Protecting and improving the nation’s health

Action on cardiovascular disease: getting serious about prevention

September 2016
Introduction

Cardiovascular disease affects around seven million people in the UK and is a significant cause of disability and death, affecting individuals, families and communities. The NHS spent about £6.8 billion on cardiovascular disease in 2012/13.

Although there has been a significant reduction in deaths from cardiovascular disease in the past 20 years, it remains the second highest cause of death in England and was responsible for 27% of all deaths (126,682) in 2014. A significant proportion of these deaths are premature: 25% in men and 17% in women under the age of 75. Within each clinical commissioning group or local authority, cardiovascular disease will account for around 1 in 4 of the total premature deaths before the age of 75.

NHS England’s ‘Five Year Forward View’, together with PHE’s publication ‘From evidence into action: opportunities to protect and improve the nation’s health’, make it clear that the system must ‘get serious about prevention’. Both reports highlight the relevance of prevention of cardiovascular disease as well as the need to work across the system and care pathways.

This document aims to highlight the ongoing impact of cardiovascular disease, provide an overview of PHE’s wide-ranging work in relation to cardiovascular disease and underline our key role in providing leadership and support to the NHS and wider partners. PHE is committed to continuing to develop this matrix of work to support local and national partnerships to reduce the burden of cardiovascular disease in England. The document is intended for those involved in the commissioning and provision of services for cardiovascular disease and its prevention, including clinicians, local authorities, service commissioners, public health specialists, the third sector and PHE staff.
Cardiovascular disease in England today – why we must improve

Deaths from cardiovascular disease have fallen in England but it remains responsible for about a quarter of deaths each year. Higher levels of obesity have also led to an increase in the prevalence of type 2 diabetes (with a further 15% increase expected by 2020). By 2022, the number of people with a higher than 20% risk of cardiovascular disease could rise from 3.5 million in 2010 to 4.2 million.\(^7\)

Cardiovascular disease can also have a serious impact on quality of life and cause considerable disability. Stroke survivors may lose their speech and have impaired mobility; those with peripheral arterial disease may lose a limb. The breathlessness and exhaustion of severe heart failure can preclude even minimal daily activities and all of these can prevent people returning to employment.

Cardiovascular disease is one of the conditions most strongly associated with health inequalities. Risk factors such as smoking, physical inactivity and obesity are greater in lower socio-economic groups and the burden of morbidity and mortality is disproportionately shouldered by the most deprived.\(^8\) CVD mortality rates vary markedly by levels of deprivation. People in the most deprived decile experienced under-75 mortality rates of 105 per 100,000 from cardiovascular disease compared with a rate of 59 per 100,000 in the least deprived decile in 2012-2014.\(^9\)

The Global Burden of Disease (GBD) Study 2013\(^10\) shows that cardiovascular disease accounts for more than 15% of total disability adjusted life years (DALYs) in England, the second largest disease burden in the country.

![Disability adjusted life years in England by cause](image)
Cardiovascular disease is an overarching term that describes a family of diseases with a common set of risk factors and that result from atherosclerosis (furring or stiffening of artery walls), particularly coronary heart disease, stroke and peripheral arterial disease. It also covers other conditions such as vascular dementia, chronic kidney disease, cardiac arrhythmias, type 2 diabetes, sudden cardiac death and heart failure. These conditions often share common risk factors or have a significant impact on cardiovascular disease mortality or morbidity.

The public health approach to prevention of cardiovascular disease cuts across all levels of prevention:

- **primary prevention**: designed to reduce the instances of an illness in a population and to reduce their duration
- **secondary prevention**: aimed at detecting and treating pre-symptomatic disease
- **tertiary prevention**: activities aimed at reducing the incidence or recurrences of chronic incapacity among those with symptomatic cardiovascular disease

A life course approach recognises the opportunities for health gains at each stage of a person’s life, and conversely, the impact poor health and inequalities have on the next life stage.

