Public Submission Cover Sheet

Please complete this sheet and submit with any attachments to the Sustainable Health Review Secretariat

Your Personal Details	
This information will be used only for contacting you in relation to this submission	
Title	Mr ☒ Miss ☐ Mrs ☐ Ms ☐ Dr ☐ Other ☐
Organisation	National Heart Foundation of Australia (WA Division)
First Name(s)	Maurice
Surname	Swanson
Contact Details	▆▆▆▆▆▆▆

Publication of Submissions
Please note all Public Submissions will be published unless otherwise selected below
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Submission Guidance

You are encouraged to address the following question:

In the context of the Sustainable Health Review Terms of Reference listed below, what is needed to develop a more sustainable, patient centred health system in WA?

- Leveraging existing investment in Primary, Secondary and Tertiary healthcare, as well as new initiatives to improve patient centred service delivery, pathways and transition;

- The mix of services provided across the system, including gaps in service provision, sub-acute, step-down, community and other out-of-hospital services across WA to deliver care in the most appropriate setting and to maximise health outcomes and value to the public;

- Ways to encourage and drive digital innovation, the use of new technology, research and data to support patient centred care and improved performance;

- Opportunities to drive partnerships across sectors and all levels of government to reduce duplication and to deliver integrated and coordinated care;

- Ways to drive improvements in safety and quality for patients, value and financial sustainability, including cost drivers, allocative and technical efficiencies;

- The key enablers of new efficiencies and change, including, research, productivity, teaching and training, culture, leadership development, procurement and improved performance monitoring;

- Any further opportunities concerning patient centred service delivery and the sustainability of the WA health system.

Submissions Response Field

Please type your response into the field below. Alternatively you may provide your submissions as a separate attachment (Suggested Maximum 5 pages).

Dear Sustainable Health Review Panel,

Thank you for the opportunity to provide a submission to the Sustainable Health Review commissioned by the WA Government and the WA Minister for Health, The Hon Roger Cook MLA.

Please find attached the WA Heart Foundation's submission, *Prevention First, Cardiovascular Disease in WA.*

This submission provides a comprehensive description of cardiovascular disease, epidemiology and risk factors in Western Australia, together with evidence-based recommendations for intervention to reduce the impact of cardiovascular disease on the WA Health System.

While the essence of this submission focusses on cardiovascular disease as a major contributor to chronic disease in Western Australia, a similar approach could be applied to other chronic diseases that have been estimated to cause 45 per cent of hospital admissions in WA.

As you will be aware, a range of public health and prevention programs have been outstandingly successful in Western Australia and Australia more generally. For example, immunisation programs have substantially reduced the impact of infectious diseases, road safety campaigns and regulations have significantly reduced the road toll, comprehensive campaigns and legislation to reduce smoking have now reduced the prevalence of smoking among adults in WA to less than 10 per cent, and five per cent for 12-17-year-olds.

Since the late 1960s, the risk of dying from cardiovascular disease in Australia has been reduced by a staggering 82 per cent.[1] This has resulted from a range of prevention initiatives and treatment interventions.

Alarmingly, in the past ten years, governments in Australia, including the West Australian Government, have reduced significantly their investment in public health and prevention.[2]

Australia now spends $89 per person a year on prevention or 1.34 per cent of total spending on health (this estimate includes expenditure on the more traditional regulatory and screening aspects of public health and therefore underestimates the allocation to dedicated prevention programs and campaigns).

This is considerably less than is spent in Britain, Canada and New Zealand.

Unfortunately, Premiers and Health Ministers never receive a phone call or letter from a constituent thanking them for the heart attack that they did not have.

Yours sincerely

Maurice Swanson

P.S. An updated edition of *Prevention First* will be provided shortly and will include more comprehensive information for return on investment for public health and prevention activities.

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[1] Australian Institute of Health and Welfare, Bulletin 141, September 2017, Trends in cardiovascular deaths

[2] Jackson H, Shiell A. (2017) *Preventive Health: How much does Australia spend and is it enough?* Canberra: Foundation for Alcohol Research and Education.

Prevention First

Cardiovascular disease in WA:

- Magnitude
- Risk factors
- Opportunities for prevention
- Heart Foundation 'best buys'.

"These statistics are alarming – but we know how to drive them down. Treating non-communicable diseases can be affordable. But preventing them can cost next to nothing, and even save money"

(Ban Ki-moon, Secretary General, United Nations, UN General Assembly, Sep., 2011)

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1.0   About this report

The target audience for *Prevention First* is Heart Foundation decision makers and the Foundation's wider stakeholders in health and related agencies.

The report's objectives are to:
- Describe the overwhelming burden of cardiovascular disease in Western Australia and its effects on the health system, economy and community
- Describe the common risk factors that explain cardiovascular disease risk in Western Australia and outline their prevalence and trends in Western Australia
- Outline the evidence to support the 'best buys' for cardiovascular disease prevention in Western Australia
- Inform decision making about which preventive interventions should form part of the niche role of the Heart Foundation as West Australia's premier agency in cardiovascular disease prevention.

Prevention is defined across the three domains of primary prevention, secondary prevention and tertiary prevention. These terms describe a continuum from the well population through to those with established disease.

Each of these domains of prevention are further elaborated by **interventions which when applied at scale, and in a comprehensive manner, will reduce the impact of cardiovascular disease across the population or in a specific sub-population**. Interventions include measures targeted at individuals, professionals, communities, living and working conditions and polices and systems.

Our most common chronic diseases account for around 90% of all deaths and an overwhelming majority of the burden of disease and suffering endured by West Australians. Cardiovascular disease, principally heart attack and stroke, is the largest cause of premature death in Australia and much of it is preventable. Heart disease is the single leading cause of death in Western Australia. One in seven West Australians die from heart disease – that's five West Australians every day.

Much of the burden of heart disease is caused by the presence and contribution of common modifiable risk factors – and therefore is preventable. Any soundly based heart disease prevention strategy must address these risk factors, their determinants and their impact on society.

Globally, around **90% of heart attacks** can be attributed to smoking, hypertension, abnormal blood

lipids, diabetes, obesity, and physical inactivity, dietary and psychological factors. This evidence provides compelling direction in regard to what should be the key issues to be addressed in a cardiovascular disease prevention strategy.

This report reflects an overwhelming global consensus around the importance of prevention in addressing heart disease and other chronic diseases. It also supports a global consensus on the most effective strategies to reduce the impact of heart disease and other chronic diseases.

Reducing the impact of cardiovascular disease in the West Australian population will require a broad range of interventions by a large number of actors. There are fewer resources for prevention in the current fiscal and political environment so **the Heart Foundation needs to be prudent in its selection of the primary interventions in which it wishes to invest** – areas that will have the greatest impact and be effective in reducing the impact of cardiovascular disease. Optimal prevention will also require the mobilisation of partnerships, both within and outside the health sector to amplify the Heart Foundation's voice, and effectiveness in preventing cardiovascular disease.

Based on a distillation of the evidence of effectiveness regarding 'best buys' for cardiovascular disease prevention this report further narrows its focus to **the distinct priorities for investment by the Heart Foundation WA to prevent cardiovascular disease,** being mindful of the distinct role and most appropriate contribution by the Heart Foundation.

Figure 1. Cardiovascular disease (CVD) – key statistics for WA

Heart Foundation®

Cardiovascular disease (CVD) – key statistics for WA

Who has CVD?

1 in 5

Around one in five WA (19.4%)[1] and Australian (22%)[2] adults reported ever being diagnosed with heart disease or stroke or currently had high blood pressure.

Regional v Major Cities

25-27%   20%

Higher proportion of people with CVD in regional and remote areas (25-27%) compared to major cities (20%).

Disadvantage

26%   17%

Higher proportion of people with CVD in highest disadvantage (26%) compared to lowest disadvantage (17%).

Who is hospitalised?

10%

10% of all WA hospitalisations are for CVD

1.1 million

Nationally, CVD = 11% of all hospitalisations in 2013-2014 as either the principal and/or additional diagnosis.[6]

2 times higher

CVD hospitalisation rates for Aboriginal Australians is twice as high as other Australians.[2]

Who dies from CVD?

30%

CVD was the underlying cause of 30% of deaths in WA (2007-2011)[4] and nationally during 2012.[5]

1.6 times higher

CVD death rates in the lowest socio-economic group compared with the highest group.[6]

Twice as likely
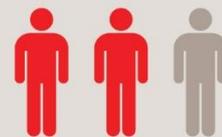
In WA, Aboriginal Australians are twice as likely to die after a heart attack than other Australians.[6]

1 in 3
PBS subsidised medicines are for CVD.[8]

80%
of premature CVD is preventable.[9]

2.0 Cardiovascular disease (CVD) in Australian and Western Australia – key statistics

Cardiovascular disease (CVD) refers to all conditions and diseases of the heart and blood vessels. In Australia the main CVDs are coronary heart disease (CHD)[1], stroke[2] and heart failure/cardiomyopathy.[1] Cardiovascular disease is the global number one killer (WHO Action plan 2013-20[2]).

