneumonia
- Lower intervention rates for total hip replacement
- Lower prevalence of smoking
- Lower teenage deliveries and lower termination of pregnancy rates in public sector for women under 19 years age

'Similar to Europeans'

- Distribution across the deprivation deciles, education, on benefit
- Mortality for stroke and diabetes
- Adult hospitalisations for myocardial infarction (MI), diabetes, chronic obstructive respiratory disease (CORD) and kidney/urinary infections
- Intervention rates for angioplasty, coronary artery bypass grafting (CABG), total knee replacement, cholecystectomy, hysterectomy and prostatectomy
- Percentage of known diabetes enrolled with CCM diabetes programme
- Child PAH from all causes, immunisation and Well Child coverage
- Average age at all deliveries and first delivery, total fertility rate (TFR), caesarean sections, percentage of deliveries complicated by pre-eclampsia, pelvic inflammatory disease and ectopic pregnancy prevalence

Comparing Indian Ethnic Group versus Chinese

The Indian ethnic group was compared with Chinese and the findings discussed under: 'Fared worse (or more at risk) than Chinese', 'Fared better than Chinese', and 'Similar to Chinese' sub headings. Findings were from CM and both genders unless mentioned otherwise.

'Fared worse than Chinese'

- Greater proportion of migrant population
- Indians more represented in deprived areas and less in affluent areas
- Lower life expectancy and higher adult PAM from all causes
- Higher mortality for IHD in Indian men
- Higher adult PAH from all causes, angina and chest pain, MI, diabetes, kidney/urinary infections, CHF, cellulitis, and asthma
- Higher hospitalisation rates for respiratory infections and CORD in Indian men
- Higher prevalence of diabetes in Indians (8.9%) compared to Chinese (2.6%)
- Higher intervention rates for angioplasty, CABG, total knee replacement, cataract extraction, and hysterectomy
- Lower percentage of Indians with MI in the last 12 months enrolled with CCM CVD programme
- Higher prevalence of high cholesterol, high blood pressure and obesity
- Higher child PAH from all causes, gastroenteritis and asthma
- Higher newborns with LBW
- Low average age at first delivery and all deliveries
- Higher caesarean section rate, deliveries complicated by pre-eclampsia
- Higher pelvic inflammatory disease prevalence and termination of pregnancy rates in public sector

'Fared better than Chinese'

- Approximately 22% of Chinese people had English as language barrier compared to 10% Indians
- Low proportion with low incomes and high proportion with high incomes
- Higher percentage of known diabetes enrolled with CCM diabetes programme
- Higher prevalence of primary care access and PHO enrolment
- More likely to be physically active, particularly Indian men
- Lower teenage deliveries
- Lower termination of pregnancy rates in private sector

'Similar to Chinese'

- Unemployment, secondary school education and percentage on benefit
- Adult PAM in women from all causes and IHD
- Adult mortality from stroke and diabetes
- Adult hospitalisation from stroke, CORD in women; asthma in men
- Intervention rates for total hip replacement, cholecystectomy and prostatectomy
- Recommended fruit and vegetable intake and breast screening
- Smoking prevalence
- Immunisation and Well Child coverage
- Gestational diabetes and ectopic pregnancy prevalence

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Abbreviations

AMAC	Auckland Medical Aid Centre Limited (private termination provider)
BMI	Body Mass Index
CABG	Coronary artery bypass graft
CCM	Chronic Care Management, a CMDHB health programme
CHF	Congestive heart failure
CI	Confidence interval
CM	Counties Manukau
CMDHB	Counties Manukau District Health Board
CORD	Chronic obstructive respiratory disease
CVD	Cardiovascular disease
DHB	District Health Board
ENT	Ear, Nose and Throat (= ORL – otorhinolaryngology)
HbA1C	Haemoglobin A1C, a blood test measure of diabetes control
HNA	Health needs assessment
ICD	International Classification of Diseases, NZ on version 10 since 2000
IHD	Ischaemic heart disease, largest category within CVD
IMR	Infant mortality rate
LBD `	Lets Beat Diabetes, a CMDHB health programme
LBW	Low birth weight, less than 2500 grams
LE	Life expectancy
MI	Myocardial Infarction
MOH	Ministry of Health
MTOP	Medical termination of pregnancy
NIR	National Immunisation Register, a MOH run programme
NMDS	National Minimum Data Set, public hospital data held by NZHIS
NZHIS	New Zealand Health Information Service, a department in MOH
NZHS	New Zealand Health Survey
NZ Dep	New Zealand Deprivation Index
PAH	Potentially avoidable hospitalisation
PAM	Potentially avoidable mortality
PHO	Primary Health Organisation
SNZ	Statistics New Zealand
STOP	Surgical termination of pregnancy
TFR	Total fertility rate
WHO	World Health Organisation

1 Introduction

Asians are the fastest growing ethnic group in New Zealand and make up almost 8.5% of the total population. This figure is expected to reach 15% of the national population by 2020 (1). The Asian population is diverse and increasing in the Counties Manukau DHB area. They make up the third largest ethnic group (18.2%) after Europeans and Pacific in CMDHB.

The New Zealand Health Strategy (2) requires District Health Boards (DHB) to conduct health needs assessment (HNA) of their local communities to reduce inequalities in health between ethnic groups and develop frameworks for implementing the national priorities. Health needs assessment is a systematic method for reviewing the health issues facing a population, leading to agreed priorities and resource allocation that will improve health and reduce inequalities (3).

CMDHB has conducted HNA for the Maaori and Pacific populations in their region. The Asian population is the next group to be targeted for a HNA, to review the health issues faced by this population, assist in resource allocation decisions and services to improve their health, and reduce inequalities.

1.1 Definition of 'Asian' in New Zealand

The definition of 'Asian' used in this report is based on the categories used in the census, developed by Statistics New Zealand in 1996 (SNZ) (4). This group is made up of people with origins in the Asian continent from Afghanistan in the west to Japan in the east and from China in the north to Indonesia in the south. A full listing of the classification can be found in Appendix 1. This is similar to the definition used by the Asian Health Chart Book 2006 (5). It excludes people originating from the Middle East (including Iran and Iraq), Central Asia (except Afghanistan) and Asian Russia.

This definition of 'Asian' is unique to New Zealand and differs from many western countries such as the United Kingdom or Australia (6). In USA, Asian people have been often grouped with Pacific peoples as 'Asian/Pacific Islanders', although the most recent census 2000 separates the different Asian and Pacific groups (7). In UK, the term 'Asian' is more commonly associated with people of South Asian origin, particularly Indians, Pakistanis, Bangladeshis and Sri Lankans (8). In Australia, the census definition is similar to New Zealand. However, it is often used to denote peoples from Southeast and East Asia.

There is increasing use of the SNZ definition of 'Asian' in the New Zealand health sector, particularly in all the major reports on Asian health in New Zealand available to date (5, 9-11). In contrast to the SNZ definition, colloquial use of the term 'Asian', as reflected in the media, often describes Chinese, other East and Southeast Asian people, and excludes Indians and other peoples with origins in the Indian subcontinent (6, 12).

1.2 Literature

There is limited information on the health status of Asian people in New Zealand. Prior to 1996, SNZ did not incorporate an 'Asian' ethnic category and Asians were included in the 'Other' category. However, the growing Asian population, particularly

in Auckland and increasing concern regarding their health, has resulted in publication of a number of reports in the recent past.

- Asian Public Health Project Report(10)
- Asian Health in Aotearoa: An analysis of the 2002-2003 New Zealand Health Survey(13)
- A Health Profile of Young Asian New Zealanders: Findings from Youth 2000 (a National Secondary School Youth Survey)(14)
- Asian Health Chart Book 2006(5)

The key issues identified in these reports include: low birth weight, obesity, type 2 diabetes and heart disease among Indian people; low utilisation of health services, particularly by Chinese people; low levels of physical activity and mental health concerns, particularly in young people. These reports also concluded that recent or first-generation migrants do better than long-standing migrants or the New Zealand born across most health indicators. This positive health effect is largely a 'healthy migrant' effect (15) and is expected to abate over time (5).

Most reports have focused on 'Asian' as a category or Indian and Chinese as sub-groupings. The report 'Asian Health in Aotearoa' looked at ethnic sub-groups - Chinese, South-Asian, Korean and South-East Asians. These reports have shown similarities and diversity in health status among Asian peoples. Further, the reports have highlighted the drawbacks of 'averaging'. When the whole Asian ethnic group is considered, it obscures the prevalence of some diseases which certain ethnic groups are more prone to such as high rates of cardiovascular disease (CVD) and diabetes in people from the Indian subcontinent.

Internationally, there is growing concern amongst health professionals and policy makers of increasing health inequalities in South Asians. In the UK, the mortality from CVD is 46% higher for men and 51% higher for women of South Asian origin than the general population (16). They are approximately 50% more likely to die prematurely than the general population (17).The increased susceptibility to CVD in South Asian migrants is well established not only in the UK, but also in South Africa, the United States, the Caribbean, Singapore and urban India (18). This disparity is increasing as the death rate from CVD is not falling as fast for South Asians as it is for the rest of the population. The incidence of type 2 diabetes in the UK is 6 times higher for South Asians than for white people (19), increasing the CVD risk in this population. The growing CVD epidemic has generated a lot of action in policy and health services to address the issue in this susceptible population.

1.3 Ethnicity data – at level 2 ethnicity

Ethnicity is the ethnic group or groups that people identify with or feel they belong to. Ethnicity is a measure of cultural affiliation, as opposed to race, ancestry, nationality or citizenship (20). Ethnicity is self perceived and people can belong to more than one ethnic group. There are ethnicity data collection standards to maintain consistency in data collection from census and health and disability Sector.

The Statistics New Zealand Ethnicity Classification is a hierarchical structure with four levels (Appendix 1: Table 13.1.2 to 13.1.5). Individual ethnic group information are aggregated into progressively broader ethnic groups from level three-four to level one, according to geographic location or origin, or cultural similarities.

Chinese, Indian, Southeast Asian and Other Asian are the Asian categories at level 2 codes. All Asian ethnic groups can be aggregated under them. The Chinese and Indian communities are the two largest groups with long histories of settlement in New Zealand (21, 22). The 'Other Asian' category includes several smaller Asian communities and risks the problem of averaging.

1.4 Asian ethnic groups in this report

This report follows the same stratification as the Asian Health Chart Book – Chinese, Indian, and 'Other Asian'. However, 'All Asian' as a group is also analysed and compared with the Europeans. In some instances comparison is made also with Maaori and Pacific groups. This will enable the identification of the possible differences or similarities between the different Asian ethnic groups, the Asian group as a whole, and avoid the pitfall of averaging.

The sub-categories of East Asians, South Asians and Southeast Asians would have been ideal for stratification and would result in more meaningful comparisons. For example the South Asian category would include people from the Indian subcontinent – India, Pakistan, Sri Lanka, Bangladesh, Nepal, Bhutan, Maldives and Fiji Indians. However, this was not possible as hospital data is not available at level 4 ethnicity. The 'Other Asian' category comprises of diverse Asian groups, varying widely in language, culture and health issues. These have been grouped under the one ethnic group rather than being completely excluded. This may result in skewed data because of the small numbers and may also be prone to the problems of averaging.

The high levels of CVD and diabetes in South Asians has future implications for planning and service provision by the health sector. In CM, the South Asian population is approximately 5% more than the Indian population (Census 2006, Usually Resident population). Therefore, assuming similar prevalence rates, for planning purposes one might increase the mortality, morbidity and health utilisation numbers in the Indian population by 5% to give approximate figures for the South Asian population.

It is also worth noting that even within the Chinese and Indian groups significant diversity exists – example Indian migrating from Fiji compared to those from India compared to those born in New Zealand.

2 Aims and Objectives

The aim of this report was to produce a selective health needs assessment of the Asian population, including the differences and inequalities in health status between the different Asian ethnic groups living in CM at level 2 ethnicity.

The objectives were:

- To describe the demography of Asian population in CM
- To identify any significant differences or inequalities in health status amongst the three Asian groups - Indian, Chinese and other Asian
- To compare these differences, where possible with Pakeha, Pacific and Maaori populations
- To Inform the CMDHB of the priority areas for intervention and service design, to improve Asian health and reduce any inequalities
- To highlight potential areas for future research

3 Methodology

3.1 Selection of indicators

The selection of indicators was to inform regarding the health of Asian people, the socioeconomic determinants, risk factors, health outcomes, health service access and utilisation. Consideration was given to the identification of key issues in the Asian population, the similarities and differences amongst the different Asian sub-groups, and comparison with the European population. Where possible, the indicators were aligned with those selected for health monitoring by the DHB and Ministry, at a national level.

The International Classification of Diseases, tenth revision (ICD-10-AM) has been used to code diseases/conditions for reporting mortality and hospitalisations. For the ICD-10-AM codes used, please refer to Appendix 2 (Table 13.2.1). This HNA was initially planned as a preliminary assessment to identify health concerns which could be followed by a more detailed assessment at a later stage if required. The availability of data at level 2 ethnicity has limited the analysis of many salient indicators that could affect health.

3.2 Data sources

Data presented in this report was collated from multiple sources. The following table lists the data sources used for the indicators.

Table 3.2.1: Data sources

Data source	Indicator	Year
Statistics New Zealand Census 2006	Demography, socioeconomic determinants, smoking prevalence for adults aged 15+ years	2006
New Zealand Health Information Service (NZHIS) Mortality collection Dataset National Minimum Dataset (NMDS)	 Mortality Hospitalisations	 2001-2004 2004-2006
Kidslink - CMDHB	Immunisation Well Child Check	2005
Chronic Care Management Database - CMDHB	CCM diabetes programme CCM CVD programme	2006 2006
Breast screening - CMDHB	Breast screening	2005-2007
Lets Beat Diabetes Survey	Fruit and vegetable intake Physical activity Smoking prevalence for adults aged 16+ years Diabetes prevalence	2007
Epsom Day Unit Dataset	Public termination of pregnancies	2004-2006
Auckland Medical Aid Centre Limited (AMAC) Dataset	Private termination of pregnancies	2004-2006
Primary Care team - CMDHB	Primary Health Organisation (PHO) enrolment	2006-2007
New Zealand Health Survey (NZHS)	Risk and protective factors	2002-2003

3.3 Statistical methods

Estimation of rates

Rates were calculated as the proportion of the population associated with the indicators compared to the population of interest. Rates were expressed per 100 (percent), per 1000 or per 100,000 (23). The denominators used for calculating the rates were derived from census population data for the same years as the numerator year.

Rates were not calculated for counts that were less than 5 (New Zealand Health Information Service data) or less than 10 (New Zealand Health Survey 2002/03 data). For most rates, age-standardisation and 95% confidence intervals were provided. Standardisation is a commonly used analytical technique for controlling confounding factors (such as the age dependency of mortality) when making comparisons between population groups and/or over time (24). This enables a valid comparison between populations with different size and age structures.

Population estimates

Census *usually resident population* (UR) is a count of all people who usually live in New Zealand**,** or in an area of New Zealand, and are present in New Zealand on a given census night. This excludes visitors from overseas and residents who are temporarily overseas on census night. Some of the Census data is analysed with UR data.

Census *estimated resident population* (ER) is an estimate of people who usually live in New Zealand, or in an area of New Zealand, at a given date. Adjustments are made to census night population counts to include residents who are missed or are temporarily overseas. Adjustments are also made for births, deaths and net migration of residents during the period between census night and the given date. The ER population is the best fit with health data and for health planning purposes, and is used throughout this report unless otherwise noted.

Ninety - five percent confidence intervals (95% CIs)

Confidence intervals give an indication of the margin of error - 95% confidence intervals were calculated where possible throughout the report. When the 95% CIs of two rates do not overlap, the difference in rates between the groups is statistically significant with 95% confidence. If the two confidence intervals do overlap any difference is more likely to be due to chance, and is generally considered to be not statistically significant (25).

3.4 Data presentation

The data in this HNA is presented with the aim and objectives in mind. The ethnic groups included were Chinese, Indian, 'Other Asian', 'All Asian' and European. In some instances, comparisons have been made with the Maaori and Pacific ethnic groups. CM data was compared with 'All NZ' data where possible. Most data was aggregated for 3 years (2004-2006) to increase the numbers and reliability. However, some data have been presented for the years available and mentioned in the table 3.2.1.

The indicators were presented with breakdown into gender, age and ethnicity as proved useful. Children have been defined as 0-14 years and adults as 15+ years of age. Within the child health data infants (0-1 year age) and the 0-4 year age group were also examined.

Ethnicity

'Total response' output was used to categorise ethnicity in most instances unless noted. The demography section shows the difference with the prioritised format (eg *Table 4.1.1*, page 77). 'Total response' records all ethnicity responses and results can exceed the total population if people have reported more than one ethnicity. This classification allows for the representation of all those people who identify with any group (24). In the 'prioritisation' classification, each respondent is assigned to a single ethnic group using the priority system, in the following order: Maaori, Pacific, Asian, European/Other group. The process ensures that the total number of responses equals the total population. However, the size of each ethnic group will be under-estimated with the exception of Maaori ethnic group (24). Although 'total response', does appear to overestimate population totals it does allow representation of all those people which identify with any given ethnic group.

3.5 Limitations

- The HNA was planned over a short time frame of 4 months. It was difficult to obtain data for many health indicators in this time frame. Data on cancer, mental illness, accidents and infectious disease were not included.

- Detailed ethnicity data was unavailable for Asians over many indicators such as, oral health, cervical screening, and mental health. The 2002/03 New Zealand health survey does not routinely analyse the Asian population at level 2 ethnicity. However, these findings were discussed in the Asian Health Chart Book at a national level and would have similar implications for the Asian people in CM.

- Asians are a diverse group. Although sub-grouping has enabled researchers to make some meaningful conclusions for the Chinese and Indian people, even within these groups significant diversity exists – example Indian migrating from Fiji versus those from India versus those born in NZ. The 'Other Asian' - comprised of several small diverse communities also has the problem of 'averaging'. Furthermore, the relatively small numbers for this population can result in large confidence intervals and skewed data for many of the health indicators.

- The indicators did not take into consideration the duration of residence in New Zealand. This will overlook the impacts of migration, acculturation and settlement on health status.

- No community engagement was undertaken.

4 Population demography and socioeconomic determinants

This section presents data on the following:

- Population characteristics, size and growth projections to 2026 by ethnic group
- Age and gender structure of the Asian population in CM
- Asian population in CM by NZ Dep2006
- Socioeconomic determinants of the Asian population

All data presented were from the Census 2006. The data in this section uses 'estimated resident' population for demography and population projections, and 'usually resident' for socioeconomic determinants as noted. 'Total response' ethnicity classification had been used throughout this report to maintain consistency. However, 'prioritised' ethnicity numbers were also illustrated in the demography data for comparison purposes.

4.1 Population characteristics, size, and growth

The Asian population in CM is increasing progressively. Approximately 20% of Asian people in New Zealand live in CM. They make up 9% of the population nationally and 16.1% of the CM population by prioritised ethnicity, the fourth largest ethnic grouping. However Asian forms the third largest ethnic group (at 18%) in CM when 'total response' is considered.

Table 4.1-1 and 4.1-2 present population data for 'All Asian' and the ethnic sub-groups at level 2 ethnicity, in CM in 2006. The ethnic populations at level 1 were compared with national data.

Table 4.1.1: Asian ethnic group distribution in CM, 2006 census usually resident and estimated resident population

	Usually resident population		Estimated resident population	
	Total response	**Prioritised**	**Total response**	**Prioritised**
Chinese	28,100	25,600	31,900	29,300
Indian	29,700	28,600	33,800	32,800
Other Asian	15,900	15,500	17,600	11,200
All Asian	73,700	69,700	82,800	73,200
As % all CMDHB			18.2%	16.1%

Table 4.1.2: Population by ethnicity, CM and New Zealand, 2006 census estimated resident, prioritised

Ethnicity	Counties Manukau		All New Zealand	
	Count	**Percent**	**Count**	**Percent**
Maaori	76,100	16.7	624,300	14.9
Pacific	87,100	19.1	226,900	6.1
Asian	73,200	16.1	356,000	8.5
European/Other	218,700	48.1	2,946,900	70.4
Total	455,100	100	4,154,100	100

Figure 4.1.1: Population demography, 2006 census estimated resident, prioritised

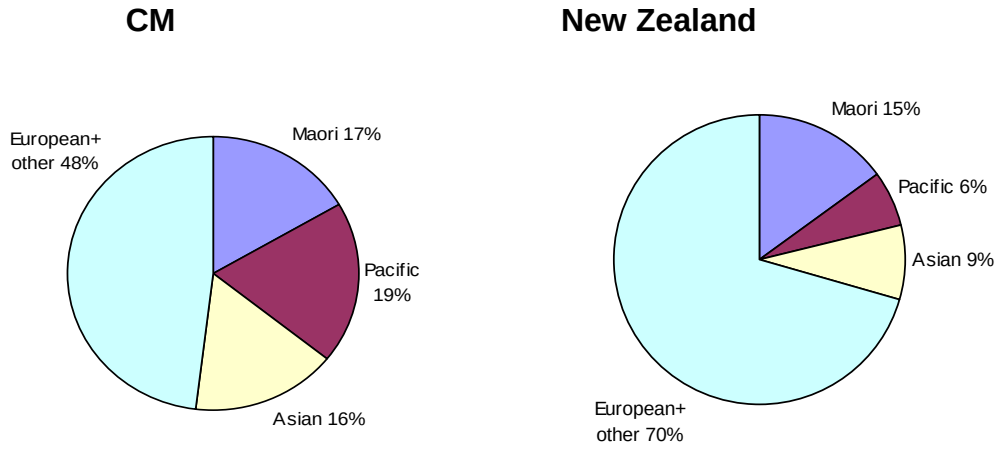
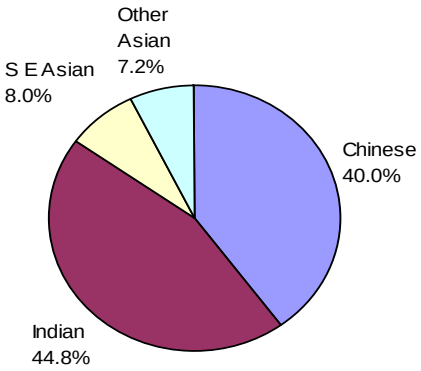


Figure 4.1.2 shows the different ethnic composition of Asian people in CM. The Indian community was the largest in CM (44.8%), followed by Chinese (40%), Southeast Asians (8%) and 'Other Asian' (7.2%), consisting of several small communities. According to Census 2006, nationally, the Chinese community was the largest, approximately 148,000 and comprising over 40% of the Asian ethnic grouping, while the Indian community numbers were approximately 105,000 (29% of the grouping), and the 'Other Asian' were approximately 105,000 (30% of the grouping)[1].

Figure 4.1.2 Percentage of the Asian population in CM, level 2 ethnicity (2006), estimated resident, prioritised



Population projection

Table 4.1-3 shows future growth of all populations in the CM region based on SNZ's medium projection, updated for the 2006 Census and updated for the recently published national ethnic-specific projections released by SNZ (2 April 2008). New

[1] Census 2006. Usually resident population, total response.

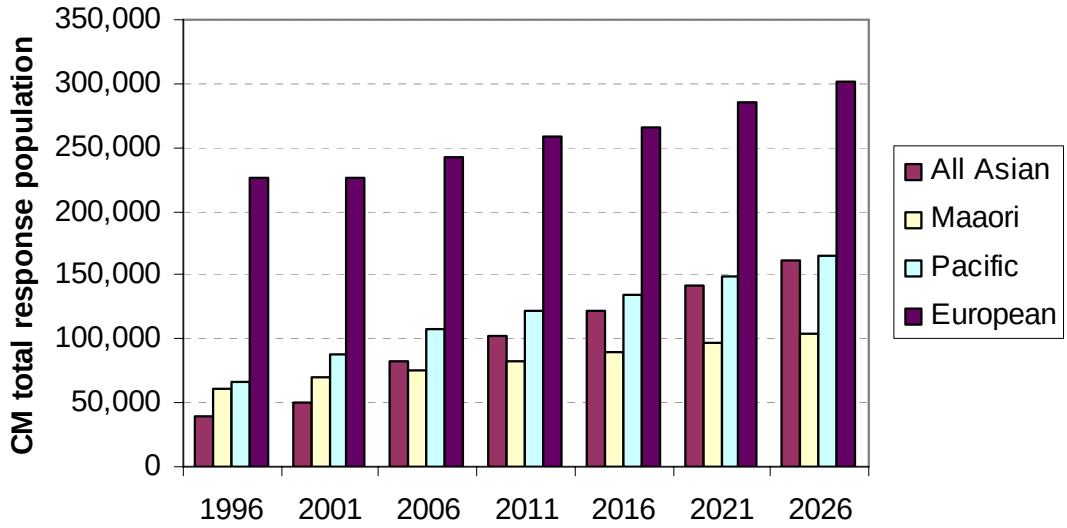
Zealand's Asian population is projected to reach 780,000 by 2026, an increase of 384,000 or 95% over the 2006 figure. Three quarters of this growth is expected to occur in the four cities of Auckland (26). Assuming CMDHB has an even share of this growth then applying the 95% to the total Asian population (extrapolating within CMDHB's overall medium projection) gives growth figures as shown in Table 4.1.3. The 95% growth over the next 20 years compares to an expected growth of only 26% for the other population groups in CMDHB.

This projected growth is very dependent on future migration policy and therefore is hard to quantify. The Asian groupings are shown for indicative purposes only by assuming they will stay in the same proportion as existed in 2006. All population projections are speculative – given the extraordinary changes seen in CM over the past 10 years we make no special claims for this one!

Table 4.1.3: Projected population increase in CM population from 1996 to 2026, by ethnicity, total response

Ethnicity	Year							% change
	1996	2001	2006	2011	2016	2021	2026	2006-26
Chinese	15,100	19,600	31,900	*39,400*	*47,000*	*54,800*	*62,300*	-
Indian	16,700	20,800	33,800	*41,600*	*49,700*	*57,900*	*65,900*	-
Other Asian	8,800	10,900	17,600	*21,700*	*25,900*	*30,100*	*34,300*	-
All Asian	40,300	51,000	82,800	102,100	122,000	142,100	161,600	95
Maaori	60,800	69,200	76,100	83,200	90,000	97,000	104,500	37
Pacific	65,900	87,500	107,000	121,300	135,000	149,200	164,600	54
European	226,800	226,500	242,400	258,800	266,100	284,800	302,100	25
Total	356,860	393,710	454,790	498,600	542,700	586,900	631,400	39

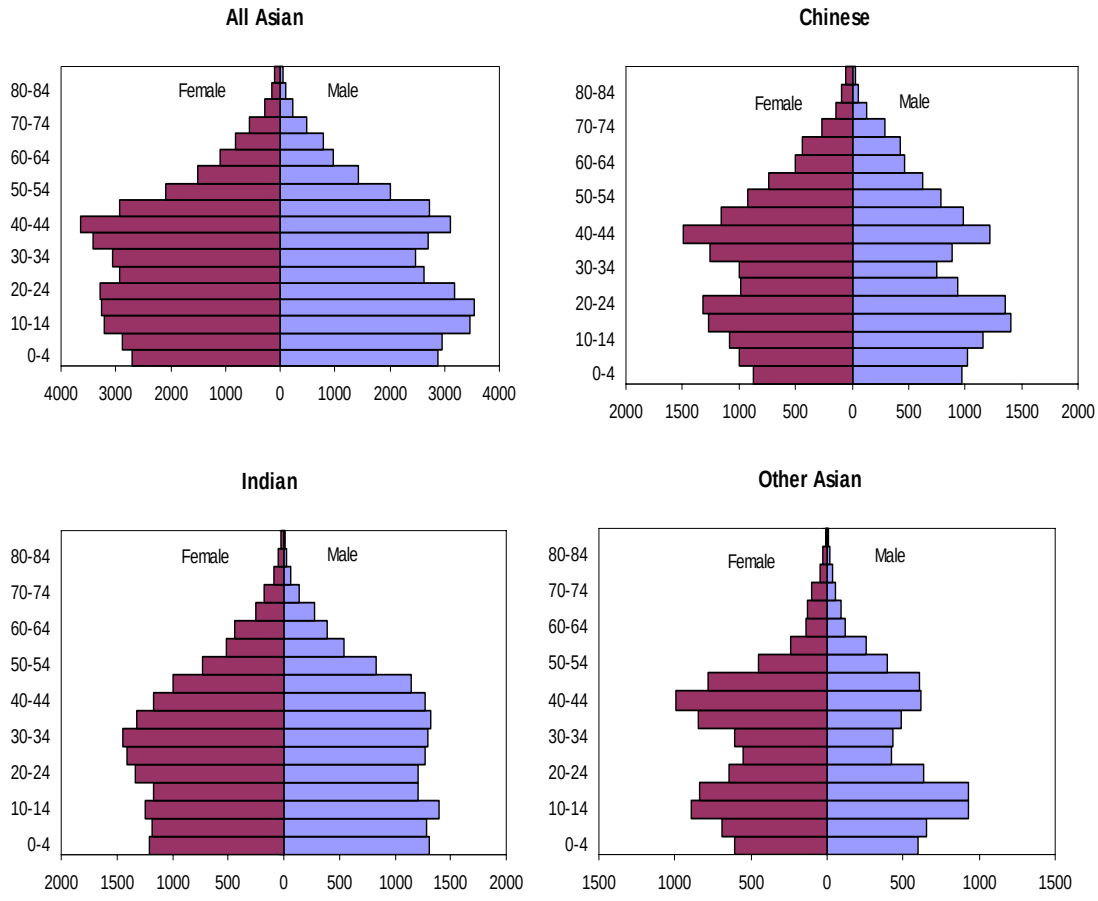
Figure 4.1.3: Population increase in CM population from 1996 to 2006, and projected to 2026, by ethnicity, total response



4.2 Population age structure

The age structure of the Asian population and the three largest ethnic groups is shown in the figure 4.2.1 below. The Asian population was a relatively young population with 23% between the ages of 0-14 years and 18% between the ages of 15-24 years respectively. Furthermore, an increase in the 30-49 years age group was found, probably representing the migrant population. Chinese and the 'Other Asian' ethnic group show this bimodal distribution well. This was less prominent in the Indian population where the age group 30-44 years is larger than the younger age groups. The proportion of males and females in all three ethnic groups were relatively similar. Approximately 5% of the Asian population in CM were elderly (65 years or older) compared to approximately 15% in the European population.

Figure 4.2.1: Population pyramid for the Asian ethnic groups in CM (2006), estimated resident, total response



4.3 Asian population map

The following section shows the Counties Manukau map with its suburbs and illustrates the growth of the Asian population from 1996 to 2006. The Asian population had grown steadily from 1996 to 2006. In particular, the growth for the Indian and the 'Other Asian' ethnic groups in CM was substantial.

