



Asian Health in Aotearoa in 2006 - 2007

TRENDS SINCE 2002-2003 | July 2010

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Author

Robert Scragg, Associate Professor in Epidemiology,
School of Population Health, The University of Auckland.

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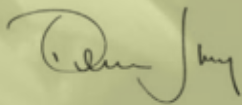
Foreword

This report was commissioned by the Northern DHB Support agency on behalf of the Auckland Regional Settlement Strategy Health Steering group which represents Waitemata, Auckland and Counties Manukau District Health Boards. The Asian Health in Aotearoa in 2006 - 2007: trends since 2002-2003 report makes a substantial contribution to understanding the disparities in the health of Asian sub groups compared to other New Zealand populations. The report finds inequities in access to health services, notably to primary health services, for Asian people compared to other New Zealanders.

The report presents significant new findings to inform health planners and funders about the health status of the Asian populations that they serve. Data analysed in this report comes primarily from the 2006-07 New Zealand Health Survey, complemented by data from Asian participants in the 2002-03 New Zealand Health Survey in order to monitor time trends in health measures among the Asian population. Both New Zealand Health Surveys were carried out by the Ministry of Health. The study is the first and only report to present Asian population health trends in New Zealand. Importantly, this five-year follow up to the first Asian Health in Aotearoa report, shows that national data sets under-represent the risk factors associated with poor health status in Asian sub groups in New Zealand. Furthermore the report is the first survey of child health among the main Asian sub groups in New Zealand. In accordance with the recommendations of the international literature the first and second Asian Health in Aotearoa reports analyse South Asian groups rather than the single group 'Indian'.

This report highlights the substantial differences in health status for diverse Asian sub groups. The averaging of Asian groups as a single ethnic group has led to the misconception that all Asian groups have better health than other New Zealand health populations. On the contrary, the analysis of the health of Asian sub groups shows that there is a high prevalence of chronic disease in some groups. Further, the report demonstrates the effects of acculturation associating the length of residence in New Zealand with declining health outcomes. The implications of the report are that future studies of Asian health should study separately the health Asian sub-groups.

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Denis Jury

Chief Planning and Funding Officer
Auckland District Health Board

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Executive Summary

Background

The completion of the 2006-07 New Zealand Health Survey has provided an opportunity to update the information on the health status of Asian people living in New Zealand, in comparison with the earlier 2002-03 New Zealand Health Survey (both funded by the Ministry of Health). This report examines time trends in the health status of Asian participants in both surveys, and compares the health status of Asian people with other ethnic groups in the 2006-07 survey. The large number of Asian participants has allowed analyses of the health status of the main Asian communities – Chinese, South Asian and Other Asian.

Methods

Both health surveys used a 3-stage, stratified sampling method to randomly recruit participants from households. The sample sizes of the main ethnic groups analysed in this report are:

2006-07 survey:

- Adults aged ≥15 years: Chinese 540, South Asian 565, Other Asian 387, 3,131, Pacific 890 and European 6,719 (total = 12,232).
- Children aged 0-14 years: Chinese 220, South Asian 316, Other Asian 165, Māori 1,947, Pacific 537 and European 1,710 (total = 4,895).

2002-03 survey:

Adults aged ≥15 years: Chinese 494, South Asian 391, Other Asian 332

Face-to-face interviews were carried out in the homes of selected participants. Information was collected on the following topics: socio-demographic status, health risk and protective factors (lifestyle), chronic disease and utilisation of health services.

Results

In the results reported below, all comparisons between Asian and non-Asian ethnic groups are from the 2006-07 survey. In contrast, all comparisons over time are restricted to the Asian samples in the 2002-03 and 2006-07 surveys.

Sociodemography

1. Age

- Asian people, along with Māori and Pacific, were distributed more towards the younger age-groups than Europeans.
- The age-distribution among Chinese and South Asians remained unchanged between the two surveys, but shifted more towards older age-groups among Other Asians from 2002-03 to 2006-07.

2. Time lived in New Zealand

- The time lived in New Zealand increased in all three Asian ethnic groups, with the percentage of all Asian adults aged ≥15 years who had lived 5 or more years in New Zealand being higher in 2006-07 (73%) than in 2002-03 (54%).

3. Education and income

- The Asian community is highly educated, with 35% having a University bachelor or post-graduate degree, compared with about 20% of the non-Asian groups.
- Asian people, along with Polynesian, were distributed more towards low household income categories than European.
- The proportion of Asian people living in the lowest NZDep quintile areas has declined substantially from 31% in 2002-03 to 18% in 2006-07.

Lifestyle

1. Nutrition

- The proportion of children who were breast fed was lower in Chinese (80%) and Other Asians (79%), along with Māori (85%) and Pacific (82%), than in Europeans and South Asians (each 90%).
- The proportion of adults eating the recommended daily number of serves of fruit and vegetables (≥5) was lower in all Asian ethnicities (Chinese 47%, South Asian 40%, Other Asian 41%), and in Māori (48%) and Pacific (44%), compared with Europeans (57%).
- The proportion of Asian men and women eating the recommended daily number of serves of fruit and vegetables did not change between the two surveys.

2. Physical activity

- Asian people (Chinese 41%, South Asian 46%, Other Asian 45%), along with Pacific (49%), were less likely to be physically active than European (54%) and Māori (57%).
- The proportion of Asian men and women who were physically active or sedentary did not change between the two surveys.

3. Tobacco

- Asian women were less likely to be current tobacco smokers than European women (4% versus 15%), while Asian and European men were similar (17% versus 15%).
- There was no change in the frequency of tobacco smoking by Asian men or women between the two surveys.
- For adults, the percent that lived in a house where people smoke inside was lower among South Asians, and similar for Chinese and Other Asians, compared to Europeans.
- For children, the percent that lived in a house where people smoke inside was similar for all ethnic groups, aside from Māori who had the highest level.

4. Alcohol

- Asian (60%) and Pacific (57%) people were less likely to drink alcohol than Māori (84%) and Europeans (89%).
- Asian people who drink alcohol were less likely to binge drink than European and Polynesian drinkers.
- The frequency of alcohol consumption increased in Chinese and Other Asians between the two surveys, but remained unchanged in South Asians.

5. Gambling

- Asian people were less likely to gamble in the last 12 months (44%) than Pacific (54%), European (68%) and Māori (72%).
- The proportion of Asian people who gamble remained unchanged between the two surveys.
- Lotto was the most common type of gambling by Asian people in the last 12 months (37%).

6. Body size

- Asian children had similar prevalences of overweight and obesity to European children, using the standard international criteria.
- The prevalence of obesity in Asian adults (using the ethnic specific criterion of BMI ≥ 25.0) increased from 26% in 2002-03 to 41% in 2006-07.

8. Acculturation

- A longer period of residence in New Zealand by Asian people was associated with increased likelihood of being an alcohol drinker and of being overweight and obese, and decreased likelihood of being a non-smoker.

Chronic Disease

1. Children

- South Asian children had lower prevalences of asthma, eczema and allergy than European children, while Chinese and Other Asian were similar.

2. Adults: Cardiovascular disease and diabetes

- South Asian, Pacific and Māori people had increased prevalences of being on treatment for hypertension compared to European.
- South Asian people had double the risk of being on treatment for high cholesterol than European.
- The prevalence of being on treatment for diabetes was increased four-fold in South Asian and Pacific people, and two-fold in Other Asian and Māori, compared with European.

3. Adults: Other chronic diseases

- The prevalences of asthma and chronic bronchitis/emphysema were lower in Asian people compared with European.
- The prevalences of arthritis, and of back and neck disorders, were lower in Chinese, South Asian, Other Asian and Pacific, compared to European and Māori.
- Self-reported depression was less common in Chinese, South Asian, Other Asian and Pacific people, compared to European and Māori.

4. Adults: time trends

- Overall, there was no change between the two surveys in the prevalence of chronic adult conditions and mental health status among Asian people.

Health Service Utilisation

1. Primary health care provider

- Asian children and adults, aside from South Asian children, were less likely to have a usual health practitioner or service to visit when first unwell, compared to non-Asians.
- Family practices and GP clinics were the most common health care provider visited by Asian people when first unwell ($\geq 90\%$), although a relatively high proportion of Chinese adults (8%) attended a student health service.
- South Asian people, along with Māori and Pacific, were more likely to receive services related to weight and cardiovascular disease from staff at their usual primary health care provider than European, Chinese and Other Asian people. However, the "Green Prescription" was not being used by South Asian people at an appropriate level, given their low physical activity and high BMI levels.

2. Type of practitioner consulted in last 12 months

- The proportion of children who saw a family doctor in the last 12 months was higher for South Asian (86%), but similar for all other ethnic groups, compared with European (79%).
- The proportion of adults who saw a family doctor in the last 12 months was lower for Chinese (65%) and Other Asian (70%), but similar for South Asian (79%), Māori (79%) and Pacific (78%), compared with European (83%).
- Chinese children were less likely to have seen a primary health care nurse and Well Child nurse in the last 12 months than European children (51% versus 76%).
- Asian adults and children were generally less likely to have seen in the last 12 months a range of other health professionals (aside from the family doctor), such as medical specialists, pharmacists, and social workers, than Europeans.
- Chinese people were more likely to have seen an acupuncturist or Chinese medical practitioner in the last 12 months, while Europeans were more likely to have seen an osteopath or chiropractor, compared to other ethnic groups.

3. Reasons for visiting family doctor

- Chinese and South Asian children were more likely to see their family doctor for a short-term illness than children of other ethnicities.
- Asian adults were more likely to see their family doctor for a short-term illness or a routine check up than European adults.
- Asian adults were less likely to see their family doctor for mental or emotional health reasons, or contraceptive advice, than Europeans.

4. Use of screening services

- The proportion of women aged 45-69 years who had a mammogram in the last two years was lower in South Asian (53%), Other Asian (52%), Māori (49%) and Pacific (50%) groups compared with Chinese (66%) and European (74%).
- The proportion of women aged 20-69 years who had a cervical smear in the last 3 years was lower in Chinese and Other Asian (both 51%), South Asian (55%), Pacific (57%) and Māori (75%) than European (84%) women.

5. Use of telephone helplines

- Overall, the parents and care-givers of Asian children were less likely to have used telephone helplines in the last 12 months than European.
- The most common helplines used by Asian people for their children were Healthline (5%), Plunketline (4%) and their family doctor (4%) or nurse (3%).

6. Secondary health services

- South Asian and Chinese children were less likely to have used a public hospital in the last 12 months (both 13%) compared to European (17%), who were similar to Other Asian (16%).
- Asian adults were less likely to have used a public hospital in the last 12 months compared to European (15% versus 22%).
- Asian adults (3%), along with Māori and Pacific (both 3%), were less likely to have used a private hospital in the last 12 months compared to European (7%).

7. Oral health

- South Asian children were less likely to have visited a dentist or oral health care worker in the last 12 months (63%) than European (79%), who were similar to Chinese (72%) and Other Asian (71%).
- Asian adults were less likely to have visited a dentist or oral health care worker in the last 12 months than European (35% versus 56%).

Conclusions

1. Asian people in New Zealand remain more highly educated than other New Zealanders; but they have lower incomes and are more likely to live in more economically deprived areas than Europeans, which limits their options for making healthy lifestyle choices.
2. The prevalence of obesity has significantly increased among Asian adults in New Zealand from 2002-03 to 2006-07. This is consistent with the lack of change between the two surveys in the levels of physical activity and daily serves of fruit and vegetables, which both remain below those of Europeans.
3. Lifestyle acculturation is occurring among Asian New Zealanders, with adverse health patterns for alcohol drinking, tobacco smoking and obesity increasing with length of residence in New Zealand.
4. South Asian people have increased prevalences of treated hypertension, high blood cholesterol and diabetes, compared with Europeans. Other chronic diseases – such as asthma, bronchitis, arthritis and back/neck disorders – are less common in Asian people than Europeans.
5. Asian people are not accessing the health services to the same degree as non-Asians. Generally, they are less likely to: have a primary health care provider; to have seen in the last 12 months a range of health professionals, including medical specialists, pharmacists, and social workers; and to have used a private or public hospital in the last 12 months. Further, Asian women are less likely to have mammography or cervical screening tests than European women.
6. Given the continual rapid increase in the size of the Asian population living in New Zealand, there is an urgent need for Asian health data from national and regional surveys, in order to monitor the health status of Asian people in Aotearoa.

Background

This report was commissioned by the Northern DHB Support Agency Ltd. Its aim is to update the information on the health status of Asian people living in New Zealand by comparing data collected in the 2006-07 New Zealand Health Survey with the earlier 2002-03 survey.¹ Both surveys were funded by the Ministry of Health which has published detailed reports of their main findings.^{2,3} However, the latter reports have analysed Asian participants as a single group and have not provided information on the main individual Asian communities in New Zealand, particularly for the Chinese and South Asian communities which are sufficiently large for their own specific analyses.

Both New Zealand Health Surveys are nationally representative samples of the New Zealand population, with 12,488 adults aged ≥ 15 years and 4921 children aged 0-14 years surveyed in 2006-07, and 12,529 adults aged ≥ 15 years surveyed in 2002-03 (no children were included in the latter survey). The Asian samples comprise 1,492 adults (540 Chinese, 565 South Asian, 387 Other Asian) in 2006-07 who have been compared with 1,217 adults (494 Chinese, 391 South Asian, 332 Other Asian) surveyed in 2002-03; and 701 children surveyed in 2006-07.

Comparisons have been made between Asian participants in both surveys, and between Asian and other ethnic groups in the 2006-07 survey. The topics included in this report cover socio-demographic status, health risk and protective factors (lifestyle), chronic disease and utilisation of health services. It is the first report to describe national data on the health status of children from the main Asian communities in New Zealand. The current report builds on earlier Asian health reports including a 2003 report on the public health needs of the Asian population living in Auckland;⁴ the 2006 Asian Health Chart Book from the Ministry of Health which analysed data from the 2002-03 New Zealand Health Survey, along with mortality and hospital morbidity data;⁵ and a needs assessment of the Asian community in South Auckland⁶ and also North and West Auckland.⁷

Literature Review

The Asian community in New Zealand continues to emerge as an important demographic group. At the time of the 2006 New Zealand census there were about 355,000 Asian people in New Zealand (8.8% of the population. This is expected to increase to about 790,000 by 2026 (14.3% of the population), similar in size to the Māori population.⁸ Understanding the health status of the Asian community, and tracking trends, is required to ensure that the health needs of Asian New Zealanders are met.

The following review summarises some of the recent literature from studies of Asian people related to the topics covered in this report. Although much of the research comes from North America, where a large effort has been undertaken to study the health issues associated with migration from Asia to the US and Canada, many of the findings are likely to be relevant to the New Zealand setting.

Nutrition

The foods we eat have an important effect on our health status. At birth, the decision to breastfeed is a critical lifestyle choice made by parents at the beginning of their child's life which may have long term consequences. High breastfeeding rates are desirable since a Vietnamese cohort study showed that longer duration of breast feeding protected against the onset of obesity in children attending kindergartens in Ho Chi Minh City.⁹ Low breastfeeding rates have been reported among Chinese mothers in Hong Kong,¹⁰ and among those who have migrated to Australia.¹¹ Reduced breastfeeding prevalences have also been identified among Asian women who have migrated to the US, where they are lower than in their Asian country of origin.¹²⁻¹³ Reasons for the low prevalences in Asian women who emigrate are unclear. A study of Cambodian, Chinese and Vietnamese who had migrated to Los Angeles found that bottled formula milk was preferred to breast milk for feeding their infants because of beliefs related to the Asian humoral medical system.¹⁴ Targeted interventions can increase breastfeeding. For example, a hospital-based intervention study showed that a staff training program on breastfeeding, along with the creation of a culturally appropriate menu, increased breastfeeding initiation in Cambodian mothers in Massachusetts.¹²

Obesity prevalences are increasing around the world including in India,¹⁵ China¹⁶ and New Zealand.¹⁷ Nutritional risk factors for obesity include increased energy consumption through dietary fat and refined carbohydrates, particularly sugary drinks, and food behaviours such as skipping breakfast.¹⁸⁻¹⁹ There are several studies indicating that energy intake by Asian people increases after migration to Western countries. Korean Americans consume more take away energy dense foods than native Koreans.²⁰ Taiwanese women increased their energy intake after migration to Australia, with energy intake associated with length of residence in Australia.²¹ Chinese Americans increased their consumption of sugary drinks (and other foods including fats and sweets) after migration to the US.²² Acculturation was associated with increased fast food consumption in Asian children at middle schools in California,²³ and increased energy intake among adult Korean Americans.²⁴ Third generation Japanese Americans were less likely to have breakfast, and consumed more take away foods and soft drinks, than their second generation parents.²⁵ In contrast, a small New Zealand study found that frequency of breakfast and intake of sugary drinks and takeaway foods by Indians declined with increasing length of residence in New Zealand.²⁶ Obesity is a major determinant of the metabolic syndrome which has a causal role in cardiovascular disease. Another risk factor for cardiovascular disease is hypertension, which is caused in part by high intakes of dietary salt. China and Japan have very high salt intakes compared to other countries.²⁷

Physical Activity

Regular physical activity is a well-established lifestyle behaviour that has been shown in many populations to protect against a range of chronic diseases, including a retrospective cohort study of Korean men which found that physical activity at least three times a week was associated with an approximate 40% reduction in total mortality during the follow-up period.²⁸ A study of US college students, which included Asians, found that physical inactivity was associated with obesity.²⁹ In contrast with diet, the association between acculturation and physical activity is less consistent. A cohort study of students at middle schools in California (mean age 11 years), which included Asian children, found that acculturation was inversely associated with physical activity during the 1 year follow-up period.²³ In contrast, acculturation was positively associated with vigorous exercise among Koreans living in California,³⁰ and length of residence in New Zealand was associated with increased physical activity among Indian New Zealanders;²⁶ while no association was found between acculturation and physical activity in Korean American women.³¹ Cross-cultural comparisons have generally found that Asian immigrants are less active than the native-born people of their host country. First-generation Asians in California had lower physical activity levels than Whites, although physical activity was higher in second and third generation Asians.³² A British study found lower levels of physical activity (measured by Actigraph counts) in South Asian children compared with Europeans and Afro-Caribbeans.³³

Television Watching

Watching television (TV) is a well-established risk factor for obesity, particularly in children.³⁴ Increased TV watching by Chinese children in Taiwan was associated with increased BMI.³⁵ A study of US college students, which included Asians, found an association between TV watching and obesity.²⁹ A Californian study observed higher average hours of watching TV by Asians than Whites.³² A national survey of US high school students found similar levels of TV watching at baseline in Asian and White students, but greater increases among Asian students one year later.³⁶

Obesity

Obesity is an emerging issue in Asia, with higher socio-economic status associated with higher obesity prevalences among Indian children in Delhi,³⁷ and increasing prevalences also observed in Chinese children.³⁸ The research on acculturation and obesity, like physical activity above, shows inconsistent results. For example, length of residence has been found to be associated with body fat among Taiwanese women in Australia,²¹ while obesity levels are higher in Chinese children born in the US than foreign-born.³⁹ In contrast, acculturation was inversely associated with percent body fat among Chinese children⁴⁰ and Asian adolescents⁴¹ in California. Body fatness has also been observed in Indians to be associated inversely with length of residence in New Zealand.²⁶ There are ethnic variations in the level of obesity associated with BMI, with a New Zealand study showing that Indians have similar body fat levels to those of Europeans with BMI levels 4-6 units higher.⁴² New Zealand research has also shown that a short-term lifestyle intervention can reduce obesity and cardiovascular risk factors in Indian New Zealanders.⁴³

Other Lifestyle Factors

Other lifestyle factors discussed in this report include tobacco smoking, alcohol drinking and gambling. While very little has been published on alcohol drinking in Asian populations, perhaps because intake is relatively low compared with other populations, tobacco smoking is an issue of increasing importance. Smoking prevalences are very high amongst men in East Asian countries (China, Korea, Japan all >50%).⁴⁴ A review of US studies on tobacco use by Asian immigrant communities shows very high smoking prevalences among men from China, Korea and Japan, and very low levels among women from these countries; while smoking is less common among people from India.⁴⁵ A survey of Chinese Americans in New York on tobacco issues found that participants were very aware of the adverse effects from tobacco, and that doctors and the Chinese media were the most trusted sources of information.⁴⁶ With acculturation, smoking prevalences among US Asian immigrants trend towards the levels among US whites – ie. they decrease in Asian men, and increase in Asian women. Hence, the opposite effects from acculturation on tobacco smoking between men and women reported in Asian Americans.⁴⁷ In New Zealand, the 2006-07 Health Survey observed lower smoking prevalences in both men and women among Asian participants compared with the national levels.³ Thus, the effects of acculturation are likely to increase smoking in the future among both Asian men and women who have migrated to New Zealand.

