Northern Sydney Central Coast Area Health Community Health Study

Profile of Cardiovascular Risk Factors in NSCCAH

Analysis of telephone survey 2006

NORTHERN SYDNEY CENTRAL COAST NSW HEALTH

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Abbreviations

ATSI	Aboriginal and / or Torres Strait Islander
BMI	Body Mass Index
CATI	Computer Aided Telephone Interview
COPD	Chronic Obstructive Pulmonary Disease
CC	Central Coast Health Service
CHD	Coronary Heart Disease
CVD	Cardiovascular Disease
ERP	Estimated Resident Population
EST	Eastern Standard Time
GP	General Practice
HDL	High Density Lipoproteins
HK	Hornsby Ku-ring-gai Health Service
HVRF	Hunter Valley Research Foundation
LDL	Low Density Lipoproteins
LGA	Local Government Area
NB	Northern Beaches Health Service
NSR	North Shore and Ryde Health Service
NS	North Sydney Health Service
NSCCH	Northern Sydney Central Coast Health
NSW	New South Wales
PCOS	Polycystic Ovary Syndrome
PVD	Peripheral Vascular Disease
TG	Triglycerides
YLL	Years of Life Lost (due to premature mortality)
YLD	Years Lost due to Disability

kg	kilogram
m	meter

Executive Summary

The 2006 Northern Sydney Central Coast Community Health Survey involved telephone interviews of 2,500 randomly selected members of the community in relation to the prevalence of risk factors for, and diagnosed chronic disease. The methodology and questions used in the Community Health Study were similar to the NSW Population Health Survey.

This report presents a summary of selected findings of the survey in relation to the prevalence of three key risk factor areas: behavioural, psychosocial and current health status within each of the 4 health services within Northern Sydney Central Coast Health. A summary table (Table 1) of the results is provided at the end of the executive summary.

Behavioural Risk Factors

There are a number of risk factors for chronic disease that are behavioural and therefore under the direct control of individuals. In many cases, positive health behaviours can contribute to the prevention of or slow the progression of chronic diseases. Some key behavioural trends are highlighted below:

- approximately 50% of residents do not achieve sufficient physical activity for health benefits, the exception being NSR (34%) which was more active than the state average;
- the prevalence of current smokers varies across the 4 health services, approximating the state average (20%) in CC (19.9%) and falling to as low as 7.5% in HK;
- across the area, only ~10% of residents eat the recommended servings of vegetables and ~50% eat the recommended daily servings of fruit (these results also approximate the state average).

Psychosocial Risk Factors

Recently, an expert working group of the National Heart Foundation concluded that there was strong and consistent evidence of an independent causal association between depression, social isolation and lack of quality social support and the causes and prognosis of CHD. The increased risk contributed by these psychosocial factors was of similar order to the more conventional CHD risk factors such as smoking, dyslipidaemia and hypertension. In the Northern Sydney Central Coast Area Health Service:

- The prevalence of high or very high levels of psychological distress varied across the area, being highest in NSR (9.8%) and CC (9.6%) and lowest in NB (6.9%);
- Residents of HK were more likely to help out a local group than residents in other health services; and across the area, 60-70% of the population had attended a local community event in the past 3 months;
- 45-60% were active members of a local organisation, although less than 50% had attended a meeting within the past week;

- in the week prior to being surveyed, 10-15% of the population had no or one telephone contact and 8-14% had not spent time with someone other than those they share a home or workplace with.

Health Status

The telephone survey provided information about the self reported prevalence of doctor diagnosed chronic diseases:

- hypertension; dyslipidaemia; diabetes and asthma prevalence in each health service were similar to or less than the state average;
- the prevalence of overweight persons is similar across the area and reflects the NSW average, however, the prevalence of obesity (a higher risk category) is unevenly distributed across the area with CC reflecting the NSW average, and the other 3 health services (HK, NB, NSR) having a significantly lower prevalence of obesity;
- the CC was consistently at the higher end of the self reported doctor diagnosed prevalence scale for respiratory, metabolic and cardiac conditions when comparing across health services;
- the prevalence of hypertension and heart disease/stroke was lower in NSR;
- the most commonly reported CHD diagnoses was irregular heart beat (which included supraventricular tachycardia, atrial fibrillation and bundle branch block);
- diabetes was more common in the CC and HK health services with Type 1 diabetes a key driver for HK and Type 2 diabetes as the driver for CC. Across all health services Type 2 diabetes was more prevalent than Type 1;
- the prevalence of respiratory diseases (emphysema, COPD, Chronic bronchitis, asthma) was higher for CC than other health services; possibly due to the higher rates of current and past smokers.

Table 1 Summary of CVD risk factors by health service

Topic	Issue	Indicator	CC	HK	NSR	NB	*NSW*
Health Related Behaviours	Physical Activity	Achieved 150 minutes of moderate physical activity over at least 5 sessions in the last week	51.2% (±3.4)	52.3% (±4.9)	65.8% (±4.2) *χϕ	56.1% (±5.4)	*51.9% (±1.2)*
		Achieved 150 minutes of physical activity in the last week	61.3% (±3.3)	61.2% (±4.8)	71.6% (±4.0) *χ	67.48% (±5.2)	*N/R*
	Smoking	Current daily smoker	19.9% (±2.8) χηϕ	7.5% (±2.7)	9.7% (±2.9)	12.5% (±3.5)	*20.1% (±1.0)*
		Smoke free home	85.6% (±2.5) χη	92.0% (±2.8)	91.8% (±2.6)	89.4% (±3.3)	*86.1% (±0.9)*
	Nutrition	Consumed at least 2 serves of fruit per day	48.6% (±3.4)	53.0% (±4.9)	47.3% (±4.5)	45.6% (±5.4)	*51.2% (±1.3)*
		Consumed at least 5 serves of vegetables daily	10.2% (±1.9) ϕ	8.3% (±2.6)	8.9% (±2.6)	5.8% (±2.2)	*7.4% (±0.6)*
Psychosocial Risk Factors	Psychological Distress	High psychological distress	7.1% (±1.7)	6.5% (±2.5)	7.5% (±2.5)	4.5% (±2.2)	*7.5% (±0.8)*
		Very high psychological distress	2.5% (±1.1)	1.2% (±0.9)	2.3% (±1.5)	2.4% (±2.1)	*3.4% (±0.5)*
	Social Capital	Attend community event at least once in past 6 months	59.0% (±3.4) χηϕ	73.0% (±4.4)	67.3% (±4.3)	68.8% (±5.1)	*60.1% (±1.3)*
		Helped out any group at least once in past 3 months	36.5% (±3.3)	49.3% (±4.9) *η	38.6% (±4.4)	42.6% (±5.4)	35.4% (±1.2)
		Active member of local organisation, group, club	47.0% (±3.4)	49.8% (±4.9)	42.1% (±4.5)	50.3% (±5.5)	42.6% (±1.3)

	Social Support	No social contact	14.1% (±2.4)	10.9% (±3.0)	10.1% (±2.7)	8.1% (±2.6)	*NR*
		No phone contact	6.7% (±1.9)	5.0% (±2.2)	3.9% (±1.7)	4.1% (±1.9)	*NR*
		No social group	55.8% (±3.4)	48.1% (±4.9)	52.2% (±4.6)	57.3% (±5.4)	*NR*
		No-one to depend on	11.3% (±2.1)	6.8% (±2.2)	9.7% (±2.6)	8.5% (±2.7)	*NR*
Health Status	Hypertension	Been told by a doctor or at a hospital that you have high blood pressure	27.2% (±2.8) η	25.1% (±4.0)	18.9% (±3.1) *	23.1% (±4.2)	*20.1% (±0.8)*
	Dyslipidemia	Been told by a doctor or at a hospital that you have high blood cholesterol	22.2% (±2.6)	20.5% (±3.7)	20.5% (±3.4)	22.3% (±4.1)	*24.6% (±1.2)*
	Overweight / Obesity	Body Mass Index >25 kg/m^2 (overweight)	36.8% (±3.3) η	35.0% (±4.7)	27.1% (±3.9)	32.7% (±5.0)	*32.9% (±1.2)*
		Body Mass Index >30 kg/ m^2 (obese)	17.5% (±2.5) χηϕ	8.8% (±2.6)	10.5% (±2.9)	11.1% (3.3)	*16.7% (±1.0)*
		Self perception overweight or obese	46.8% (±3.4) χηϕ	36.3% (±4.6)	32.3% (±4.2)	32.5% (±4.9)	*N/R*
	Family History	Have an immediate family member who has been diagnosed with a stroke or heart condition	45.3% (±3.4) ϕ	42.9% (±4.8)	37.9% (±4.3)	35.3% (±4.9)	*N/R*
	Prior Diagnosis CHD / Stroke	Been diagnosed with a heart condition	12.8% (±2.0)	12.6% (±3.1)	9.4% (±2.4)	10.3% (±2.8)	*N/R*
		Been diagnosed with a stroke or TIA	4.3% (±1.1)	1.9% (±1.4)	2.0% (±1.2)	2.5% (±1.3)	*N/R*
	Diabetes / Pre Diabetes	Been told by a doctor or at a hospital that you have diabetes	7.9% (±1.6)	7.1% (±2.4)	5.1% (±1.7)	5.4% (±2.0)	*7.6% (±0.6)*
	Chronic Obstructive Pulmonary Disease	Been told by a doctor or at a hospital that you have Emphysema	2.2% (±0.8) ηϕ	0.8% (±0.7)	0.5% (±0.5)	0.6% (±0.6)	*N/R*
		Chronic Bronchitis	5.0% (±1.3)	3.2% (±1.7)	3.5% (±1.4)	2.8% (±1.4)	*N/R*
		COPD	1.5% (±0.7)	0.4% (±0.4)	0.6% (±0.6)	0.7% (±0.7)	*N/R*

	Asthma	Been told by a doctor or at a hospital that you have asthma	17.8% (±2.6)	15.0% (±3.6)	14.4% (±3.2)	14.0% (±4.2)	*19.2% (±1.0)*
	Polycystic Ovary Syndrome	Been told by a doctor or at a hospital that you have polycystic ovary syndrome	**5.7% (NSCCH)				*N/R*
		Women with oligo- or amenorrhea and hirsutism	**1.4% (NSCCH)				*N/R*

Where "∗" represents significantly different to CC; "χ" significantly different to HK, "η" significantly different to NSR, "ϕ" significantly different to NB. Data for each of the 4 health services (CC, HK, NSR, NB) are weighted results from the current study for people aged ≥18 years living within the in NSCCH area. Results for NSW are based on the NSW Health Population Survey 2005 which includes people aged ≥16 years, due to differences in weighting methodology and sample ages, results for each health service may not be directly comparable to NSW results. **Due to small numbers Polycystic Ovary Syndrome data only available for NSCCH.

Introduction

Chronic diseases such as cardiovascular disease (CVD), cerebrovascular disease, chronic obstructive pulmonary disease, asthma and diabetes are major contributors to morbidity, disability and mortality in Australia and are considered priority health areas because of their impact on and cost to society. Risk factors for chronic diseases can be classified as modifiable (eg smoking) and non-modifiable (eg age, genetics) factors. Modifiable risk factors, as the name suggests, can be influenced by behavioural and lifestyle choices. Many modifiable risk factors are common across a range of chronic diseases, therefore targeting these factors has the potential to be particularly effective in the prevention and management of chronic disease.

Whilst national and state mortality and hospital admissions information is relatively easy to obtain, there is less information available about the prevalence of risk factors for chronic diseases in the general community. Some information is provided by the National Health Survey and the NSW Health Population Survey, but the sample sizes for each individual health service within these surveys are quite small. In addition, local populations can vary quite significantly from the national or state average, and therefore, it is useful in the management of chronic diseases such as CVD and diabetes to have local prevalence and local risk data.

This publication presents the results of the 2006 Northern Sydney Central Coast Community Health Survey which was conducted by the Central Coast Public Health Unit. Self reported information about a number of risk factors was obtained from a telephone interview of randomly selected persons aged 18 years and over who lived within the geographical area for Northern Sydney Central Coast Health. Whilst the focus of this study was to provide local prevalence data for CVD and the risk factors for CVD, because of the commonality of risk factors, the survey also included some questions about other illnesses such as diabetes, chronic obstructive pulmonary disease and asthma.

Methodology

The 2006 Northern Sydney Central Coast Health Community Health Study was commissioned to provide local prevalence data for the priority health areas of cardiovascular disease, respiratory disease, diabetes, and mental health as well as risk factors for those diseases.

The study involved two parts, first, a telephone survey with a target population of individuals aged 18 or over who lived in the Northern Sydney Central Coast Health Area. Additional Polycystic Ovary Syndrome (PCOS) symptom based questions were asked for premenopausal women aged 18-45years. The second part of the study, undertaken in the Central Coast Health Service only, involved inviting telephone survey respondents who were aged 45 or over, and women aged 18-45 years who responded positively to symptom based questions to attend a free clinic assessment of risk factors for CVD, diabetes and respiratory diseases. This report details results of the telephone survey component only.

The survey was conducted by the Hunter Valley Research Foundation (HVRF) using a computer assisted telephone interviewing (CATI) system that guided trained interviewers through the introduction, subject selection and interview. A small pilot test of 30 interviews was conducted by the HVRF in March 2006 to test the wording and flow of the survey. The survey was conducted in March / April 2006 in the Central Coast health service and May/June 2006 in the 3 Northern Sydney health services.

Subject Selection & Recruitment

Respondents were selected using a two stage sampling process. First, a random digit dialing sample was provided by NSW Health. Numbers were selected based on the likelihood that they represented households within the NSCCH area using the methodology described in the NSW Population Health Survey (Centre for Epidemiology and Research, 2005). In addition, numbers were data matched to the electronic white pages in order to enable survey introduction letters to be mailed to households where a corresponding mailing address could be found.

Once a household was contacted by phone, the number of eligible respondents (≥18years of age) in the household was ascertained, and a respondent was randomly selected based on age position within the household (eg third eldest). If the household refused to provide the number of eligible respondents, a respondent was selected based on birthday (eg the last birthday). Once selected, the respondent could not be substituted by another household member.

Up to six call attempts were made in an attempt to establish initial contact with each selected household. A maximum of three messages, which included a contact number for the study, were left on the household answering machine. Once a respondent had been selected from the household, up to five attempts

were made to speak to the selected respondent to obtain either a completed interview or a refusal. Calls were made on weekdays between 9am and 8pm EST unless an alternative appointment time was arranged.

Interviews were conducted until a target number of respondents was achieved, ie 1,000 for the Central Coast health service and 1,500 for Northern Sydney (which includes Hornsby-Ku-Ring-Gai; North Shore Ryde; and Northern Beaches health services).

Survey Instrument

The telephone survey (refer Appendix 2) asked questions about self reported prevalence of diagnoses of and risk factors for cardiovascular disease, cerebrovascular disease, dyslipidaemia, hypertension, diabetes, asthma, chronic obstructive pulmonary disease (COPD), obesity, social isolation and polycystic ovary syndrome (PCOS). The questions were adapted from well established studies such as the NSW Population Health Survey; the National Health Survey; the 45 & up study (all Australian); and the European Community Respiratory Health Survey.

The specific methodology for each question is described with the resultant data in the report. This report provides an overview of the results of the telephone survey, some areas of the survey are not covered in this report.

Sample Size and Response Rate

The raw response rate obtained for the survey was 74%, which represented 76% for the Central Coast arm and 72% for Northern Sydney arm. A total of 2,562 telephone interviews were completed, 1,046 in the Central Coast and 1,516 in Northern Sydney. Seven respondents from the Central Coast arm of the survey and 18 from the Northern Sydney arm of the survey were removed from analysis because they did not provide information that would enable them to be allocated to either a Health Service (within their arm of the survey) or a 5 year age group. The resulting valid respondent count was 1039 for the Central Coast health service (CC), 493 for Hornsby Ku-Ring-Gai health service (HK), 580 for North Shore and Ryde health service (NSR) and 425 for the Northern Beaches health service (NB).

Data Analysis - Weighting

Response data was weighted based on age and sex to allow the generation of estimated population proportions based on the Australian Bureau of Statistics 30th June 2006 sex by 5 year age group Estimated Resident Populations (ERP) for Statistical Local Areas. The 20-25 year age group was augmented by including single year ERPs for the 18 and 19 year-old groups. Three sets of weights were generated: one for the full survey, one for the two survey areas, and one for the four health services. The weighting methodology used in this

survey differs from the NSW Health Survey, which used populations of private households for weighting rather than ERP.

Part 1 Demographics of Survey Population

Geographical Area

Participants for the telephone survey were derived from the local government areas (LGAs) for Northern Sydney Central Coast Health (Figure 1). There are four health services within NSCCH:

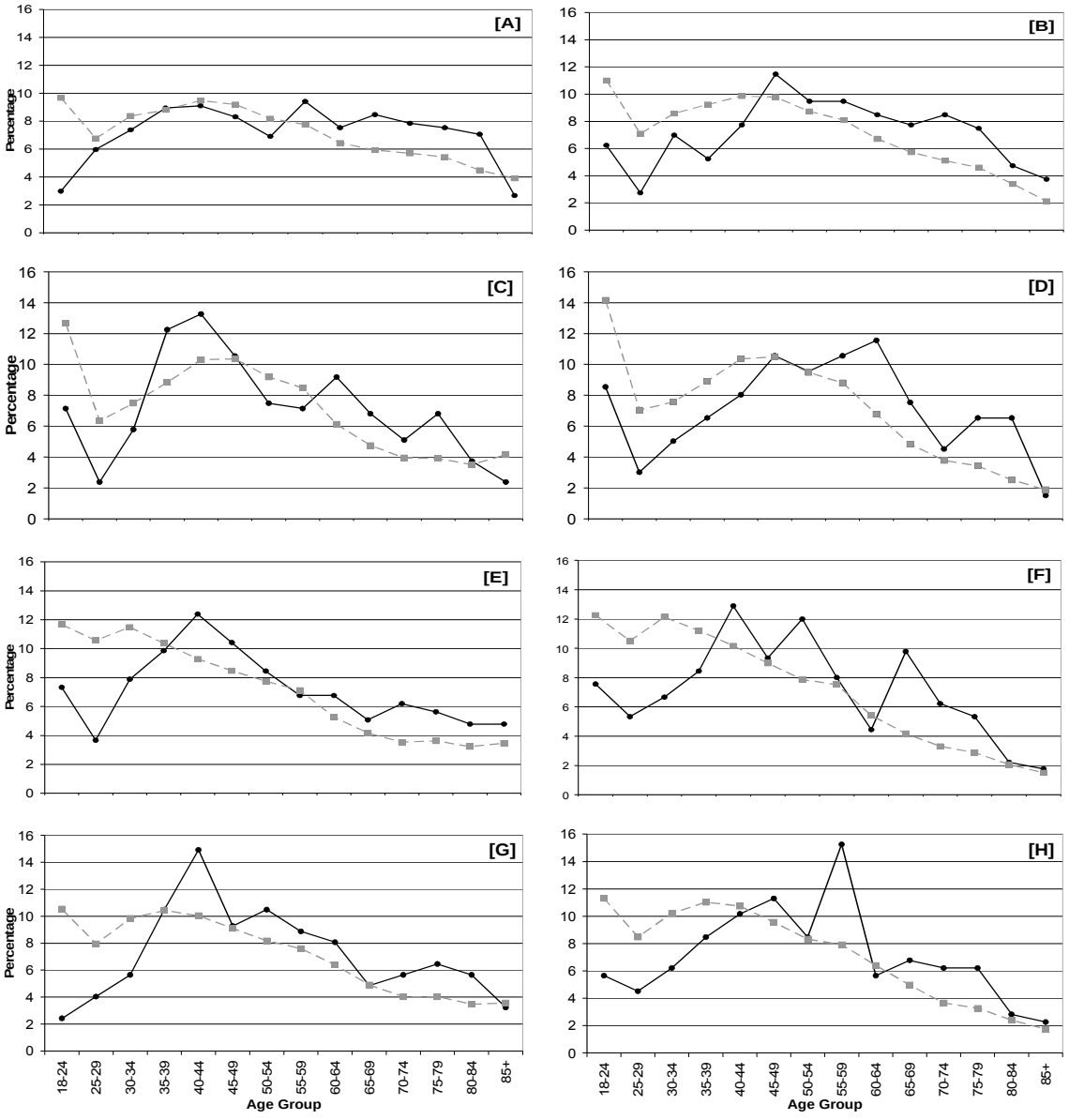
- Central Coast (CC) which includes the LGAs of Wyong and Gosford;
- Hornsby Ku-Ring-Gai (HK) which includes the LGAs of Hornsby and Ku-ring-gai;
- North Shore & Ryde (NSR) which includes the LGAs of Hunters Hill, Lane Cove, Mosman, North Sydney, Ryde and Willoughby; and
- Northern Beaches (NB) which includes the LGAs of Manly, Pittwater and Warringah.

