

SERVICE FRAMEWORK FOR CARDIOVASCULAR HEALTH AND WELL BEING

SECTION 3: Why Develop a Service Framework for Cardiovascular Health and Wellbeing?

Cardiovascular disease (CVD) refers to a group of diseases that involve the heart and / or the blood vessels (arteries and veins). Many of the diseases that affect the cardiovascular system have a similar cause and similar risk factors. Considering these diseases together under one framework allows the development of an integrated approach to prevention and management.

CVD was selected for the first Service Framework in Northern Ireland as it continues to be one of the biggest causes of death and disability in Northern Ireland (Figure 1). The World Health Organisation (WHO) estimates that 17.5 million people died of CVD in 2005¹. Its significance is also in the years of potential life lost, which is a measure of premature mortality (representing the number of years forgone by someone dying before the age of 75). CVD contributes proportionately less potential years of life lost because it typically affects the older population (Table 1). CVD does not have a uniform impact on the population with higher rates strongly associated with areas of deprivation and for people who are unemployed or in manual work (Annex 1).

Figure 1 – Principal causes of death in Northern Ireland as a % of total deaths (2005)

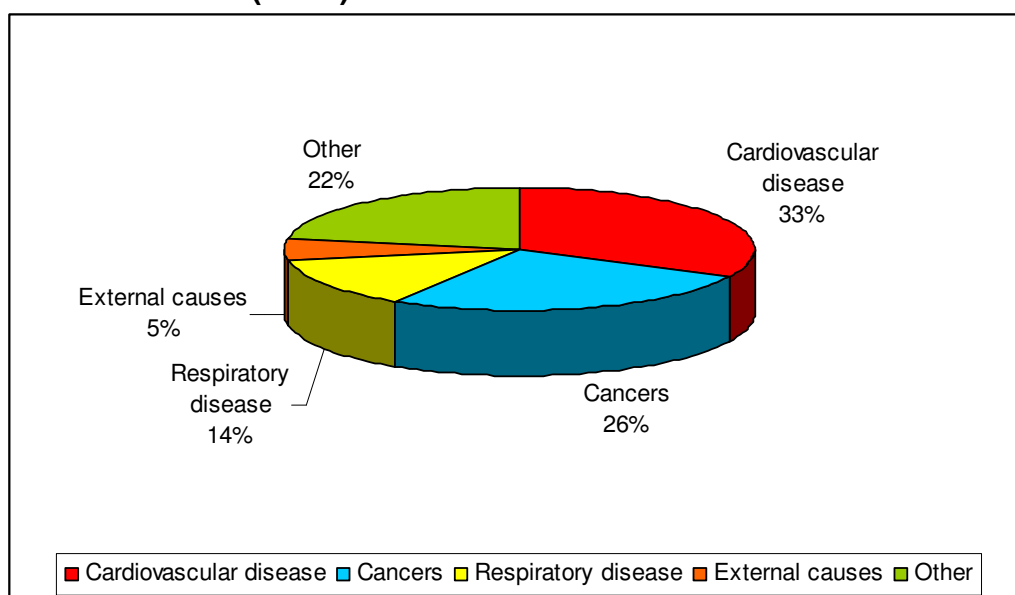


Table 1: Potential Years of Life Lost in Northern Ireland in 2005

¹ <http://www.who.int/mediacentre/factsheets/fs317/en/index.html>. Accessed 20/06/2007.

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Cause	ICD Code	Number of deaths	% of total deaths	Potential Years of Life Lost
Cardiovascular disease	<i>I10-I15, I20-I25, I50, I60- I79</i>	4,633	32.6%	14,156
Cancers	<i>C00-C97</i>	3,735	26.3%	24,220
Respiratory disease	<i>J00-J99</i>	1,921	13.5%	4,868
External causes (accidents, accidental poisoning, suicide, homicide etc)	<i>V00-Y98</i>	761	5.4%	20,305
Other		3,174	22.3%	29,935
<i>All causes</i>	<i>A00-Y98</i>	<i>14,224</i>	<i>100.1%</i>	<i>93,484</i>

Source: Registrar General Office (NISRA)

Investing for Health, the Public Health Strategy for Northern Ireland² has set regional targets to:

- Improve the levels of life expectancy in Northern Ireland towards the levels of the best EU countries, by increasing life expectancy by at least 3 years for men and 2 years for women between 2000 and 2010;
- Halve the gap in life expectancy between those in the fifth most deprived electoral wards and the average life expectancy here for both men and women between 2000 and 2010; and,
- Halt the increase in the levels of obesity in men and women so that by 2010, the proportion of men who are obese is less than 17% and of women less than 20%.

The Regional Strategy for Northern Ireland also sets objectives for improving health and wellbeing:

http://www.dhsspsni.gov.uk/index/hss/regional_strategy.htm

² DHSSPSNI. Investing for Health. March 2002

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What causes Cardiovascular Disease?

Although not the only cause, one of the most common causes of coronary heart disease (CHD) and stroke is the formation of fatty plaques (atheroma) in the arteries, which obstruct the flow of blood. There are a number of risk factors which are known to predispose to the development of these fatty plaques and, therefore, to the development of cardiovascular disease.

Risk Factors

Non-modifiable Risk Factors

Factors which increase risk of cardiovascular disease but which cannot be modified include hereditary factors such as ethnicity, increasing age and male gender. Men are more affected by atherosclerosis than pre-menopausal women, but after the menopause this relative protection decreases.

Modifiable Risk Factors

Smoking

Smoking is the major modifiable risk factor for chronic disease mortality in all European countries³. It is estimated to have caused 2,300 deaths in Northern Ireland per year over the period 1998-2002⁴. It is a major risk factor for CHD, and its effects are dose related (the more cigarettes smoked the greater the risk). Autopsy studies have shown greater atheroma development in smokers. Smoking has been shown to be a risk factor in acute myocardial infarction and sudden death^{5,6,7,8}.

³ Ezzati M, Lopez AD, Rodgers A, Vander Hoorn S, Murray CJ; Comparative Risk Assessment Collaborating Group. The Burden of Disease. *Lancet* 2002;360(9343):1347-60. (<http://ehs.sph.berkeley.edu/guat/publications/CRA%20Lancet.pdf>)

⁴ Twigg L, Moon, G, Walker S. The smoking epidemic in England. Health Development Agency. (<http://www.nice.org.uk/page.aspx?o=502811>)

⁵ Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years observations on male British doctors. *BMJ* 2004;328:1519. (<http://www.bmj.com/cgi/content/full/328/7455/1519>)

⁶ Ramsdale DR, Faragher EB, Bray CL, Bennett DH, Ward C, Beton DC. Smoking and coronary artery disease assessed by routine coronary arteriography. *BMJ* 1985;290:197-200. (<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1417970>)

⁷ Weintraub WS, Klein LW, Seelaus PA, Agarwal JB, Helfant RH. Importance of total life consumption of cigarettes as a risk factor for coronary artery disease. *Am J Cardiol.* 1985 Mar 1;55(6):669-72. (<http://www.ncbi.nlm.nih.gov/pubmed/3976509?dopt=Abstract>)

⁸ Auerbach O, Carter HW, Garfinkel L, Hammond EC. Cigarette smoking and coronary artery disease. A macroscopic and microscopic study. *Chest* 1976;70:697-705. (<http://www.chestjournal.org/cgi/content/abstract/70/6/697>)

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The Northern Ireland Health and Wellbeing Survey (NIHWBS) 2005/6 estimated the adult smoking prevalence at 26% (25% in males and 27% in females), with the highest prevalence in the 25-34 year age group. These figures are supported by the 2006/7 Continuous Household Survey (CHS) which found smoking prevalence to be 25% (25% in men; 26% in women). The latter survey found that 75% of all smokers who took part would like to quit.