With activity at all three levels of prevention, PHE is adopting a population health systems approach across the life course. This encourages us to think of the components within a care pathway as a whole unit. Rather than focusing on individual parts of the system, we look at the overarching aim and how a care pathway in its totality might work, addressing issues such as bottlenecks that hinder the overall system’s operation.

**PHE’s role**

- review the evidence for what works in cardiovascular disease prevention
- develop evidence-based programmes that address the risk factors for cardiovascular disease
- work with partners to implement and evaluate effective programmes
- advocate effective prevention policies to improve population health
- work to tackle inequalities linked to cardiovascular disease
The key risk factors for cardiovascular disease

**Behavioural risks**
- Smoking
- High Cholesterol
- High blood pressure
- Diet
- Physical inactivity
- Harmful drinking

**Social and environmental factors**
- Employment
- Family history
- Poverty
- Housing
- Pollution

Non-modifiable risk factors include age, gender and ethnicity

- Every 10 mmHg reduction in systolic blood pressure significantly reduces the risk of major cardiovascular disease events, including average relative risk reductions of 20% for CHD, 27% for stroke, and 28% for heart failure.11
- For every 1 mmol/L decrease in total cholesterol, people can reduce their relative risk for CVD-related mortality by 24.5%, and by 29.5% for any CVD event.12
- Over 20% of all hypertension – a major risk factor for CVD – is linked to alcohol misuse. Only 1 in 5 people with hypertension are assessed for their alcohol use by their GPs.13,14
- Quitting smoking is linked to a 36% reduction in risk of all-cause mortality among people with coronary heart disease.17
- Meeting recommended physical activity levels reduces risk of CVD by 20-35%.16

11,600 AF-related strokes could be averted each year if everyone with AF at high risk of stroke received anticoagulation – 25% of people with AF are not currently on anticoagulation.15

101 cardiovascular deaths can be avoided per 1,000 familial hypercholesterolaemia patients (aged 30 to 85 years) who are treated optimally, when compared with no treatment.16
# The key interventions for cardiovascular disease

The next two pages highlight different individual and population level interventions and their impact on cardiovascular risk factors, as well as opportunities for risk detection and management in primary care. The interventions highlighted have a strong evidence base linked to risk reduction and improved outcomes.

## Cardiovascular Disease Prevention: Individual and Population Interventions

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<th>Cross-cutting Interventions</th>
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<th>The Opportunities</th>
<th>The Evidence</th>
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<tr>
<td>Brief interventions and referral in primary care</td>
<td>Overweight/Obesity</td>
<td>A quarter of men and women are obese. Many more are overweight</td>
<td>Weight reduction significantly reduces incidence of CVD</td>
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<tr>
<td>Brief interventions and referral in other settings</td>
<td>Physical Activity</td>
<td>A third of men and almost half of women are underactive</td>
<td>Being physically active reduces risk of CVD by a third</td>
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<tr>
<td>NHS Health Check, NHS Diabetes Prevention Program</td>
<td>Poor Diet</td>
<td>Over 65% - excess salt &amp; saturated fat and most have low fruit/veg intake</td>
<td>Poor diet is lead cause of early death and disability, much through CVD</td>
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<tr>
<td>Community wellbeing services/social prescribing etc</td>
<td>Smoking</td>
<td>20% of adults smoke – over 30% in deprived communities</td>
<td>Smoking causes 14% of CVD-related deaths</td>
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<tr>
<td>Place-based population interventions</td>
<td>Alcohol Excess</td>
<td>10.8 million men and women drink alcohol at harmful levels</td>
<td>Safe drinking substantially lowers risk of CVD</td>
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<td>Planning, licensing, marketing, active transport, healthy workplace, schools etc</td>
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<td>Political, legislative, commercial partnership etc</td>
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## Primary Prevention: Individual and Cumulative Impact of Multiple Risks