Figure 1 Map of Northern Sydney Central Coast Area Health

Age / sex

A comparison of the age/sex of the survey population to the estimated resident population (ABS, 2006) is presented in Figure 2. In each health service, younger age groups18-40 years were undersampled and older age groups >65 years were oversampled. The weighting process effectively converts the age and sex profile of the sample to that of the ERP.

Figure 2 Sample representativeness by health service



The sex – age breakdown of each health service is presented in a separate panel with —●— representing the survey sample and —■— representing the estimated population for the health service calculated as at June 2006 (ABS data). Panel [A] depicts CC♀; panel [B] represents CC♂; panel [C] represents HK♀ ; panel [D] represents HK♂; panel [E] represents NSR♀ ; panel [F] represents NSR♂; panel [G] represents NB♀; panel [H] represents NB♂.

Language spoken at home / country of birth / culture

The country of birth of respondents varied between each of the health services (Table 2) with Australia being the most common response, particularly on the Central Coast. The Central Coast also had a higher rate of respondents (2.1%) identifying as Aboriginal or Torres Strait Islander than other health services (NB 0.9%; NSR 0.3% and HK 0%).

The percentage of respondents born in the UK / Ireland and New Zealand were high ranking for all health services. In HK and NSR a high percentage of respondents were born in China or Hong Kong.

Table 2 Country of birth by health service

Central Coast		**Hornsby Ku-Ring-Gai**		**North Shore & Ryde**		**Northern Beaches**	
Birth Country	%	Birth Country	%	Birth Country	%	Birth Country	%
Australia	82.9	Australia	65.5	Australia	65.4	Australia	63.5
UK/Ireland	9.0	UK / Ireland	8.4	UK/Ireland	7.6	UK/Ireland	16.5
New Zealand	1.8	Hong Kong	3.2	New Zealand	3.1	New Zealand	3.3
South Africa	0.8	New Zealand	2.4	Hong Kong	2.2	Canada	1.6
Phillipines	0.6	China	2.4	China	2.1	South Africa	1.4
Italy	0.5	India	2.2	Malaysia	1.5	Italy	1.2
Other	4.4	Other	15.9	Other	18.1	Other	12.5

Survey respondents most commonly spoke English at home (Table 3). The HK and NSR health services had a higher rate of households where English was not the predominant language spoken at home. In these two health services, Chinese was the second most common language spoken at home.

It should be noted that it was a prerequisite for inclusion into the study that respondents be able to speak English sufficiently well to answer the telephone survey. A total of 137 potential respondents (1.2%) were ineligible and did not complete the survey due to language difficulties.

Table 3 Language spoken at home by health service

Central Coast		**Hornsby Ku-Ring-Gai**		**North Shore & Ryde**		**Northern Beaches**	
Language	%	Language	%	Language	%	Language	%
English	99.2	English	90.0	English	90.5	English	95.5
French	0.2	Chinese	4.8	Chinese	3.6	Chinese	0.5
Italian	0.1	Russian	0.8	Italian	0.9	German	0.5
German	0.1	Hindi	0.6	Indonesian / Malay	0.7	Other	3.5
Greek	0.1	Other	3.8				
Korean	0.1			Other	4.3		
Other	0.2						

Education

Survey respondents were asked to indicate the highest level of education that they had achieved (Table 4). There was a larger percentage of respondents at the lower end of the education scale in the CC, in particular the number of respondents who had left school at or before having completed year 10.

Respondents in HK, NSR and NB were more likely to have achieved a university degree or higher qualification than those in CC. The percentage of university graduates was slightly larger and the percentage of TAFE certificate / diploma holders was slightly smaller in NSR when compared to other health services.

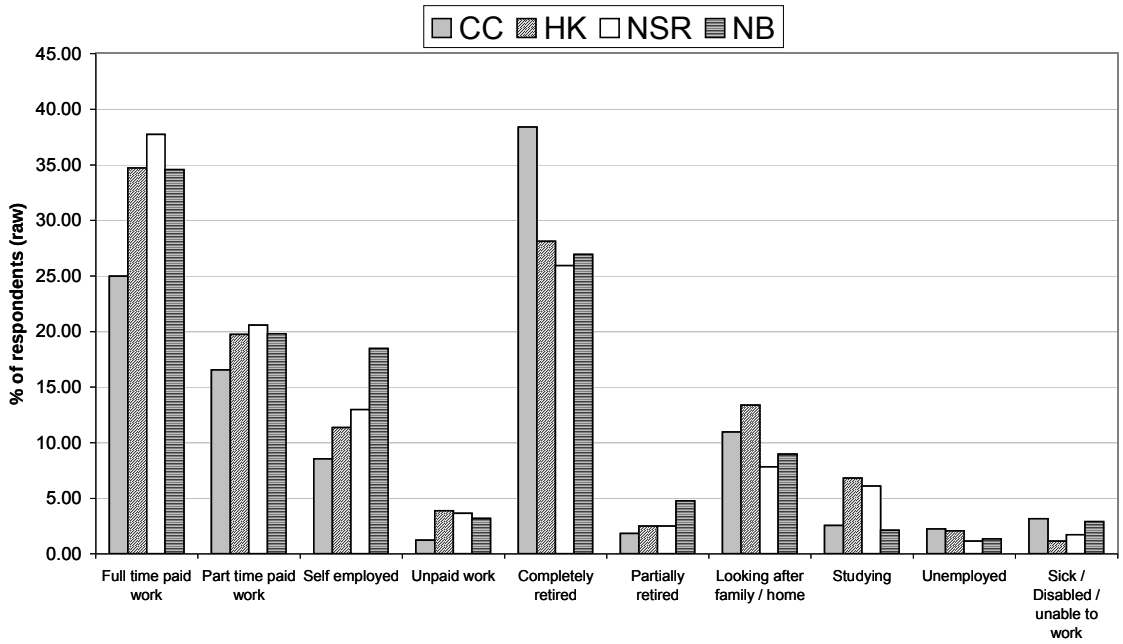
Table 4 Highest level of education achieved by health service

	Central Coast (%)	Hornsby Ku-Ring-Gai (%)	North Shore & Ryde (%)	Northern Beaches (%)
University (tertiary degree or higher)	15.4	47.5	53.0	35.5
TAFE (certificate / diploma)	25.2	20.4	14.8	23.3
Yr 12 (6th Form)	13.1	13.2	14.5	16.9
Yr 10 (4th Form)	31.6	15.2	12.9	17.9
Some high school	10.8	2.8	3.1	4.9
Primary school	3.2	0.8	0.7	0.7
Non school attender	0.0	0.0	0.0	0.5
Other	0.6	0.0	0.7	0.2
Refused	0.2	0.0	0.3	0.0
Total	**100.1**	**99.9**	**100**	**99.9**

Current Employment

A slightly smaller percentage of respondents in the CC reported being in full time work, this may be offset by the higher percentage of retirees in this health service. Self employment was more commonly reported by those living in the NB area. There were similar levels of part time workers across all health services.

Figure 3 Current employment status by health service

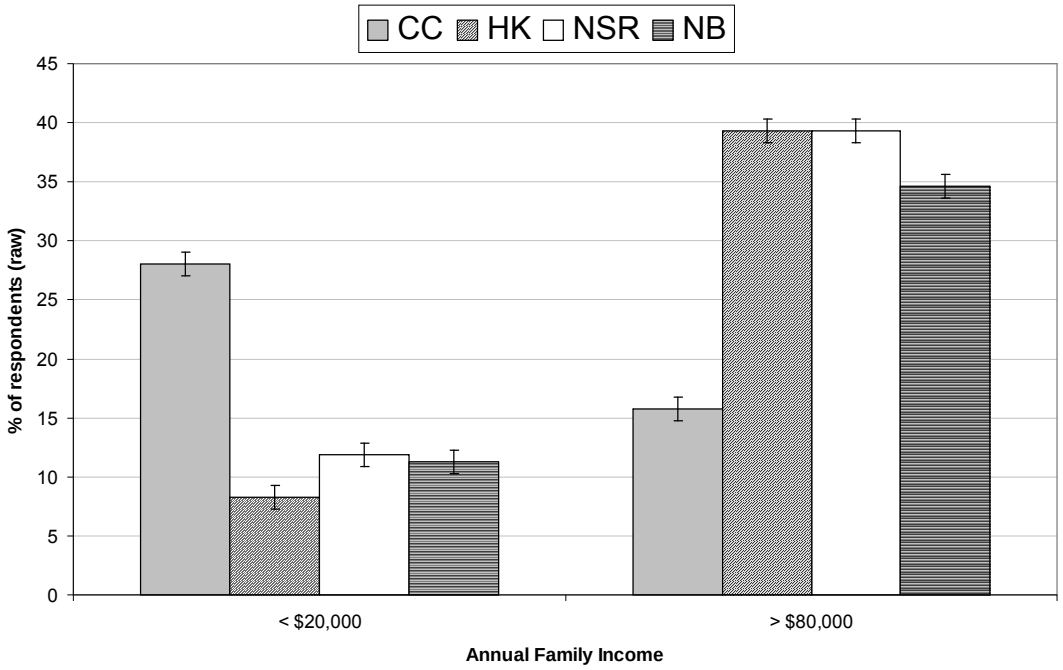


Percentages have been calculated on the raw number of respondents for each health service. Multiple responses were allowed and therefore percentages for each health service may sum to >100%. CC (n=1039); HK (n=493); NSR (n=580); NB (n=425). A number of respondents (n=4, 0.6%) answered "Don't Know" or "Refused" and a further n=10 (0.4%) respondents indicated that they were on maternity leave when asked to indicate their current employment status.

Family Income

There were marked differences in family income between the health services. There was a larger percentage of respondents in the CC region who reported family income of less than $20,000pa and a smaller percentage of respondents who reported a family income of greater than $80,000pa when compared to other health services. This may be a reflection of the lower education achievement and smaller number of full time workers in the CC health service when compared with the other health services.

Figure 4 Family income by health service



Percentages have been calculated on the raw number of respondents for each health service. Where CC (n=1039); HK (n=499); NSR (n=581); NB (n=425). A number of respondents (n=432, 17.0%) answered "Don't Know" or "Refused" when asked to indicate their family income bracket, this was comprised of CC (n=177, 17.0%); HK (n=79, 16.0%); NSR (n=113, 19.5%); and NB (n=63, 14.8%).

Part 2 Health Related Behaviours

There are a number of risk factors for chronic lifestyle diseases that are under the direct control of individuals eg whether they choose to smoke or to participate in regular physical activity. The health behaviours described in this section include: physical activity; smoking; and nutrition.

Physical Activity

Low levels of physical activity accounted for 6.7% of the burden of disease and injury in Australia in 2003 (AIHW, 2006). There is evidence of an inverse linear dose-response relationship between volume of physical activity and all cause mortality rates (Lee and Skerrett, 2001; Eaton, 1992). The health benefits of regular physical activity are wide reaching. A longitudinal study (Sesso et al, 2000) showed that for men with multiple coronary risk factors, expending ≥4,200 kJ/week significantly reduced CHD risk and is also associated with 20-30% reduced risk for all cause mortality (Lee and Skerrett, 2001). Exercise has also been shown to reduce the development of type 2 diabetes in at risk groups (Diabetes Prevention Research Group 2002; Tuomilehto et al 2001). Further, regular physical activity over a 6 month period has been shown to improve insulin sensitivity in previously sedentary individuals independent of changes in BMI (Duncan et al, 2003).

The National Physical Activity Guidelines for Australians (CDOHA, 1999) recommend that individuals achieve "at least 30 minutes of moderate intensity physical activity on most, preferably all days", (approximately 3000 kJ / week). In the current study, respondents were asked to recall the number of sessions and the time spent during the past week: walking continuously for at least 10 minutes; doing vigorous physical activity; and performing more moderate physical activity. The intensity of activities was self assessed by respondents with the aid of examples (Appendix 2).

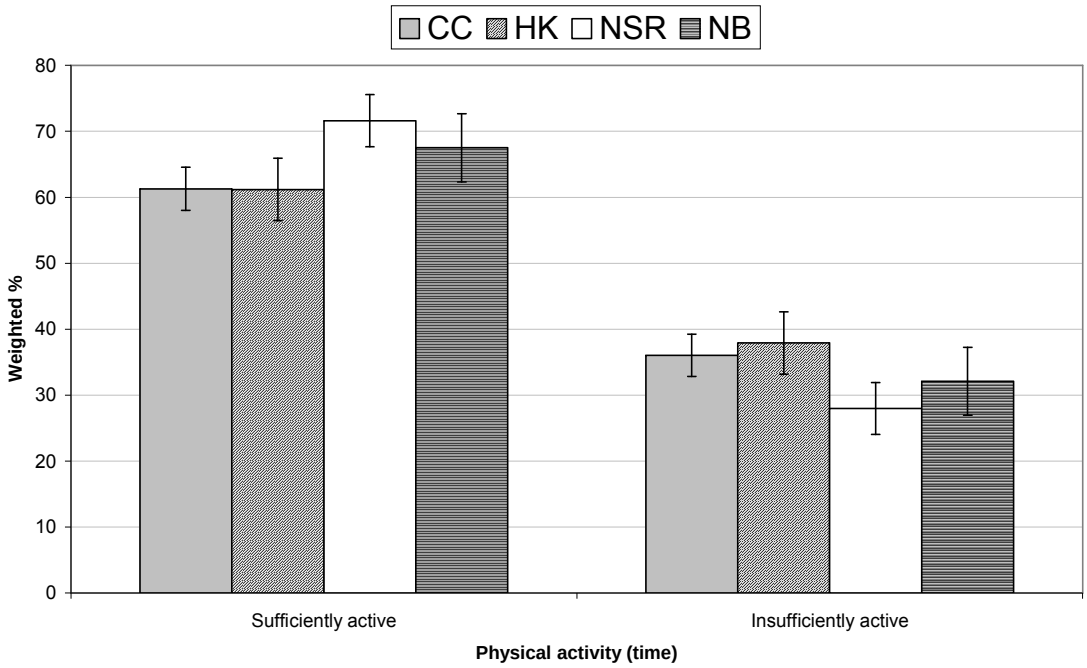
For the purposes of this study, respondents were classified as "sedentary" if they reported doing no physical activity during the past week, and "insufficiently active" if they reported some activity but did not meet the criteria for "sufficient time" or "sufficient time and sessions". "Sufficient time" (Figure 5) was defined as 150 minutes of accumulated physical activity from the above categories, where time spent performing vigorous activity was weighted at twice the reported time to reflect the higher intensity (and therefore greater protective effect) of the activity. A significantly larger percentage (71%) of NSR achieved sufficient physical activity time when compared to CC (61.3%) and HK (61.2%).

"Sufficient time and sessions" (Figure 6) was defined as per "sufficient time" except that the time must have been accumulated over at least 5 sessions during the week. Across all health services, a lower percentage of survey respondents achieved sufficient physical activity when the additional criteria of achieving 5 sessions was required. The frequency of sessions is important because some of

the metabolic effects of a bout of exercise are acute eg increased insulin sensitivity for 48-72 hours post an acute bout of exercise (Mikines et al 1988; Boulé et al 2005).

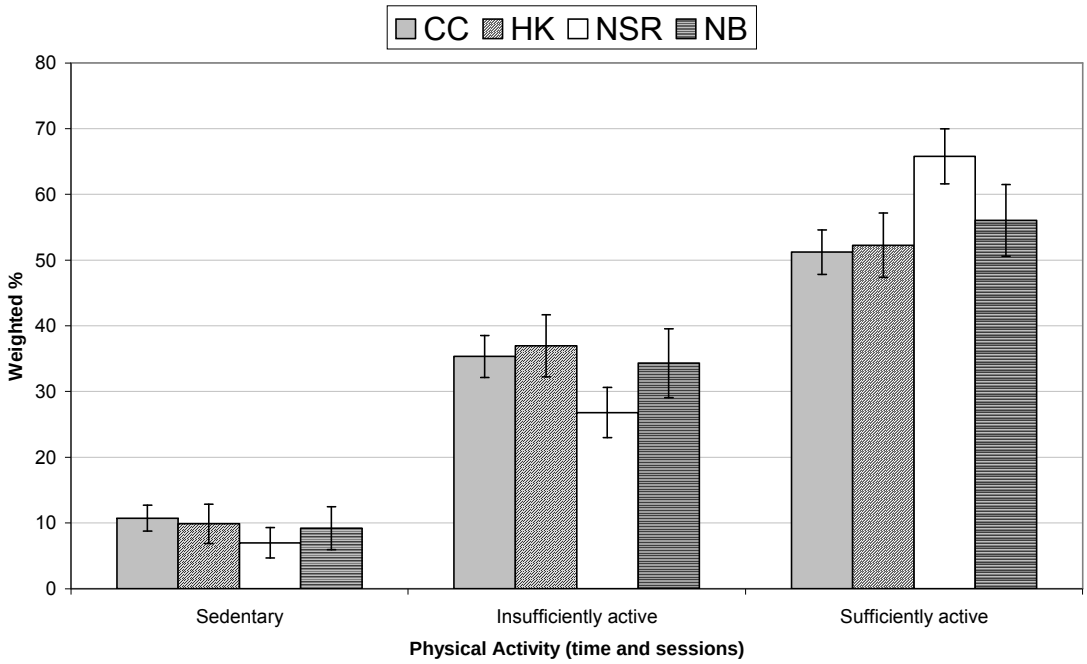
Physical activity estimates provided by respondents excluded occupational and household chores and gardening because to date there is limited research on the validity of self reported intensity of these activities. To this extent, leisure time physical activity levels presented in Figure 6 and Figure 5 are likely to be lower than total physical expenditure.

Figure 5 Sufficient physical activity time by health service



Columns represent mean weighted data for each health service, error bars represent 95% confidence intervals. Sufficient physical activity was defined as achieving 150 minutes of physical activity accumulated in the past week over any amount of sessions. When calculating physical activity time spent, vigorous physical activity time was doubled to account for the higher metabolic cost of more vigorous activity. Insufficient activity was defined as having achieved less than 150 minutes of activity in a week. A number of respondents answered "Don't know" to one of the questions used to calculate time spent performing physical activity (CC 2.7%; HK 0.9%; NSR 0.4%; NB 0.4%).