Gambling is a long-established behaviour in Chinese culture, extending back thousands of years, and used by the state 3000 years ago to help fund the building of the Great Wall.⁴⁸ A recent review of gambling among Chinese people found that problem gambling has increased over the years, particularly in men.⁴⁸ A study of Chinese people in Canada (aged ≥55 years) identified the following risk factors for any type of gambling (not just problem gambling): being male, longer residence in Canada, and having a strong level of Chinese ethnic identity; while having post-secondary education and higher level of life satisfaction reduced the probability of gambling.⁴⁹ Similar findings were observed in a study of US Cambodian refugees which linked problem gambling to being male, being married and to pre-migration trauma exposure.⁵⁰

Health conditions

Cardiovascular disease is typically thought to be common only in Western countries. However, the disease also is very common in the Indian sub-continent where it has increased 6-fold in the last 40 years, and occurs at much younger ages, with relatively greater years-of-life lost, compared with the rest of the world.⁵¹ The prevalence of diabetes is also increasing in India,⁵² and in other Asian countries.⁵³ In East and South-East Asian countries, including China and Korea, the prevalence of the metabolic syndrome, a major risk factor for cardiovascular disease and diabetes, is also rising rapidly and approaching the levels in Western countries.⁵⁴

The risk of having the metabolic syndrome and cardiovascular disease appears to further increase after migration from Asia. Insulin resistance and blood triglyceride levels are associated with length of stay by Taiwanese women in Australia.⁵⁵ Cardiovascular disease mortality is 40-50% higher among South Asians in the UK compared with the rest of the population.^{56,57} A similar pattern of high cardiovascular disease morbidity and mortality exists in North America, where rates are increasing in South Asians in contrast with other ethnic groups where they are declining.^{58,59}

The traditional risk factors (ie. hypercholesterolaemia and hypertension) partly explain the high rates of cardiovascular disease in South Asians. They also are important for other Asian groups. For example, poorly controlled hypertension has been identified as a risk factor for stroke in Chinese Americans.⁶⁰ Lack of knowledge about the symptoms causing cardiovascular disease may be important, as a study of Korean Americans found that they had variable knowledge about heart attack symptoms.⁶¹ There is also evidence of other chronic diseases becoming more common after migration from Asia. Cancer incidence has been observed to increase in Indians after migration to Canada.⁶² Migration was found to adversely impact mental health status in a study of Chinese Canadian women.⁶³ Factors have been identified which appear to protect against the stress of migration. Self-esteem and optimism were associated with increased resilience among Korean women who had migrated to the US.⁶⁴ Young age and increasing length of stay in the US were associated with decreased stress from migration in Pakistani female adolescents,⁶⁵ while acculturation has been shown to moderate the onset of depression among Korean Americans.⁶⁶

Health Services

There is increasing evidence that Asian people who have migrated to Western countries are less likely to access health services. A Canadian study found that Chinese Canadians are less likely to use mental health services than non-Chinese Canadians.⁶⁷ There is a substantial literature showing that breast and cervical cancer screening are less common among Asian women who have migrated to North America than the host populations. A Canadian study found that Asian immigrant women were less likely to have had a cervical screening test than native-born women.⁶⁸ The prevalence of breast screening is low among Asian American women in general,⁶⁹ and in Korean American women specifically.⁷⁰ A study of South Asian women in New York identified having medical insurance, being married, education and increasing length of residence in the US, as factors associated with increased breast and cervical screening.⁷¹ Similar findings were reported in a study of colorectal cancer screening in US Koreans,⁷² while acculturation was associated with increased participation in colorectal screening by Chinese Americans.⁷³

Beliefs about cancer among Asian Americans, such as Chinese in the US where it is thought to be a contagious disease, and also stigma associated with having cancer, are thought to affect attitudes to screening.⁷⁴ In addition, there is evidence that Asian American physicians are reticent about referring their Asian patients for cancer screening.^{75,76} Use of Chinese media in the US was effective in increasing breast awareness among Chinese American women.⁷⁷ However, sources of health information are ethnic-specific; for example, they are different among Vietnamese men in the US to other ethnic groups.⁷⁸ Effective sources of health information are important for other diseases, such as asthma, about which Asian Americans have less knowledge than non-Asian Americans.⁷⁹ In contrast with decreased use of allopathic cancer screening services by Asian Americans, the use of complementary health services by Chinese Americans is very high.^{80,81}

Summary

There is a substantial body of research showing that acculturation affects the health status of Asian people who have emigrated to other countries, and that acculturation can have both negative and positive benefits. Although the lifestyle of Asian people is predominantly determined by cultural practices derived from their countries of origin, the above review indicates it is inevitable that the majority culture already established in New Zealand increasingly will influence the lifestyles of Asian people, the longer they live in New Zealand.

Methods

Data analysed in this report come primarily from the 2006-07 New Zealand Health Survey, complemented by data from Asian participants in the 2002-03 New Zealand Health Survey in order to monitor time trends in health measures among the Asian population. Full details of the methods used in both New Zealand Health Surveys have been published.^{2,3} The 2006-07 survey sampled both children aged 0-14 years and also adults aged 15 years and over, while the 2002-03 survey sampled only adults aged 15 years and over. The target population for sampling into both surveys was the New Zealand population resident in permanent private dwellings.

The 2006-07 survey used a 3-stage, stratified method to select participants. The first stage was to randomly sample Statistics New Zealand meshblocks with probability proportional to their size. The second stage was to randomly select households within meshblocks. These comprised a 'core' sample of every k^{th} house within the meshblock, plus a 'screened' sample of every j^{th} house within a meshblock (ie. at a different sampling probability to the core sample) from which people were only selected if they were of Māori, Pacific or Asian ethnicity. The third stage was to select individuals (one adult and one child, if available) from within each household. A total of 12,488 adults aged ≥ 15 years and 4921 children aged 0-14 years (through their parent or caregiver) were interviewed. The response rate was 68% for adults and 71% for children, and interviews were carried out from October 2006 to November 2007.

The 2002-03 survey used a similar 3-stage method, with meshblocks stratified by Māori ethnicity, with oversampling of Asian residents in meshblocks with $< 70\%$ Māori to ensure that 1000 Asian participants aged ≥ 15 years were recruited (one person per household). A total of 12,529 people were interviewed, with a response rate of 72%, and interviews were carried out from September 2002 to January 2004.

In both surveys, face-to-face interviews (lasting 60 minutes on average) were carried out in the homes of participants, with interviewers and participants matched by language, ethnicity and sex, when required. Trained interviewers administered the questionnaire to participants. The adult questionnaires had 5 modules: chronic disease, health service utilisation, health risk and protective factors, self-reported health status and socio-demographic status. The child questionnaire (2006-07 survey) had 4 modules: health status and development, health service utilisation, health risk and protective factors and socio-demographic status. In addition, weight and height of participants were measured using portable scales and stadiometers. The questionnaires are available from the Ministry of Health's website at www.moh.govt.nz

In both surveys, ethnicity of participants was recorded by self-identification using the standard census question, which allows a person to choose more than one ethnic group. The following priority system was used for this report:

- If any Asian ethnicities were recorded, the participant was assigned to 'Asian'.
- If Māori was recorded, the participant was assigned to 'Māori'.

- If any Pacific ethnicities were recorded, the participant was assigned to 'Pacific'.
- If European was recorded, the participant was assigned to 'European'.
- All remaining participants were assigned to 'Other'.

The Asian sample was further assigned, based on coding available from the Ministry of Health, into three groups, with the following order of priority: South-Asian (Indian, Fiji-Indian, Pakistani, Sri Lankan, Bengali, Nepali and Afghani), Chinese and Other Asian. The numbers of participants in the 2006-07 survey analysed in this report were 12,232 adults aged ≥ 15 years after excluding 139 participants of other ethnicities and 117 with missing ethnicity, and 4,895 children aged 0-14 years after excluding 25 of other ethnicity and one with missing ethnicity. Their sex and ethnic breakdown for questionnaire and anthropometric data are shown in Table 1a. The sample sizes for Asian participants from the 2002-03 survey included in analyses are shown in Table 1b.

NZDep2006 is the main summary measure of socioeconomic status (SES). This is an area-based index of deprivation for all houses in the mesh block that includes the participant's home address. The measures of deprivation are from the 2006 census and include income, access to a car, home ownership, and employment status.

The weight and height of each participant was measured. Body mass index (BMI) was calculated according to the standard formula: weight (kg) / height (m)². The World Health Organisation (WHO) classifications for overweight (BMI 25.0-29.9) and obesity (BMI > 30.0) were applied to European participants, while for Asians the classification of overweight was BMI 23.0-24.9 and of obesity was BMI ≥ 25.0 , as used in previous New Zealand reports.⁵ For Māori and Pacific people, the classification of overweight was BMI 26.0-31.9 and of obesity BMI > 32.0 . For children, the age- and sex-specific classifications for obesity, overweight and thinness from the International Obesity Task Force (IOTF) were used.⁸² Data were analysed using SUDAAN (version 10.0.0, Research Triangle Park, NC). The datasets provided by the Ministry of Health included survey weights to produce nationally representative estimates. Importantly, the datasets did not include a primary sampling unit cluster variable to correct for possible design effects from the complex survey design. Instead, replicate weights were included in the data set for use with the jack-knife statistical method to adjust standard errors for any design effects arising from the clustered sampling, where multiple dwellings were sampled within each selected primary sampling unit. In this report, standard errors were calculated using replicate weights with the SUDAAN software. However, the complete method recommended in the main Ministry of Health reports for correcting standard errors involves additional manual calculations. This could not be done with the time and resources available, so it is possible that standard errors have been under-estimated. Thus, p-values between 0.05 and 0.01 need to be interpreted with caution. In all figures, the error bars are 95% confidence intervals (95% CI).

Table 1a: Number of survey participants with questionnaire and anthropometry measurements – 2006-07 NZ Health Survey, by sex and ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
Adults (≥ 15 years)						
Questionnaire						
Female	322	270	247	1934	511	3803
Male	218	295	140	1197	379	2916
Total	540	565	387	3131	890	6719
Anthropometry						
Female	300	246	237	1745	454	3454
Male	215	289	136	1147	370	2849
Total	515	535	373	2892	824	6303
Children (0 -14 years)						
Questionnaire						
Female	93	154	84	928	248	807
Male	127	162	81	1019	289	903
Total	220	316	165	1947	537	1710
Anthropometry*						
Female	76	121	71	735	201	675
Male	110	124	70	814	238	763
Total	186	245	141	1549	439	1438
* measured on ages 2-14 years only						

Table 1b: Number of Asian adults aged ≥15 years with questionnaire and anthropometry measurements – 2002-03 NZ Health Survey, by sex and Asian ethnicity.

Variable	Chinese	South Asian	Other Asian
Questionnaire			
Female	290	207	209
Male	204	184	123
Total	494	391	332
Anthropometry			
Female	269	193	193
Male	196	177	121
Total	465	370	314

Results

The adult and child datasets from the 2006-07 New Zealand Health Survey have been analysed, comparing the following six ethnic groups – Chinese, South Asian, Other Asian, Māori, Pacific and European.

Comparisons between adults aged ≥ 15 years in the 2002-03 and 2006-07 surveys have been made for the three Asian ethnic groups – Chinese, South Asian, and Other Asian – for selected variables in order to monitor time trends in health measures among the Asian population.

Text, tables and figures are shown for each of the following sections:

- Sociodemography: gender, age, New Zealand born, NZDep2006 (a summary measure of SES), education, household income, government benefit support and health insurance;
- Lifestyle: nutrition, physical activity, television, tobacco, alcohol, gambling and anthropometry;
- Chronic disease: including asthma, eczema and allergy in children, and past history of cardiovascular disease, diabetes, lung disease, arthritis and cancer in adults;
- Health service utilisation: including usual health service, type of practitioner consulted in last 12 months including alternative health care worker, reasons for visiting general practitioner, mammography and cervical smear testing, use of helplines, secondary health services and oral health care.

Values shown are weighted to represent the New Zealand population, unless otherwise stated.

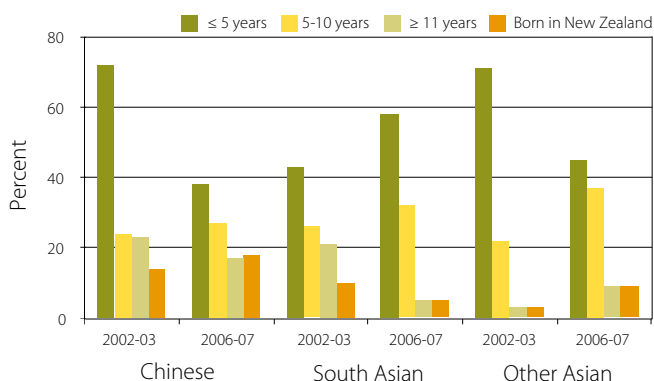
Sociodemography

Gender, Age and NZ Born

2006-07 survey (Tables 2a, 2b): the gender distribution was similar across all six ethnic groups in children (Table 2a), but varied among adults with Chinese and Māori having a higher proportion of women (57% and 53%, respectively), and South Asian a lower proportion (47%), compared with European (52% - Table 2b). The age-distribution varied among children, with Māori and Pacific being distributed more, and Other Asians less, towards the youngest age group (0-4 years) than Europeans (Table 2a). Among adults, all ethnic groups were distributed more towards the younger age-groups than the European (Table 2b). Among adults, the proportion born in New Zealand was lowest in the three Asian communities – Other Asian 4%, South Asian 9%, Chinese 12% - and highest in Māori (99%). South Asians had the highest proportion who had arrived in New Zealand within 5 years prior to the survey (32%), followed by Other Asians (27%) and Chinese (22%); with all three being much higher than Pacific (5%) and Europeans (3%).

Asian time trends (Table 2c): the proportions of men and women in each Asian ethnic group did not change between the two surveys ($p>0.05$). The age distribution also remained unchanged for Chinese and South Asians, although Other Asians were distributed more towards the older age groups (≥ 45 years) in 2006-07 (32%) than in 2002-03 (23%). The time lived in New Zealand was increased in all three Asian ethnic groups, with the percentage who had lived 5 or more years being substantially higher in 2006-07 than in 2002-03 (Figure 1). The percentage of all Asian adults who had lived 5 or more years in New Zealand was 73% in 2006-07 compared with 54% in 2002-03.

Figure 1: Time lived in New Zealand by Asian adults aged ≥ 15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.



Education and Income

2006-07 survey (Table 3a): the Asian community in New Zealand is highly educated, with all three Asian ethnicities being more likely to have a University bachelor or post-graduate degree – Chinese 37%, South Asian 35%, Other Asian 31% (all Asians 35%) - than Europeans (18%), Māori (10%), or Pacific (6%) (Figure 2). Despite this, the proportion studying more than 20 hours per week was highest among Chinese (20%) and Other Asian (19%), and lowest among European (7%), although these differences were not significant after adjusting for age and sex. Chinese and South Asian people were more likely to live in low SES decile areas than European, as were Māori and Pacific people. All Asian and Polynesian ethnicities were distributed more towards low household income categories than European. The proportion receiving government income support was similar for all three Asian ethnic groups and Europeans, and highest for Māori and Pacific, after adjusting for age and sex. A lower proportion of South Asians and Other Asians had health insurance (33% and 32%, respectively), as did Māori (23%) and Pacific (18%), compared to Europeans (42%), who were similar to Chinese (47%), adjusting for age and sex.

Asian time trends (Table 3b): there was no change in the education qualification profile between the two surveys in any of the three Asian ethnic groups ($p>0.05$), although the proportion of Chinese studying more than 20 hours per week declined substantially from 35% in 2002-03 to 20% in 2006-07 ($p=0.0002$). The proportion in the highest household income category ($> \$70,000$) increased substantially in all three Asian groups between the two surveys, although these percentages have not been adjusted for inflation. However, the proportion living in the lowest NZDep quintile areas declined substantially from 2002-03 to 2006-07 – Chinese 26% to 17%, South Asian 38% to 22%, Other Asian 28% to 13% (all Asians 31% to 18%) – suggesting an increase in socioeconomic status relative to the wider New Zealand population during this period. There was no change in the proportion of Asian people receiving government support between the surveys, and no change in the proportion having health insurance, aside from an increase among Chinese.

Figure 2: Highest educational qualification in Asian adults aged ≥ 15 years – 2006-07 survey, by Asian ethnicity.