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Overweight/Obesity</th>
<th>Physical Activity</th>
<th>Poor Diet</th>
<th>Smoking</th>
<th>Alcohol Excess</th>
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<tbody>
<tr>
<td>Marked increase in risk of type 2 DM, hypertension, heart attack, stroke</td>
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<td>Marked increase in risk of heart attack, stroke, PVD, dementia</td>
<td>Marked increase in risk of type 2 DM, hypertension, heart attack, stroke</td>
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Additional impact of these risk factors on early death and disability from wide range of physical and mental health conditions.
Cardiovascular Disease Prevention: Risk Detection and Management in Primary Care

### The Interventions

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Opportunities</th>
<th>Evidence</th>
<th>Risk Condition</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>High BP detection and treatment</td>
<td>5 million undiagnosed – 40% poorly controlled</td>
<td>BP lowering prevents strokes and heart attacks</td>
<td>Blood Pressure</td>
<td>50% of all strokes &amp; heart attacks, plus CKD &amp; dementia</td>
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<tr>
<td>AF detection and anticoagulation</td>
<td>30% undiagnosed. Over half untreated or poorly controlled</td>
<td>Anticoagulation prevents 2/3 of strokes in AF</td>
<td>Atrial Fibrillation</td>
<td>5-fold increase in strokes, often of greater severity</td>
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<tr>
<td>Detection, CVD risk assessment,</td>
<td>85% of FH undiagnosed &amp; most people at high CVD risk do not receive statins</td>
<td>Behaviour change and statins reduce lifetime risk of CVD</td>
<td>High CVD risk &amp; Familial H/cholesterol</td>
<td>Marked increase in premature death and disability from CVD</td>
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<tr>
<td>treatment</td>
<td></td>
<td></td>
<td>NDH ('pre-diabetes')</td>
<td>Marked increase in Type 2 DM and CVD at an earlier age</td>
</tr>
<tr>
<td>Type 2 Diabetes preventive</td>
<td>5 million undiagnosed. Most do not receive intervention</td>
<td>Intensive behaviour change (eg NHS DPP) reduces T2DM risk 30-60%</td>
<td>Type 1 and 2 Diabetes</td>
<td>Marked increase heart attack, stroke, kidney, eye, nerve damage</td>
</tr>
<tr>
<td>intervention</td>
<td></td>
<td></td>
<td></td>
<td>Increase in CVD, acute kidney injury &amp; renal replacement</td>
</tr>
<tr>
<td>Diabetes detection and treatment</td>
<td>940k undiagnosed. 40% do not receive all 8 care processes</td>
<td>Control of BP, HbA1c and lipids improves CVD outcomes</td>
<td>Chronic Kidney Disease</td>
<td></td>
</tr>
<tr>
<td>CKD detection and management</td>
<td>1.2m undiagnosed. Many have poor BP &amp; proteinuria control</td>
<td>Control of BP, CVD risk and proteinuria improves outcomes</td>
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</tbody>
</table>

### Cross Cutting

1. NHS Health Check systematic detection of high BP, AF, NDH, T2DM, CKD, high cholesterol, CVD risk
2. System level action to support guideline implementation by clinicians
3. Support for patient activation, individual behaviour change and self management
Existing leadership, resources and support from PHE

PHE has a central role to play in influencing evidence-based national policies and providing guidance and tools to support effective intervention and implementation and help measure progress at both national and local levels. The examples shown here illustrate the breadth of action already taking place on cardiovascular disease (CVD) prevention.