The prevalence of cardiovascular disease in Western Australia is estimated from the Health and Wellbeing Surveillance System (HWSS) conducted by the WA Department of Health.[3] In 2013, almost one in five (19.4%) adults reported in the HWSS to have ever been diagnosed with heart disease or stroke or currently had high blood pressure.[3] Nationally in 2012, 3.7 million Australians (22%) adults reported they were living with one or more cardiovascular diseases.[4]

Western Australia is a national leader of CVD research using linked data.[3] Studies of linked hospital data from WA showed an overall declining incidence of hospitalised acute coronary syndromes (ACS)[4] and heart attacks between 1996 and 2010. The overall trend is consistent with successful primary prevention in recent decades, but as noted by the researchers, increases in the prevalence of CVD risk factors such as diabetes and obesity may explain the higher incidence observed among some age and gender groups such as women 35-54 years.[5, 6]

1.1 What is the burden of CVD?

In Australia, CVDs are major contributors to the **burden of disease**. The total disease burden is commonly described in **disability-adjusted life years (DALYs),** a measure of years of full health lost due to illness or injury from death and disability. **DALYs** are calculated as the sum of **years of life lost (YLL)** due to premature mortality and **years of healthy life lost (YLD)** due to disability.[7]

$$DALYs = YLL + YLD$$

In Australia, CVD accounted for 14% of the total burden of disease (DALYs) and 26% of the mortality

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[1] CHD – also called ischaemic heart disease (IHD)
[2] Stroke – also called cerebrovascular disease (CeVD)
[3] Linked data - information from public and private hospitalisations, and registered deaths
[4] Acute coronary syndrome (ACS) is a presentation to hospital with acute CHD

burden (YLL) in 2010.[8] While there is not a recent equivalent statistic for Australia, the most current (2013) global **burden of disease** evidence indicates that **behavioural, environmental, occupational and biomedical risk factors** account for **87.9%** of cardiovascular DALYs.[9]

2.1 Mortality

Deaths (all ages) from both CVD generally, and CHD specifically, have decreased significantly since the 1960s and continue to decrease (Figure 1).[8] Despite this, CVD was the underlying cause of 30% of mortality in WA during 2007-2011[10] and 30% of Australian deaths (all ages) in 2012,[11] with CHD being the leading cause of death. In WA, CHD accounted for 15% of deaths during the period 2007-2011. Of the CHD deaths during this period 55.5% were male.[10]

When we look at premature death (0-74 years of age), in Western Australia, CVD accounted for 19% of deaths during 2007-2011.[10] Premature heart disease deaths are three to four times higher among men than women, however, after age 75 the difference is reduced.[12]
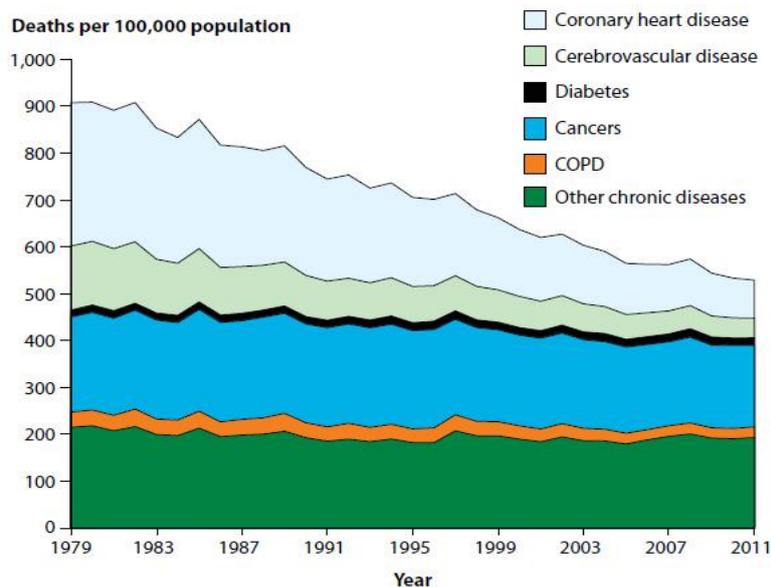

Figure 2 Changes in death rates for chronic diseases, 1979-2011[8] Source: AIHW National Mortality Database

2.2 Hospitalisations

CVD is a major cause of **morbidity** in Australia. While there has been a decrease in hospital admission for ACS or heart attacks in WA up to 2010,[5] there has been a significant recent increase in

CHD admissions during the 5 year period from 2008 to 2012 for both males and females (Figure 2),[10] which may be partly due to an increase in CHD treatment options for patient safety requiring admission and transfers to tertiary hospitals (Tom Briffa – personal communication). Of these CHD hospitalisations 66.9% were male.

Overall, in WA, **CVD either as the principal or additional diagnosis still accounted for 10% of hospitalisations** during 2008-2012.[10] This is consistent with AIHW national reporting where 11% of all hospitalisations in 2013-2014 were for CVD as either the principal or additional diagnosis.[13]

2.3 The cost of cardiovascular disease

CVD also incurs the most expenditure of all diseases – this includes hospitalisations, out of hospital medical expenses and pharmaceuticals as shown in Figure 3.[8] [14] One third of **medicines** subsidised by the Pharmaceutical Benefit Scheme (PBS) are for the cardiovascular system.[8]
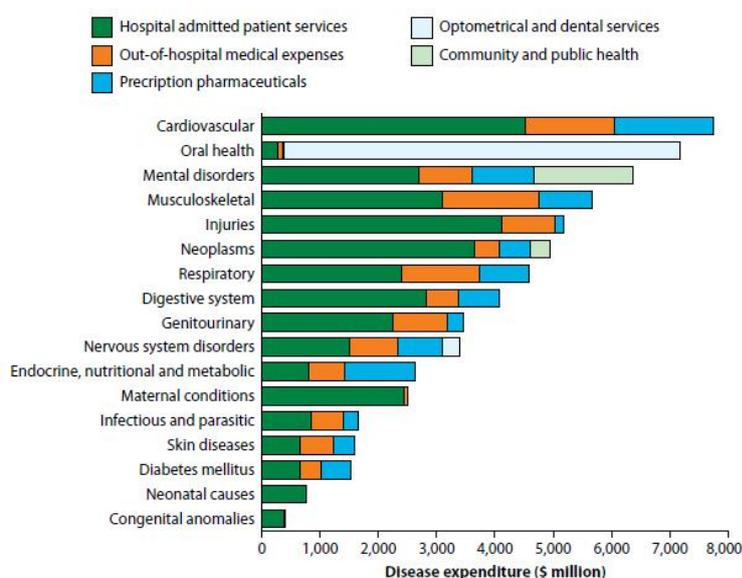
Figure 3 Health expenditure in Australia, by disease group and area of expenditure 2008-09[8]

2.4 Inequalities in cardiovascular disease

There are significant **inequalities in the prevalence, mortality and morbidity** from CVD in Australia. In this report the Australian Bureau of Statistics (ABS) Statistical Area Level 3s and ARIAs were used to measure geographical groupings and Statistical Area Level 2s were used to measure socio-economic status (SES).[15] The lowest SES equals the 20% lowermost and highest SES equals the 20% uppermost.

Geographical and socio-economic statistics

In WA, premature deaths from CVD are **2.5 times higher in very remote regions** compared to areas that have high access to health and community services,[10] while national mortality (all ages) from CVD is 1.3 times higher in remote regions than major cities. Cardiovascular death rates were **1.6 times higher in the lowest socio-economic group** compared to highest socio-economic group.[16]. These statistics are partly explained by the proportion of Aboriginal Australians living in socio-economic disadvantage in remote areas with limited access to healthcare and social services.[16]

Overall, the prevalence of CVD is higher in **regional and remote areas** (25-27%) compared with **major cities** (20%). Those living in areas with **highest social disadvantage fare worse** (26% with CVD) compared to those in the lowest disadvantage (17% with CVD).[4]

CVD and Aboriginal populations

CVD is the leading cause of death among Aboriginal and Torres Strait Islander people (hereafter referred to in this report as Aboriginal people) in WA[10] and nationally.[16] Overall, Aboriginal people have a higher prevalence of heart disease and experience twice as many hospitalisations for cardiovascular disease.[17] The onset of CVD occurs at much younger ages among Aboriginal people, with the proportion of females being higher among Aboriginal than non-Aboriginal people [17]

Since 2001 there has been a significant increase in Aboriginal people reporting a cardiovascular condition.[1] One of the reasons for this is that Aboriginal Australians have undergone an **epidemiological transition** where earlier mortality rates from infectious (communicable) disease have been significantly reduced and replaced by non-communicable disease morbidity and mortality.[18] However, the gap in life expectancy between Aboriginal and non-Aboriginal Australians remains[18], of which 80% can be attributed to chronic disease where CHD accounts for 22%.[19] In WA the gaps in life expectancy in 2010-2012 between Aboriginal and non-Aboriginal people were 15.1 years for males (65 vs 80.1 years of age) and 13.5 years for females (70.2 vs 83.7 years of age) – larger than any other state or territory.[18] Nationally, during 2009-2011, deaths from CVD for **Aboriginal people were 30% (1.3 times) as high as** other Australians.[16]

In WA, Aboriginal people who have had their first heart attack are twice as likely to be readmitted to hospital or die within the following two years as non-Aboriginal people, while Aboriginal patients are 2.4 times more likely to discharge themselves against medical advice than non-Aboriginal patients.[17]

While there has also been a significant decrease in mortality from CHD for Aboriginal people in WA, in 2011, West Australian Aboriginal people were 2.1 times more likely to die from CHD than other West Australians.[10] Aboriginal people in WA in 2012 were hospitalised 2.7 times for a cardiovascular condition and 2.9 times for CHD than other non-Aboriginal people in Western Australia.[10]