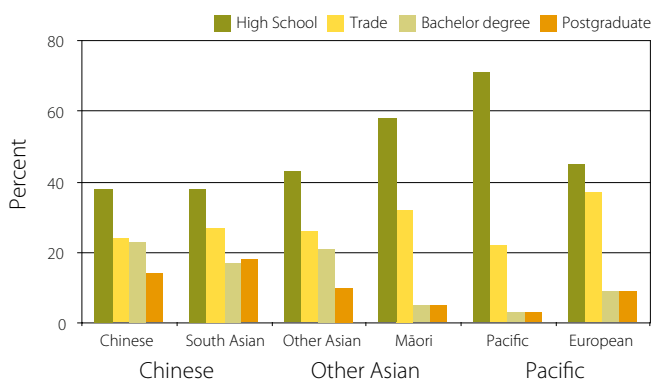


Table 2a: Distribution of demographic variables in children aged 0-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Gender						
Female	55	54	48	51	51	51
Male	45	46	52	49	49	49
Age (years)*						
0-4	33	37	§18	§34	‡36	32
5-9	40	29	37	34	32	33
10-14	28	34	32	32	32	35

P-value compared with European: ‡ <0.01, § <0.001* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 2b: Distribution of demographic variables in adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group						
	Chinese	South Asian	Other Asian	Māori	Pacific	European	
	%	%	%	%	%	%	
Gender*							
Female	†57	†47	57	§53	52	52	
Male	43	53	43	47	48	48	
Age (years)*							
15-24	§29	§23	§31	§27	§28	15	
25-34	22	25	16	21	22	14	
35-44	21	23	22	21	21	19	
45-54	13	16	21	16	14	19	
55-64	9	7	7	9	8	15	
65-74	5	5	3	5	5	10	
75+	2	1	1	2	2	8	
NZ Born?	Years in NZ*						
No	<5	§22	§32	§27	§<1	§5	3
No	5-10	35	35	34	<1	10	2
No	11-20	26	19	27	1	14	3
No	>20	5	6	8	<1	30	10
Yes	-	12	9	4	99	41	82

P-value compared with European: † <0.05, ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 2c: Distribution of demographic variables in Asian adults aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian		
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07	
	%	%	%	%	%	%	
Gender							
Female	56	57	56	57	58	57	
Male	44	43	44	43	42	43	
P-value	0.88		0.99		0.92		
Age (years)							
15-24	33	29	17	23	30	31	
25-34	21	22	26	25	28	16	
35-44	20	21	23	23	17	22	
45-54	13	13	22	16	17	21	
55-64	6	9	6	7	4	7	
65-74	5	5	4	5	4	3	
75+	2	2	1	1	0	1	
P-value	0.65		0.61		0.046		
NZ Born?	Years in NZ						
No	<5	45	22	50	32	43	27
No	5-10	28	35	14	35	31	34
No	11-20	13	26	22	19	18	27
No	>20	4	5	8	6	2	8
Yes	-	10	12	7	9	5	4
P-value	<0.0001		<0.0001		0.0038		

Table 3a: Distribution of Socioeconomic Status (SES) variables in adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
NZDep2006 quintile*						
1 & 2 (high)	†16	‡8	24	‡9	‡4	26
3 & 4	20	17	17	13	8	22
5 & 6	22	17	22	16	14	22
7 & 8	25	36	25	24	18	19
9 & 10 (low)	17	22	13	38	57	12
Highest qualification*						
High school only	‡38	‡38	‡43	‡58	‡71	45
Trade, certificate, etc	24	27	26	32	22	37
Bachelor degree	23	17	21	5	3	9
Postgraduate degree	14	18	10	5	3	9
Study >20 hours / week	20	11	19	11	13	7
Household income* (\$ in last 12 months)						
≤ 15,000	‡15	†6	‡9	‡9	‡8	5
15,001 – 25,000	14	9	13	13	10	10
25,001 – 40,000	15	15	18	18	19	14
40,001 – 70,000	27	32	32	26	30	25
70,001 – 100,000	18	19	16	18	16	20
>100,000	11	19	12	16	17	27
Receive government income support	28	31	32	‡51	‡45	39
Have health insurance	47	‡33	‡32	‡23	‡18	42

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 3b: Distribution of Socioeconomic Status (SES) variables in Asian adults aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
NZDep quintile						
1 & 2 (high)	15	16	10	8	12	24
3 & 4	21	20	13	17	12	17
5 & 6	18	22	21	17	19	22
7 & 8	20	25	18	36	29	25
9 & 10 (low)	26	17	38	22	28	13
P-value	0.42		0.03		0.012	
Highest qualification						
High school only	51	38	38	38	44	43
Trade, certificate, etc	18	24	20	27	20	26
Bachelor degree	20	23	16	17	25	21
Post graduate degree	11	14	26	18	11	10
P-value	0.04		0.30		0.56	
Study >20 hours / week	35	20	15	11	23	19
P-value	0.0002		0.31		0.44	
Household income (\$ in last 12 months)						
≤ 15,000	24	15	11	6	23	9
15,001 – 25,000	21	14	16	9	12	13
25,001 – 40,000	16	15	24	15	29	18
40,001 – 70,000	23	27	31	32	23	32
> 70,000	16	28	17	38	12	29
P-value	0.0076		<0.0001		0.0045	
Receive government income support	22	28	23	31	30	32
P-value	0.19		0.07		0.72	
Have health insurance	37	47	30	33	28	32
P-value	0.04		0.42		0.48	

Lifestyle

The lifestyle variables reported in the following section cover the general areas of nutrition, physical activity and TV watching, tobacco smoking, alcohol drinking, gambling, body size, and acculturation (the association between these variables and length of residence in New Zealand).

Nutrition

2006-07 survey (Tables 4a, 4b):

Children (Table 4a): the proportion of children who had ever been breast-fed was lower in Chinese (80%), Other Asian (79%), Māori (85%) and Pacific (82%), but similar for South Asian (90%), compared to European (90%) (Figure 3). The proportion of children having breakfast at home every day (a protective factor against obesity) was similar ($p>0.05$) in all three Asian groups (Chinese 84%, South Asian 73%, Other Asian 82%), but significantly lower in Māori (72%) and Pacific (68%), compared to European (79%). The proportion of children eating a school lunch brought from home every day (another protective factor against obesity) was highest for South Asian (90%), followed by Chinese (87%) and Other Asian (85%), who were similar to European (83%), and lowest for Māori (72%) and Pacific (68%). The frequency of fizzy/soft drink consumption in the last week (a risk factor for obesity) was similar for all three Asian ethnic groups, but higher for Māori and Pacific children, compared to European. Takeaway food consumption (another risk factor for obesity) was lowest for South Asian children, intermediate for Chinese, Other Asian and European children, and highest for Māori and Pacific children.

Adults (Table 4b): the proportion of women who ate fruit two or more times a day was lower ($p<0.05$) for South Asian (59%) and Māori (63%), but similar for Chinese (66%), Other Asian (60%) and Pacific (67%), compared to European (71%); while fruit consumption by men did not vary between ethnic groups. The proportion of people who ate vegetables three or more times per day was reduced in all three Asian ethnic groups, for both men and women, and also in Māori and Pacific, compared to European. Consequently, the proportion of men and women (combined) who ate five or more serves of fruit and vegetables per day was lower in Chinese (47%), South Asian (40%) and Other Asian (41%), and also lower for Māori (48%) and Pacific (44%), compared to European (57%).

Asian time trends (Table 4c): there was no change in the proportion of men and/or women eating the recommended number of serves of fruit and vegetables per day between the two surveys in all three Asian ethnic groups ($p>0.05$).

Table 4a: Nutritional behaviour patterns of children aged 0-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Ever breast-fed (0-14 yrs)	†80	90	‡79	§85	§82	90
Breakfast at home – every day in last 7 days (2-14 yrs)	84	73	82	§72	§68	79
School lunch from home – every day in last 5 school days (5-14 yrs)	87	†90	85	†78	†75	83
Fizzy or soft drinks – times in last week (2-14 yrs)*						
0	43	35	40	§32	§32	38
1	25	26	28	25	23	30
2	12	14	13	18	22	15
≥3	20	25	18	25	24	17
Takeaway foods – times in last week (2-14 yrs)*						
0	36	‡48	37	§20	§23	31
1	42	38	38	52	43	52
≥2	21	13	25	28	34	16

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Figure 3: Percent (95% CI) of children aged 0-14 years ever breast fed –2006-07 survey, by ethnicity.

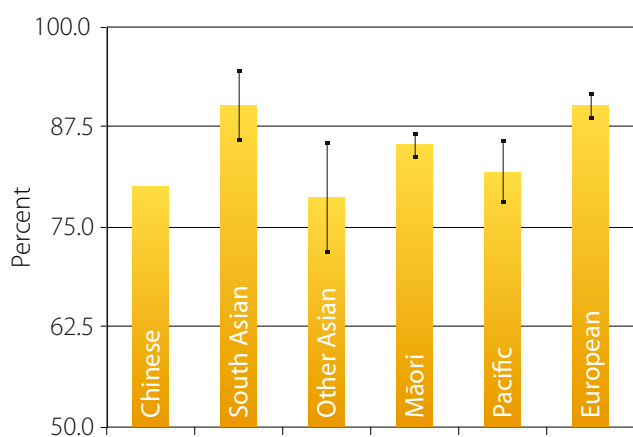


Table 4b: Percent of adults aged ≥15 years meeting the recommended daily serves of fruit and vegetable intake – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Fruit 2+ a day						
Both sexes	59	55	56	‡55	59	61
Female	66	‡59	60	‡63	67	71
Male	49	51	51	47	50	51
Vegetables 3+ a day						
Both sexes	§51	§43	§46	§60	§44	69
Female	§58	§48	§49	§65	§46	75
Male	§42	§39	‡42	55	§42	62
Fruit & Veges 5+ a day						
Both sexes	‡47	§40	§41	§48	§44	57
Female	‡56	§46	§46	§56	§50	67
Male	35	‡34	35	39	37	45

P-value compared with European, adjusted for age and sex (as appropriate): † <0.05, ‡ <0.01, § <0.001

Table 4c: Percent of Asian adults aged ≥15 years meeting the recommended daily serves of fruit and vegetable intake – 2002-03 and 2006-07 surveys, by Asian ethnicity.*

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
Fruit 2+ a day						
Both sexes	64	59	50	55	55	56
Female	70	66	60	59	57	60
Male	56	49	41	51	51	51
Vegetables 3+ a day						
Both sexes	48	51	41	43	44	46
Female	51	58	44	48	49	49
Male	44	42	39	39	36	42
Fruit & Veges 5+ a day						
Both sexes	43	47	39	40	40	41
Female	50	56	46	46	44	46
Male	36	35	32	34	34	35

* no significant changes (p>0.05) between surveys.

Physical Activity and TV

2006-07 survey (Tables 5a, 5b):

Children (Table 5a): The modes of transport to and from school are shown in Table 5a. Chinese, Māori and Pacific children walked to and from school more frequently than European children, who were similar to South Asian and Other Asian children. European children were more likely to use a bike to get to and from school than children of all other ethnicities. Chinese, Māori and Pacific children used a car to get to and from school less frequently than European children. The school bus was used by a smaller proportion of Chinese (6%), South Asian (12%), Other Asian (13%) and Pacific (7%) than European students (22%), who were similar to Māori (20%). Public transport was used equally by all ethnic groups. The proportion of children who watched TV more than 2 hours per weekday and more than 4 hours per weekend was similar for all Asian ethnicities, compared with European, although higher for Māori and Pacific.

Adults (Table 5b): being physically active was defined as doing at least 15 minutes of vigorous (aerobic) activity, or 30 minutes of moderate activity, on 5 of the previous 7 days. A lower proportion of combined male and female Chinese (41%), South Asian (46%) Other Asian (45%), and Pacific were active compared with European (54%), who were similar to Māori (57%) (Figure 4). Being sedentary was defined as less than 30 minutes of any physical activity (walking, moderate and vigorous) in the last seven days. All three Asian ethnicities of either sex, aside from male Other Asians, were more likely to be sedentary, as were Pacific people, compared with Europeans. Māori also were more likely to be sedentary than European after adjusting for age and sex (relative risk = 1.24; 95% CI: 1.09, 1.41).

Asian time trends (Table 5c): there was no change in the proportion of men and/or women who were active or sedentary between the two surveys in all three Asian ethnic groups ($p > 0.05$).

Table 5a: Transport to and from school (trips in the last 5 school days) and TV watching patterns of children aged 5-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Walk (trips)*						
0	†50	53	64	‡53	§42	59
1-5	13	14	15	17	22	19
6-10	37	33	21	31	37	22
Bike (≥ 1 trips)	§4	‡4	§4	§7	§3	12
Car (trips)*						
0	‡41	44	†32	†40	40	33
1-5	14	19	14	22	20	26
6-10	45	37	53	38	41	42
School bus (≥ 1 trips)	§6	‡12	†13	20	§7	22
Public transport (≥ 1 trips)	3	8	4	2	6	4
TV: >2 hours / weekday	19	14	14	§24	†18	13
TV: >4 hours / weekend	12	14	20	§28	20	18

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Figure 4: Percent (95% CI) of adults aged ≥ 15 years physically active – 2006-07 survey, by sex & ethnicity.

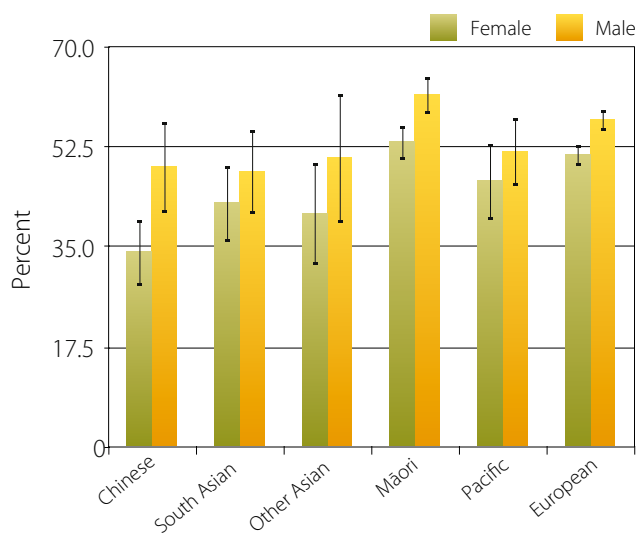


Table 5b: Prevalence of physical activity in the last 7 days in adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Active						
Both sexes	\$41	\$46	‡45	57	‡49	54
Female	\$34	‡43	†41	53	47	51
Male	†49	‡48	51	62	‡52	57
Sedentary						
Both sexes	\$26	\$23	‡19	‡14	\$20	14
Female	\$28	\$26	‡25	†15	\$22	16
Male	\$22	\$20	11	†12	‡18	12

P-value compared with European, adjusted for age and sex (as appropriate): † <0.05, ‡ <0.01, § <0.001

Table 5c: Prevalence of physical activity in the last 7 days in Asian adults aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
Active						
Both sexes	35	41	45	46	42	45
P-value	0.17		0.86		0.61	
Female	34	34	40	43	35	41
P-value	0.91		0.70		0.34	
Male	37	49	49	48	53	51
P-value	0.08		0.93		0.82	
Sedentary						
Both sexes	20	26	24	23	21	19
P-value	0.14		0.77		0.65	
Female	24	28	30	26	28	25
P-value	0.35		0.42		0.61	
Male	15	22	18	20	10	11
P-value	0.18		0.67		0.90	

Tobacco Smoking

2006-07 survey (Tables 6a, 6c, 6d): Asian women were less likely to be current tobacco smokers (4% for all Asian women combined) than all other ethnic groups in New Zealand, while the smoking prevalence was similar in Asian men (15% combined) compared to European (Figure 5). The proportions of never smokers among women were highest in South Asian (94%), Chinese (93%) and Other Asian (91%), intermediate in Pacific (67%) and European (61%) and lowest in Māori (35%). A similar ethnic pattern was seen in men, although they were more likely to smoke than women of their same ethnic group, aside from Māori.

Despite the reduced smoking prevalence in the Asian population, this pattern did not extend to exposure to passive smoking. For adults (Table 6c), only the South Asian community had a reduced prevalence of living in a house where smoking was allowed inside (6%), compared to Europeans (12%), who were similar to Chinese (15%) and Other Asian (9%); while Māori and Pacific had higher proportions of smoking inside the house (27% and 20%, respectively) than Europeans. In children (Table 6d), the proportion who lived in a house where people smoked inside was similar for all ethnic groups, aside from Māori who had the highest level (19%); although smoking inside the car was lower for South Asian (3%) and Other Asian (4%), and similar in Chinese (6%), compared to European (9%), but higher in Māori (24%) and Pacific (13%).

Asian time trends (Table 6b): there was no change in the frequency of smoking by men and/or women between the two surveys in all three Asian ethnic groups ($p > 0.05$).

Figure 5: Percent (95% CI) of adults aged ≥ 15 years who are current smokers – 2006-07 survey, by sex and ethnicity.

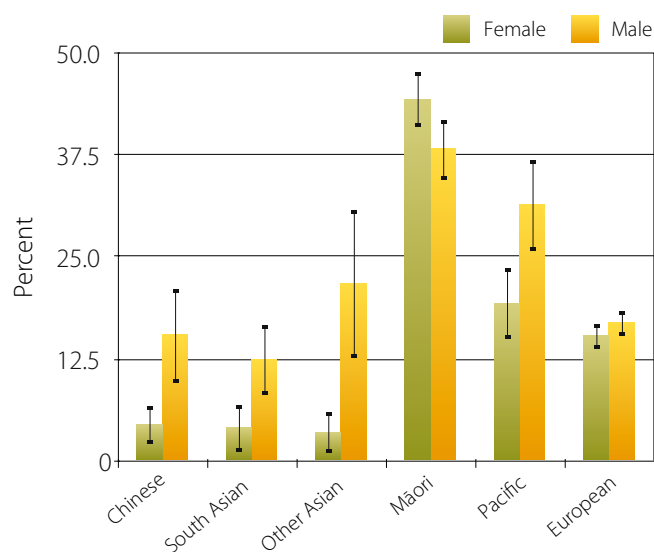


Table 6a: Frequency of tobacco smoking (cigarettes per day) by adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Both sexes*						
21+	§<1	§0	§1	§4	§2	2
11-20	2	2	1	15	6	6
1-10	7	7	9	23	17	8
Ex-smoker	9	7	9	20	15	26
Never smoker	82	84	80	38	60	58
Females*						
21+	§1	§0	§0	§3	§<1	1
11-20	1	2	<1	16	5	6
1-10	2	2	3	26	14	8
Ex-smoker	3	2	6	21	14	23
Never smoker	93	94	91	35	67	61
Males*						
21+	§0	§0	§1	§5	§3	3
11-20	2	1	2	14	7	7
1-10	13	11	18	19	21	7
Ex-smoker	16	12	14	20	17	29
Never smoker	68	75	65	42	51	54

P-value compared with European: † <0.05, ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 6b: Frequency of tobacco smoking (cigarettes per day) by Asian adults aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
Both sexes						
21+	<1	<1	1	0	1	1
11-20	2	2	2	2	4	1
1-10	10	7	7	7	8	9
Ex-smoker	9	9	9	7	10	9
Never smoker	78	82	81	84	77	80
P-value	0.60		0.79		0.55	
Females						
21+	0	1	0	0	0	0
11-20	2	1	1	2	1	<1
1-10	5	2	2	2	3	3
Ex-smoker	4	3	2	2	7	6
Never smoker	89	93	95	94	89	91
P-value	0.40		0.93		0.88	
Males						
21+	1	0	1	0	2	1
11-20	3	2	2	1	8	2
1-10	16	13	13	11	16	18
Ex-smoker	16	16	15	12	15	14
Never smoker	64	68	69	75	60	65
P-value	0.63		0.75		0.63	

Table 6c: Percent adults aged ≥15 years living in a house where people smoke inside (including sometimes) – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
People smoke inside house	15	§6	9	§27	§20	12

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

Table 6d: Percent of children aged 0-14 years exposed to passive smoking (including sometimes) – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
People smoke inside house	8	4	6	§19	9	7
People smoke inside car	6	‡3	§4	§24	†13	9

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

Alcohol

2006-07 survey (Tables 7a, 7c): the frequency of alcohol consumption in the last year was lowest among the Asian and Pacific communities, intermediate in Māori and highest in European (Table 7a - Figure 6). For both sexes combined, the proportion who had no alcohol in the last year was highest in South Asians (48%) and Pacific (43%), followed by Chinese (36%), Other Asians (34%), Māori (16%) and Europeans (11%). For all Asians combined, 40% did not drink alcohol in the last year (women 51%, men 28%). Asian men and women who drank alcohol in the last year were more likely to have only 1-2 drinks (Chinese 78%, South Asian and Other Asian 70% each), and least likely to have 10 or more drinks (2%), on a typical day, than any other ethnic group (Table 7c). Overall, the Asian community drinks alcohol least often, and in the smallest amounts.