Primary prevention

- PHE’s updated Local Tobacco Control Profiles are designed to inform commissioning and planning decisions to tackle tobacco use
- we have also published guidance to support local areas to provide smoking cessation support in mental health secondary care settings
- we are working with NHS England to roll out the Healthier You: NHS National Diabetes Prevention Programme
- the One You public health campaign aims to support adults across the country to avoid future diseases caused by everyday habits and behaviours
- we advise local authorities on developing robust nutrition initiatives

- PHE has published guidance to help those who must meet, or voluntarily adopt, the Government Buying Standards for Food and Catering Services
- PHE’s social marketing campaigns such as Change4Life and One You support individuals to improve their diet and increase levels of physical activity
- we review healthy eating messages including the Eatwell Guide and 5-a-day logo
- PHE has helped to develop resources for key sectors to increase physical activity, including ‘What works’ in schools and colleges guidance
- free e-learning resources for health professionals on physical activity are available (including a module on cardiovascular disease)
- Local Alcohol Profiles for England (LAPE) provide data for local government, health organisations, commissioners and other agencies to monitor the impact of alcohol on communities and to monitor the services and initiatives in place to prevent and reduce alcohol harm
- the Healthier Lives: Alcohol & Drugs tool provides data on prevalence and drug use risk for local authorities.
Secondary prevention

- PHE’s national [NHS Diabetic Eye Screening Programme](#) aims to reduce the risk of sight loss among people aged 12 and over with diabetes
- the [NHS Abdominal Aortic Aneurysm Screening Programme](#) (NAAASP) aims to reduce aneurysm-related deaths
- PHE provides national oversight of the [NHS Health Check programme](#)
- PHE delivers local [Blood Pressure Learning Action](#) events across the country to share latest evidence, tools and resources
- the [National Cardiovascular Intelligence Network](#) (NCVIN) provides a range of data and information on cardiovascular disease
- we lead and support partners in applying a population healthcare systems approach model to service planning and delivery e.g. the Blood Pressure, Atrial Fibrillation (AF) and Familial Hypercholesterolaemia Programmes
- we are supporting the development of a cardiovascular prevention pathway (to support NHS Right Care work) to incorporate hypertension, AF, high cholesterol, diabetes, pre-diabetes and chronic kidney disease
- PHE is leading a national AF, stroke and vascular dementia prevention programme in England

Tertiary prevention

- PHE’s specialised commissioning consultants support the NHS on commissioning specialised services including complex invasive cardiology
- PHE has partnered with NHS England to deliver a Healthcare Variation and Value Service. This includes the PHE led Atlas of Variation series
- We support and advise NHS Right Care in developing its commissioning for value products, to drive improvements in health service quality and efficiency. e.g. its CVD prevention optimal value pathway
- in partnership with third sector organisations, we have developed a series of [Can Do Better](#) resources to support management of key cardiovascular disease conditions

Reducing inequalities

- we provide [CLeaR assessment training](#) for two people engaged in tobacco control in each local authority to maximise the effectiveness of programmes at local level
- PHE has developed a standard operating procedure with prisons to rectify variable access to national AAA and diabetic eye screening programmes
- in partnership with NHS Improvement, PHE developed the Lester tool to support people with serious mental illness to manage cardiovascular conditions
PHE’s *Behavioural Insights team* (BIT) uses behavioural insights to design interventions with the potential to scale up using low resource, and robustly test interventions to enable sharing and generalisability of evidence. The team has provided advice on interventions, trials and policies to reduce calorie consumption, sedentary behaviour and smoking and has informed the smoking and childhood obesity strategies, all of which contribute to cardiovascular disease. Partners can commission or co-bid with PHE BIT, which can advise and develop further interventions, trials and evidence around reducing risk or provide policy advice using behavioural insights.

PHE will continue to run a range of public marketing campaigns that address a broad range of risk factors and early diagnosis of cardiovascular disease.
CVD work across our local centres

PHE centres are crucial in developing and implementing local CVD prevention programmes. This page provides a flavour of just some of the diverse actions taking place.

**PHE North East**
Facilitates the North East NHS Health Check/CVD Network, collaborating and sharing best/promising practice. We incorporate NHS Diabetes Prevention Programme (NHS DPP) into our Network and have strong links with Health Care Public Health and work closely with the Strategic Clinical Network (SCN) and local Director of Public Health/Consultant leads.