Table 4.3.1: Map of Counties Manukau showing areas

Figure 4.3.1: Asian people in Counties Manukau, 1996

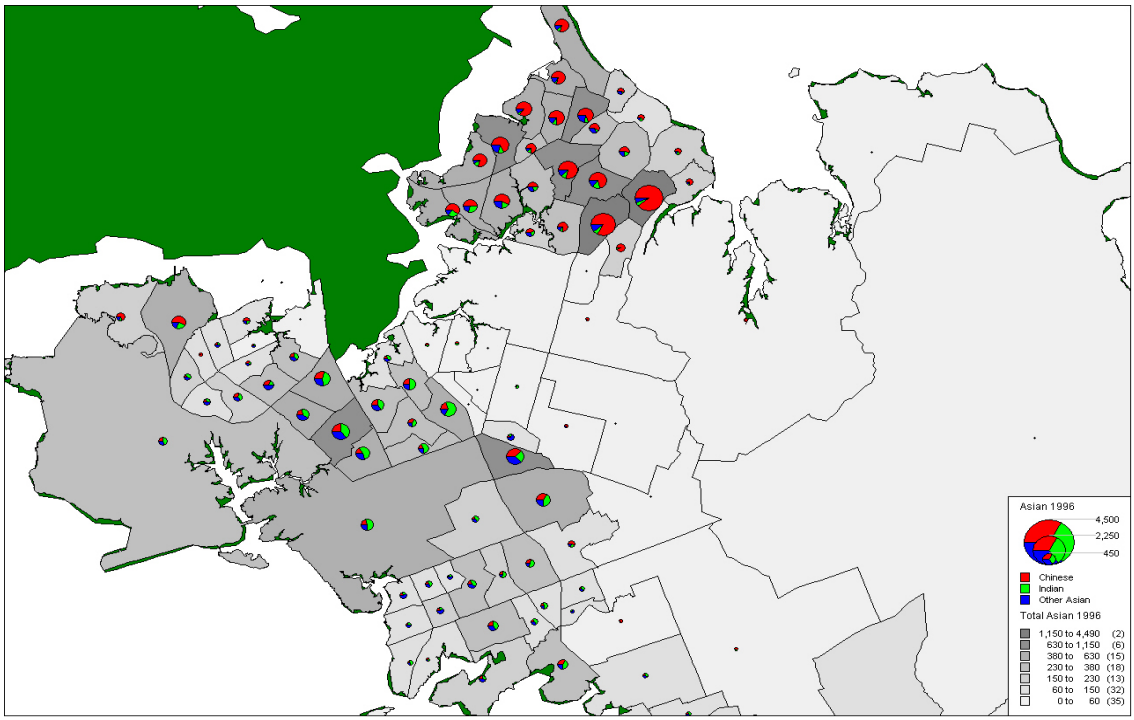


Figure 4.3.2: Asian people in Counties Manukau, 2001

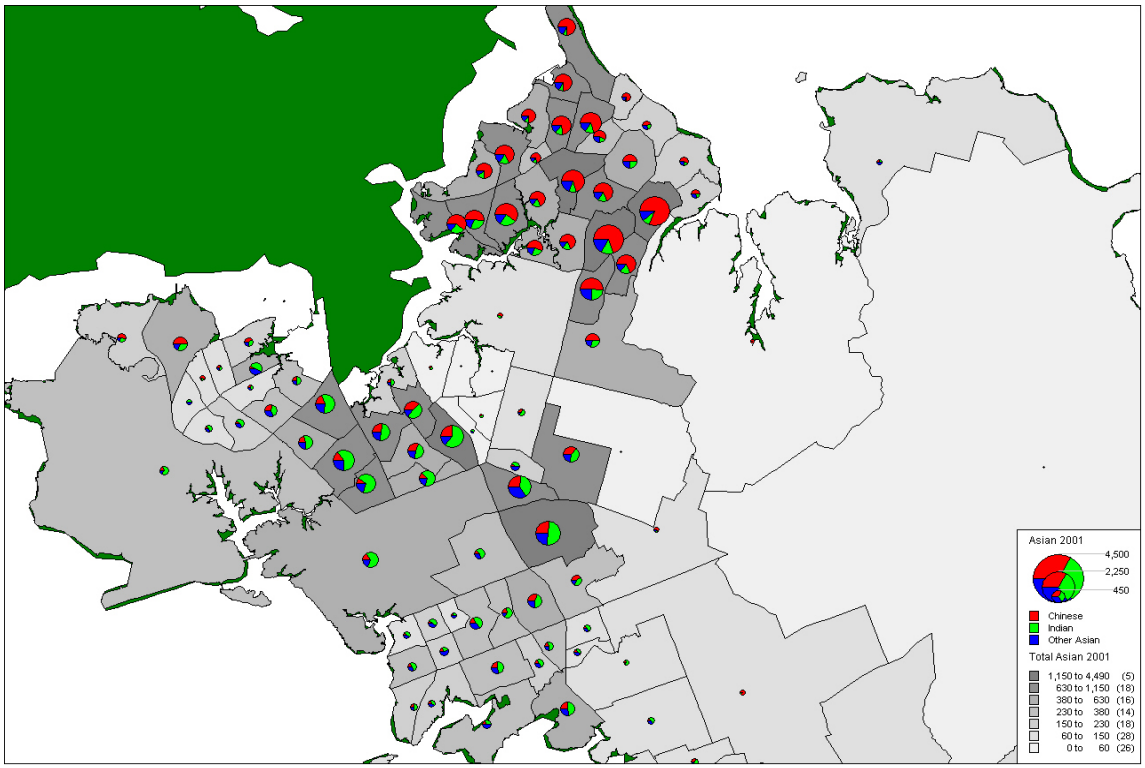
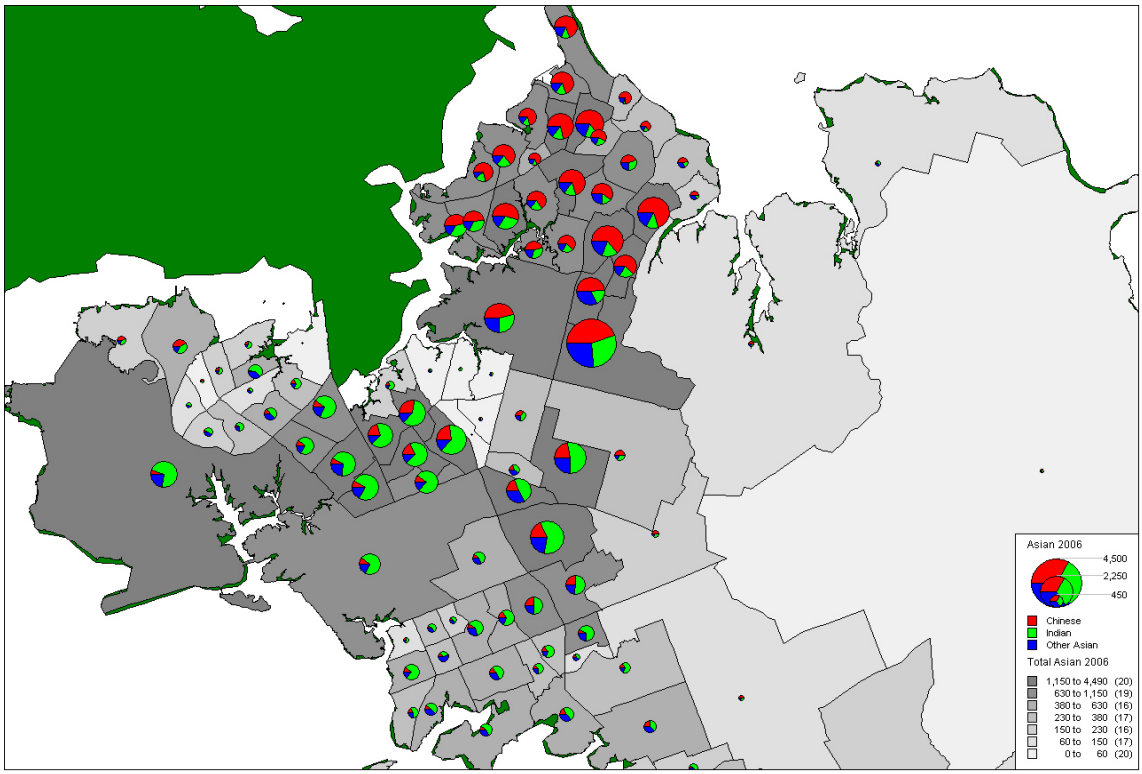


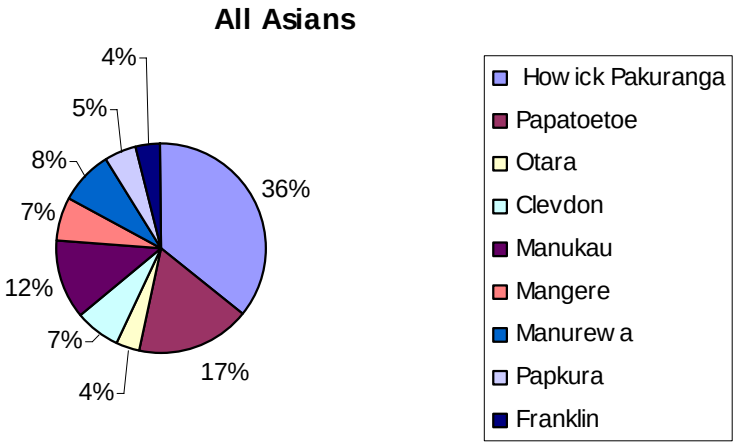
Figure 4.3.3: Asian people in Counties Manukau, 2006



4.4 Area of residence

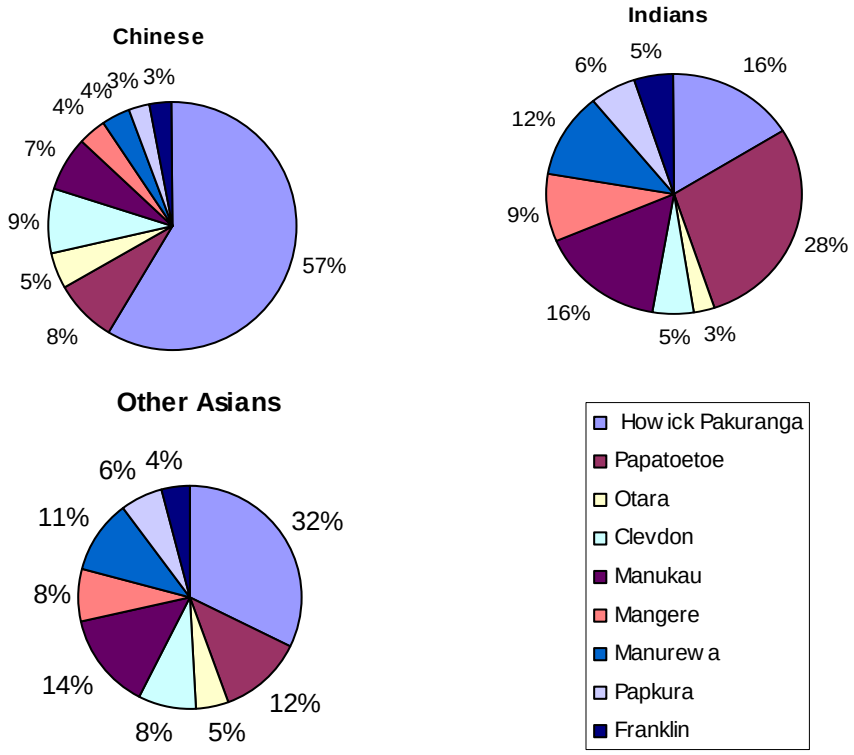
The suburbs in which CM Asian people were living (Census 2006) is shown in the figure below. Approximately three-quarters of CM's Asian people lived in Howick, Pakuranga, Manukau, and Papatoetoe. The information below helps to orient health services to be culturally appropriate for the given population. New initiatives can be started in areas addressing the respective needs of the ethnic population.

Figure 4.4.1: Percentage of 'All Asian' people living in each Counties Manukau suburb (2006), usually resident, total response



The figure below shows the distribution of the three Asian ethnic groups across CM's region. The Chinese and the 'Other Asian" population were concentrated in the Howick – Pakuranga region (57% & 32% respectively) compared to the Indian population in Papatoetoe, Howick – Pakuranga and Manukau regions (60%).

Figure 4.4.2: Percentage of each Asian ethnic group living in Counties Manukau suburbs (2006), usually resident, total response

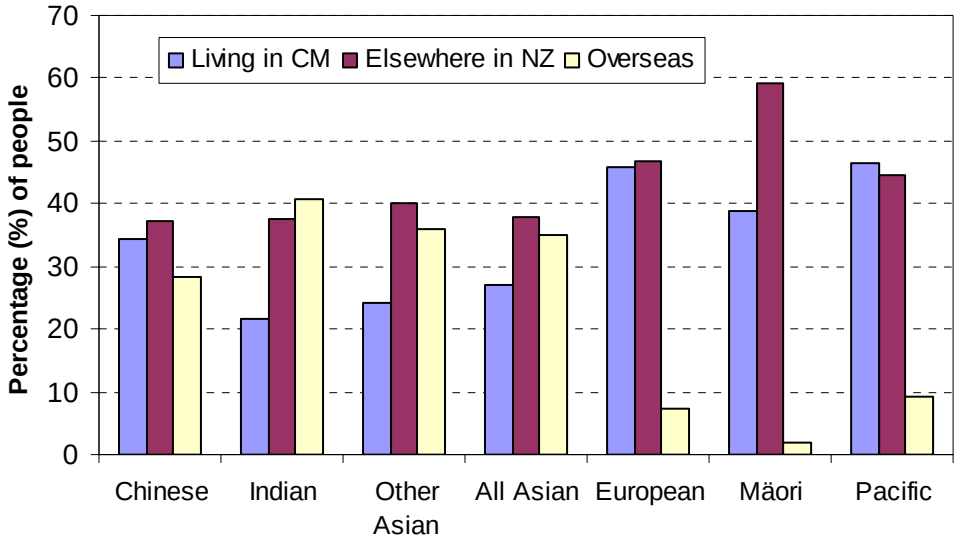


4.5 Mobility of population

The figure below shows the population movement into CM from other places in New Zealand and overseas (migration) in the last five years. Greater mobility was seen into the CM region for all ethnic groups from other places in New Zealand.

The Chinese population had an approximately equal proportion of local people (people who have been living in CM for more than 5 years), mobility from other places in New Zealand, and overseas migration. The Indian and 'Other Asian' population comprised of approximately 20% local people when compared to 80% mobility from outside CM region. Both these groups consisted of high proportion of recent migrants (40% and 36% respectively).

Figure 4.5.1: Percentage of people living in CM, elsewhere in New Zealand and overseas, five years ago by ethnicity (2006), UR, total response



4.6 Language

Approximately two thirds of the Asian population could speak another language, which was most probably the language they are associated with geographically and culturally (figure 4.6.1). Approximately 17% of the Asian people in CM could not speak English. The percentage of Chinese and 'Other Asian' (22% & 20%) unable to speak English language were higher compared to the Indians (10%) as shown in figure 4.6.2.

Figure 4.6.1: Percentage of people in CM (of those able to speak) speaking English and other ethnic languages, by ethnicity (2006), total response

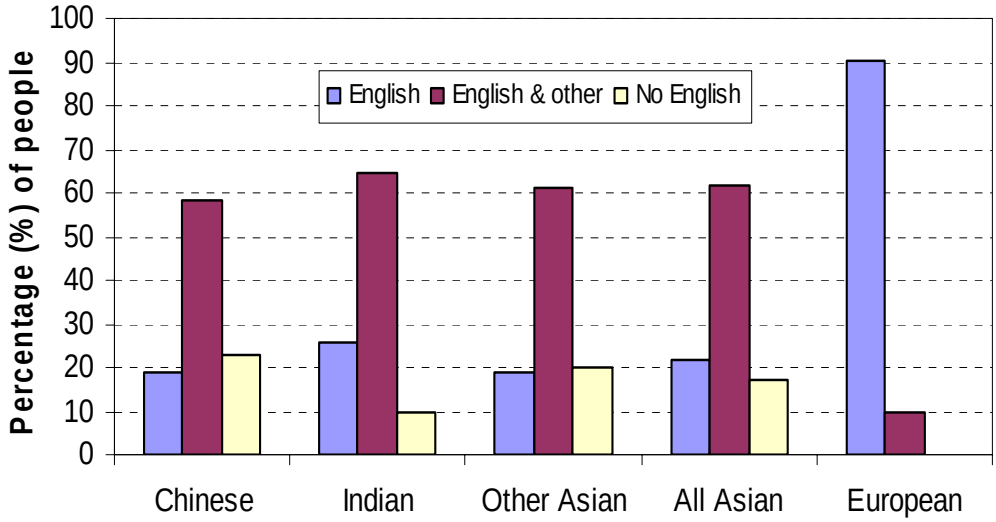
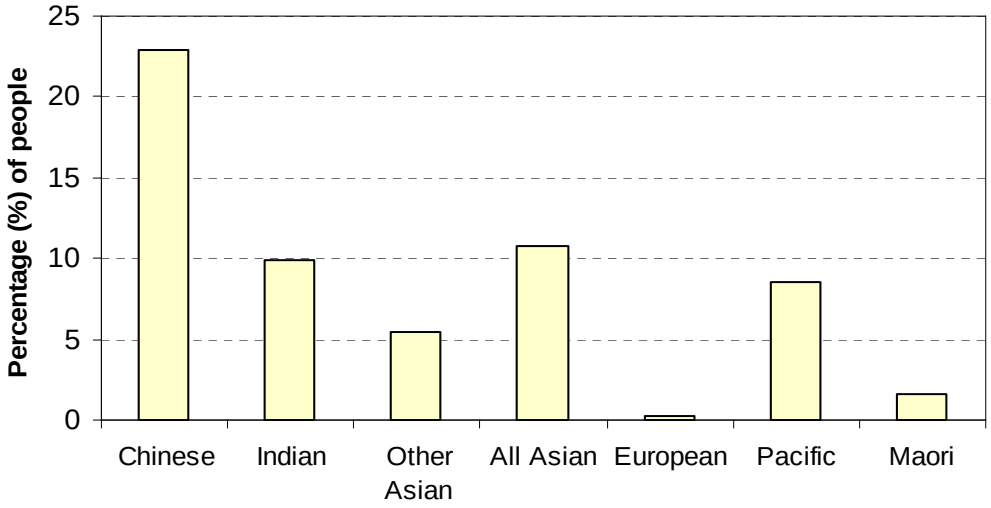


Figure 4.6.2: Percentage of people in CM (of those able to speak) not speaking English, by ethnicity (2006), total response



This has implications for the DHB in terms of access to health services for this population. Providing interpreting services to this population and use of translated material for communicating information regarding NZ healthcare systems, services and entitlements could improve access to health services for this culturally diverse population.

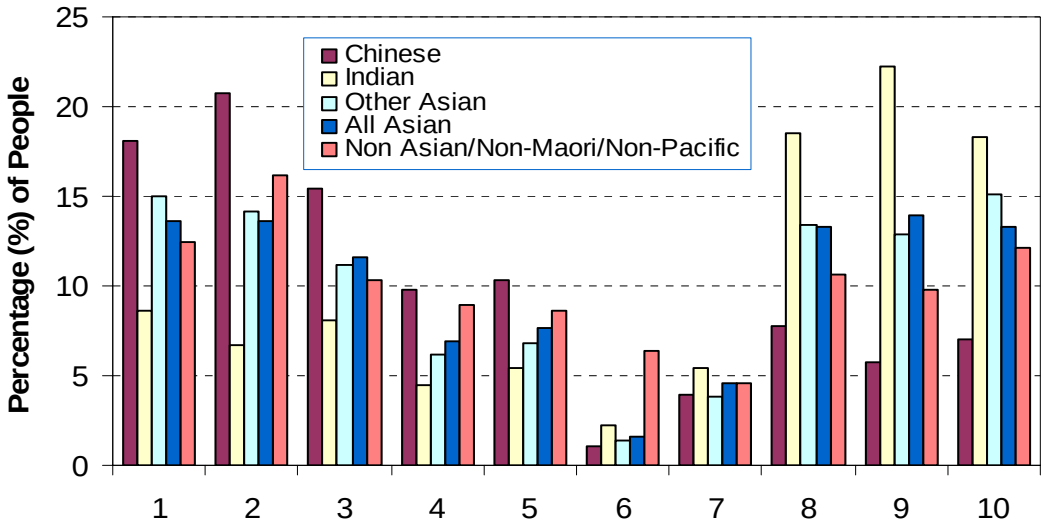
4.7 Deprivation measures

Deprivation is an important factor to consider as it impacts upon health negatively. The NZDep06 (27) is a small area-based index of deprivation, combining nine variables: income, receiving benefit, transport, home ownership, living space, employment status, qualifications, support and access to telephone from census 2006 (Appendix 3: Table 13.3.1). The deprivation scores apply to areas rather than individual people.

The NZDep06 index of deprivation is usually presented as ordinal scale ranges from 1 to 10, where 1 represents the 10% of areas in NZ with the least deprived scores and 10 the 10% of areas with the most deprived scores (27). The CM Asian population as a whole is fairly evenly distributed across the deprivation deciles, similar to the European population. However, there were significant differences between the Asian sub-groups as shown in the figure below.

Chinese people were moderately over-represented in the affluent areas (decile1 & 2 - 39%) and under-represented in the most deprived areas (decile 9 & 10 - 13%). Indian population follow the opposite pattern, 16% in the two most affluent areas and 40% in the two most deprived areas respectively. The 'Other Asian' group had 29% in the two most affluent areas and 28% in the two most deprived areas respectively.

Figure 4.7.1: Percentage of people in CM per deprivation decile, by ethnicity (2006), total response

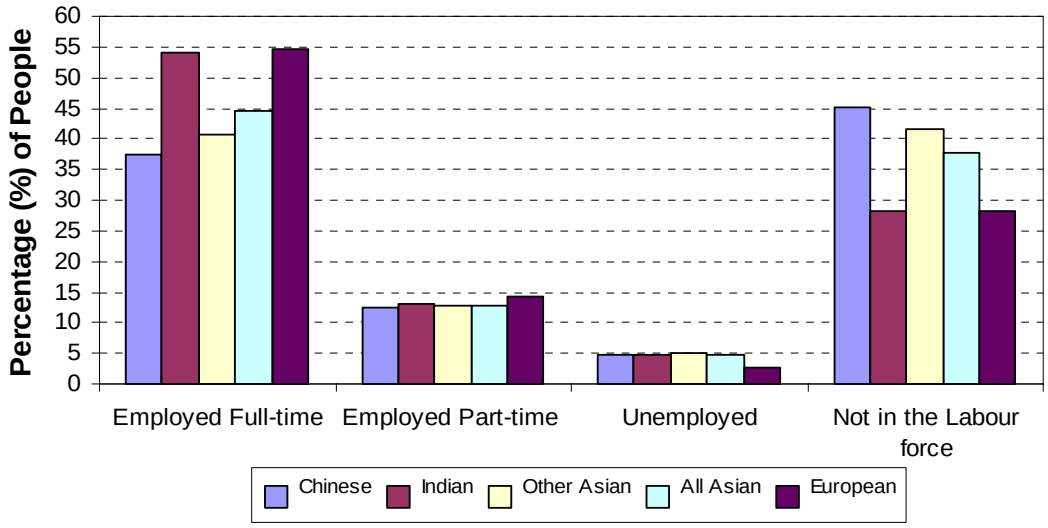


4.8 Employment

The unemployment rate at approximately 5% was similar across all CM Asian ethnic groups and higher than the European population (3%). Approximately 55% of the Indian population were employed full time and 28% not in labour force*, similar to that found in European population. Approximately 37% of the Chinese population was employed full time and 45% not in labour force. The figures for the 'Other Asian' group were 41% and 42% respectively.

* 'Not in labour force' includes any person in the working-age population who is neither employed nor unemployed. Example –retired, disability, looking after children at home.

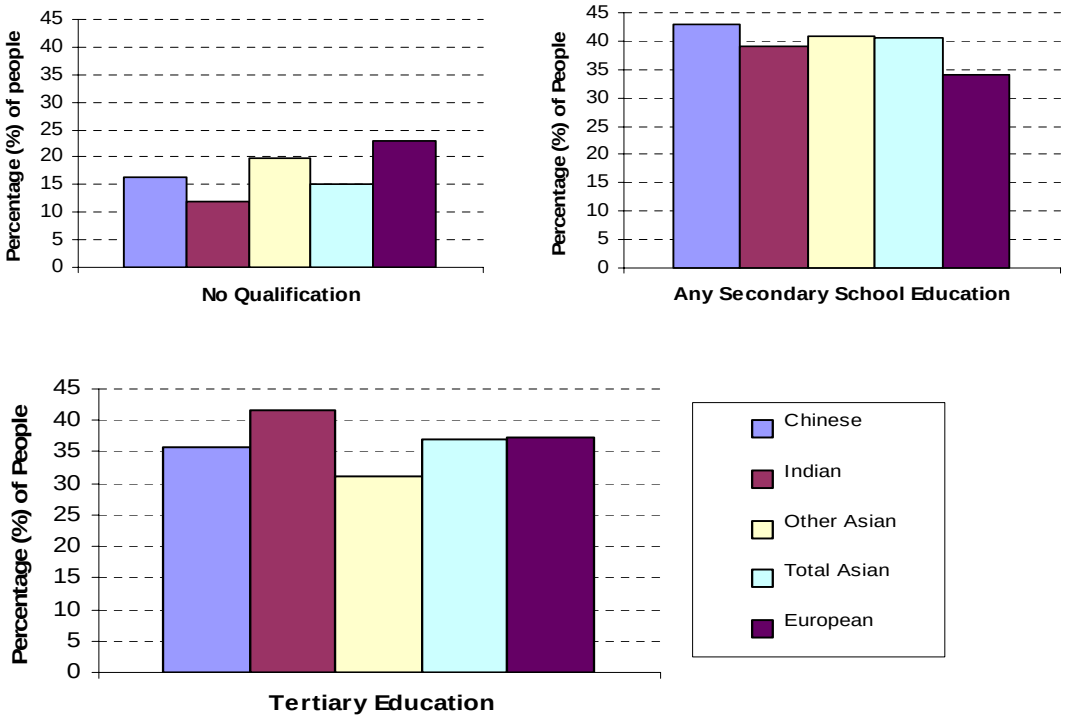
Figure 4.8.1: Percentage of people in CM, 15+ years of age, by work and labour force status and ethnicity (2006), UR, total response



4.9 Education

The CM Asians were highly educated; approximately 75% or higher had secondary school or higher education. This was similar to the CM European population. Indians were more likely to have a tertiary qualification (42%), compared to the Chinese (36%), 'Other Asian' (31%) and European (37%) populations.

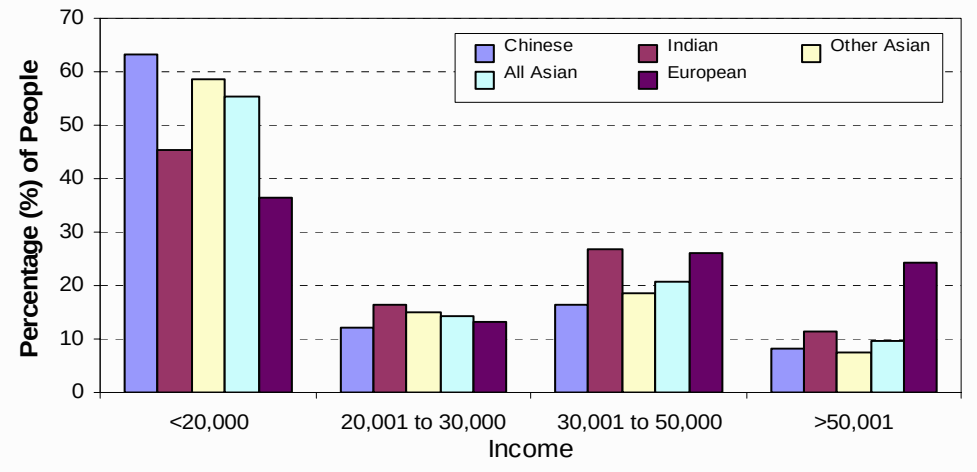
Figure 4.9.1: Percentage of people in CM 15+ years of age, by level of education and ethnicity (2006), UR, total response



4.10 Personal income

The CM Asians as a whole had a higher percentage of people (55%) on low incomes (< $20,000) compared to the European population (36%). Chinese (63%) and 'Other Asians' were more likely to earn less than $20,000 when compared to the Indian population (45%).

Figure 4.10.1: Percentage of people in CM, 15+ years of age, by personal income and ethnicity (2006), UR, total response

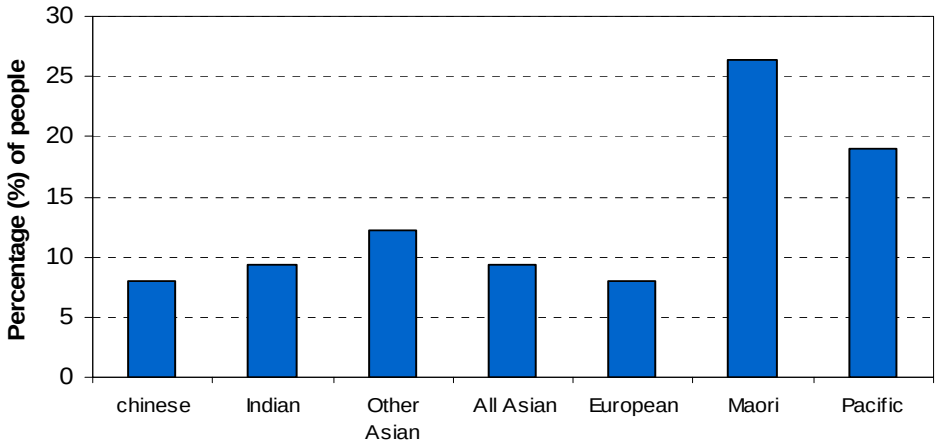


As shown in the figure above, only a small percentage of CM Asians were on high incomes (> than $50,000) per year. Approximately 9% of CM Asians earned high incomes in comparison to 24% of CM Europeans. Chinese and 'Other Asians' (8% each respectively) were less likely to earn high incomes annually in comparison to Indians (12%).

4.11 Benefit receipt

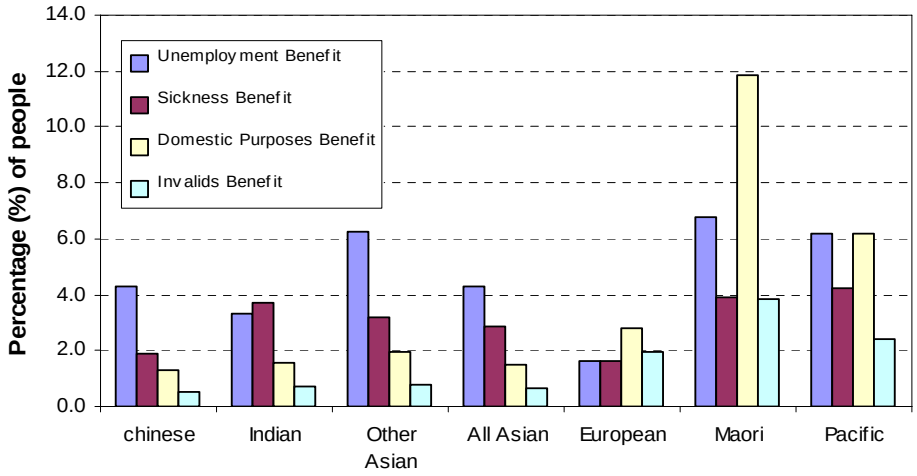
A lower percentage of CM Asian people (9.3%) received any form of means-tested benefit (unemployment, sickness, domestic purpose and invalids), compared to the CM average. This is similar to the European population (8%). The 'Other Asians' (12.2%) were more likely to receive some form of benefit when compared to the Chinese (8%) and Indian (9.4%) populations. This is much lower when compared to the Maaori (26.4%) and Pacific (19%) populations.

Figure 4.11.1: Percentage of people in CM, 15+ years of age, by receiving any benefit (all benefit combined) and ethnicity (2006), UR, total response



Counties Manukau Asians received less domestic purpose (1.5%) and invalids benefit (0.7%) in comparison to the European population (2.8% and 1.9% respectively). However, they received more unemployment (4.3%) and sickness benefit (2.9%) than the European population (1.6% and 1.6% respectively). The 'Other Asians' received more unemployment benefit (6.2%) and the Indian population (3.7%) received more sickness benefit.

Figure 4.11.2*: Percentage of people in CM, 15+ years of age, by receiving the combined benefit and ethnicity (2006), UR, total response*



4.12 Summary - population demography

The Asian people in CM have increased significantly over the last decade and now make up 18.2 percent of the population, the third largest ethnic group after Europeans and Pacific. The Indian, Chinese and the 'Other Asians' were the three main ethnic sub groups. The Indian population was the largest (44.8%), followed by Chinese (40%), and 'Other Asian' (15.2%), which includes Southeast Asians (8%) and many other smaller Asian communities (7.2%). In CM the Asian population is projected to grow (95%) at more than three times the rate of the rest of the population (26%) over the next twenty years.

- The Asian population is relatively young with a bimodal distribution; 41% of the population was 0-24 years of age and 33% was between the ages 30-50 years, the migrant population
- Approximately 5% of the Asian population was elderly compared to 15% of Europeans
- The age and gender distribution all three ethnic Asian groups were similar
- 75% of the Asian people lived in Howick, Pakuranga, Manukau and Papatoetoe suburbs of CM
- 57% Chinese and 32% 'Other Asians' lived in Howick-Pakuranga and 60% Indians live in Papatoetoe, Manukau and and Howick-Pakuranga
- Approximately 66% of the Chinese population moved into CM from other regions of New Zealand and overseas
- Approximately 80% of Indian and 'Other Asians' in CM had moved from outside CM region. Both these groups consisted of a high proportion of migrants (40% and 36% respectively)
- The majority of the Asian population could speak English. Approximately 20% of the Chinese and 'Other Asians' were unable to speak English, compared to 10% of Indians
- The Asian population was evenly distributed across the deprivation deciles, similar to the European population
- 45% Chinese, 12% Indian and 30% 'Other Asians' lived in the most affluent areas of CM (decile 1 & 2)
- 4% Chinese, 46% Indian and 24% 'Other Asian' lived in the most deprived areas of CM (decile 9 &10)
- CM Asians had similar unemployment rates (5%), which was higher than the European (3%) population
- CM Asians were highly educated, similar to the European population. Over three-quarters of all Asian ethnic populations had secondary or higher education
- CM Indians had more tertiary qualification (42%) compared to Europeans (37%)
- 55% CM Asians earned less than $20,000 per year compared to 36% Europeans
- 9% CM Asians earned more than $50,000 per year compared to 24% Europeans
- A lower percentage of CM Asian people (9.3%) received any form of benefit, similar to Europeans

5 Health outcomes

This section presents data on the following:

- Life expectancy at birth in CM and 'All NZ' by gender and ethnicity
- Adult all cause mortality in CM and 'All NZ' by gender and ethnicity
- Top five potentially avoidable causes of mortality in adults in CM and 'All NZ', by gender and ethnicity

Data were obtained from the New Zealand Health Information Service for years 2004-2006 for life expectancy and 2001-2004 for mortality data. Note that death counts for 2005 and 2006 are still considered provisional. All data presented in this section is 'total response' ethnicity.

5.1 Life expectancy

Life expectancy is a summary indicator of a population health, reflecting mortality across all ages from all causes. Life expectancy at birth indicates the total number of years a person could expect to live, based on the mortality rates of the population at each age in a given year or period (28). Figures were collated over three years to improve stability of the estimates, but CM figures are still based on relatively small numbers within each age group, and would be prone to change with a small movement in death numbers.

Table 5.1.1: Life expectancy at birth (in years) in CM and 'All NZ', by gender and ethnicity, 2004-2006, total response

Ethnicity	CM			All NZ		
	Female	Male	Gap	Female	Male	Gap
Chinese	93.8	82.8	11.1	90.0	84.6	5.4
Indian	86.9	81.7	5.1	85.4	81.3	4.1
Other Asian	83.8	81.2	2.6	87.3	83.2	4.0
All Asian	91.2	81.4	9.8	88.3	83.1	5.3
European	84.2	79.6	4.7	83.1	79.1	4.0
Maaori	74.9	69.3	5.6	75.0	70.5	4.5
Pacific	77.9	73.2	4.7	77.8	72.8	5.1

In CM, the life expectancy of 'All Asian' (male 81.4 and female 91.2 years) was higher than the European population (male 79.6 and female 84.2 years). There was no significant difference in life expectancy between the Indians, 'Other Asians' and the Europeans. The gap between male and female life expectancy in 'All Asian' (9.8 Years) was approximately twice that of Europeans (4.7 years).

Chinese females had the highest life expectancy, approximately 9.6 years higher than their counterpart Europeans. No significant gender differences were shown among the Europeans, Indians and 'Other Asians'. The higher life expectancy of the Asian people, particularly the Chinese population may reflect selection processes, the *healthy migrant effect* and can also be explained by the young demography of this population.

The life expectancy of 'All NZ' Asians and Europeans were comparable with CM. However, the gender gap in the 'All NZ' Chinese population (5.4 years) was considerably less than CM Chinese population (11.2 years). The above findings are shown in the Figure 5.1.1 and 5.1.2.