Asian time trends (Table 7b, 7d): the frequency of alcohol consumption in the last year by both men and women increased in Chinese ($p=0.030$) and Other Asians ($p=0.033$) between the two survey periods (Table 7b), but remained unchanged in South Asians ($p=0.59$). There was no change between the two surveys in the amount of alcohol consumed on a typical day by Asian alcohol drinkers (Table 7d).

Figure 6: Percent (95% CI) of adults aged ≥ 15 years who drank alcohol in the last year, by sex and ethnicity – 2006-07 survey.

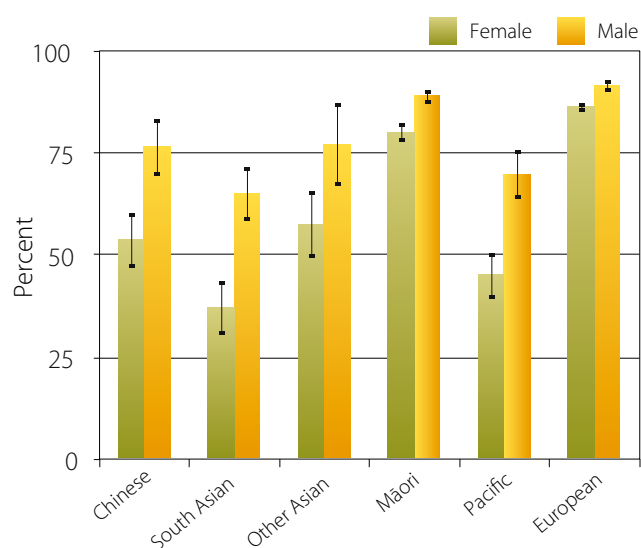


Table 7a: Frequency of alcohol intake in the last year by adults aged ≥ 15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Both sexes*						
4 + / week	§4	§5	§5	§10	§5	25
2-3 / week	6	7	7	15	6	20
2-4 / month	15	16	18	24	18	20
Monthly or less often	38	24	35	35	28	24
Not in last 12 months	36	48	34	16	43	11
Females*						
4 + / week	§3	§2	§3	§8	§4	20
2-3 / week	4	2	5	13	4	18
2-4 / month	11	10	15	20	12	19
Monthly or less often	36	23	35	40	25	29
Not in last 12 months	46	63	42	20	55	14
Males*						
4 + / week	§7	§7	§8	§12	§5	30
2-3 / week	9	11	10	19	9	23
2-4 / month	20	21	23	29	25	20
Monthly or less often	41	25	35	29	31	19
Not in last 12 months	23	35	23	11	30	9

P-value compared with European: † <0.05, ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 7b: Frequency of alcohol intake in the last year by Asian adults aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
Both sexes						
4 + / week	2	4	4	5	2	5
2-3 / week	3	6	5	7	7	7
2-4 / month	13	15	14	16	12	18
Monthly or less often	31	38	22	24	34	35
Not in last 12 months	50	36	55	48	45	34
P-value	0.030		0.59		0.033	
Females						
4 + / week	1	3	1	2	2	3
2-3 / week	2	4	2	2	5	5
2-4 / month	7	11	7	10	11	15
Monthly or less often	30	36	20	23	29	35
Not in last 12 months	60	46	69	63	53	42
P-value	0.17		0.86		0.46	
Males						
4 + / week	3	7	7	7	2	8
2-3 / week	5	9	7	11	10	10
2-4 / month	21	20	20	21	13	23
Monthly or less often	33	41	24	25	42	35
Not in last 12 months	38	23	42	35	34	23
P-value	0.11		0.68		0.063	

Table 7c: Number of alcohol drinks consumed on a typical day by adult drinkers aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Both sexes*						
10+	§2	†2	2	§23	§22	4
7-9	<1	2	4	9	9	3
5-6	7	5	8	16	17	8
3-4	12	22	17	20	17	22
1-2	78	70	70	32	34	63
Females*						
10+	§1	§<1	§0	§19	§19	2
7-9	<1	2	2	8	9	2
5-6	7	1	1	15	8	6
3-4	8	16	12	21	18	18
1-2	83	81	85	37	46	73
Males*						
10+	§3	†3	4	§28	§25	6
7-9	<1	2	7	10	10	5
5-6	8	7	14	18	23	11
3-4	16	25	21	19	16	26
1-2	73	65	54	26	26	53

P-value compared with European: † <0.05, ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 7d: Number of alcohol drinks consumed on a typical day by Asian adult drinkers aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
Both sexes						
10+	<1	2	1	2	9	2
7-9	1	<1	5	2	0	4
5-6	5	7	6	5	8	8
3-4	11	12	15	22	14	17
1-2	83	78	71	70	69	70
P-value	0.21		0.31		0.16	
Females						
10+	0	1	<1	<1	6	0
7-9	1	<1	3	2	0	2
5-6	3	7	4	1	4	1
3-4	8	8	7	16	8	12
1-2	88	83	87	81	83	85
P-value	0.57		0.32		0.27	
Males						
10+	<1	3	2	3	12	4
7-9	<1	<1	7	2	0	7
5-6	7	8	8	7	12	14
3-4	14	16	20	25	20	21
1-2	79	73	64	65	56	54
P-value	0.44		0.43		0.32	

Gambling

2006-07 survey (Table 8a): the proportion of adults who gambled in the last 12 months was lowest among South Asian (43%), Chinese (45%) and Other Asian (45%), followed by Pacific (54%), European (68%) and Māori (72%) (Figure 7). For all Asians combined, the proportion who gambled in the last 12 months was 44%. Asian men and women were less likely to have participated in most specific types of gambling, compared with the other ethnic groups. These findings contrast with community-wide perceptions that gambling is common in the Asian population. The most common type of gambling by Asians was Lotto, with 37-38% buying Lotto in the last 12 months. Māori were more likely to buy Lotto than European after adjusting for age and sex (relative risk = 1.09; 95% CI: 1.04, 1.14).

Asian time trends (Table 8b): there was no change between the two surveys in the proportion of Asian adults who did not gamble in the last 12 months. However, among the Chinese community there was a significant increase from 2002-03 to 2006-07 in the proportion who bought Lotto (from 30% to 37%) and Instant Kiwi (from 7% to 13%).

Figure 7: Percent (95% CI) of adults aged ≥ 15 years who gambled in the last 12 months – 2006-07 survey, by ethnicity.

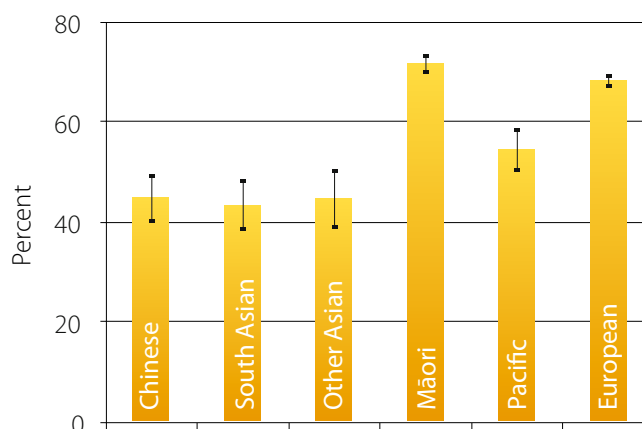


Table 8a: Percent of adults aged ≥15 years who gambled in the last 12 months – 2006-07 survey, by ethnicity.

Type of Gambling*	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Did not gamble	55	57	55	28	46	32
Lotto	37	37	38	58	46	58
Instant Kiwi	13	12	14	31	17	29
Daily Keno	<1	1	2	4	4	1
Housie	<1	1	2	4	6	1
Track (horses or dogs)	2	1	2	9	5	10
Sports (TAB & overseas)	2	4	1	6	4	6
Pokies – not in casino	4	2	4	16	7	11
Pokies - casino	9	5	8	10	7	8
Casino tables	1	2	2	2	2	2
Casino (pokies & tables)	10	6	8	11	8	9
Internet	1	0	<1	<1	<1	<1

* more than one type of gambling could be selected
P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

Table 8b: Percent of adults aged ≥15 years who gambled in the last 12 months – 2002-03 and 2006-07 surveys, by Asian ethnicity.

	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
Type of Gambling*	%	%	%	%	%	%
Did not gamble	59	55	61	57	58	55
Lotto	30	†37	33	37	34	38
Instant Kiwi	7	†13	11	12	12	14
Daily Keno	<1	<1	1	1	1	2
Housie	0	<1	<1	1	<1	2
Track (horses or dogs)	4	2	2	1	3	2
Sports (TAB & overseas)	2	2	3	4	<1	1
Pokies – not in casino	5	4	4	2	5	4
Casino (pokies & tables)	11	10	4	6	6	8
Internet	3	1	1	†0	1	<1

* more than one type of gambling could be selected
P-value compared with 2002-03: † <0.05

Body size

2006-07 survey:

Children (Tables 9a, 9b): data for Asian children have been combined to increase the statistical power of comparisons with other ethnic groups, since there were no differences in mean BMI between Chinese, South Asian or Other Asian children ($p > 0.05$). Asian children had similar mean levels of all anthropometric variables, including BMI, as European children, while means for Māori and Pacific children were generally higher, adjusting for age and sex (Table 9a). Further adjustment for height did not affect the mean difference in waist circumference between Asian and European children indicating that they had similar levels of central obesity. The prevalences of obesity, overweight, normal weight and thinness, based on the International Obesity Task Force criteria, differed between Asian and European children, with the former having a higher proportion of thin children; while the prevalence of obesity was higher in Māori and Pacific children compared with European (Table 9b – Figure 8).

Adults (Tables 9c, 9d): the mean values of all anthropometry measures – height, weight, waist circumference and body mass index (BMI) – were significantly lower for men and women in all three Asian ethnic groups, when compared to Māori, Pacific and European groups, aside for BMI in South Asians, which was similar to that for Europeans (Table 9c). Adjusting further for height removed the mean difference in waist circumference between South Asians and Europeans ($p > 0.05$), indicating that this measure of central obesity was similar between the two groups after correcting for height differences; while the other ethnic groups retained their significant difference in waist circumference when compared to Europeans (data not shown). The prevalence of obesity, based on ethnic-specific definitions (see Methods section), was higher in all three Asian ethnic groups, and also for Māori and Pacific, compared to Europeans (Table 9d).

Asian time trends (Tables 9e, 9f): there was no change between the two surveys in mean height for each Asian ethnic group. However, mean weight increased by 3-4 kg within each Asian group from 2002-03 to 2006-07 (Table 9e), resulting in a significant increase in mean BMI. The prevalence of obesity also increased in all three Asian groups (Figure 9), particularly in males (Table 9f). The obesity prevalence for all Asian people combined increased from 26% in 2002-03 to 41% in 2006-07, using ethnic specific criteria. Using the standard WHO criterion of $BMI \geq 30.0$ units, the obesity prevalence among all Asian people increased from 6% in 2002-03 to 11% in 2006-07.

Figure 8: Prevalence (95% CI) of overweight and obesity (IOTF definition) in children aged 2-14 years – 2006-07 survey, by ethnicity.

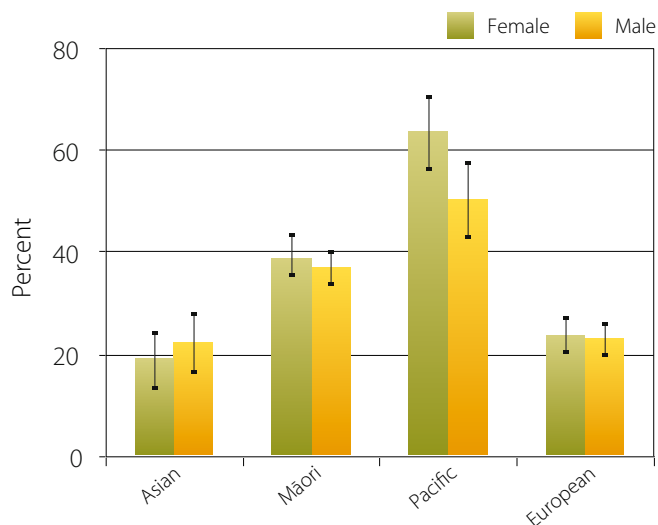


Figure 9: Trends in obesity ($BMI \geq 25.0$) prevalence (95% CI) among Asian male and female adults aged ≥ 15 years – 2002-03 and 2006-07 surveys.

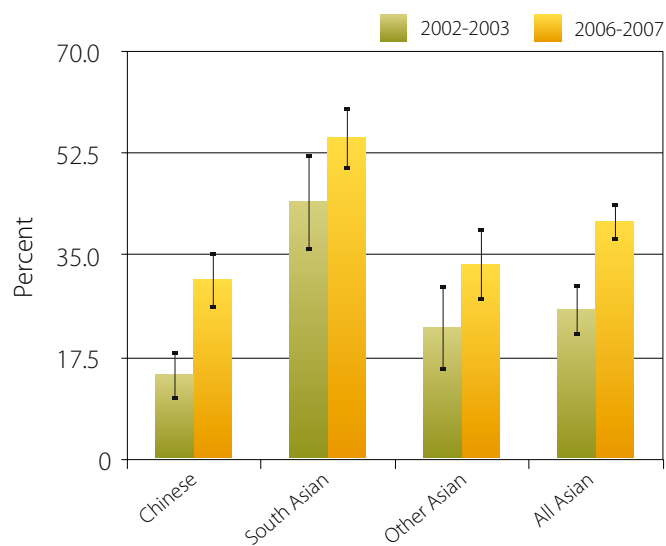


Table 9a: Mean anthropometry measures, adjusted for age and sex (as appropriate), in children aged 2-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group			
	Asian	Māori	Pacific	European
Both sexes				
Height (cm)	130.2	131.0	‡133.3	130.8
Weight (kg)	32.9	‡35.7	‡41.0	33.0
Waist (cm)	64.3	‡67.1	‡72.0	64.3
BMI (kg / m2)	18.1	‡19.4	‡21.3	18.2
Females				
Height (cm)	129.8	130.5	†133.7	130.9
Weight (kg)	32.9	‡35.6	‡42.5	33.1
Waist (cm)	63.6	‡66.2	‡72.1	63.3
BMI (kg / m2)	18.2	‡19.5	‡21.9	18.2
Males				
Height (cm)	130.6	131.5	†132.9	130.7
Weight (kg)	32.9	‡35.8	‡39.7	32.9
Waist (cm)	65.0	‡68.0	‡72.0	65.2
BMI (kg / m2)	18.0	‡19.3	‡20.8	19.2

P-value compared with European, adjusted for age and sex (as appropriate): † <0.05, ‡ <0.01, § <0.001

Table 9b: Prevalence of obesity (IOTF categories) in children aged 2-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group			
	Asian	Māori	Pacific	European
	%	%	%	%
Both sexes*				
Obese	‡6	‡12	‡26	5
Overweight	14	26	31	19
Normal weight	71	60	42	74
Thin	8	2	2	2
Females*				
Obese	‡6	‡12	‡29	5
Overweight	11	27	35	19
Normal weight	73	58	36	74
Thin	10	3	1	3
Males*				
Obese	†7	‡11	‡23	5
Overweight	16	26	27	18
Normal weight	71	61	47	75
Thin	7	2	3	2

P-value compared with European: † <0.05, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 9c: Mean anthropometry measures, adjusted for age and sex (as appropriate), in adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
Both sexes						
Height (cm)	\$164.0	\$162.4	\$162.3	\$168.3	‡168.9	169.8
Weight (kg)	\$65.0	\$69.5	\$65.4	\$84.9	\$96.4	77.7
Waist (cm)	\$82.0	‡88.0	\$82.6	\$95.3	\$102.6	89.2
BMI (kg / m2)	\$24.0	26.4	\$24.7	\$29.9	\$33.7	26.9
Females						
Height (cm)	\$158.4	\$156.6	\$155.9	\$161.9	163.0	163.3
Weight (kg)	\$59.1	\$64.7	\$58.8	\$79.0	\$92.1	71.2
Waist (cm)	\$78.1	84.7	\$78.0	\$91.3	\$100.6	83.9
BMI (kg / m2)	\$23.6	26.3	\$24.3	\$30.1	\$34.6	26.7
Males						
Height (cm)	\$169.7	\$168.3	\$168.8	\$174.8	‡175.0	176.4
Weight (kg)	\$71.0	\$74.8	\$72.3	\$90.8	\$100.8	84.3
Waist (cm)	\$85.6	\$91.8	\$87.2	\$99.3	\$104.8	94.7
BMI (kg / m2)	\$24.6	26.4	\$25.3	\$29.7	\$32.9	27.1

P-value compared with European, adjusted for age and sex (as appropriate): † <0.05, ‡ <0.01, § <0.001

Table 9d: Prevalence of obesity (ethnic specific definitions) in adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Both sexes*						
Obese	\$31	\$55	\$33	\$30	\$54	24
Overweight	19	18	25	35	31	38
Normal weight	51	27	42	35	15	38
Females*						
Obese	\$25	\$52	29	\$32	\$58	24
Overweight	18	16	22	33	27	32
Normal weight	58	32	49	35	16	44
Males*						
Obese	\$38	\$58	‡39	\$29	\$49	23
Overweight	20	20	28	36	36	44
Normal weight	42	22	33	35	15	33

P-value compared with European: ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 9e: Mean anthropometry measures, adjusted for age and sex (as appropriate), in Asian adults aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
Both sexes						
Height (cm)	165.2	164.3	164.1	163.8	162.2	162.4
Weight (kg)	60.1	‡63.5	66.4	†70.2	60.0	‡63.9
Waist (cm)	78.0	79.6	87.7	87.5	78.3	80.1
BMI (kg / m2)	22.0	‡23.5	24.6	‡26.1	22.7	‡24.2
Females						
Height (cm)	159.9	159.3	156.4	157.4	156.0	156.7
Weight (kg)	55.1	‡58.6	61.4	†64.9	54.8	†58.4
Waist (cm)	74.5	†76.6	83.8	84.0	75.0	76.6
BMI (kg / m2)	21.6	‡23.1	25.1	26.1	22.6	23.8
Males						
Height (cm)	171.9	170.5	170.5	169.1	170.4	169.9
Weight (kg)	66.5	69.6	70.4	74.5	66.7	†71.4
Waist (cm)	82.5	83.3	90.8	90.4	82.4	84.9
BMI (kg / m2)	22.5	†23.9	24.2	‡26.1	22.9	‡24.7

P-value compared with 2002-03 survey, adjusted for age & sex (as appropriate): † <0.05, ‡ <0.01, § <0.001

Table 9f: Prevalence of obesity (ethnic specific definitions) in Asian adults aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
Both sexes						
Obese	14	31	44	55	23	33
Overweight	19	19	19	18	18	25
Normal weight	66	57	37	27	60	42
P-value	0.0001		0.052		0.0089	
Females						
Obese	10	25	50	52	20	29
Overweight	19	18	16	16	20	22
Normal weight	70	58	34	32	59	49
P-value	0.0010		0.92		0.22	
Males						
Obese	20	38	39	58	26	39
Overweight	19	20	21	20	14	28
Normal weight	61	42	39	22	60	33
P-value	0.0058		0.0072		0.023	

Acculturation

2006-07 survey (Table 10, Figure 10): The association between the number of years living in New Zealand and selected key lifestyle factors was examined in Asian participants to determine if any were related to increasing length of exposure to the New Zealand lifestyle. A mixed pattern, in terms of healthiness, was observed. An important beneficial pattern was observed for sedentary activity, with the proportion categorised as sedentary decreasing with increasing time in New Zealand; while the proportion eating 5 or more serves of fruit and vegetables per day was highest in people born or resident in New Zealand for more than 10 years (48%). However, levels of other adverse risk factors increased with living more years in New Zealand. These included higher prevalences of alcohol drinking and obesity/overweight with longer stay in New Zealand (Figure 10). The proportion of never smokers also decreased with increasing time in New Zealand. The results for sedentary activity, alcohol drinking and obesity/overweight remained significant after adjusting for age and sex, indicating that changes in these variables with increasing time in New Zealand were not due to a changing demographic composition in the Asian community.