The chasm between Aboriginal and non-Aboriginal CVD across the care continuum has been attributed to a number of factors. These include: Aboriginal people with heart disease have more co-morbidity (the presence of other illnesses) than non-Aboriginal people with heart disease. The presence of co-morbidities results in more complex health issues, more difficulty in the management of those health issues and an increase in poor health outcomes.[17] For those living in rural and remote areas (60% of the Aboriginal population in WA[18]) the gaps in access to culturally suitable specialists' health care services are greatest - compounded by socio-economic disadvantage and the tyranny of distance.[17] Data from what was the Kimberley Pilbara Medicare Local (KPML) region showed that WA ranked as one of the most disadvantaged Medicare Locals in Australia.[20] The Kimberley Pilbara region has the highest national rates for avoidable deaths from cardiovascular disease, and the worst affected areas are Halls Creek, Derby-West Kimberley and Ashburton.[20] The Pilbara region along with the Wheatbelt has been reviewed as underfunded in Aboriginal health.[18]

Acute rheumatic fever (ARF) is an illness caused by reaction to a bacterial infection. **Rheumatic heart disease (RHD)** is permanent damage to the heart following ARF. Aboriginal and Torres Strait Islander Australians, especially children, have among the highest levels of RHD in the world. It is a particular problem in remote regions. RHD is preventable and its eradication should be a public health priority. Prevention is enabled by good health and hygiene as well as early diagnosis and treatment of the infection with antibiotics. (To be completed and referenced – NHF and RHD Australia)

Figure 4 Cardiovascular disease (CVD) risk factors

Heart Foundation®

Cardiovascular disease (CVD) – Risk Factors

90% of Australians have a modifiable risk factor.[18]
68.9% of West Australians have three or more risk factors.[1]

Obesity – High BMI is the leading burden of disease risk factor[16]

	Where?	Gender	Aboriginal Australians
2 out of 3 West Australians are either overweight (38.9%) or obese (27.7%).[23] 62.8% of Australian adults are either overweight or obese.[8]	More common in the lowest SES (66%) compared to the hghest SES (59%) in Australia.[8] WA country areas reported higher obesity (34.5%) compared to metro (25.6%).[23]	Males are more likely to be overweight or obese than females.[8]	**1.6 times** Aboriginal Australians are 1.6 times more obese than other Australians.[24]

Who is smoking?

12.8%
of Australian adults smoke.

12.3%
of West Australians aged
16 and over smoke.[23]

More common in the lowest SES (23%) compared to the hghest SES (10%) in Australia.[8]

WA country areas reported higher smoking (14.6%) compared to metro (11.7%).[23]

2.6 times

Aboriginal Australians are 2.6 times more likely to be smokers than other Australians.[24]
39% in non-remote and 50% in remote areas.[24]

Who is physically active (150 minutes per week)?

43%

Australian adults
(all ages) meet physical
activity guidelines.[5]

Sufficient physical activity less common in lowest SES (34%) compared to the highest SES (52%).[8]

38%

Aboriginal Australian adults in non-remote areas meet physical activity guidelines.[24]

Heart Foundation®

Cardiovascular disease (CVD) – Risk Factors

Who meets the recommended fruit and vegetable intake?

51% **8%**

51% of Australian adults meet the recommended fruit (2 serves) intake and only 8% the vegetable (5 serves) intake.[8]

Where?	Gender	Aboriginal Australians
In WA	**In WA**	**42%** **4.8%**
52% and 8.8% of West Australian (19+ years) meet the recommended fruit and vegetable intake.[23]	**(16+ years)** 46.7% and 7.4% of males compared to 57.5% and 13.7% of females meet sufficient fruit and vegetable intake.[23]	of Aboriginal Australians (15+ years) meet fruit and vegetable intake guidelines.[24]
2013 vegetable intake lowest on record for WA.[1]		
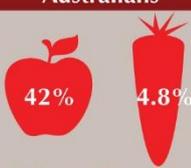
Too many kilojoules from discretionary foods

35% of the energy (kiloujoules)

adults eat is from discretionary (junk) foods and drinks high in added sugar, saturated fat, salt or alcohol.

Too much saturated fat

12%

Saturated fat contributes 12% of daily energy intake, above the recommended maximum 10%.

High blood pressure = hypertension

1 in 5

Australian adults had high cholesterol when tested in 2011-13.[2]

Yet less than 1 in 3
Australians found to have hypertension were aware they had high blood pressure.[17, 25]

1 in 4

Aboriginal Australian adults had high blood pressure when tested in 2012-13.[17]

High cholesterol

1 in 3

Australian adults had high cholesterol when tested in 2011-13.[2]

Yet only 1 in 10
Australians tested had self-reported to have high cholesterol.[17, 26]

3.0 Risk factors and determinants of cardiovascular disease

In Western Australia, and nationally, there has been success in lowering smoking rates and improvements in treatment and management of cardiovascular risk and disease[4] that have helped to reduce mortality from CVD over the past two decades.[12] However, the prevalence of CVD is expected to rise due to increasing levels of obesity, physical inactivity, and dietary risk factors, in addition to an ageing population.[4, 8]

There are a number of well-established risk factors and determinants of CVD. Evidence shows that preventive approaches contribute between approximately 50% and 75% to the reduction of CVD mortality in high-income countries, and 78% globally (WHO - Euro).[21] This section looks at these risk factors in Western Australia and nationally within global trends and the influence of inequalities.

3.1 What are the risk factors?

Globally, around **90% of myocardial infarctions (heart attacks),** an acute outcome of CHD, can be attributed to smoking, hypertension, abnormal blood lipids (cholesterols), diabetes, obesity, and physical inactivity, dietary and psychological factors.[22] **In Australia, 90% of adults have at least one modifiable CVD risk factor** [14] **and over two thirds (68.9%) of West Australians have three or more modifiable risk factors (Figure 4)** (smoking, insufficient fruit and vegetable, physical inactivity, unsafe alcohol intake, type 2 diabetes, high blood pressure, high cholesterol, excessive body weight, and depression).[3]
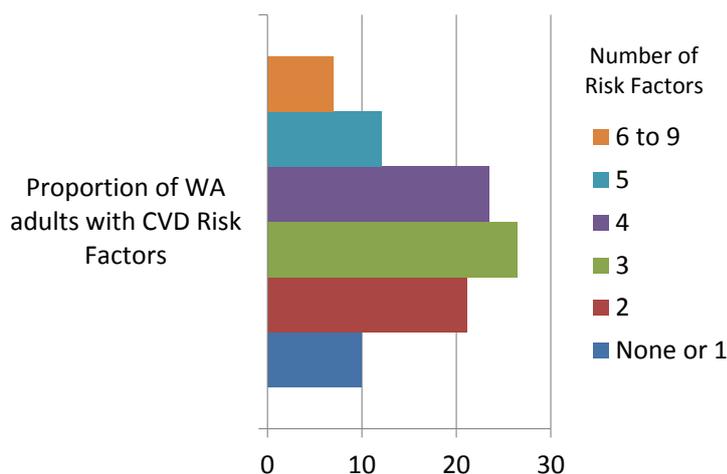

Figure 5 Proportion of WA adults in 2013 CVD modifiable risk factors

As the number of individual cardiovascular risk factors increases the likelihood of developing a CVD rises.[8] The combined effects of three risk factors: high blood pressure, high cholesterol and physical

inactivity, have been attributed to 70% of all cardiovascular mortality.[8, 23] However in recent years, in Australia like many high income countries, **high body mass (BMI>25kg/m^2) has become a leading contributor to burden of disease** and has overtaken smoking and high blood pressure. [9, 24] While we have experienced an encouraging **decline in smoking** rates (12.3% in WA, 12.8% nationally[25]) the level of **obesity has increased.**[8]

3.1.1 High body mass index (BMI) (>25kg/m^2)

BMI is a useful approximate measure of body fat. It is calculated by dividing your weight in kilograms by your height in metres then dividing by your height again.

> **Underweight (<18.5kg/m^2)**
> **Normal weight (18.5-24.9 kg/m^2)**
> **Overweight (25-29.9 kg/m^2)**
> **Obese (>30 kg/m^2)**

In WA and nationally, there has been a significant trend upwards in the BMI obese category (BMI>30 kg/m^2).[8, 26] Two thirds of the WA Health and Wellbeing Surveillance System (HWSS) participants, 16 years and older, in 2014 (66.6%) reported being either overweight (38.9%) or obese (27.7%).[26] Nationally, almost two thirds of Australian adults are either overweight (35%) or obese (28%), and males are more likely to have a high BMI than females (Figure 6).[8]
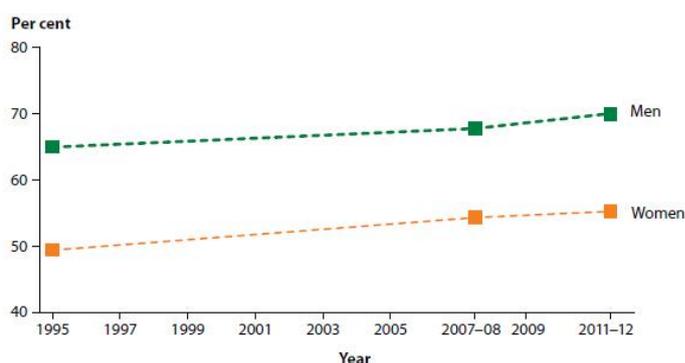

Figure 6 Age-standardised rate of overweight or obesity, people aged 18 and over, by sex, 1995 to 2011-12[8]

In WA, the HWSS reported higher obesity (34.5%) in country compared to metropolitan areas (25.6%).[26] Females, 16 years and over, were classified less as overweight and obese compared to

males (60.7% compared to 71.8%).[26] Nationally, high BMI is more common in lower socio-economic areas (66%) compared to higher socio-economic areas (59%).[8]

Several factors such as physical inactivity, sedentary behaviours, poor dietary choices and excessive intake and urban design that discourages active transport have a significant impact on the weight of the nation. Alternatively, we know that a nutritious diet and exercise are protective factors for healthy weight.