Figure 5.1.1: Life expectancy at birth (in years) in CM, by gender and ethnicity, 2004-2006, total response

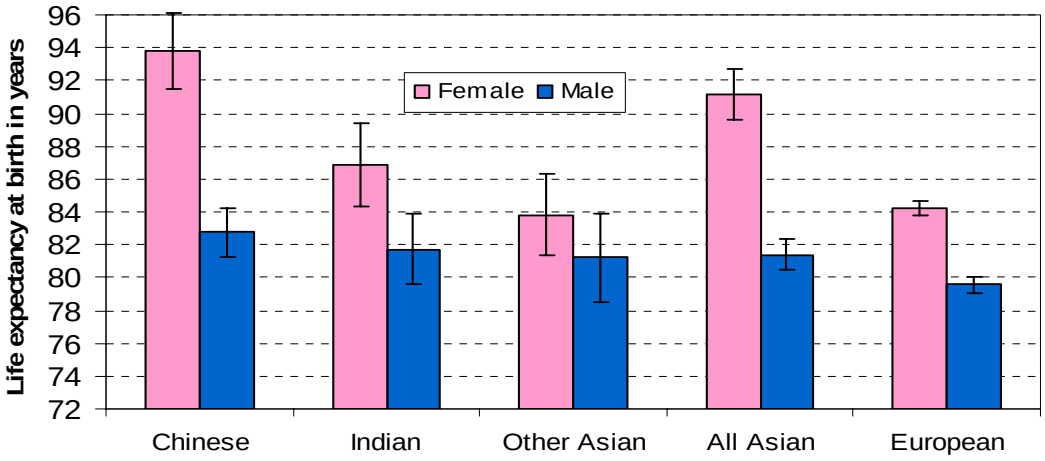
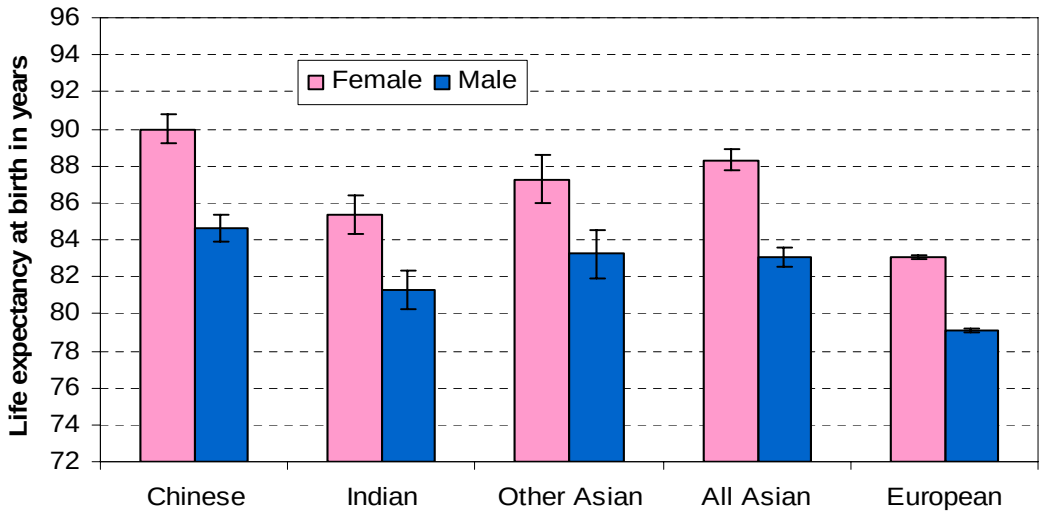


Figure 5.1.2: Life expectancy at birth (in years) in All NZ, by gender and ethnicity, 2004-2006, total response

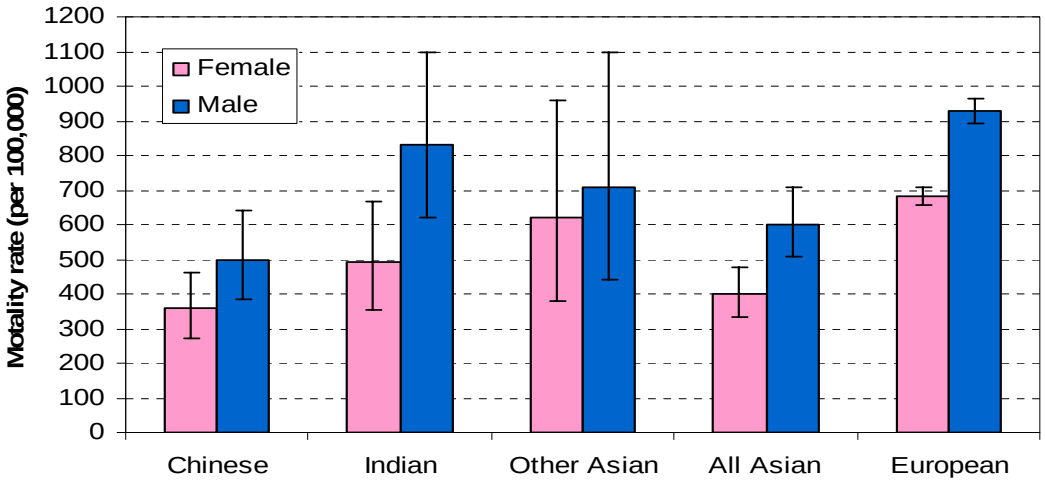


5.2 Adult mortality – all cause

The CM Asians overall had lower adult all cause mortality rates (female and male rates, 400 and 600 per 100,000 respectively) than the European population (680 and 920). The adult all cause mortality rate for Indian males (830) and 'Other Asian' males (700) were considerably higher than the Chinese population but lower than the European population.

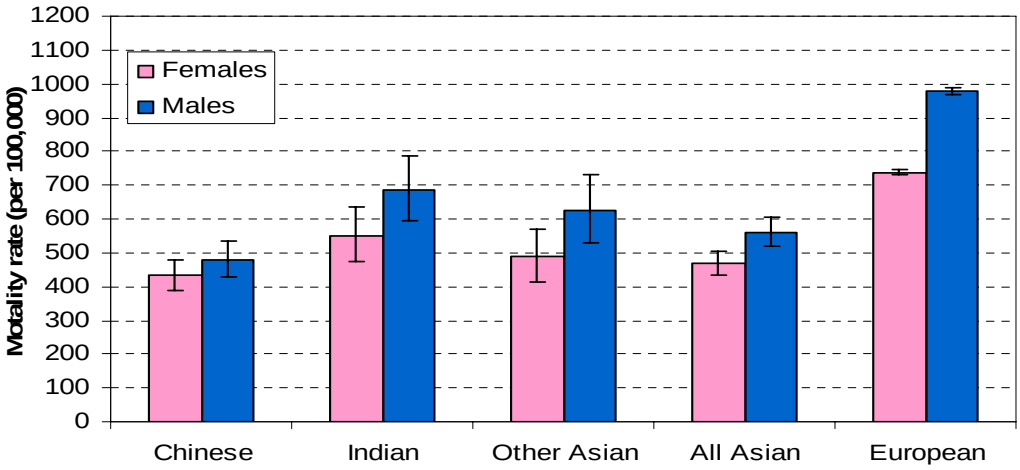
European males had significantly higher all cause mortality than females. Although, males had higher adult all cause mortality in the Asian ethnic groups, the gender difference was not statistically significant.

Figure 5.2.1: Age-standardised mortality rate (per 100,000) in CM for all causes, 15+ year olds, by gender and ethnicity, 2001-2004, total response



The adult all-cause mortality for 'All NZ' Asian people showed a similar pattern to CMDHB, being lower than the European population as shown in the Figure 5.2.2.

Figure 5.2.2: Age-standardised mortality rate (per 100,000) in 'All NZ' for all causes, 15+ year olds, by gender and ethnicity, 2001-2004, total response



5.3 Adult potentially avoidable mortality (PAM) – top 5 causes

Potentially avoidable mortality (PAM) includes deaths occurring under the age of 75 years that could have potentially been avoided through population-based interventions, or through preventive and curative interventions at an individual level (29). It includes death due to injuries. This gives an indication of the conditions that are avoidable and the interventions that could be targeted to improve life expectancy and the health of the population.

The top 5 causes, instead of top 10 causes of PAM are discussed below, because of small numbers of mortality at level 2 ethnicity. The top five causes of PAM in descending order for CM 'All Asian' people were ischaemic heart disease, stroke, diabetes, chronic obstructive respiratory disease and lung cancer. A similar distribution was seen in 'All NZ' Asian people except lung cancer and chronic obstructive respiratory disease were top fourth and fifth causes respectively.

Ischaemic heart disease was the leading cause of PAM, followed by stroke for both CM Asians and Europeans. The Chinese and the European population had lower rates of PAM from diabetes when compared to the Indian and the 'Other Asian' population.

Table 5.3.1: Age-standardised potentially avoidable mortality rate (per 100,000) in CM for top 5 causes, 15-74 year olds, males and females combined, 2001-2004, total response

	All Asian		Chinese		Indian		Other Asian		European	
	Rank	Mortality rate	Rank	Mortality rate	Rank	Mortality rate	Rank	Mortality rate	Rank	Mortality rate
Ischaemic heart disease	1	106	1	77	1	189	1	88	1	186
Stroke	2	60	2	52	2	82	2	67	2	78
Diabetes	3	38	5	18	3	80	4	45	7	15
Chronic obstructive respiratory disease	4	27	3	27	4	26	5	34	3	53
Lung cancer	5	22	4	22	8	12	3	48	4	40

The PAM rates were fairly similar in CM and 'All NZ' for the Asian ethnic groups and the European population as shown in Table 5.3.2.

Table 5.3.2: Age-standardised potentially avoidable mortality rate (per 100,000) in 'All NZ' for top 5 causes, 15-74 year olds, males and females combined, 2001-2004, total response

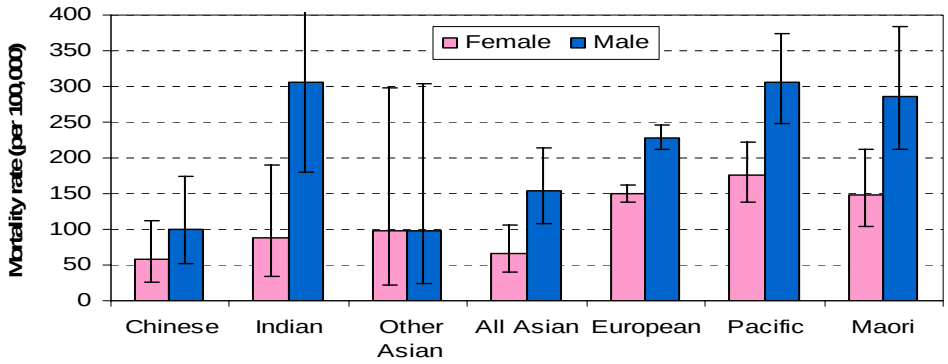
	All Asian		Chinese		Indian		Other Asian		European	
	Rank	Mortality rate	Rank	Mortality rate	Rank	Mortality rate	Rank	Mortality rate	Rank	Mortality rate
Ischaemic heart Disease	1	107	1	74	1	178	1	113	1	193
Stroke	2	69	2	72	2	73	2	58	2	87
Diabetes	3	37	4	23	3	76	3	33	7	19
Lung cancer	4	27	3	33	4	29	5	17	3	52
Chronic obstructive respiratory disease	5	19	3	33	8	12	4	30	4	43

Ischaemic heart disease

The avoidable ischaemic heart disease (IHD) mortality in males and females for CM Asians (153 and 66 per 100,000 respectively) were significantly lower than the CM European population (229 and 150). The avoidable IHD mortality for the CM Indians was significantly higher than the Chinese population.

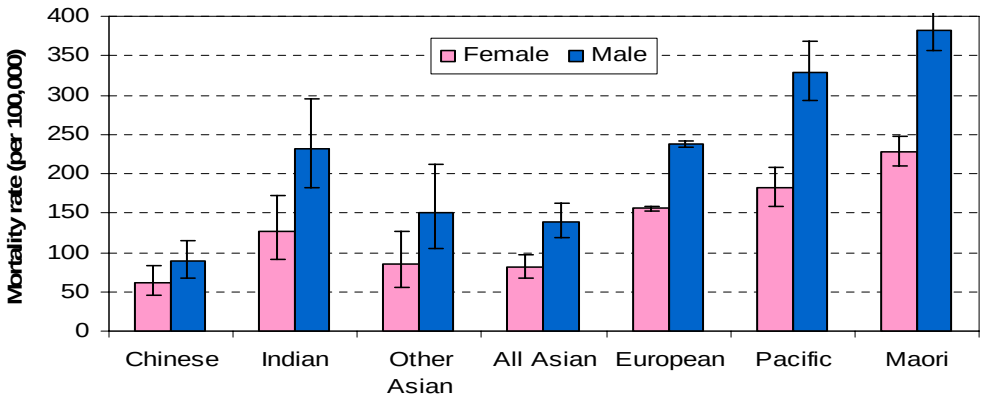
The avoidable IHD mortality rate in the Indian male population (306 per 100,000) was approximately similar to the Pacific and Maaori male population and considerably higher than the European males but not statistically significant. It is difficult to comment on the 'Other Asian' group because of small numbers and wide confidence intervals.

Figure 5.3.1: Age-standardised mortality rate (per 100,000) in CM for ischaemic heart disease, 15-74 year olds, by gender and ethnicity, 2001-2004, total response



Statistically significant gender differences (male avoidable IHD mortality higher than female) were shown for CM Asians as a whole and in the European population but not at level 2 Asian ethnic groups. See *Figure 5.3.1.*

Figure 5.3.2: Age-standardised mortality rate (per 100,000) in 'All NZ' for ischaemic heart disease, 15-74 year olds, by gender and ethnicity, 2001-2004, total response



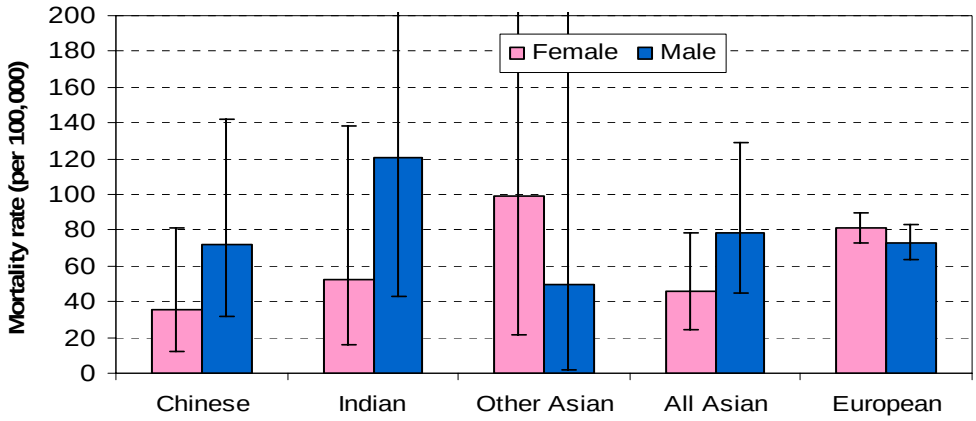
Similar distribution to CM was seen for 'All NZ'. The avoidable IHD mortality in males and females for 'All Asians' (138 and 80 per 100,000) was significantly lower than the

European population (238 and 156). The avoidable IHD mortality for Indian male and female populations were significantly higher than the Chinese population.

Stroke

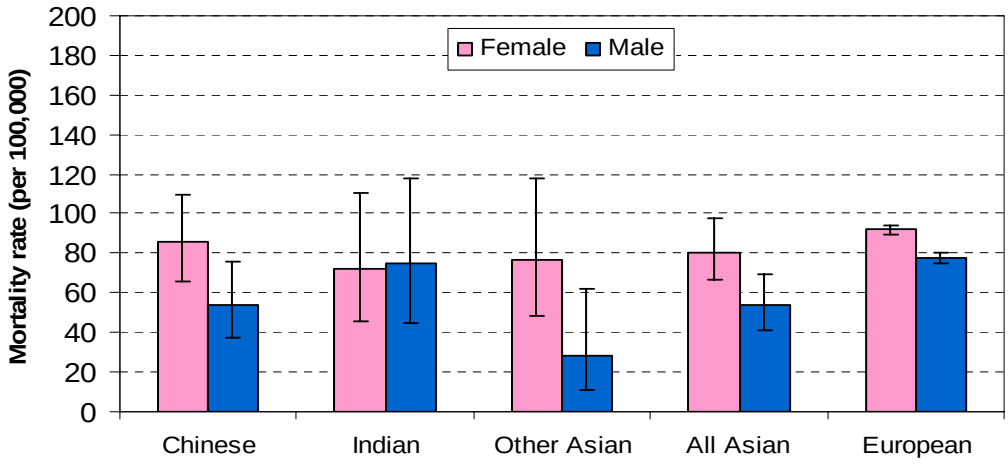
No statistically significant difference was seen in avoidable stroke mortality rate between the Asian and the European population in CM. No significant gender difference was seen in avoidable stroke mortality in all ethnic groups. Because of the small numbers, the data showed wide confidence intervals in all ethnic groups.

Figure 5.3.3: Age-standardised potentially avoidable mortality rate (per 100,000) in CM for stroke, 15-74 year olds, by gender and ethnicity, 2001-2004, total response



The avoidable stroke mortality in the 'All NZ' European population was significantly higher in males when compared to 'All Asian' male population. Although no significant gender difference was seen among the Asian populations, the avoidable stroke mortality in European females (92 per 100,000) was significantly higher then the European males (77).

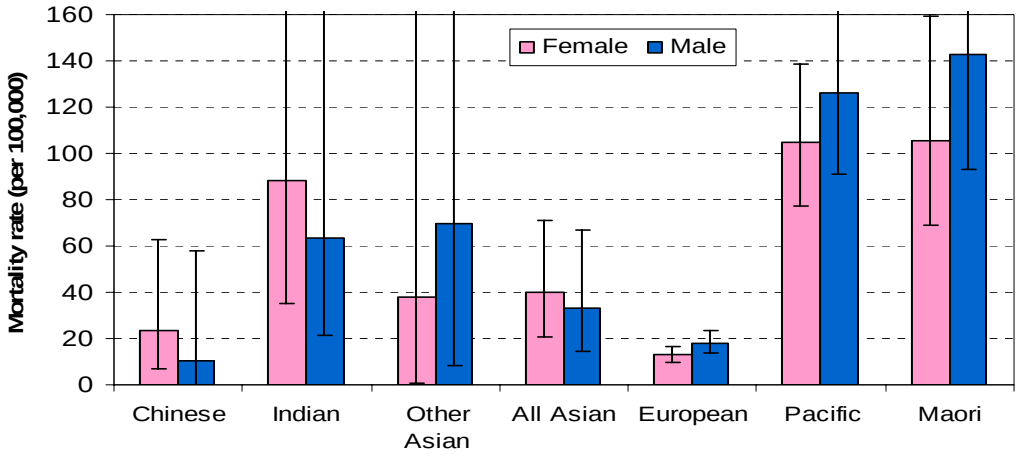
Figure 5.3.4: Age-standardised mortality rate (per 100,000) in 'All NZ' for stroke, 15-74 year olds, by gender and ethnicity, 2001-2004, total response



Diabetes

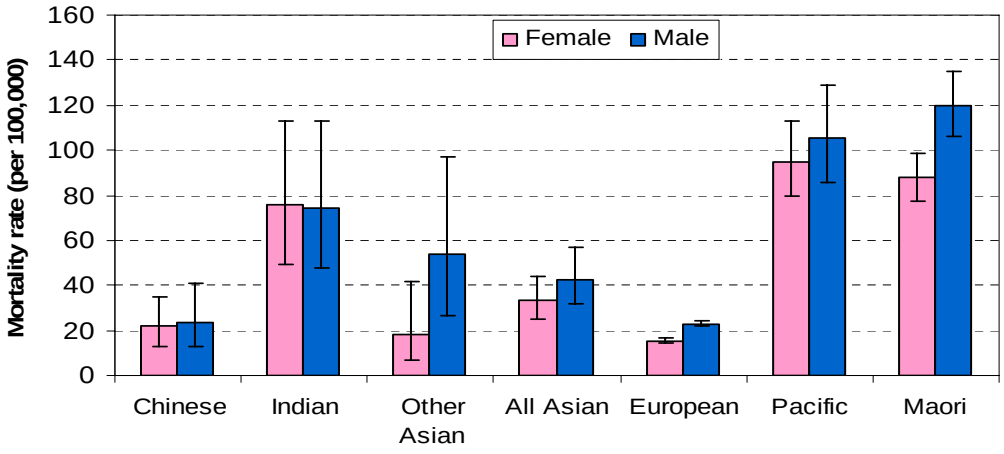
In CM, no statistically significant difference was seen in avoidable diabetes mortality between the all Asian and European populations, but Indians had a higher mortality for both females and males. No significant gender difference was seen in avoidable diabetes mortality in all ethnic groups. Chinese people in CM had similar diabetes mortality rates to the European population, with lower rates than Indian people. The confidence intervals were extremely wide for this data (Figure 5.3.5).

Figure 5.3.5: Age-standardised mortality rate (per 100,000) in CM for Diabetes, 15-74 year olds, by gender and ethnicity, 2001-2004, total response



The avoidable diabetes mortality in males and females for 'All NZ' Asians (43 and 33 per 100,000) as a whole was significantly higher than the 'All NZ' European population (23 and 15). The avoidable diabetes mortality for the Indian population (74 and 76) was significantly higher than the Chinese population (24 and 22) and almost similar to Maaori (119 and 87) and Pacific populations (105 and 95).

Figure 5.3.6: Age-standardised mortality rate (per 100,000) in 'All NZ' for diabetes, 15-74 year olds, by gender and ethnicity, 2001-2004, total response



5.4 Summary – health outcomes

Life expectancy

- The life expectancy of Asians was higher than the European population in CM and 'All NZ'
- The life expectancy of women was higher than men in all ethnic groups, both in CM and 'All NZ'
- In CM and 'All NZ', Chinese males and females had the highest life expectancy at birth
- In CM and 'All NZ', the gender gap in Indian, 'Other Asian' and European population was approximately 4-5 years
- A gender gap of 11.2 years in the CM Chinese population was approximately twice that of the European population
- A gender gap of 5.4 years in 'All NZ' Chinese population was considerably less than CM Chinese population

Adult mortality –all cause

- The adult all cause mortality rates for Asians were lower compared to Europeans in CM and 'All NZ'
- The adult all cause mortality rates for Indian population, particularly males was higher than the Chinese population, which was statistically significant for 'All NZ' but not for CM
- European and 'All Asian' males have higher adult all cause mortality in both CM and 'All NZ'. This was not statistically significant among Asian subgroups

Adult potentially avoidable mortality (PAM) – top 5 causes

- The top 5 causes of PAM in CM and 'All NZ' Asians were ischaemic heart disease, stroke, diabetes, chronic obstructive respiratory diseases and lung cancer
- Avoidable IHD mortality in males and females for 'All Asians' was lower than the European population in both CM and 'All NZ'
- Potentially avoidable IHD mortality in Indian male population was significantly higher than the Chinese male population both in CM and 'All NZ'
- No statistically significant difference was shown in potentially avoidable stroke mortality rates between Asian and European population in CM
- Potentially avoidable stroke mortality was higher in 'All NZ' European male population compared to the Asian population
- Potentially avoidable stroke mortality was significantly higher in 'All NZ 'European females than males. No gender difference was shown in all ethnic groups in CM
- Potentially avoidable diabetes mortality in males and females for 'All Asians' was significantly higher than the European population in 'All NZ' but not so in CM
- Potentially avoidable diabetes mortality in males and females for Indian population was significantly higher than the Chinese population in 'All NZ' and is likely to be so in CM

6 Health services utilisation

This section presents data on the following:

- Adult potentially avoidable hospitalisations (PAH) all cause in CM and 'All NZ' by gender and ethnicity
- Top 10 causes of adult potentially avoidable hospitalisations in CM by gender and ethnicity
- Adult surgical intervention rates for selected surgical procedures in CM by ethnicity
- Chronic Care Management (CCM) data for people enrolled in the diabetes and CVD programmes in CM
- Breast screening rates in CM by ethnicity
- PHO enrolment data by ethnicity

All data were obtained from the New Zealand Health Information Service for years 2004-2006. The CCM CVD programme data was for last one year and the CCM diabetes programme data was for all people enrolled up to date in the programme. The breast screening data was for 2 years (Nov 2005–Oct 2007) and the PHO data was for the year 2006. All data presented in this section is 'total response' ethnicity.

6.1 Adult potentially avoidable hospitalisations – all cause

Potentially avoidable hospitalisations (PAH) are admissions to hospital that might be considered to be avoidable and consist of (30):

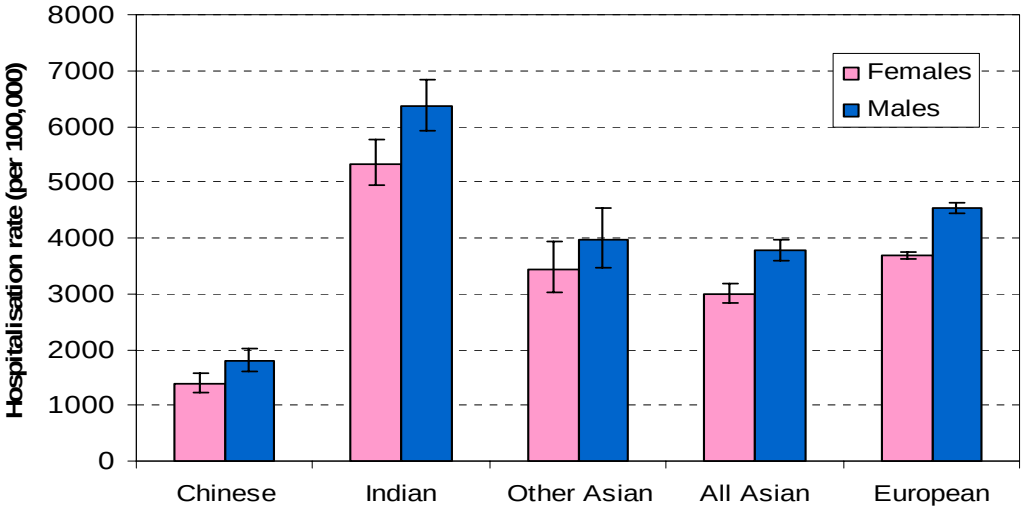
- Preventable hospitalisations – hospitalisations resulting from diseases that may be prevented through population-based health promotion strategies (e.g. tobacco tax and smoke free laws, exercise, good diet)
- Ambulatory sensitive hospitalisations – hospitalisations resulting from disease able to be looked after in a primary health care setting (e.g. vaccine preventable diseases, diabetes control, asthma prevention)

An age threshold of 75 years is applied because of high prevalence of co-morbidity at older ages. It also excludes hospitalisations due to injury, for which different preventive strategies apply.

In CM, 'All Asian' males and females had significantly lower PAH rates for all causes (3800 and 3000 per 100,000 respectively) than their European counterparts (4500 and 3700). The Indian male and female PAH rates for all causes (6400 and 5300) were significantly higher than the Chinese (1800 and 1400) and the European population. The 'Other Asian' ethnic group had PAH hospitalisation rates higher than the Chinese but lower than the Indian population.

In CM, the Asian (except the 'Other Asian') and European males had significantly higher PAH rates compared to the females. See *Figure 6.1.1*.

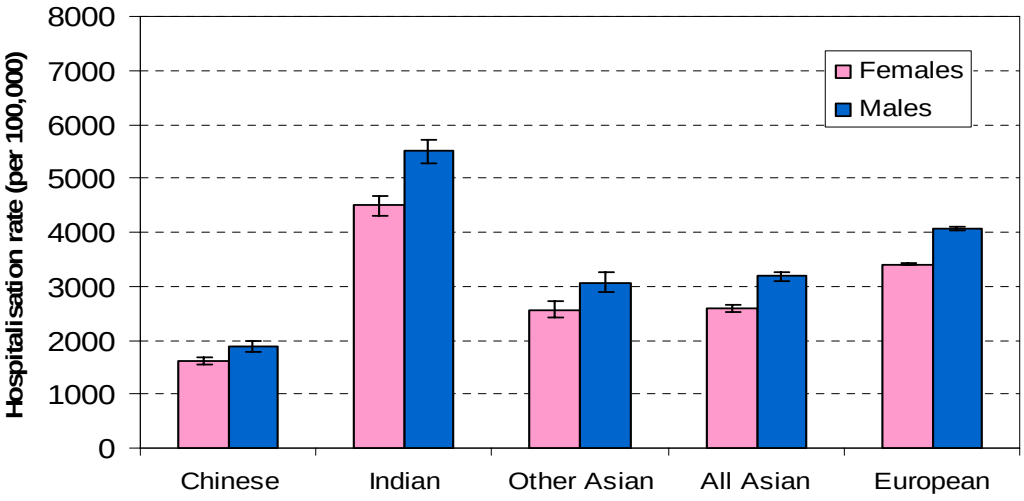
Figure 6.1.1: Age-standardised potentially avoidable hospitalisation rate (per 100,000) in CM for all causes, 15-74 year olds, by gender and ethnicity, 2004-2006, total response



The distribution of the PAH rates in the Asian and European populations in 'All NZ' was similar to CM. 'All Asian' males and females had significantly lower PAH rates for all causes (3100 and 2600 per 100,000 respectively) than their European counterparts (4100 and 3400). The Indian male and female PAH rates for all causes (5500 and 4500) were significantly higher than the Chinese (1900 and 1600) and the European population. The 'Other Asian' ethnic group had PAH rates higher than the Chinese but lower than the Indian population.

In 'All NZ' males had significantly higher PAH rates compared to the females across all ethnic groups. The overall pattern mirrored the CM experience - see *Figure 6.1.2*.

Figure 6.1.2: Age-standardised potentially avoidable hospitalisation rate (per 100,000) in 'All NZ' for all causes, 15-74 year olds, by gender and ethnicity, 2004-2006, total response



6.2 Adult potentially avoidable hospitalisations – top 10 causes

The top ten potentially avoidable causes of hospitalisations in adults for CM are in *Table 6.2.1* below. The causes of avoidable hospitalisations are ranked in descending order from the highest to lowest rate for 'All Asian' people. The corresponding ranking along with the rates is shown for Asian ethnic groups at level 2 ethnicity and the European population. There were considerable differences in the ranking order between the 'All Asian' and European population. Amongst the Asian ethnic groups, there were considerable differences in ranking order between the Indian and the Chinese population.

All the ethnic groups had angina and chest pain as the leading cause of avoidable hospitalisation. Myocardial Infarction and diabetes were second and third top cause of avoidable hospitalisations in the Indian and 'Other Asian' ethnic group but not for Chinese and European population.

Table 6.2.1: Age-standardised potentially avoidable hospitalisations rate (per 100,000) in CM for top 10 causes in Asian and European people, 15-74 year olds, males and females combined, 2004-2006, total response

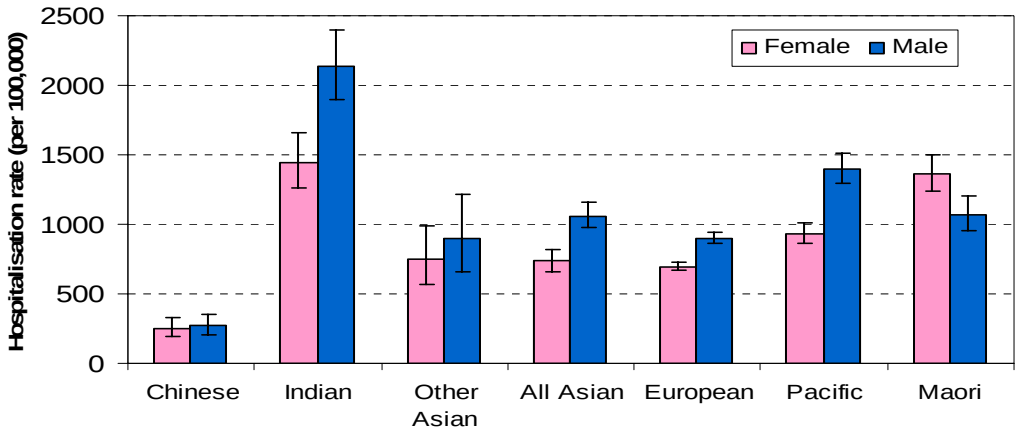
	All Asian		Chinese		Indian		Other Asian		European	
Cause of PAH	Rank	Hosp. rate	Rank	Hosp. rate	Rank	Hosp. rate	Rank	Hosp. rate	Rank	Hosp. rate
Angina and chest pain	1	897	1	263	1	1794	1	786	1	795
Myocardial infarction	2	333	4	98	2	711	2	304	3	356
Diabetes	3	223	8	66	3	465	4	226	9	173
Stroke	4	220	2	153	5	301	3	292	10	164
CORD	5	169	3	101	6	295	8	146	5	286
Kidney/urinary infection	6	155	7	72	7	251	7	172	8	175
Congestive heart failure	7	153	10	59	4	389	23	32	7	188
Pneumonia	8	139	6	80	9	204	5	196	6	216
Asthma	9	103	18	26	8	209	11	95	13	94
Cellulitis	10	97	14	47	11	142	10	131	4	293

Angina and chest pain

The 'All Asian' male population in CM had significantly higher PAH for angina and chest pain (1100 per 100,000) than the European population (900). The male and female PAH for angina and chest pain were highest for the Indian population (2100 and 1400 per 100,000) and lowest for the Chinese population (270 and 250) when all ethnic groups (including Maaori and Pacific) were considered.

A significant gender difference existed amongst most ethnic groups, with males having higher rates compared to females, except in Chinese and 'Other Asian' groups where they were comparable, and Maaori where female had higher rates than male. See *Figure 6.2.1*.

Figure 6.2.1: Age-standardised hospitalisation rates (per 100,000) for angina and chest pain, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response

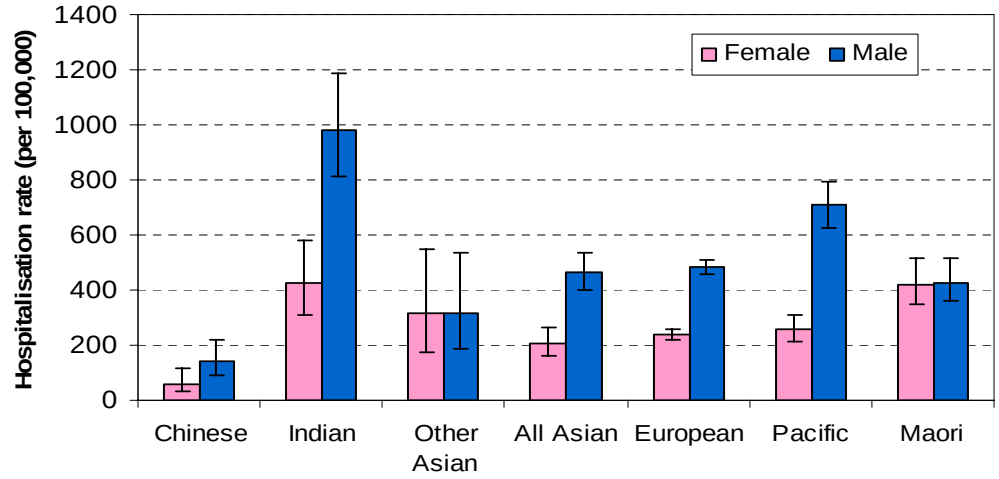


Myocardial infarction

In CM no statistically significant difference were seen in the PAH rates for myocardial infarction between 'All Asians' and Europeans. However, the PAH rates for myocardial infarction were significantly high in the male and female Indian population (980 and 430 per 100,000 respectively) compared to Chinese population (140 and 60). The low rates of myocardial infarction in the Chinese population averaged out the high rates in the Indian population, when the broad category 'Asian' was used.