**PHE North West**
Worked with Champs Public Health Collaborative and other local partners to develop a blood pressure strategy and action plan and held atrial fibrillation workshops with the SCN.

**PHE West Midlands**
Pursued a partnership approach with SCNs and the Academic Health Science Network to form a local network looking at how to embed CVD prevention more effectively upstream.

**PHE South West**
Ran a series of webinars for local PH teams during 2015/16 which promoted use of data tools and evidence to improve outcomes, including sessions on NHS Health Check (NHS HC), tobacco control, obesity, nutrition and physical exercise.

**PHE Yorkshire & Humber (Y&H)**
The Y&H Regional CVD Prevention Strategy was developed by the SCN in 2015, led by PHE and NHS England. Five key areas identified for the SCN to support are hypertension, cholesterol management, atrial fibrillation, acute kidney injury and NHS DPP.

**PHE East Midlands**
Works closely with the SCN via the CVD prevention and diabetes prevention groups, jointly facilitating a hypertension workshop and contributing to the NHS DPP.

**PHE East of England**
Formed a Diabetes Prevention Liaison Group linking with the SCN, organising a workshop on Obesogenic Environment and Obesity workshops with the Clinical Senate.

**PHE London**
Runs the London NHS HC Network, aimed at facilitating, collaborating and sharing best practice on the programme and link with the NHS DPP London so that eligible clients can benefit from that programme.

**PHE South East**
Worked collaboratively with local partners to produce guidance that supports the development and improvement of NHS HC training, which has been published online and promoted nationally.
PHE’s population interventions

Population-level interventions are the most effective in tackling the structural causes of ill health, including CVD. PHE is leading and partnering with other organisations to deliver a range of place-based population interventions supported by national action to influence the CVD prevention agenda, as illustrated in the following examples:

**Alcohol**

We support local authorities to develop their understanding of how public health can contribute to and make use of the local alcohol licensing system to shape the drinking environment.

**Tobacco**

PHE has launched new data modelling tools to estimate youth smoking, commissioned by PHE and the National Institute for Health and Care Excellence (NICE) and modelled by the universities of Portsmouth and Southampton. The figures estimate youth smoking rates for every local authority, ward and local NHS footprint. PHE published our third independent evidence review on e-cigarettes in 2015 to consolidate the evidence base around this emerging technology. Our National Centre for Smoking Cessation and Training provides free training to thousands of health professionals who have supported 3.8 million smokers to reach the four-week quit standard and an estimated one million smokers to quit for more than a year.

**Diet and obesity**

We published ‘Sugar Reduction: The evidence for action’, a mixed methods review undertaken to better understand what drives sugar consumption, which identified eight actions that, if implemented together, could help reduce sugar intakes. Some of the work completed for the report involved partnership working with other organisations including West Sussex County Council and the Association for Nutrition. The Eatwell Guide and promotion of healthier catering helps reduce salt, saturated fat and sugars, promoting improved diet and health outcomes.

**Physical activity**

In 2014, PHE worked with more than 1,000 stakeholders to produce a physical activity framework for England, ‘Everybody Active Every Day’. This is an evidence-based, whole system approach to increasing physical activity and reducing inactivity across the population.

**Air pollution**

PHE is working to support national and local government to reduce the health impact of poor air quality by developing and disseminating evidence and engaging with local networks to increase awareness of the impacts of air pollution and how to reduce emissions and exposure.

**Immunisation**

PHE operates many population-wide immunisation programmes that give herd immunity and help protect people with CVD in later life. For instance, adults with existing CVD who receive the seasonal flu vaccination and immunisation against pneumococcal disease benefit from added protection, as their CVD makes them less resilient to infection.