3.1.2 Physical inactivity

According to the Australian National Health Survey almost 3 in 5 adults (57%) do not meet the National Physical Activity Guideline target of 150 minutes per week of moderate to vigorous physical activity. The figure for West Australian adults is 55.4%[2]. Insufficient physical activity was more common in lower socio-economic areas (66%) compared to higher socio-economic areas (48%).[8]

Physical activity is associated with a 35 percent reduction in risk of cardiovascular mortality, and a 33 percent reduced risk of all-cause mortality. These positive effects were found in both men and women.[27]

Poor urban design and a dependency on motor vehicles promote physical inactivity, whereas good urban design and active transport options support walkability and subsequent physical activity levels.[28] These associations have been demonstrated across countries and across socio-economic strata.[29] Urban areas of social disadvantage have often been found to have poorer quality public open space, more fast food outlets than urban areas with social advantage. (ref.)

3.1.3 Dietary factors

In WA in 2014, only 52% of HWSS participants (aged 16 years and over) reported a sufficient intake of **fruit** (two or more serves daily) and only 8.8% reported a sufficient intake of **vegetables** (five or more serves daily).[26] **The lowest mean for vegetable intake in WA was recorded in 2013.**[3] Nationally, 92% of adults do not eat enough vegetables and 49% of adults do not eat enough fruit.[8]

In WA, almost a third (28%) of HWSS participants, 16 years of age and over, consumed meals from fast food outlets once or twice a week, and males (40%) consumed more fast food each week than females (23.5%).[26] Meals from fast food outlets are commonly high in sugar, fat and salt.

According to the Australian National Health Survey, 35% of the energy (kilojoules) adults eat is from discretionary (junk) foods and drinks high in added sugar, saturated fat, salt or alcohol[2].

Saturated fat contributes about 12% of daily energy intake, above the recommended maximum of 10%[2].

3.1.4 Smoking

In WA and nationally, encouragingly, **smoking has declined over the past decade**.[3, 8] In 2014 in WA, only 12.3% of HWSS participants reported that they currently smoke, with males were 1.4 times more likely to smoke than females.[26]

While smoking rates have declined significantly, this decline has not been even across population groups. Smoking is higher in lower socio-economic areas (23%) compared to the highest SES (10%), and higher among men (18%) compared to women (14%).[8] It is notable that there are four times as many tobacco retail outlets in low socio-economic areas.[30]

Aboriginal people are 2.6 times more likely to use tobacco than non-Aboriginal people.[31] While there have been some reported declines in smoking among Aboriginal people in non-remote areas (39%) there has been no significant decline observed in remote areas (50%).[31]

In addition there are sub-populations where smoking rates remain very high. This includes prisoners and those with mental health problems.

3.1.5 High risk alcohol consumption

In WA and nationally, while **risky alcohol consumption have declined over the past decade it remains a significant public health problem**.[3, 8] In 2014 in WA, high risk alcohol consumption was reported by 27.9% (long-term harm) and 11% (short-term harm).[26] Males in all age groups were more likely to have high risk alcohol consumption than females.[26]

Harmful levels of alcohol consumption are more common in lower socio-economic areas (22%) compared to the high SES (17%), and three times as high among men (29%) as it is among women (10%).[8] Weekly harmful alcohol consumption was reported by 18% of Aboriginal adults.[18]

3.1.6 Depression and social isolation

Evidence indicates that psychosocial stressors have an impact on coronary heart disease. The Heart Foundation updated its guidance in relation to psychosocial risk factors for coronary heart disease in 2013. This review concluded that perceived chronic job strain is associated with a small absolute increase in coronary heart disease risk, and that social isolation after myocardial infraction is

associated with an adverse prognosis.[32] The Heart Foundation has further concluded that the prevalence of depression is high in patients with coronary heart disease and has a significant impact on quality of life and adherence to therapy, and an independent effect on prognosis.[33]

3.2 The biomedical risk factors for cardiovascular disease

3.2.1 High blood pressure

The Australian Health Survey (AHS) found in 2012-13 that **1 in 5 Australian adults had high blood pressure** when tested; yet, less than 1 in 3 Australians found to have hypertension were aware they had high blood pressure. [12, 34] In WA, the 2014 HWSS found that 18.6% (aged 25 years and over) reported to have and/or were being treated for high blood pressure.[26] In WA there have been no significant changes in the prevalence of current high blood pressure reported compared to previous years.[26]

3.2.2 High blood cholesterol

The AHS also found that almost **one third of Australian adults tested had high cholesterol** while only 10% of those tested reported high cholesterol.[12] In WA, the 2014 HWSS found that 19.3% (aged 25 years and over) reported to have current high cholesterol.[26] In WA there have been no significant changes in the prevalence of high cholesterol reported compared to previous years.[26]

3.2.3 Diabetes and the 'cluster' factor

Medical risk factors (overweight and obesity, high cholesterol, high blood pressure, diabetes and mental health) often exist together (cluster) and compound the cardiovascular risk for those affected.[12] Obesity has contributed, along with sedentary lifestyle, to the increase in diabetes, which is itself a risk factor for CVD.[8] It was estimated that one million Australians had diabetes in 2011-12.[8]

The established causes that explain premature death from cardiovascular disease are referred to as a*ttributable risk factors* and can be described as a proportion of the years of life lost. For all cardiovascular disease, the proportions of Years of Life Lost (YLL) can be attributed to: dietary risks (60.4%), high blood pressure (48.3%), overweight or obesity (28.1%), high cholesterol (21.3%), physical inactivity (20.8%), smoking (16.1%) and diabetes (10.1%). [35, 36]

3.3 Aboriginal population risk factors

In addition to tobacco consumption there are several large differences in cardiovascular risk factors and determinants between the Aboriginal and non-Aboriginal populations in Western Australia. Aboriginal people are 1.6 times more likely to be obese than non-Indigenous Australians.[31] Two thirds of Aboriginal people aged 15 and older were either overweight (29%) or obese (37%). In non-remote areas, 38% of Aboriginal Australian adults meet physical activity guidelines, which is less than non-Aboriginal Australians. However, Aboriginal people are more likely to walk for transport.[31] In the AHS, 1 in 4 Aboriginal Australian adults had high blood pressure when tested in 2012-13[12]
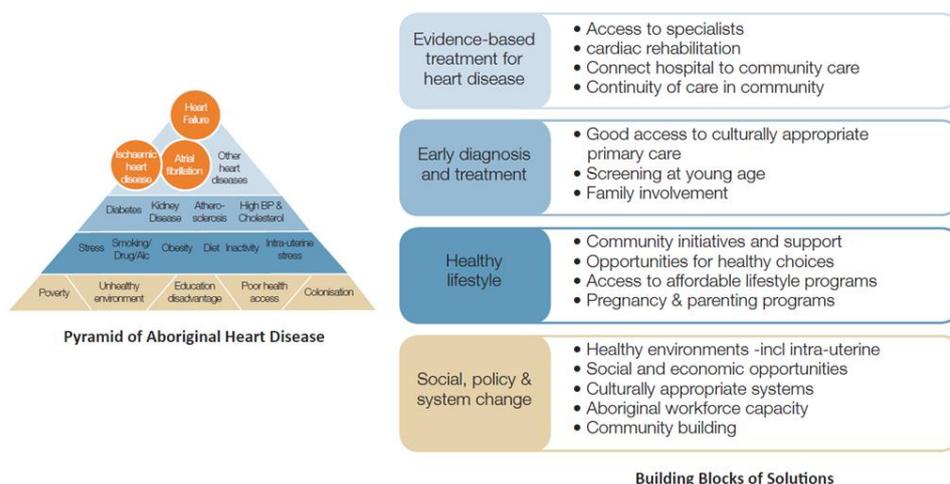
Figure 1: Building blocks of solutions to address pyramid of Aboriginal heart disease*   [17]

3.3.1 The case for Aboriginal cardiovascular disease prevention programs

Aboriginal health programs in WA have recently been reviewed as part of the WA government's '*WA Footprints to Better Health Strategy 2014-2018'.* Improved funding in WA for the Aboriginal health sector has encouraged optimism to tackle Aboriginal health effectively. However, short term funding processes resulted in poor stability of Aboriginal health programs, and loss of staff until funding resumed or some programs ceased altogether. While programs were usually underpinned by strong evidence, program proposals and service providers were often weak in identifying the cost-effectiveness for WA programs. Holman and Joyce recommended the development of strong evaluation within the WA health sector .[18]

Holman and Joyce propose that as preventive measures, such as a reduction in smoking, have been effective in reducing heart disease in non-indigenous Australians, such measures need to be targeted for Aboriginal Australians.[18]

The review of cost-effective programs specific to Aboriginal people referred to in the ACE-Prevention study are shown in Appendix 1. While ACE did not assess smoking, other studies (refs 134, 135 – p54) found anti-smoking media campaigns had a strong impact on Aboriginal people. In particular, Holman and Joyce recommend smoking and health programs for Aboriginal people need to have a significant mass media component.[18]

Holman and Joyce, drawing on the historical gains in life expectancy in the Australian population and recognising that 45% of Aboriginal people in WA in 2010-12[10] were in the highest quintile of social disadvantage, propose that halving the gap in life expectancy within a generation is achievable - with a vision to closure of the gap at 50 years.