Physical Inactivity

Lack of physical activity is associated with an increase in the risk of CHD⁹. The Joint British Society Guidelines on prevention of CHD in clinical practice¹⁰ recognised the role that physical activity has to play in reducing the incidence of cardiovascular events.

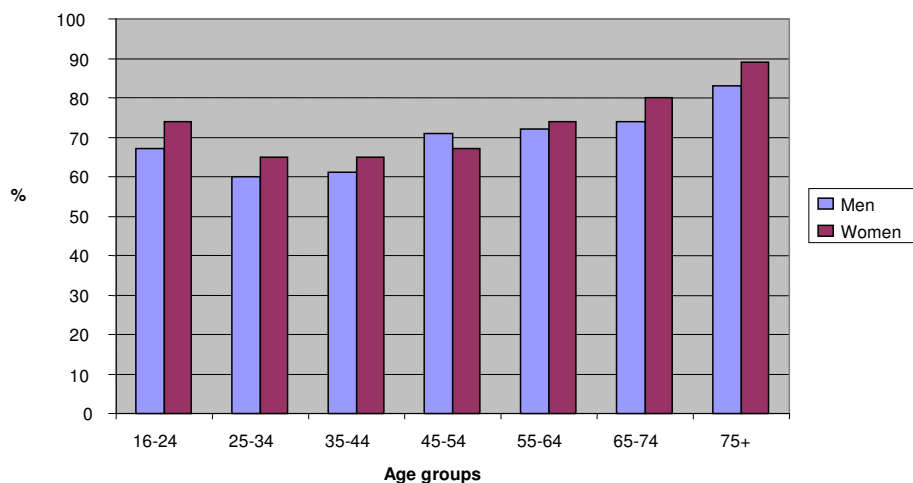
The NIHWBS 2005/06 found that 23% of all people aged 16 and over can be classified as sedentary i.e. have not performed any moderate level of activity lasting 20 minutes on at least one occasion in the last 7 days. 70% of those surveyed indicated that they do not take the recommended level of physical activity of at least 30 minutes a day on 5 days per week (Figure 2).

⁹ Thompson PD, Buchner D, Pina IL, *et al.* Exercise and physical activity in the prevention and treatment of atherosclerotic cardiovascular disease: A statement from the Council on Clinical Cardiology (Subcommittee on Exercise, Rehabilitation and Prevention) and the Council on Nutrition, Physical Activity and Metabolism (Subcommittee on Physical Activity). *Circulation* 2003; 107; 3109-3116. (<http://circ.ahajournals.org/cgi/content/full/107/24/3109>)

¹⁰ JBS 2: Joint British Societies' Guidelines on Prevention of Cardiovascular Disease in Clinical Practice (<http://www.bcs.com/download/651/JBS2final.pdf>)

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Figure 2 – Percentage of people aged 16 years + who are below recommended physical activity level



Source: NI Health and Wellbeing Survey 2005/06

Nutrition

The relationship between what we eat and our health is complex. Studies have shown that the risk of CVD is associated with the total fat, especially saturated fat, in our diets; the amount of salt; and, the consumption of fruit and vegetables. The DASH (Dietary Approaches to Stop Hypertension) diet plus salt reduction has shown some benefit in reducing high blood pressure but the diet appears to have to be followed rigidly¹¹. Emerging evidence supports looking at the diet as a whole and the amount and quality of the different components¹².

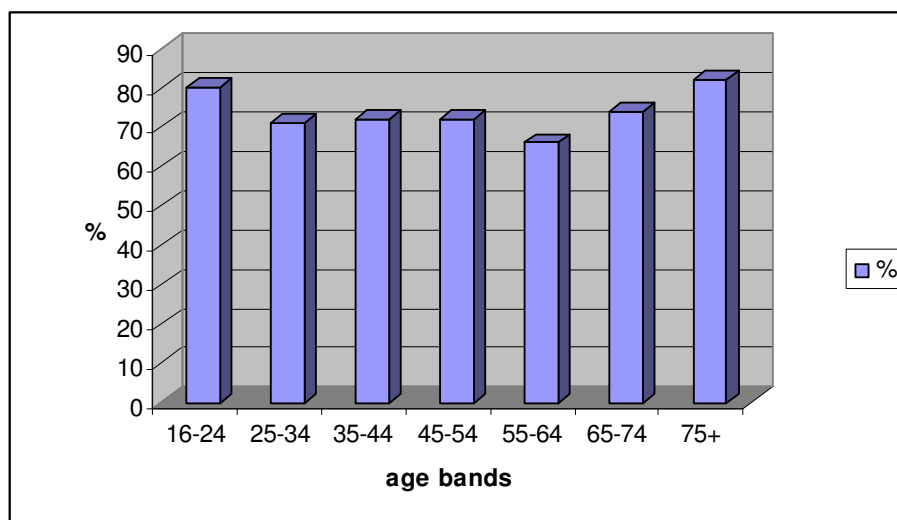
Figure 3 shows that although the Five a Day message for fruit and vegetables is widely publicised here there is still relatively poor compliance with the advice within Northern Ireland.

¹¹ Folsom AR, Parker ED, Harnack LJ. Degree of concordance with DASH Diet guidelines and incidence of hypertension and fatal cardiovascular disease. *AJH* 2007; 20; 225-232. (<http://www.ncbi.nlm.nih.gov/pubmed/17324731>)

¹² McCarron DA, Reusser ME. Reducing cardiovascular disease risk with diet. *Obesity Research* 2001; 9; S335-S340. (<http://www.nature.com/oby/journal/v9/n11s/abs/oby2001139a.html>)

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Figure 3 – Percentage of people aged 16 years + who ate less than 5 portions of fruit or vegetables per day by age



Source: Northern Ireland Health and Wellbeing Survey 2005/06

Overweight / obesity

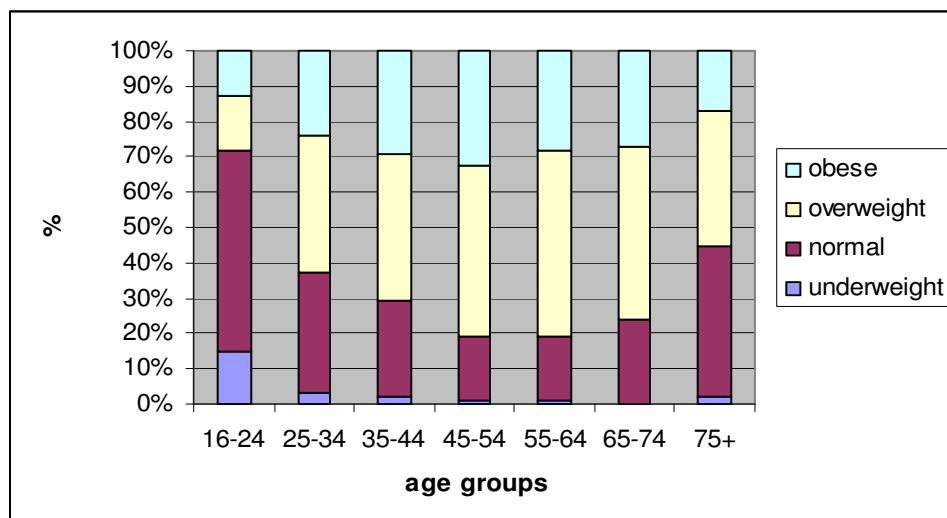
Obesity is a risk factor for CVD, and for other diseases such as diabetes and cancer. It is often associated with other factors such as high blood pressure and raised cholesterol. Obesity is an increasing problem within Northern Ireland. The NIHWBS 2005/6 found that 64% of males and 54% of females were overweight or obese (Figures 4 and 5). The Survey also calculated BMI rates for children (based on age, sex, height and weight). Using the International Obesity Task Force method of calculation, 8% of children were obese and 26% were overweight or obese.