Figure 6 Sufficient physical activity (time and sessions) by health service



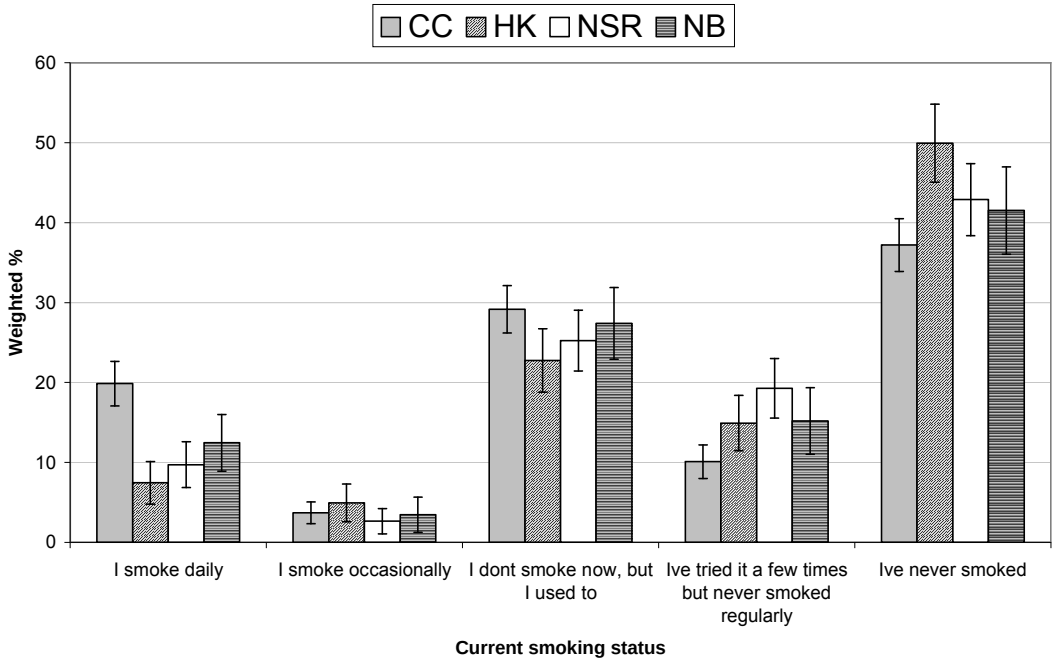
Columns represent mean weighted data for each health service, error bars represent 95% confidence intervals. Sufficient physical activity was defined as achieving 150 minutes of moderate intensity physical activity (or equivalent) accumulated over 5 sessions in the past week. When calculating physical activity time spent, vigorous physical activity time was doubled to account for the higher metabolic cost of more vigorous activity. Insufficient activity was defined as having achieved less than 150 minutes or less than 5 sessions in a week. A number of respondents answered "Don't know" to one of the questions used to calculate physical activity levels (CC 2.7%; HK 0.9%; NSR 0.4%; NB 0.4%).

Smoking Status

Tobacco smoking was responsible for 7.9% of the burden on the health of Australia in 2003 (AIHW, 2006) and is a known risk factor for CVD, some cancers and COPD. In Australia, the prevalence of smoking has been decreasing since the 1950s (AIHW, 2006), however, on a worldwide basis, estimates predict that "even if all current smokers quit smoking today, the toll of COPD would continue for several generations since there are so many people already afflicted" (Chapman et al, 2006).

The NSCC Community Health Survey asked questions about smoking habits; intention to quit; and environmental tobacco smoke exposure in the home (Appendix 2). The number of respondents who smoked daily was higher in the CC (19.9%) than other health services (Figure 7). There was also a non significant trend for more cigarettes per day to be smoked by CC residents (for all categories >10 cigarettes per day) than those in other health services. There was no significant difference in the percentage of respondents in each health service who reported having quit smoking ("I don't smoke now but I used to") (Figure 7).

Figure 7 Current smoking status by health service

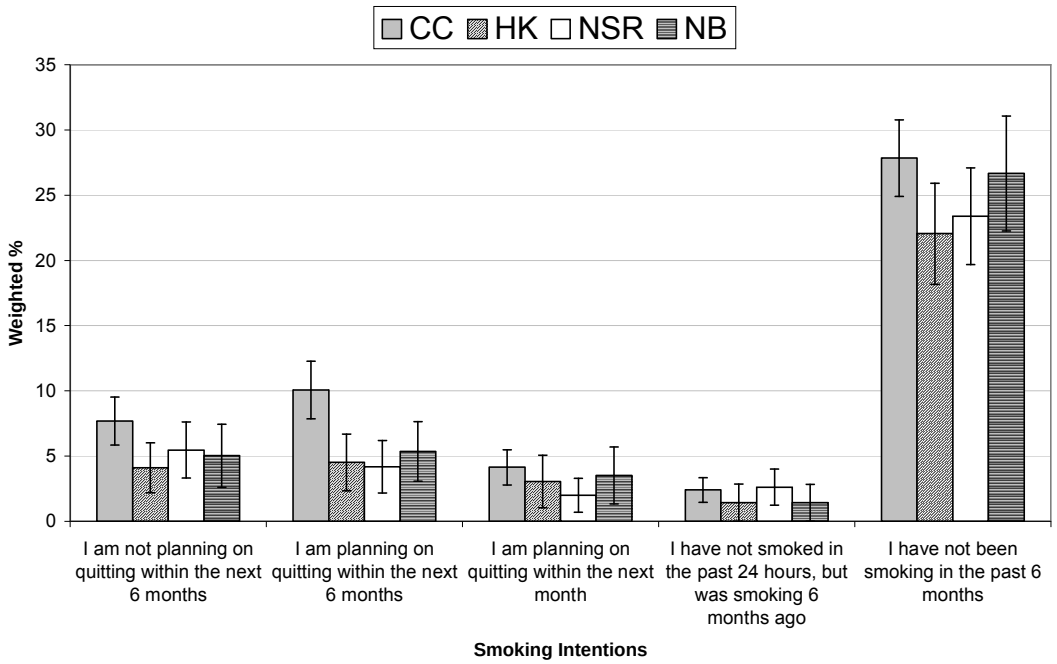


Percentages reported represent mean weighted scores for each option when respondents were asked which category best described their smoking status; error bars represent 95% confidence intervals. 0.2% of the weighted NSR population refused to answer this question.

Where respondents indicated that they were a current smoker (daily or occasional) or a past smoker, they were asked about their quit intentions. The number of respondents who reported being past smokers (Figure 7) was similar

to and therefore supported by the number of respondents reporting that they had not smoked during the past 6 months (Figure 8). Approximately 10% of the population had recently quit or was planning on quitting within the next 6 months highlighting the continued need for support services to assist potential quitters. The percentage of respondents planning on quitting in the near future (6 months) was slightly higher in CC than other health services, possibly reflecting the larger smoking population in this area.

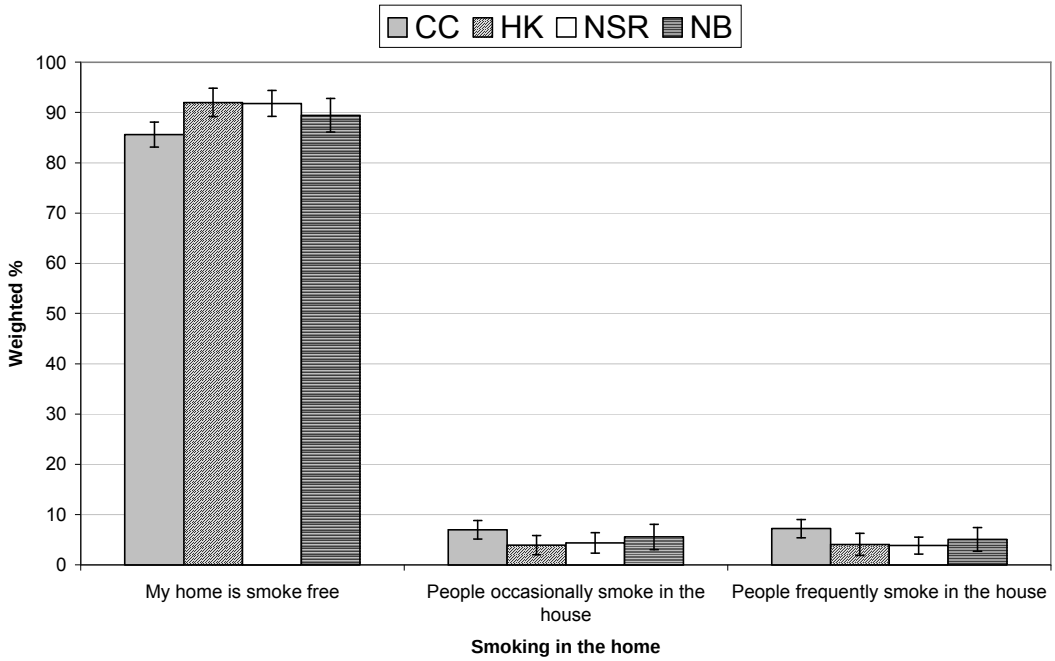
Figure 8 Quit smoking intentions by health service



Percentages reported represent mean weighted scores for each option where respondents were asked which category best described how they felt about their smoking; error bars represent 95% confidence intervals. A number of respondents answered "Don't Know" or "refused" to answer the question (CC 0.6%; NB 1.3%). Non smokers or occasional smokers for each health service are not displayed on the above figure, refer to Figure 7.

Environmental tobacco smoke contributes to the risk of disease. Most people spend a significant amount of time in their home environment resulting in a relatively high potential for environmental tobacco smoke exposure in that environment. Across all health services the vast majority of homes (~90%) are smoke free (Figure 9), however, the rate of smoke free homes was lower in CC compared to HK and NSR reflecting higher smoking rates on the CC.

Figure 9 Environmental tobacco smoke in the household by health service



Percentages reported represent mean weighted scores for each option when respondents were asked which category best described their home situation regarding smoking; error bars represent 95% confidence intervals. A total of 0.2% of the CC population answered “don’t know” or “refused” when asked whether people smoked in their home.

Nutrition

Good dietary habits may play a health protective role. Conversely poor dietary habits may contribute to risk factors for diseases such as coronary heart disease, type 2 diabetes, overweight / obesity, osteoporosis, some cancers. The nutrition focus in the current report is on fruit and vegetable intake.

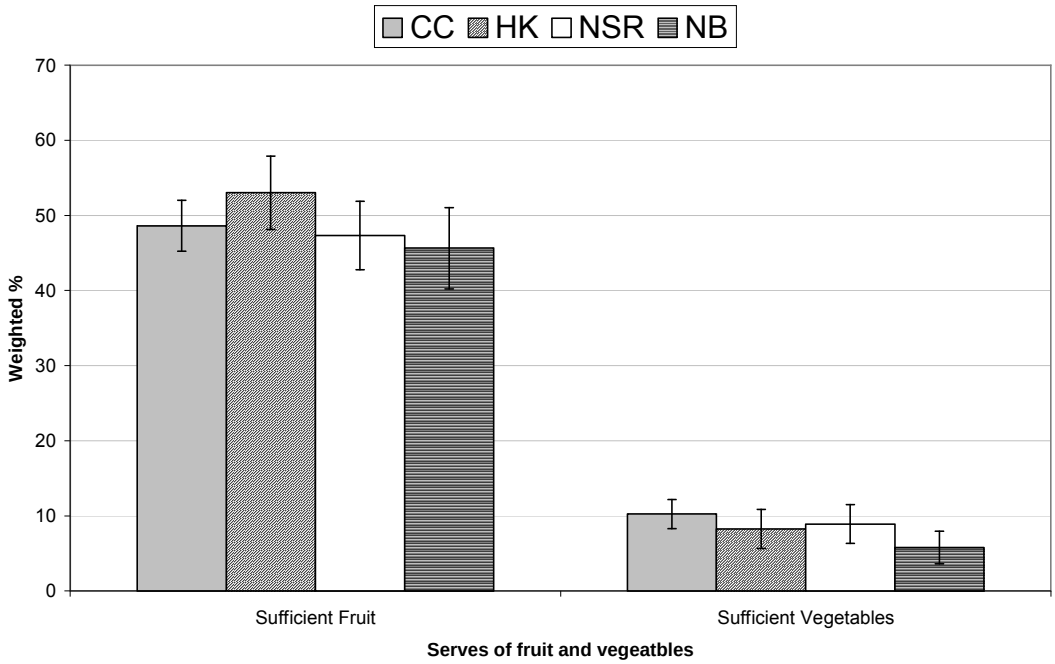
Observational studies suggest that fruit and vegetable intake is inversely associated with both diastolic and systolic blood pressure (Ascherio et al, 1996, Appel, 2006) and with overall CVD risk (Liu, 2000). A randomised control trial found that a diet high in fruit and vegetable intake resulted in a lower blood pressure, and that this effect was exacerbated when the diet also contained low fat dairy products and reduced saturated and total fat intakes (Appel, 1997). "The totality of the evidence strongly supports the notion that fruit and vegetable intake reduces risk of ischaemic heart disease, stroke and diabetes, independently of other health habits." (Bazzano, 2005)

Insufficient fruit and vegetable intake contributed 1.4% to the burden of disease in Australia in 2003 (AIHW, 2006). The Dietary Guidelines for Australian Adults (NHMRC, 2003) recommend a minimum of 5 serves of vegetables and 2 serves of fruit be consumed each day. For the purposes of the current study, achievement of the NHMRC guidelines was considered to be "sufficient serves of fruit and vegetables" (Figure 10).

Respondents were asked to report their usual daily consumption of fruit and vegetables. A serve of fruit was described as 1 medium piece or 2 small pieces of fruit (excluding juice). A serve of vegetables was described as 0.5 cup cooked or 1 cup of raw or salad vegetables. Where the respondent usually consumed less than 1 serve per day of fruit or vegetables, they were asked to estimate their weekly consumption.

Approximately 50% of respondents across each health service consumed sufficient daily serves of fruit and approximately 10% of respondents met the target of 5 serves of vegetables per day (Figure 10).

Figure 10 Sufficient serves of fruit & vegetables by health service



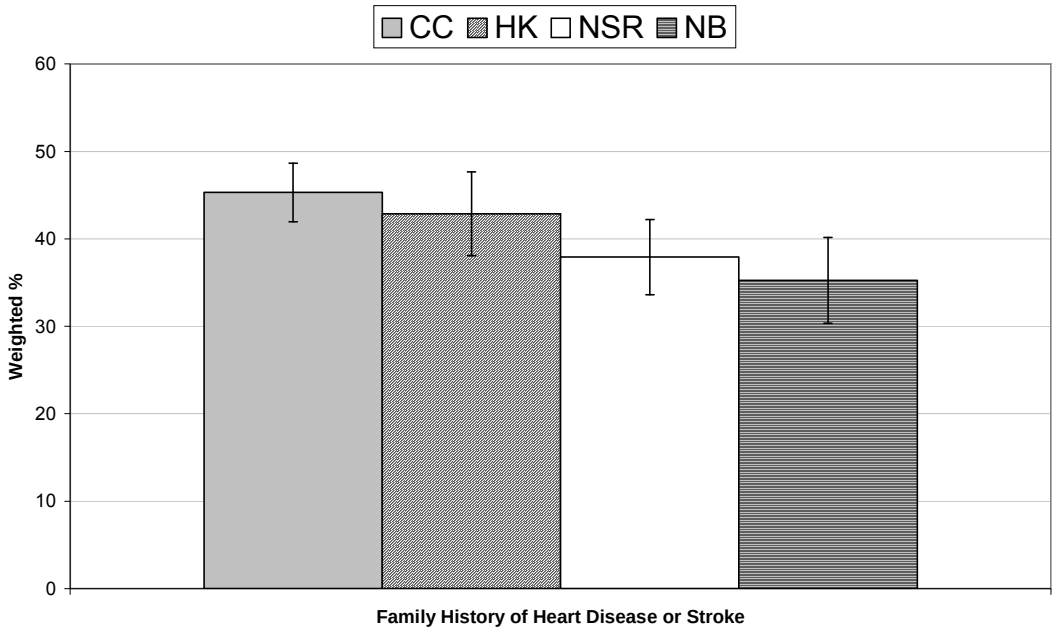
Percentages represent mean weighted scores for each category where 2 serves of fruit per day and 5 serves of vegetables per day respectively were considered sufficient; error bars represent 95% confidence intervals. A total of 0.3%CC, NSR and NB and 0%HK answered "don't know" or "refused" to the question about fruit consumption. A total of 0.2%CC, 0.12%HK, 0.3%NSR and 0%NB answered "don't know" or "refused" to the question about vegetable consumption.

Family History

Family history is an important risk factor for common chronic diseases such as coronary artery disease, diabetes, asthma, osteoporosis and several cancers. It reflects the complex interaction of inherited genetic susceptibilities with shared cultural, environmental and behavioural factors.

Figure 11 indicates that there was no significant difference across the area in the frequency of family history of heart attack or stroke. For the purposes of this survey, family was taken to include mother, father, brothers, sisters and children.

Figure 11 Self reported prevalence of family history of CVD by health service



Percentages represent mean weighted scores; error bars represent 95% confidence intervals. For analysis purposes, family included parents, siblings and children. A number of respondents answered “don’t know” representing 0.9%CC, 0.9%HK, 1.1%NSR and 1.0%NB.

Part 3 Psychosocial Status

Over the past three decades there has been an increasing awareness of the psychological and social needs of populations, in addition to their physical needs (Strang and Ager, 2007). There is emerging evidence that inequalities in social, economic and environmental factors are determinants of CVD and diabetes (Dept. Human Resources, 2007).

An Expert Working Group of the National Heart Foundation of Australia reviewed the evidence relating to major psychosocial risk factors and any independent associations with the development and progression of CHD. The Working Group concluded that there is strong and consistent evidence of an independent causal association between depression, social isolation and lack of quality social support and the causes and prognosis of CHD. The increased risk contributed by these psychosocial factors is of similar order to the more conventional CHD risk factors such as smoking, dyslipidaemia and hypertension (Bunker et al, 2003).

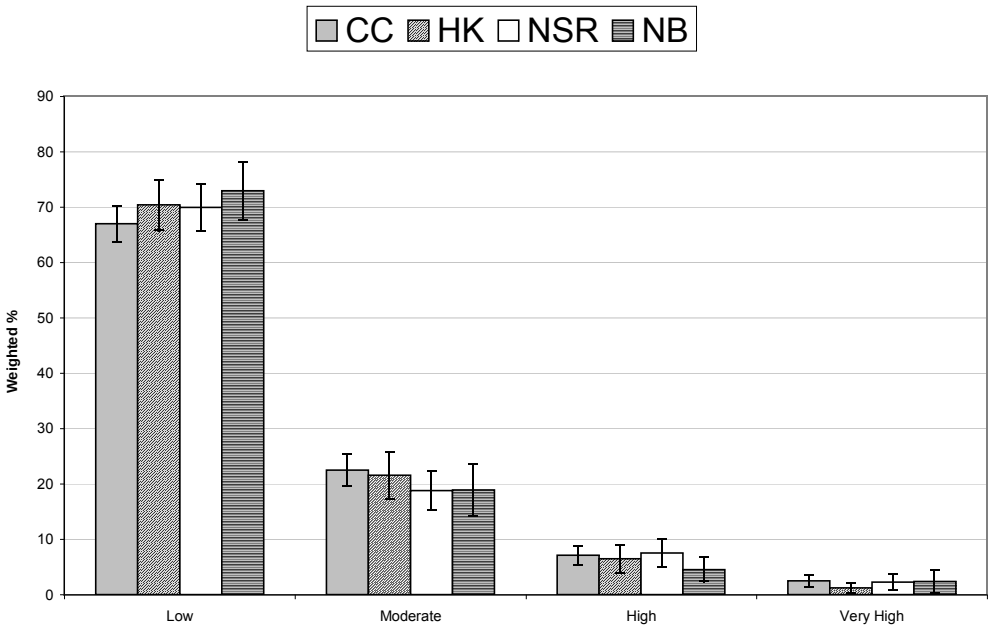
Psychological distress using the Kessler 10 (K10)

Psychological distress has a major effect on the ability of people to work, study and manage their day-to-day activities. About 1 in 10 Australians report having a long-term anxiety or mood related problem. Of these, 32% were daily smokers and 15% consumed alcohol at high risk levels (Centre for Epidemiology and Research, 2005).