Priorities for Close the Gap action areas of particular relevance to this report are as follows (NPA - p4)[37]:

Area 1: *Tackling smoking* to reduce smoking and the burden of tobacco-related disease in Indigenous communities.

Area 2: *Healthy transition to adulthood* to increase social and emotional wellbeing, reduce uptake of alcohol, tobacco and illicit drugs, reduce sexually transmissible infections
(STIs), reduce violence and injury and excess mortality and morbidity in Indigenous men.

Area 3: *Making Indigenous health everyone's business* to improve multi-agency collaboration, improve interventions in high need families; reduce waiting times for health services and reduce early mortality in men.

Area 4: *Primary health care service that can deliver* to implement best practice standards and accreditation, increase uptake of services funded by the Medical Benefits Schedule (MBS); improve coordination of care for chronic diseases and patients with complex needs and improve the cultural competence of the primary care workforce men.

Area 5: *Fixing the gaps and improving the patient journey* to reduce length of hospital stay, improve engagement between patients and service providers to deliver better referral and follow-up processes, improve provider choice; improve patient satisfaction with care and reduce hospital admissions with incomplete treatment.

Holman and Joyce's key recommendations of particular relevance to this report include:

- Minimum three year funding for programs and strengthening governance
- Re-allocation of some resources to Pilbara and Wheatbelt as under-funded
- Re-allocation of some resources to focus on nutrition, smoking and alcohol education

- A move from the measurement of output of programs to evaluation of the impact of programs
- Stronger integration, co-ordination and partnerships to reduce fragmentation of programs and services

3.4 Ecological framework of cardiovascular risk factors and determinants

The relationships between CVD risk factors and the social and environmental determinants that contribute to CVD can be viewed within a determinants model (Figure 8). This builds on social-ecological theories.[38] This model demonstrates how different levels of risk factors and determinants, from proximal (downstream) to distal (upstream), can influence other levels and have an impact on the cardiovascular health of an individual. For example, the walkability of the built environment (distal) impacts on physical inactivity (proximal), while tobacco legislation and taxation (distal) impacts on smoking (proximal).
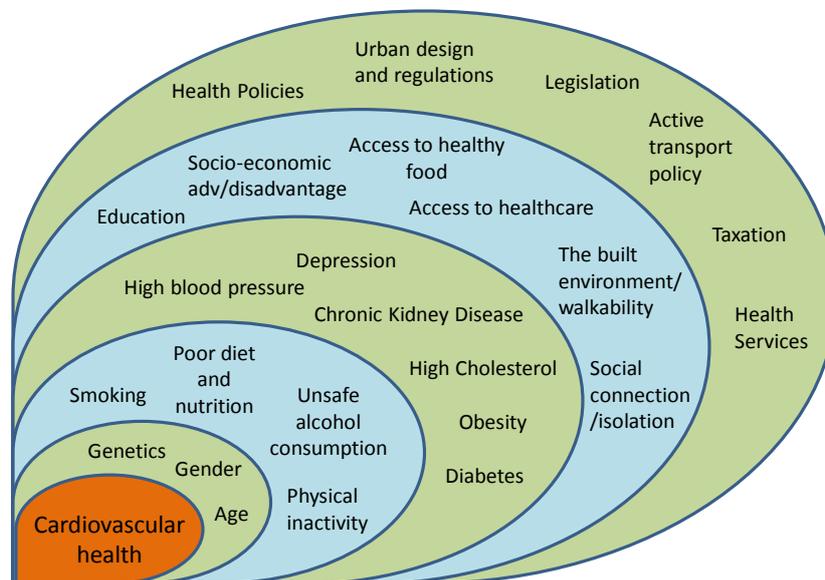
Figure 8 A model of CVD risk factors and determinants

Social isolation, low social support and depression are three risk factors that have been found to influence the incidence and survival from CHD, and are independent of other risk factors such as smoking and elevated blood pressure and cholesterol.[14]

4.0 Prevention – Evidence-based priorities for investment

Section 4 presents the best buys for cardiovascular disease prevention based on the best available evidence. It relies on a synthesis of the epidemiology, the evidence of effective interventions, systematic reviews, national and global guidance documents from health authorities and research institutes.

In section 3 we reported that globally, around **90% of myocardial infarctions (heart attacks),** an acute outcome of CHD, can be attributed to smoking, hypertension, abnormal blood lipids (cholesterols), diabetes, obesity, and physical inactivity, dietary and psychological factors.[22] The combined effects of three risk factors: high blood pressure, high cholesterol and physical inactivity, have been attributed to 70% of all cardiovascular mortality.[8, 23]

This evidence provides compelling direction in regard to what should be the key issues to be addressed in a cardiovascular disease prevention strategy.

Consideration should be given also to the trends in these risk factors. In Australia like many high income countries, **overweight and obesity is rapidly increasing and has become a leading risk factor contributing to cardiovascular burden of disease**.[9, 24] Addressing obesity, in conjunction with preventive approaches to healthy eating and physical inactivity, is a key priority for the future.

4.1 Prevention levels

Prevention is commonly described as primary, secondary or tertiary. *Primary prevention* targets population health before disease has occurred, such as campaigns targeting smoking reduction or increasing physical activity. *Secondary prevention* is detecting risk factors and disease before they become harmful to health, such as blood pressure and cholesterol screening. *Tertiary prevention* is the treatment of disease with the view to rehabilitation and limiting further harm.[39]

Importantly, global reductions in CHD morbidity have been attributed to greater reductions in risk factors (50-70%) than treatments (25-50%) as illustrated in Figure 9 [40] and there is an expanding body of evidence supporting the economic returns on prevention.[40]

Contribution of treatment and risk factor reduction to global CHD mortality


- reduction in risk factors
- treatment CHD
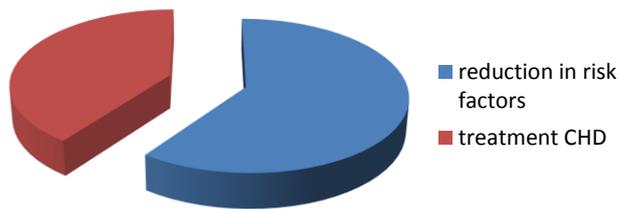
Figure 9 - The case for investing in public health[40]

At any one time the three levels of prevention may be at work. For example, an individual may be counselled on primary prevention strategies such as increasing physical activity at the same time as secondary prevention involving screening for hypertension or other risk factors, which may involve treatment of biomedical factors to prevent disease. In this context, as part of secondary prevention efforts, it is important to support education about adherence to medications, directed at those who are at high risk and those with existing disease.

Tertiary prevention involves the management and rehabilitation of disease to slow or reverse disease progression, which may involve further screening, education and intervention for other risk factors. Health promotion through public health and primary health care measures are ongoing.

Globally, secondary cardiovascular prevention that includes smoking cessation, cholesterol and blood pressure lowering medication has been proposed to reduce the risk of a CVD event by up to 90%.[41]

Cardiac rehabilitation

Tertiary prevention includes cardiac rehabilitation. Cardiac Rehabilitation (CR) is 'a coordinated program of long-term care that helps people with coronary heart disease (CHD) or other heart problems return to an active and satisfying life, and reduces their risk of further heart problems'[42] Robust cardiac rehabilitation programs that include an exercise component have been shown to reduce risk of death by up to 25% and readmission to hospital by 45%.[43]   Considering around half of all coronary events occur in those people who have had a prior event, there is considerable health and cost benefits in funding cardiac rehabilitation programs.

Table 1 compares Australians with ischaemic heart disease to the general population aged 25 and

over. It illustrates the potential for further gains to be made in the population that already has heart disease – both in relation to the management of clinical risk factors and health-related behaviours. For example, these data show that the proportion of people with ischaemic heart disease who are overweight or obese mirrors that of the general population, still far too many patients are smokers, one in two people with high cholesterol are not taking statins and people with heart disease are significantly more likely to be inactive, with sedentary rates close to double that of the general population.[34]

Table 1   Comparison of Australians with Ischaemic heart disease to the general population aged 25 and over.

	People with Ischaemic heart disease (25+)	General population (25+)
Hypertension	• 30% have high blood pressure (>140/90 mmHg). • 10% have blood pressure above 160/100 mmHg.	• 24% have high blood pressure (>140/90 mmHg). • 6% have blood pressure above 160/100 mmHg.
Total blood cholesterol	• 18% have abnormal total cholesterol (> 55. mmol/L) • Average cholesterol of 4.5 mmol/L	• 38% have abnormal total cholesterol (> 55. mmol/L) • Average cholesterol of 5.2 mmol/L
Body mass index	• 33% are overweight (BMI 25 to 29.9) • 32% are obese (BMI >30)	• 37% are overweight (BMI 25 to 29.9) • 30% are obese (BMI >30)
Physical activity	• 29% are sufficiently active for health • 37% are inactive, that is, they do no physical activity	• 43% are sufficiently active for health • 20% are inactive, that is, they do no physical activity
Smoking	• 12% are current smokers	• 16% are current smokers

4.2 'Evidence' and 'evidence of effectiveness'

In considering criteria for prioritising activities that will have greatest impact consideration should be given to:

- **Evidence** of the importance and CV health burden associated with the proposed issue
- **Evidence of effectiveness** of the proposed intervention.

Evidence	**Evidence** of the importance and cardiovascular health burden associated with the proposed issue. This includes the prevalence, trends, distribution and contribution/causation attributed to an issue, condition, risk factor or behaviour to cardiovascular disease burden.
Evidence of effectiveness	**Evidence of effectiveness** relates to the proposed intervention and evidence that it is both effective and cost effective. This includes assessment that an intervention will make a difference to behaviour, environments or systems. Evidence of effectiveness translates the first criteria 'evidence' into application and assesses the degree to which an activity intervenes in the causal process in order to eliminate, retard, maintain or accelerate the causal relationship.