Analysis commissioned by Fit Futures¹³, revealed that, in 1997/98, based on measurements carried out in P1, approximately 4% of children around the age of 5 years were obese and 17% were classified as overweight. In 2004/05 this had increased to 5% classified as obese and 22% overweight, and projections to 2010 estimate 7% will be obese and 27% overweight, if there is no intervention.

¹³ Fit Futures: Focus on Food, Activity and Young People (2007). (<http://www.dhsspsni.gov.uk/fit-futures-implementation-plan.pdf>)

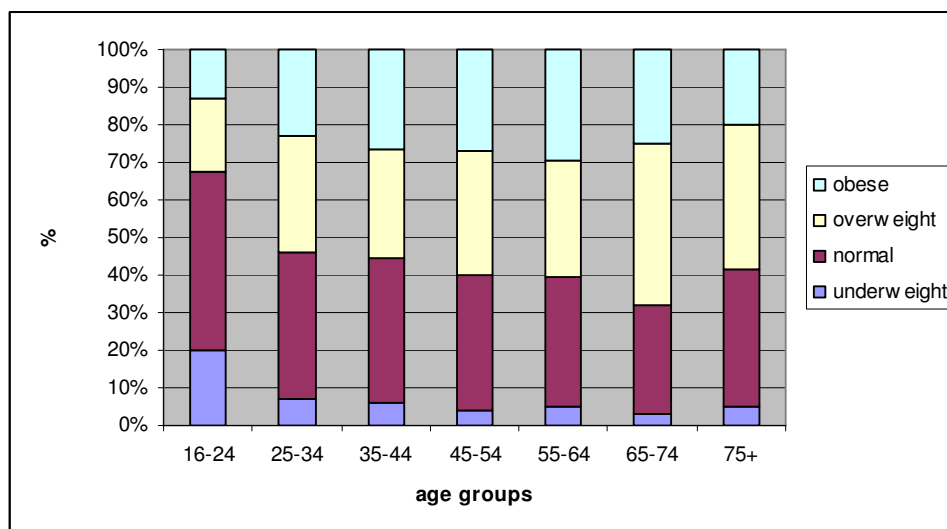
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Figure 4 – BMI for men by age, 2005/06



Source: NI Health and Wellbeing Survey 2005/06

Figure 5 – BMI for women by age, 2005/06



Source: NI Health and Wellbeing Survey 2005/06

Other lifestyle factors such as stress and alcohol also confer risk and require an integrated approach to the prevention of disease and promotion of health.

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Diabetes

Diabetes is a condition associated with too much sugar, or glucose, in the bloodstream. Long term this is detrimental to the blood vessels. It can be caused by a lack of the hormone, insulin, which regulates glucose, and this is called Type 1 Diabetes. It can also result from the body producing too little insulin or the insulin not being effective, referred to as Type 2 Diabetes. People who have diabetes have a two to four times greater risk of developing CVD¹⁴.

The incidence of diabetes is increasing world wide. In Northern Ireland, between 1989 and 2003, there were 1,433 cases of Type 1 diabetes recorded on the Northern Ireland Childhood Diabetes Register (directly age standardised incident rate of 24.7 per 100,000 person-years)¹⁵.

Table 2 below shows estimates of the prevalence of Type 1 and Type 2 diabetes in the adult population of Northern Ireland. These estimates were produced by the Irish Diabetes Population Prevalence Working Group led by Ireland and Northern Ireland's Population Health Observatory (INIsPHO) at the Institute of Public Health in Ireland. The group used the PHO-Brent- SchARR (PBS) Diabetes Population Prevalence Model developed by Yorkshire and Humber Public Health Observatory, Brent NHS Primary Care Trust and the University of Sheffield School of Health and Related Research.

There are also estimates available on the INIsPHO website from the subsequent phase, forecasting population prevalence for 2010 and 2015. In order to provide a range of estimates, they used three different scenarios. More information and data on the scenarios for different levels within NI and Ireland is available at <http://www.inispho.org/phs/indicators>.

¹⁴ Haffner SM, Lehto S, Ronnema T, *et al.* Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. *N Engl J Med* 1998;339:229-34. (<http://content.nejm.org/cgi/content/abstract/339/4/229>)

¹⁵ Cardwell CR, Carson DJ, Patterson CC. Higher incidence of childhood-onset type 1 diabetes mellitus in remote areas: A UK regional small area analysis. *Diabetologia* 2006;49:9;2074. (<http://www.ncbi.nlm.nih.gov/pubmed/16868747>)

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Since 2004, General Practices across Northern Ireland have been collecting morbidity data as part of the Quality and Outcomes Framework (QOF), and this can be used to estimate the prevalence of selected conditions on which information is gathered. The QOF requires the practice to produce a register of patients aged 17 years and over with diabetes mellitus and includes both Type 1 and Type 2 (Table 3). Prevalence is calculated using the number of patients on the register as a proportion of the list of the patients aged 17 years and over.

The two sources (INIsPHO and QOF) indicate that, in 2005, there were around 60,000 adults living with diabetes in Northern Ireland.

Table 2 - Northern Ireland Diabetes Population Prevalence Estimates Type 1 and Type 2 in adults by gender, 2005

		Prevalence	Estimated Numbers in adults
Female	Type 1	0.3	1,992
	Type 2	6.0	38,497
Male	Type 1	0.5	2,784
	Type 2	4.0	23,790
All	Type 1	0.4	4,776
	Type 2	5.1	62,287

Source: Ireland and Northern Ireland's Population Health Observatory (INIsPHO).