Figure 10: Percent (95% CI) of Asian adults (≥ 15 years) who drank alcohol in the last 12 months, or were overweight or obese, by time lived in New Zealand – 2006-07 survey.

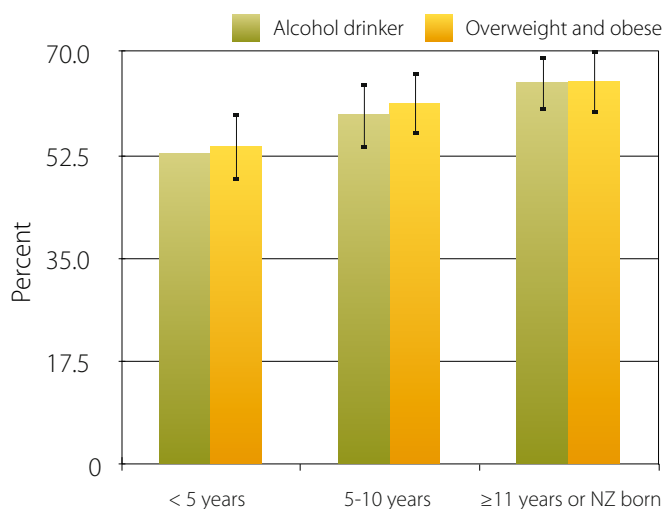


Table 10: Association between lifestyle and years living in New Zealand among Asian adults aged ≥15 years – 2006-07 survey.

Variable	Years in New Zealand			P-Value
	< 5 years	5-10 years	Others*	
	%	%	%	
Physically active	47	38	46	0.07
Sedentary	26	28	16	0.0004
Fruit 2+ per day	55	53	61	0.057
Vegetables 3+ per day	47	42	52	0.059
Fruit & Vegetables 5+ per day	43	38	48	0.042
Drank alcohol in last 12 months	53	59	65	0.0027
Smoker				
Current	9	11	8	0.045
Ex	7	7	11	
Never	85	82	81	
BMI				
Obese & Overweight	54	61	65	0.041
Normal	46	39	35	

* includes more than 10 years and born in New Zealand

Chronic Disease

The disease prevalences described in this section are based on self-reports by survey participants, and have not been validated against medical records.

2006-07 survey:

Children (Table 11a):

South Asian children had lower prevalences of asthma, eczema and allergy than European children, while Chinese and Other Asian were similar. Māori children had higher prevalences of asthma and eczema, and Pacific similar, when compared with European children. Children of both Polynesian groups also had lower allergy prevalences than European children.

European children had higher prevalences of birth conditions (abnormalities) compared to all other ethnic groups.

The proportion of children with asthma and allergy symptoms within the last 12 months was similar for children of all three Asian groups, aside from a lower prevalence of wheezing in Other Asian children, when compared to European children. In contrast, Māori children had higher prevalences of all three symptoms (asthma, sneezing and itchy rash) than European, while Pacific children were more likely to have had an itchy rash in the last 12 months.

Adults (Tables 11b, 11d):

Table 11b shows unadjusted prevalences of a number of chronic diseases. The P-values are from comparisons adjusted for age and sex. The following significant differences in disease risk, compared to Europeans, were observed.

Cardiovascular disease: South Asian, Pacific and Māori people had increased prevalences of being on treatment for hypertension compared to European (Figure 11). South Asian had double the risk of being on treatment for high cholesterol than European (Figure 12). Māori had a 40% increase in the risk of previous heart attack, while South Asian had a 58% increase in heart attack risk that was not significant because of their relatively small sample size (Figure 13). The prevalence of total cardiovascular disease was increased only in Māori compared to European after adjusting for age and sex (relative risk 1.29; 95% CI: 1.10, 1.51). Appendix A (at the end of this report) lists ethnic specific adjusted relative risks of cardiovascular disease, compared to Europeans.

Diabetes: the prevalence of being on treatment for diabetes was increased four-fold in South Asian and Pacific, and two-fold in Other Asian and Māori (Figure 14).

Lung disease: the prevalences of asthma and chronic bronchitis/emphysema were lower in all three Asian ethnic groups, and similar in Pacific, when compared to European, but higher in Māori (Table 11b).

Bone and joint conditions (Table 11b): the total prevalence of arthritis, and of back and neck disorders, were lower in Chinese, South Asian, Other Asian and Pacific, compared to European and Māori. In contrast, there was no variation between ethnic groups in the prevalence of osteoporosis.

Cancer (Table 11b): self-reported cancer was less common in Chinese, South Asian, Other Asian and Pacific, compared to European and Māori.

Depression (Table 11b): self-reported depression was less common in Chinese, South Asian, Other Asian and Pacific, compared to European and Māori.

Mental health status (Table 11d): Chinese, Other Asian, Māori and Pacific people were less likely to report feeling happy than European. On the other hand, South Asian, Other Asian and Pacific people were more likely to report feeling full of life than European.

Asian time trends (Tables 11c, 11e): there was no change between the two surveys in the prevalence of chronic adult conditions and mental health status among Asian participants, aside from a decreased prevalence in 2006-07, compared to 2002-03, of bronchitis and emphysema in South Asians, and increased prevalence of total cardiovascular disease and feeling down among Chinese. These are isolated findings and need to be interpreted with caution.

Figure 11: Relative risk (95% CI) of being on treatment for hypertension associated with ethnicity, compared to Europeans, adjusted for age and sex – adults aged ≥ 25 years in the 2006-07 survey.

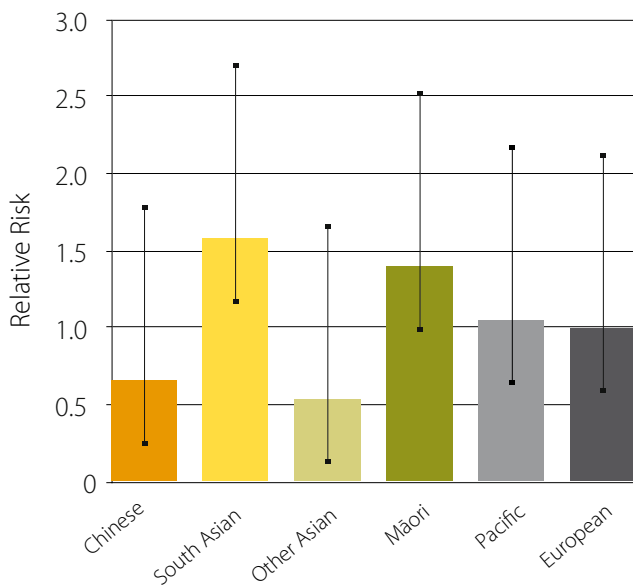


Figure 12: Relative risk (95% CI) of being on treatment for high serum cholesterol associated with ethnicity, compared to Europeans, adjusted for age and sex – adults aged ≥ 25 years in the 2006-07 survey.

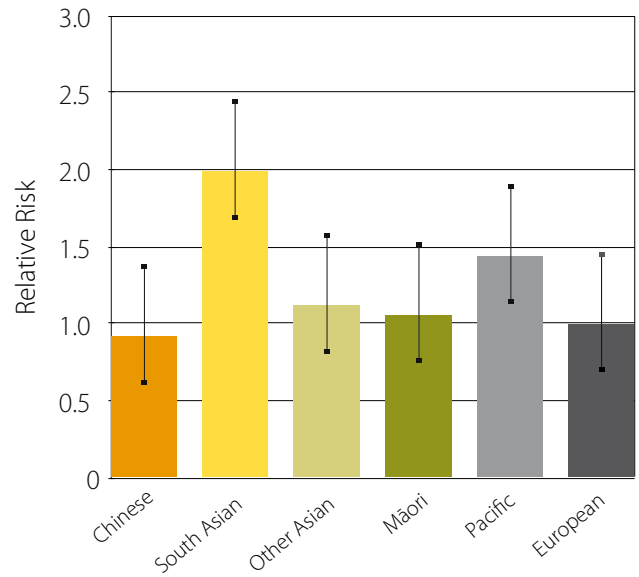


Figure 13: Relative risk (95% CI) of having a previous heart attack associated with ethnicity, compared to Europeans, adjusted for age and sex – adults aged ≥ 25 years in the 2006-07 survey.

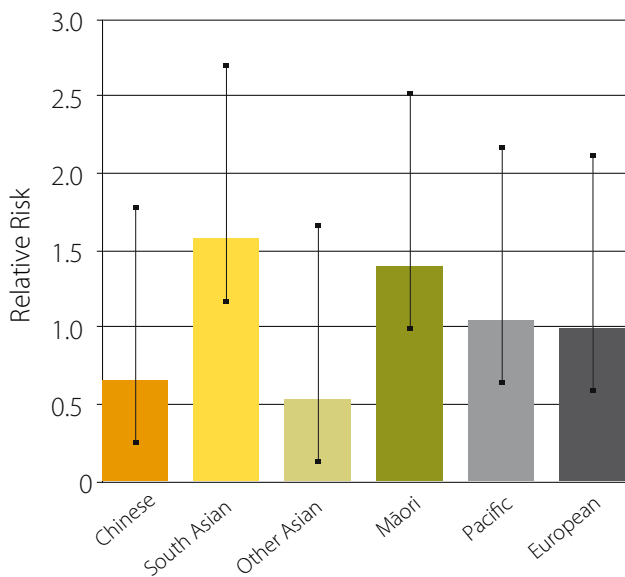


Figure 14: Relative risk (95% CI) of being on treatment for diabetes associated with ethnicity, compared to Europeans, adjusted for age and sex – adults aged ≥ 25 years in the 2006-07 survey.

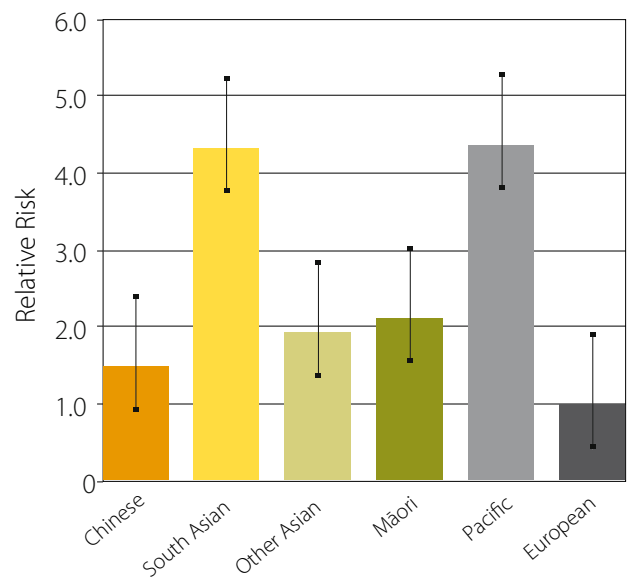


Table 11a: Prevalence of chronic health conditions in children aged 0-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Told by doctor that child has health condition lasting > 6 months:						
Asthma	14	†9	16	§24	17	17
Eczema	14	†8	15	‡18	17	13
Allergy	6	§3	12	‡5	‡4	7
Birth condition	§1	§1	‡2	‡3	‡2	5
Child had following symptoms in last 12 months:*						
Wheezing	12	16	‡8	‡22	18	17
Sneezing (no cold/flu)	22	21	21	22	20	19
Itchy rash	11	17	14	‡15	‡20	10

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

* ISAAC questions on asthma and allergy symptoms asked of children aged 5-14 years

Table 11b: Prevalence of chronic disease in adults aged ≥ 25 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Hypertension*	9	†14	13	§14	‡15	17
High cholesterol*	6	‡13	7	7	10	11
Cardiovascular disease						
Heart attack	2	4	1	†4	3	5
Total CV disease	†6	7	†6	‡12	9	14
Diabetes*	4	§12	5	§6	§13	4
Asthma	§6	§7	§8	†23	15	17
Bronchitis / emphysema	§2	†3	§1	§13	5	6
Arthritis						
Rheumatoid	3	3	2	4	3	4
Osteoarthritis	§3	§2	‡4	7	§4	12
Gout	1	1	1	‡2	†3	1
Total	†9	§8	‡8	15	†11	19
Back & neck disorder	§12	§13	§13	27	§14	30
Osteoporosis	3	1	2	2	1	4
Cancer	§2	§<1	§2	6	§2	9
Depression	§4	§5	§5	‡11	§4	13

* Currently on medication

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

Table 11c: Prevalence of chronic disease in adults aged ≥ 25 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
Hypertension*	9	9	12	14	9	13
High cholesterol*	3	6	11	13	4	7
Cardiovascular disease						
Heart disease	2	5	9	6	4	5
Stroke	<1	1	<1	1	1	2
Total	2	†6	9	7	5	6
Diabetes†	3	4	12	12	3	5
Asthma	7	6	12	6	6	8
Bronchitis / emphysema	<1	2	8	†3	0	1
Arthritis						
Rheumatoid	3	3	5	3	0	2
Osteoarthritis	2	3	2	2	3	4
Gout	1	1	2	1	3	1
Total	8	9	12	8	8	8
Back & neck disorder	16	12	12	13	15	13
Osteoporosis	2	3	1	1	2	2
Cancer	2	2	2	<1	5	2

* currently on medication P-value compared with 2002-03 survey: † <0.05

Table 11d: Mental health status in last 4 weeks of adults aged ≥15 years – 2006-07 survey, by ethnicity.

Mental health status (feeling all or most of the time)	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Feel happy	‡78	83	†79	‡83	†82	85
Feel calm and peaceful	72	73	73	71	70	71
Feel so down nothing can cheer me up	2	3	3	†2	‡4	1
Feel very nervous	5	2	2	3	‡5	2
Feel full of life	64	‡74	†71	63	†68	63

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

Table 11e: Mental health status in last 4 weeks of adults aged ≥15 years – 2002-03 and 2006-07 surveys, by Asian ethnicity.

Variable	Chinese		South Asian		Other Asian	
	2002-03	2006-07	2002-03	2006-07	2002-03	2006-07
	%	%	%	%	%	%
Feel happy	78	78	76	83	78	79
Feel calm and peaceful	76	72	70	73	67	73
Feel so down nothing can cheer me up	<1	‡2	2	3	1	3
Feel very nervous	1	5	2	2	2	2
Feel full of life	65	64	65	74	64	71

P-value compared with 2002-03: ‡ <0.01

Health Service Utilisation

The variables on health service utilisation reported in the following section cover the general areas of primary health care, secondary health services and oral health.

Primary Health Care

The tables in this section come only from the 2006-07 health survey, as change in many of the questions did not allow comparisons with the 2002-03 health survey.

Primary Health Care Provider

Children (Table 12a): the proportion of children who had a usual health practitioner or service that they could attend when first unwell was lower in Chinese (92%) and Other Asian (87%), and similar in South Asian (95%), Māori (99%) and Pacific (98%) compared to European (98%) (Figure 15). Of those who had a usual health practitioner, nearly all children (98-100%) attended a family practice or GP clinic when first unwell, with the remainder mainly attending a private accident and emergency clinic.

Adults (Table 12b): the proportion of adults who had a usual health practitioner or service, that they could attend when first unwell, was lower in Chinese (82%), South Asian (90%) and Other Asian (81%), and similar in Māori and Pacific (93% each) compared to European (95%) (Figure 15). Of those who had a usual health practitioner, nearly all adults (90-98%) attended a family practice or GP clinic when first unwell, while a higher proportion of Chinese (8%) attended a student health service.

South Asian people were more likely to have received services related to weight and cardiovascular disease from staff at their usual primary health care provider than European people. For example, the relative risk of South Asians having a cholesterol test was 1.36 (95% CI: 1.18, 1.57) compared with Europeans, adjusting for age and sex. A similar pattern was seen for Māori, with the adjusted relative risk of having a weight or height measure being 1.16 (1.06, 1.28), and of having a diabetes test being 1.44 (1.28, 1.62), compared to Europeans; and also for Pacific people, with the adjusted relative risk of having a blood pressure test being 1.10 (1.01, 1.20), and of having a cholesterol test being 1.25 (1.08, 1.44), compared to Europeans. In contrast, Chinese and Other Asians had a similar profile to Europeans for services provided in the last 12 months ($p < 0.05$). The proportion of people given a "Green Prescription" was not higher in non-Europeans, despite higher obesity prevalences (Table 9d). However, practice staff were more likely to discuss lifestyle risk factors related to cardiovascular disease and diabetes (eg. nutrition, weight and exercise) with South Asian people, and with Māori and Pacific, than with European.

Type of Practitioner Consulted in Last 12 Months

Children (Table 12c): the proportion of children who saw a family doctor or general practitioner (GP) in the last 12 months was higher for South Asian (85%), but similar for all other ethnic groups, compared with European (79%) (Figure 16). A higher proportion of Māori children (7%) could not see a GP in the last 12 months when they needed to, compared with European (3%) and other ethnic groups. Chinese children were less likely to have seen a primary health care nurse and Well Child nurse in the last 12 months than European children. Compared with European, in the last 12 months, Chinese

and South Asian children were: less likely to have seen a medical specialist (12% and 13% respectively, versus 23%); less likely to have seen a pharmacist (5% and 4% respectively, versus 11%); less likely to have seen a chiropractor or osteopath (1% each, versus 4%); and less likely to have seen a speech therapist (1% and 0% respectively, versus 3%). Children from all three Asian groups were less likely to have seen a social worker – Chinese <1%, South Asian 1%, Other Asian 0% – than European children (4%).

Adults (Tables 12d, 12e): the proportion of adults who saw a family doctor or GP in the last 12 months was lower for Chinese (65%) and Other Asian (70%), but similar for all other ethnic groups, compared with European (83%) (Figure 16). As reported above for children, in the last 12 months, Asian adults were generally less likely to have seen a wide range of health professionals, including medical specialists, pharmacists, physiotherapists, optometrists and social workers, than Europeans (Table 12d). South Asian and Pacific people were less likely to have seen a complementary or alternative health care worker than European (11% and 12% respectively, versus 19%). Chinese people were more likely to have seen an acupuncturist or Chinese medical practitioner while Europeans were more likely to have seen an osteopath or chiropractor (Table 12e).