The K10 (Kessler et al, 2002) measures non-specific psychological distress based on questions about the level of nervousness, agitation, psychological fatigue and depression in the most recent 4-week period. Each item is scored from 1 indicating that the person experiences the problem 'none of the time' to 5 for 'all of the time'. Resultant total K10 scores range between 10 (all responses = ‘none of the time) through to 50 (all responses = ‘all of the time’). When a respondent answered say 9 questions, the score for the missing question was imputed as the mean score of the 9 answered questions.

Figure 12 indicates that levels of psychological distress were fairly consistent for all categories and across health services. The majority of people fell into the low psychological distress category, however, more adults in CC and NSR health services had high or very high levels of psychological distress (9.6%CC, 7.7%HK, 9.8%NSR, 6.9%NB).

Figure 12 Psychological distress by Kessler 10 categories, by health service



Percentages represent mean weighted scores for each level of psychological distress measured by the K10; error bars represent 95% confidence intervals. NSW Health Survey Program cut-off scores were used: 'low psychological distress' (10-15), 'moderate psychological distress' (16-21), 'high psychological distress' (22-29), and 'very high psychological distress' (30+). A number of respondents answered "don't know/refused" representing 0.9%CC, 0.4%HK, 1.5%NS and 1.3%NB.

Social Capital – participation in the local community

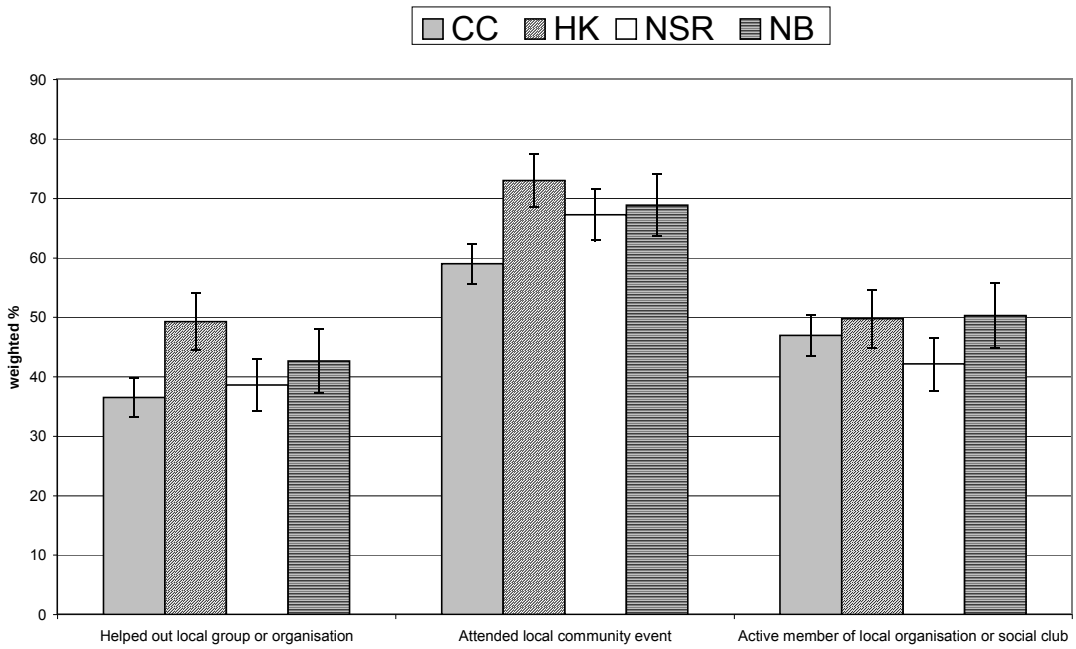
Social capital originates with people forming social connections and networks based on principles of trust, mutual reciprocity, and norms of action (Centre for Epidemiology and Research, 2005). Social capital is an attribute of communities, it differs from social support, which is an individual attribute (Washington State DOH, 2002).

Social capital may influence the health behaviours of neighbourhood residents by more rapid diffusion of health information, increasing the likelihood that social norms are adopted and/or by exerting social control over deviant health-related behaviour. An analysis of social capital indicators across 39 US States in relation to state level mortality rates reported that the density of civic associations (voluntary membership of groups, churches etc) was strongly inversely correlated with age adjusted, all cause mortality. Density of civic association membership was also a predictor of deaths from coronary heart disease (Berkman and Kawachi, 2000; Eckersley et al 2001).

Participation in the local community depends on a tendency among people to be social and to form new associations and networks. Three questions regarding participation in the local community were taken from the NSW Adult Health Survey 2003 (Centre for Epidemiology and Research, 2003). Respondents were asked: how often in the past 3 months they had helped out at any local group or organisation, how often in the past 6 months had they attended a local community event, and whether they were an active member of a local organisation, church or club. Responses to questions were grouped into positive or negative responses.

Figure 13 shows that the percentage of respondents helping out at local groups or organisations was highest for HK. The percentage of respondents attending local community events was lowest for the CC. Active membership of a local organisation, church or club is consistent across health services.

Figure 13 Self reported participation in the local community by health service



Percentages represent mean weighted scores for positive responses to each of the 3 questions regarding community participation; error bars represent 95% confidence intervals. Some respondents answered “don’t know/refused”, representing 0.2% NS for the question on ‘helped out’, and 0.1%CC, 0.2%HK, and 0.4%NS for ‘attended …event’.

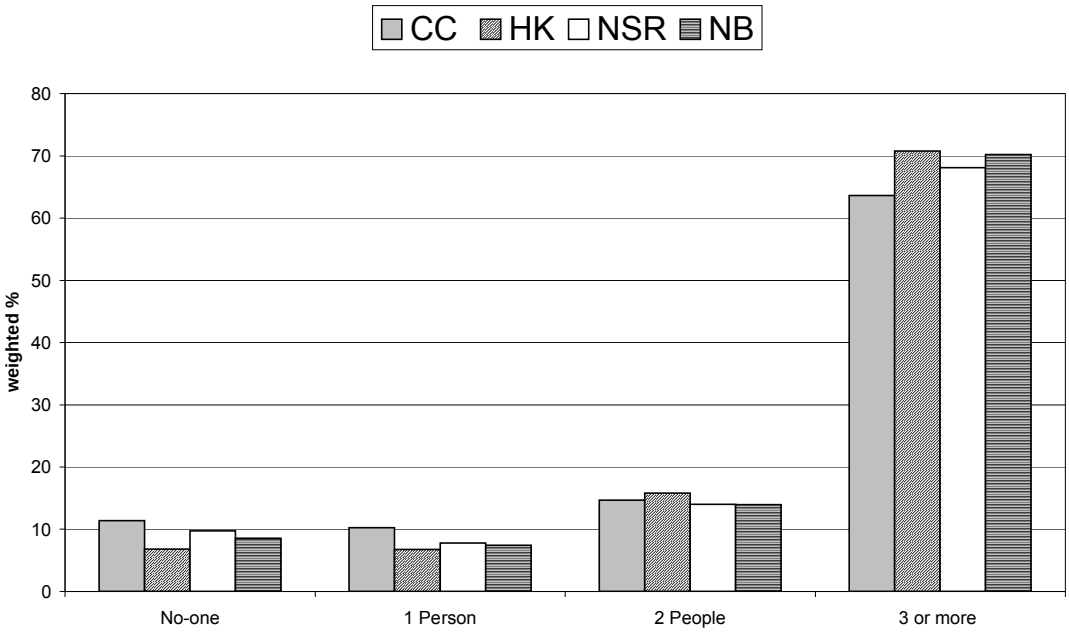
Social Support

Social well being includes feelings of belonging, social acceptance and approval, and the ability to depend on others for support. It relies on having a social network, which is enhanced or maintained through social activities. People who belong to a social network generally feel cared for and valued, which greatly affects their health. Individuals with social support have a reduced risk of mortality from specific diseases and recover more quickly from already-diagnosed illness (Washington State DOH, 2002).

Studies show that a supportive family or social network acts as a buffer to the adverse health effects of stress (eg illness). Conversely, ill health can reduce the person's ability to maintain contacts and activities (Bowling, 2001). Orth-Gomer and colleagues (1993) measured emotional support from very close persons ("attachment"), the support provided by the extended network ("social integration") and the incidence of myocardial infarction and death from coronary heart disease. The study found that both "attachment" and "social integration" were significant predictors of new coronary heart disease events. Smoking and lack of social support were the two leading risk factors for coronary heart disease in middle-aged men.

Survey questions were adapted from the Duke Social Support Index and provide a measure of social interaction. Figure 14 shows that most respondents could depend on 3 or more people; HK recorded the highest rate (70.7%) and the CC the lowest (63.6%). There were more respondents on the CC who felt they had no-one they could depend on (11.7% CC, 6.8% HK, 9.7% NS, 8.5 NB).

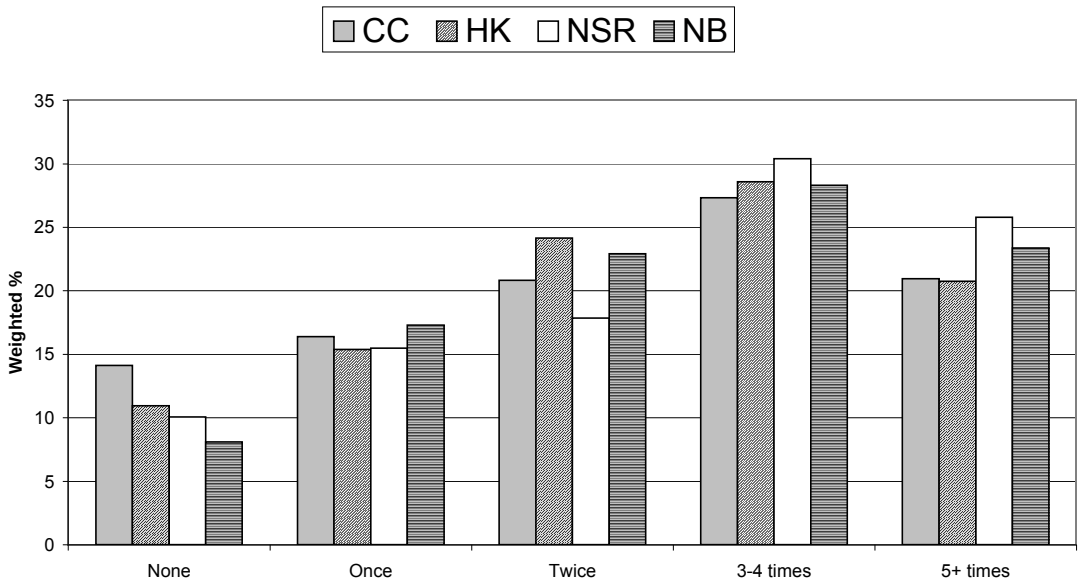
Figure 14 Percentage of respondents nominating the No. of people within one hours travel from home (excl. family) that they can depend on or feel close to, by health service



Percentages represent mean weighted scores; error bars represent 95% confidence intervals. Some respondents answered "don't know/refused" representing 0.3%CC and 0.5%NS.

Figure 15 suggests that most respondents spent time with someone (that they did not live with) on at least three to four occasions, in the past week. More respondents on the CC answered that they had not spent any time with others, outside of work (14.1%CC, 10.9%HK, 10.1%NS, 8.1%NB)

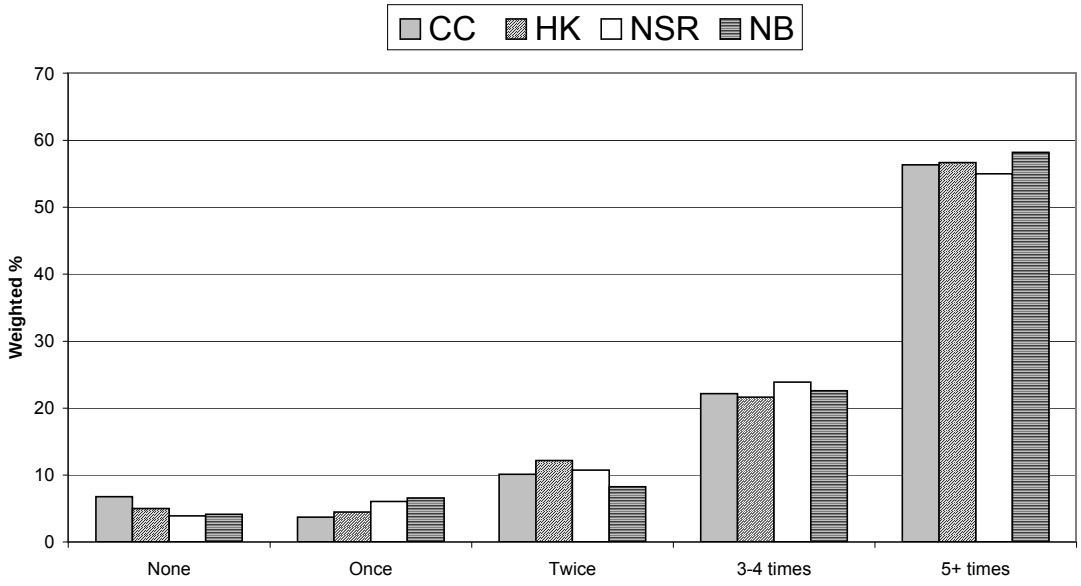
Figure 15 Percentage of respondents nominating the No. of times in the past week that they spent time with someone they did not live with (Excl. work), by health service



Percentages represent mean weighted scores; error bars represent 95% confidence intervals. A number of respondents answered "don't know/refused" representing 0.4%CC, 0.2%HK and 0.4%NS.

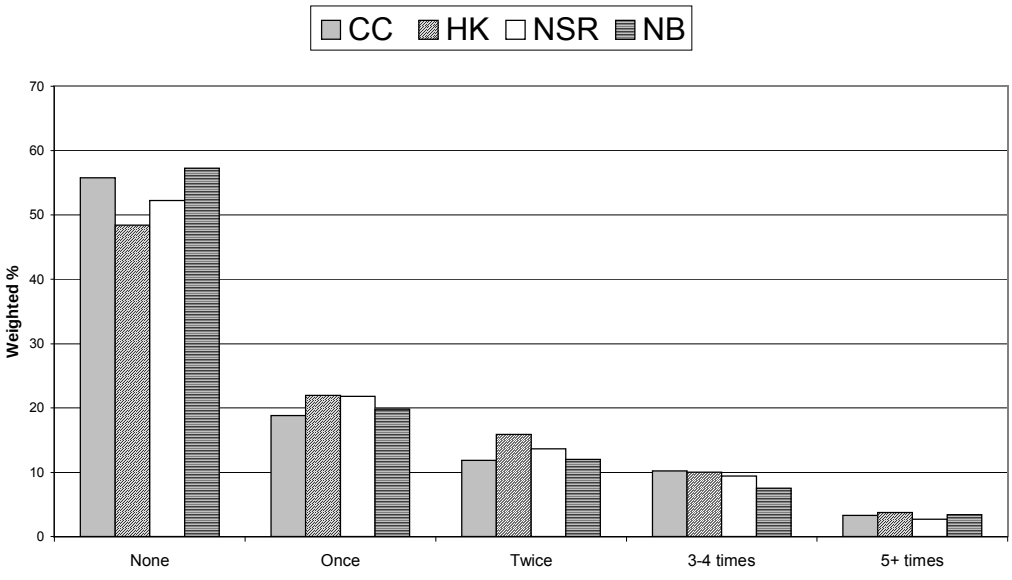
Figure 16 indicates that over 50% of respondents in each health service talked to family, friends or others (excl. work) on the telephone five times or more, in the past week. Figure 17 shows that most respondents did not attend any social, religious meetings or any other groups they belong to, in the past week.

Figure 16 Percentage of respondents nominating the No. of times in the past week they talked to someone on the telephone (Excl. work), by health service



Percentages represent mean weighted scores; error bars represent 95% confidence intervals. A number of respondents answered "don't know/refused" representing 1.0%CC, 0.1%HK, 0.5%NS and 0.3%NB.

Figure 17 Percentage of respondents nominating how often in the past week they attended social, religious meetings or other groups that they belong to, by health service



Percentages represent mean weighted scores; error bars represent 95% confidence intervals. Some respondents answered "don't know/refused" representing 0.1%CC and 02%NS.

Part 4 Health Status

This section focuses on the prevalence of health conditions within the community. Respondents to the survey were asked whether they had ever been told by a doctor or at a hospital that they had the condition in question. Conditions covered by this report include: hypertension; dyslipidemia; overweight/obesity; cardiovascular disease (including stroke); diabetes; and respiratory conditions such as COPD and asthma.

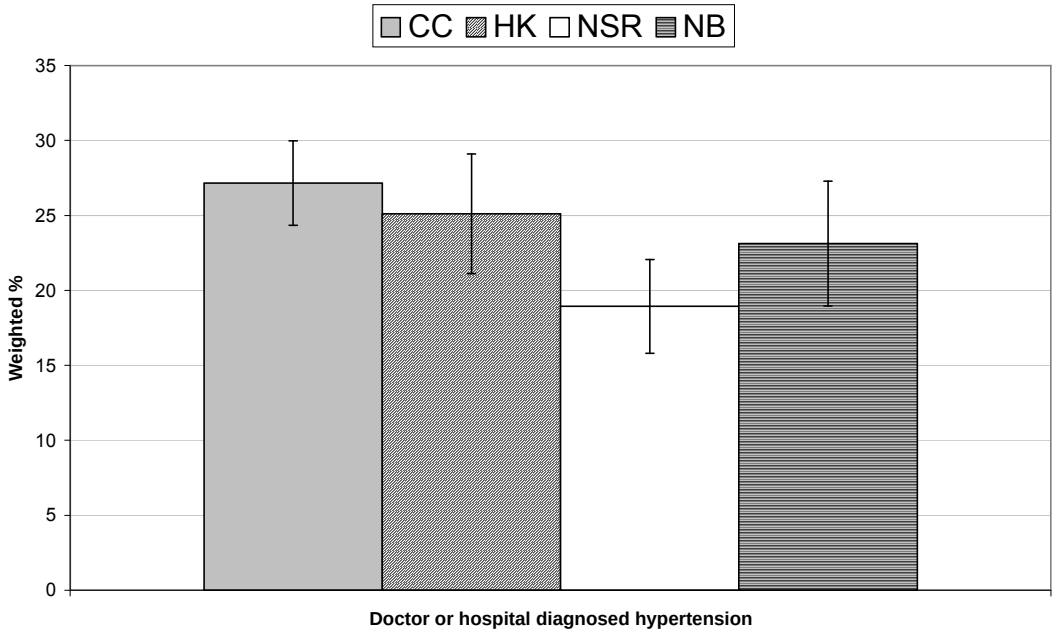
Hypertension

Blood pressure is a measure of the pressure in the arteries during the two phases of a heart contraction ie systolic is the pressure during the working/pumping phase of the heart contraction and diastolic is the pressure in the arteries during the relaxation / filling phase of the heart contraction. Blood pressure is not stagnant but changes according to the needs of the body so that blood pressure will be higher during exercise than it is during supine rest. However, when baseline blood pressure is raised for a prolonged period of time (hypertension), an individual will be at increased risk of heart disease, stroke, kidney failure and / or damage to the blood vessels. The Heart Foundation (2004) has issued guidelines describing the assessment, management and classification of blood pressure (normal, high-normal, and mild /moderate/ severe hypertension).