Table 3 - Number on General Practice Quality and Outcome Framework Diabetic Registers (age 17 years and over, type I and II)

Year	Northern Ireland	
	Prevalence /1000 pt	No. on Register
2004/05	37.19	51,541
2005/06	39.46	54,950
2006/07	40.35	56,294

Source: Quality and Outcome Frameworks PCAS/DHSSPSNI

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Hypertension

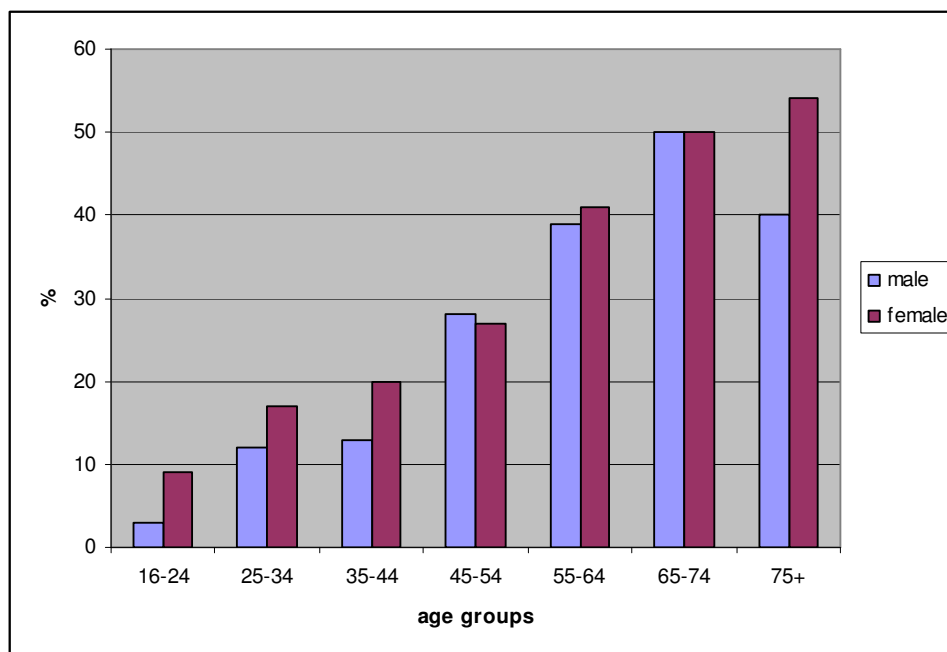
High blood pressure (hypertension) is associated with an increased risk of stroke, coronary heart disease and heart failure. 'High' blood pressure is generally accepted as a systolic pressure of greater than 140mmHg and / or a diastolic pressure of over 90mmHg in people aged 18 years or over. The decision to treat high blood pressure is based on an assessment of risk and includes assessing other risk factors such as diabetes.

The incidence of high blood pressure increases with age as demonstrated in the responses from the NIHWBS for 2005/06 (Figure 6) with 50% of men and women aged 65-74 reporting having high blood pressure. The HALS 2002 (Annex 4) shows clear variation in the prevalence of hypertension with age, and there is only minor variation in the corresponding figures available from HWBS.

A number of risk factors are associated with developing high blood pressure including obesity, alcohol and salt intake. Other disease processes such as renal and endocrine disease can also cause hypertension.

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Figure 6 – Percentage of respondents who reported high blood pressure by age and sex from NIHWBS 2005/06



Source: NI Health and Wellbeing Survey 2005/06

The PRIME study (Prospective Epidemiological Study of Myocardial Infarction) ran between 1991 and 1993 and assessed men aged 50-60 years from 4 centres – three in France and one in Northern Ireland (Belfast); approximately 42.6% of the sample from Belfast had high blood pressure¹⁶.

As part of QOF, General Practices have been gathering information on the number of patients with established hypertension, or a blood pressure of 150/90 mmHg or greater. Table 4 gives the total numbers on the register and the prevalence per 1000 population. For every 1000 patients registered with a GP in 2006/7, nearly 117 had high blood pressure. However, this information is not gathered by age group so we cannot compare directly with the information from HALS and HWBS.

¹⁶ Graille V, Ferrieres J, Evans A, *et al.* Associations between classical cardiovascular risk factors and coronary artery disease in two countries at contrasting risk for myocardial infarction: the PRIME Study. *Int J Cardiology* 2000 (74); 191-198. (<http://www.ncbi.nlm.nih.gov/pubmed/10962121>)

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Table 4 - Number on General Practice Quality and Outcomes Framework Hypertension Registers by year

Year	Northern Ireland	
	Prevalence /1000 pt	No. on Register
2004/05	102.91	184,824
2005/06	111.27	199,956
2006/07	116.51	211,382

Source: Quality and Outcome Frameworks PCAS/DHSSPSNI

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Hyperlipidaemia

There is a clear association between high blood cholesterol and coronary heart disease. Lowering total cholesterol can lead to a reduction in cardiovascular morbidity and mortality.

One of the areas studied was the effect of cholesterol on the risk of heart disease. The European Atherosclerosis Society Guidelines defines hyperlipidaemia (high cholesterol) as present when there is a total cholesterol level greater than 240 mg/dl (6.2 mmol/L) and/or a triglyceride level greater than 200 mg/dl (5.18 mmol/L) and/or the subject is taking a hypolipidaemic drug. Data on 2,342 subjects from Northern Ireland was collected and 1,357 were found to be hyperlipidaemic (prevalence 57.9%)¹⁷.

The World Health Organisation's MONICA Project (monitoring trends and determinants in disease) collected information on the incidence of heart attacks (myocardial infarctions) occurring in 35 different countries during the 1980s and 1990s. This study collected information on levels of cholesterol in the adult population aged 35 to 64 years. In men, 71% had a cholesterol between 5.2 and 7.8, with 6% having a cholesterol greater than 7.8 mmol/L. In women, 63% had a cholesterol level of between 5.2 and 7.8 mmol/L, and 8% were over this¹⁸.

More recently, the HALS 2002 asked people if they had ever been told that they had high cholesterol (Annex 4). Twelve percent of people aged 35 to 54 had been advised that they had high cholesterol. The corresponding figure in those aged 55 to 69 was 21%.

¹⁷ Vidal PM, Arveiler D, Evans A, *et al.* Awareness, treatment and control of hyperlipidaemia in middle-aged men in France and Northern Ireland in 1991-1993: the PRIME study. *Acta Cardiol* 2002; 57(2): 117-123. (<http://cat.inist.fr/?aModele=afficheN&cpsid=13575020>)

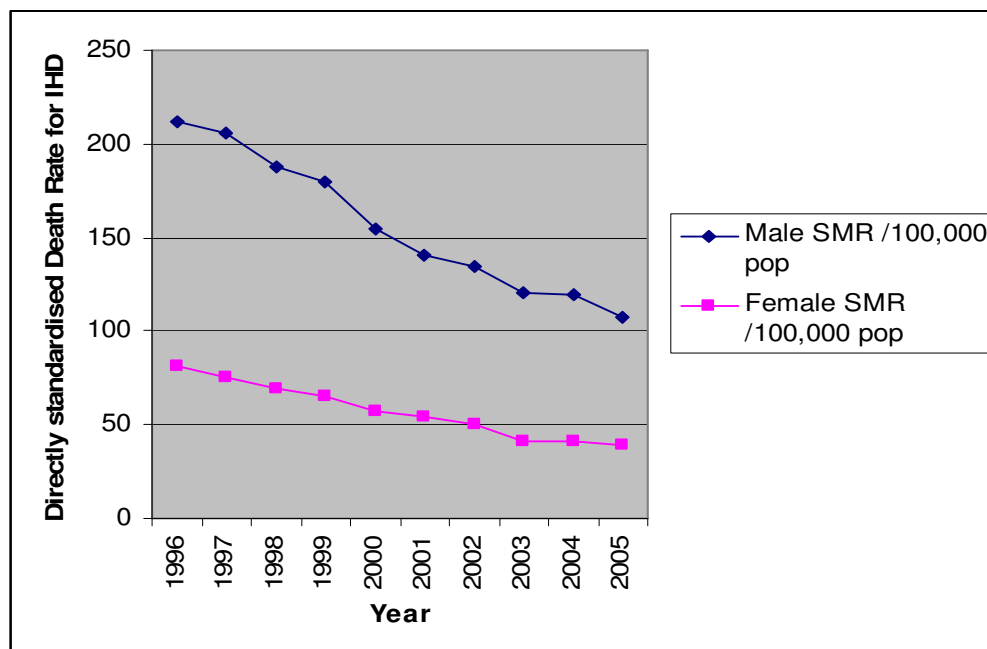
¹⁸ <http://www.heartstats.org/atozpage.asp?id=3142>

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Coronary Heart Disease

Death Rates from CHD have been falling in recent years in Northern Ireland (see below).