Reasons for Visiting Family Doctor

Children (Table 12f): On their last visit, Chinese and South Asian children were more likely to have seen their family doctor for a short-term illness (77% and 72% respectively, versus 64%).

Adults (Table 12g): a similar pattern was seen in adults. On their last visit, compared with Europeans, Chinese were less likely to have seen their family doctor for a long-term illness (14% versus 24%), while South Asian were more likely to have seen their family doctor for a short-term illness (45% versus 34%). All Asian groups were also less likely than Europeans to have seen their doctor for contraception, but more likely to have gone for routine check-ups or advice.

Use of Screening Services

Adults (Table 12h, Figure 17): South Asian, Other Asian, Māori and Pacific women were less likely to have had a mammogram in the last 2 years, than European women; while women in all non-European ethnicities were less likely to have had a cervical smear in the last 3 years, than European women.

Use of Telephone Helplines

Children (Table 12i): overall, the parents and care-givers of Asian children were less likely to have used telephone helplines in the last 12 months than European. This was particularly so for ringing their family doctor or nurse, pharmacist or after-hours accident and emergency clinics. In contrast, Plunketline was used as much by Asian families as European. The most common helplines used by parents of all Asian children were Healthline (5%), Plunketline (4%), Family doctor (both 4%) and nurse at GP clinic (3%).

Figure 15: Percent (95% CI) of children aged 0-14 years and adults aged ≥ 15 years who have a usual health practitioner to see when first unwell – 2006-07 survey, by ethnicity.

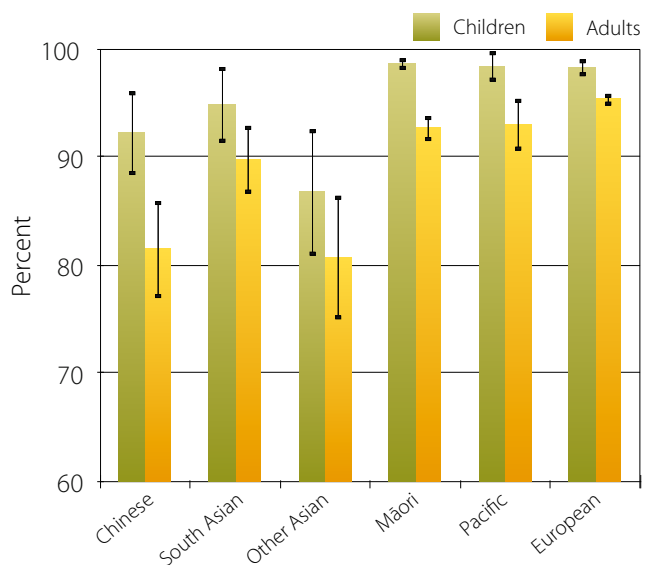


Figure 16: Percent (95% CI) of children aged 0-14 years and adults aged ≥ 15 years who saw a family doctor in the last 12 months – 2006-07 survey, by ethnicity.

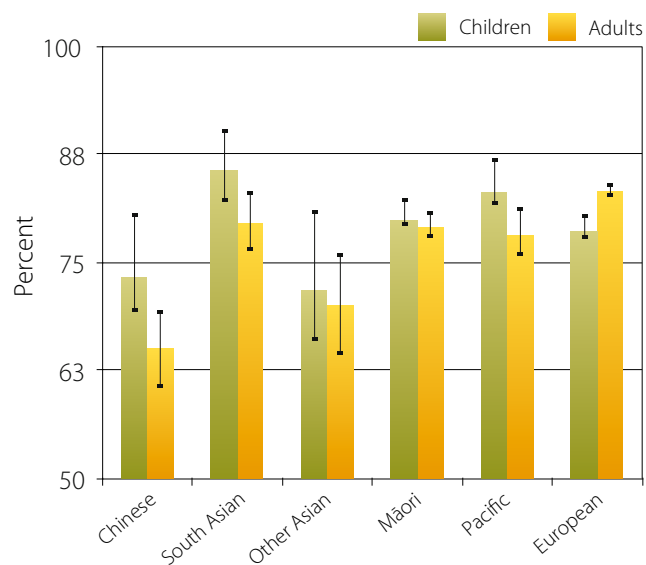


Figure 17: Percent (95% CI) of women who had a mammogram (aged 45-69 years) or cervical smear (aged 20-69 years) in the last 2-3 years – 2006-07 survey, by ethnicity.

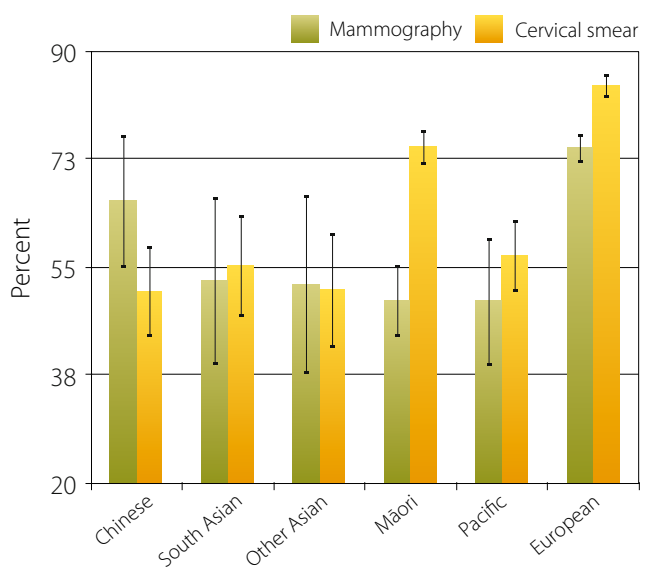


Table 12a: Usual practitioner or service seen first when unwell, and visits to a general practitioner (GP) or primary health care nurse in the last 12 months, for children aged 0-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Have health practitioner or service to see when 1st unwell	‡92	95	§87	99	98	98
Practitioner seen when 1st unwell:						
GP clinic	98	99	§100	98	98	99
Private A & E clinic	1	†<1	§0	1	2	1
Nurse clinic	0	0	0	<1	0	<1
Other (eg. chemist)	0	0	0	<1	0	<1

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

Table 12b: Usual practitioner or service seen first when unwell, and services provided by usual practice in the last 12 months, for adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Have health practitioner or service to see when 1st unwell	§82	†90	§81	93	93	95
Practitioner seen when 1st unwell:						
GP clinic	‡90	95	95	97	98	98
Student health service	‡8	3	3	1	‡<1	1
Chemist	†0	†0	†0	<1	<1	<1
Private A & E clinic	2	1	<1	1	1	1
Nurse clinic	0	<1	<1	<1	<1	<1
Alternative provider	<1	‡0	1	<1	‡0	<1
Service provided in last 12 months:						
Weight/height measure	26	§35	23	‡29	§39	29
Blood pressure test	44	50	41	47	†52	56
Cholesterol test	22	§30	21	22	‡27	31
Diabetes test	18	§29	16	§20	§26	19
Flu vaccination	14	14	13	14	15	21
Other vaccination	3	3	5	4	‡2	4
"Green prescription"	1	1	2	2	2	2
Practice staff discussed (in the last 12 months):						
Smoking	6	‡4	7	§15	§16	7
Healthy food/nutrition	9	§17	11	§12	§24	8
Weight	5	§14	7	§13	§25	9
Exercise/physical activity	8	§15	11	§12	§25	9
Teeth/oral health	2	3	1	§3	§6	1
Alcohol	2	4	3	§4	§9	2
Mental/emotional health	§2	§3	§2	6	5	6

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

Table 12c Type of practitioner seen in the last 12 months by children aged 0-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Family doctor (GP)	73	†86	72	80	83	79
Could not see GP when needed	5	4	4	§7	3	3
Nurse:						
Primary health care						
As part of GP consultation	‡23	32	23	36	38	33
Without seeing GP	§14	†18	†14	25	‡18	24
Well Child (eg. Plunket)	†14	17	9	20	20	19
Other (eg. district nurse)	2	3	3	‡7	3	4
Medical specialist	§12	§13	17	‡19	‡16	23
Specialist seen last visit at:*						
Public hospital	42	‡72	64	§70	‡66	57
Private hospital	5	0	10	1	<1	5
Specialist's private rooms	53	28	26	29	33	38
Pharmacist	†5	§4	7	‡8	§4	11
Physiotherapist	2	2	3	§1	3	3
Chiropractor/Osteopath	§1	§1	2	‡2	§1	4
Dietitian	1	‡0	1	1	1	1
Optometrist	6	6	11	§3	§2	8
Occupational therapist	<1	†0	<1	1	1	1
Speech therapist	†1	§0	1	3	‡1	3
Midwife	5	6	3	6	6	5
Social worker/counsellor	§<1	§1	§0	3	†2	4
Alternative health worker	§0	1	‡0	1	†<1	1
Audiologist	<1	‡0	‡0	1	‡0	1
Podiatrist	0	0	0	<1	<1	<1

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 12d: Type of practitioner seen in the last 12 months by adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Family doctor (GP)	\$65	79	\$70	79	78	83
Could not see GP when needed	9	7	6	\$12	†11	5
Nurse:						
Primary health care	7	6	6	9	†6	7
Other (eg. district nurse)	\$3	4	†3	†7	7	6
Medical specialist	\$20	\$18	‡22	29	\$19	35
Pharmacist	\$13	\$11	‡13	\$16	\$10	20
Physiotherapist	\$6	\$7	10	\$11	\$8	14
Dietitian	‡1	1	1	†3	†3	2
Diet & fitness worker	\$0	<1	\$0	<1	<1	<1
Optometrist	‡8	†9	†8	\$7	\$6	15
Occupational therapist	<1	<1	1	1	1	1
Speech therapist	<1	<1	1	<1	0	<1
Midwife*	8	11	8	†13	12	10
Social worker/counsellor	‡1	†2	\$1	‡6	3	3
Podiatrist	1	<1	\$0	<1	†<1	1
Audiologist	<1	‡<1	\$0	1	<1	<1
Radiologist	1	1	\$0	<1	<1	1

* for females aged 15-44.

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, \$ <0.001

Table 12e: Complementary or alternative health care worker seen in the last 12 months by adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Saw a complementary health care worker	23	\$11	18	20	\$12	19
Type of complementary health care worker:						
Acupuncturist	\$10	2	†7	2	\$1	3
Chinese medical practitioner	\$12	\$<1	3	1	1	1
Osteopath	\$1	\$1	\$<1	†4	\$1	5
Chiropractor	\$1	\$1	\$2	‡4	\$2	6

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, \$ <0.001

Table 12f: Health issue* seen by family doctor at last visit for children aged 0-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Long-term illness	9	9	17	§14	13	9
Short-term illness	†77	71	63	66	62	64
Injury or poisoning	6	7	8	†7	11	10
Immunisation	12	12	14	14	15	13
Mental/emotional health	†0	†0	†0	1	†<1	1
Routine check-up	†4	7	10	10	9	10
Referral advice	<1	<1	1	1	1	1

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

* more than one issue could be reported

Table 12g: Health issue* seen by family doctor at last visit for adults aged ≥15 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Long-term illness	†14	15	18	20	18	24
Short-term illness	41	†45	43	39	41	34
Injury or poisoning	11	†8	8	13	10	11
Immunisation	4	2	‡1	2	3	3
Mental/emotional health	§1	§1	§2	‡3	§1	4
Contraception	§3	§3	‡3	7	†4	5
Sexual health problem	§<1	1	†1	1	2	1
Routine check-up/advice	†32	‡33	†32	24	27	30

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

* more than one issue could be reported

Table 12h: Percent of women who had a mammogram or cervical smear in the last 2-3 years – 2006-07 survey, by ethnicity

Ethnic Group						
Screening Test	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Mammogram in last 2 years (aged 45-69 yrs)	66	‡53	‡52	§49	§50	74
Cervical smear in last 3 years (aged 20-69 yrs)	§51	§55	§51	§75	§57	84

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

Table 12i: Percent of children aged 0-14 years whose parents or caregivers used phone services in the last 12 months to get health advice – 2006-07 survey, by ethnicity.

Ethnic Group						
Variable	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Healthline	6	†5	6	8	§4	8
Plunketline	5	5	2	4	†3	5
Family doctor	†5	§4	‡3	9	7	9
Nurse at GP clinic	§4	§3	§3	†8	§5	11
Pharmacist	§<1	§<1	3	3	§1	3
After hours A & E Clinic	‡1	§1	§0	†3	†2	4
Public hospital A & E clinic	§0	‡1	§0	2	1	2
111 emergency line	‡0	1	1	1	2	1
Midwife	<1	0	0	<1	1	<1
Counsellor	0	<1	†0	<1	†0	<1

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

Secondary Health Services

The tables in this section come only from the 2006-07 health survey, as change in many of the questions did not allow comparisons with the 2002-03 health survey.

Children (Table 13a): the proportion of children who used a public hospital in the last 12 months was lower in South Asian and Chinese (both 13%), and higher in Māori (22%), compared to European (17%) (Figure 18). Children of both above Asian groups generally were less likely to use all types of public hospital services – emergency department, out-patient, day treatment and in-patient – compared to European, while Other Asian children were generally similar. The proportion of children using a private hospital in the last 12 months was lower than for public hospitals, and ranged from 1-5% with no significant variation between ethnic groups.

Adults (Table 13b): the proportion of adults who used a public hospital in the last 12 months was lower in Chinese (16%), South Asian (14%) and Other Asian (13%), and higher in Māori (27%), compared with European (22%), who were similar to Pacific (21%) (Figure 18). All three Asian groups generally were less likely to use all types of public hospital services – emergency department, out-patient, day-patient and in-patient – compared to European. Asian people, particularly Chinese and South Asian, and also Māori and Pacific, were less likely to use private hospitals than European. For all Asian ethnicities, 15% used a public hospital and 3% used a private hospital in the last 12 months.

Figure 18: Percent (95% CI) of children aged 0-14 years, and adults aged ≥ 15 years, who attended a public hospital in the last 12 months – 2006-07 survey, by ethnicity.

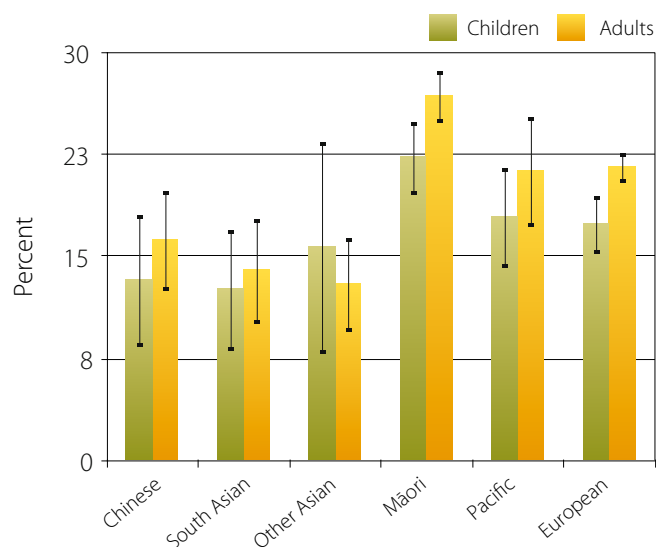


Table 13a: Percent of children aged 0-14 years who used secondary health care (hospital) services in the last 12 months – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Public hospital	13	†13	16	‡22	18	17
Emergency department	5	†5	5	10	8	8
Out-patient	§3	§4	8	8	†5	8
Day treatment	§1	2	1	3	3	3
In-patient	3	§1	§1	5	5	4
Private hospital	1	1	5	1	2	2
Out-patient	1	1	2	‡<1	1	1
Day treatment	‡0	‡0	3	1	1	1
In-patient	†0	†0	1	<1	†0	<1

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, § <0.001

Table 13b: Percent of adults aged ≥15 years who used secondary health care (hospital) services in the last 12 months – 2006-07 survey, by ethnicity.

Type of Hospital & Service	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Public hospital:						
Emergency department	†16	‡14	§13	§27	21	22
Out-patient	†6	§4	6	10	9	9
Day-patient	5	†5	6	†10	7	9
Admitted as in-patient	2	‡2	§1	4	3	4
Private hospital:	‡4	5	†4	§11	8	8
Day-patient	†4	§3	4	§3	§3	7
Admitted as in-patient	<1	‡1	1	§1	1	2
	§2	§1	2	1	†2	3

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

Oral Health

Children (Table 14a): Chinese and Other Asian children had a higher frequency of brushing their teeth each day, and South Asian, Māori and Pacific a lower frequency, compared with European children. The proportion of children who had a filling was generally lowest in Asian children, intermediate in Pacific and European, and highest in Māori. Asian children were less likely to be awake at night with oral pain than European children. However, non-European children were more likely to have had a tooth removed than European. South Asian children were less likely to have visited a dentist or oral health care worker in the last 12 months than European (79%), who were similar to Chinese and Other Asians (Figure 19).

Adults (Table 14b): the proportion of adults who had seen a dentist or oral health care worker in the last 12 months (35% for all Asian combined) was lower in Chinese (36%), South Asian (31%), Other Asian (41%), Māori (387%), and Pacific (34%) compared with European (56%) (Figure 19). All non-Europeans were also less likely to have had regular dental checkups every 2 years compared to European.

Figure 19: Percent (95% CI) of children aged 1-14 years, and adults aged ≥ 15 years, who visited an oral health care worker in the last 12 months – 2006-07 survey, by ethnicity.

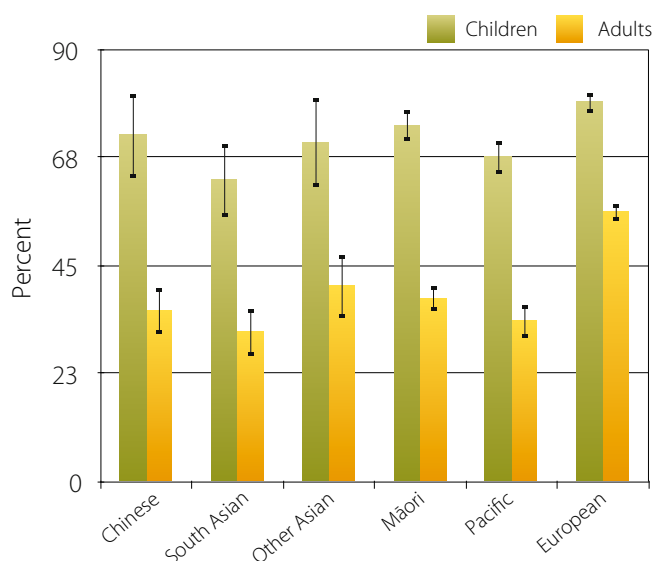


Table 14a: Oral health care of children aged 1-14 years – 2006-07 survey, by ethnicity.