Evidence and effectiveness are fundamental criteria that should be '**established first'**, before other more business-focused criteria are applied in the strategy selection process.

4.3 Typologies for strategy selection

Once it has been determined which key risk factors or health issues are to be prioritised the next strategic question is to consider the interventions and approaches that are most likely to reduce the impact of that risk factor. For each of the levels of prevention described at 4.1 interventions can be classified into a typology or categories of intervention based on international evidence and frameworks.

Whitehead [44] described a typology for interventions to reduce social inequality. Four categories were

identified:

Category 1:   Strengthening individuals

Category 2:   Strengthening communities

Category 3:   Improving living and working conditions

Category 4:   Promoting Healthy macro-policies

Three levels of intervention have been recommended by the Public Health Agency of Canada.[45] These are:

- Health services and clinical interventions that target individuals
- Community level interventions that directly influence behaviours, and
- Public policies that target broad social or environmental determinants.

In this document we have adopted a hybrid of these typologies

4.4 Global frameworks and guidance

Global bodies such as the World Health Organization, professional societies and non-government organisations (NGOs) have developed guidance to inform investments in prevention. These typically have used methodologies that included expert consultation and reviews of the relevant literature. They provide authoritative guidance for action. These papers offer high level advice to governments, including regulatory activity which is often the responsibility of national governments.

4.4.1 The World Health Organization

The United Nations Political Declaration on non-communicable diseases (NCDs) [46] is a landmark document for prevention. It provides the highest level support for member states regarding interventions to reduce the impact of chronic diseases.

The United Nations charged the World Health Organization (WHO) with the task of developing Global Monitoring Framework for NCDs. The agreed targets are listed in Table 2 [11].

Table 2. WHO Global Action Plan for NCDs: Targets

WHO Global Action Plan Targets[47]
25% reduction by 2025 in mortality from chronic disease
25% **relative reduction in overall mortality from** CVD, **cancer, diabetes, or chronic**

respiratory disease
At least 10% **relative reduction in the harmful use of alcohol, as appropriate, within the national context**
10% **relative reduction in prevalence of insufficient physical activity**
30% **relative reduction in mean population intake of salt/sodium**
30% **relative reduction in prevalence of current tobacco use**
25% **relative reduction in the prevalence of hypertension or contain the prevalence of hypertension, according to national circumstances**
Halt the rise **in diabetes and obesity**
At least 50% **of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes**
80% **availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCD in both public and private facilities**

The World Health Organization Global Action Plan for Non-communicable Diseases [2] builds on the recommendations from the United Nations and provides specific guidance on chronic disease prevention and management strategies to be undertaken by member states. These strategies for member states and civil society reflect global consensus and the best available evidence from systematic reviews.

Other global examples of guidance documents include:

- o **Diet and physical activity**. A World Health Organization 2007 document (WHO, 2007) provides guidance to assist in implementing the WHO Diet and Physical Activity Strategy (DPAS). This outlines effective population-based approaches to increasing levels of physical activity.[48]
- o **Tobacco**. The Framework Convention on Tobacco control (FCTC) came into force in 2005 and covers 85% of the world's population. It outlines the key effective measures to reduce population prevalence of smoking. These include tax increases, smoke-free public policy, health warnings and hard hitting media campaigns.
- o **Physical activity.** The International Society for Physical Activity and Health (ISPAH) and its Advocacy Council, Global Advocacy for Physical Activity (GAPA) have played a key role in building global professional consensus to inform advocacy for physical activity policy and for advancing policy frameworks for physical activity. The *Toronto Charter for physical activity: A global call to action* was developed through a global consultative process including physical activity experts. It outlines key guiding principles for population approaches to physical activity and outlines a framework for action.[49] ISPAH and GAPA followed up the work on the Toronto Charter with further guidance on

evidence-based investments for physical activity. *Investments that work for physical activity* is a complementary document to the *Toronto charter for physical activity.* Seven best investments to increase population levels of physical activity are identified.[50]

o **Nutrition.** In May 2014 World Obesity Federation and Consumers International published a set of recommendations towards a global convention to protect and promote healthy diets. The recommendations have been modelled on the WHO Framework Convention on Tobacco Control. The Convention is intended to support nations in selecting approaches to achieve diet-related goals in the United Nations Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases.[46]

A number of policy frameworks have been published to assist with informing diet-related strategies to reduce non-communicable diseases, including cardiovascular disease. These policy frameworks include the NOURISHING framework and the INFORMAS (International Network for Food and Obesity/NCDs Research, Monitoring and Action Support). These are consistent with and supportive of the list of policy options included in the WHO's Global Action Plan for the Prevention and Control of Non-Communicable Diseases (2013–2020).

4.4.2 Country-level guidance

At national level, governments, NGOs and Institutes have produced documents that provide guidance or frameworks to inform chronic disease prevention strategy selection. Examples include:

o **Obesity.** A British Report, the Foresight Report describes the complexity of influences on obesity, including physical activity and nutrition influences [51].

o **Obesity, physical activity and nutrition**. The US Institute of Medicine, 2012 (USA) published a highly relevant 460 page text that offers guidance on taking a systems approach to improving population health and reducing obesity with recommendations and guidance for implementation of physical activity and nutrition changes at various levels: policy, environment, community, school, health care and work [52].

o **Childhood obesity.** The White House Task Force on Childhood Obesity is a US-report to the President on actions to prevent childhood obesity. It provides a good outline of appropriate settings for healthy food and physical activity interventions [53].

o **Australia's National Preventative Health Taskforce – smoking, obesity and alcohol.[54]**

The Australian Preventative Health Taskforce was established to provide advice to the Australian Government on ways to reduce the diseases caused by obesity, tobacco and alcohol. Recommendations from the Taskforce were based on the best available evidence.

These guidance documents recognise and address the complexity of prevention, the importance of working across sectors and the importance of comprehensive and multi-strategy approaches.

5.0 What works – a distillation of the evidence

Table 3 provides a summarised distillation of the evidence of effectiveness for cardiovascular disease prevention as outlined in the literature and in global and national guidance documents. The table applies strategies across the continuum of:

- primary prevention
- secondary prevention and
- tertiary prevention.

Table 3 further applies a typology for interventions based on Whitehead (2207), the Canadian Public Health Agency (2011) and World Health Organization (2013) grouping evidence based strategies into the categories of:

- Strengthening individuals
- Strengthening professionals
- Strengthening communities
- Improving living and working conditions
- Implementing healthy macro-policies

System supports for prevention

Outside the typology of Table 3 'higher order' system supports for prevention are identified. These are:

- Ensure a stable funding base for prevention equal to 5% of the health budget
- Support regular monitoring of health behaviours, biomedical risk factors and health system performance
- Provide increased Government funding for cardiovascular research

- Support and enable translation of research findings into practice
- Fund the community-wide 'scaling up' and 'sustainability' of prevention programs proven to be effective.

Table 3: Best buys for cardiovascular disease prevention in Australia

Typology ↓ Method ↓	Prevention Pathway Setting – Sector								
	Equity Ensure heart health strategies influence systems, policies and programs and take account of the environmental, social and economic conditions that increase risk, or limit opportunities for the disadvantaged and for Aboriginal and Torres Strait Islander people to achieve better heart health.								
	Primary Prevention			Secondary Prevention			Tertiary Prevention		
	Tobacco	Healthy Eating	Physical Inactivity	Primary Care	Absolute Risk and Integrated Health Checks	Cardiac Rehabilitation	Warning Signs	Heart Failure	Tertiary Care
Strengthening Individuals	Provide cessation support for individuals to quit smoking	Build skills and literacy for healthy eating, food choice and preparation	Build knowledge and skills to enable lifelong participation in physical activity	Help people at risk of heart disease to access evidence-based community programs	Develop culturally appropriate consumer awareness and knowledge of hypertension and high cholesterol as risk factors of heart disease and the importance of medication adherence	Build patient awareness of the benefits of cardiac rehabilitation	Build community knowledge of heart attack warning signs and the need to act quickly and call an ambulance		
Strengthening Professionals	Provide training for doctors & professionals in tobacco control including cessation and brief advice	Integrate nutrition risk assessment, brief advice and referral into primary care	Integrate physical activity assessment and brief advice into primary care	Build skills in primary care for heart disease prevention	Build knowledge and provide tools to Implement integrated health checks and absolute risk assessment Build heart health skills in doctors, health professionals and Aboriginal Health Workers	Conduct Regular guideline updates and allocate resources for systematic implementation	Build professional knowledge in CPR and need for rapid action in heart attack Build on existing community and health professional	Conduct Regular guideline updates and allocate resources for systematic implement ation	

							engagement		
Strengthening Communities	Warn people about the dangers of tobacco use through well funded, hard hitting Public education campaigns	Implement hard hitting public education about the harms from obesity and benefits of healthy eating. Implement community nutrition programs to build food literacy.	Implement public education about the benefits of physical activity and to promote an active culture. Implement community physical activity programs to meet needs across the lifespan.				Ensure implementation of first responder and similar programs in communities Ensure Government funded campaigns to promote the warning signs for heart attack.		
Improving living and working conditions	Extend smoke-free public places indoors and outdoors	Implement a 'whole-of-school' approach to healthy eating Implement healthy catering policies in workplaces, school and community facilities. Ensure equitable access to healthy foods	Implement a 'whole-of-school' approach to physical activity including 120-180 minutes of quality physical education						
Implementing healthy macro-polices	Strengthen state Tobacco Control Act with comprehensive bans on all forms of promotion, extending smoke-free areas and bans on e-cigarette promotion, sale and use. Advocate	Restrict marketing of foods and beverages to children. Implement and strengthen the Health Star Rating front of package food labelling system to promote healthy choices. Promote taxation as a mechanism	Implement urban design regulations that promote health and physical activity Implement transport systems and policies that prioritise walking, cycling and public transport		Ensure funding for Primary Care Networks and Aboriginal Health Services to enable system support for integrated health checks and absolute Risk assessment. Ensure incentive	Ensure equitable access to evidence based and culturally tailored cardiac rehabilitation for all eligible patients. Eliminate heart health disparities experienced by Aboriginal and Torres Strait islander patients.	Implement a universal ambulance cover scheme.	Advocate for a systematic approach and pathways for chronic heart failure care. Ensure equitable access to evidence based	Implement quality standards as endorsed by the Commission on Safety and Quality of Health Care. Eliminate hospital based disparities experienced by

	federally for real increases in tobacco tax.	to reduce consumption of junk foods and beverages and raise funds for prevention.			programs for GPs to implement health checks			multidisciplinary heart failure care programs	by Aboriginal and Torres Strait Islander patients – building on the results of the Lighthouse Project