Figure 7 – Directly standardised death rate for Ischaemic Heart Disease in Northern Ireland in those aged 15-74 years, per 100,000 population (Annex 2).



Source: Derived from the Register General Northern Ireland (NISRA) Mortality statistics and Home population estimates.

Stable angina is chest pain caused by too little blood flowing into the heart muscle, which is relieved by rest or medication. The Scottish Continuous Morbidity Study¹⁹ estimates the incidence of angina (first ever diagnosis) by age and sex (Figure 8), which gives some indication of the incidence in the Northern Ireland population.

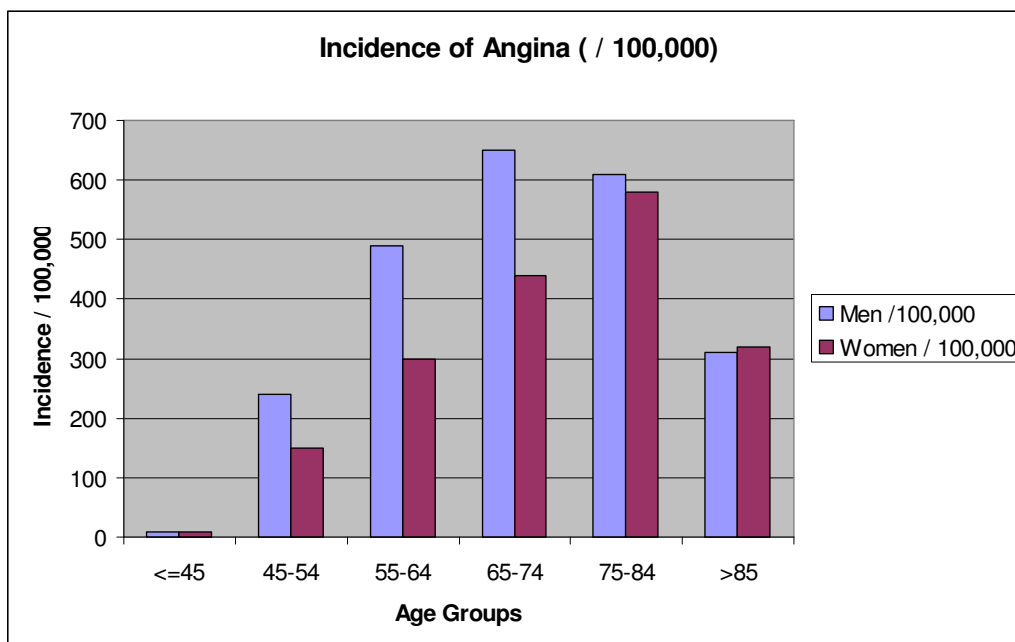
The MONICA Project showed Belfast rates of coronary events (heart attacks) were the second highest after Glasgow, of the 35 countries participating. The incidence of men aged 35-64 was 695/100,000, with a case fatality of 41% within 28 days. Women

¹⁹ Murphy NF, Simpson CR, MacIntyre K, McAlister FA, Chalmers J, McMurray JJV. Prevalence, incidence, primary care burden and medical treatment of angina in Scotland: age, sex and socioeconomic disparities: a population-based study. *Heart* 92:1047-1054. (<http://heart.bmj.com/cgi/content/abstract/92/8/1047>)

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had an incidence of 188/100,000, and a fatality rate of 41.5% within 28 days.

Figure 8 – Incidence of Angina (first ever diagnosis) from Scottish Continuous Morbidity Study, 2001/02 by age and sex.



Heart failure occurs whenever the heart is unable to maintain a high enough output to meet the demands of the body. Whilst there are many causes, CHD is one of the most common. A study in Hillingdon, England, estimated the total incidence of heart failure to be 1.3 / 1,000 population²⁰. The MONICA project estimated the prevalence of heart failure in the Glasgow cohort as 2.5% in men aged 55 to 64 years and 3.2% in those aged 65 to 74 years. The equivalent figures for women were 2.0% and 3.6%.

QOF requires practices to maintain registers of patients with coronary heart disease (Table 5) and since 2006/7, on those with heart failure and atrial fibrillation (Table 6). Annex 2 provides information on mortality data related to heart failure. Although it is suspected that the incidence of heart failure is increasing, particularly in the elderly population, this isn't reflected in the mortality data because of the way it is coded on ICD.

²⁰ Cowie MR, Wood DA, Coats AJS, Poole-Wilson PA, Suresh V, Sutton GC. Incidence and aetiology of heart failure. A population-based study. *European Heart Journal* 1999. 20 (6); 421-428 (<http://eurheartj.oxfordjournals.org/cgi/content/abstract/20/6/421>)

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Table 5 - Number on General Practice Quality and Outcomes Framework Coronary Heart Disease Registers by year

Year	Northern Ireland	
	Prevalence /1000 pt	No. on Register
2004/05	41.71	74,921
2005/06	42.29	75,988
2006/07	41.96	76,126

Source: Quality and Outcome Frameworks PCAS/DHSSPSNI

Table 6 - Number on General Practice Quality and Outcomes Framework Heart Failure and Atrial Fibrillation Registers

Disease Area 2006/07	NI	
	Prevalence /1000 pt	No. on Register
Heart Failure 1*	8.18	14,847
Heart Failure (LVD)**	3.92	7,116
AF	12.52	22,722

Source: Quality and Outcome Frameworks PCAS/DHSSPSNI

*the practice can produce a register of patients with heart failure

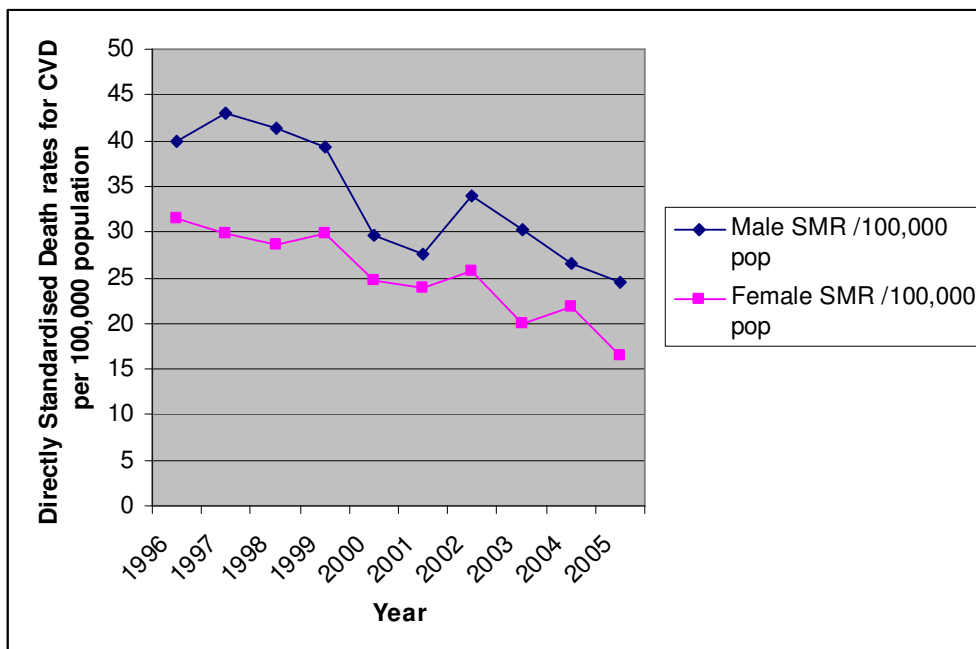
**Heart Failure (due to Left Ventricular Dysfunction) – the percentage of pts with a current diagnosis of heart failure due to LVD are currently treated with an ACE inhibitor Angiotensin Receptor Blocker, who can tolerate therapy and for whom there is no contraindication