Hypertension was estimated to contribute 7.3% to the burden of disease in Australia in 2003 (AIHW, 2006). The prevalence of hypertension varied across health services, and there was a non significant trend towards lower prevalence of hypertension in NSR which reached significance when compared to CC (Figure 18). The graph excludes respondents who indicated that they had high blood pressure temporarily or only during pregnancy.

Medication was the most common technique reported to manage hypertension followed by exercise, diet and then weight loss, this was consistent across all health services.

Figure 18 Self reported prevalence of hypertension by health service



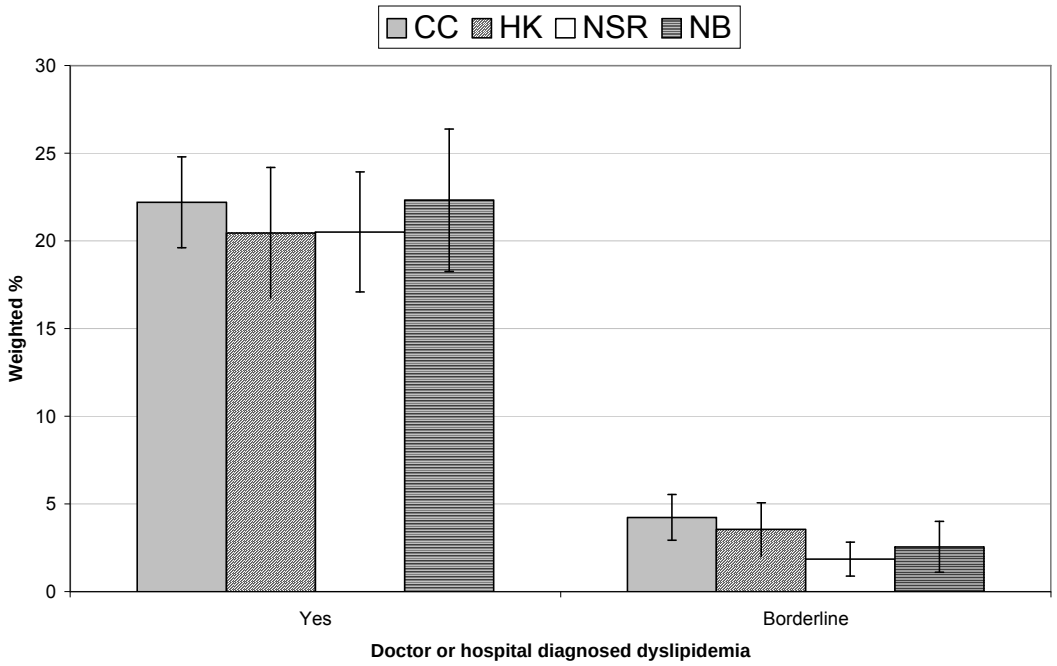
Columns represent mean weighted self reported prevalence of doctor diagnosed hypertension; error bars represent 95% confidence intervals. A total of 0.1%CC weighted sample responded “don’t know”. An additional, 4.1%CC, 3.1%HK, 3.9%NSR and 3.5%NB had hypertension temporarily or during pregnancy.

Dyslipidemia

Cholesterol is a lipid related compound produced naturally by the liver and is transported in the blood. It plays an essential role in the structure of cell membranes, the production of hormones and also has a role in tissue repair. However, where cholesterol levels in the blood become abnormally high there may be increased deposition in the walls of blood vessels leading to atherosclerosis. This is apparent in people who consume a high fat diet, inactive individuals, smokers and people with a genetic pre disposition to atherosclerosis.

High blood cholesterol (dyslipidemia / hypercholesterolemia) contributed 6.1% to the burden of disease in Australia in 2003. Across all health services approximately 23% of residents had at some time been told by a doctor or at a hospital that they had high blood cholesterol. A further 2-4% had cholesterol levels bordering on those considered to increase the risk of CVD.

Figure 19 Self reported prevalence of dyslipidaemia by health service



Columns represent mean weighted self reported prevalence of dyslipidemia; error bars represent 95% confidence intervals. A total of 0.4%CC, 0.3%HK, 0.2%NSR and 0.2%NB weighted samples responded “don’t know”.

The most common technique reported to manage dyslipidemia was diet followed by medication, exercise, and then weight loss, although the order of management techniques did vary slightly across health services.

Overweight / Obesity

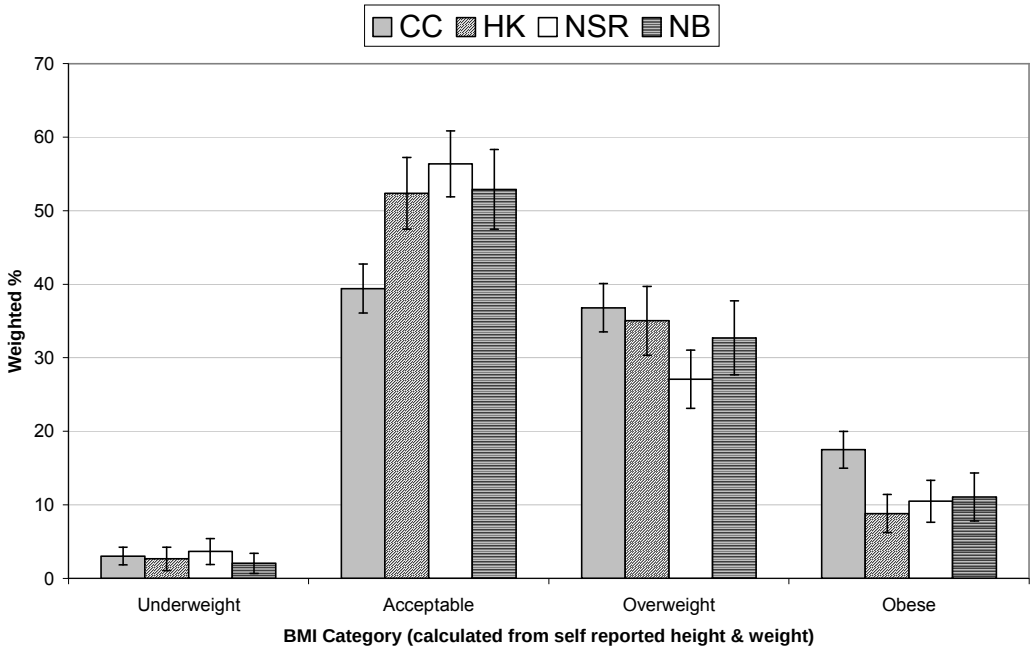
Obesity is a key risk factor for a number of chronic conditions eg diabetes, CVD and hypertension. In 2003, 8.6% of the burden of disease in Australia was attributed to overweight and obesity (AIHW, 2006). Recent analysis shows that younger people are gaining weight faster than previous generations and if the trends observed during the 1990s continue, it is predicted that 61.4% of generation X women (born 1966-1970) and 88% of generation X men in NSW will be overweight by 2010 (Allman-Farinelli et al, 2006a & 2006b).

Body Mass Index (BMI) is a commonly used measure of obesity and is calculated by dividing weight (kg) by height (m^2). The World Health Organisation defines the following weight categories: underweight (BMI<18.5), acceptable weight (18.5≤BMI<25), overweight (25.0≤BMI<30) and obese (BMI≥30 kg/m^2). Previous research has shown that respondents to telephone surveys often misreport their height (overestimate) and / or weight (underestimate) (Taylor et al, 2006). The results in this survey may have varied if BMI was clinically measured rather than based on self reported height and weight.

In the current study, the acceptable weight category (BMI 18.5 -25kg/m^2) was most commonly reported across all health services when BMI was calculated on the basis of self reported height and weight (Figure 20). Across all health services, respondents were more likely to fall within the overweight or obese categories than the underweight category (Figure 20). A significantly smaller percentage of the CC population was within the acceptable weight category (39% v ~53%), and a significantly greater percentage was within the obese category (17.5% v ~10%) than in other health services.

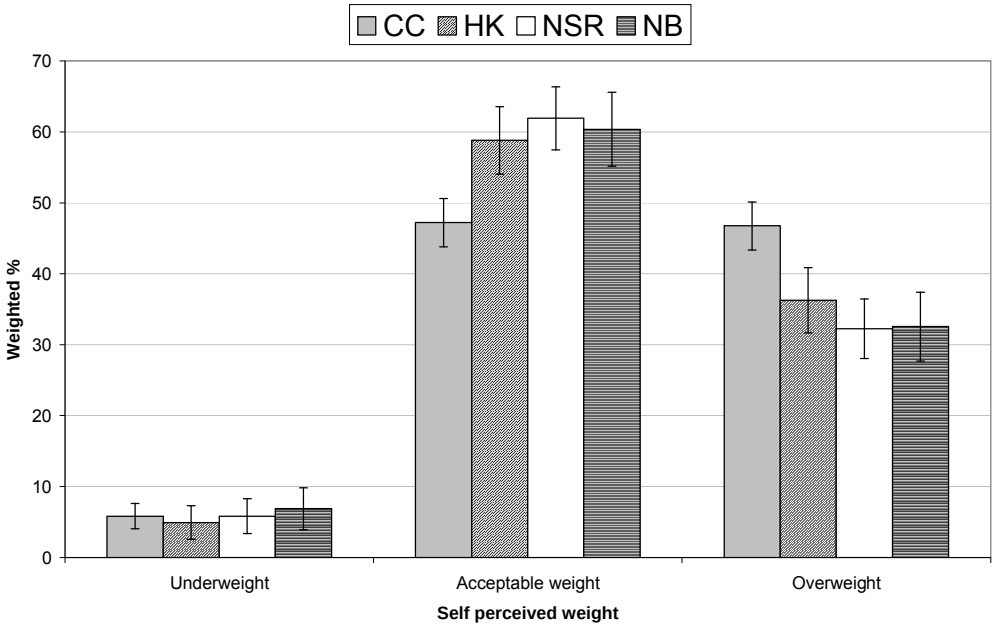
When respondents were asked to subjectively assess their weight category (Figure 21), the trends were similar to those observed in Figure 20. However, more respondents thought they were in the acceptable range and less in the overweight / obese range than was indicated on the basis of BMI calculated on self reported height and weight indicating that many people may not realise they have a weight problem.

Figure 20 Weight category based on self reported height and weight by health service



Percentages represent mean weighted scores for each category where BMI was calculated based on self reported height (m^2) and weight (kg); error bars represent 95% confidence intervals. WHO weight classifications were used ie underweight (BMI<18.5 kg/m^2), acceptable weight (18.5≤BMI<25 kg/m^2), overweight (25.0≤BMI<30 kg/m^2) and obese (BMI≥30 kg/m^2). Where respondents failed to provide a valid height or weight, BMI could not be calculated, this affected 3.3%CC, 1.2%HK, 2.4%NSR and 1.3%NB.

Figure 21 Self perceived weight by health service

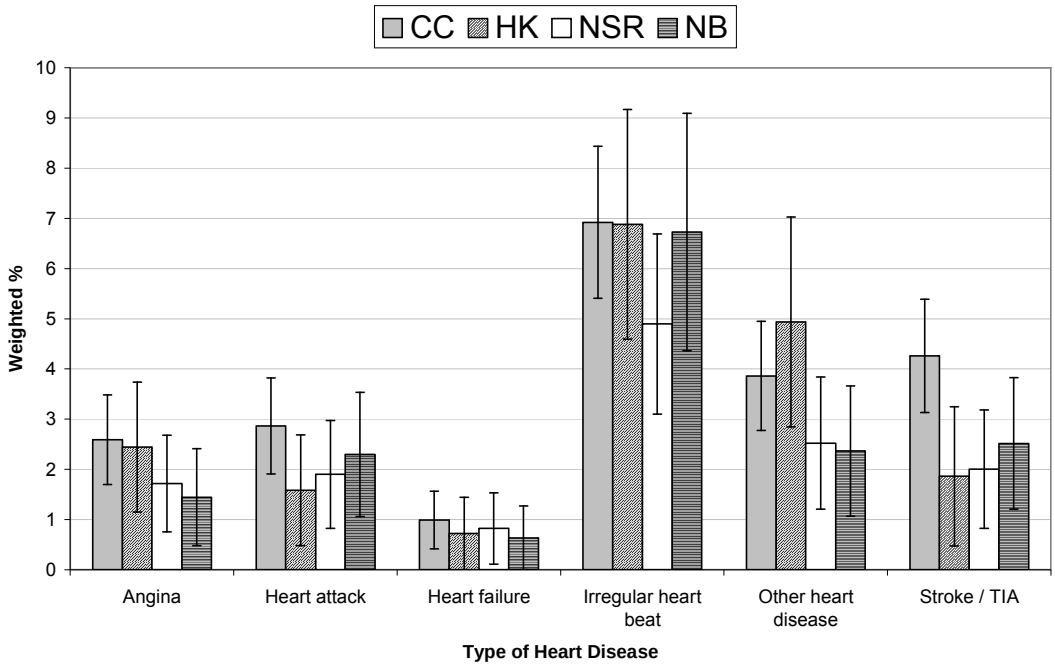


Percentages represent mean weighted scores for each category where weight category was self assessed by the respondent (no definition of categories was provided to respondents); error bars represent 95% confidence intervals. A number of respondents answered “don’t know” or “refused” representing 0.19%CC and 0.2%NB.

Prior Diagnosis CHD / Stroke

Individuals who have a previous cardiac or vascular problem are at increased risk of future CVD problems. The percentage of respondents who indicated they had been told by a doctor or at a hospital that they had heart disease or stroke was fairly consistent across the health services (CC 15.5%; HK 14.8%; NSR 11.9%; NB 13.4%). Figure 22 shows the self reported prevalence by type of heart condition or stroke.

Figure 22 Self reported prevalence of heart disease by type and health service



Columns represent mean weighted self reported prevalence of heart disease / stroke; error bars represent 95% confidence intervals. Respondents were able to answer positively to indicate that they had more than one condition, therefore total weighted percentages may be >100% for each health service. Between 0.1 and 1.15% of the population in each health service did not know whether they had been diagnosed with each of the above categories of heart disease.

The most common type of heart/stroke condition reported in each health service was irregular heart beat which included supraventricular tachycardia, atrial fibrillation and bundle branch block. Whilst there are some obvious trends in the data eg higher prevalence of stroke in CC and lower prevalence of irregular heart rate in NSR, these did not reach statistical significance. It is possible that significant trends would have occurred with a larger sample size.

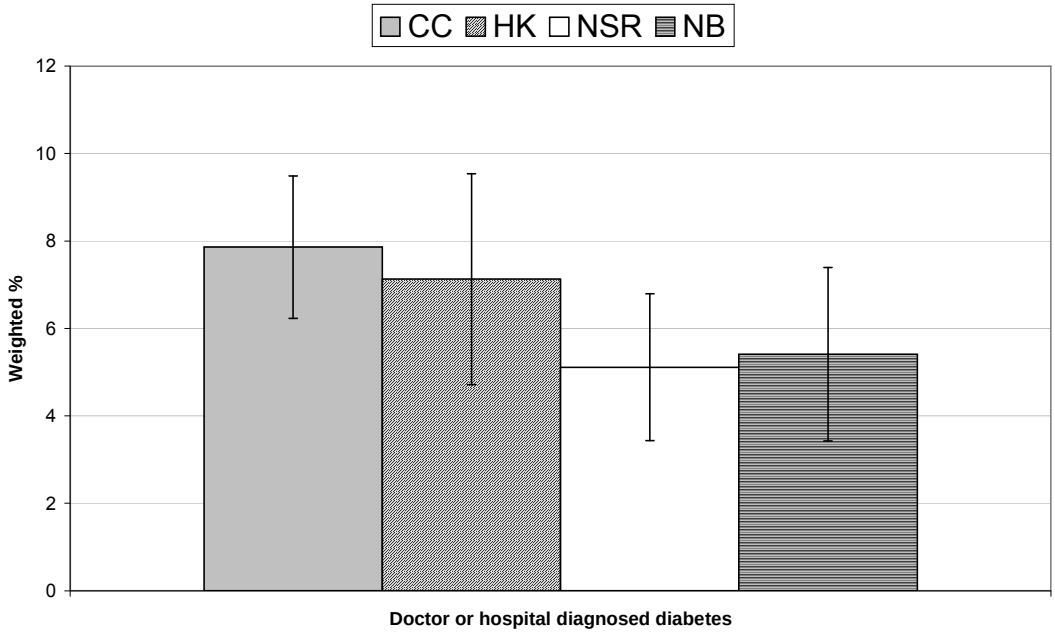
The most common techniques used for managing heart conditions were medication, exercise and diet. Management techniques for stroke included medication, diet and exercise, although the preference for each management technique differed across health services.

Diabetes / Pre Diabetes

Diabetes is a metabolic disease in which high blood glucose levels result from defective insulin secretion and / or insulin action. Diabetes is a National Priority Health Area and was estimated to account for 5.8% of the overall disease burden in Australia in 2003 (AIHW, 2006). Results of the AusDiab study conducted in 1999-2000 estimated that 7.5% of the population aged 25 and over had diabetes and about half of those were unaware of their condition (AIHW 2006 p70). This is of serious concern because complications are more likely in uncontrolled diabetes and control is less likely if the condition remains undiagnosed. Long-term complications of diabetes include damage to blood vessels which can result in CVD, PVD, stroke, kidney disease, nerve damage and retinopathy.