6.0 Priorities for Heart Foundation WA investment in prevention

Reducing the impact of cardiovascular disease on the West Australian population will require a broad range of interventions by a large number of actors. There are fewer resources for prevention in the current fiscal and political environment so the Heart Foundation needs to be prudent in its selection of the primary interventions in which it wishes to invest – areas that will have the greatest impact and highest effectiveness in reducing the impact of cardiovascular disease. Optimal prevention will also require the mobilisation of partnerships, both within and outside the health sector to amplify the Heart Foundation's voice, and effectiveness in preventing cardiovascular disease. This section details the best buys and priorities for Heart Foundation WA investment in cardiovascular disease prevention.

In considering criteria for prioritising activities that will have population impact two fundamental elements have influenced the interventions listed in Table 5.

- **Evidence** of the importance and CV health burden associated with the proposed issue
- **Evidence of effectiveness** of the proposed intervention.

Evidence and effectiveness are fundamental criteria that should be used to establish priorities. Other 'business' factors will be considered in establishing implementation strategy.

In describing priorities for Heart Foundation investment we build on the evidence presented in Section 4 describing evidence and evidence of effectiveness.

The Heart Foundation as an independent non-government organisation has additional considerations that inform its investment decisions. These are expressed in Table 4.

Table 4   Considerations to inform Heart Foundation investment decisions

Mandatory considerations	**Evidence** of the importance and cardiovascular health burden associated with the proposed issue. - Prevalence, trends and distribution - Contribution/causation attributed to an issue, condition, risk factor or behaviour to cardiovascular disease burden **Evidence of effectiveness** Evidence that the proposed intervention is both effective and cost effective. This includes: - assessment of the degree to which an intervention will make a difference to behaviour, environments or systems.

	- the degree an activity intervenes in the causal process in order to eliminate, retard, maintain or accelerate the causal relationship.
Other Heart Foundation considerations	Does the activity: ◦ Align with the Heart Foundation core mission ◦ Does the Heart Foundation have the competence to deliver this work? ◦ Reach - Does the activity reach a large number of people? ◦ Impact – does the activity have a high impact on the people involved? ◦ Filling an important gap – do competitors or alternate providers fill any part of the gap already? ◦ Community building – does the activity help build and strengthen the communities in which the Heart Foundation works? ◦ Leverage – does the activity increase impact for other activities?

Table 5 builds on Table 3 by listing priority strategies for execution by the Heart Foundation. It lists only priority strategies for the Heart Foundation and assigns a star rating to each where:

XXXX = Highest priority

XXX = High priority

XX = priority

X = Moderate priority

Table 5: Priorities for Heart Foundation WA investment in cardiovascular disease prevention

Typology ↓ Method ↓	Prevention Pathway - Setting – Sector								
	Equity XXXX								
	. Rural and remote health. Aboriginal and Torres Strait Islander health. Aboriginal cardiac rehabilitation. low SES targeting through workplaces and public education.								
	Primary Prevention			Secondary Prevention			Tertiary Prevention		
	Tobacco Control	Healthy Eating	Physical Activity	Primary Care	Absolute Risk and integrated health checks	Cardiac Rehabilitation	Warning signs	Heart Failure	Tertiary care
Strengthening Individuals	**X** Advocate for cessation support	**XXX** Deliver community education as a component of social marketing	**XXX** Deliver community education and develop skills as a component of social marketing		**XXX** Raising individual awareness of risk factors and to 'know your numbers' and promote adherence to medications	**XXXX** Build patient awareness of cardiac rehabilitation Provide patient support and education resources	**XX** Build awareness of warning signs of heart attack		**XXX** Increasing compliance to medication
Strengthening Professionals	**X** Encourage and support health professionals to provide brief advice for smoking cessation	**XX** Develop and deliver professional guidance in healthy eating and obesity prevention	**XX** Develop and deliver professional guidance in providing brief advice on physical activity	**XX** Collaborate with Primary Health Networks to build skills for heart disease prevention	**XXX** Provide tools to support implementation of integrated health checks and absolute risk checks	**XX** Advocate for updated guidelines and resources for systematic implementation Build cardiac rehabilitation skills in doctors, health professionals and Aboriginal Health Workers	**X** Ensure key warning signs competencies in health professionals and medical receptionists	**XX** Advocate for updated guidelines and resources and their systematic implementation	
Strengthening Communities	**X** Advocate for comprehensive tobacco public	**XXX** Advocate for and lead comprehensive	**XXX** Advocate for and lead comprehensive physical activity			**X** Mobilise patients to advocate for cardiac rehabilitation	**XXX** Advocate for Government funding for		

	education campaigns	nutrition and obesity public education campaigns	public education campaigns Provide Heart Foundation Walking groups				public education on warning signs		
Improving living and working conditions	**XXX** Advocate for extending smoke-free places	**XXX** Advocate for and support healthy eating policies in workplaces, schools and communities	**XXX** Advocate for and support physical activity and sit less policies in workplaces, schools and communities Ensure a minimum 150 minutes per week of quality physical education for all children						
Implementing healthy macro-polices	**XXXX** Advocate for a strengthened Tobacco Act Advocate for real increases in tobacco tax	**XXXX** Advocate for a ban on advertising and promotion to children of junk foods and sugary drinks Advocate and support implementation and strengthening of the Health Star Rating System for food labels and related consumer education Promote taxation to reduce consumption of junk foods and sugary drinks and raise revenue for healthy eating	**XXXX** Implement the Healthy Active by Design initiative to integrate healthy urban design within planning policy Advocate for transport systems and policies that prioritise walking, cycling and public transport		**XXXX** Collaborate with the Primary Health Network and Aboriginal Health Services to ensure integrated health checks and absolute risk assessment	**XXXX** Advocate for and support equitable access to cardiac rehabilitation services for all eligible patients Advocate policy supports that ensure elimination of disparities experienced by Aboriginal and Torres Strait Islander heart patients	**XX** Advocate for introduction of a universal ambulance cover scheme	**XXX** Advocate for implementation of a systematic pathway for Heart Failure care Ensure equitable access to evidence based heart failure programs	**XXXX** Advocate for implementation of quality standards for acute coronary syndromes as endorsed by the Commission for safety and quality of Health Care

Scale for funding priority

XXXX = Highest priority; XXX = High priority; XX = priority; X = Moderate priority

Advocate for system support for prevention

- Ensure a stable funding base for prevention equal to 5% of the health budget   **XXXX**
- Support regular monitoring of health behaviours, biomedical risk factors and health system performance   **XXX**
- Advocate for increased Government funding for cardiovascular research   **XXXX**
- Support translation of research findings into practice   **XXXX**
- Fund the community-wide 'scaling up' and 'sustainability' of programs proven to be effective   **XXXX**
- Advocate for heart health in the policies of non-health key agencies, e. g. Transport, Agriculture, Treasury, Planning   **XXXX**

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8.0 APPENDICES

Appendix 1: - What works? Evidence table.