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Cerebrovascular Disease

A stroke is a localised neurological deficit with a vascular cause, lasting longer than 24 hours. It is usually due to either a blockage of the blood vessels to the brain, or by a bleed into the brain. The risk factors already described for CHD are associated with an increased risk of stroke. A transient ischaemic attack (TIA) causes similar symptoms as a stroke, but lasts less than 24 hours. This is a strong indicator of the risk of a more serious stroke.

Figure 9 - Directly standardised death rate for Stroke in Northern Ireland in those aged 15-74 years, per 100,000 population (Annex 2).



Source: Derived from the Register General Northern Ireland (NISRA) Mortality statistics and Home population estimates.

Figure 9 indicates that deaths from stroke are decreasing in Northern Ireland. There are some concerns that the real numbers of deaths from strokes are not being recognised, but this downward trend is also occurring in other regions. Despite the decreasing number of deaths from stroke, statistics for England

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show that the case fatality rate from a stroke has remained constant over the period 1992 – 2002, at around 24%²¹.

Annexes 4 and 5 show the response from Northern Ireland surveys to the questions about whether respondents have ever been advised that they have had a stroke. The graphs show a clear association between stroke and increasing age and a higher risk among men. In General Practice, under the QOF, registers are kept of the patients with stroke or TIA (Table 7), which allows a calculation of the prevalence (per 1000 patients) on the registers.

Table 7 - Number on General Practice Quality and Outcomes Framework Stroke Registers by year

Year	Northern Ireland	
	Prevalence /1000 pt	No. on Register
2004/05	14.14	25,402
2005/06	15.66	28,142
2006/07	16.19	29,376

Source: Quality and Outcome Frameworks PCAS/DHSSPSNI

Peripheral Vascular Disease

Atheroma development can also affect the blood vessels in the rest of the body – resulting in peripheral vascular disease (PVD). The risk factors for PVD are those already considered. Addressing the risk factors is essential to prevent the development of PVD, or minimise harm if it has already developed.

Intermittent claudication is a pain in the calf which develops on walking and is relieved by rest. In most cases it is caused by atherosclerosis narrowing the blood vessels which supply blood to the legs. A number of surveys in the 1980s and 1990s assessed PVD, and found similar results. Under the age of 55 years, intermittent claudication is rare, but the prevalence increases

²¹ Report by the Comptroller and Auditor General. Reducing Brain Damage: Faster Access to better stroke care. National Audit Office. Department of Health. HC452 Session 2005-2006. (<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmpublic/911/911.pdf>)

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steeply to around 5% of those over 55 years²². There is also an association with socio-economic group. The prevalence was found to be 3.6% in Class I and 5.9% in Classes IV & V²³.

Critical Limb Ischemia is a severe obstruction of the arteries which seriously decreases blood flow to the extremities (hands, feet and legs) causing severe pain (at rest) and even skin ulcers or sores. The incidence has been estimated at 500 – 1000 per million population per year.

The aorta is the major blood vessel bringing blood from the heart to the body. If there is a progressive weakening of the wall of the aorta, it begins to 'balloon'. This is called an aneurysm. It will grow larger and eventually rupture (usually fatal) if it is not diagnosed and treated. The prevalence of symptomless abdominal aortic aneurysm (AAA) is unknown, but ultrasound screening surveys have estimated that about 5% of men aged 65 to 74 years have an aneurysm 3 cm or greater. The prevalence in women is much lower (M:F 3:1). A study in Swansea estimated the annual incidence of rupture of AAA to be 17 per 100,000 population. Of these 60% die outside the hospital, and of those that make it to hospital, over half died during admission.

Renal Disease

The kidneys are responsible for 'filtering' blood to remove waste products and water from the body. In chronic kidney disease (CKD), the kidneys gradually stop functioning efficiently. Using the Glomerular Filtration Rate (GFR) as a measure of how the kidneys are performing, CKD is classified from stage 1 to 5 (Table 8). CKD usually refers to stages 3 to 5.

²² Fowkes G. Peripheral vascular disease. In Stevens A, Raftery J, Mont J, Simpson S (eds). *Health Care Needs Assessment: The Epidemiologically Based Needs Assessment Reviews: Third Series 2006*. Radcliffe Publishing Ltd 679-733.

²³ Fowkes FGR, Housley E, Cawood EHH, Macintyre CCA, Ruckley CV, Prescott RJ. Edinburgh Artery Study: Prevalence of asymptomatic and symptomatic peripheral arterial disease in the general population. *Int J Epidemiol* 1991;20:384-92.

(<http://ije.oxfordjournals.org/cgi/content/abstract/20/2/384>)

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Table 8 - Classification of Chronic Kidney Disease by US K/DOQI group²⁴

Stage	Description
1	Normal: GFR >90mL/min/1.73m ² with other evidence of chronic kidney damage
2	Mild impairment: GFR 60-89 mL/min/1.73m ² with other evidence of chronic kidney damage
3	Moderate impairment: GFR 30-59 mL/min/1.73m ²
4	Severe impairment: GFR 15-29 mL/min/1.73m ²
5	Established renal failure GFR < mL/min/1.73m ² or on dialysis

The crude prevalence rate of laboratory detected CKD (stage 3-5) in Northern Ireland has been estimated at 3.69%²⁵ in 2001/2. In general practice in 2006/7 for the first time under QOF, the practices have been asked to produce a register of patients aged 18 years and over, with CKD (Stage 3 to 5 CKD). Table 9 shows the total number on the register and the prevalence. This is a new register and the results must be viewed with caution until validated.

Table 9 - Number on General Practice Quality and Outcomes Framework Chronic Kidney Disease Register for 2006/07

Year	Northern Ireland	
	Prevalence /1000 pt	No. on Register
2006/07	30.24	41,852

Source: Quality and Outcome Frameworks PCAS/DHSSPSNI

²⁴ National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification and stratification. *Am J Kidney Disease* 2002;39 (Suppl 2): S1-246. (http://www.kidney.org/professionals/kdoqi/guidelines_ckd/toc.htm)

²⁵ Quinn MP, Rainey A, Cairns KJ, Marshall AH, Savage G, Kee F, Maxwell AP, Reaney E, Fogarty DG. The practical implications of using standardized estimation equations in calculating the prevalence of chronic kidney disease. *Nephrol Dial Transplant* 2007. (<http://ndt.oxfordjournals.org/cgi/content/abstract/gfm599v1>)

SERVICE FRAMEWORK FOR CARDIOVASCULAR HEALTH AND WELL BEING

Congenital Heart Disease

Congenital Heart Disease (CoHD) describes the spectrum of malfunctions of the heart and great blood vessels present at birth, ranging in severity from uncomplicated defects to complex abnormalities with potentially serious consequences²⁶. It is the most commonly occurring major congenital abnormality, with a prevalence of approximately 0.8 per 1000 live births. Assuming stable birth prevalence rates (number of new cases of CoHD per 1000 births per year) and rising birth rates, the overall incidence of CoHD is set to rise slightly over the coming years. In 2005, it was estimated that 179 children were born with CoHD²⁷.