The rates of PAH for myocardial infarction in Indian males were considerably higher than the Pacific and Maaori males. A significant gender difference existed for myocardial infarction, male hospitalisations being higher than the female for most ethnic groups except Chinese, 'Other Asian' and Maaori.

Figure 6.2.2: Age-standardised hospitalisation rates (per 100,000) for myocardial infarction, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response

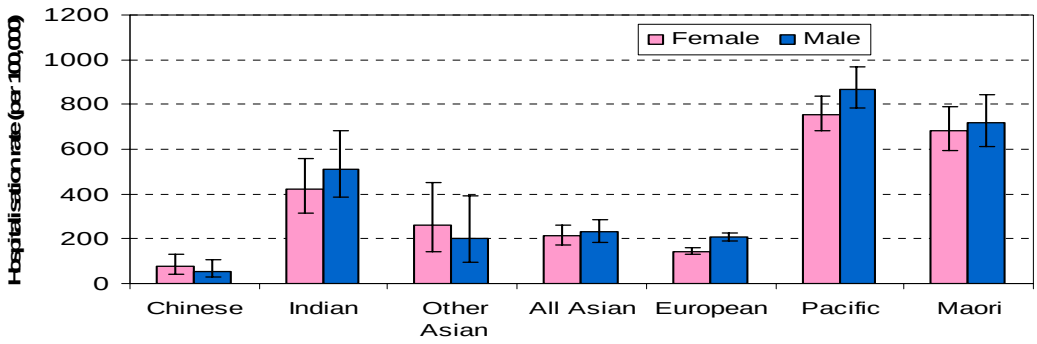


Diabetes

In CM, no statistically significant difference were seen in the PAH rates for diabetes between 'All Asians' and Europeans. However, hospitalisation rates for diabetes were significantly higher in the Indian population compared to the European and Chinese populations. The low rates of diabetes in the Chinese population averaged out the high rates in the Indian population when the broad category 'Asian' was used.

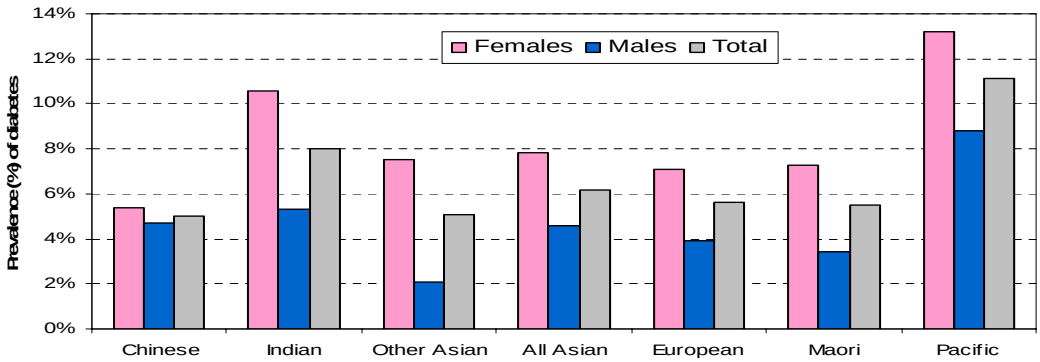
The PAH rates for diabetes in Indians, while higher than Chinese or European were lower than the Maaori and Pacific populations. A significant gender difference was present in the PAH rates for diabetes in Europeans but not among the Asian ethnic groups. There are many reasons why people are admitted to hospital. The high hospitalisation rates for Maori and Pacific compared to Indian comes despite a relatively similar prevalence of disease (see next section). This has been interpreted in various ways – lower use of primary care; poorer diabetes control, more severe disease – further work is underway to ascertain the burden of diabetes in these populations. At this stage it does not appear to be a relative under-use of hospital care by Indian people with diabetes.

Figure 6.2.3: Age-standardised hospitalisation rates (per 100,000) for diabetes, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response



Diabetes prevalence

Figure 6.2.4: Age-standardised prevalence (% of adult population 16+ years of age) of self reported diabetes in CM, by gender and ethnicity, (LBD Survey 2007), total response

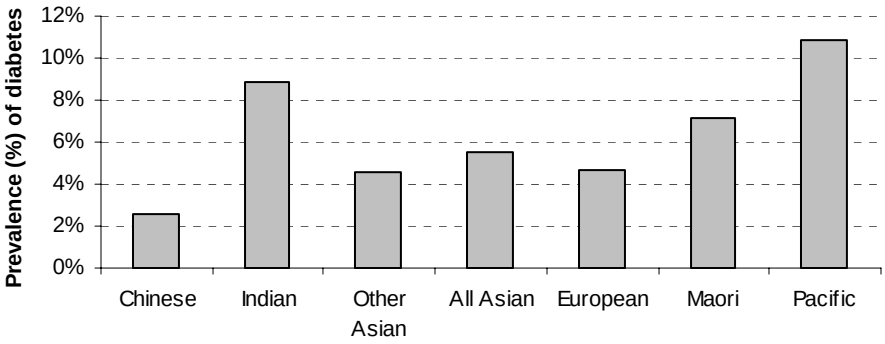


The Lets Beat Diabetes (LBD) survey showed the prevalence of diabetes in CM. The diabetes prevalence in Indians (8%) was significantly higher than the Chinese (5%),

'Other Asian (5.1%) and the European population (5.6%). In all ethnic groups, females had higher rates of diabetes than males. See *Figure 6.2.4*.

The self-reported doctor-diagnosed diabetes, obtained from 2002/03 New Zealand Health Survey (NZHS) showed that prevalence of diabetes in 'All NZ' in Indians (9.4%) was significantly higher than the Chinese (3.4%), 'Other Asians' (5.7%) and the European population (4.1%) (5, 30). Although, there were some differences, the LBD survey results were quite comparable with the NZHS 2002/03.

Figure 6.2.5: Diabetes prevalence (% of adult population 15+ years of age) in CM, by ethnicity (estimate from multiple databases), total response



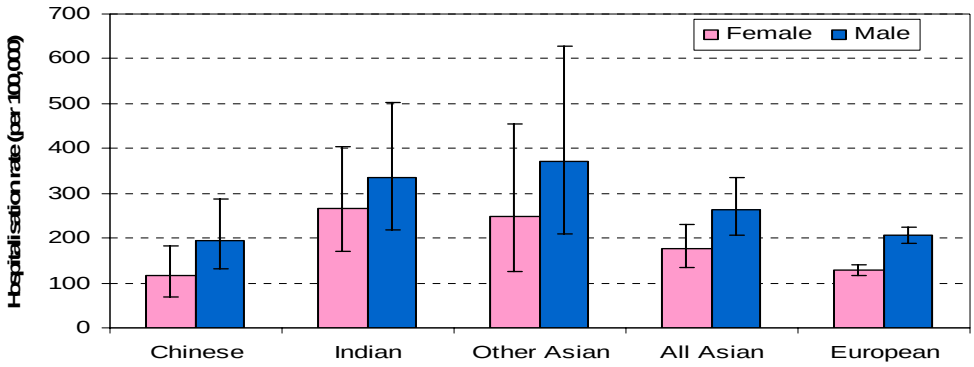
An estimate of people with diagnosed diabetes living in CMDHB was enumerated by 'Known Diabetes' project from multiple data bases, such as CMDHB inpatients and outpatients, CMDHB diabetes waitlist, diabetes referrals (in PIMS), diabetes CCM enrolees, Get Checked enrolees and retinal screening patients. Prevalence of diabetes in adult Indians (8.9%) was significantly higher than the Chinese (2.6%) and European (4.7%) populations. The prevalence was averaged to 5.5% when 'All Asian' population was considered, highlighting the importance of analysing data at level 2 ethnicity. See *Figure 6.2.5*. The Known Diabetes project results are very consistent with the LBD survey and NZHS results, pointing to a significant health concern for the Indian community. Based on these figures around 2300-2500 Indian people had diagnosed diabetes in CM in 2007, with perhaps 600-800 more currently undiagnosed[2].

Stroke

In CM, the PAH rates for stroke in 'All Asian' population were significantly higher compared to European population. Although, the rates were higher for the Indian and the 'Other Asian' population when compared to the Chinese, they were not statistically significant because of wide confidence intervals. Significant gender difference, rates higher in males than females were shown for the European population but not amongst the Asian population. See *Figure 6.2.6*.

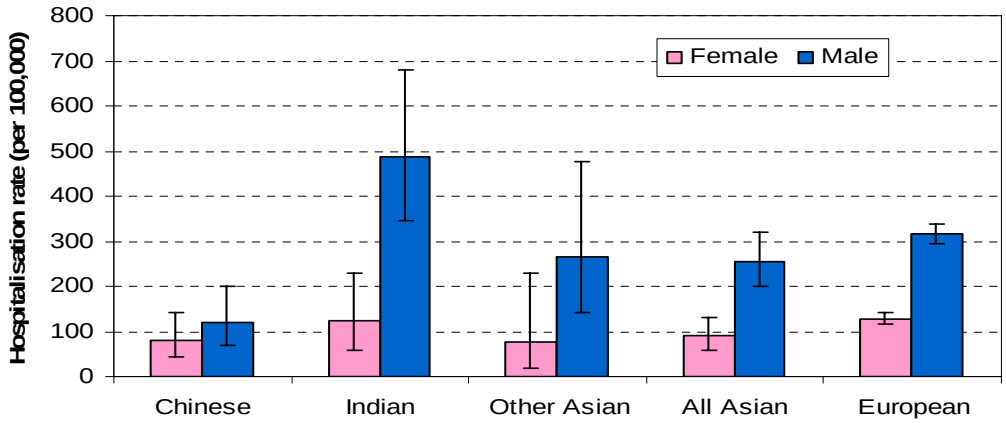
[2] CMDHB estimate applying Auckland Heart and Health study findings to the CMDHB population

Figure 6.2.6: Age-standardised hospitalisation rates (per 100,000) for stroke, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response



Chronic obstructive respiratory disease (CORD)

Figure 6.2.7: Age-standardised hospitalisation rates (per 100,000) for CORD, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response



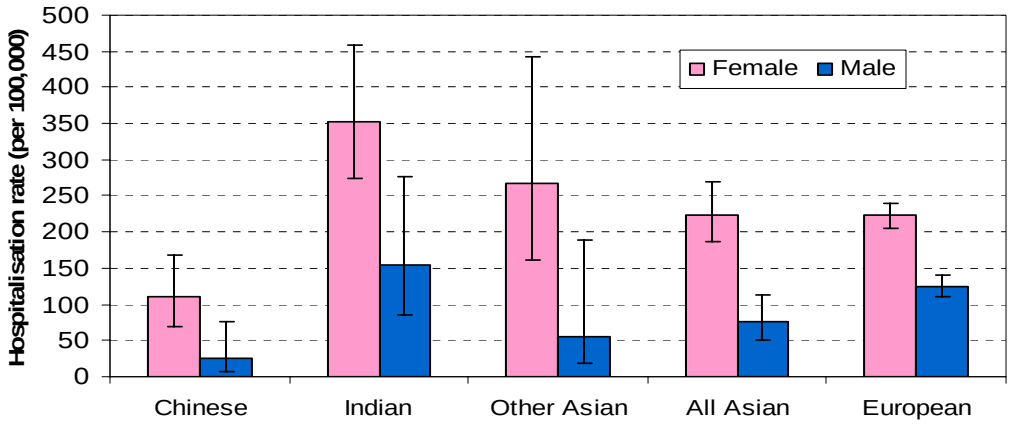
In CM, no statistically significant difference were seen in the PAH rates for CORD between 'All Asians' and Europeans. The PAH rates for CORD were significantly higher in the Indian males (490 per 100,000) and lower in Chinese males (120), compared to European male population (320).

The European and the Indian population showed significant gender difference with much higher rates in males than females, presumably reflecting past smoking rates in those populations. See *Figure 6.2.7.*

Kidney/urinary infection

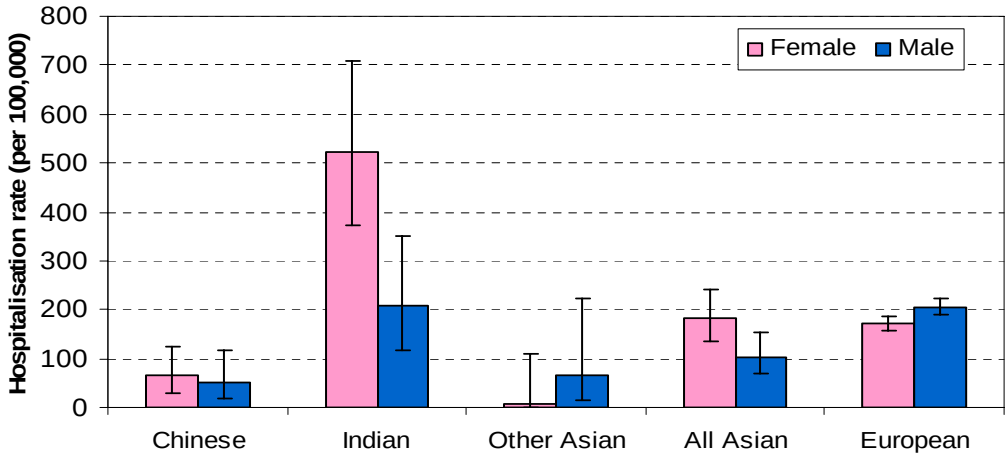
No statistically significant difference were shown in the PAH rates for kidney/urinary infections between 'All Asians' and the Europeans. However, both male and female rates PAH rates for kidney/urinary infections were significantly lower in the Chinese population compared to the Indian and European population. *See Figure 6.2.8*.

Figure 6.2.8: Age-standardised hospitalisation rates (per 100,000) for kidney/urinary infection, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response



Congestive heart failure (CHF)

Figure 6.2.9: Age-standardised hospitalisation rates (per 100,000) for congestive heart failure, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response

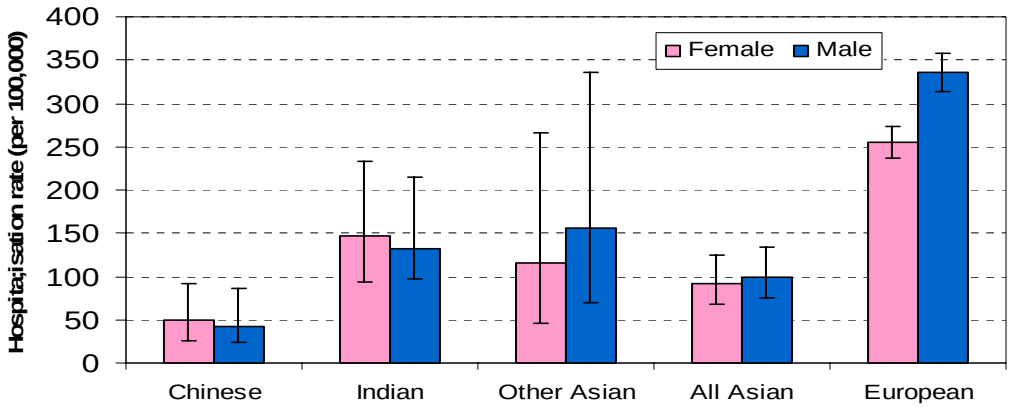


In CM the PAH rates for CHF in 'All Asian' male population were significantly higher compared to European male population. The PAH rate for CHF was highest in Indian females, significantly higher than the rates in all Asian ethnic groups and Europeans (both sexes). The Chinese and the 'Other Asian' numbers were very low. See *Figure 6.2.9*.

Cellulitis

In CM the PAH rates for cellulitis were significantly lower (approximately three times) in 'All Asian' male and female population when compared to the European population. Among the Asian ethnic groups, the rates (both male and female) were significantly lower in the Chinese population when compared to the Indian population. See *Figure 6.2.10.*

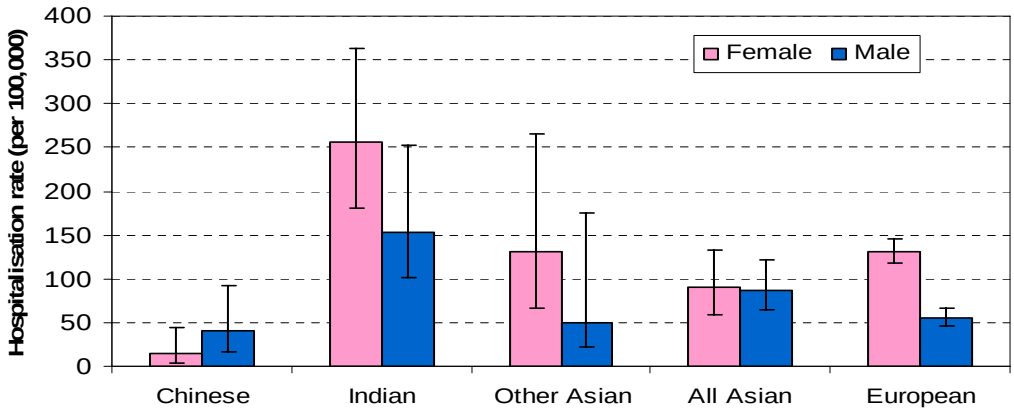
Figure 6.2.10: Age-standardised hospitalisation rates (per 100,000) for cellulitis, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response



Asthma

In CM, the PAH rates for asthma in 'All Asian' males were significantly higher than the European males. The Indian male and females had significantly higher rates than the Chinese and European population. See *Figure 6.2.11*.

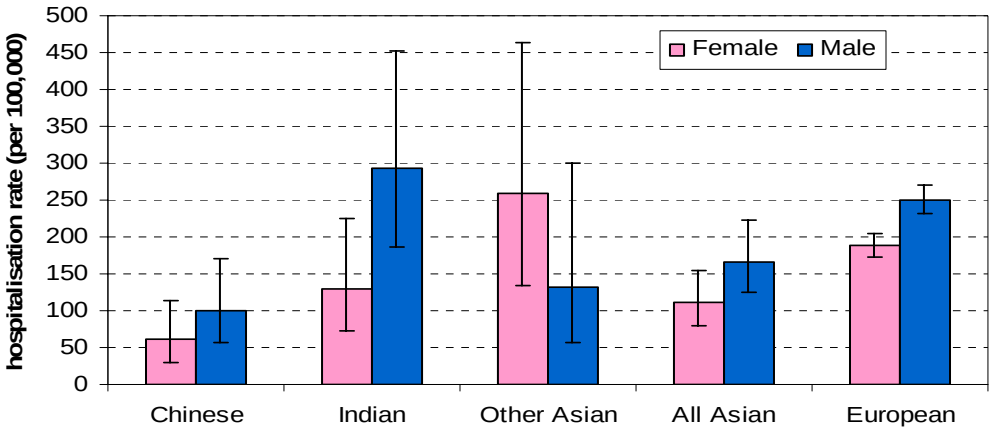
Figure 6.2.11: Age-standardised hospitalisation rates (per 100,000) for asthma, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response



Respiratory infection: pneumonia

In CM, the PAH rates for pneumonia were significantly higher in the male and female European population when compared to the 'All Asian' population. The Indian males had significantly higher rates when compared to Chinese males. Significant gender difference, higher rates in males than females was seen in European population but not among all the Asian ethnic groups. See *Figure 6.2.12*.

Figure 6.2.12: Age-standardised potentially avoidable hospitalisation rates (per 100,000) for pneumonia, 15-74 year olds, by gender and ethnicity, for CM, 2004-2006, total response



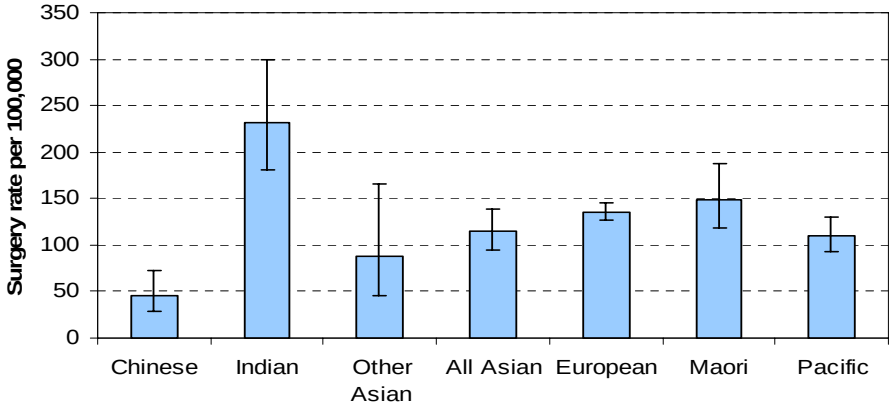
6.3 Adult surgical indicators

In this section, a range of relatively high-cost, high-volume surgical procedures were selected for use as indicators. The surgical intervention rates over three years (2004-06) in CM were compared with national rates by ethnicity (total response).

Angioplasty

Angioplasty (or more properly percutaneous coronary intervention), is a therapeutic procedure, usually non-invasive, to treat the narrowed coronary arteries of the heart found in coronary heart disease. In CM no statistically significant difference was shown in intervention rates for angioplasty between 'All Asian' (114 per 100,000) and European (135) population. However, the CM Indians (230) had significantly higher intervention rates for angioplasty than all Asian ethnic groups, Europeans, Pacific and Maaori population (*Figure 6.3.1*). The angioplasty rate ratio of Indian to European was in proportion to their IHD hospitalisation rates, and higher than the mortality differential, probably indicating good access to services.

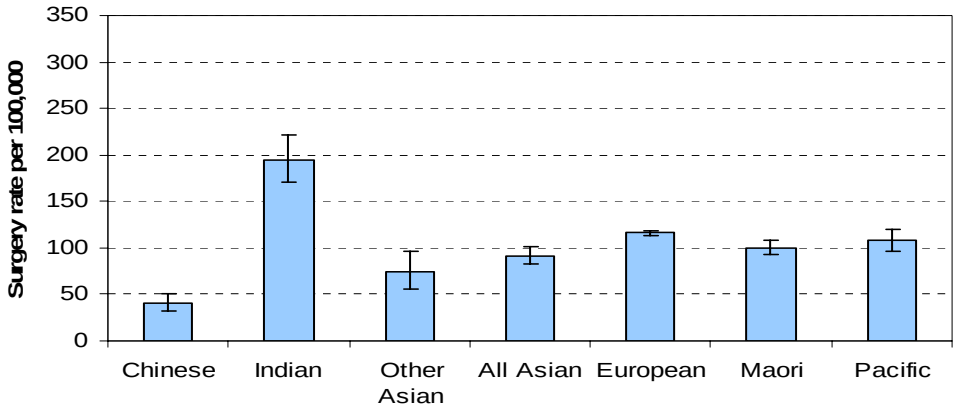
Figure 6.3.1: Age-standardised surgical intervention rate (per 100,000) in CM for angioplasty, 15+ years olds, by ethnicity, 2004-2006, total response



The CM Chinese (45 per 100,000) had significantly lower intervention rates than the Indians, Europeans, Pacific and Maaori population. Again this appears to in proportion to their mortality and IHD hospitalisation rates. The intervention rates for angioplasty in CM Indians were approximately five times that of the Chinese population.

In 'All NZ' the picture was similar to that seen in CM, as seen in *Figure 6.3.2.*

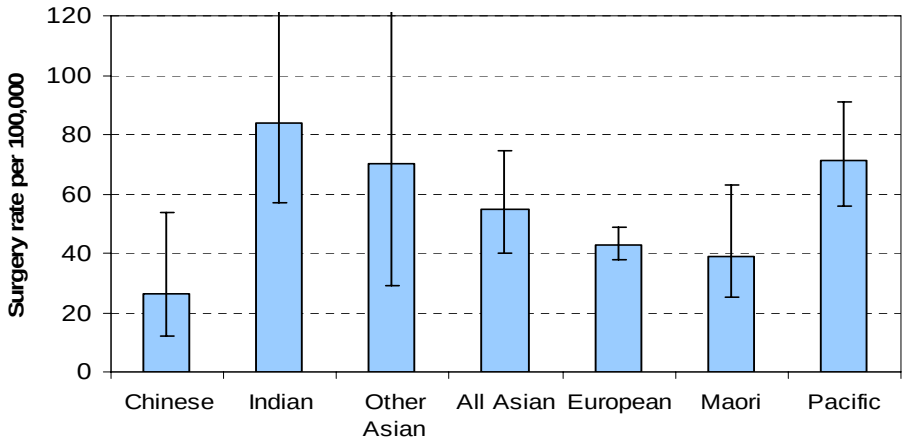
Figure 6.3.2: Age-standardised surgical intervention rate (per 100,000) in 'All NZ' for angioplasty, 15+ years olds, by ethnicity, 2004-2006, total response



Coronary artery bypass graft (CABG)

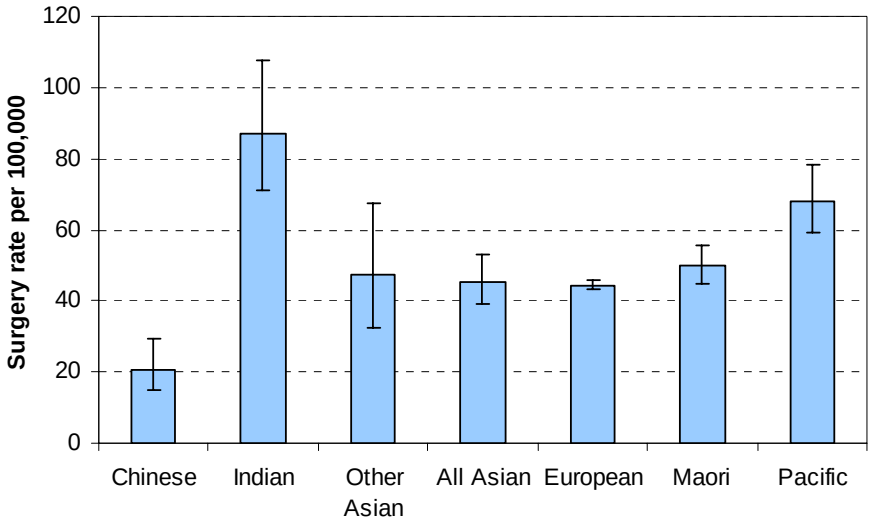
In CABG surgery arteries or veins from elsewhere in the patient's body are grafted to the coronary arteries to bypass atherosclerotic narrowing. For CM patients this surgery is usually performed at Auckland City Hospital. For CM residents no statistically significant differences were shown in intervention rates for CABG between 'All Asians' and Europeans. Indians (84 per 100,000) had significantly higher CABG when compared to the Europeans (43) and Chinese (26) populations, in proportion to the angioplasty rates noted above. The CABG rates for Indian males were highest (132). See *Figure 6.3.3*.

Figure 6.3.3: Age-standardised surgical intervention rates (per 100,000) for coronary artery bypass grafts, 15+ year olds, by ethnicity, for CM, 2004-2006, total response



The CABG intervention rates nationally were similar to CM. No significant differences were shown between 'All Asians' and Europeans but the rates were significantly higher for the Indians and lower for the Chinese people (*Figure 6.3.4).*

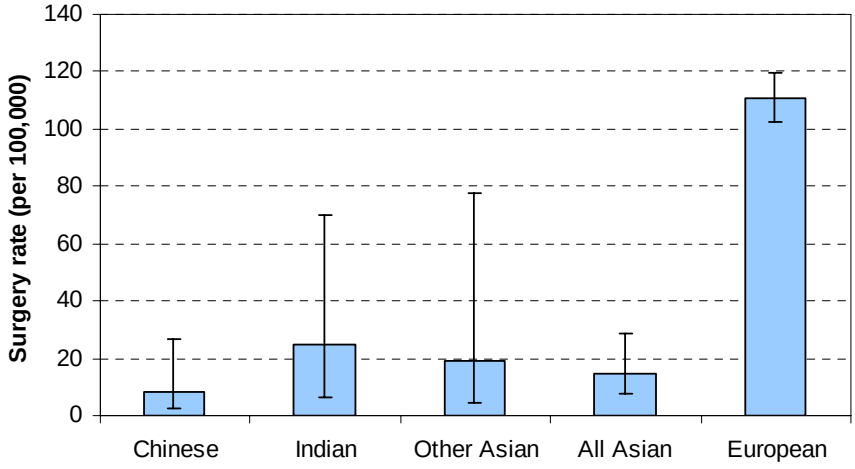
Figure 6.3.4: Age-standardised surgical intervention rates (per 100,000) for coronary artery bypass grafts, 15+ year olds, by ethnicity, for 'All NZ', 2004-2006, total response



Total hip joint replacement

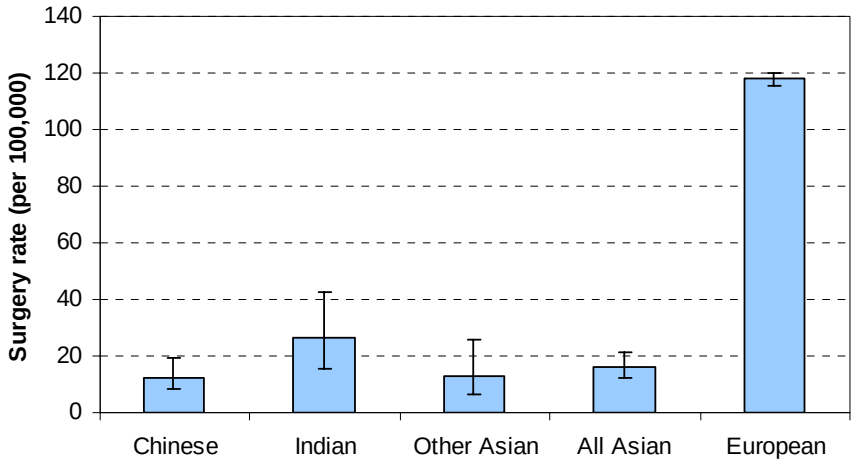
Hip joint replacement orthopaedic surgery is generally conducted to relieve arthritis restrictions and pain or to fix severe physical joint damage as part of hip fracture treatment. In CM the intervention rate for total hip replacement was significantly higher in the European population (110 per 100,000) when compared to the 'All Asian' population (15). See *Figure 6.3.5*. This is in contrast to knee replacement (below) where there is a smaller excess – maybe 50% higher.

Figure 6.3.5: Age-standardised surgical intervention rates (per 100,000) for total hip joint replacement, 15+ year olds, by ethnicity, for CM, 2004-2006, total response



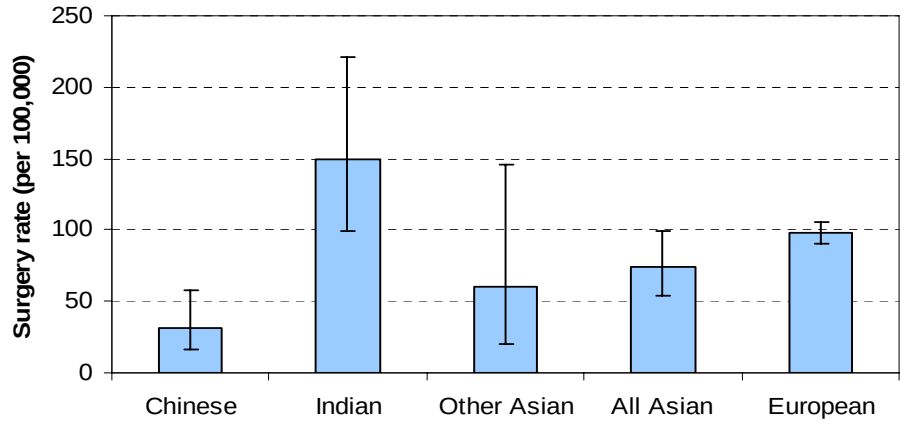
One could speculate whether the height difference in the current older generation of Europeans and Asians create a mechanical increased risk of hip fracture[3] [4]. It does not seem likely that osteoarthritis prevalence differences would match this 10-fold differential as that would show in knee replacement rates. No statistically significant differences were shown for total hip replacement between any of the level 2 Asian ethnic groups for CM, and the all New Zealand rates follow the same pattern. See *Figure 6.3.6*.

Figure 6.3.6: Age-standardised surgical intervention rates (per 100,000) for total hip joint replacement, 15+ year olds, by ethnicity, for 'All NZ', 2004-2006, total response



Total knee joint replacement

Figure 6.3.7: Age-standardised surgical intervention rates (per 100,000) for total knee joint replacement, 15+ year olds, by ethnicity, for CM, 2004-2006, total response



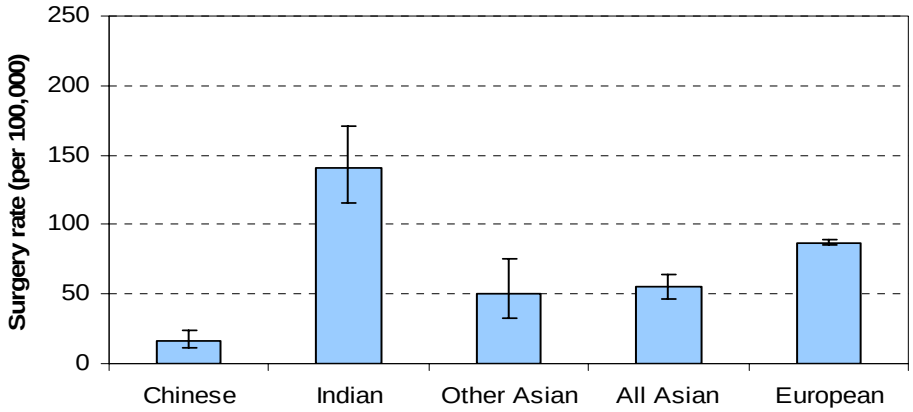
Like hip replacement, knee joint replacement is a common operation done to relieve the pain and disability from degenerative arthritis, most commonly osteoarthritis. In

[3] Lau EMC. The epidemiology of hip fracture in Asia: An update. Osteporosis Int 1996; 6: 19-23.
[4] Nakamura T. et al. Do variations in hip geometry explain differences in hip fracture risk between Japanese and white Americans? J Bone Min Res 1994; 9: 1071-6.