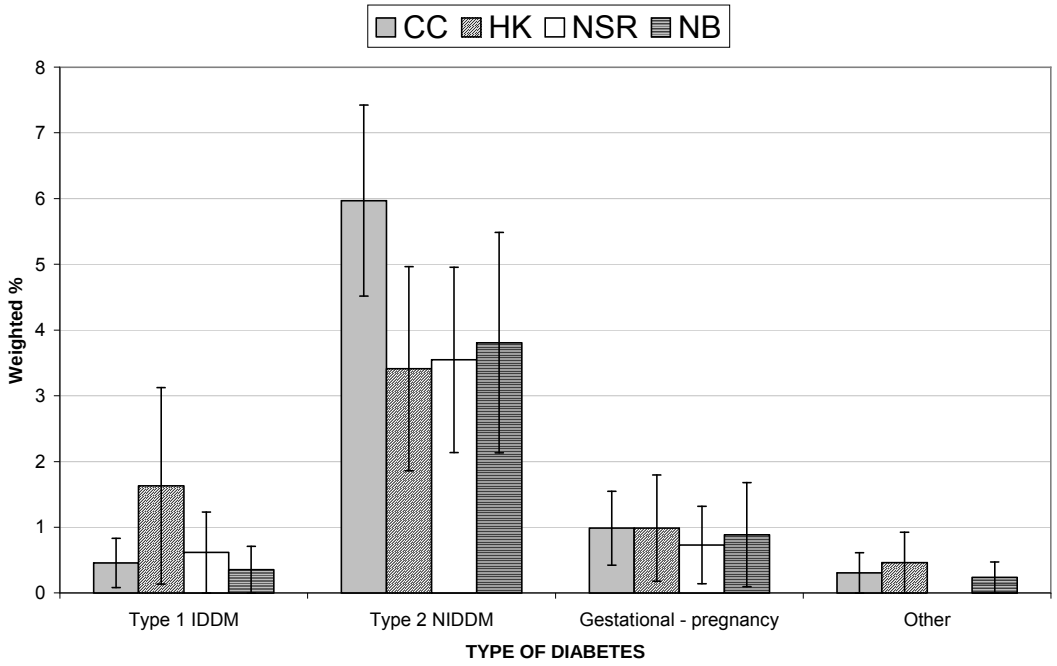
There was no significant difference across health services in the percentage of people who had been told by a doctor or at a hospital that they had diabetes (Figure 23), although there was a trend towards a higher prevalence in CC and HK. Based on the results of the AusDiab study it is likely that these results underestimate the true prevalence of the disease due to the number of people who remain undiagnosed.

Figure 23 Self reported diagnosis of diabetes by health service



Columns represent mean weighted self reported prevalence of doctor diagnosed diabetes; error bars represent 95% confidence intervals. All respondents provided a yes or no answer.

Figure 24 Self reported type of diabetes by health service



Columns represent mean weighted self reported prevalence by type of diabetes; error bars represent 95% confidence intervals. A total of 0.1%CC, 0.6%HK, 0.2%NSR and 0.1%NB of the weighted samples responded did not know what type of diabetes they had. The "other" category includes diabetes insipidous and prediabetic conditions.

There are a number of different types of diabetes. Type 1 involves an inability to produce the hormone insulin, Type 2 involves an inability to effectively use insulin. Diabetes can also occur during pregnancy (gestational) and whilst the condition may resolve after the birth, there is an increased risk of the mother developing diabetes later in life.

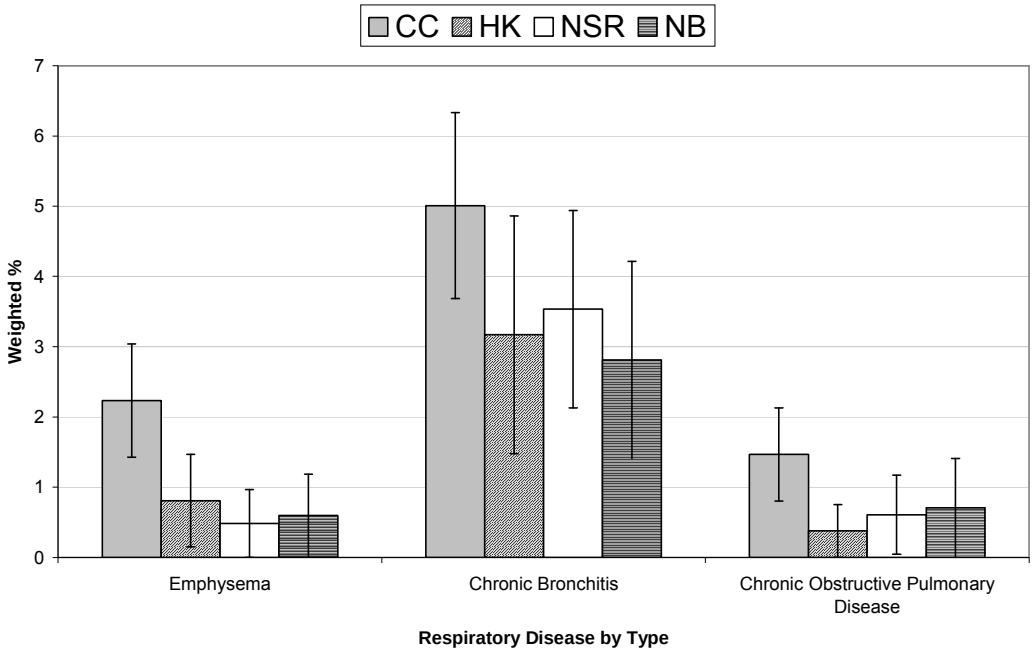
The prevalence of diabetes by type is presented in Figure 24. Type 2 was most commonly reported across all health services. There was an insignificant trend to higher prevalence of Type 2 diabetes in the CC (Figure 24) and an insignificant trend to higher prevalence of Type 1 diabetes in the HK.

Chronic Obstructive Pulmonary Disease (COPD)

COPD is a chronic respiratory condition in which the capacity of the lungs is limited either by mucus secretions or by damage to the airways and lung structures. It results in shortness of breath on exertion and in severe cases at rest. COPD includes both emphysema and chronic bronchitis and was estimated to account for 3.6% of the burden of disease in Australia in 2004 (AIHW 2006).

The prevalence of COPD is difficult to estimate as the condition is often only diagnosed when it is moderately advanced, thus self reported diagnosis figures presented in Figure 25 are likely to underestimate the true prevalence of the disease. The main risk factor for COPD is tobacco smoking, so it is not surprising that there is a trend towards higher prevalence of COPD in the CC (Figure 25), given the higher rate of current and past smokers in that health service (Figure 7).

Figure 25 Self reported prevalence of COPD by health service



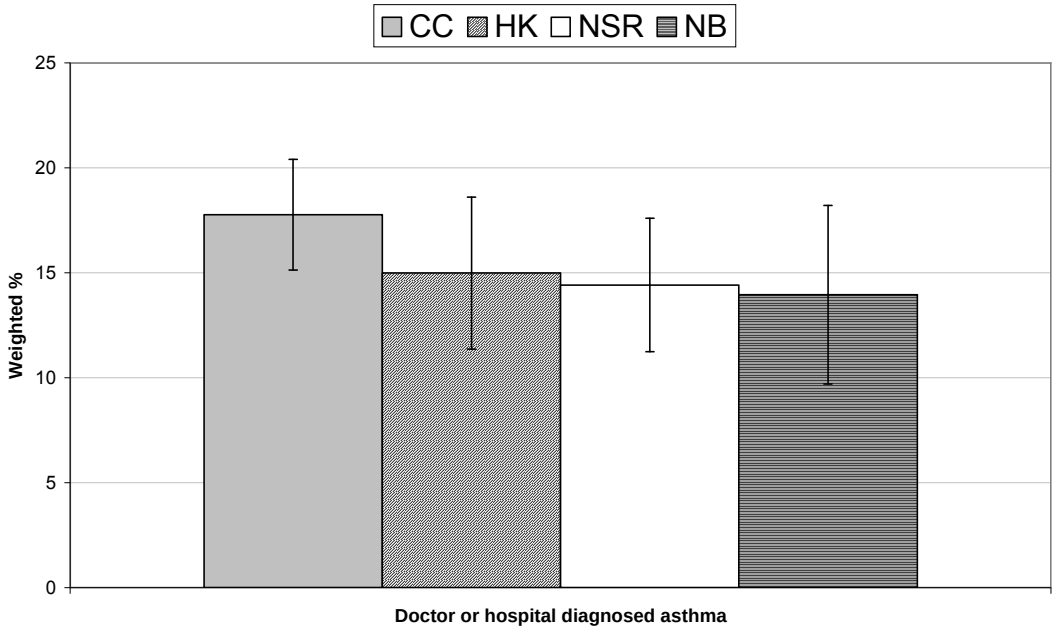
Columns represent mean weighted self reported prevalence of each doctor diagnosed condition; error bars represent 95% confidence intervals. Respondents were able to indicate that they had more than one of the named conditions and therefore totals for each health service may sum to >100%. In addition, there will be some overlap eg respondents answering that they had COPD and emphysema. Less than 0.6% of people in each health service responded "Don't Know" to each condition.

Asthma

Asthma is a chronic condition in which exposure to a trigger creates an inflammatory response of the airways resulting in acute bouts of wheezing, breathlessness and chest tightening. Asthma was estimated to account for 2.3% of the burden of disease in Australia in 2003, consisting of 0.3% of years of life lost due to premature mortality and 4% of years of "healthy" life lost due to poor health or disability (AIHW, 2006, p83).

Approximately 15% of the adult population of NSCCH have been diagnosed with asthma at some point in their lives (Figure 26). There was a non-significant trend towards higher prevalence of asthma in the CC. Few asthmatics reported having a written asthma plan provided by their GP to assist them to manage their condition (CC 24%, HK 34%, LNS 25%, NB 22%).

Figure 26 Self reported prevalence of asthma by health service



Columns represent mean weighted prevalence; error bars represent 95% confidence intervals. A total of 0.1%CC, 0.4%HK, 0.2%NSR and 0.5%NB weighted samples responded "don't know".

At Risk for Polycystic Ovary Syndrome (PCOS)

PCOS is a risk factor for cardiovascular disease, affecting up to 10% of women of reproductive age. Common clinical symptoms include infrequent menstrual periods and evidence of excess male hormones (hyperandrogenism), which can cause body hairiness (hirsutism) persistent acne, central obesity, and infertility. PCOS is reported to be associated with obesity, insulin resistance, type 2 diabetes, dyslipidaemia, hypertension and cardiovascular disease (Azziz et al, 2004).

The 2003 consensus on diagnostic criteria of PCOS concluded that 2 out of 3 of the following criteria must be met: (1) oligo- or amenorrhea (long or absent menstrual cycle), (2) clinical and/or biochemical signs of hyperandrogenism, (3) polycystic ovaries. In addition, disorders with a similar presentation must be excluded (Rotterdam PCOS Consensus Workshop Group, 2004).

In this survey, women identified as pre-menopausal and aged 18-45 years (n=593) were asked seven PCOS symptom-based questions (Appendix 2). A small percentage (n=34, 5.7%) of these women had been diagnosed with PCOS by a doctor or at a hospital and have therefore been excluded from Table 5. Of the remaining undiagnosed women (n=559), 14.4% reported hirsutism and 10.7% reported menstrual dysfunction (long or absent menstrual cycle). A total of 8 (1.4%) women reported both hirsutism and menstrual dysfunction.

Table 5 Self-reported menstrual cycle (%) by hirsutism
Pre-menopausal women 18-45 years who had not been diagnosed with PCOS

Hirsutism	Menstrual Cycle (Proportion %)				
	Absent	**Long**	**Normal**	**Other ***	**Total**
Yes	1 (0.2%)	7 (1.3%)	63 (11.3%)	9 (1.6%)	80 (14.4%)
No	5 (0.9%)	47 (8.4%)	376 (67.3%)	51 (9.1%)	479 (85.7%)
Total	6 (1.1%)	54 (9.7%)	439 (78.6%)	60 (10.7%)	559 (100.1%)**

- includes short cycle (N=46), refused (n=1) and other (N=13).
- **due to rounding
- Due to the small sample size, data presented in Table 5 have not been weighted or analysed by health service

Conclusions

This report presents a summary of selected findings of the 2006 Northern Sydney Central Coast Community Health Survey in relation to three key risk factor areas: behavioural, psychosocial and current health status.

Behavioural Risk Factors

There are a number of risk factors for chronic disease that are behavioural and therefore under the direct control of individuals. In many cases, positive health behaviours can contribute to the prevention of or slow the progression of chronic diseases. Some key behavioural trends are highlighted below:

- approximately 50% of residents do not achieve sufficient physical activity for health benefits, the exception being NSR (34%) which was more active than the state average;
- the prevalence of current smokers varies across the health services, approximating the state average (20%) in the CC (19.9%) and falling to as low as 7.5% in the HK;
- across the area, only ~10% of residents eat the recommended servings of vegetables and ~50% eat the recommended daily servings of fruit (these results also approximate the state average).

Psychosocial Risk Factors

Recently, an expert working group of the National Heart Foundation concluded that there was strong and consistent evidence of an independent causal association between depression, social isolation and lack of quality social support and the causes and prognosis of CHD. The increased risk contributed by these psychosocial factors was of similar order to the more conventional CHD risk factors such as smoking, dyslipidaemia and hypertension. In the Northern Sydney Central Coast Area Health Service:

- The prevalence of high or very high levels of psychological distress varied across the area, being highest in NSR (9.8%) and CC (9.6%) and lowest in NB health service (6.9%);
- Residents of HK health service were more likely to help out a local group than in other health services; and across the area, 60-70% of the population had attended a local community event in the past 3 months;
- 45-60% were active members of a local organisation, although less than 50% had attended a meeting within the past week;
- in the week prior to being surveyed, 10-15% of the population had no or one telephone contact and 8-14% had not spent time with someone other than those they share a home or workplace with.

Health Status

The telephone survey provided information about the self reported prevalence of doctor diagnosed chronic diseases:

- hypertension; dyslipidaemia; diabetes and asthma prevalence in each health service were similar to or less than the state average;
- the prevalence of overweight persons is similar across the area and reflects the NSW average, however, the prevalence of obesity (a higher risk category) is unevenly distributed across the area with CC reflecting the NSW average, and the other 3 health services (HK, NB, NSR) having a significantly lower prevalence of obesity;
- the CC was consistently at the higher end of the self reported doctor diagnosed prevalence scale for respiratory, metabolic and cardiac conditions when comparing across health services;
- the prevalence of hypertension and heart disease/stroke was lower in NSR;
- the most commonly reported CHD diagnoses was irregular heart beat (which included supraventricular tachycardia, atrial fibrillation and bundle branch block);
- diabetes was more common in the CC and HK health services with Type 1 a key driver for HK and Type 2 as the driver for CC. Across all health services Type 2 diabetes was more prevalent than Type 1;
- the prevalence of respiratory diseases (emphysema, COPD, Chronic bronchitis, asthma) was higher for CC than other health services; possibly due to the higher rates of current and past smokers.

APPENDICES

Appendix 1: Notification Letter to Survey Respondents

IDCODE:

NORTHERN SYDNEY CENTRAL COAST
NSW HEALTH

February 2006

Dear Householder,

Re Central Coast Community Health Survey

I am writing to tell you about an important survey that is being conducted by the Central Coast Public Health Unit. The main aim of the survey is to learn more about the cardiovascular (heart) health of people on the Central Coast and the factors that affect it, however, we will also ask some questions about other common illnesses like diabetes and respiratory diseases. The results of the survey will be used to help us plan and improve our local health services.

We will be interviewing approximately 1, 000 Central Coast residents by telephone. Your telephone number has been randomly selected to take part in this survey. One of our trained telephone interviewers will be calling you within the next 2 weeks to invite your household to participate. They will ask to interview one person randomly selected from your household. Each interview will take around 15 minutes. If you are unable to be interviewed at the time our interviewer rings, they can arrange a time that is convenient to you for us to call back. Interviews are conducted during the daytime and in the evening, as well as on weekends.

Please be assured that your answers to the survey questions will remain confidential. The results will not be used in any way in which they can be associated with your name and address. We hope that you can help us in our project, however, we understand that you may not wish to participate. If this is the case, simply let the interviewer know and we will remove your household from our contact list.

Some people who participate in the survey may be invited to attend a free clinical assessment. During this Clinic Assessment some of cardiovascular disease risk factors, including your weight, blood pressure and those in your blood (such as cholesterol), will be measured. Of course participation in the clinic is entirely voluntary.

Answers to some questions about the Community Health Survey are provided overleaf. If you have any further questions please contact Norma Taylor, the Survey Supervisor, on freecall 1800 355 534 between 1pm and 8pm, Monday to Friday.

Thank you in advance for your help with the survey.

Yours faithfully

Dr Peter Lewis
Area Director, Public Health

Questions & Answers about

The Central Coast Community Health Survey

How did you choose my telephone number?
Your number was chosen at random from all of the possible telephone numbers in your local area, similar to a Lotto draw.

When will the interviewer ring me?
Interviewers will call between 9.00am and 9.00pm on weekdays or between 11.00am and 6.00pm on Saturdays. If you are busy when they ring, they will be happy to phone back at a time convenient to you.

What types of questions will be asked?
The questions in the survey cover topics such as cardiovascular (heart) disease risk factors, diabetes, asthma, chronic obstructive pulmonary disorder, depression and polycystic ovary syndrome. There will also be some questions about basic individual characteristics such as age, occupation and languages spoken at home.

People are more at risk of cardiovascular (heart) disease if they:

- have high blood cholesterol;
- smoke;
- are physically inactive;
- have high blood pressure;
- have diabetes;
- have poor nutrition; or
- are overweight.

Do I have to answer all of the questions?
We would really appreciate your help with this important survey, however, your participation is voluntary and you are free to withdraw from the survey at any time. If you do choose to participate, you don't have to answer all of the questions in the survey. Some of the questions are of a personal nature, if you feel uncomfortable with any question, you can just tell the interviewer and they will move on to the next question.

How long will it take?
The whole survey will take around 15 minutes for most people. It may take a little longer for people who have a heart disease or one of the risk factors for heart disease.

Will the information I give be kept confidential?
Please be assured that your answers to the survey questions will remain confidential. The results will not be used in any way in which they can be associated with your household's name, address or phone number. Reports that are written as a result of the survey will refer to groups of people, not individuals e.g. 25% of men reported that they were smokers.

Any Questions?
If you have any questions in relation to the Central Coast Community Health Study, please contact Nicole Armstrong (Project Officer) or Dr Peter Lewis (Director) at the Central Coast Public Health Unit on (02) 4349 4845.

This project has been approved by the Ethics Committee of Northern Sydney Central Coast Health. If you have any concerns about the way this study is conducted or wish to make a complaint, you can contact the Ethics and Research Officer at Northern Sydney Central Coast Health on (02) 4320 3070.

April 2006

Dear Householder,

Re Northern Sydney Community Health Survey

I am writing to tell you about an important survey that is being conducted by the Public Health unit of Northern Sydney Central Coast Health. The main aim of the survey is to learn more about the cardiovascular (heart) health of people living in Northern Sydney and the factors that affect it, however, we will also ask some questions about other common illnesses like diabetes and respiratory diseases. The results of the survey will be used to help us plan and improve our local health services.

We will be interviewing approximately 1, 500 Northern Sydney residents by telephone. Your telephone number has been randomly selected to take part in this survey. One of our trained telephone interviewers will be calling you within the next 2 weeks to invite your household to participate. They will ask to interview one person randomly selected from your household. Each interview will take about 15 minutes. If you are unable to be interviewed at the time our interviewer rings, they can arrange a time that is convenient to you for us to call back. Interviews are conducted during the daytime and in the evening, as well as on weekends.

Please be assured that your answers to the survey questions will remain confidential. The results will not be used in any way in which they can be associated with your name and address. We hope that you can help us in our project, however, we understand that you may not wish to participate. If this is the case, simply let the interviewer know and we will remove your household from our contact list.

Answers to some questions about the Community Health Survey are provided overleaf. If you have any further questions please contact Norma Taylor, the Survey Supervisor, on freecall 1800 355 534 between 1pm and 8pm, Monday to Friday.

Thank you in advance for your help with the survey.

Yours faithfully

Dr Peter Lewis
Area Director, Public Health

Questions & Answers about

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What types of questions will be asked?
The questions in the survey cover topics such as cardiovascular (heart) disease risk factors, diabetes, asthma, chronic obstructive pulmonary disorder, depression and polycystic ovary syndrome. There will also be some questions about basic individual characteristics such as age, occupation and languages spoken at home.