Variable	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Number of times brushed teeth yesterday:*						
0	†4	‡7	\$1	\$15	‡10	6
1	20	42	19	36	31	30
2	74	49	69	44	53	62
≥3	1	2	12	5	6	2
Ever:						
Had Filling	39	39	\$39	\$50	41	45
Awake at night by oral pain	\$6	\$10	†12	20	‡14	19
Had tooth removed	12	9	†12	\$13	‡14	9
Last visit to oral care worker:*						
Last 12 months	72	\$63	71	†74	\$68	79
> 1 year - < 2 years	15	12	12	9	9	8
≥ 2 years	3	3	1	1	3	1
Never	11	23	17	16	20	12
Needed to see dentist in last 12 months but could not	4	\$1	3	4	2	3

P-value compared with European, adjusted for age: † <0.05, ‡ <0.01, \$ <0.001

* P-value (unadjusted) applies to all percentages for each ethnic group compared with European.

Table 14b: Oral health care services used by adults aged ≥15 years – 2006-07 survey, by ethnicity.

Type of Hospital & Service	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
	%	%	%	%	%	%
Visited oral health care worker in last 12 months	§36	§31	§41	§38	§34	56
Needed to see dentist in last 12 months but could not	9	10	†7	§18	13	9
Have regular dental check-ups at least every 2 years	§27	§18	§30	§24	§16	48

P-value compared with European, adjusted for age and sex: † <0.05, ‡ <0.01, § <0.001

Summary of Main Results

In the results summarised below, all comparisons between Asian and non-Asian ethnic groups are from the 2006-07 survey. In contrast, all comparisons over time are restricted to the Asian samples in the 2002-03 and 2006-07 surveys.

Sociodemography

1. Age

- Asian people, along with Māori and Pacific, were distributed more towards the younger age-groups than Europeans.
- The age-distribution among Chinese and South Asians remained unchanged between the two surveys, but shifted more towards older age-groups among Other Asians from 2002-03 to 2006-07.

2. Time lived in New Zealand

- The time lived in New Zealand increased in all three Asian ethnic groups, with the percentage who had lived 5 or more years being substantially higher in 2006-07 than in 2002-03.

3. Education and income

- The Asian community is highly educated, with all three Asian ethnicities being more likely to have a University bachelor or post-graduate degree than non-Asian groups.
- Asian people, along with Polynesian, were distributed more towards low household income categories than European.
- The proportion of Asian people living in the lowest NZDep quintile areas declined substantially from 2002-03 to 2006-07.

Lifestyle

1. Nutrition

- Chinese and Other Asian children, along with Māori and Pacific, were less likely to have been breast-fed than European and South Asian children.
- All Asian ethnicities, along with Māori and Pacific, had lower proportions of people eating the recommended daily number of serves of fruit and vegetables (≥ 5) than Europeans.
- The proportion of Asian men and women eating the recommended daily number of serves of fruit and vegetables did not change between the two surveys.

2. Physical activity

- Asian people, along with Pacific, were less likely to be physically active than European and Māori.
- The proportion of Asian men and women who were physically active or sedentary did not change between the two surveys.

3. Tobacco

- Asian women were less likely to smoke tobacco than European women, while Asian and European men were similar.
- There was no change in the frequency of tobacco smoking by Asian men or women between the two surveys.
- For adults, the percent that lived in a house where people smoked inside was lower among South Asians, and similar for Chinese and Other Asians, compared to Europeans.
- For children, the percent that lived in a house where people smoked inside was similar for all ethnic groups, aside from Māori who had the highest level.

4. Alcohol

Asian and Pacific people were less likely to drink alcohol than Māori and Europeans.

Asian people who drink alcohol were less likely to binge drink than European and Polynesian drinkers.

The frequency of alcohol consumption increased in Chinese and Other Asians between the two surveys, but remained unchanged in South Asians.

5. Gambling

- Asian people were less likely to gamble than other New Zealanders.
- The proportion of Asian people who gamble remained unchanged between the two surveys.
- Lotto was the most common type of gambling by Asian people.

6. Body size

- Asian children had similar prevalences of overweight and obesity to European children.
- The prevalence of obesity increased in Asian adults between the two surveys.

7. Acculturation

- A longer period of residence in New Zealand by Asian people was associated with increased likelihood of being an alcohol drinker and of being overweight and obese, and decreased likelihood of being a non-smoker.

Chronic Disease

1. Children

- South Asian children had lower prevalences of asthma, eczema and allergy than European children, while Chinese and Other Asian were similar.

2. Adults: Cardiovascular disease and diabetes

- South Asian, Pacific and Māori people had increased prevalences of being on treatment for hypertension compared to European.
- South Asian people had double the risk of being on treatment for high cholesterol than European.
- The prevalence of being on treatment for diabetes was increased four-fold in South Asian and Pacific, and two-fold in Other Asian and Māori, compared with European.

3. Adults: Other chronic diseases

- The prevalences of asthma and chronic bronchitis/emphysema were lower in Asian people compared with European.
- The prevalence of arthritis, and of back and neck disorders, were lower in Chinese, South Asian, Other Asian and Pacific, compared to European and Māori.
- Self-reported depression was less common in Chinese, South Asian, Other Asian and Pacific, compared to European and Māori.

4. Adults: time trends

- Overall, there was no change between the two surveys in the prevalence of chronic adult conditions and mental health status among Asian people.

Health Service Utilisation

1. Primary health care provider

- Asian children and adults, aside from South Asian children, were less likely to have a usual health practitioner or service to visit when first unwell, compared to non-Asians.
- Family practices and GP clinics were the most common health care provider visited by Asian people when first unwell ($\geq 90\%$), although a relatively high proportion of Chinese adults (8%) attended a student health service.
- South Asian people, along with Māori and Pacific people, were more likely to receive services related to weight and cardiovascular disease from staff at their usual primary health care provider than European, Chinese and Other Asian people. However, the “Green Prescription” was not being used by South Asian people at an appropriate level, given their low physical activity and high BMI levels.

2. Type of practitioner consulted in last 12 months

- The proportion of children who saw a family doctor in the last 12 months was higher for South Asian, but similar for all other ethnic groups, compared with European.
- The proportion of adults who saw a family doctor in the last 12 months was lower for Chinese and Other Asian, but similar for South Asian and all other ethnic groups, compared with European.
- Chinese children were less likely to have seen a primary health care nurse and Well Child nurse in the last 12 months than European children.
- Asian adults and children were generally less likely to have seen in the last 12 months a range of health professionals, including medical specialists, pharmacists, and social workers, than Europeans.
- Chinese people were more likely to have seen an acupuncturist or Chinese medical practitioner in the last 12 months, while Europeans were more likely to have seen an osteopath or chiropractor, compared to other ethnic groups.

3. Reasons for visiting family doctor

- Chinese and South Asian children were more likely to see their family doctor for a short-term illness than children of other ethnicities.
- Asian adults were more likely to see their family doctor for a short-term illness or a routine check up than European adults.
- Asian adults were less likely to see their family doctor for mental or emotional health reasons, or contraceptive advice, than Europeans.

4. Use of screening services

- South Asian, Other Asian, Māori and Pacific women were less likely to have had a mammogram in the last 2 years than European women.
- Asian and Polynesian women were all less likely to have had a cervical smear in the last 3 years than European women.

5. Use of telephone helplines

- Overall, the parents and care-givers of Asian children were less likely to have used telephone helplines in the last 12 months than European.
- The most common helplines used by Asian people for their children were Healthline, Plunketline and their family doctor or nurse.

6. Secondary health services

- South Asian and Chinese children were less likely to have used a public hospital in the last 12 months compared to European, who were similar to Other Asian.
- Asian adults were less likely to have used a public hospital in the last 12 months compared to European.
- Asian adults were less likely to have used a private hospital in the last 12 months compared to European.

7. Oral health

- South Asian children were less likely to have visited a dentist or oral health care worker in the last 12 months than European, who were similar to Chinese and Other Asian.
- Asian adults were less likely to have visited a dentist or oral health care worker in the last 12 months than European.

Discussion

The results in this report provide an overview of the health status of the Asian community in 2006-07, in comparison to the rest of the New Zealand population; and at the same time provide information on trends in health status among the Asian community since 2002-03.

Sociodemography

The Asian population in 2006-07 remains relatively young, with about 50% of adults aged 15-34 years compared with 29% of the Pakeha majority (Table 2b). The age-distribution in 2006-07 for Asians remains similar to that for Māori and Pacific. Since 2002-03 there has been no change in the age-distribution for Chinese and South Asian people, and a small increase in age for Other Asians (Table 2c). As identified in the previous report of the 2002-03 New Zealand Health Survey,¹ the relatively younger age of the Asian population will create a relatively greater demand for health services, as it ages over the next few decades, than the total New Zealand population.

The Asian population continues to have the highest proportion of people who have newly arrived in New Zealand – with about a quarter of Asian adults in 2006-07 having arrived within the last 5 years, compared to 3% of Europeans (Table 2b). However, the above proportion for Asian adults is well down from 46% of Asian adults in 2002-03 having arrived within the last 5 years (Table 2c), indicating that the average time lived in New Zealand by Asian community is increasing. This has implications for the lifestyle and health effects from acculturation which are discussed below.

The Asian population remains the most highly educated community in New Zealand, with 35% of adults in 2006-07 having a university degree, compared to only 18% of Europeans (Table 3a). Despite this, Asian households are distributed more towards the lower income categories, and are more likely to live in low NZDep quintile areas, than European households (Table 3a). This is likely to limit the options for Asian people to make healthy lifestyle choices, particularly with regard to foods. However, Asian people are less likely to live in low NZDep quintile areas in 2006-07 than in 2002-03 (Table 3b), indicating that they are moving to more affluent residential areas over time.

Lifestyle

The overall lifestyle pattern among Asian children indicates no areas of concern, when compared with other ethnic groups, aside from the lower proportion of Chinese and Other Asian children who were ever breast fed (Table 4a). The possible reasons for this are unclear, as no previous research on the topic from studies of Asian participants was identified. The finding suggest that breast feeding needs to be promoted more during pregnancy among Chinese and Other Asian women, as well as for Māori and Pacific women. Obesity may also be an unrecognised issue in Asian children, as they are likely to have higher body fat levels than European children, despite having similar BMIs (Table 9a).^{83 84}

Among Asian adults, lower levels of fruit and vegetable intake, and of physical activity, when compared with Europeans, remain areas of concern (Tables 4b & 5b), particularly when there has been no change in both lifestyle practices since the 2002-03 survey (Tables 4c & 5c). The energy balance between food intake and physical activity is a primary determinant of obesity. The most worrying finding of this report is the significant increase in obesity levels among Asian adults from 2002-03 to 2007-07 (Table 9f). The prevalence of obesity increased among Asian people, regardless of whether the ethnic specific BMI cut-point of 25.0 or the WHO cut-point of 30.0 was used. This is most likely a consequence of increasing acculturation among the Asian community, since length of residence in New Zealand was associated with increased prevalence of overweight and obesity in the 2006-07 survey (Table 10). However, an effect from selection of migrants who are healthy prior to entry into New Zealand, may be contributing partly to the association between length of stay in New Zealand and adverse life style risk factor levels. This adverse effect from acculturation is likely to continue into the future, and the increased prevalences of diabetes and cardiovascular disease observed in South Asians (discussed below) could extend to the Chinese and Other Asian communities. The association observed among Taiwanese women in Australia between length of residence in Australia and insulin resistance and blood triglyceride levels, supports this conclusion.⁵⁵ Culturally-appropriate health promotion efforts, by a range of organisations, both national and regional,⁸⁵ are required to nullify and mitigate its effects.

The profile for other lifestyle behaviours, such as tobacco smoking, alcohol drinking and gambling, among Asian adults is healthier than for all other ethnic groups, with lower levels of participation in these behaviours in 2006-07 (Tables 6a, 7a & 8a). However, there have been some changes since the 2002-03 survey that warrant attention, in particular the increased alcohol consumption by Chinese and Other Asians in 2006-07 (Table 7b). Acculturation is also occurring, with length of residence in New Zealand associated with increased likelihood of being an alcohol drinker and decreased likelihood of being a non-smoker in the 2006-07 survey (Table 10). The presence of lifestyle acculturation among Asian people in New Zealand is consistent with the large body of research on this topic from other countries, particularly North America (see Literature Review). The low levels of gambling among Asian adults, compared to other ethnic groups, confirm earlier findings from the 2002-03 survey.¹ However, the possibility cannot be excluded of a social desirability bias leading to higher under-reporting by Asian participants because of previous community stigmatisation about gambling; and neither can a bimodal gambling pattern, with a core of problem gamblers particularly in the Chinese community, given previous research in New Zealand⁸⁶ and overseas.⁴⁸

Chronic Disease

The pattern of chronic disease in children in 2006-07 is very similar for Chinese, Other Asian and European children, while South Asian children have lower self-reported prevalences of diagnosed asthma, eczema and allergy, although the prevalence of symptoms for these diseases is similar in all four ethnic groups (Table 11a).

In contrast, the pattern in adults in 2006-07 shows a different picture, with increased prevalences of self-reported diabetes in Asian people compared with Europeans, particularly in South Asians and Other Asians (Figure 14). This is most probably a consequence of insulin resistance from the ongoing increase in obesity levels due to insufficient physical activity (see above), but may also be due to vitamin D deficiency among the Asian community in New Zealand.⁸⁷ Chinese people are likely also to experience elevated prevalences of diabetes in the future if the above lifestyle patterns continue with increasing acculturation.

The South Asian community also has an added burden from cardiovascular disease, with increased risks of both self-reported hypertension and hypercholesterolaemia (Figures 11 and 12). The data also suggest an increased risk of self-reported heart attack (Figure 13), particularly in men (Appendix 1). This finding is consistent with previous hospital discharge data showing high rates for myocardial infarction in Indian men from South Auckland,⁹ and with reports of national data showing higher hospital discharge rates for cardiovascular disease among Indian and South Asian people compared with the total New Zealand population.^{5,89} The lack of statistical significance in the 2006-07 data in this report may be due to the small sample size for South Asian participants. The New Zealand data confirm previous reports of increased rates of cardiovascular disease among South Asians living in both the UK and North America.⁵⁶⁻⁵⁹

The prevalences of all other diseases among adults in 2006-07 – asthma, bronchitis, arthritis, back and neck disorders, and cancer – are generally lower in Asian people compared with European (Table 11b). This confirms the findings from the 2002-03 survey.¹ Self-reported mental health status appeared to be better for Asians compared with Europeans (Table 11d). This is a surprising finding given the stresses associated with migration,⁶³ and may be a consequence of misunderstanding questions in a foreign language in the health survey or stigma about revealing depression to interviewers from another culture.

Health Service Utilisation

Asian children and adults, particularly Chinese and Other Asian, are less likely to have a regular primary health care provider compared to other ethnic groups (Tables 12a & 12b). The reasons for this are unclear, but may be due to their limited time living in New Zealand resulting in a lack of familiarity with the health system and how to access it. The percentage of adult Chinese and Other Asians who have a regular health care provider (82% and 81%, respectively) is so much lower than for Europeans (95%) that it warrants further research to rectify this inequity in access to basic health care services. On the other hand, for people who said they had a primary health care provider, the higher proportion of South Asian people who received services related to nutrition, physical activity, weight and diabetes, compared with European, indicates that these health services are aware of, and responding to, the greater cardiovascular disease burden among the South Asian population (Table 12b). The percentages of women who had breast and cervical screening, as recommended by national guidelines, are similar to the data from national screening programmes,⁹⁰ aside from a higher proportion of Asian and Māori women in the 2006-07 survey reporting having had a cervical smear within the last 3 years (Table 12h). Asian women were less likely to have used screening services for breast and cervical cancers in the last 2-3 years than European women. This is an ongoing concern which was identified in the data from the 2002-03 health survey,¹ and which does not appear to have been rectified. It is similar to the pattern described for Asian women in North America.⁶⁸⁻⁷⁰

Asian people also are less likely to have seen a wide range of health care professionals within the last 12 months in the 2006-07 survey, including medical specialists, pharmacists and social workers (Tables 12c & 12d), and less likely to have used public and private hospitals (Tables 13a & 13b), than Europeans. Increased use of traditional Chinese healers by the Chinese and Other Asians (Table 12e) may be a factor in the lower use of allopathic healers by these communities.

Conclusions

1. Asian people in New Zealand remain more highly educated than other New Zealanders; but they have lower incomes and are more likely to live in more economically deprived areas than Europeans, which limits their options for making healthy lifestyle choices.
2. The prevalence of obesity has significantly increased among Asian adults in New Zealand from 2002-03 to 2006-07. This is consistent with the lack of change between the two surveys in the levels of physical activity and daily serves of fruit and vegetables, which both remain below those of Europeans.
3. Lifestyle acculturation is occurring among Asian New Zealanders, with adverse health patterns for alcohol drinking, tobacco smoking and obesity increasing with length of residence in New Zealand.
4. South Asian people have increased prevalences of treated hypertension, high blood cholesterol and diabetes, compared with Europeans. Other chronic diseases – such as asthma, bronchitis, arthritis and back/neck disorders – are less common in Asian people than Europeans.
5. Asian people are not accessing the health services to the same degree as non-Asians. Generally, they are less likely to: have a primary health care provider; to have seen in the last 12 months a range of health professionals, including medical specialists, pharmacists, and social workers; to have used a private or public hospital in the last 12 months. Further, Asian women are less likely to have mammography or cervical screening tests than European women.
6. Given the continual rapid increase in the size of the Asian population living in New Zealand, there is an urgent need for Asian health data from national and regional surveys, in order to monitor the health status of Asian people in Aotearoa.