CM no statistically significant differences were shown in intervention rates for total knee replacement between 'All Asians' and the Europeans. See *Figure 6.3.7*. Among the Asians, Indians (150 per 100,000) had significantly higher rates than the Chinese (30) population, and are likely to have a higher rate than Europeans.

The intervention rates for total knee replacement were similar for 'All NZ' and CM. No statistically significant differences were shown between the 'All Asian' and the European population. The Indian rates (140 per 100,000) were significantly higher than the Chinese (16) and European (87) population. See *Figure 6.3.8*.

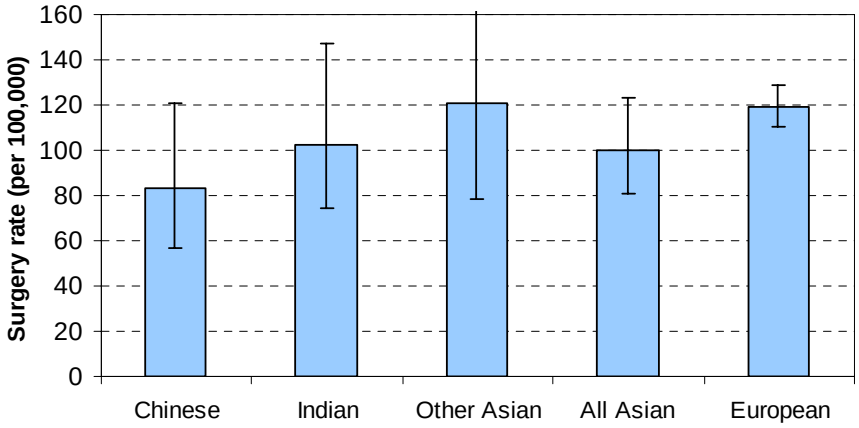
Figure 6.3.8: Age-standardised surgical intervention rates (per 100,000) for total knee joint replacement, 15+ year olds, by ethnicity, for 'All NZ', 2004-2006, total response



Cholecystectomy

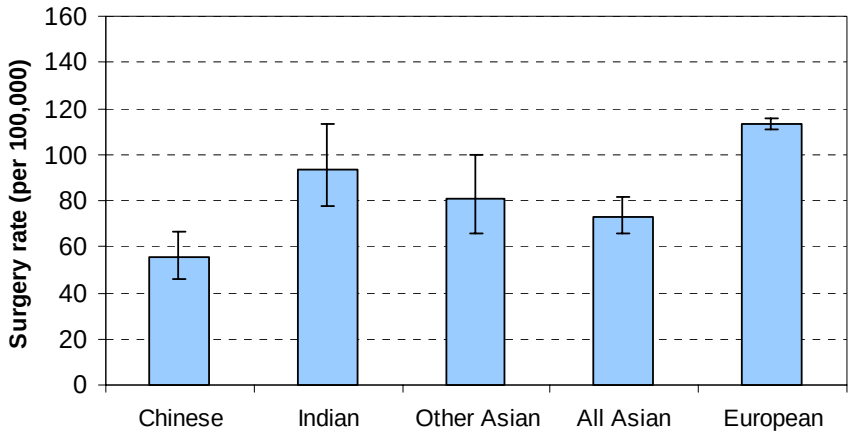
Cholecystectomy is the surgical removal of the gallbladder, usually for the treatment of symptomatic gallstones. It is mainly carried out laparoscopically. In CM no statistically significant differences were shown in intervention rates for cholecystectomy between any of the level 2 Asian ethnic groups, or between the 'All Asian' and the European population. *See Figure 6.3.9*.

Figure 6.3.9: Age-standardised surgical intervention rates (per 100,000) for cholecystectomy, 15+ year olds, by ethnicity, for CM, 2004-2006, total response



The intervention rates for cholecystectomy in 'All NZ' followed a different pattern compared to CM. 'All Asians' had significantly lower rates (73 per 100,000) than Europeans (113) population. Among the Asians, the Indians had significantly higher rates (93) than the Chinese (55) population. See *Figure 6.3.10*.

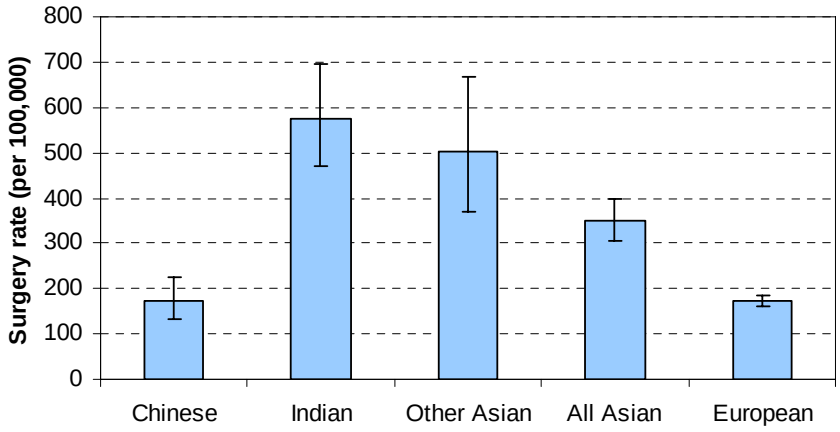
Figure 6.3.10: Age-standardised surgical intervention rates (per 100,000) for cholecystectomy, 15+ year olds, by ethnicity, for 'All NZ', 2004-2006, total response



Cataract extraction

Removal of cataracts is the most common ophthalmologic procedure. Cataracts are opacities that develops in the crystalline lens of the eye or in its envelope, and are the most common cause of blindness across the world. In CM the intervention rates for cataract extraction were significantly higher in 'All Asian' (350 per 100,000) than the European (170) population. The Indian rates were significantly higher (575 per 100,000) than the Chinese (175 per 100,000) population. See Figure 6.3.11.

Figure 6.3.11: Age-standardised surgical intervention rates (per 100,000) for cataract extraction, 15+ year olds, by ethnicity, for CM, 2004-2006, total response

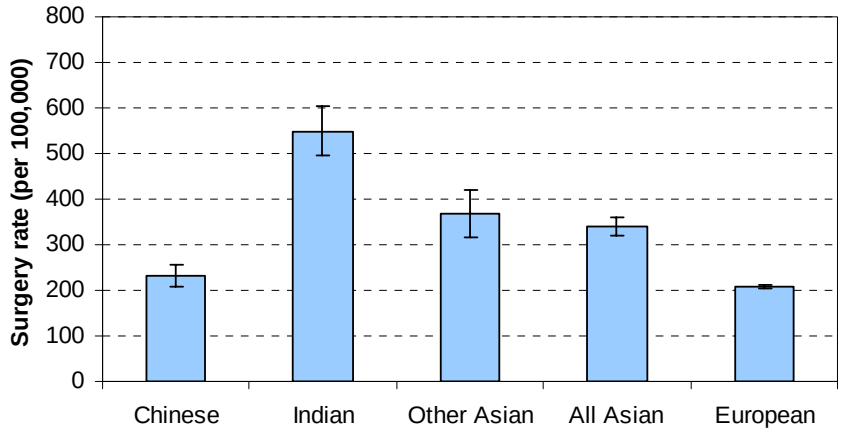


The intervention rates for cataract extraction nationally followed the same pattern as in CM. The rates were significantly higher in 'All Asian' (340 per 100,000) compared

to European (207) population.. Amongst the Asians, the Indians had significantly higher rates (550) than the Chinese (230). See *Figure 6.3.12.*

The intervention rates for cataract extraction were highest in the Pacific population followed by the Indians, both in CM and 'All NZ', probably reflecting the high rates of diabetes and its complications in these populations.

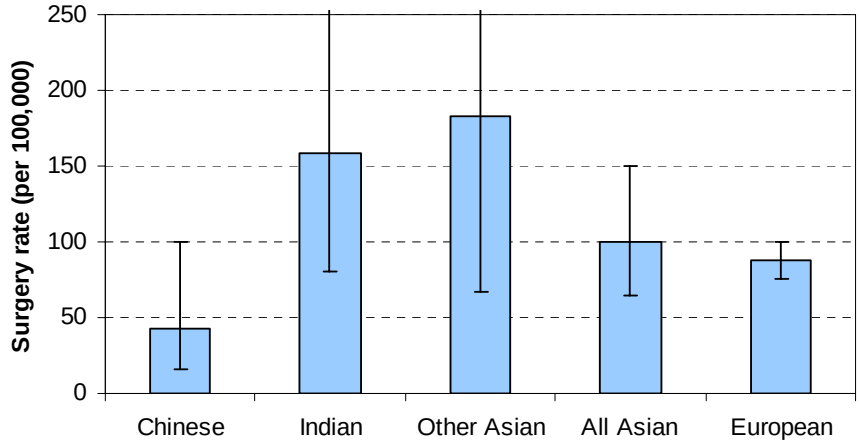
Figure 6.3.12: Age-standardised surgical intervention rates (per 100,000) for cataract extraction, 15+ year olds, by ethnicity, for 'All NZ', 2004-2006, total response



Prostatectomy

A prostatectomy is the surgical removal of all or part of the prostate gland, usually due to abnormalities of the prostate such as a tumour or other enlargement. The procedure can be either open or more usually transurethral. In CM no statistically significant differences were shown in intervention rates for prostatectomy between any of the level 2 Asian ethnic groups, or between the 'All Asian' and the European population. See *Figure 6.3.13.*

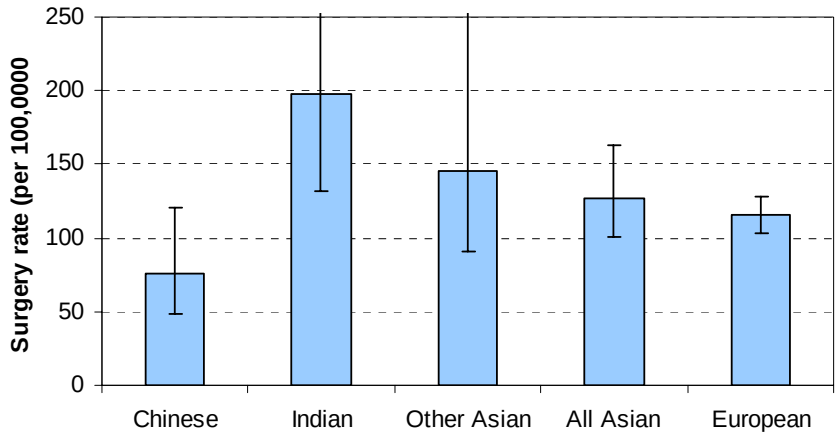
Figure 6.3.13: Age-standardised surgical intervention rates (per 100,000) for prostatectomy, 15+ year old males, by ethnicity, for CM, 2004-2006, total response



Hysterectomy

In CM, no statistically significant differences were shown in intervention rates for hysterectomy between the 'All Asian' and the European population. Indian women had a higher rate of surgery than did Chinese or European women. See *Figure 6.3.14*. All New Zealand showed a similar pattern (not shown).

Figure 6.3.14: Age-standardised surgical intervention rates (per 100,000) for hysterectomy, 15+ year old females, by ethnicity, for CM, 2004-2006, total response



6.4 Chronic Care Management (CCM)

Since 2000 the CCM programme in CM has been a leader in the area of managing people with chronic disease. It is designed to support patients with chronic conditions in the community where they can be followed up on a regular basis throughout each year. The programme targets the high needs population. Approximately, 70% of people enrolled in CCM were Maaori and Pacific. The programme currently includes five modules: diabetes, cardiovascular disease (CVD), congestive cardiac failure, respiratory disease (COPD) and depression.

This section presents data obtained from the CM CCM database for diabetes and CVD programmes. The CCM diabetes programme includes all the CM diabetes patients enrolled into the programme since 2000 and the one year CVD programme includes the patients enrolled for the last year.

CCM diabetes programme

The percentages of known diabetes enrolled with the programme were high for Pacific and Maaori populations. Although the percentage of Asians with known diabetes (21%) enrolled with the programme was high compared to European population, they were significantly lower than the Pacific (46%) and Maaori population (49%). Amongst the Asians at level 2 ethnicity, the percentage of known diabetes enrolled were Indians (25%), Chinese (6.8%) and the 'Other Asian' (22.5%) respectively. The numbers for the Chinese and 'Other Asian' group were very small. As the main criterion for enrolment into the programme is an HBA1C over 8 the relative ethnicity enrolment percentages could well reflect relative diabetes

severity/control in each group. *Table 6.4.1* shows the actual numbers enrolled and *Table 6.4.2* and *Figure 6.4.1* show the percentage of known diabetes enrolled in the CCM Diabetes Programme.

Table 6.4.1: Number of people on CCM diabetes programme in CM, by gender and ethnicity (2006), total response

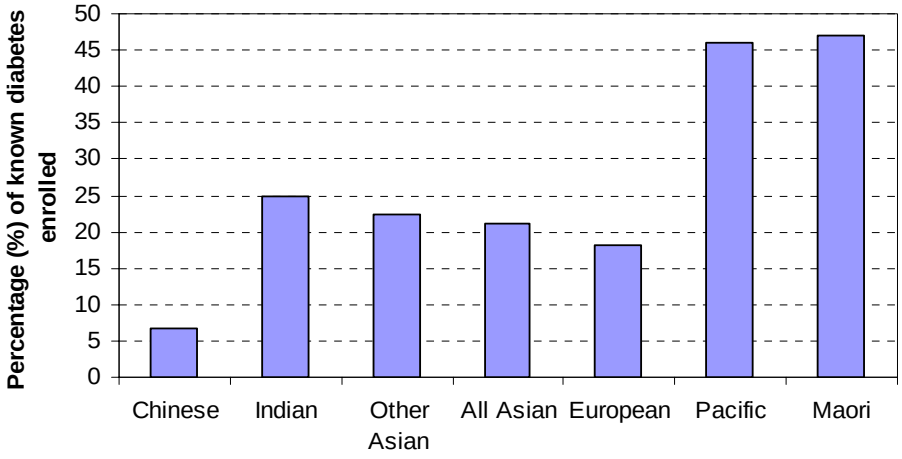
Gender	Chinese	Indian	Other Asian	All Asian	European	Pacific	Maaori
Female	25	257	59	341	744	1,863	867
Male	21	320	76	417	878	1,595	778
Total	46	577	135	758	1,622	3,458	1645

Table 6.4.2: Percentage of people with known diabetes enrolled in the CCM diabetes programme in CM, by ethnicity (2006), total response

	Chinese	Indian	Other Asian	All Asian	European	Pacific	Maaori
Estimated 'Known Diabetes'	680	2310	600	3590	8970	7530	3500
Enrolled	46	577	135	758	1622	3458	1645
% enrolled	6.8	25.0	22.5	21.1	18.1	45.9	47.0

The data from CCM diabetes programme may not reflect accurately the status of diabetes in the community as there can be several factors/bases which affect the selection of the patients into the programme, such as patient preference, GP engagement, etc.

Figure 6.4.1: Percentage of people with known diabetes enrolled in the CCM diabetes programme in CM, by ethnicity (2006), total response



CCM Cardiovascular Disease (CVD) Programme

The number of 'All Asians' enrolled in the CVD programme were proportionately less than the European population. Amongst the Asians, more number of Indians were enrolled than other Asian ethnic groups. However, these numbers were proportionately lower compared to Europeans, Maaori and Pacific populations – less

than a half on a population basis, and considering the high burden of cardiovascular disease in the Indian population possibly a quarter or what might have been expected. See *Table 6.4.3.*

Table 6.4.3: Number of people on CCM cardiovascular disease programme in CM, by gender and ethnicity (2006), total response

Gender	Chinese	Indian	Other Asian	All Asian	European	Pacific	Maaori
Female	3	10	7	20	161	41	100
Male	5	33	7	45	287	78	109
Total	8	43	14	65	448	119	209

Percentage of people with myocardial infarction (MI) enrolled in CCM

People could be enrolled on the CCM CVD programme for a year, with many being enrolled following a specific cardiac event. *Table 6.4.4* compares the percentage of people enrolled with the CVD programme with the number of people hospitalised with MI in the last year. Having a heart attack in the last year is a fundamental marker of cardiovascular disease and should be very clear motivation for both the patient and their physician to be involved in the CVD programme.

The percentage of 'All Asians' enrolled were lower than the Europeans. Although the Indian population had high CVD risk the percentage enrolled in CVD CCM was lower than the European rate. The percentage of Maaori enrolled was greater than 100%, probably because the CCM programme has been targeting the Maaori population. Many Maaori people were enrolled in both CCM diabetes and CVD programme, as they had high CVD risk but had not necessarily had an MI in the last year.

Table 6.4.4: Percentage of people with myocardial infarction hospitalisation enrolled in the CCM CVD programme in CM, by ethnicity (2006), total response

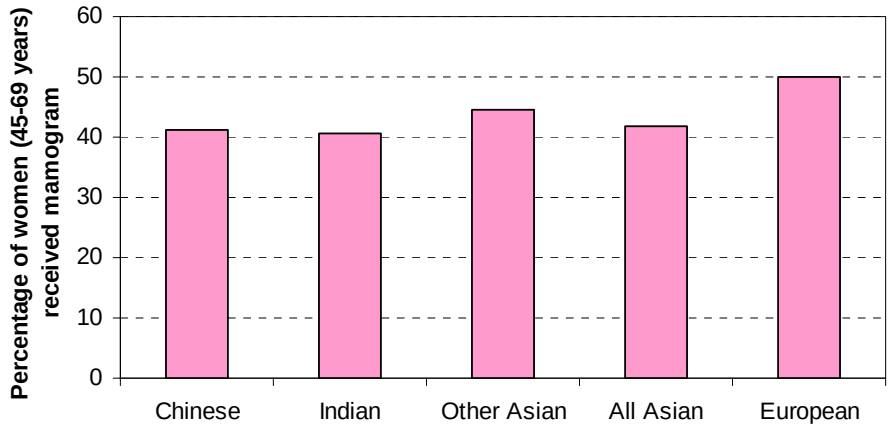
	Chinese	Indian	Other Asian	All Asian	European	Pacific	Maaori
MI hosp annually	15	93	14	121	692	177	128
Enrolled	8	43	14	65	448	119	209
% enrolled	54.5	46.2	97.7	53.7	64.7	67.2	163.7

6.5 Breast screening

Screening for breast cancer via mammography is one of the few preventive interventions proven to be effective in reducing female breast cancer mortality. In CM the percentage of women 45-69 years age receiving mammogram in the last two years was lower for 'All Asians'(42%) compared to Europeans (50%). No significant differences were shown amongst the Asians at level 2 ethnicity. See *Figure 6.5.1.*

According to the NZHS 2002/03 the percentage of self reported mammogram in the last 3 years for women aged 50-64 years was significantly lower for Asians compared to Europeans (31). Although the CM data is more limited, it is similar and comparable to the national data.

Figure 6.5.1: Rate (per 100) of uptake of breast screening (45-69 years) in previous two years in CM, by ethnicity, Nov 2005 -Oct 2007, total response



6.6 Cervical screening

No data for cervical screening was available for CM Asians. According to the NZHS 2002/03, the percentage of cervical smears in women 20-69 years (who had not had a hysterectomy) was significantly higher for European women (approximately 75%) when compared to Asians (approximately 40%) (31). No significant differences were shown amongst the Asians at level 2 ethnicity (5).

6.7 Primary health care access

This section presents the PHO enrolment by age and ethnicity; and data on the frequency of use of primary care, obtained from the LBD survey.

Primary Health Organisations (PHOs) have been the main vehicles through which the Primary Health Care Strategy (32) has been implemented. PHOs are the local structures for delivering and co-coordinating primary health care services. Enrolment with a PHO means that the person enrolling intends to use a PHO provider (general practice or health service) as their normal provider of ongoing first level services.

<u>Primary Health Organisation (PHO) enrolment</u>

Figure 6.7.1 shows the population enrolled in the six PHOs of CMDHB by ethnicity for the period January to December 2006. The percentage enrolled was higher for Europeans when compared to 'All Asians'. Amongst the Asians at level 2 ethnicity, the enrolment for Chinese people was significantly lower than the Indians, 'Other Asians' and European people.

Figure 6.7.1: Age-standardised percentage of people enrolled with a PHO in CM, by age and ethnicity as at December 2006, total response

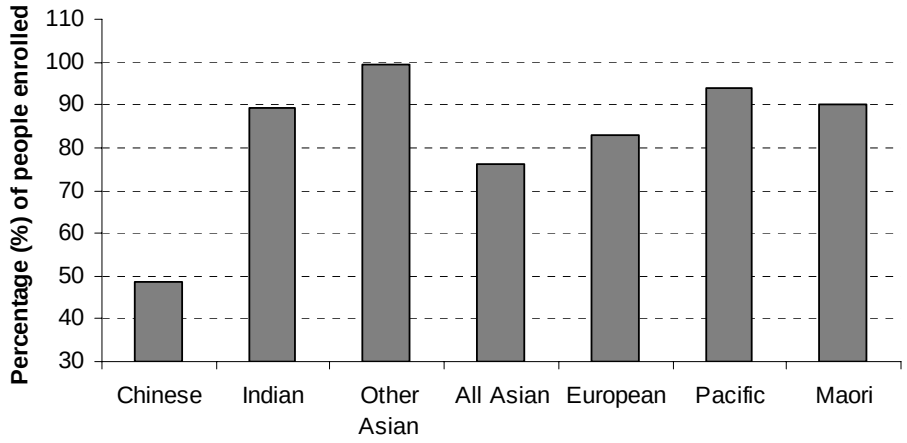


Table 6.7.1: Age-standardised percentage of people enrolled with a PHO in CM, by age and ethnicity as at December 2006, total response

	0-4	5-14	15-24	25-44	45-64	65+	Total
Chinese	47	49	42	49	53	56	49
Indian	88	87	78	90	93	125	89
Other Asian	91	98	80	97	114	181	99
All Asian	76	77	65	77	80	94	76
European	66	74	83	83	88	93	83
Pacific	85	91	87	102	97	109	94
Maaori	81	87	90	95	92	90	90

Table 6.7.1 shows the percentage of enrolled population by age bands and ethnicity. Chinese people across all age bands were significantly less likely to utilise primary care services, which was similar to that shown in the Asian Health Chart Book (5).

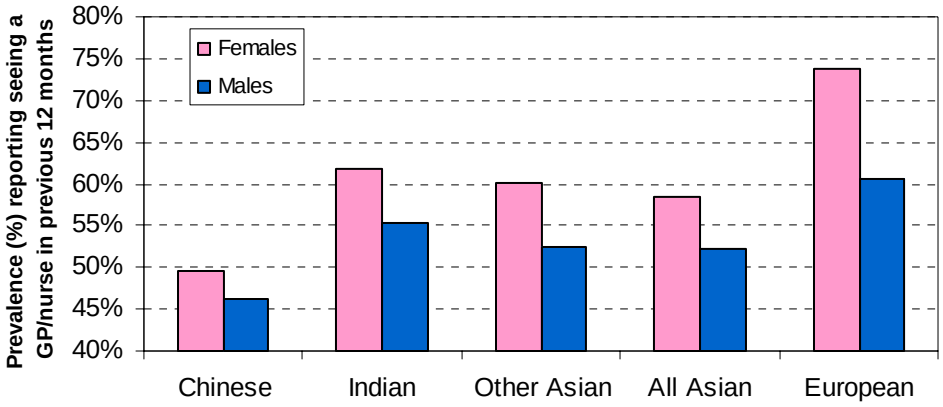
The percentage of people enrolled with the PHO includes the population domiciled in CM and enrolled with CMDHB PHOs. Omitted were those that were enrolled in PHOs from other DHB regions, although living in CM region. There is a possibility that Chinese people use either complementary or alternative providers; or utilise primary care services from services in other DHBs.

Use of primary care services

The percentage of people who had seen their general practitioner (GP) or nurse was identified from the LBD survey 2007 (*Figure 6.7.2*). The Chinese were less likely to see their GP or nurse in the last 12 months when compared to Indians and 'Other Asians'. 'All Asians' had a lower prevalence of reporting seeing a GP or nurse in the

previous 12 months. Females were more likely to report seeing their GP or nurse among Asians and Europeans.

Figure 6.7.2: Age-standardised prevalence (% of adult population 16+ years of age) reporting seeing a general practitioner or nurse in previous 12 months in CM, by gender and ethnicity, (LBD Survey 2007), total response



6.8 Summary – health service utilisation

Adult potentially avoidable hospitalisation (PAH) – all cause

- In CM and 'All NZ', adult PAH rates from all causes were significantly lower in 'All Asians' compared to Europeans in both sexes
- In CM and 'All NZ', among Asians, Chinese had significantly lower adult PAH rates from all causes compared to Indians and 'Other Asians'
- In CM and 'All NZ', males had significantly higher adult PAH rates from all causes than females among Europeans and Asians

Adult potentially avoidable hospitalisation – top 10 causes

- The top 10 causes of adult PAH were angina and chest pain, myocardial infarction, diabetes, stroke, CORD, kidney infections, congestive heart failure, pneumonia, asthma and cellulitis in 'All Asians'
- Most of these top 10 causes were similar among all Asian ethnic groups and the Europeans. Adult PAH rates for all the top 10 causes were significantly lower in Chinese people compared to Indians and Europeans
- Angina and chest pain were the leading cause of adult PAH among Asian ethnic groups and Europeans, highest for Indian people (higher than Maaori and Pacific people) and lowest for the Chinese people
- Diabetes was among the top five causes of adult PAH among the Indians and 'Other Asians' but not so for Chinese and the Europeans. The adult PAH rates for diabetes were significantly higher in the Indians and lower in the Chinese
- Prevalence of diabetes was high in Indians, lower than the Pacific people but higher than all other ethnic groups
- Asthma was not among the top 10 causes for PAH among the Chinese, 'Other Asian' and the Europeans
- The adult PAH for stroke is significantly higher in 'All Asians' compared to the Europeans. No statistically significant difference was shown among the Asian ethnic groups
- The adult PAH rates for CORD, CHF was significantly higher in Indian people and lower in the Chinese people when compared to the Europeans
- In contrast, the adult PAH rates for cellulitis and pneumonia were significantly lower in the Asians compared to the Europeans

Adult surgical indicators

- The intervention rates for angioplasty, CABG, and total knee replacement were significantly higher for Indians and lower for Chinese, compared to the Europeans, both in CM and 'All NZ'
- The intervention rates for cataract were significantly higher in 'All Asians' compared to the Europeans. At level 2 ethnicity, the intervention rates were significantly higher among the Indian people and lower in the Chinese people in CM and 'All NZ'
- The intervention rates for total hip replacement were significantly lower in all the Asian ethnic groups, compared to the Europeans, in CM and 'All NZ'
- No statistically significant difference were shown in the intervention rates for cholecystectomy, prostatectomy and hysterectomy between the 'All Asian' and the Europeans and among the Asian ethnic sub groups in CM and 'All NZ'

Chronic Care Management (CCM)

- The percentage of people with known diabetes enrolled with the CCM diabetes module were similar for Asians and Europeans (18-25%), but approximately half that of Maaori and Pacific people (46-49%)
- The proportion of Indian people enrolled in the CCM CVD programme were relatively low given the high burden of disease in this population
- The percentage of Asian people with MI in the last 12 months enrolled with the CCM CVD programme was lower than the Europeans

Breast screening & cervical screening

- The uptake of mammography was significantly lower in Asian women compared to European. No significant difference was present among the Asian ethnic groups
- According to the NZHS the rates of cervical screening were significantly higher for European women than Asian women. No statistically significant difference was shown among the Asian ethnic groups

Primary health care access

- 'All Asians', particularly the Chinese had a lower prevalence of seeing a GP or nurse in the previous 12 months compared to the Europeans.
- The percentage of Asian people enrolled with the PHOs was lower than the Europeans, with the enrolment of Chinese people across all age bands particularly lower

7 Risk and protective factors

This section presents results on risk and protective factors, obtained from the LBD survey 2007. Data on smoking prevalence was also obtained from Census 2006.

Results of physiological risk factors, such as hypercholesterolemia, hypertension, overweight and obesity; obtained from the NZHS 2002/03 were summarised from the Asian Health Chart Book.

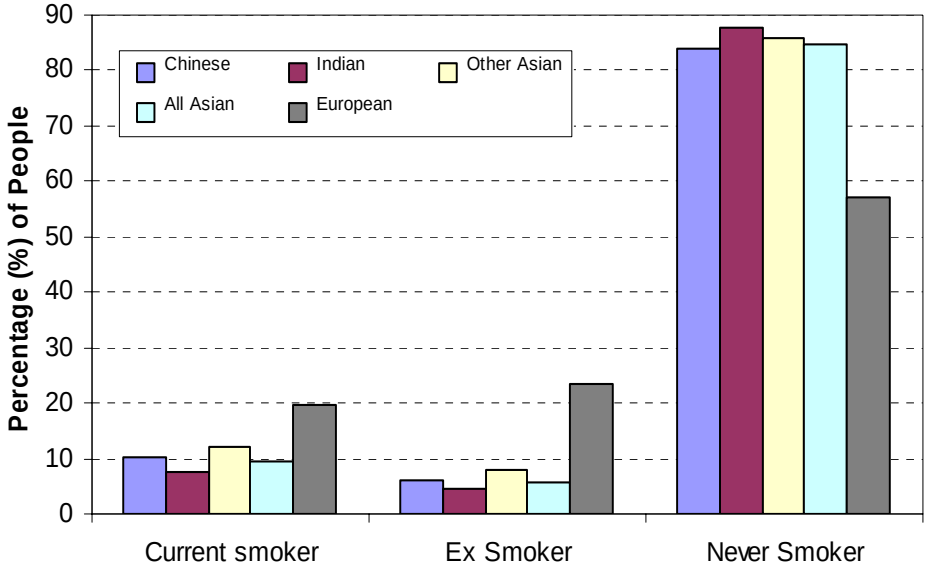
7.1 Smoking

The Census 2006 is the best source of data on smoking prevalence and identified regular smokers, ex-smokers and never smokers. The definition of a regular smoker used for the census is someone who smokes cigarettes regularly, ie one or more cigarettes a day. An ex-smoker is defined as someone who used to smoke regularly, but no longer does. The definition for never smoked regularly is people who have never been regular smokers. Smoking of pipes, cigars and cigarillos, other smoked substances such as marijuana and tobacco used for chewing are not included in these definitions (33). In contrast the LBD survey identified only current smokers with a single question.

Current smokers – Census 2006

The smoking prevalence in all Asian ethnic groups was significantly lower than European. The percentage of ex-smokers was significantly lower and never smokers significantly higher among the Asian population than the European population. See *Figure 7.1.1.*

Figure 7.1.1*: Age-standardised prevalence (% of adult population 15+ years of age) of smoking status in CM, by ethnicity, Census 2006, total response*



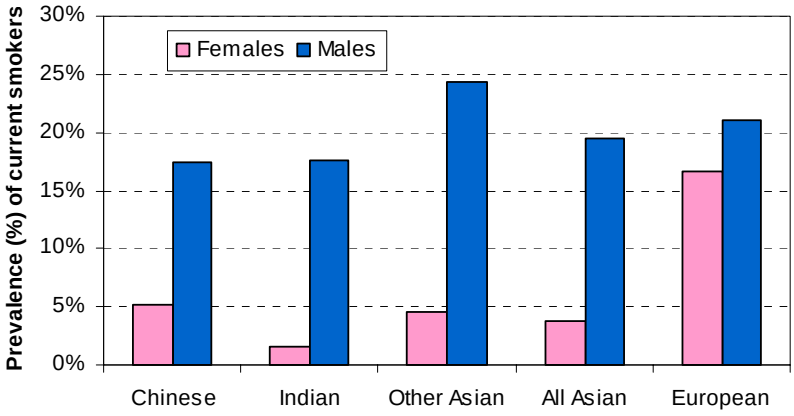
Current smokers – LBD Survey

Table 7.1.1 and *Figure 7.1.2* shows the age-standardised prevalence of smoking by gender and ethnicity from the LBD survey. 'All Asian' males and females were significantly less likely to be smokers compared to Europeans. No statistically significant difference was seen in the prevalence of smoking among the Asian ethnic groups. The smoking prevalence was significantly low among women in all Asian ethnic groups, particularly among Indian women.

Table 7.1.1*: Age-standardised prevalence (% of adult population 16+ years of age) of current smoking in CM, by gender and ethnicity, LBD Survey 2007, total response*

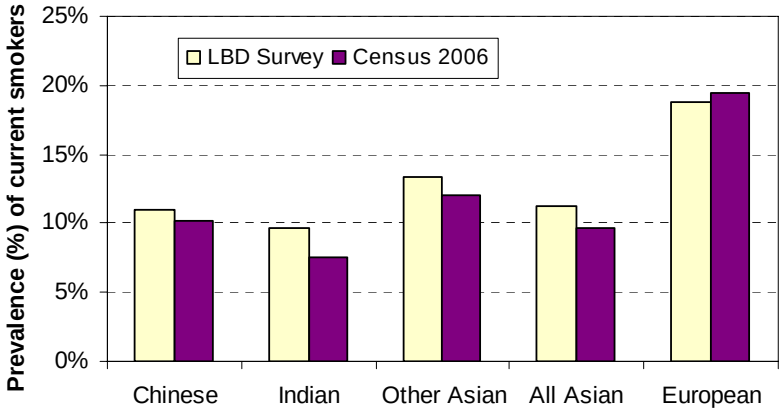
	Chinese	Indian	Other Asian	All Asian	European
Female	5.2%	1.5%	4.5%	3.8%	16.7%
Male	17.5%	17.6%	24.3%	19.4%	21.1%
Total	11.0%	9.6%	13.3%	11.3%	18.8%

Figure 7.1.2: Age-standardised prevalence (% of adult population 16+) of current smoking in CM, LBD Survey 2007, total response



The LBD survey showed slightly higher prevalence of smoking for the Asian population and lower prevalence for the European population but the findings were comparable with smoking prevalence from Census. See *Figure 7.1.3*.