Over the past 30 years improvements in medical and surgical treatments have transformed the outcome for affected children. It is estimated that 90% of children born with major cardiac defects now survive into adulthood. The prevalence of CoHD will continue to rise as treatments become more successful and population growth due to inward migration continues. Based on figures from the year 2000, an increase of between 15% and 25% in the number of adults with CoHD has been predicted for year 2010 (using the modelling adopted by the Department of Health in England and the British Cardiac Society Working Party on Grown Up Congenital Heart Disease²⁸).

Complex disease makes up approximately one third of all CoHD, and the number of affected adults is estimated to increase by 50%. Patients are normally considered for transfer from Paediatric Cardiology clinics to Adult Congenital Heart disease (ACHD) clinics between the ages of 14 and 17 years. In Northern Ireland the number of patients attending ACHD clinics is currently increasing by approximately 80 -100 patients per year (personal communication) with an increasing trend.

²⁶ MacMahon B, McKeown T, Record RG. The incidence and life expectation of children with congenital heart disease. *Heart* 1953;15:121-129.

(<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=479477>)

²⁷ Northern Ireland Statistics and Research Authority <http://www.dhsspsni.gov.uk/births2005.pdf> accessed 13/09/2007

²⁸ Armstrong B. Adults with Congenital Heart Disease: Multiple needs of a fast growing cardiac patient group within Northern Ireland. Cardiovascular Thoracic Division Business Proposal, Royal Victoria Hospital, Belfast, 2006.

SERVICE FRAMEWORK FOR CARDIOVASCULAR HEALTH AND WELL BEING

Annex 1

Rates of deaths due to cardiovascular disease by social class (NS-SeC) to persons aged 16-74 across Northern Ireland during 2005

Rates of deaths due to cardiovascular disease by social class (NS-SeC) to persons aged 16-74 across Northern Ireland during 2005

NS-SeC	No. of deaths	Population (16-74) from 2001 Census	Crude rate per 1,000 pop.	SDR per 100,000 population	
				Male	Female
Higher managerial	62	69,973	0.9	8.73	1.81
Lower managerial	111	229,609	0.5	13.35	5.43
Intermediate	103	131,679	0.8	10.95	6.42
Small employers	140	103,648	1.4	22.42	1.48
Lower supervisory	171	104,088	1.6	22.93	6.09
Semi-routine	267	183,131	1.5	32.34	12.85
Routine	301	193,187	1.6	37.31	13.67
Never worked & long term unemployed	37	77,975	0.5	3.08	3.13
Not classified	138	93,789	1.5	3.08	19.76
Total	1,330	1,187,079	1.1	154.19	70.65

Source: Derived from Registrar General Northern Ireland (NISRA) Mortality Statistics and Home Population Estimates

CVD: ICD codes – I10-I15, I20-I25, I50, I60-I69, I70-I79.

NB from 2005, housewives who had previously been categorised by their husbands' social class were coded into not classified

SERVICE FRAMEWORK FOR CARDIOVASCULAR HEALTH AND WELL BEING

Annex 2

Directly standardised death rate in Northern Ireland since 1996 for selected causes in those aged 15 - 74 years, per 100,000 population.

MALES

Cause	ICD09 Codes	ICD10 Code	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ischaemic heart disease	410-414	<i>I20 - I25</i>	211.7	205.6	188.0	179.7	154.5	140.9	134.1	120.6	119.9	107.9
Heart failure	428	<i>I50</i>	6.2	7.1	6.1	8.1	4.9	6.5	7.0	4.8	3.1	3.8
Stroke (CVD)	430-438	<i>I60 - I69</i>	39.9	43.0	41.3	39.4	29.6	27.5	34.0	30.2	26.5	24.5
Diabetes	250	<i>E10 - E14</i>	2.2	4.6	2.7	4.9	5.4	4.1	9.4	9.1	8.6	6.3
Hypertensive disease	401-405	<i>I10 - I15</i>	3.2	2.9	3.3	3.1	2.4	1.9	1.8	2.8	3.4	2.2
Peripheral vascular	440-448	<i>I70 - I79</i>	10.9	11.9	11.6	7.7	11.7	10.8	11.1	10.3	8.4	8.9
Renal disease	580-589	<i>N00-N19</i>	4.0	3.4	3.7	2.9	3.8	3.4	4.7	2.5	2.8	3.5
<i>All causes</i>	<i>001-E999</i>	<i>A00-Y98</i>	<i>689.6</i>	<i>675.5</i>	<i>655.0</i>	<i>644.6</i>	<i>599.5</i>	<i>575.2</i>	<i>578.4</i>	<i>543.2</i>	<i>539.6</i>	<i>526.8</i>

FEMALES

Cause	ICD09 Codes	ICD10 Code	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ischaemic heart disease	410-414	<i>I20 - I25</i>	81.8	74.9	68.8	65.0	57.3	54.3	49.8	40.7	41.2	38.8
Heart failure	428	<i>I50</i>	5.5	5.2	5.1	5.2	5.0	4.5	3.8	3.8	2.6	2.6

SERVICE FRAMEWORK FOR CARDIOVASCULAR HEALTH AND WELL BEING

Stroke (CVD)	430-438	<i>I60 - I69</i>	31.4	29.9	28.7	29.8	24.6	23.9	25.7	19.9	21.8	16.5
Diabetes	250	<i>E10 - E14</i>	2.4	2.7	2.3	2.2	1.5	3.8	5.0	4.2	3.9	4.6
Hypertensive disease	401-405	<i>I10 - I15</i>	2.2	2.7	1.7	1.1	1.4	1.8	1.2	2.0	1.0	2.2
Peripheral vascular	440-448	<i>I70 - I79</i>	5.0	5.1	6.2	3.4	4.0	3.0	3.1	2.7	4.9	2.9
Renal disease	580-589	<i>N00-N19</i>	2.7	3.1	2.1	2.9	1.6	2.9	3.5	3.1	2.7	2.1
<i>All causes</i>	<i>001-E999</i>	<i>A00-Y98</i>	<i>405.7</i>	<i>381.7</i>	<i>371.6</i>	<i>374.0</i>	<i>370.0</i>	<i>346.3</i>	<i>343.6</i>	<i>328.9</i>	<i>328.4</i>	<i>306.2</i>

Source: Derived from the Registrar General Northern Ireland (NISRA) Mortality statistics and Home population estimates. All rates are standardised to the revised 2001 Home mid year estimate.