References

1. Scragg R, Maitra A. Asian Health in Aotearoa: an analysis of the 2002-2003 New Zealand Health Survey. Auckland: The Asian Network Inc (TANI), 2005.
2. Ministry of Health. A Portrait of Health: key results of the 2002/03 New Zealand Health Survey. Wellington: Ministry of Health, 2004.
3. Ministry of Health. A Portrait of Health: key results of the 2006/07 New Zealand Health Survey. Wellington: Ministry of Health, 2008.
4. Asian Public Health Project Team. Asian Public Health Project report, February 2003. Auckland: Ministry of Health, 2003.
5. Ministry of Health. Asian Health Chart Book 2006. Wellington: Ministry of Health, 2006.
6. Gala G. Health Needs Assessment for Asian People in Counties Manukau. Auckland: Counties Manukau District Health Board, 2008.
7. Zhou L. Health Needs Assessment for Asian people in Waitemata. Auckland: Waitemata District Health Board, 2009.
8. Statistics New Zealand. National ethnic population projections: 2006 (base) - 2026. Wellington: Statistics New Zealand. http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections (accessed 11/11/2009).
9. Dieu HT, Dibley MJ, Sibbritt D, Hanh TT. Prevalence of overweight and obesity in preschool children and associated socio-demographic factors in Ho Chi Minh City, Vietnam. *Int J Pediatr Obes* 2007;2(1):40-50.
10. Leung TF, Tam WH, Hung EC, Fok TF, Wong GW. Sociodemographic and atopic factors affecting breastfeeding intention in Chinese mothers. *J Paediatr Child Health* 2003;39(6):460-4.
11. Diong S, Johnson M, Langdon R. Breastfeeding and Chinese mothers living in Australia. *Breastfeed Rev* 2000;8:17-23.
12. Galvin S, Grossman X, Feldman-Winter L, Chaudhuri J, Merewood A. A practical intervention to increase breastfeeding initiation among Cambodian women in the US. *Matern Child Health J* 2008;12(4):545-7.
13. Mistry Y, Freedman M, Sweeney K, Hollenbeck C. Infant-feeding practices of low-income Vietnamese American women. *J Hum Lact* 2008;24(4):406-14.
14. Fishman C, Evans R, Jenks E. Warm bodies, cool milk: conflicts in post partum food choice for Indochinese women in California. *Soc Sci Med* 1988;26(11):1125-32.
15. Wang Y, Chen HJ, Shaikh S, Mathur P. Is obesity becoming a public health problem in India? Examine the shift from under- to overnutrition problems over time. *Obes Rev* 2009;10(4):456-74.
16. Wang H, Du S, Zhai F, Popkin BM. Trends in the distribution of body mass index among Chinese adults, aged 20-45 years (1989-2000). *Int J Obes (Lond)* 2007;31(2):272-8.
17. Ministry of Health. Tracking the Obesity Epidemic: New Zealand 1977-2003. Wellington: Ministry of Health, 2004.
18. Taylor R, Scragg R, Quigley R. Do sugary drinks contribute to obesity in children? A report prepared by the Scientific Committee of the Agencies for Nutrition Action (May 2005). Wellington: Agencies for Nutrition Action, 2005.
19. Utter J, Scragg R, Schaaf D, Fitzgerald E, Wilson N. Correlates of body mass index among a nationally representative sample of New Zealand children. *Int J Pediatr Obes* 2007;2(2):104-13.
20. Kim MJ, Lee SJ, Ahn YH, Bowen P, Lee H. Dietary acculturation and diet quality of hypertensive Korean Americans. *J Adv Nurs* 2007;58(5):436-45.
21. Lee WP, Lingard J, Bermingham M. Change in diet and body mass index in Taiwanese women with length of residence in Australia. *Asia Pac J Clin Nutr* 2007;16(1):56-65.
22. Lv N, Cason KL. Dietary pattern change and acculturation of Chinese Americans in Pennsylvania. *J Am Diet Assoc* 2004;104(5):771-8.
23. Unger JB, Reynolds K, Shakib S, Spruijt-Metz D, Sun P, Johnson CA. Acculturation, physical activity, and fast-food consumption among Asian-American and Hispanic adolescents. *J Community Health* 2004;29(6):467-81.
24. Kim J, Chan MM. Acculturation and dietary habits of Korean Americans. *Br J Nutr* 2004;91(3):469-78.
25. Kudo Y, Falciglia GA, Couch SC. Evolution of meal patterns and food choices of Japanese-American females born in the United States. *Eur J Clin Nutr* 2000;54(8):665-70.
26. Kolt GS, Schofield GM, Rush EC, Oliver M, Chadha NK. Body fatness, physical activity, and nutritional behaviours in Asian Indian immigrants to New Zealand. *Asia Pac J Clin Nutr* 2007;16(4):663-70.
27. Brown IJ, Tzoulaki I, Candeias V, Elliott P. Salt intakes around the world: implications for public health. *Int J Epidemiol* 2009;38(3):791-813.

28. Park MS, Chung SY, Chang Y, Kim K. Physical activity and physical fitness as predictors of all-cause mortality in Korean men. *J Korean Med Sci* 2009;24(1):13-9.
29. Nelson TF, Gortmaker SL, Subramanian SV, Cheung L, Wechsler H. Disparities in overweight and obesity among US college students. *Am J Health Behav* 2007;31(4):363-73.
30. Hofstetter CR, Irvin V, Schmitz K, Hovell MF, Nichols J, Kim HR, et al. Demography of exercise among Californians of Korean descent: a cross-sectional telephone survey. *J Immigr Minor Health* 2008;10(1):53-65.
31. Yang K, Laffrey SC, Stuifbergen A, Im EO, May K, Kouzekanani K. Leisure-time physical activity among midlife Korean immigrant women in the US. *J Immigr Minor Health* 2007;9(4):291-8.
32. Allen ML, Elliott MN, Morales LS, Diamant AL, Hambarsoomian K, Schuster MA. Adolescent participation in preventive health behaviors, physical activity, and nutrition: differences across immigrant generations for Asians and Latinos compared with Whites. *Am J Public Health* 2007;97(2):337-43.
33. Owen CG, Nightingale CM, Rudnicka AR, Cook DG, Ekelund U, Whincup PH. Ethnic and gender differences in physical activity levels among 9-10-year-old children of white European, South Asian and African-Caribbean origin: the Child Heart Health Study in England (CHASE Study). *Int J Epidemiol* 2009;38(4):1082-93.
34. Scragg R, Quigley R, Taylor R. Does watching TV contribute to increased obesity and body weight in children? A report prepared by the Scientific Committee of the Agencies for Nutrition Action (July 2006). Wellington: Agencies for Nutrition Action, 2006.
35. Chen JL, Wall D, Kennedy C, Unnithan V, Yeh CH. Predictors of increased body mass index in Chinese children. *Prog Cardiovasc Nurs* 2007;22(3):138-44.
36. Gordon-Larsen P, Adair LS, Popkin BM. Ethnic differences in physical activity and inactivity patterns and overweight status. *Obes Res* 2002;10(3):141-9.
37. Kaur S, Sachdev HP, Dwivedi SN, Lakshmy R, Kapil U. Prevalence of overweight and obesity amongst school children in Delhi, India. *Asia Pac J Clin Nutr* 2008;17(4):592-6.
38. Zhou H, Yamauchi T, Natsuhara K, Yan Z, Lin H, Ichimaru N, et al. Overweight in urban schoolchildren assessed by body mass index and body fat mass in Dalian, China. *J Physiol Anthropol* 2006;25(1):41-8.
39. Au L, Kwong K, Chou JC, Tso A, Wong M. Prevalence of overweight and obesity in Chinese American children in New York City. *J Immigr Minor Health* 2009;11(5):337-41.
40. Chen JL. Household income, maternal acculturation, maternal education level and health behaviors of Chinese-American children and mothers. *J Immigr Minor Health* 2009;11(3):198-204.
41. Schaefer SE, Salazar M, Bruhn C, Saviano D, Boushey C, Van Loan MD. Influence of race, acculturation, and socioeconomic status on tendency toward overweight in Asian-American and Mexican-American early adolescent females. *J Immigr Minor Health* 2009;11(3):188-97.
42. Rush EC, Freitas I, Plank LD. Body size, body composition and fat distribution: comparative analysis of European, Māori, Pacific Island and Asian Indian adults. *Br J Nutr* 2009;102(4):632-41.
43. Rush EC, Chandu V, Plank LD. Reduction of abdominal fat and chronic disease factors by lifestyle change in migrant Asian Indians older than 50 years. *Asia Pac J Clin Nutr* 2007;16(4):671-6.
44. Mackay J, Eriksen M. *The Tobacco Atlas*. Geneva: World Health Organisation, 2002.
45. Kim SS, Ziedonis D, Chen KW. Tobacco use and dependence in Asian Americans: a review of the literature. *Nicotine Tob Res* 2007;9(2):169-84.
46. Chen MS, Jr., Ferketich AK, Moeschberger ML, Wewers ME. Preparing the "Ground War" against tobacco among Chinese Americans in New York City: baseline data. *Asian Am Pac Isl J Health* 2001;9(1):88-94.
47. Choi S, Rankin S, Stewart A, Oka R. Effects of acculturation on smoking behavior in Asian Americans: a meta-analysis. *J Cardiovasc Nurs* 2008;23(1):67-73.
48. Loo JM, Raylu N, Oei TP. Gambling among the Chinese: a comprehensive review. *Clin Psychol Rev* 2008;28(7):1152-66.
49. Lai DW. Gambling and the older Chinese in Canada. *J Gambli Stud* 2006;22(1):121-41.
50. Marshall GN, Elliott MN, Schell TL. Prevalence and correlates of lifetime disordered gambling in Cambodian refugees residing in Long Beach, CA. *J Immigr Minor Health* 2009;11(1):35-40.
51. Goyal A, Yusuf S. The burden of cardiovascular disease in the Indian subcontinent. *Indian J Med Res* 2006;124(3):235-44.
52. Ramachandran A. Epidemiology of diabetes in India--three decades of research. *J Assoc Physicians India* 2005;53:34-8.
53. Chan JC, Malik V, Jia W, Kadowaki T, Yajnik CS, Yoon KH, et al. Diabetes in Asia: epidemiology, risk factors, and pathophysiology. *JAMA* 2009;301(20):2129-40.

54. Nestel P, Lyu R, Low LP, Sheu WH, Nitiyanant W, Saito I, et al. Metabolic syndrome: recent prevalence in East and Southeast Asian populations. *Asia Pac J Clin Nutr* 2007;16(2):362-7.
55. Lee WP, Lingard J, Bermingham M. Insulin, lipid profiles and measures of fatness in Taiwanese women in relation to duration of residence in Australia. *Asia Pac J Clin Nutr* 2007;16(2):254-61.
56. Ramaraj R, Chellappa P. Cardiovascular risk in South Asians. *Postgrad Med J* 2008;84(996):518-23.
57. Lip GY, Barnett AH, Bradbury A, Cappuccio FP, Gill PS, Hughes E, et al. Ethnicity and cardiovascular disease prevention in the United Kingdom: a practical approach to management. *J Hum Hypertens* 2007;21(3):183-211.
58. Dodani S. Coronary artery diseases in South Asian immigrants: an update on high density lipoprotein role in disease prevention. *J Immigr Minor Health* 2009;11(5):415-21.
59. Baaney KR, Jugdutt BI. Increased burden of coronary artery disease in South-Asians living in North America. Need for an aggressive management algorithm. *Atherosclerosis* 2009;204(1):1-10.
60. Fang J, Foo SH, Fung C, Wylie-Rosett J, Alderman MH. Stroke risk among Chinese immigrants in New York City. *J Immigr Minor Health* 2006;8(4):387-93.
61. Hwang SY, Ryan CJ, Zerwic JJ. Korean immigrants' knowledge of heart attack symptoms and risk factors. *J Immigr Minor Health* 2008;10(1):67-72.
62. Hislop TG, Bajdik CD, Saroa SR, Yeole BB, Barroetavena MC. Cancer incidence in Indians from three areas: Delhi and Mumbai, India, and British Columbia, Canada. *J Immigr Minor Health* 2007;9(3):221-7.
63. Tang TN, Oatley K, Toner BB. Impact of life events and difficulties on the mental health of Chinese immigrant women. *J Immigr Minor Health* 2007;9(4):281-90.
64. Lee HS, Brown SL, Mitchell MM, Schiraldi GR. Correlates of resilience in the face of adversity for Korean women immigrating to the US. *J Immigr Minor Health* 2008;10(5):415-22.
65. Khuwaja SA, Selwyn BJ, Kapadia A, McCurdy S, Khuwaja A. Pakistani Ismaili Muslim adolescent females living in the United States of America: stresses associated with the process of adaptation to U.S. Culture. *J Immigr Minor Health* 2007;9(1):35-42.
66. Park SY, Bernstein KS. Depression and Korean American immigrants. *Arch Psychiatr Nurs* 2008;22(1):12-9.
67. Chen AW, Kazanjian A, Wong H. Determinants of mental health consultations among recent Chinese immigrants in British Columbia, Canada: implications for mental health risk and access to services. *J Immigr Minor Health* 2008;10(6):529-40.
68. McDonald JT, Kennedy S. Cervical cancer screening by immigrant and minority women in Canada. *J Immigr Minor Health* 2007;9(4):323-34.
69. Leong-Wu CA, Fernandez ME. Correlates of breast cancer screening among Asian Americans enrolled in ENCOREplus. *J Immigr Minor Health* 2006;8(3):235-43.
70. Lee EE, Fogg LF, Sadler GR. Factors of breast cancer screening among Korean immigrants in the United States. *J Immigr Minor Health* 2006;8(3):223-33.
71. Islam N, Kwon SC, Senie R, Kathuria N. Breast and cervical cancer screening among South Asian women in New York City. *J Immigr Minor Health* 2006;8(3):211-21.
72. Jo AM, Maxwell AE, Wong WK, Bastani R. Colorectal cancer screening among underserved Korean Americans in Los Angeles County. *J Immigr Minor Health* 2008;10(2):119-26.
73. Yip MP, Tu SP, Chun A, Yasui Y, Taylor VM. Participation in colorectal cancer screening among Chinese Americans. *Asian Pac J Cancer Prev* 2006;7(4):645-50.
74. Wong-Kim E, Sun A, DeMattos MC. Assessing cancer beliefs in a Chinese immigrant community. *Cancer Control* 2003;10(5 Suppl):22-8.
75. Bodle EE, Islam N, Kwon SC, Zojwala N, Ahsan H, Senie RT. Cancer screening practices of Asian American physicians in New York City. *J Immigr Minor Health* 2008;10(3):239-46.
76. Jo AM, Maxwell AE, Rick AJ, Cha J, Bastani R. Why are Korean American physicians reluctant to recommend colorectal cancer screening to Korean American patients? Exploratory interview findings. *J Immigr Minor Health* 2009;11(4):302-9.
77. Sun A, Zhang J, Tsoh J, Wong-Kim E, Chow E. The effectiveness in utilizing Chinese media to promote breast health among Chinese women. *J Health Commun* 2007;12(2):157-71.
78. Woodall ED, Taylor VM, Yasui Y, Ngo-Metzger Q, Burke N, Thai H, et al. Sources of health information among Vietnamese American men. *J Immigr Minor Health* 2006;8(3):263-71.
79. Lee AC, Brugge D, Phan L, Woodin M. A Comparison of knowledge about asthma between Asians and non-Asians at two pediatric clinics. *J Immigr Minor Health* 2007;9(4):245-54.

80. Wade C, Chao MT, Kronenberg F. Medical pluralism of Chinese women living in the United States. *J Immigr Minor Health* 2007;9(4):255-67.
81. Roth MA, Kobayashi KM. The use of complementary and alternative medicine among Chinese Canadians: results from a national survey. *J Immigr Minor Health* 2008;10(6):517-28.
82. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ* 2000;320(7244):1240-3.
83. Duncan JS, Duncan EK, Schofield G. Accuracy of body mass index (BMI) thresholds for predicting excess body fat in girls from five ethnicities. *Asia Pac J Clin Nutr* 2009;18(3):404-11.
84. Sluyter JD, Schaaf D, Scragg RK, Plank LD. Body mass index and percent body fat in a New Zealand multi-ethnic adolescent population. *Int J Pediatr Obes* 2010 (in press).
85. Spoonley P, Taiapa C. *Sport and Cultural Diversity: responding to the sports and leisure needs of immigrants and ethnic minorities in Auckland*. Auckland: Massey University & Auckland Regional Physical Activity & Sport Strategy, 2009.
86. Abbott MW. *What do we know about Gambling and Problem Gambling in New Zealand?* Wellington: Department of Internal Affairs, 2001.
87. Scragg R, Holdaway I, Singh V, Metcalf P, Baker J, Dryson E. Serum 25-hydroxyvitamin D3 levels decreased in impaired glucose tolerance and diabetes mellitus. *Diabetes Res Clin Pract* 1995;27(3):181-8.
88. von Hurst PR, Stonehouse W, Coad J. Vitamin D supplementation reduces insulin resistance in South Asian women living in New Zealand who are insulin resistant and vitamin D deficient - a randomised, placebo-controlled trial. *Br J Nutr* 2009;1-7.
89. Chan WC, Wright C, Riddell T, Wells S, Kerr AJ, Gala G, et al. Ethnic and socioeconomic disparities in the prevalence of cardiovascular disease in New Zealand. *N Z Med J* 2008;121(1285):11-20.
90. Gala G. *Cancer in the Northern Region of New Zealand: Health Needs Assessment - 2009*. Auckland: Northern Cancer Network, 2009.

Appendix

Age-adjusted relative risks (95% CI) of cardiovascular diseases for main ethnic groups compared with Europeans.

Disease	Ethnic Group					
	Chinese	South Asian	Other Asian	Māori	Pacific	European
Both sexes†						
Hypertension*	0.86 (0.65, 1.15)	1.45 (1.12, 1.87)	1.18 (0.80, 1.74)	1.27 (1.12, 1.44)	1.43 (1.15, 1.79)	1.00
High cholesterol*	0.92 (0.61, 1.39)	1.99 (1.41, 2.80)	1.12 (0.64, 1.95)	1.06 (0.86, 1.30)	1.44 (1.02, 2.03)	1.00
Cardiovascular disease						
Heart attack	0.66 (0.24, 1.81)	1.58 (0.70, 3.56)	0.54 (0.28, 1.08)	1.40 (1.06, 1.86)	1.05 (0.49, 2.28)	1.00
Total CV disease	0.71 (0.45, 1.14)	0.86 (0.54, 1.36)	0.68 (0.39, 1.16)	1.29 (1.10, 1.51)	0.90 (0.67, 1.21)	1.00
Diabetes*	1.49 (0.91, 2.43)	4.33 (3.20, 5.88)	1.93 (1.07, 3.50)	2.12 (1.68, 2.67)	4.37 (3.37, 5.67)	1.00
Males						
Hypertension*	1.19 (0.82, 1.74)	1.83 (1.33, 2.50)	1.27 (0.75, 2.16)	1.34 (1.09, 1.66)	1.54 (1.10, 2.15)	1.00
High cholesterol*	1.14 (0.72, 1.81)	2.42 (1.59, 3.69)	1.10 (0.53, 2.25)	1.06 (0.79, 1.42)	1.03 (0.67, 1.59)	1.00
Cardiovascular disease						
Heart attack	0.48 (0.14, 1.66)	1.85 (0.75, 4.58)	0.55 (0.27, 1.12)	1.16 (0.81, 1.65)	0.52 (0.16, 1.71)	1.00
Total CV disease	0.33 (0.14, 0.74)	1.01 (0.54, 1.89)	0.68 (0.28, 1.64)	1.04 (0.81, 1.33)	0.68 (0.43, 1.09)	1.00
Diabetes*	1.37 (0.64, 2.92)	5.48 (3.95, 7.61)	2.35 (1.10, 5.02)	2.20 (1.64, 2.97)	4.47 (2.93, 6.80)	1.00
Females						
Hypertension*	0.61 (0.36, 1.01)	1.08 (0.73, 1.60)	1.12 (0.61, 2.05)	1.21 (1.03, 1.43)	1.35 (1.06, 1.71)	1.00
High cholesterol*	0.63 (0.27, 1.49)	1.32 (0.75, 2.31)	1.14 (0.42, 3.11)	1.06 (0.79, 1.42)	1.95 (1.25, 3.04)	1.00
Cardiovascular disease						
Heart attack	1.09 (0.28, 4.22)	0.84 (0.41, 1.74)	0.54 (0.04, 6.92)	1.90 (1.26, 2.87)	1.96 (1.03, 3.73)	1.00
Total CV disease	1.18 (0.71, 1.96)	0.65 (0.32, 1.31)	0.67 (0.33, 1.37)	1.58 (1.30, 1.92)	1.15 (0.81, 1.62)	1.00
Diabetes*	1.60 (0.76, 3.38)	2.77 (1.49, 5.17)	1.56 (0.55, 4.45)	2.03 (1.47, 2.80)	4.27 (2.86, 6.35)	1.00

† also adjusted for sex * currently on medication CV = cardiovascular