Figure 7.1.3: Age-standardised prevalence (% of adult population) LBD Survey 2007 and Census 2006, smoking status in CM, by ethnicity, total response



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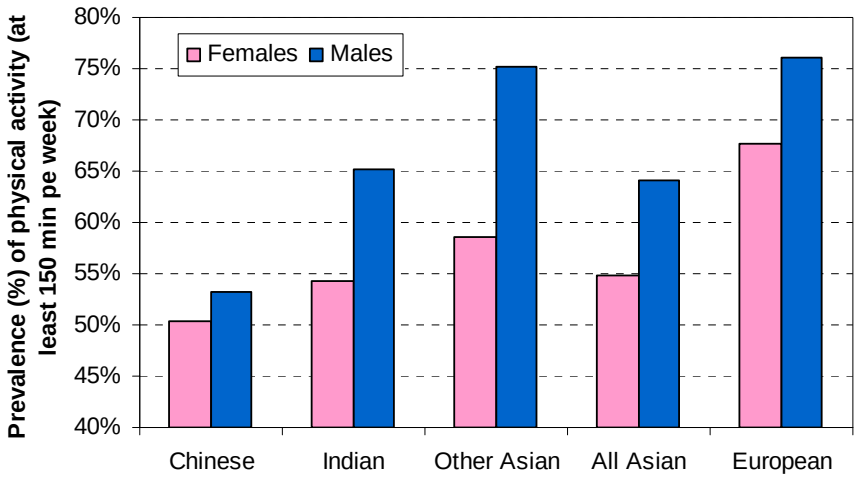
7.2 Physical activity

The definition 'physically active' refers to those who reported doing at least 150 minutes physical activity in the last week. It captures both moderate and vigorous levels activity, as well as recreational and work related activity. For health benefit, 30 minutes of physical activity of moderate intensity on most, if not all, days of the week is the current recommendation (34), known as regularly physically active.

Figure 7.2.1 shows participation in 150 minutes of physical activity per week by ethnicity and gender, identified by the LBD survey 2007 in CM.

Figure 7.2.1: Age-standardised prevalence (% of adult population 16+ years of age) of self-reported physical activity (at least 150 minutes per week) in CM, by gender and ethnicity, (LBD Survey 2007), total response



The male and female 'All Asians' were significantly less likely to participate in at least 150 minutes of physical activity per week than the Europeans. Females were less physically active than males among all Asian ethnic groups and Europeans. The self-reported physical activity prevalence was particularly low among Chinese and Indian women. Chinese and Indian males were significantly less likely to be regularly physically active than the Europeans. See *Figure 7.2.1.*

Similar results were shown nationally (NZHS 2002/03) and described in the Asian Health Chart Book.

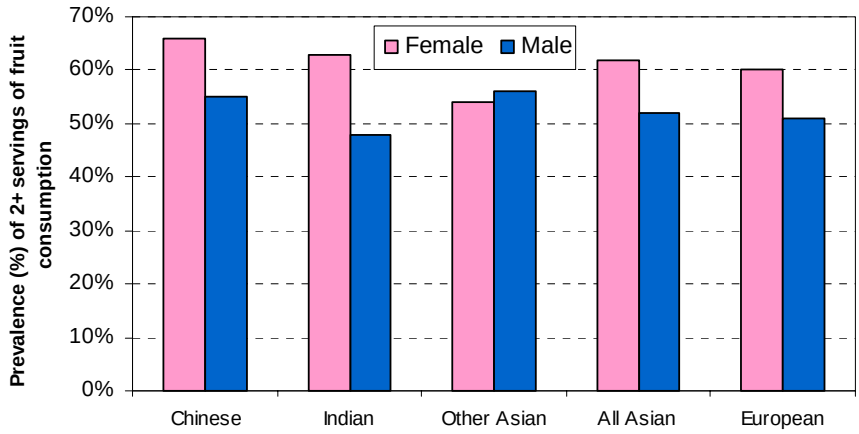
7.3 Fruit and vegetable consumption

Consumption of vegetables and fruit has been strongly linked with positive health outcomes, including protection against cardiovascular diseases and some cancers. Recommended fruit and vegetable intakes to protect health are at least two and three serving per day i.e. "5+ a day" (35).

No significant differences were seen in the prevalence of recommended two or more servings of fruit each day between 'All Asians' and the Europeans, either gender. Amongst the Asian ethnic groups, Indian men had the lowest prevalence of 2+ fruit consumption. Females in all ethnic groups, except 'Other Asians' were more likely to

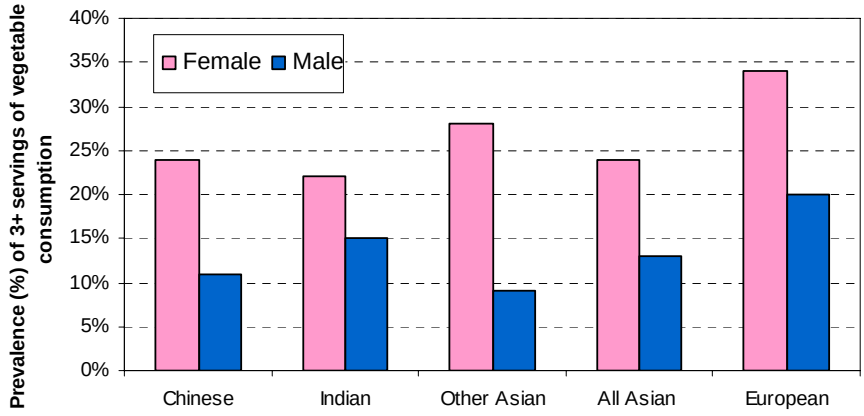
meet the recommendation of fruit intake. Overall, 60% of the adults ate the recommended two or more servings of fruit each day. This was similar to that identified in the NZHS 2002/03 (31). See *Figure 7.3.1*.

Figure 7.3.1: Age-standardised prevalence (% of adult population 16+ years of age) of minimum recommended fruit (2+ a day) in CM, by gender and ethnicity, (LBD Survey 2007), total response



The *Figure 7.3.2* shows the age-adjusted prevalence of recommended vegetable consumption by gender and ethnicity. All Asian men and women had significantly lower prevalence of recommended vegetable intake compared to the Europeans.

Figure 7.3.2: Age-standardised prevalence (% of adult population 16+ years of age) of minimum recommended vegetable (3+ a day) in CM, by gender and ethnicity, (LBD Survey 2007), total response



No significant difference was seen in the prevalence of recommended vegetable intake amongst the Asian ethnic groups (18-20%) overall but there were gender differences. Women in all ethnic groups, Asian and European were more likely to meet the recommendation of vegetable intake. The recommended vegetable intake was most prevalent amongst Indian men (15%) followed by Chinese (11%) and 'Other Asians' (9%) respectively.

The results from the LBD survey were quite different to those from the NZHS 2002/03. According to the NZHS, overall, two-thirds adults ate the recommended

three or more servings of vegetables per day (31). The intake of recommended vegetables for Asians (approximately 50%) was significantly lower than Europeans. Although the LBD survey showed low vegetable consumption among Asians and Europeans, the differences in vegetable intake between Asians and Europeans was similar in both surveys.

According to the Asian Health Chart Book, Indians and 'Other Asians' were significantly less likely to consume the recommended intake of fruit and vegetables (5+ a day) than the Europeans (5).

7.4 'High cholesterol'

The results for this risk factor were obtained from the NZHS 2002/03, described in the Asian Health Chart Book. Although the data was national, similar prevalence would be expected in the Asian population of CM.

- No statistically significant association for self-reported high cholesterol was seen between Asian ethnic groups and Europeans, except the Indians.

7.5 High blood pressure

The results for this risk factor were obtained from the NZHS 2002/03, described in the Asian Health Chart Book. Although the data was national, similar prevalence would be expected in the Asian population of CM.

- Chinese and 'Other Asians were less likely to self-report high blood pressure than Europeans. However, longer the duration of residence in New Zealand, more the likelihood of self-reported high blood pressure

7.6 Overweight and obesity

The results for this risk factor were obtained from the NZHS 2002/03, described in the Asian Health Chart Book. Although the data was national, similar prevalence would be expected in the Asian population of CM.

The ethnic specific BMI cut-points for Asians as suggested by WHO(36) are: overweight (23.0-24.9)and obesity (25.0) respectively.

- Using the ethnic specific BMI cut-points, Chinese and 'Other Asians' males had a significantly lower prevalence of overweight than the total population

- Indians (both sexes) had a significantly lower prevalence of overweight than the total population

- Chinese and 'Other Asian' females had a higher prevalence of overweight than their male counterparts (although the difference is not statistically significant)

- Indians had a higher prevalence of obesity than Europeans. Duration of residence increases the likelihood of being obese.

- ‘Other Asians’ had a slightly increased prevalence of obesity than Europeans

Note that these results would be different when standard BMI cut-points are used, and may lead to underestimation of overweight and obesity in this population.

7.7 Summary – risk and protective factors

- The prevalence of smoking was significantly lower in males and females of all Asian ethnic groups compared to Europeans.
- Except for Indian males, no significant difference was seen in the consumption of two or more servings of fruit between the Asian ethnic groups than the Europeans
- Women were more likely to consume recommended fruit compared to men in all ethnic groups
- All Asian ethnic groups were significantly less likely to consume the recommended 3+ servings of vegetables
- Except for Indian males, no significant difference was seen in the prevalence of self-reported high cholesterol between the Asian ethnic groups and Europeans
- Chinese and ‘Other Asian’ females have significantly higher prevalence of overweight than the Europeans when ethnic specific BMI cut-points were used
- Indian males and females have significantly higher prevalence of obesity than the Europeans when ethnic specific BMI cut-points were used
- ‘Other Asians have slightly higher prevalence of obesity than the Europeans when ethnic specific BMI cut-points were used

8 Child health

This section presents data on the following:

- Infant mortality - all cause in CM and 'All NZ' by ethnicity
- Child mortality - all cause in CM and 'All NZ' by ethnicity
- Percentage of births that are low birth weight in CM and 'All NZ'
- Child (0-14 years) PAH for all causes in CM and 'All NZ' by gender and ethnicity
- Top 10 causes of Child PAH in CM, by ethnicity
- Immunisation and Well Child coverage in CM

All data were obtained from the New Zealand Health Information Service for years 2004 - 2006. Immunisation and Well Child coverage was obtained from Kidslink for birth cohorts 05 to 08 at a specific point (01.01.2005) of time. It would have been preferable to get more up to date data from the National Immunisation Register (NIR), but this was not available in a useful format. All data presented in this section is 'total response' ethnicity.

8.1 Infant mortality – all cause

Infant mortality rate (IMR) is the number of deaths in the first year of life per 1000 live births. It is a most common indicator of child health status and is used to compare health and well-being of populations across and within countries.

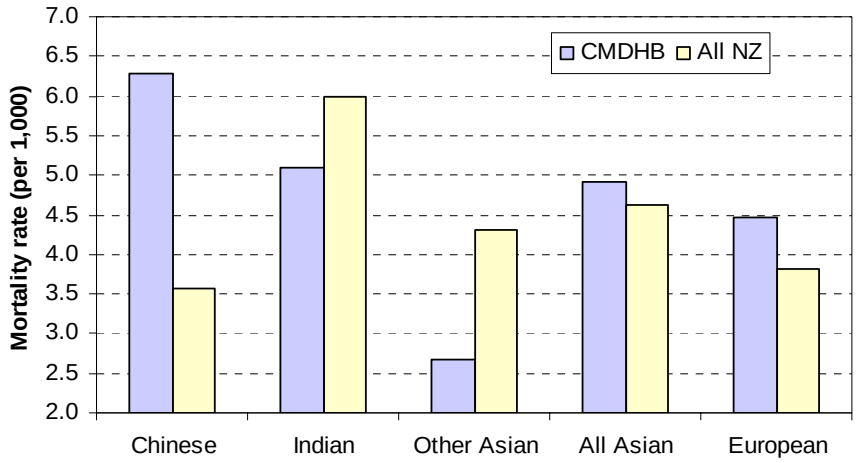
As the numbers were small, both the actual numbers of infant deaths along with the rates are presented in *Table 8.1.1*. However, caution should be exercised in interpreting these results as one extra death in the population can significantly influence the rate, which can be a variation due to chance alone(24).

Table 8.1.1: Infant mortality rate (per 1,000) in CM and 'All NZ' for all causes, by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Number	Rate (per 1,000)	Number	Rate (per 1,000)
Chinese	7	6.3	18	3.6
Indian	8	5.1	32	6.0
Other Asian	2	2.7	21	4.3
All Asian	17	4.9	71	4.6
European	47	4.5	480	3.8

In CM, the IMR for the Asian population as a whole was higher than the European population. The Chinese IMR was higher but difficult to comment because of small numbers of infant deaths in this population. The national IMR for Chinese as shown in the table above and also described by the Asian Health Chart Book (1998-2002) was significantly lower than the Europeans. The Indian IMR was higher than Europeans in CM and 'All NZ'. See *Table 8.1.1* and *Figure 8.1.1*.

Figure 8.1.1: Infant mortality rate (per 1,000) in CM and 'All NZ' for all causes, by ethnicity (2004-2006), total response



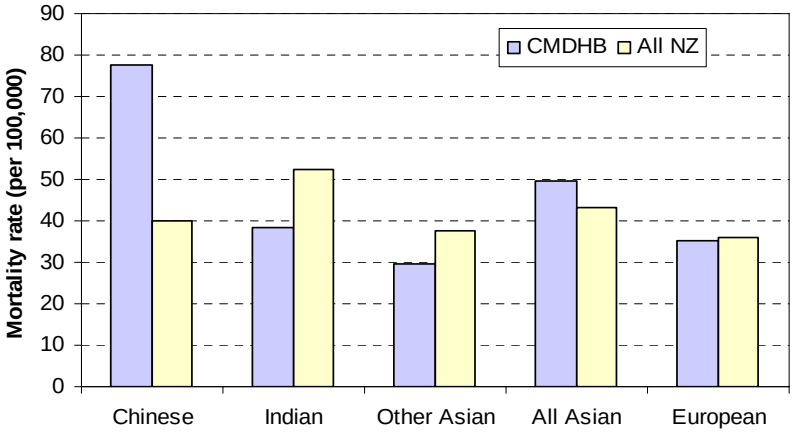
8.2 Child mortality (0-14 years) – all cause

The age standardised child mortality rates in CM and 'All NZ' were higher for the Asian population as a whole than the European population. The Chinese child mortality rates were higher in CM, difficult to comment because of small numbers and lack of confidence intervals. The Indian IMR was higher than the Europeans in both CM and 'All NZ'. See *Table 8.2.1* and *Figure 8.2.1*.

Table 8.2.1: Age standardised mortality rate (per 100,000) in CM and 'All NZ' for all causes, 0-14 year olds, by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Number	Rate (per 100,000)	Number	Rate (per 100,000)
Chinese	14	77.6	31	40.1
Indian	9	38.6	41	52.5
Other Asian	4	29.5	32	37.8
All Asian	27	49.7	103	43.4
European	56	35.2	699	36.0

Figure 8.2.1: Age standardised mortality rate (per 100,000) in CM and 'All NZ' for all causes, 0-14 yea, by ethnicity, 2004-2006, total response



8.3 Low birth weight

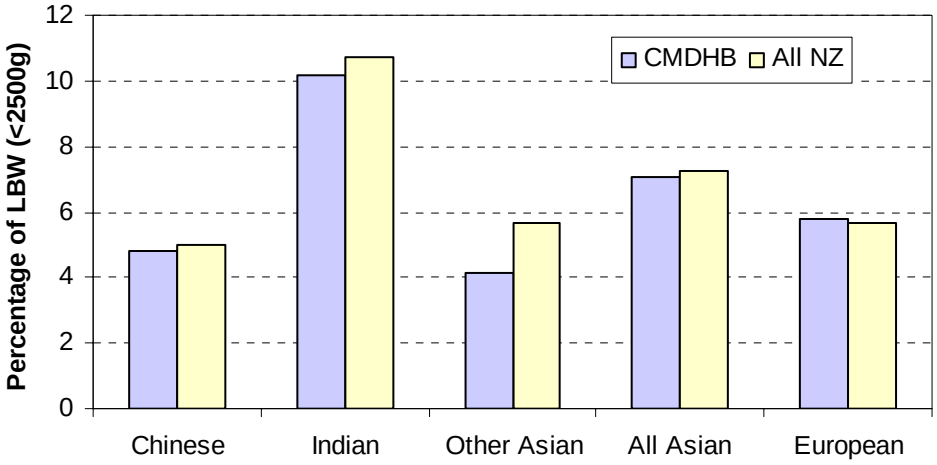
Low birth weight is defined as a birth weight less than 2500 grams, caused by prematurity or to intrauterine growth retardation (small for gestational age). Low birth weight is correlated with higher neonatal morbidity and mortality and it has also been suggested that babies who are growth restricted at birth have a greater risk of coronary heart disease and diabetes in later life (37).

Table 8.3.1: Percentage of births LBW (<2500g), by ethnicity in CM and 'All NZ', 2004-2006, total response

Ethnicity	Counties Manukau			All New Zealand		
	<2500g	Total births	%LBW	<2500g	Total births	%LBW
Chinese	48	992	4.8	249	4,995	5.0
Indian	148	1,459	10.1	581	5,420	10.7
Other Asian	33	797	4.1	289	5,080	5.7
All Asian	229	3,244	7.1	1,113	15,417	7.2
European	437	7,575	5.8	5,946	104,876	5.7

'All Asian' newborns, particularly the Indian babies were significantly more likely to be low birth weight (approximately 10%) compared to Europeans (approximately 6%) in CM and 'All NZ'. Chinese and 'Other Asian' newborns were less likely to be low birth weight than the Europeans. See *Table 8.3.1* and *Figure 8.3.1.*

Figure 8.3.1: Percentage of births LBW (<2500g), by ethnicity in CM and 'All NZ', 2004-2006, total response



The main determinants of small for gestational age are poor maternal nutrition, smoking, hypertension, while the main determinants for preterm births are genital tract infection, multiple birth, pregnancy induced hypertension and obstetric problems. Therefore, preventive measures differ between the two aetiologies and include smoking cessation, prenatal care (primary prevention), antenatal care (secondary prevention) and specialist obstetric and neonatal care (tertiary services).

There were significant differences in mean birth weights between different ethnic groups. A study from National women's Hospital database from 1993-2000, showed that the mean birth weights for European and Indian babies were 3521 and 3192 grams respectively (38). Although, caution should be exercised when using 2500 grams as the LBW cut-point for Indian babies, there is sufficient research proposing

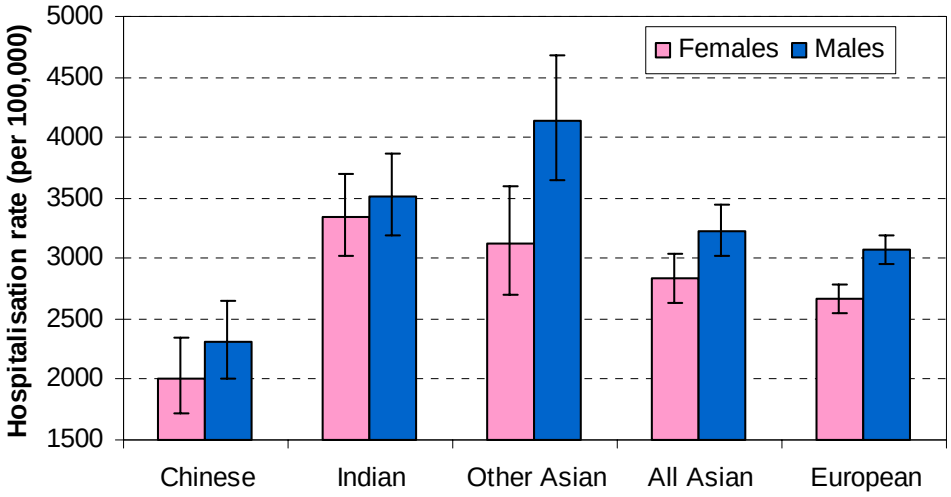
that the foetal under-nutrition increases the risk of type 2 diabetes and coronary heart disease and could be the reason for the present rapidly escalating type 2 diabetes and coronary heart disease epidemic in this population (39-41).

8.4 Child (0-14 years) potentially avoidable hospitalisation

For children, potentially avoidable hospitalisations (PAH) mainly involve infectious diseases. In CM no statistically significant difference was seen in the PAH rates from all causes between 'All Asian' and European population in both genders. Indian male and female PAH rates from all causes (3300 and 3500 per 100,000 respectively) were significantly higher than the Chinese (2000 and 2300) and the European population (2700 and 3100). The PAH rates for 'Other Asian' ethnic group was similar to the Indian population, higher than the Chinese and the European groups.

No statistically significant gender difference was seen for PAH rates among the Asian ethnic groups. However, in Europeans, males have significantly higher PAH rates compared to the females. See *Figure 8.4.1.*

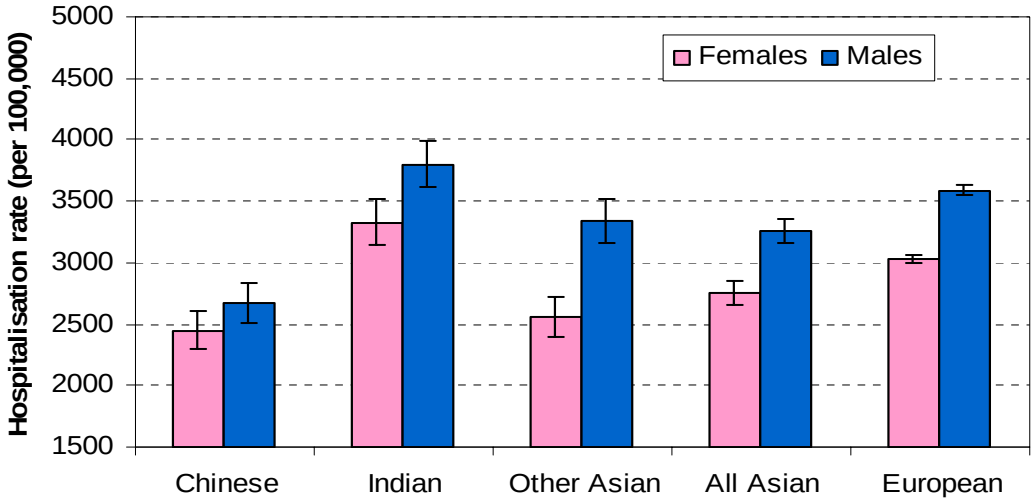
Figure 8.4.1: Age-specific potentially avoidable hospitalisation rate (per 100,000) in CM for all causes, 0-14 year olds, by gender and ethnicity, 2004-2006, total response



'All Asian' males and females had significantly lower PAH rates from all causes than the European population in 'All NZ'. The Indian male and female PAH rates from all causes were significantly higher than the Chinese and the European population. The 'Other Asian' ethnic group had avoidable hospitalisation rates higher than the Chinese but lower than the Indian population. Asian children in CM had similar or slightly lower PAH rates than their NZ counterparts. See *Figure 8.4.2.*

Males had significantly higher PAH rates compared to the females among all Asian ethnic groups and Europeans in the New Zealand data, a stronger pattern than that seen in CM.

Figure 8.4.2: Age-specific potentially avoidable hospitalisation rate (per 100,000) in 'All NZ' for all causes, 0-14 year olds, by gender and ethnicity, 2004-2006, total response



8.5 Child (0-14 years) potentially avoidable hospitalisations – top ten causes

Table 8.5.1: Age-standardised hospitalisation rate (per 100,000) in CM for top 10 PAH causes in Asian and European people, 0-14 years, males and females combined, 2004-2006, total response

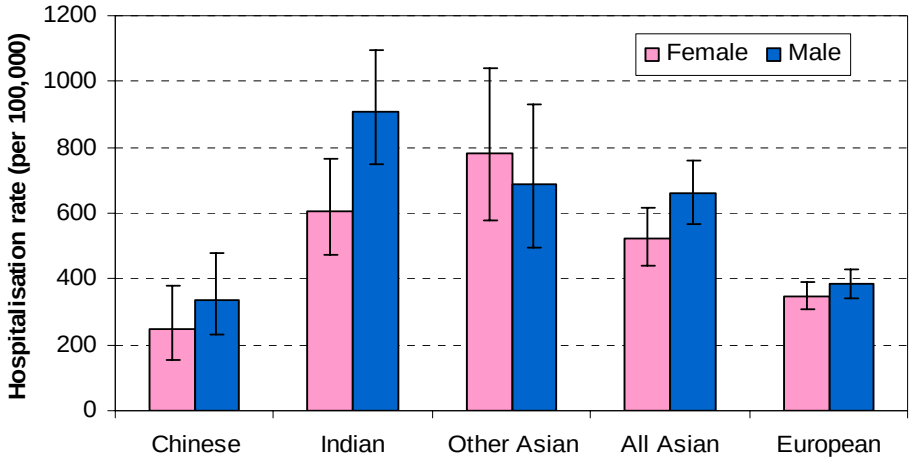
Cause of PAH	All Asian		Chinese		Indian		Other Asian		European	
	Rank	Hosp. rate	Rank	Hosp. rate	Rank	Hosp. rate	Rank	Hosp. rate	Rank	Hosp. rate
Gastroenteritis	1	594	2	295	1	762	2	737	3	366
Dental conditions	2	577	1	470	2	565	1	823	2	408
Asthma	3	419	3	286	3	535	3	361	4	306
Respiratory infections: Pneumonia	4	261	4	232	5	254	4	325	7	196
ENT infections	5	241	5	186	4	281	5	267	1	556
Respiratory infections: Other	6	193	8	108	6	242	6	225	9	141
Respiratory infections: Acute Bronchiolitis	7	173	6	148	7	182	7	196	5	208
Cellulitis	8	142	7	129	9	139	9	176	6	206
Epilepsy	9	138	9	85	8	148	8	192	8	182
Kidney/Urinary infections	10	108	10	73	10	125	10	125	10	114

The top ten potentially avoidable causes of hospitalisations in children in CM are shown in the *Table 8.5.1*. The causes of avoidable hospitalisations were ranked in descending order from the highest to lowest rate for 'All Asian' people. The corresponding ranking along with the rates was shown for Asian ethnic groups at level 2 ethnicity and the European population. Among the Asian ethnic groups the top three causes (gastroenteritis, asthma and dental conditions) of PAH were similar, although in varying order. The top three causes of PAH for European children were ENT infections, gastroenteritis and dental conditions respectively.

Gastroenteritis

In CM the PAH rates for gastroenteritis in children were significantly higher in 'All Asians' compared to Europeans. Among the Asian ethnic groups, the Chinese had significantly lower rates. No statistically significant gender difference was seen among Asians and Europeans. See *Figure 8.5.1*.

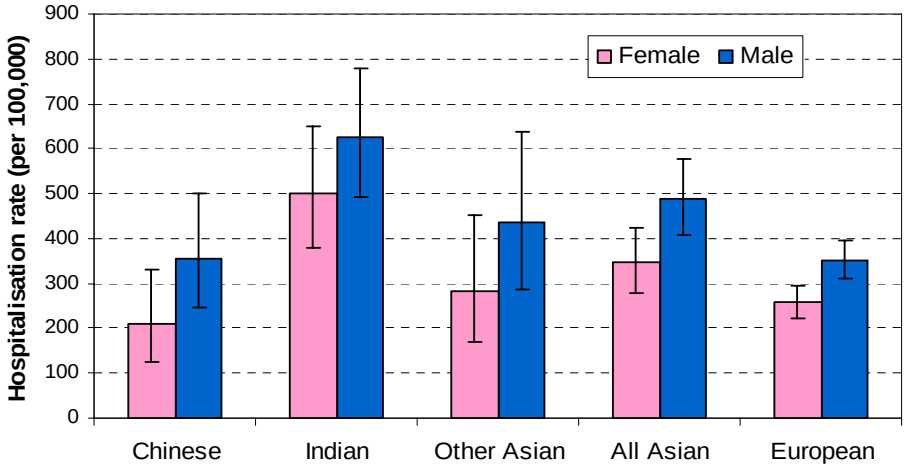
Figure 8.5.1: Age-standardised hospitalisation rate (per 100,000) in CM for gastroenteritis, 0-14 year olds, by gender and ethnicity, 2004-2006, total response



Asthma

In CM the hospitalisation rates for asthma were significantly higher in 'All Asian' boys compared to the Europeans. Indian boys and girls were more likely to be hospitalised for asthma than the 'Chinese' and 'Other Asian' children. Boys were more likely to be hospitalised with asthma than girls for both Asians and Europeans. See *Figure 8.5.2.*

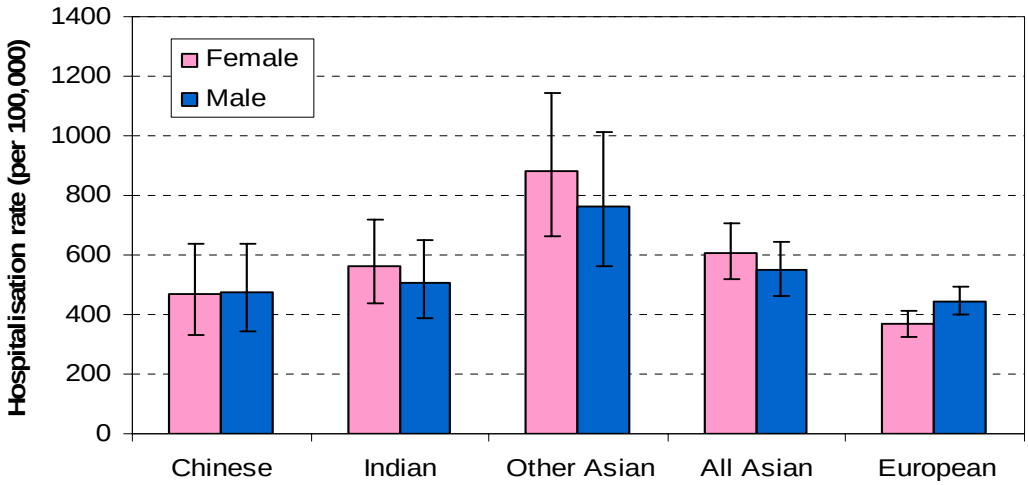
Figure 8.5.2: Age-standardised hospitalisation rates (per 100,000) in CM for asthma, 0-14 year olds, by gender and ethnicity, 2004-2006, total response



Dental conditions

In CM, 'All Asian' girls had significantly higher hospitalisation rates for dental conditions then their Europeans counterparts. The boys and girls of 'Other Asian' ethnic group had significantly higher rates for dental conditions than the European children. This was probably due to the refugee population and migrants represented in this ethnic group, who are known to have poor oral health (42, 43). No statistical significant differences in rates were seen among the Asian ethnic groups at level 2 ethnicity. See *Figure 8.5.3*.

Figure 8.5.3: Age-standardised hospitalisation rates (per 100,000) in CM for dental conditions, 0-14 year olds, by gender and ethnicity, 2004-2006, total response



8.6 Immunisation coverage

Table 8.6.1 and *Figure 8.6.1* below show immunisation coverage in CM at a particular point in time (01.01.2005) for four aggregated birth cohorts (born 1 Jan 03 to 31 Dec 03). Historical data is used due to problems getting current data from the National Immunisation Register (NIR).

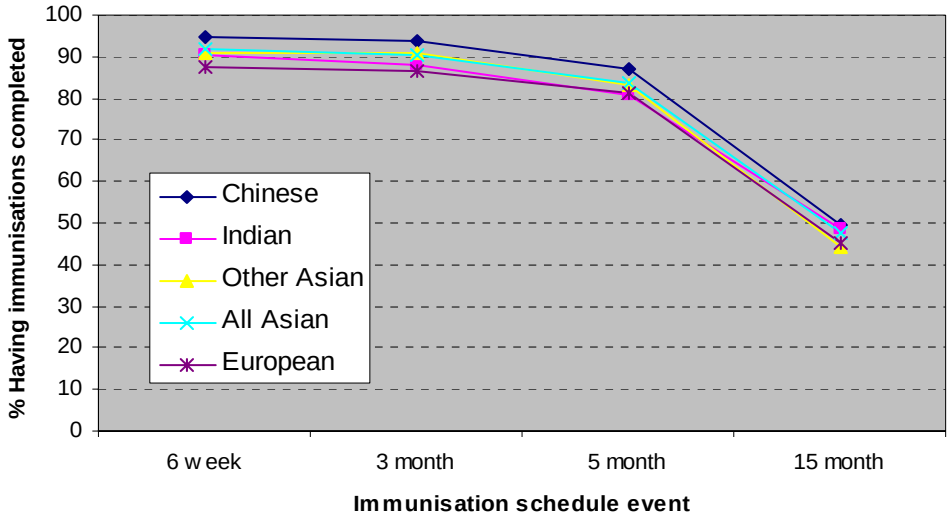
Table 8.6.1: Percentage of children having immunisations completed by 1 Jan 2005 in CM, birth cohorts 05-08 combined, by ethnicity

Ethnicity	Immunisation Schedule Event (% completed)			
	6 week	3 month	5 month	15 month
Chinese	94.6	93.6	87.1	49.7
Indian	90.5	87.8	81.0	48.5
Other Asian	90.8	90.8	83.3	44.2
All Asian	91.9	90.5	83.6	47.7
European	87.5	86.3	81.2	45.3

The children were enrolled on Kidslink-NIR and were between 2-3 yrs age at the time of reporting. The percentage of children who completed immunisation at 6 weeks, 3 months, 5 months and 15 months by ethnicity was reported. This data does not

include those who have a status of ‘gone no address’, ‘opt off’ (the Kidslink programme) or ‘deceased’.

Figure 8.6.1: Percentage of children having immunisations completed at one specific point in time (01.01.2005) in CM, birth cohorts 05-08 combined, by ethnicity



No significant difference was shown in the immunisation coverage among the Asian ethnic groups and Europeans for 6 weeks, 3 months, 5 months and 15 months immunisation completed. A higher percentage of children had their early (6 weeks, 3 months and 5 months) immunisation completed (83-96%) than the 15 months immunisation (52-58%).

According to the Ministry of Health immunisation coverage data (44), 74% Asians and 66% Other (European) population in CM completed their appropriate milestone immunisation at 2 years age (this will include 6 weeks, 3 months, 5 months and 15 months immunisation). The National Immunisation Coverage Survey 2005 (45) showed that approximately 80% Asian and European children were fully immunised by 2 years of age.

The National Immunisation Register (NIR) was developed on the basis of the Kidslink system to increase the immunisation rates. The above discrepancy in the data could be the technical difficulties in data reporting by the Kidslink programme and not the actual rates of immunisation completed in CM.

8.7 Well Child coverage

Table 8.7.1 and *Figure 8.7.1* below show Well Child coverage in CM at a particular time (01.01.2005) for four aggregated birth cohorts (born 1Jan 03 to 31 Dec 03). The children were enrolled on Kidslink-NIR and were between 2-3 yrs age at the time of reporting. The percentage of children who completed the Well Child checks at 6 weeks, 3 months, 5 months, 9 months and 15 months by ethnicity was reported. This data does not include those who have a status of ‘gone no address’, ‘opt off’ (the Kidslink programme) or ‘deceased’.