SERVICE FRAMEWORK FOR CARDIOVASCULAR HEALTH AND WELL BEING

Annex 3

Energy and Nutrient Intake by Country (average April 2003 to March 2006) from Expenditure and Food Survey 2005/06

	England	Wales	Scotland	NI
No. of households	16,199	1,050	1706	1,676
Energy (Kcal/day)	2357	2413	2355	2393
Total protein (g)	81.3	83.3	80.2	82.0
Fat (g)	97	99	96	98
<i>% of macronutrients</i>	<i>38.2%</i>	<i>38.2%</i>	<i>38.1%</i>	<i>37.8%</i>
Saturated fats (g)	37.1	38.2	37.9	38.3
<i>% of macronutrients</i>	<i>14.7%</i>	<i>14.7%</i>	<i>15.0%</i>	<i>14.8%</i>
Carbohydrate (g)	289	295	291	300
Total sugars (g)	135	142	137	132
Non-milk extrinsic sugars (g)	89	96	93	88
Sodium (g)	3.07	3.19	3.22	3.19
<i>Sodium (as a % of weighted reference nutrient intake)</i>	<i>197%</i>	<i>197%</i>	<i>203%</i>	<i>217%</i>
* excludes sodium from table salt				

Source: Office for National Statistics. Expenditure and Food Survey 2005/06

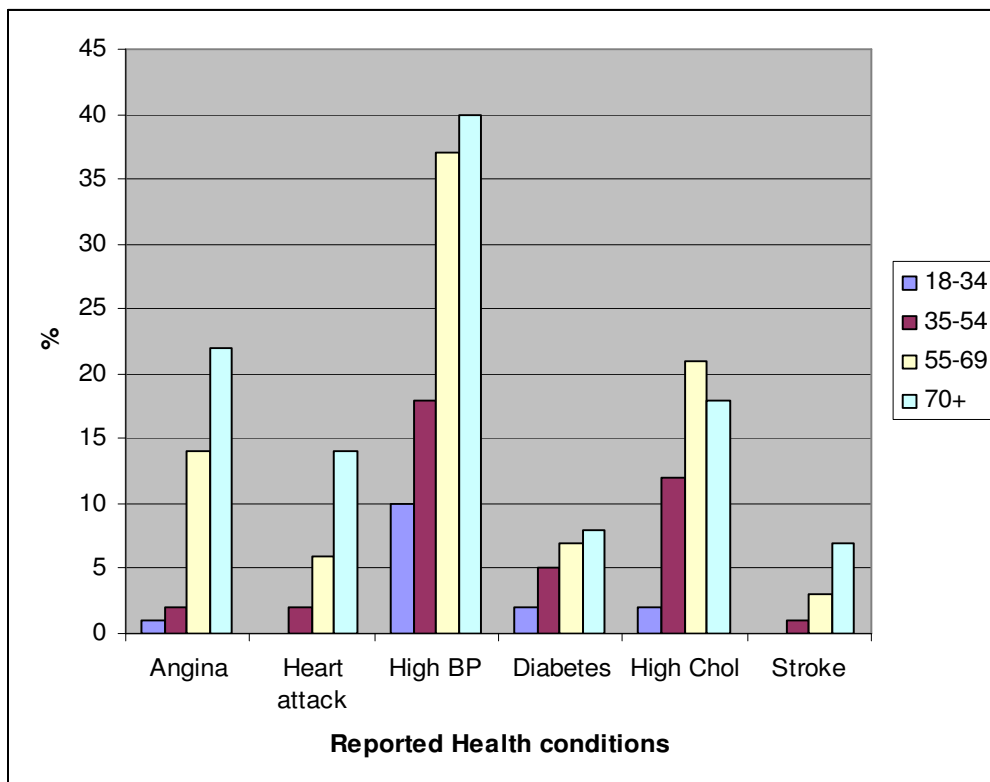
SERVICE FRAMEWORK FOR CARDIOVASCULAR HEALTH AND WELL BEING

Annex 4

Northern Ireland Health and Lifestyle Survey 2002

Designed to yield a representative sample of men and women aged 18years + living in Northern Ireland. The 2002 Register of Electors was used as the sampling frame and 6,500 adults were randomly sampled from it. The questionnaire was a postal survey with telephone follow-ups. There was a 39.5% response rate (2,500 returns).

Reported Health condition by age from Health and Lifestyle Survey (HALS) 2002



Age Groups	Angina	Heart attack	High BP	Diabetes	High Chol	Stroke
18-34	1	0	10	2	2	0
35-54	2	2	18	5	12	1
55-69	14	6	37	7	21	3
70+	22	14	40	8	18	7

Source: Health Promotion Agency for Northern Ireland

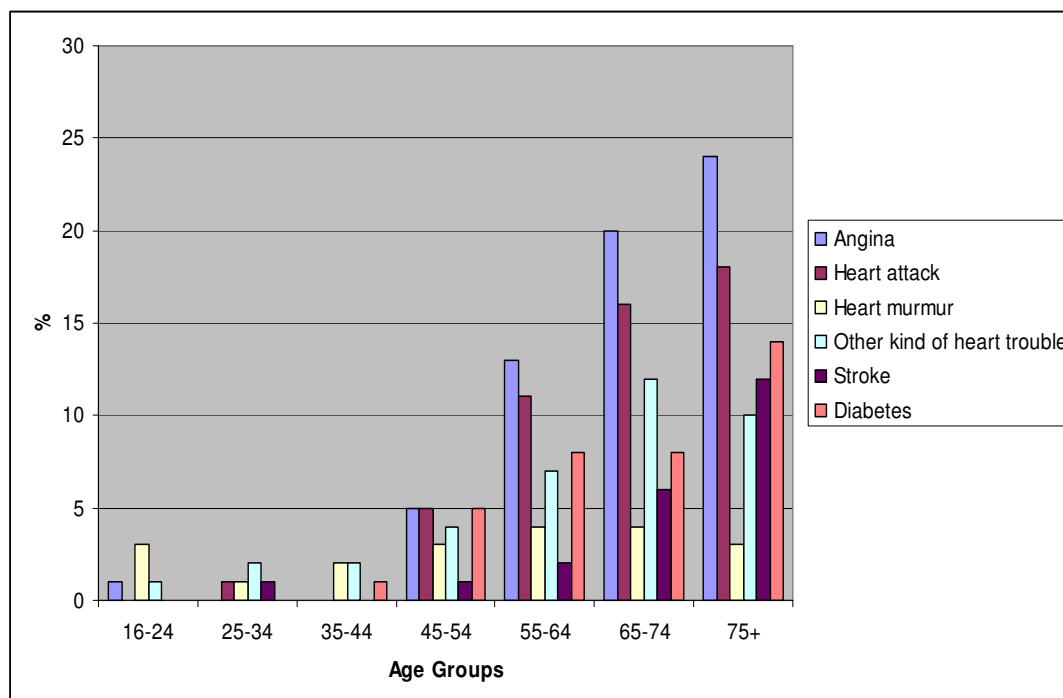
SERVICE FRAMEWORK FOR CARDIOVASCULAR HEALTH AND WELL BEING

Annex 5

Northern Ireland Health and Wellbeing Survey

The Health and Social Wellbeing Surveys in 2005/06 and 2001/02 were based on a systematic random sample of 5,000 addresses drawn from the Land and Property Services Agency's property database. The LPSA addresses were sorted by district council and ward, so the sample was effectively stratified geographically. Fieldwork for the 2005/06 survey was spread over a one year period from February 2005 to March 2006. Interviews were sought of all adult members (those aged 16 and over) of eligible addresses to yield a representative sample across Northern Ireland.

Ever been told by a doctor that you have a condition by age for men from the NIHWBS 2005/06



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Ever been told by a doctor that you have a condition by age for women from the NIHWBS 2005/06

Source: NI Health and Wellbeing Survey 2005/06