People are more at risk of cardiovascular (heart) disease if they:

- have high blood cholesterol;
- smoke;
- are physically inactive;
- have high blood pressure;
- have diabetes;
- have poor nutrition; or
- are overweight.

Do I have to answer all of the questions?
We would really appreciate your help with this important survey, however, your participation is voluntary and you are free to withdraw from the survey at any time. If you do choose to participate, you don't have to answer all of the questions in the survey. Some of the questions are of a personal nature, if you feel uncomfortable with any question, you can just tell the interviewer and they will move on to the next question.

How long will it take?
The whole survey will take around 15 minutes for most people. It may take a little longer for people who have a heart disease or one of the risk factors for heart disease.

Will the information I give be kept confidential?
Please be assured that your answers to the survey questions will remain confidential. The results will not be used in any way in which they can be associated with your household's name, address or phone number. Reports that are written as a result of the survey will refer to groups of people, not individuals e.g. 25% of men reported that they were smokers.

Any Questions?
For questions about the administration of the study, please contact Norma Taylor (Survey Supervisor) on freecall 1800 355 534 between 1pm and 8pm, Monday to Friday. If you have any other questions in relation to the Northern Sydney Community Health Study, please contact Nicole Armstrong (Project Officer) or Dr Peter Lewis (Director) at the Public Health Unit on (02) 4349 4845.

This project has been approved by the Ethics Committee of Northern Sydney Central Coast Health. If you have any concerns about the way this study is conducted or wish to make a complaint, you can contact the Ethics and Research Officer at Northern Sydney Central Coast Health on (02) 4320 3070.

Appendix 2: NSCCH Community Health Survey

HYPERTENSION

Q1. Have you ever been told by a doctor or at a hospital that you have high blood pressure (sometimes called hypertension)? [DO NOT READ OPTIONS]

1. YES
2. NO
3. YES, BUT ONLY DURING PREGNANCY?
4. YES, BUT ONLY TEMPORARILY?
8. DON'T KNOW
9. REFUSED

Q2. What are you doing now to manage your high blood pressure (hypertension)? [DO NOT READ OPTIONS - ENTER 1 FOR ANY ITEMS THAT APPLY]

\# FOLLOWING A DIET (including reducing salty food, weight reduction diet)
\# TRYING TO LOSE WEIGHT
\# EXERCISING MOST DAYS
\# TAKING MEDICATION TO HELP LOWER YOUR BLOOD PRESSURE

Q2 OTH. Are you doing anything else to manage your blood pressure?

2. NO
7. NOT APPLICABLE - NO LONGER HAVE HIGH BLOOD PRESSURE
8. DON'T KNOW
9. REFUSED

[TYPE IN OTHER RESPONSE]

DYSLIPIDAEMIA

Q3. Have you ever been told by a doctor or at a hospital that you have high cholesterol? [DO NOT READ OPTIONS]

1. YES
2. NO
7. BORDERLINE
8. DON'T KNOW
9. REFUSED

Q4. What are you doing to manage your high cholesterol? [DO NOT READ OPTIONS - ENTER 1 FOR ANY ITEMS THAT APPLY]

\# FOLLOWING A DIET (including reducing salty food, weight reduction diet)
\# TRYING TO LOSE WEIGHT
\# EXERCISING MOST DAYS
\# TAKING MEDICATION TO HELP LOWER YOUR CHOLESTEROL

Q4 OTH. Are you doing anything else to manage your cholesterol?
2. NO
7. NOT APPLICABLE - NO LONGER HAVE HIGH CHOLESTEROL
8. DON'T KNOW
9. REFUSED
[TYPE IN OTHER RESPONSE]

HEART DISEASE AND STROKE

Now I would like to ask you about heart disease and stroke.

Q5. Has anyone in your immediate family ever had a heart attack or a stroke?
[IMMEDIATE FAMILY includes mother, father, brothers and sisters and children.]
1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Q6. Have you ever been told by a doctor or at a hospital that you have heart disease or a heart condition?
1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Q7. What type of heart disease do you have? [READ OPTIONS - MULTIPLE RESPONSE ALLOWED] [1. YES 2. NO 8. DON'T KNOW / NOT SURE 9. REFUSED]
Angina
Heart attack (myocardial infarction)
Heart failure
Irregular heart beat (incl: SVT, atrial fibrillation, bundle branch block)

Q7 OTH. Do you have any other type of heart disease?
2. NO
8. DON'T KNOW
9. REFUSED
[TYPE IN OTHER RESPONSE]

Q8. What are you doing now to manage your heart condition?
[DO NOT READ OPTIONS - ENTER 1 FOR ANY ITEMS THAT APPLY]
Following a special diet
Trying to lose weight
Exercising most days
Trying to quit smoking, or have already quit smoking
Taking medication to manage your heart condition

Q8 OTH. Are you doing anything else to manage your heart condition?
2. NO
7. NOT APPLICABLE - NO LONGER HAVE HEART CONDITION
8. DON'T KNOW
9. REFUSED
[TYPE IN OTHER RESPONSE]

Q9. Have you ever been told by a doctor or at a hospital that you have had a stroke or TIA (transient ischaemic attack or warning sign of a stroke)?
1. YES
2. NO
8. DON'T KNOW
9. REFUSED]

Q10. What are you doing now to manage your stroke condition?
[DO NOT READ OPTIONS - ENTER 1 FOR ANY ITEMS THAT APPLY]
Following a special diet
Trying to lose weight
Exercising most days
Trying to quit smoking, or have already quit smoking
Taking medication to manage your {my} stroke condition

Q10 OTH. Are you doing anything else to manage your stroke condition?
2. NO
7. NOT APPLICABLE - NO LONGER HAVE STROKE CONDITION
8. DON'T KNOW
9. REFUSED
[TYPE IN OTHER RESPONSE]

DIABETES

The next few questions are about diabetes. Diabetes is a condition where there is too much sugar in the blood.

Q11. Have you ever been told by a doctor or at a hospital that you have diabetes?
[DO NOT READ ITEMS]
1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Q12. What type of diabetes were you told you had?
1. TYPE 1 (insulin dependent diabetes mellitus)
2. TYPE 2 (non-insulin dependent diabetes mellitus)
3. GESTATIONAL (diabetes in pregnancy)
[TYPE IN OTHER - 88. DON'T KNOW - 99. REFUSED]

Q13. What are you doing now to manage your diabetes?
[DO NOT READ OPTIONS - ENTER 1 FOR ANY ITEMS THAT APPLY]

Having insulin injections
On tablets for diabetes or high blood sugar
Following a special diet [eg. reducing sugar and/or fat in the diet]
Losing weight
Exercising most days

Q13 OTH. Are you doing anything else to manage your diabetes?

2. NO
7. NOT APPLICABLE - NO LONGER HAVE DIABETES
8. DON'T KNOW
9. REFUSED

[TYPE IN OTHER RESPONSE]

ASTHMA

The next few questions are about asthma.

Q14. Have you ever been told by a doctor or at a hospital that you have asthma?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Q15. Do you have a written asthma management plan from your doctor on how to treat your asthma?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Q16. During the last four weeks, did your asthma interfere with your ability to manage your day to day activities?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Q17. Did it interfere with these activities... [READ SCALE AS PRESENTED]:

1. A little bit
2. Moderately
3. Quite a lot
4. Extremely
8. DON'T KNOW
9. REFUSED

HOME HEATING

Q18. In the last 12 months, have you used a wood-burning heater or unflued gas heater in your home?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED

COPD

Qcopd1. Have you ever been told by a doctor or hospital that you have:
[READ OPTIONS]

[1. YES 2. NO 8. DON'T KNOW 9. REFUSED]

Emphysema
Chronic Bronchitis
Chronic Obstructive Pulmonary Disease (COPD)

Qcopd2. Do you cough in the morning on most days for as much as 3 months of each year?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Qcopd3. Do you usually bring up phlegm/sputum from your chest when you cough?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Qcopd4. In the last 12 months, have you been troubled by breathlessness when hurrying on the level, walking up a slight hill or up a flight of stairs?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED

FOOD AND DRINK

The next few questions are about food.

Q19. How many serves of vegetables do you usually eat each day? One serve is ½ cup cooked or 1 cup raw vegetables or 1 cup of salad vegetables.

[SERVES PER DAY]
77. NEVER EAT
88. DON'T KNOW
99. REFUSED

If respondent USUALLY eats less than 1 serve per day Enter weekly value

[SERVES PER WEEK]
88. DON'T KNOW
99. REFUSED

Q20. How many serves of fruit do you usually eat each day? A serve is 1 medium piece or 2 small pieces of fruit or 1 cup of diced pieces. [NOT JUICE.]

[SERVES PER DAY]
77. NEVER EAT
88. DON'T KNOW
99. REFUSED

If respondent USUALLY eats less than 1 serve per day Enter weekly value

[SERVES PER WEEK]
88. DON'T KNOW
99. REFUSED

Q20J. How many CUPS of fruit juice do you usually drink each day?
[INCLUDE FRUIT JUICE DRINKS - DO NOT INCLUDE CORDIALS]

1 CUP = 250 ml (approx) COMMERCIAL PACKAGES:
Popper = 1 cup
Small bottle (320ml) = 1.5 cups
Large bottle (500ml) = 2 cups

[CUPS PER DAY]
77. NEVER DRINK
88. DON'T KNOW
99. REFUSED

If respondent USUALLY drinks less than 1 cup per day enter weekly value

[CUPS PER WEEK
88. DON'T KNOW
99. REFUSED

Q20a. How many serves of hot chips (French fries) did you eat yesterday?
[PROMPT IF NECESSARY]

[NUMBER: RANGE 0 - 2, 3 = >2]
8. DON'T REMEMBER
9. REFUSED

Q20b. How much sweet carbonated soft drink did you drink yesterday?
[DO NOT INCLUDE DIET SOFT DRINKS/DRINKS WITH ARTIFICIAL SWEETNERS]

standard cup 250ml
300-330ml bottle
375ml can
600ml bottle
1.25 litre bottle
Other in mls (1000ml = 1 litre)

[88. DON'T REMEMBER 99. REFUSED]

PHYSICAL ACTIVITY

The next few questions are about physical activity.

Q21. In the last week, how many times have you walked continuously for at least 10 minutes for recreation or exercise or to get to or from places?

[NUMBER OF TIMES]
88. DON'T KNOW - USE ONLY AS AN ABSOLUTE LAST RESORT

Q22. What do you estimate was the total time you spent walking in this way IN THE LAST WEEK?

MINUTES [88. DON'T KNOW]
HOURS [888. DON'T KNOW]

This next question does not include household chores or gardening.

Q23. In the last week, how many times did you do any vigorous physical activity which made you breathe harder or puff and pant? (e.g football, tennis, squash, athletics, cycling, jogging, gym, swimming etc.)

[NO. OF TIMES: RANGE 0 – 80]
88. DON'T KNOW - USE AS ABSOLUTE LAST RESORT

Q24. What do you estimate was the total time you spent doing this vigorous physical activity IN THE LAST WEEK?

MINUTES [88. DON'T KNOW]
HOURS [888. DON'T KNOW]

This next question does not include household chores or gardening.

Q25. In the last week, how many times did you do any other more moderate physical activity that you haven't already mentioned? (e.g. lawn bowls, golf, tai chi)

[NO. OF TIMES: RANGE 0 – 80]
88. DON'T KNOW - USE AS ABSOLUTE LAST RESORT

Q26. What do you estimate was the total time you spent doing these activities in the last week?

MINUTES [88. DON'T KNOW]
HOURS [888. DON'T KNOW]

TOBACCO SMOKING (incl: cigarettes, cigars, pipes)
The next few questions are about tobacco smoking. This includes cigarettes, cigars and pipes.

Q27. Which of the following best describes your smoking status? [READ ITEMS]
1. I SMOKE DAILY
2. I SMOKE OCCASIONALLY
3. I DON'T SMOKE NOW, BUT I USED TO
4. I'VE TRIED IT A FEW TIMES BUT NEVER SMOKED REGULARLY
5. I'VE NEVER SMOKED
8. DON'T KNOW [DO NOT READ]
9. REFUSED [DO NOT READ]

Q28. Which of the following best describes how you feel about your smoking?
[READ ITEMS AS PRESENTED]
1. I AM NOT PLANNING ON QUITTING WITHIN THE NEXT 6 MONTHS
2. I AM PLANNING ON QUITTING WITHIN THE NEXT 6 MONTHS
3. I AM PLANNING ON QUITTING WITHIN THE NEXT MONTH
4. I HAVE NOT SMOKED IN THE PAST 24 HOURS BUT WAS SMOKING 6 MONTHS AGO
5. I HAVE NOT BEEN SMOKING IN THE PAST 6 MONTHS
8. DON'T KNOW
9. REFUSED

Q29. In the past year, has your GP or doctor provided any advice on stopping smoking?
1. YES
2. NO
8. DON'T KNOW
9. REFUSED

Q30y. What was this advice? [MULTIPLE CHOICES PERMITTED]
1. RECOMMENDED NICOTINE REPLACEMENT THERAPY
2. RECOMMENDED THE QUITLINE
3. RECOMMENDED/PRESCRIBED ZYBAN (BUPROPRION)
88. DON'T REMEMBER
99. REFUSED
[TYPE IN OTHER ADVICE]

Q30a. On average, how many cigarettes per day did you / do you smoke?
[RANGE 1 – 100]
888. DON'T REMEMBER
999. REFUSED]
777. OTHER/LESS THAN 1 PER DAY

Q30b. How many years did you smoke / have you been smoking for?
YEARS [RANGE 1 – 90]
888. DON'T REMEMBER
999. REFUSED]

Q31. Which of the following best describes your home situation regarding smoking? [READ OPTIONS AS PRESENTED]

1. MY HOME IS SMOKE FREE (includes smoking is only allowed outside)
2. PEOPLE OCCASIONALLY SMOKE IN THE HOUSE
3. PEOPLE FREQUENTLY SMOKE IN THE HOUSE
8. DON'T KNOW
9. REFUSED

HEIGHT AND WEIGHT

The next few questions are about height and weight.

Q32. How tall are you without shoes?

\# FEET & # INCHES OR
\# CENTIMETERS
[888. DON'T KNOW 999. REFUSED]

Q33. How much do you weigh without clothes or shoes?

\# STONES & # POUNDS OR
\# KILOGRAMS
[888. DON'T KNOW; 999. REFUSED

Q34. Do you consider yourself to be: [READ OUT ITEMS AS PRESENTED]

1. UNDERWEIGHT
2. ACCEPTABLE WEIGHT
3. OVERWEIGHT
8. DON'T KNOW
9. REFUSED

PSYCHOLOGICAL DISTRESS

The next few questions are about how you feel about your life.

Q35. In the last four weeks, about how often did you feel tired out for no good reasons? [READ SCALE]

1. ALL OF THE TIME
2. MOST OF THE TIME
3. SOME OF THE TIME
4. A LITTLE OF THE TIME
5. NONE OF THE TIME
8. DON'T KNOW [DO NOT READ]
9. REFUSED [DO NOT READ]

Q36. In the last four weeks, about how often did you feel nervous? [READ SCALE PER Q35 IF REQUIRED]

Q37. In the last four weeks, about how often did you feel so nervous that nothing could calm you down? [READ SCALE PER Q35 IF REQUIRED]

Q38. In the last four weeks, about how often did you feel hopeless?
[READ SCALE PER Q35 IF REQUIRED]

Q39. In the last four weeks, about how often did you feel restless or fidgety?
[READ SCALE PER Q35 IF REQUIRED]

Q40. In the last four weeks, about how often did you feel so restless that you could not sit still? [READ SCALE PER Q35 IF REQUIRED]

Q41. In the last four weeks, about how often did you feel depressed?
[READ SCALE PER Q35 IF REQUIRED]

Q42. In the last four weeks, about how often did you feel that everything was an effort?
[READ SCALE PER Q35 IF REQUIRED]

Q43. In the last four weeks, about how often did you feel so sad that nothing could cheer you up? [READ SCALE PER Q35 IF REQUIRED]

Q44. In the last four weeks, about how often did you feel worthless?
[READ SCALE PER Q35 IF REQUIRED]

SOCIAL SUPPORT

Q45. How many persons who live within one hours travelling time from your home do you feel you can depend on or feel very close to (other than members of your own family)?

0. NO ONE
1. 1 PERSON
2. 2 PEOPLE
3. 3 OR MORE PEOPLE
8. DON'T KNOW [DO NOT READ]
9. REFUSED [DO NOT READ]

Q46. (Other than at work) How many times during the past week did you spend time with someone who does not live with you? For example, you went to see them or they came to visit you, or you went out together?

\# [TIMES: RANGE 0 - 7 (7=7 or more)]
8. DON'T KNOW
9. REFUSED

Q47. (Other than at work) How many times did you talk to someone - friends, relatives or others - on the telephone in the past week (either they called you, or you called them)?

\# [TIMES: RANGE 0 - 7 (7=7 or more)]
8. DON'T KNOW
9. REFUSED

Q48. Other than at work, about how often did you go to meetings of social clubs, religious meetings, or other groups that you belong to in the past week?

[TIMES: RANGE 0 - 7 (7=7 or more)]
8. DON'T KNOW
9. REFUSED]

Q48A. In the past three months, how often have you helped out any local group or organisation such as a school, scouts and brownies, a sporting club, or hospital as a volunteer, or other organisation ...? [READ OUT FIRST 4 ITEMS]

1. ABOUT ONCE A WEEK
2. ONCE EVERY 2-3 WEEKS
3. ONCE A MONTH OR LESS
7. NO, NOT AT ALL
8. DON'T KNOW
9. REFUSED

Q48B. In the past six months, how often have you attended a local community event such as a church or school fete, school concert, or a street fair? [READ OUT FIRST 4 ITEMS]

1. THREE TIMES OR MORE
2. TWICE
3. ONCE
7. NEVER
8. DON'T KNOW
9. REFUSED

Q48C. Are you an active member of a local organisation, church or club, such as a sport, craft, or social club? [READ OUT]

1. YES, VERY ACTIVE
2. YES, SOMEWHAT ACTIVE
3. YES, A LITTLE ACTIVE
7. NO, NOT AN ACTIVE MEMBER
8. DON'T KNOW
9. REFUSED

SEX AND AGE

Q57. [INTERVIEWER] What is the gender of the respondent? [OBSERVE OR ASK]

M = MALE
F = FEMALE

Q62. Could you please tell me how old you are today?

[ENTER AGE]
999. REFUSED [ATTEMPT AGE RANGE QUESTION Q62R]

Q62R. What is your age group? Is it ... [READ OPTIONS]

1. 18 – 24
2. 25 - 29
3. 30 - 34
4. 35 – 39
5. 40 – 44
6. 45 – 49
7. 50 - 54
8. 55 - 59
9. 60 - 64
10. 65 – 69
11. 70 AND OVER
99. REFUSED

You've said that you are aged between 45 and 49.
Q62R6. Can I ask if you are aged OVER 45 (this is important for the next set of questions)?

1. YES, OVER 45
2. NO, AGED 45
9. REFUSED

POLYCYSTIC OVARY SYNDROME MODULE

[THIS MODULE FOR PREMENOPAUSAL WOMEN AGED 18-45 YEARS ONLY].

Q49. Have you reached menopause?