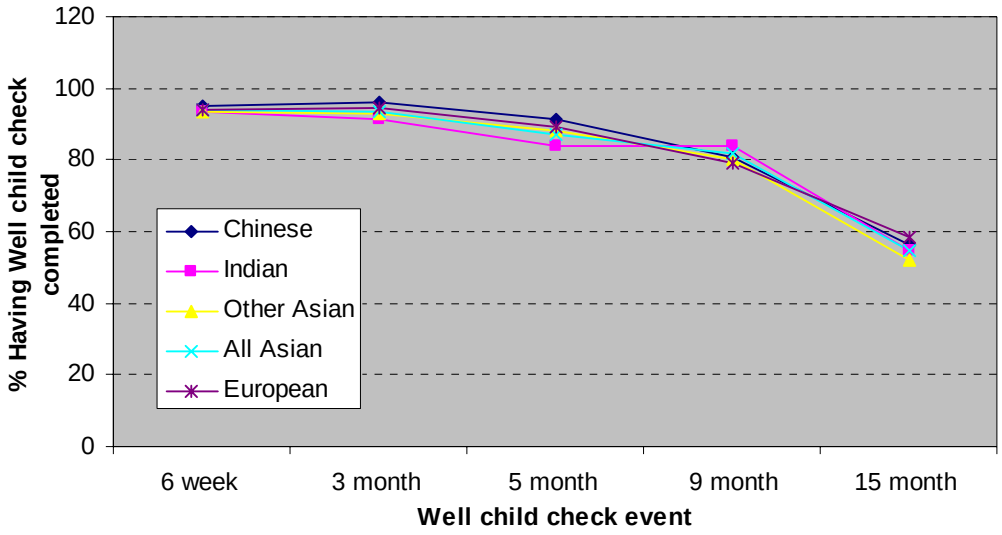
Table 8.7.1: Percentage of children having Well Child checks completed at one specific point in time (01.01.2005) in CM, birth cohorts 05-08 combined, by ethnicity

Ethnicity	Well Child Schedule Event (% completed)				
	6 week	3 month	5 month	9 month	15 month
Chinese	94.9	96.3	91.2	80.7	56.3
Indian	93.5	91.3	83.7	84.1	54.8
Other Asian	93.6	93.2	88.0	80.3	52.2
All Asian	94.0	93.4	87.3	81.7	54.6
European	93.9	94.3	89.4	79.0	58.3

No significant difference was shown in the Well Child coverage among the Asian ethnic groups and Europeans for 6 weeks, 3 months, 5 months, 9 months and 15 months Well Child checks respectively. A higher percentage of children had their early (6 weeks, 3 month and 5 month) Well Child checks completed (approximately 90%) than the 9 month (approximately 80%) and 15 month Well Child checks (52-58% respectively).

The Well Child checks followed similar trend as the immunisation coverage. Encouraging Well Child checks would improve the immunisation coverage and enable CM to reach the target of 95 percent of children fully immunised by two years of age.

Figure 8.7.1: Percentage of children having Well Child checks completed by 1 Jan 2005 in CM, birth cohorts 05-08 combined, by ethnicity



8.8 Summary – child health

- In CM and 'All NZ', infant and child mortality rates were higher in 'All Asians' compared to Europeans.
- In CM and 'All NZ', Indian babies were more likely to be low birth weight than European babies
- In CM, no statistically significant difference was seen in child (0-14 years) PAH rates from all causes between 'All Asian' and European children but the rates were lower for 'All Asian' than the European children in 'All NZ'
- Indian boys and girls had significantly higher rates of child (0-14 years) PAH rates than the Chinese and European population in CM and 'All NZ'
- 'Other Asian' children had PAH rates similar to Indian children in CM. The rates in 'All NZ' were higher than the Chinese but lower than the Indian children
- Overall Asian child PAH rates in CM were similar to Asian rates elsewhere in NZ
- Boys had higher rates of PAH when compared to girls among all Asian ethnic groups and Europeans in 'All NZ' but not so in CM
- In CM gastroenteritis, dental conditions and asthma were the top three PAH causes in all the Asian ethnic groups
- In CM ENT infections, gastroenteritis and dental conditions were the top three causes of PAH for European children
- In CM the PAH rates for gastroenteritis was significantly higher in 'All Asians' than the Europeans. Chinese children had significantly lower rates
- In CM the PAH rates for asthma was significantly higher for 'All Asian' boys compared to European boys. Indian boys and girls had higher PAH rates for asthma than their European counterparts
- In CM the PAH rates for dental conditions was significantly higher in 'All Asian' girls compared to European girls. 'Other Asian' boys and girls had significantly high rates of PAH for dental conditions than Europeans
- In CM no statistical differences were seen in Immunisation and Well Child coverage among the Asian ethnic groups and Europeans

9 Women's/maternal health

This section presents data on the following:

- Number of deliveries and average maternal age for first and all deliveries in CM
- Total fertility rate (15-44years) in CM by ethnicity
- Teenage deliveries in CM and 'All NZ' by ethnicity
- Percentage of assisted deliveries, caesarean sections, deliveries complicated by pre-eclampsia and diabetes in CM and ''All NZ'' by ethnicity
- Age-standardised hospitalisation rates for pelvic inflammatory disease and ectopic pregnancy per 100,000 women in CM and 'All NZ' by ethnicity
- Age-standardised rates for termination of pregnancy per 1,000 women, public (Epsom Day Unit) and private (Auckland Medical Aid Centre) settings

All data, except the termination of pregnancy data were obtained from the New Zealand Health Information Service for years 2004-2006 and is 'total response' ethnicity. The termination of pregnancy data was obtained from Epsom Day Unit and Auckland Medical Aid Centre.

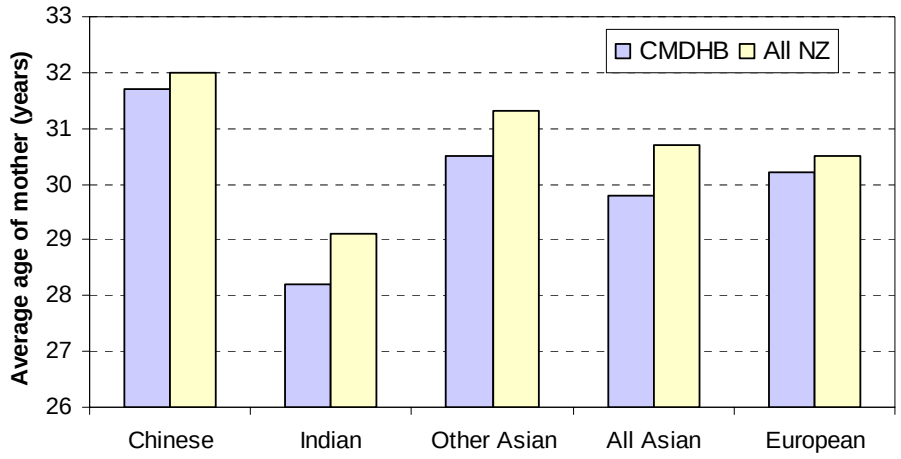
9.1 Deliveries

Number of deliveries and average age at delivery

Table 9.1.1: Number of deliveries and average age of mother at delivery in CM and 'All NZ', by ethnicity, 2004-2006, total response

Ethnicity	Counties Manukau		All NZ	
	Deliveries	Avg age	Deliveries	Avg age
Chinese	974	31.7	4,734	32.0
Indian	1,574	28.2	5,397	29.1
Other Asian	780	30.5	4,978	31.3
All Asian	3,308	29.8	15,035	30.7
European	7,686	30.2	101,715	30.5

Figure 9.1.1: Average age of mother at delivery in CM and 'All NZ', by ethnicity, 2004-2006, total response



No significant difference was seen in the average age at delivery between 'All Asians' and Europeans in CM and 'All NZ'. The average age at delivery was lower for Indians in CM and 'All NZ' (28.2 and 29.1 years respectively) compared to Chinese (31.7 and 32 years respectively) and 'Other Asians' (30.5 and 31.3 years respectively). See *Table 9.1.1* and *Figure 9.1.1*.

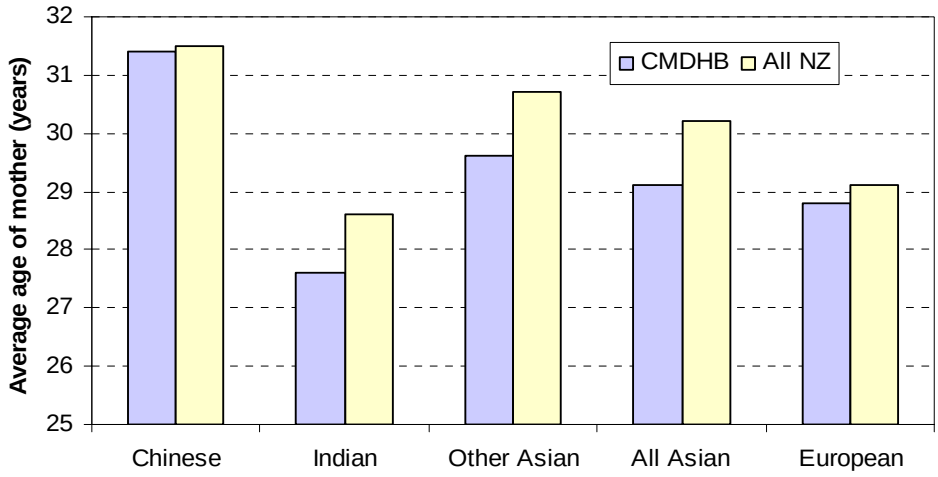
Number of first deliveries and average age at first delivery

Table 9.1.2: Number of first deliveries and average age of mother at first delivery in CM and 'All NZ', by ethnicity, 2004-2006, total response

Ethnicity	Counties Manukau		All NZ	
	Deliveries	Avg age	Deliveries	Avg age
Chinese	632	31.4	3,234	31.5
Indian	1,047	27.6	3,739	28.6
Other Asian	457	29.6	3,267	30.7
All Asian	2,129	29.1	10,200	30.2
European	3,495	28.8	49,623	29.1

No significant difference was seen in the average age at first delivery between 'All Asians' and Europeans in CM and 'All NZ'. The average age at first delivery was lower for Indians in CM and 'All NZ' (27.6 and 28.6 years respectively) compared to Chinese (31.4 and 31.5 years respectively) and 'Other Asians' (29.6 and 30.7 years respectively). See *Table 9.1.2* and *Figure 9.1.2.*

Figure 9.1.2: Average age of mother at first delivery in CM and 'All NZ', by ethnicity, 2004-2006, total response



9.2 Total fertility rate

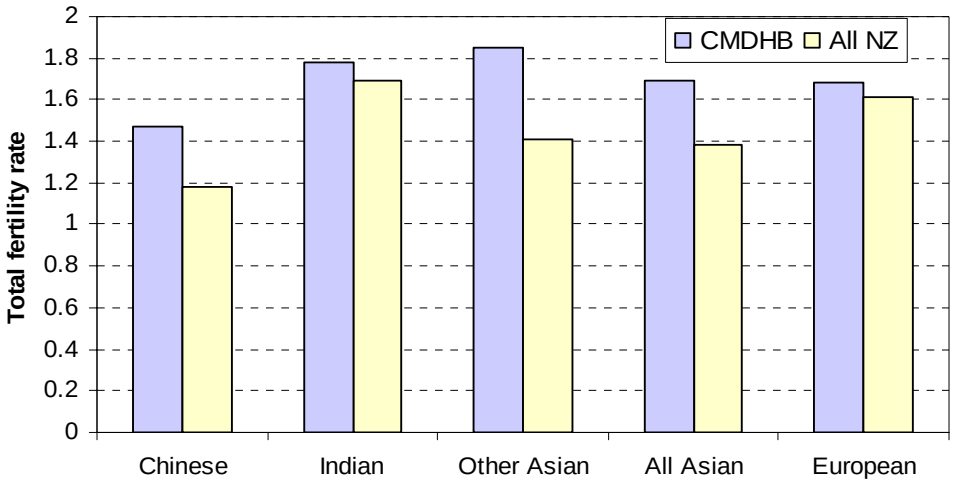
The fertility rate is defined as the number of live births (per 1000 women) aged 15-44 in a given year. The total fertility rate (TFR) is the average number of children that would be born to a woman during her reproductive lifetime (15-44 years) if she were to conform to the fertility rate of a given year. The TFR was higher for women in CM than 'All NZ', across all Asian ethnic groups and Europeans. See *Table 9.2.1* and *Figure 9.2.1.*

Table 9.2.1: Total fertility rate for women in CM and 'All NZ', 15-44 years, by ethnicity, 2004-2006, total response

Ethnicity	Counties Manukau	All NZ
Chinese	1.47	1.18
Indian	1.78	1.69
Other Asian	1.85	1.41
All Asian	1.69	1.38
European	1.68	1.61

The TFR for 'All Asian' and European women was similar in CM. However, the TFR for 'All Asian' woman was lower (1.38) than the European women (1.61) for 'All NZ'. The TFR for Indian women was higher than the Chinese women in CM and 'All NZ'.

Figure 9.2.1: Total fertility rate for women in CM and 'All NZ', 15-44 years, by ethnicity, 2004-2006, total response



9.3 Teenage deliveries

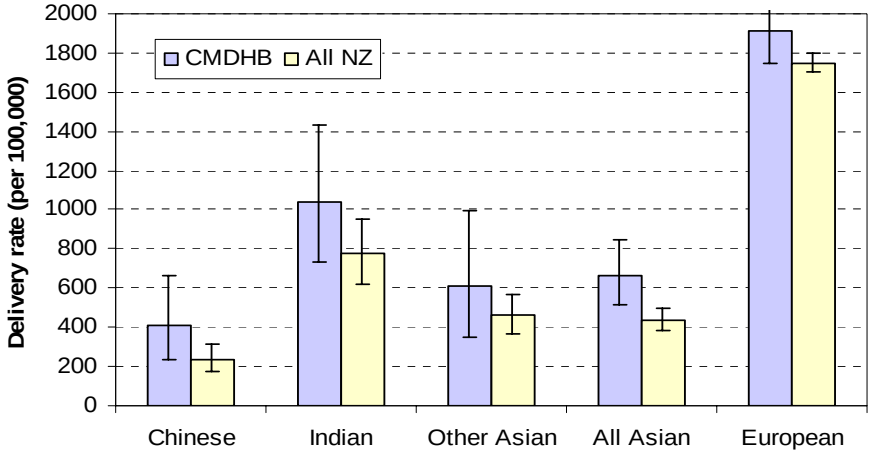
Deliveries to teenage mothers were higher across all Asian ethnic groups and Europeans in CM than 'All NZ'. 'All Asian' women had significantly lower teenage deliveries compared to Europeans in CM and 'All NZ'.

Among the Asian groups Indian women had significantly higher teenage deliveries than Chinese and 'Other Asians' in CM and 'All NZ'. See *Table 9.3.1* and *Figure 9.3.1*.

Table 9.3.1: Number and age-specific rate (per 100,000) of teenage deliveries (women 15-19years) in CM and 'All NZ', by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Deliveries	Rate (per100,000)	Deliveries	Rate (per100,000)
Chinese	16	411	47	235
Indian	37	1,037	92	774
Other Asian	16	612	88	460
All Asian	68	666	223	436
European	468	1,915	5,660	1,750

Figure 9.3.1: Age-specific teenage delivery rate (per 100,000 women aged 15-19 years) in CM and 'All NZ', by ethnicity, 2004-2006, total response



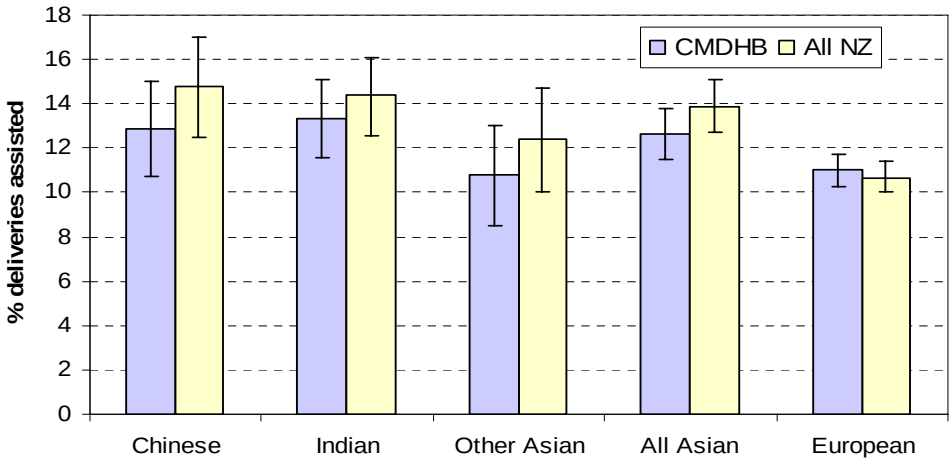
9.4 Assisted deliveries

Assisted deliveries here refers to vaginal deliveries that required some form of assistance such as forceps or Ventoux. The percentage of deliveries that were assisted was not significantly different between CM and 'All NZ' across Asian ethnic groups and Europeans. The percentage of assisted deliveries was significantly higher in 'All Asian' women compared to Europeans in CM and 'All NZ'. The percentage of assisted deliveries was not significantly different among the Asian ethnic groups in CM and 'All NZ'. See *Table 9.4.1* and *Figure 9.4.1.*

Table 9.4.1: Number of assisted deliveries, and as a percentage of all deliveries in CM and 'All NZ', by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Number	Percentage of all deliveries	Number	Percentage of all deliveries
Chinese	125	12.8	699	14.8
Indian	210	13.3	776	14.4
Other Asian	84	10.8	616	12.4
All Asian	417	12.6	2083	13.9
European	847	11.0	10,849	10.7

Figure 9.4.1: Number of assisted deliveries, and as a percentage of all deliveries in CM and 'All NZ', by ethnicity, 2004-2006, total response



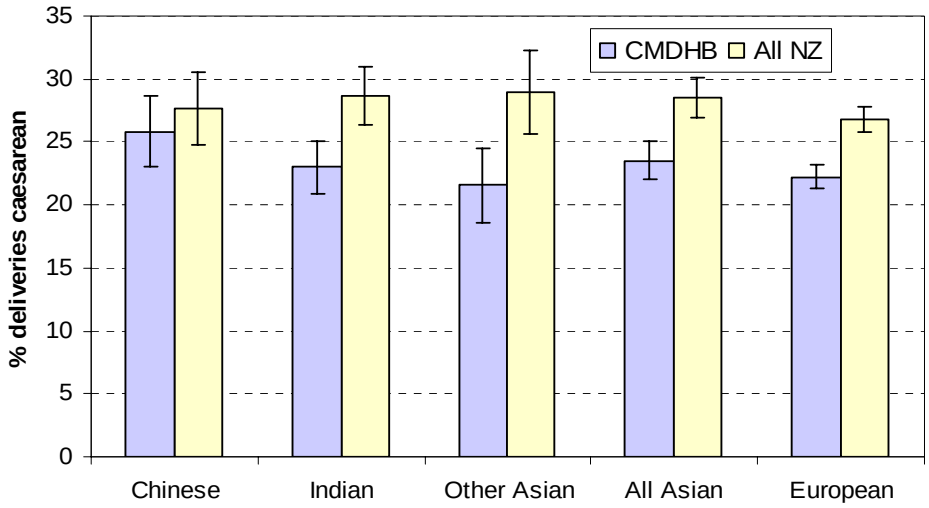
9.5 Caesarean sections

The percentage of caesareans in CM across all Asian ethnic groups and Europeans were significantly lower than in 'All NZ'. The percentage of caesareans (22-29%) was not significantly different between the Asian ethnic groups and Europeans in CM and 'All NZ'. See *Table 9.5.1* and *Figure 9.5.1.*

Table 9.5.1: Number of assisted caesareans, and caesareans as a percentage of all deliveries in CM and 'All NZ', by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Number	Percentage of all deliveries	Number	Percentage of all deliveries
Chinese	251	25.8	1,310	27.7
Indian	362	23.0	1,547	28.7
Other Asian	168	21.5	1,443	29.0
All Asian	777	23.5	4,284	28.5
European	1,708	22.2	27,282	26.8

Figure 9.5.1: Number of assisted caesareans, and caesareans as a percentage of all deliveries in CM and 'All NZ', by ethnicity, 2004-2006, total response



9.6 Pre-eclampsia

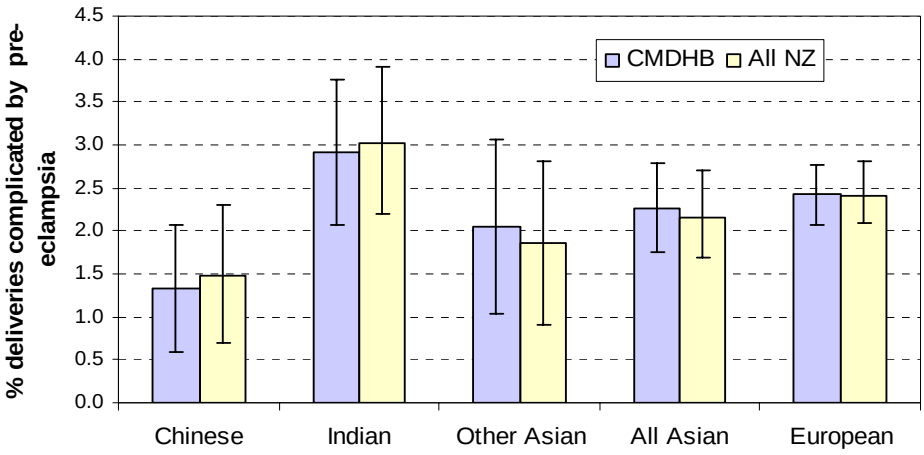
The percentages of deliveries complicated by pre-eclampsia were not significantly different between CM and 'All NZ' across all Asian ethnic groups and Europeans.

Table 9.6.1: Number of deliveries complicated by pre-eclampsia, and as a percentage of all deliveries in CM and 'All NZ', by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Number	Percentage of all deliveries	Number	Percentage of all deliveries
Chinese	13	1.3	70	1.5
Indian	46	2.9	163	3.0
Other Asian	16	2.1	93	1.9
All Asian	75	2.3	324	2.2
European	186	2.4	2,443	2.4

Although the percentage of deliveries complicated by pre-eclampsia was relatively low in Chinese and high in Indian women, differences did not reach statistical significance between any of the Asian ethnic groups and Europeans in CM and 'All NZ'. See *Table 9.6.1* and *Figure 9.6.1.*

Figure 9.6.1: Percentage of all deliveries that were complicated by pre-eclampsia in CM and 'All NZ', 15-44 years, by ethnicity, 2004-2006, total response



9.7 Diabetes in pregnancy

The percentages of pregnancies complicated by diabetes were not significantly different between CM and 'All NZ' across all Asian ethnic groups and Europeans.

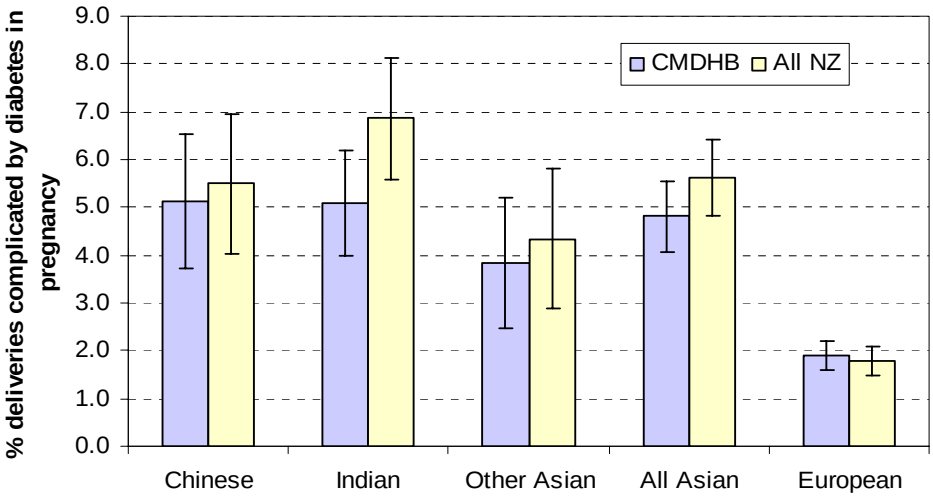
Among the Asian ethnic groups, no statistical difference was seen in the percentages of pregnancies complicated by diabetes in CM and 'All NZ'. However, all the Asian ethnic groups had a significantly higher percentage of pregnancy (more than twice) complicated by diabetes compared to Europeans in CM and 'All NZ'. See *Table 9.7.1* and *Figure 9.7.1*.

Women who have had gestational diabetes have a 20 to 50 percent chance of developing diabetes in the next 5 to 10 years following pregnancy (46). The high trend of gestational diabetes in Asian women indicates a need for monitoring and planning services.

Table 9.7.1: Number of deliveries complicated by diabetes in pregnancy, and deliveries complicated by diabetes as a percentage of all deliveries in CM and 'All NZ', 15-44 years, by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Number	Percentage of all deliveries	Number	Percentage of all deliveries
Chinese	50	5.1	260	5.5
Indian	80	5.1	370	6.9
Other Asian	30	3.8	216	4.3
All Asian	159	4.8	843	5.6
European	146	1.9	1,829	1.8

Figure 9.7.1: Percentage of all deliveries that were complicated by diabetes in pregnancy in CM and 'All NZ', by ethnicity, 2004-2006, total response



9.8 Pelvic inflammatory disease

No significant difference was shown in the hospitalisation rate for pelvic inflammatory disease across Asian ethnic groups and Europeans, between CM and 'All NZ'. In CM, although the Indians had higher rates of hospitalisation for pelvic inflammatory disease, no statistical difference was seen among the Asian ethnic groups or between 'All Asians' and Europeans.

'All Asians' had significantly lower rates of hospitalisation for pelvic inflammatory disease in 'All NZ' than the Europeans. Chinese had significantly lower rates of hospitalisation compared to Indians in 'All NZ'. *See Table 9.8.1* and *Figure 9.8.1.*

Figure 9.8.1: Number of women and age-standardised hospitalisation rate (per 100,000) in CM and 'All NZ' with pelvic inflammatory disease, 15-44 years, by ethnicity, 2004-2006, total response

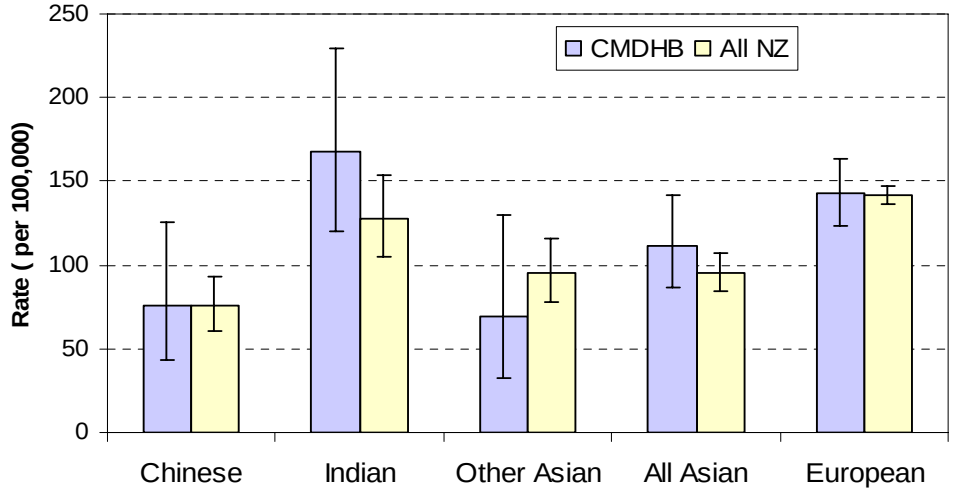


Table 9.8.1: Number of women and age-standardised hospitalisation rate (per 100,000) in CM and 'All NZ' with pelvic inflammatory disease, 15-44 years, by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Number	Rate (per100,000)	Number	Rate (per100,000)
Chinese	16	76	93	76
Indian	42	168	116	127
Other Asian	10	69	104	95
All Asian	68	112	312	95
European	205	143	2,779	142

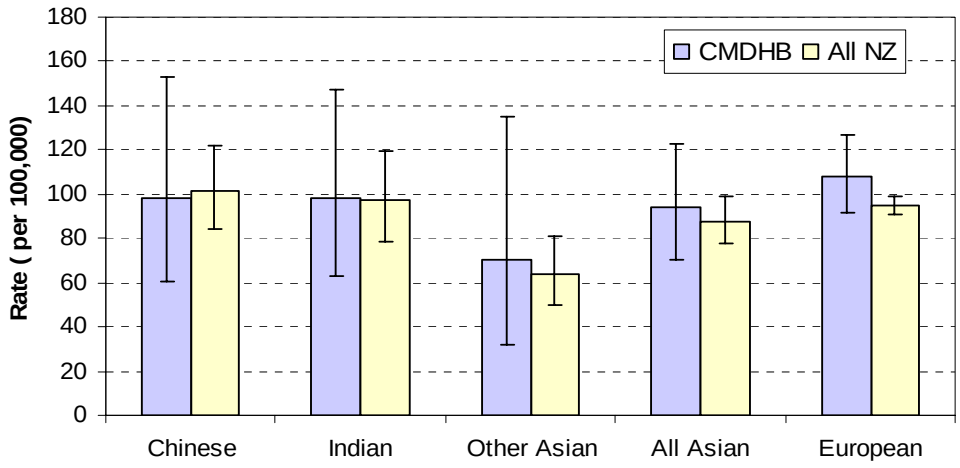
9.9 Ectopic pregnancy

No statistical difference was seen in the hospitalisation rate for ectopic pregnancy between any of the Asian ethnic groups in CM and ''All NZ''. Further, no statistical difference was seen in the hospitalisation rate for ectopic pregnancy between 'All Asians' and Europeans in CM and 'All NZ'. See *Table 9.9.1* and *Figure 9.9.1.*

Table 9.9.1: Number of women and age-standardised hospitalisation rate (per 100,000) in CM and 'All NZ' with ectopic pregnancy, 15-44 years, by ethnicity, 2004-2006, total response

Ethnicity	CM		All NZ	
	Number	Rate (per100,000)	Number	Rate (per100,000)
Chinese	21	99	124	102
Indian	25	98	93	97
Other Asian	9	70	68	64
All Asian	55	94	285	88
European	151	108	1,834	95

Figure 9.9.1: Age-standardised hospitalisation rate (per 100,000 women) in CM and 'All NZ' for ectopic pregnancy, 15-44 years, by ethnicity, 2004-2006, total response



9.10 Termination of pregnancy

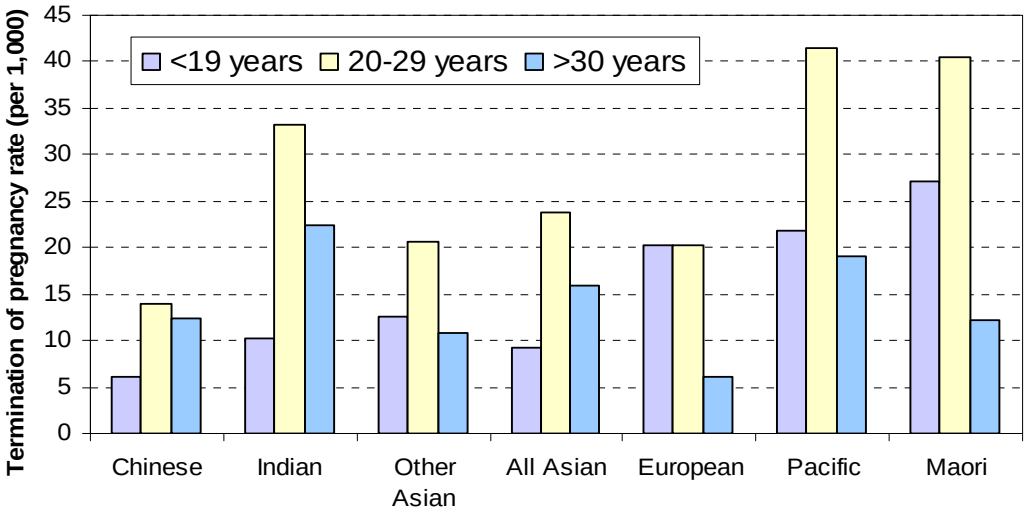
The *Table 9.10.1* and *Figure 9.10.1* show the age-standardised termination of pregnancy rate (per 1000) in public sector (Epsom Day Unit) for CM by age and ethnicity.

Public – Epsom Day Unit

Table 9.10.1: Age-standardised termination of pregnancy rate (per 1,000) in public sector for CM, by age and ethnicity, 2004-2006, total response

Age	Chinese	Indian	Other Asian	All Asian	European	Pacific	Maaori
<19 years	6.0	10.3	12.5	9.2	20.2	21.9	27.2
20-29 years	13.9	33.2	20.6	23.8	20.2	41.5	40.6
>30 years	12.2	22.3	10.7	15.9	6.0	19.1	12.2

Figure 9.10.1: Age-standardised termination of pregnancy rate (per 1,000) in public sector for CM, by age and ethnicity, 2004-2006, total response



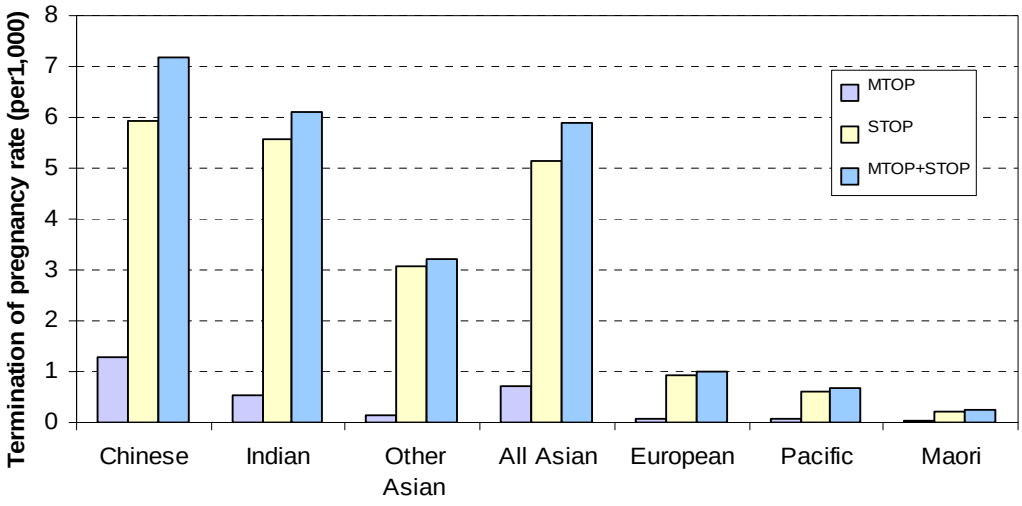
The termination of pregnancy rates in 'All Asians' were higher than the Europeans for women over 20 years age but lower than the Europeans for women less than 19 years age. The termination of pregnancy rates in Maaori and Pacific women were significantly higher in all age groups.