Evidence from The World Health Organization, National Heart Foundation of Australia, Global Advocacy for Physical activity (GAPA), APA, American Heart Association, ACE-Prevention etc

Table 6 **Primary prevention strategies** using grouped **Action Areas** as listed in Western Australian Health Promotion Strategic Framework 2012-2016 – starting upstream

Action Area	Priorities/ risk factors	Strategies/programs	WHO best buys, Heart Foundation Blueprint and GAPA	AHA Statement[55]	ACE-Prevention[56] for cost effectiveness
Health policy, legislation and regulation					
	Smoking	• Community (city, state, or federal) restrictions on smoking in public places[40] • Local workplace-specific restrictions on smoking • Stronger enforcement of local school-specific restrictions on smoking • Local residence-specific restrictions on smoking • Partial or complete restrictions on advertising and promotion of tobacco products[40] • Cigarette package warnings, especially those that are graphic and health related (I B) • Smoking bans in prisons[57]	WHO Best Buys[40] – very cost-effective ↓mortality in US study[57]	(I A) (I A) (IIa B) (IIa B) (I B) (I B)	not evaluated
	Nutrition	• Restrictions on TV advertisements for less healthful foods or beverages advertised to children.[40] • Restrictions on advertising and marketing less healthful foods or beverages near schools and public places frequented by youth.[40] • General nutrition standards for foods and beverages marketed and advertised to children in any fashion, including on-package promotion	WHO Best Buys[40] very to ?very cost-effective (more studies needed)	(I B) (IIa B) (IIa B) (I B)	Dominant - likely (salt limits in processed

		• Regulatory policies to ↓ specific nutrients in foods (e.g trans fats, salt, certain fats)[40] • Mandated nutrition fact labels/icons as mean to influence industry behaviour and product formulations		(IIa B)	food)
	Alcohol	• Advertising bans[40] • Licensing controls[40] • Breath testing[40]	WHO Best Buys[40] Very cost-effective quite cost-effective	not evaluated	Dominant - limited Very cost-effective – likely cost effective - likely
	Physical activity	• Urban design policy, legislation and regulation • Transport policies • School policies	Blueprint for an active Australia[58, 59] Global Advocacy for Physical Activity (GAPA)[50]	not evaluated	not evaluated
Economic intervention					
	Smoking	• Tax increase 30% • Higher taxes on tobacco products to reduce use and fund tobacco control programs[40]	WHO Best Buys[40] – very cost-effective	(I A)	Dominant - likely
	Nutrition	• Subsidy strategies to ↓ prices of more healthful food and beverages[40] • Tax strategies to ↑ prices of less healthful food and beverages[40] • Changes in both agricultural subsidies and related policies to create infrastructure that facilitates production, transportation, and marketing of healthier foods, sustained over several decades	WHO Best Buys[40] quite cost-effective	(I A) (IIa B) (IIa B)	Dominant – may be effective (unhealthy food tax 10%)
	Alcohol	• Tax increase 30% and volumetric tax • Raise taxes on alcohol[40]	WHO Best Buys[40] very cost-effective	not evaluated	Dominant - likely
	Physical activity	• Increase petrol taxes to ↑ active transport/commuting	Blueprint for an active Australia[59]	(IIa B)	not evaluated
Creating environments for living and working that support healthy choices Includes community development					
	Smoking	**Workplaces** • Comprehensive worksite wellness programs with nutrition, physical activity, and tobacco cessation/prevention components **Schools and communities** • Reduced density of retail tobacco outlets around homes and schools • Development of community telephone lines for cessation counselling and support services		(IIa A) (I B) (I A)	not evaluated
	Nutrition	**Schools** • multicomponent interventions focused on improving diet and physical activity. Includes: curriculum content, teacher training, school policies, PE program, healthy	WHO Best Buys[40] less cost effective	(I A)	

		food and beverage options, and parent/family component[40] • garden programs that include nutrition, gardening education and hands on skills • Fresh *free* fruit and vegetable programs for students **Workplaces** • Comprehensive workplace wellness programs with nutrition, physical activity and smoking[40] • ↑ availability of healthier food/beverage options and/or strong nutrition standards served, in combination with vending machines prompts, labels or icons to make healthier choices **Communities** • Increased availability of supermarkets near homes		(IIa A) (IIa A) (IIa A) (IIa B) (IIa B)	Not cost-effective – poor effectiveness (workplace fruit and veg interventions)
	Alcohol	• Restrict access to retailed alcohol[40] • ??Lisa has something in this area	WHO Best Buys[40] very cost-effective	not evaluated	not evaluated
	Physical activity	• Point-of-decision prompts to use stairs **Schools[40]** • multicomponent interventions focused on improving diet and physical activity. Includes: curriculum content, teacher training, school policies, PE program, and parent/family component ENREF_7 • ↑ availability and types of school playground spaces and equipment • ↑ number of PE classes and ↑ time in at least moderate activity, PE teachers at schools • Regular classroom PA breaks during academic lessons **Workplaces[40]** • Comprehensive workplace wellness programs with nutrition, physical activity and smoking • Programs that encourage activity and provide set times for physical activity during work hours • Improving stairway access and appeal, potentially in combination with 'skip stop' lifts • Adding or updated worksite fitness centres **Communities[40]** • Improved accessibility of recreation and exercise spaces and facilities (eg, building of parks and playgrounds, ↑ use of school facilities during non-school hours) • Improved land-use design (eg, integration and interrelationships of residential, school, work, retail, and public spaces) • Improved sidewalk and street design to increase active commuting (walking or bicycling) to school by children • Improved traffic safety	Blueprint for an active Australia[58, 60-65] Global Advocacy for Physical Activity (GAPA)[50] WHO Best Buys [40] ENREF_8_ENREF_8_ENREF_8 Supporting active transport quite cost-effective. Other strategies less cost-effective or not assessed	(IIa A) (IIa A) (I B) (IIa A/IIb A) (IIa A) (IIa A) (IIa B) (IIa B) (IIa B) (IIa B) (IIa B) (IIa B) (IIa B)	not evaluated

		• Improved neighbourhood aesthetics (to increase activity in adults) • Improved walkability, a composite indicator that incorporates aspects of land-use mix, street connectivity, pedestrian infrastructure, aesthetics, traffic safety, and/or crime safety		(IIa B) (IIa B)	
Raising public awareness and engagement					
	Smoking	• Sustained, focused media and educational campaigns to reduce smoking[40]	WHO Best Buys[40] very cost-effective	Either alone (IIa B) or large multi-component (I A)	
	Nutrition	• Sustained, focused media and educational campaigns, using multiple modes to promote ↑ consumption of healthful foods **or** ↓ consumption of less healthful foods and beverages	WHO Best Buys[40] very cost effective	Either alone (IIa B) or multi-component (I B)	Dominant – may be effective (fruit and veg promotion)
	Alcohol	• Drink drive mass media		not evaluated	Cost-effective - limited
	Physical activity	• Sustained, focused media and educational campaigns, using multiple modes to promote physical activity[40] • Shorter term community based media and education programs on multiple CVD risk factors • TravelSmart	Blueprint for an active Australia[66] Global Advocacy for Physical Activity (GAPA)[50] WHO Best Buys[40] very cost-effective	(IIb B) (IIb-B)	Dominant - inconclusive Cost-effective – may be effective
Targeted interventions Includes individuals and identified groups eg. ATSI, CALD, low SES, diagnosed <mark>or with known risk factors</mark>					
	Smoking	• Cessation aids • Counselling[40]	WHO Best Buys[40] quite cost-effective	not evaluated	Very cost-effective - sufficient
	Nutrition	• Voluntary salt limits • Multiple tailored mailed fruit and vegetable promotion • Offer counselling in primary care[40]	WHO Best Buys[40] less cost-effective	not evaluated	Dominant - likely Cost-effective to very cost-effective – limited Not cost-effective – poor effectiveness (individual fruit and veg, advice on salt, weight watchers, multi

					diet/PA/weight intervention)
	Alcohol	• Brief alcohol intervention GP (with or without telemarketing and support) • Offer brief advice for hazardous drinking[40]	WHO Best Buys[40] Quite cost-effective	not evaluated	Very cost-effective - sufficient
	Physical activity	• Pedometers • GP Green Prescription or internet intervention • GP referral • Offer counselling in primary care[40]	Blueprint for an active Australia[65, 67-69] Global Advocacy for Physical Activity (GAPA)[50] WHO Best Buys[40] less cost-effective	not evaluated	Dominant - sufficient Very cost-effective – limited Cost-effective - limited

Secondary and Tertiary prevention strategies and management effectiveness

Biomedical risk factor/ CVD disease	Strategies/programs		ACE-Prevention cost effectiveness
Hypertension and elevated cholesterol	• Community heart health program – may be effective • Polypill for >5% CVD risk • Low dose diuretics >5% CVD risk • Polypill $200 to ages 55+ • Calcium channel blockers (CCB) >10% CVD risk • ACE inhibitors >15% CVD risk • Dietary counselling for >5% CVD risk by GP/Dietician • Phytosterol supplementation >5% CVD risk • Statins >5% CVD risk • Statins and ezetimibe >5% CVD risk • Beta-blockers >5% CVD risk • CCBs >5% CVD risk • Ace inhibitors >5% CVD risk	Cardiac rehabilitation program ↓BP and total cholesterol (Taylor 2004) and is cost-effective (NHS)	Dominant Dominant Very cost-effective Very cost-effective Very cost-effective Very cost-effective Cost-effective Cost-effective Cost-effective Cost-effective Cost-effective Cost-effective Cost-effective
Obesity	• 10% tax on unhealthy food		Dominant Very cost-effective for

	• Gastric banding • Diet and exercise for overweight • Low fat diet		severe obesity Cost-effective
Diabetes	• Pre-diabetes screen and dietary advice and/or exercise physiologist • Pre-diabetes screen and metformin • Pre-diabetes screen and acarbose		Cost-effective Cost-effective Cost-effective
Chronic kidney disease	• Proteinuria screen and ACE inhibitors for diabetics • Chronic kidney disease screen and ACE inhibitors for non-diabetics age >25		Dominant Cost-effective
Depression	• Screen and group CBT to prevent adult depression • Individual or group CBT treatment for major depression • TCAs and SSRIs for major depression		Cost-effective Very cost-effective Cost-effective
Cardiac rehabilitation	• Exercise based with or without education and/or psychological intervention for stable or low to moderate risk heart failure and CHD • Education (e.g. healthy lifestyle) and/or psychological intervention (e.g. counselling to ↓stress) alone • Recommendation to use comprehensive program (exercise, education and counselling) (nhs, Taylor 2015)	↓26% relative mortality (Taylor 2004, NHS 2013) ↓hospitalisations (Taylor 2015) ↑health related quality of life (Taylor 2015) May improve quality of life Cost-saving (NHS 2013)	Very cost-effective
ATSI population groups			