2. NO, I HAVE NOT REACHED MENOPAUSE
3. YES, I HAVE BEEN THROUGH MENOPAUSE
4. YES, I AM CURRENTLY GOING THROUGH MENOPAUSE
5. I HAVE HAD BOTH OVARIES REMOVED SURGICALLY
8. DON'T KNOW
9. REFUSED

Now I would like to ask you about a women's health issue known as polycystic ovary syndrome or PCOS.

Q50. Have you ever been told by a doctor or at hospital that you have polycystic ovary syndrome (PCOS)?

1. YES [CLINIC INVITE PROMPTED]
2. NO
8. DON'T KNOW
9. REFUSED

Q51A. Do you have thinning of hair on your scalp?

1. YES [CLINIC INVITE PROMPTED]
2. NO
8. DON'T KNOW
9. REFUSED

Q51. Do you have increased hair growth in the following areas: [READ OUT] [MULTIPLE RESPONSE]

[1. YES 2. NO 8. DON'T KNOW/CAN'T JUDGE 9. REFUSED]

Facial
Chest, stomach or back
Thighs

[IF ANY YES, CLINIC INVITE PROMPTED]

Q52. When you were NOT pregnant and NOT on the contraceptive pill, would you describe your menstrual cycle as: [READ ITEMS]

1. LONG - more than 35 days or 5 weeks apart [CLINIC INVITE PROMPTED]
2. NORMAL - 26-34 days
3. SHORT - less than 26 days
4. ABSENT - You do not get periods [CLINIC INVITE PROMPTED]
7. OTHER [TYPE IN]
9. REFUSED

[RESPONSE MUST BE TYPED IN FOR 'OTHER' CODE]

Q53. Have you gained a lot of weight since finishing high school or since you were 18 years old?

1. YES [CLINIC INVITE PROMPTED]
2. NO
8. DON'T KNOW
9. REFUSED

Q54. Do you have problems with acne?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED]

Q55. Have you had any problems falling pregnant naturally?

1. YES
2. NO
3. I HAVE NOT TRIED TO FALL PREGNANT
8. DON'T KNOW
9. REFUSED

DEMOGRAPHICS AND OTHER

Q58. What is your postcode?

ENTER POSTCODE
9999 REFUSED

Q60. Were you in the same postcode 1 year ago?

1. YES
2. NO
9. REFUSED

Q59. Were you in the same postcode 5 years ago?

1. YES
2. NO
9. REFUSED

Q61. [CATI INSERTS THIS QUESTION IF CLINIC CRITERIA MET – FOR CENTRAL COAST ONLY] As it says in the letter you received, the Northern Sydney Central Coast Health Service is conducting free clinics looking at the risk factors for heart disease and associated diseases so it can provide better healthcare for Central Coast residents.

Would you like to attend a free clinic to have your risk factors for heart disease checked (eg blood pressure and cholesterol)?

1. YES
2. NO
8. DON"T KNOW
9. REFUSED

Q61a. [IF Q61=1] Do you give permission for the Public Health Unit to call you to arrange a clinic time?

1. YES [PROMPTED CHECK OF CONTACT DETAILS]
2. NO

Q61b. [IF >65 YEARS OLD] Do you give permission for the Public Health Unit to contact you about other cardiovascular disease studies related to this study?

1. YES
2. NO

Q63. Which country were you born in?

1. AUSTRALIA
2. CHINA (EXCL. TAIWAN)
3. CYPRUS
4. EGYPT
5. FIJI
6. GERMANY
7. GREECE
8. HONG KONG
9. INDIA
10. INDONESIA/TIMOR
11. ITALY
12. JAPAN
13. KOREA
14. LEBANON
15. MALAYSIA
16. MALTA
17. NEW ZEALAND
18. PHILIPPINES
19. PORTUGAL
20. SOUTH AFRICA
21. UK AND IRELAND
22. USA
23. VIET NAM
24. FORMER YUGOSLAVIA

[TYPE IN OTHER RESPONSES - 88. DON'T KNOW - 99. REFUSED]

Q64. Do you identify as Aboriginal or Torres Strait Islander?

1. YES
2. NO
8. DON'T KNOW
9. REFUSED]

Q49. What language do you usually speak at home? [By home we mean where you live]

1. ENGLISH
2. ARABIC (INCL LEBANESE, EGYPTIAN)
3. CAMBODIAN (KHMER)
4. CHINESE (INCL MANDARIN/CANTONESE)
5. CROATIAN
6. DUTCH
7. FIJIAN
8. FILIPINO LANGUAGES (INCL TAGALOG)
9. FRENCH
10. GERMAN
11. GREEK
12. HINDI
13. HUNGARIAN
14. INDONESIAN/MALAY
15. ITALIAN
16. JAPANESE
17. KOREAN
18. MACEDONIA
19. MALTESE
20. POLISH
21. PORTUGESE
22. RUSSIAN
23. SERBIAN
24. SPANISH
25. THAI
26. TURKISH
27. VIETNAMESE.

[TYPE IN OTHER - 88. OTHER 99. REFUSED]

Q66. What is the highest level of education you have completed?
[DO NOT READ - PROMPT IF NECESSARY]

1. NEVER ATTENDED SCHOOL
2. COMPLETED PRIMARY SCHOOL
3. SOME HIGH SCHOOL
4. COMPLETED SCHOOL CERTIFICATE/INTERMEDIATE/YEAR 10/4TH FORM
5. COMPLETE HSC/LEAVING/YEAR 12/6TH FORM
6. TAFE CERTIFICATE OR DIPLOMA
7. UNIVERSITY, CAE OR OTHER TERTIARY INSTITUTE DEGREE OR HIGHER

[TYPE IN OTHER RESPONSES - 99. REFUSED]

Q67. Which of the following best describes your current employment status?
[MULTIPLE OPTIONS ALLOWED]:

1. IN FULL TIME PAID WORK
2. IN PART TIME PAID WORK
3. SELF EMPLOYED
4. DOING UNPAID WORK
5. COMPLETELY RETIRED
6. PARTIALLY RETIRED
7. LOOKING AFTER HOME/FAMILY
8. STUDYING
9. UNEMPLOYED
10. SICK / DISABLED / UNABLE TO WORK

[TYPE IN OTHER - 88. DON'T KNOW 99. REFUSED]

Q68. What is your approximate FAMILY INCOME before tax and other deductions?
That's the total for you, your partner and your children if they live at home. I'll read out the categories and you just give me the number. [CLARIFY: before tax, super, health insurance etc. deducted]
[READ OUT LIST WITH NUMBERS]

1. Less than $10,000
2. $10,000-$20,000
3. $20,000-$40,000
4. $40,000-$60,000
5. $60,000-$80,000
6. More than $80,000
8. DON'T KNOW
9. REFUSED

Q69. How many adults 18 years and over, including yourself, live at your home?

\# [NUMBER OF ADULTS: RANGE 1-7]

8. 8 OR MORE
9. REFUSED

* * * * *

Thank you for taking the time to complete this questionnaire. The information will be used to help improve health services in your local area. My name is _____, calling for the Northern Sydney Central Coast Area Health Service. If you have any concerns about this survey, please contact my supervisor on 1800 XXX XXX.

Glossary

Aboriginal Torres Strait Islander a person who identifies themselves as being accepted by and belonging to an Aboriginal or Torres Strait Islander community.

Angina temporary chest pain or discomfort when blood supply to the heart is inadequate to meet additional needs such as in exercise.

Arrhythmias a disturbed rhythm of the heart, that may be fast, slow or irregular.

Associated Cause of Death Any conditions, diseases and injuries (other than the underlying cause) considered to contribute to a death.

Atherosclerosis A process in which fatty and fibre like deposits accumulate on the inner walls of arteries, often forming plaques that can restrict flow in the artery or break off and cause blockages in the artery.

Atrial Fibrillation A condition where the atrium of the heart do not beat in a regular rhythm causing an irregular rapid heart beat.

Blood Cholesterol A fatty substance produced by the liver and transported via the blood to other parts of the body. If cholesterol levels in the blood are too high, there may be an increased risk of atherosclerosis and heart disease.

Body Mass Index (BMI) A calculated measure that gives an indication of the expected weight for a given height. It is calculated as weight (kg) divided by height (m^2). Standard categories of BMI for both men and women are underweight <18.5, acceptable weight 18.5 to <25, overweight ≥25 and obese ≥30 $k•gm^2$.

Cardiovascular Disease Any disease of the heart (cardio) or blood vessels (vascular).

Cerebrovascular Disease A disorder of the blood vessels supplying the brain or it's membranes.

Chronic Persistent and long lasting.

Chronic Diseases Term applied to a diverse group of non communicable diseases that are long lasting in either their symptoms or development (eg cardiovascular disease, chronic obstructive pulmonary disease, diabetes)

Chronic Obstructive Pulmonary Disease (COPD) progressive disease of the lungs that obstructs oxygen intake and causes shortness of breath. COPD encompasses both chronic bronchitis and emphysema.

Comorbidity Multiple health conditions experienced at the same time.

Diabetes Mellitus (Diabetes) A condition defined by a marked increase in blood glucose levels due to an inability to produce or reduced ability to utilise the hormone insulin, which assists glucose to pass from the blood to other cells.

Gestational Diabetes Diabetes which is first diagnosed during preganancy, it may disappear after preganancy but signals a high risk of diabetes occurring later on.

Generation X cohort born between 1966 and 1970.

Hypertensive Disease Disease occurring when elevated blood pressure is severe or prolonged enough to cause damage to the heart, brain or kidneys.

Impaired Glucose Tolerance condition in which blood glucose levels are higher than normal but less than required for a diagnosis of diabetes.

Insulin a hormone produced by the pancreas that regulates the body's energy sources, especially glucose.

Ischaemia reduced or blocked blood supply

Morbidity levels of ill health in an individual or population group

Obesity marked degree of being overweight, classified as a BMI of $\geq$30 kg$\bullet$m^2.

Overweight defined as a BMI of $\geq$25 kg$\bullet$m^2

Peripheral Vascular Disease pain in the legs due to inadequate blood supply (ischaemia).

Prevalence the number or proportion of cases or occurances present in a population at a given time.

Rheumatic Heart Disease chronic disease related to heart valve damage caused by earlier attack(s) of rheumatic fever.

Risk Factor A condition or state that when present represents a greater risk of a health disorder or event.

Stroke when an artery supplying the brain suddenly becomes blocked or bleeds.

Transient Ischaemic Attack A "mini stroke" with temporary problems (paralysis or speech disorder) that last for 24 hours or less.

Underlying Cause of Death The disease or injury that initiated the sequence of events leading directly to death; ie the principal cause of death.

References

Allman-Farrelli M, Kiong L, Bonfigliolo C, Bauman A. *The weight of time: time influences on overweight and obesity in men.* NSW Centre for Overweight and Obesity. Sydney, 2006a. Available online at www.health.nsw.gov.au/pubs/2006/wot_men.html [Accessed 19 April 2007].

Allman-Farrelli M, Kiong L, Bonfigliolo C, Bauman A. *The weight of time: time influences on overweight and obesity in women.* NSW Centre for Overweight and Obesity. Sydney, 2006b. Available online at http://www.health.nsw.gov.au/pubs/2006/wot_women.html [Accessed 19 April 2007].

Appel LJ, Moore TJ, Obarzanek E, Vollmer WM, Svetkey LP, Sacks FM, Bray GA, Vogt TM, Cutler JA, Winhausser MM, Lin PH, Kranja N. A clinical trial of the effects of dietary patterns on blood pressure. *The New England Journal of Medicine* 1997; 336(16): 1117-24.

Appel LJ, Brands MW, Daniels SR, Karanja N, Elmer PJ, Sacks FM. Dietary approaches to prevent and treat hypertension – A scientific statement from the American Heart Association. *Hypertension* 2006; 47: 296-308.

Armstrong T, Bauman A, Davies J. *Physical activity patterns of Australian adults; results of the 1999 National Physical Activity Survey*. Canberra: Australian Institute of Health and Welfare. 2000 Catalogue No. CVD 10.
Available online at http://www.aihw.gov.au/publications/health/papaa/papaa.pdf

Ascherio A, Hennekens C, Willett WC, Sacks F, Rosner B, Manson J, Witteman J, Stampfer MJ. Prospecitve study of nutritional factors, blood pressure, and hypertension among US women. *Hypertension* 1996; 27:1065-1072.

Australian Bureau of Statistics. 2006. *Causes of death, Australia*, *2004* Catalogue No 3303.0. Canberra: ABS. Available online at www.abs.gov.au [Accessed 27 September 2006].

Australian Institute of Health and Welfare (AIHW). 2006. *Australia's Health 2006*. Canberra: AIHW.

Azziz R, Woods KS, Reyna R, Key TJ**,** Knochenhauer ES, Yildiz BO. The prevalence and features of the polycystic ovary syndrome in an unselected population. *The Journal of Clinical Endocrinology and Metabolism* 2004; 89 (6): 2745-2749

Bazzano LA. Dietary intakes of fruits and vegetables and risk of Diabetes Mellitus and cardiovascular diseases. 2005. Available online at

http://www.who.int/dietphysicalactivity/publications/f&v_cvd_diabetes.pdf [Accessed 11 September 2006].

Berkman LF, Kawachi I. (Eds). *Social Epidemiology*. Chapter 8: social cohesion, social capital and health (p181). Oxford University Press, 2000

BouléNJ, Weisnagel SJ, Lakka TA, Tremblay SG. Effects of exercise training on glucose homeostasis : The HERITAGE Family Study. *Diabetes Care* 2005; 28(1):108-114.

Bowling A. Measuring disease: A review of disease-specific quality of life measurement scales. 2nd Ed. Open University Press, Philadelphia 2001.

Bunker SJ, Colquhoun DM, Esler MD, Hickie IB, Hunt D, Jelinek VM, Oldenburg BF, Peach HG, Ruth D, Tennant CC, Tonkin AM. . "Stress" and coronary heart disease: psychosocial risk factors. National Heart Foundation of Australia position statement update. *Medical Journal of Australia* 17 March 2003; 178: 272 – 276.

Centre for Epidemiology and Research. *2003 Report on Adult Health from the New South Wales Population Health Survey*. Sydney: NSW Department of Health, 2006.

Centre for Epidemiology and Research. *2004 Report on Adult Health from the New South Wales Population Health Survey*. NSW Public Health Bulletin 2005; 16 (S-1).

Centre for Epidemiology and Research. *2005 Report on Adult Health from the New South Wales Population Health Survey*. Sydney: NSW Department of Health, 2006.

Chapman KR, Mannino DM, Soriano JB, Vermeire PA, Buist AS, Thun MJ, Connell C, Jemal A, Lee TA, Miravitlles M, Aldington S, Beasley R. Epidemiology and costs of chronic obstructive pulmonary disease. *European Respiratory Journal* 2006; 27 (1): 188-207.

Commonwealth Department of Health and Ageing. *National Physical Activity Guidelines for Australians*. Canberra: CDOHA, 1999. Available online at http://www.ausport.gov.au/fulltext/1999/feddep/physguide.pdf#search=%22physical%20activity%20guidelines%22. [Accessed 11 April 2007].

Department of Human Resources. State Government of Victoria, Health Promotion. Planning for Health Communities. Chapter 10. *Improving socioenvironmental conditions and psychosocial factors.* Available online at http://www.health.vic.gov.au/healthpromotion/downloads/ch_10.pdf [Accessed 13 March 2007].

Diabetes Prevention Program Research Group. Reduction in the incidence of Type 2 diabetes with lifestyle intervention or Metformin. *New England Journal of Medicine* 2002; 346 (6): 393-403.

Duncan GE, Perri MG, Theriaque DW, Hutson AD, Eckel RH, Stacpoole PW. Exercise training without weight loss, increases insulin sensitivity and postheparin plasma lipase activity in previously sedentary adults. *Diabetes Care* 2003; 26(3): 557-562.

Eaton CB. Relation of physical activity and cardiovascular fitness to coronary heart disease, Part 1: A meta-analysis of the independent relation of physical activity and coronary heart disease. *Journal of the American Board of Family Practice* 1992; 5(1): 31-42.

Eckersley R, Dixon J, Douglas B (Eds*). The social origins of health and well-being*. Ch 13: Health, inequalities community and social capital. Australian National University, Cambridge University Press, 2001

Heart Foundation. *Hypertension Management Guide for Doctors 2004.* Available www.heartfoundation.com.au [accessed 16 February 2006]

Kessler RC, Andrews G, Colpe LJ, Hiripe E, Mroczek DK, Normand S-LT, Walters EE, Zaslavsky A. Short screening scales to monitor population prevalences and trends in nonspecific psychological distress. *Psychological Medicine* 2002; 32:6: 959-976.

Lee IM, Skerrett PJ. Physical Activity and All-cause Mortality: What is the Dose-Response Relation? *Medicine & Science in Sports & Exercise* 2001; 33(6): 459-471.

Liu S, Manson JE, Lee IM, Cole SR, Hennekens CH, Willett WC, Buring JE. Fruit and vegetable intake and risk of cardiovascular disease: the Women's Health Study. *American Journal of Clinical Nutrition* 2000 Oct; 72(4): 922-8.

Mikines KJ, Sonne B, Farrell PA, Tronier B, Galbo H. Effects of physical exercise on sensitivity and responsiveness to insulin in humans. *American Journal of Physiology* 1988; 254: E248-59.

National Health and Medical Research Council. *Dietary guidelines for Australian adults – guide to healthy eating.* NHMRC, 2003. Available online at http://www.nhmrc.gov.au/publications/synopses/dietsyn.htm [Accessed 11 April 2007].

Orth-Gomer K, Rosengren A, Wilhelmsen L. Lack of social support and incidence of coronary heart disease in middle aged Swedish men. *Psychosomatic Medicine* 1993; 55: 37-43.

Rotterdam PCOS Consensus Workshop Group. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. The Rotterdam ESHRE/ASRM-sponsored PCOS Consensus Workshop Group, *Fertility and Sterility* Jan 2004; 81 (1): 19-25.

Sesso HD, Paffenbarger RS, Lee IM. Physical activity and coronary heart disease in men – The Harvard Alumni Study. *Circulation* 2000; 102: 975-980.

Strang AB, Ager A. Building a conceptual framework for psychosocial intervention in complex emergencies: reporting on the work of the Psychosocial Working Group. Centre for International Health Studies, Queen Margaret University College, Edinburgh. Available online at http://www.ishhr.org/conference/articles/strang.pdf [Accessed 12 March 2007].

Taylor AW, Grande ED, Gill TK, Chittleborough CR, Wilson DH, Adams RJ, Grant JF, Phillips P, Appleton S, Ruffin RE. How valid are self-reported height and weight? A comparison between CATI self report and clinic measurements using a large cohort study. *Australian and New Zealand Journal of Public Health* 2006; 30 (3): 238-246.

Tuomilehto J, Lindstrom J, Eriksson JG, Valle TT, Hamalainen H, Ilanne-Parikka P, Keinanen-Kiukaanniemi S, Laakso M, Louheranta A, Rastas M, Salminen V, Aunola S, Cepaitis Z, Moltchanov V, Hakumaki M, Mannelin M, Martikkala V, Sundvall J, Uusitupa. Prevention of type 2 diabetes mellitus by changes in lifestyle among patients with impaired glucose tolerance. *New England Journal of Medicine* 2001; 344 (18):1343-50.

Washington State Department of Health. *Social determinants of health. The health of Washington State.* 2002. Available online at http://www.doh.wa.gov/HWS/doc/RPF/RPF_Soc.doc [Accessed 13 March 2007].