Among the Asian ethnic groups, the termination of pregnancy rates in Indian women was higher than the Chinese women. 'Other Asian' women had higher termination rates for women less than 19 years and lower termination rates for women over 20 years when compared to Indian women.

Private - Auckland Medical Aid Centre Limited (AMAC)

Figure 9.10.2 shows the termination of pregnancy rate (per 1000 women) in the private sector (AMAC).

Figure 9.10.2: Age-standardised termination of pregnancy rate (per 1,000) in private sector for CM, by ethnicity, 2004-2006, total response



The termination of pregnancy rates per 1000 women was significantly higher in all Asian ethnic groups when compared to European, Maaori or Pacific women. This holds true for both medical and surgical termination of pregnancy (MTOP & STOP). The termination rates of pregnancy were significantly high in Chinese women followed by the Indian women. The data above cannot differentiate if the women accessing private termination of pregnancy were residents of New Zealand or for example overseas students at the University. What is likely is that there is inadequate contraception advice in Asian migrants and the need for culturally appropriate education.

9.11 Summary – women's/maternal health

- In CM and 'All NZ', no significant difference was seen in the average age for all delivery and first delivery between 'All Asians' and Europeans. The average age for all delivery and first delivery was lower for Indians compared to Europeans and other Asian ethnic groups
- In 'All NZ', the TFR for 'All Asians' was lower than the Europeans but similar in CM
- In CM and 'All NZ', the TFR for Indian women was higher than Chinese and 'Other Asians'
- Teenage deliveries were higher across all ethnic groups in CM than 'All NZ'
- Teenage deliveries were significantly lower in all Asian ethnic groups compared to Europeans in CM and 'All NZ'
- Among the Asians, Indians have significantly higher teenage deliveries than Chinese and 'other Asians' in CM and 'All NZ'
- In CM and 'All NZ', the percentage of assisted deliveries were significantly higher in 'All Asians' compared to Europeans but not among the Asia ethnic groups
- In CM and 'All NZ', the percentage of caesareans were not significantly different between the Asian ethnic groups and Europeans
- In CM and 'All NZ', no statistical significant difference was seen in percentage of deliveries complicated by pre-eclampsia between Asian ethnic groups and Europeans
- In CM and 'All NZ', the percentage of deliveries complicated by diabetes was significantly higher in all Asian ethnic groups compared to Europeans. No statistical significant difference was shown among the Asian ethnic groups.
- In CM, no statistical significant difference was seen in the percentage of hospitalisations for pelvic inflammatory disease between Asian ethnic groups and Europeans
- In 'All NZ', 'All Asians' had significantly lower rates of hospitalisation for pelvic inflammatory disease. Chinese women had significantly lower rates compared to Indian women
- In CM and 'All NZ', no statistical significant difference was seen in the ectopic pregnancy rates across all Asian ethnic groups and Europeans
- In CM, the termination rates of pregnancy in the public sector was higher in Asian women over 20 years age compared to Europeans
- In CM, the termination rates of pregnancy in the public sector was lower in Asian women below 19 years age compared to Europeans
- In CM, the termination rates of pregnancy in the public sector was higher in Indian women compared to Chinese women
- In CM, the termination rates of pregnancy in the private sector was significantly higher in all the Asian ethnic groups, compared to Europeans
- In CM, the termination rates of pregnancy in the private sector was highest in Chinese women

10 Summary of key findings

The Asian people have increased significantly over the last decade and make up 16% of the total CM population. Approximately 83,000 Asian people live in CM, comprising of 33,000 Indians, 32,000 Chinese and 18,000 'Other Asians'. The total Asian population was projected to grow by more than 90% over the next 20 years.

The Asian population is relatively young with a bimodal distribution; 41% being under 24 years age and 33% between 30-49 years age. Three quarters of the Asian people lived in Howick, Pakuranga, Manukau and Papatoetoe suburbs of CM. Approximately 65% of Asian people moved into CM from other regions of New Zealand and from overseas. Asian people were highly educated but with lower incomes and high unemployment rates compared to Europeans. They were evenly distributed across the deprivation deciles. However, there were inequalities in socio-economic determinants among the different Asian ethnic groups.

The Asian population as a whole fared better than Europeans on many indicators including: life expectancy, avoidable mortality and hospitalisation, child health and women's health indicators. No differences were shown in some indicators and they fared worse in indicators such as diabetes, cardiovascular disease (CVD), risk and protective factors (obesity, physical activity, and vegetable consumption), and health utilisation (primary care, cancer screening and Chronic Care Management (CCM) programmes in CM).

There was immense diversity of health status within the Asian population. Major differences were found in health outcomes, risk factors and health service utilisation among Asian ethnic groups. Indians did worse than Chinese on many indicators, which would result in the problem of 'averaging' if the broad category 'Asian' was considered. 'Other Asians' were generally intermediate between Indian and Chinese, but it was difficult to comment on this group because of small numbers. Further, this ethnic group comprised of several small diverse communities and the pitfall of 'averaging' could not be avoided in this group. Some of the differences are likely to be due to socioeconomic differences in the population groups as settled in Counties Manukau. However it is not possible in this type of health review to disentangle the effects of socioeconomic, migrant and cultural differences.

The main areas of concern for Indians were high rates of low birth weight, obesity, diabetes (type 2), and cardiovascular disease. They had high adult and Child PAH rates for many conditions; high surgical intervention rates; low prevalence of accessing primary care despite high PHO enrolment; increased prevalence of risk factors such as high cholesterol, blood pressure and obesity; decreased prevalence of protective factors such as physical activity and vegetable consumption; lower average age at first and all deliveries, high percentage of assisted deliveries including caesareans, high percentage of deliveries complicated by pre-eclampsia and diabetes; and high termination of pregnancy rates in private setting.

The Chinese population in general fared better than Europeans on many health indicators: life expectancy, avoidable mortality and hospitalisation, surgical intervention rates, child and women's health. Low primary care utilisation, low physical activity, particularly in women, low uptake of cervical and breast screening, gestational diabetes, and high rates of termination of pregnancy in private setting were the key issues identified in Chinese population. IMR and child mortality rates

were higher than Europeans in CM but not in 'All NZ'. There were extremely small numbers of death and one extra death can tilt the rates unfavourably and this was not considered as an issue.

Although, Asian population as a whole fared better than Europeans in many health indicators, there were many inequalities between the Indian ethnic group and Europeans. No major differences were discerned for most of the health indicators analysed, between CM and 'All NZ' for both Asians and Europeans.

A more detailed comparison of Asians with Europeans and comparison between Indian and Chinese ethnic groups are discussed below. The data on 'Other Asian' ethnic group was skewed in many of the indicators because of small numbers and wide confidence intervals. Hence, it was difficult to draw meaningful conclusions and therefore is not further discussed here.

10.1 Comparing 'All Asian' versus European

The Asian population as a whole were compared against Europeans and the findings discussed under: 'Fared worse than Europeans', 'Fared better than Europeans', and 'Similar to Europeans' sub headings. Findings were from CM and both gender unless mentioned otherwise.

'Fared worse than Europeans'

'All Asians' fared worse on many indicators compared to Europeans. Summary of the indicators from this HNA where 'All Asians' fare relatively poorly were:

- Greater proportion of migrant population
- Approximately 17% had English as language barrier
- 5% unemployment rates against 3% in Europeans
- High proportion with low incomes and low proportion with high incomes
- Higher adult PAH rates for angina and stroke
- Higher adult PAH rates for asthma and CHF in 'All Asian' men
- Higher intervention rates for cataract extraction
- Lower percentage enrolled with CCM CVD programme
- Lower rates of breast and cervical cancer screening
- Lower prevalence of primary care access and PHO enrolment
- Lower prevalence of physical activity and recommended vegetable intake
- Higher LBW, IMR and child mortality (0-14 years) from all causes
- Higher PAH rates for gastroenteritis in boys and girls, for asthma in boys and for dental conditions in Asian girls
- Higher gestational diabetes
- Higher gestational diabetes and higher termination of pregnancy rates in private sector

'Fared better than Europeans'

All Asians' fared better on many indicators than Europeans. Summary of the indicators from this HNA where Europeans fare relatively poorly were:

- Higher life expectancy
- Lower adult all cause mortality and avoidable mortality for IHD

- Lower adult PAH rates from all causes, from cellulites and pneumonia
- Lower intervention rates for total hip replacement
- Lower prevalence of smoking
- Lower teenage deliveries and lower termination of pregnancy rates in public sector for women under 19 years age

‘Similar to Europeans’

No differences were found among many indicators between Asians and Europeans Summary of the indicators from this HNA where ‘All Asians’ fare relatively similarly to Europeans were:

- Distribution across the deprivation deciles and education
- Lower percentage on any form of benefit
- Adult PAM for stroke and diabetes
- Adult PAH for MI, diabetes, CORD and kidney/urinary infections
- Intervention rates for angioplasty, CABG, total knee replacement, cholecystectomy, hysterectomy and prostatectomy
- Percentage of known diabetes enrolled with CCM diabetes programme
- Recommended fruit intake
- Child PAH from all causes, immunisation and Well Child coverage
- Average age at all deliveries and first delivery, TFR, caesarean sections, percentage of deliveries complicated by pre-eclampsia, pelvic inflammatory disease and ectopic pregnancy prevalence

10.2 Comparing Indian ethnic group versus Chinese

The Indian ethnic group was compared with Chinese and the findings discussed under: ‘Fared worse than Chinese’, ‘Fared better than Chinese’, and ‘Similar to Chinese’ sub headings. Findings were from CM and both gender unless mentioned otherwise.

‘Fared worse than Chinese’

Indians faired worse on many indicators compared to Chinese. Summary of the indicators from this HNA where Indians fare relatively poorly were:

- Greater proportion of migrant population
- Indians more-represented in deprived areas and under-represented in affluent areas
- Lower life expectancy and higher adult PAM from all causes
- Higher PAM for IHD in Indian men
- Higher adult PAH from all causes, angina and chest pain, MI, diabetes, kidney/urinary infections, CCF, cellulitis, and asthma
- Higher PAH from respiratory infections and CORD in Indian men
- Higher prevalence of diabetes in Indians (8.9%) compared to Chinese (2.6%)
- Higher intervention rates for angioplasty, CABG, total knee replacement, cataract extraction, and hysterectomy
- Lower percentage of Indians with MI in the last 12 months, enrolled with CCM CVD programme
- Higher prevalence of high cholesterol, high blood pressure and obesity
- Higher LBW, child PAH from all cause, gastroenteritis and asthma

- Low average age at first delivery and all deliveries
- Higher caesarean sections, percentage of deliveries complicated by pre-eclampsia
- Higher pelvic inflammatory disease prevalence and termination of pregnancy rates in public sector

‘Fared better than Chinese’

Indians fared better on some indicators compared to Chinese. Summary of the indicators from this HNA where Chinese fare relatively poorly were:

- Approximately 22% of Chinese people had English as language barrier compared to 10% Indians
- Low proportion with low incomes and high proportion with high incomes
- Higher percentage of known diabetes enrolled with CCM diabetes programme
- Higher prevalence of primary care access and PHO enrolment
- More likely to be physically active, particularly Indian men
- Lower teenage deliveries
- Lower termination of pregnancy rates in private sector

‘Similar to Chinese’

No differences were found among many indicators between Indians and Chinese. Summary of the indicators from this HNA where Indians fare similar to Chinese were:

- Unemployment, secondary school education and percentage on any form of benefit
- Adult PAM in women from all causes and IHD
- Adult PAM from stroke and diabetes
- Adult PAH from stroke, CORD in women; asthma in men
- Intervention rates for total hip replacement, cholecystectomy and prostatectomy
- Recommended fruit and vegetable intake and breast screening
- Smoking prevalence
- Immunisation and Well Child coverage
- Gestational diabetes and ectopic pregnancy prevalence

10.3 Conclusion

The Asian population is the fastest growing ethnic group in CM and tremendous diversity exists with respect to health status, health risk and health service utilisation among different Asian ethnic groups.

The Asian population as a whole fared better than Europeans on many health indicators, particularly, life expectancy and avoidable mortality. However, there were many inequalities between Indians and Europeans. Indians had high utilisation of secondary health services, particularly in relation to diabetes and CVD but lower utilisation of preventive and primary health services. Despite the low utilisation of health services, like primary care and cancer screening by the Chinese, their health was generally better than Indians and Europeans.

The inequalities between the Chinese and Indian population were often large, resulting in ‘averaging’ of the results when the ‘Asian’ broad category was

considered. Recognising these differences and monitoring the health of Asian people at level 2 ethnicity would assist in identifying and improving their health needs.

11 Recommendations

The following recommendations were made to the Counties Manukau District Health Board (CMDHB) Chief Funding and Planning Officer:

1. Priority should be given to reduce the health inequalities in Indians

   - A strategic approach is needed to address and reduce the high rates of low birth weight, obesity, diabetes and cardiovascular disease in this ethnic group
   - CMDHB's service development and health gain priority areas should also target Indian people in the interventions such as, Let's Beat Diabetes, Youth Health Plan, Chronic Diseases Plan, Primary Care Plan, Child Health Plan
   - Awareness of the above conditions and the risk factors should be raised in the Indian community through community organisations, PHO's and use of appropriate media
   - 'Lets Beat Diabetes' five year plan needs to acknowledge Indian as high risk group. Development of community leadership and action should be supported, to empower this community to slow the progression of diabetes
   - CCM Diabetes and CVD programmes should include Indians in their high risk groups and encourage their enrolment within the programmes
   - Look for interventions at community level that have been shown to be effective in addressing the increased risk of cardiovascular disease in the Indian communities. CMDHB should advocate to include Indians as a priority group in the 'Healthy Eating - Healthy Action' (HEHA) Implementation Plan 2004-2010

2. Improve primary care access and preventive services for Chinese people

   - The advantage in health of Chinese people is likely to regress with acculturation and as the 'selection' effect wanes. Efforts should be made to monitor the health of this population, learn the positive aspects and encourage health promotion messages in a culturally appropriate manner
   - Information regarding health system in New Zealand, primary care and cancer screening should be disseminated in a culturally consist manner to improve access

3. Reliable data collection of Asian as an entire group and sub-group

   - Reliable data collection as entire group and sub groups is essential to better understand the diversity and particular health issues of this population.

CMDHB should advocate for consistency in ethnicity classification at national, District Health Board (DHB), PHO and Non Governmental Organisation (NGO) level

- Data and information need to be gathered about best practices and lessons learned from health promotion activities and health interventions, particularly at the community level and disseminated widely

4. Future work and research

- Further analysis of health indicators such as mental illness, cancer and infectious diseases, not addressed by this HNA should be conducted

- Further research into effects of migration and differences between first and second generation Asians is required to understand the effects of acculturation and migrant needs

- Further research is required at community and national level to understand the risk factors of CVD in Indians. Community engagement is necessary to design interventions to address these risk factors and for health promotion in a culturally appropriate manner

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13 Appendices

13.1 Appendix1: Classification and codes

Table 13.1.1: Asian categories defined by Statistics New Zealand

Chinese	Indian	Other Asian
Chinese NFD	Indian NFD	Asian NFD
Hong Kong Chinese	Bengali	Southeast Asian NFD
Cambodian Chinese	Fijian Indian	Filipino
Malaysian Chinese	Gujarathi	Cambodian
Singaporean Chinese	Tamil	Vietnamese
Vietnamese Chinese	Punjabi	Burmese
Taiwanese	Sikh	Indonesian
Chinese NEC	Anglo Indian	Laotian
	Indian NEC	Malay
		Thai
		Southeast Asian NEC
		Japanese
		Korean
		Afghani
		Sri Lankan NFD
		Sri Lankan Tamil
		Sri Lankan NEC
		Sinhalese
		Bangladeshi
		Nepalese
		Pakistani
		Tibetan
		Eurasian
(41 categories)		Asian NEC

Notes: NEC = not elsewhere classified; NFD = not further defined

Table 13.1.2: Level 1 codes

1 European
2 Mäori
3 Pacific Peoples
4 Asian
5 Middle Eastern/Latin American/African
6 Other Ethnicity
9 Residual Categories

Table 13.1.3: Level 2 codes

10 European nfd	11 New Zealand European
12 Other European	21 Mäori
30 Pacific Peoples nfd	31 Samoan
32 Cook Islands Maaori	33 Tongan
34 Niuean	35 Tokelauan
36 Fijian	37 Other Pacific Peoples
40 Asian nfd	41 Southeast Asian
42 Chinese	43 Indian
44 Other Asian	51 Middle Eastern
52 Latin American	53 African
61 Other Ethnicity	94 Don't Know
95 Refused to Answer	96 Repeated Value
97 Response Unidentifiable	98 Response Outside Scope
99 Not Stated	

Table 13.1.4: Level 3 codes

100 European nfd	111 New Zealand European
121 British and Irish	122 Dutch
123 Greek	124 Polish
125 South Slav	126 Italian
127 German	128 Australian
129 Other European	211 Mäori
300 Pacific Peoples nfd	311 Samoan
321 Cook Islands Maaori	331 Tongan
341 Niuean	351 Tokelauan
361 Fijian	371 Other Pacific Peoples
400 Asian nfd	410 Southeast Asian nfd
411 Filipino	412 Cambodian
413 Vietnamese	414 Other Southeast Asian
421 Chinese	431 Indian
441 Sri Lankan	442 Japanese
443 Korean	444 Other Asian
511 Middle Eastern	521 Latin American
531 African	611 Other Ethnicity
944 Don't Know	955 Refused to Answer
966 Repeated Value	977 Response Unidentifiable
988 Response Outside Scope	999 Not Stated

Table 13.1.5: Level 4 codes

10000 European nfd
11111 New Zealand European
12100 British nfd
12111 Celtic nfd
12112 Channel Islander
12113 Cornish
12114 English
12115 Gaelic
12116 Irish
12117 Manx
12118 Orkney Islander
12119 Scottish
12120 Shetland Islander
12121 Welsh
12199 British nec
12211 Dutch
12311 Greek
12411 Polish
12500 South Slav nfd
12511 Croatian
12512 Dalmatian
12513 Macedonian
12514 Serbian
12515 Slovenian
12516 Bosnian
12599 South Slav nec
12611 Italian
12711 German
12811 Australian
12911 Albanian
12912 Armenian
12913 Austrian
12914 Belgian
12915 Bulgarian
12916 Belorussian
12917 Corsican
12918 Cypriot nfd
12919 Czech
12920 Danish
12921 Estonian
12922 Finnish
12923 Flemish
12924 French
12925 Greenlander
12926 Hungarian
12927 Icelandic
12928 Latvian
12929 Lithuanian
12930 Maltese
12931 Norwegian
12932 Portuguese
12933 Romanian
12934 Gypsy
12935 Russian
12936 Sardinian
12937 Slavic
12938 Slovak
12939 Spanish
12940 Swedish
12941 Swiss
12942 Ukrainian
12943 American
12944 Burgher
12945 Canadian
12946 Falkland Islander
12947 New Caledonian
12948 South African nec
12949 Afrikaner
12950 Zimbabwean
12999 European nec
21111 Mäori
30000 Pacific Peoples nfd
31111 Samoan
32100 Cook Islands Maori nfd
32111 Aitutaki Islander
32117 Palmerston Islander
32118 Penrhyn Islander
32119 Pukapuka Islander
32120 Rakahanga Islander
32121 Rarotongan
33111 Tongan
34111 Niuean
35111 Tokelauan
36111 Fijian
37111 Admiralty Islander
37112 Australian Aboriginal
37113 Austral Islander
37114 Palau Islander
37115 Bismark Archipelagoan
37116 Bougainvillean
37117 Caroline Islander
37118 Easter Islander
37119 Gambier Islander
37120 Guadalcanalian
37121 Chamorro
37122 Hawaiian
37123 Kanak
37124 Kiribati
37125 Malaitian
37126 Manus Islander
37127 Marianas Islander
37128 Marquesas Islander
37129 Marshall Islander
37130 Nauruan
37131 New Britain Islander
37132 New Georgian
37133 New Irelander
37134 Banaban
37135 Papua New Guinean
37136 Phoenix Islander
37137 Pitcairn Islander
37138 Rotuman
37139 Santa Cruz Islander
37140 Tahitian
37141 Solomon Islander
37142 Torres Strait Islander
37143 Tuamotu Islander
37144 Tuvaluan
37145 Ni Vanuatu
37146 Wake Islander
37147 Wallis Islander
37148 Yap Islander
37199 Pacific Peoples nec
40000 Asian nfd
41000 Southeast Asian nfd
41111 Filipino
41211 Cambodian
41311 Vietnamese
41411 Burmese
41412 Indonesian
41413 Laotian
41414 Malay
41415 Thai
41499 Southeast Asian nec
42100 Chinese nfd
42111 Hong Kong Chinese
42112 Cambodian Chinese
42113 Malaysian Chinese
42114 Singaporean Chinese
42115 Vietnamese Chinese
42116 Taiwanese
42199 Chinese nec
43100 Indian nfd
43111 Bengali
43112 Fijian Indian
43113 Gujarati
43114 Tamil
43115 Punjabi
43116 Sikh
43117 Anglo Indian
44211 Japanese
44311 Korean
44411 Afghani
44412 Bangladeshi
44413 Nepalese
44414 Pakistani
44415 Tibetan
44416 Eurasian
44499 Asian nec
51100 Middle Eastern nfd
51111 Algerian
51112 Arab
51113 Assyrian
51114 Egyptian
51115 Iranian/Persian
51116 Iraqi
51117 Israeli/Jewish
51118 Jordanian
51119 Kurd
51120 Lebanese
51121 Libyan
51122 Moroccan
51123 Omani
51124 Palestinian
51125 Syrian
51126 Tunisian
51127 Turkish
51128 Yemeni
51199 Middle Eastern nec
52100 Latin American nfd
52111 Argentinian
52112 Bolivian
52113 Brazilian
52114 Chilean
52115 Colombian
52116 Costa Rican
52117 Latin American Creole
52118 Ecuadorian
52119 Guatemalan
52120 Guyanese
52121 Honduran
52122 Malvinian
52123 Mexican
52124 Nicaraguan
52125 Panamanian
52126 Paraguayan
52127 Peruvian
52128 Puerto Rican
52129 Uruguayan
52130 Venezuelan
52199 Latin American nec
53100 African nfd
53112 United States Creole
53113 Jamaican
53114 Kenyan
53115 Nigerian
53116 African American
53117 Ugandan
53118 West Indian
53119 Somali
53120 Eritrean
53121 Ethiopian
53122 Ghanaian
53199 African nec
61111 Central American Indian
61112 Inuit
61113 North American Indian
61114 South American Indian
61115 Mauritian
61116 Seychellois
61117 South African Coloured
61118 New Zealander
61199 Other Ethnicity nec
94444 Don't Know
95555 Refused to Answer

13.2 Appendix 2: ICD 10 AM Codes

Table 13.2.1: ICD-10-AM codes

Mortality – PAM categories	Diagnosis codes ICD-10	Condition description
Diarrhoeal disease	A00-A09	Diarrhoeal diseases
Tuberculosis	A15-A19, B90	Tuberculosis
Childhood vaccine preventable disease	A36, B16, A492,J11, B05, A390, A491, A80, B06, A35, B01, A37	Diphtheria, whooping cough, tetanus, polio, measles, Hib, rubella
Sexually transmitted disease except HIV	A50-A64, M023, N341, N70-N735, N738, N739, N750, N751, N764, N766,O00	Syphilis, gonorrhoea + other STDs, ectopic pregnancy
Hepatitis	B15-B19	Hepatitis A, B, C,D,E primary liver cancer
HIV/AIDS	B20-B24	HIV/AIDS
Skin cancers	C00,C43-C44	Lip, melanoma, other skin cancer
Oral cancers	C00-C14	Malig neoplasm mouth, pharynx, larynx
Stomach cancer	C16	Stomach cancer
Colo-rectal cancer	C18-C21	Colo-rectal cancer
Lung cancer	C33-C34	Malig neoplasm trachea, bronchus, lung
Breast cancer	C50	Breast cancer
Cervix	C53	Cervical cancer
Cancer of uterus	C54-C55	Cancer of uterus
Cancer of testis	C62	Cancer of testis
Eye cancer	C69	Eye cancer
Thyroid cancer	C73	Thyroid cancer
Hodgkin's disease	C81	Hodgkin's disease
Lymphoid leukaemia	C91	Lymphoid leukaemia
Benign and in-situ cancers	D00-D36	Benign and in-situ cancers
Nutritional problems	D50-D53, E40-E67	Nutritional deficits including anaemia
Thyroid disorders	E00-E02,E032-E039,E04,E05	Goitre, thyrotoxicosis, hypothyroidism
Newborn screening disorders	E030-E032, E25, E700, E74	Congenital hypothyroidism, CAH, PKU, Galactosaemia
Diabetes	E10-E14	Diabetes
Alcohol-related	F10, I426, K292, K70, Q860, X45	psychosis, alcoholism, cardiac, gastric or liver damage due to alcohol, poisoning
Illicit drug use	F11-F16, F18-F19, X42	Use of illicit drugs
Epilepsy	G40-G41	Epilepsy
Ear infections	H65-H66, H70	Otitis media & mastoiditis
Rheumatic and other valvular heart disease*	I01-I09	Acute rheumatic fever, heart disease
Hypertensive disease	I10-I15, I674	Hypertensive disease
Ischaemic heart disease	I20-I25	Ischaemic heart disease
Stroke	I61, I63-I164, I166	Intracerebral haemorrhage or occlusion
Respiratory infections	J00-J06, J10-J16, J18, J20-J22	Respiratory infections incl pneumonia & influenza
Selected invasive bacterial and protozoal	J020, A38, A46, A39-A41, A481, B50-B54, G00, G03, J13-J15, J18, L03	Brucellosis + other zoonoses, strepto-coccal infection, malaria, meningitis,

infections		congenital infections
CORD	J40-J44	Chronic bronchitis and emphysema
Asthma	J45-J46	Asthma
Peptic ulcer disease	K25-K28	Gastric & duodenal ulcers
Acute abdominal disorders	K35-K38, K40-K46, K80-K83, K915	Acute abdomen, appendicitis, intestinal obstruction, cholecystitis / lithiasis, hernia
Musculo-skeletal infections	L00-L08, M00, M86	Skin, bone & joint infections
Acute renal failure	N17	Acute renal failure
Complication of pregnancy, labor or the puerperium	O01-O99	Complications of pregnancy
Birth trauma & asphyxia	P03, P10-P15, P21	Birth trauma & asphyxia
Low birthweight babies	P05-P07	Prematurity, low birthweight, respiratory disease from prematurity
Other perinatal	P08, P22, P25, P52-P59	respiratory disease, haemolytic disease, jaundice etc
Neural tube defects	Q00, Q05, Q06	Congenital anomalies of brain and spinal cord
Congenital anomalies	Q12-Q22, Q230-Q233, Q238, Q239, Q24-Q28, Q35-Q74	Congenital cardiac, digestive, GU, musculoskeletal anomalies
SIDS	R95	Sudden infant death syndrome
Road traffic injuries, other transport injuries	V01-V04, V06, V09-V80, V87, V89, V99	Motor vehicle crashes
Falls from playground equipment, sport injury	W02, W09, W21,Y930	Falls from playground equipment, sport injury
Drownings	W65-W74	Drownings
Burns and scalds	X00-X09	Burns and scalds
Accidental Poisonings	X40-X41,X43-44, X46-X49	Poisoning (excl alcohol, narcotics)
Suicide and self inflicted injuries	X60-X84, Y870, Y10-Y34	Suicide
Iatrogenic	Y60-Y69	Complications of treatment
PAH categories	Diagnosis codes ICD-10-AM	Condition description
Gastroenteritis	A01-A09	Diarrhoeal diseases, digestive symptoms
Tuberculosis	A15-A19, B90	Tuberculosis
Other infections	A23, A26, A28, A32, A38, B50-B54, J020, J030, P23, P351, P352-P352, P358, P359, P36, P371-P379	Brucellosis, other zoonoses, strep throat, erysipelas, malaria, congenital infections
HIV/AIDS	B20-B24	HIV/AIDS
Immunisation-preventable	A413, A492, B9631, B9639, G000, B05, B06, B26, P350, A37, A33-A36, A80	Diphtheria, whooping cough, tetanus, polio, measles, mumps, HIB, rubella
Hepatitis & liver cancer	B15-B19, C22, P353	Hepatitis A, B, C,D,E primary liver cancer
Sexually-transmitted diseases	A50-A58, A638, A64, I980, M023, M031, M730, M731, N290, N302, N341, N70-N77, O00	Syphilis, gonorrhoea + other STDs, PID, ectopic pregnancy
Skin cancers	C00, C43-C44	Lip, melanoma, other skin cancer
Oral cancers	C01-C06, C09-C10	Malig neoplasm mouth, pharynx, larynx
Colo-rectal cancer	C18-C21	Colo-rectal cancer
Lung cancer	C33-C34	Malig neoplasm trachea, bronchus, lung
Breast cancer	C50	Breast cancer
Cervical cancer	C53	Cervical cancer
Thyroid disease	E00-E05, E890	Goitre, thyrotoxicosis, hypothyroidism

Diabetes	E10-E14, E162	Diabetes, hypoglycaemia
Nutrition	D50-D53, E40-E46, E50-E64, M833, P923	Nutritional deficits incl anaemia
Dehydration	E86-E86, E870	Hypernatraemia, dehydration/volume depletion
Alcohol-related conditions	F10, I426, K290, K292, K70	psychosis, alcoholism, cardiac, gastric or liver damage due to alcohol
Epilepsy	G40-G41, R560, R568	Epilepsy, convulsions
ENT infections	H65-H68, H70, J01, J028-J029, J038-J039	Otitis media & mastoiditis, sinusitis, tonsillitis, pharyngitis
Rheumatic fever/heart disease	I00-I09	Acute rheumatic fever, heart disease
Hypertensive disease	I10-I15, I674-I674	Hypertensive disease, hypokalaemia
Ischaemic heart disease	I21, I22, I25, I240, I241, I248, I249	Myocardial infarction, atherosclerosis, chronic IHD
Angina	I20, R071-R074	Angina, chest pain
Congestive heart failure	I50, J81	Congestive heart failure, acute pulmonary oedema
Stroke	I61, I63-I669	Intracerebral haemorrhage or occlusion
Respiratory infections	J21, A481, J13-J18, J00, J06, J10-J11, J20	Common cold & URTI, acute bronchitis, pneumonia, influenza
CORD	J40-J44, J47	Acute and chronic bronchitis, emphysema, bronchiectasis
Asthma	J45-J46	Asthma
Dental conditions	K00-K06	Dental conditions
Peptic ulcer	K25-K28	Gastric & duodenal ulcers
Ruptured appendix	K350-K351	Ruptured appendix
Obstructed hernia	K400-K401, K403-K404, K410-K411, K413-K414, K420-K421, K430-K431, K440-K441, K450-K451, K460-K461	Obstructed or gangrenous inguinal or other hernia
Kidney/urinary infection	N10, N12, N136, N151, N390	Pyelonephritis, urinary infections
Cellulitis	A46-A469, H000, H010, H050, J340, K122, L01-L04, L08, L980	Skin infections - carbuncles, abscesses, impetigo, pilonidal cyst
Failure to thrive	R62, R633, R64	Feeding problems, Lack of expected development
Gangrene	R02	Gangrene
Surgical indicators	Procedure codes ICD10-AM	comment
Angioplasty	360 excl 3530400, 3530500, 3531000, 3531001, 3531002	Age standardised 15+ years
Coronary artery bypass graft	3849700 - 7, 3850000 - 4, 3850300 - 4, 3863700, 9020100 - 3	Age standardised for 15+ years
Total hip joint replacement	4931800, 4931900, 4932400, 4932700, 4933000, 4933300, 4934500	Age standardised for 15+ years
Total knee joint replacement	4951800, 4951900, 4952100 - 3, 4952400 - 1, 4952700, 495300 - 1, 4953300, 4953400, 4955400	Age standardised for 15+ years
Cholecystectomy	3044300, 3044500, 3044600, 3044800, 3044900, 3045401, 3045500	Age standardised 15+ years
Cataract extraction	4269800 - 5, 4270100 - 1, 4270200 - 211 4270300, 4270400 – 1, 4270700, 4278800 4279102	Age standardised 15+ years
Prostatectomy	3683901 – 4, 3684200, 3700804, 3720000 – 6, 3720300 – 2, 3720700 – 1, 3720900	Age standardised for 15+ males
Hysterectomy	3565300 - 3, 3565700, 3566100, 3566400 - 1, 3566700- 1, 3567000, 3567300 -1, 3575000, 3575300-1, 3575600 - 2	Age standardised for 15-44 year old females
Maternity	Procedure codes ICD-10-AM	comment
Assisted delivery %	9046800 – 4, 9046900, 9047001 - 4	As percentage of all deliveries
Forceps delivery %	9046800 – 4, 9046900, 9047001- 4	As percentage of all deliveries
Caesarean sections %	1652000 – 3	As percentage of all deliveries

13.3 Appendix 3: Census variables included in the NZDep06

Table 13.3.1: Census variables included in the NZDep06

NZDep2006 combines the following census data (calculated as proportions for each small area)

Dimension of deprivation	*Variable description (in order of decreasing weight)*
Income	People aged 18-64 receiving a means tested benefit
Income	People living in equivalised* households with income below an income threshold
Owned home	People not living in own home
Support	People aged <65 living in a single parent family
Employment	People aged 18-64 unemployed
Qualifications	People aged 18-64 without any qualifications
Living space	People living in equivalised* households below a bedroom occupancy threshold
Communication	People with no access to a telephone
Transport	People with no access to a car

*Equivalisation: methods used to control for household composition.