**All Our Health**

Led by PHE’s Chief Nurse Directorate, this is a ‘Call to Action’ for all health and care professionals to embed and extend prevention, health protection and promotion of wellbeing and resilience into practice. This framework incorporates priority population, community and individual level interventions, including topics related to CVD prevention.
Local authorities and CVD prevention

Local authorities have a critical role to improve health and wellbeing of all communities through CVD prevention. PHE is working alongside local authorities on a number of programmes that cut across key areas of public health, including:

- **PHE provides technical advice to local authorities for local nutrition initiatives to support people to make healthier choices.**
- **PHE is working with local authorities and other partners to develop best practice guidance for commissioning weight management services.** PHE has committed to working with local government to develop a framework for a whole system approach for tackling obesity.
- **PHE’s Fingertips tool will allow local authorities and other partners to compare trends, export data and benchmark against other areas on levels of physical activity.**
- **PHE’s National Cardiovascular Health Intelligence Network (NCVIN) provides a host of data and modelling tools including the diabetes prevalence model and hypertension profiles.**
- **PHE’s Healthier Lives: Alcohol & Drugs tool provides data on prevalence and risk for drug use for local authorities to help reduce harm from alcohol and drugs at local level.**
- **PHE provides national oversight of the NHS Health Check programme, including key resources and guidance for local authorities.**

**NUTRITION**

**TOBACCO, ALCOHOL and DRUGS**

**DIABETES**

**PHYSICAL ACTIVITY**

**OBESITY**
Priorities for action in 2016-2017

This section outlines further actions that PHE will take in the coming year to tackle cardiovascular disease and work towards our vision for improved health and reduced inequalities.

What?

PHE recognises the importance of tackling cardiovascular disease and will demonstrate its commitment through providing system leadership and supporting the wider health system to take action.

How?

- develop an action plan setting out organisation-wide commitments to cardiovascular disease prevention
- determine mechanisms to measure PHE’s impact on cardiovascular disease prevention
- system leadership, including the development of a national network of primary care leaders in cardiovascular disease
- strategic partnership building
- in partnership with other organisations, PHE is enhancing the successful Heart Age tool, which provides a self-assessment of cardiovascular risk
- provision of intelligence and data through NCVIN
- an annual review of PHE’s work on cardiovascular disease for the next four years
- in collaboration with NHS Choices, PHE is developing and launching an online blood pressure tool to help people understand what their blood pressure numbers mean and direct them to relevant information.

What?

PHE will strengthen joint working between internal teams to better address cardiovascular disease outcomes.

How?

- aligning work to address cardiovascular risk factors with improving cardiovascular disease outcomes across PHE
- develop governance structures that effectively and efficiently deliver desired outcomes
- use the recent PHE internal stocktake exercise as an opportunity to signpost internal resources and contributions on cardiovascular disease.
What?
PHE will strengthen its work with external partners to deliver better cardiovascular disease outcomes

How?

• identify and develop mechanisms to ensure effective working with partners including clinical networks, the CVD Collaborative which provides cross-organisational leadership to enhance CVD outcomes, the third sector and local authorities to maximise opportunities for cardiovascular disease prevention
• optimise support for NHS England in areas where positive gains can be made, such as sustainability and transformation plans (STP), the General Practice Forward View and NHS Right Care
• use our position to influence the cardiovascular disease agenda and guide implementation of prevention interventions within STP footprint areas
• further develop the dementia profile, particularly around health inequalities and support the development of a global dementia observatory

What?
PHE will collaborate with external partners to develop work programmes, recommendations and guidance for risk factors where gaps currently exist

How?

• increasing early detection of people with undiagnosed or undetected cardiovascular disease risk factors or risk conditions such as diabetes, pre-diabetes, raised cholesterol, raised blood pressure etc
• driving improvements in the provision and uptake of effective interventions for people to reduce their risk of cardiovascular disease, such as increasing the number of people with atrial fibrillation who are prescribed anticoagulants
• improving the care and management of people with established cardiovascular disease, such as increasing the number of people with elevated cholesterol receiving lipid management treatments
References


4. Ibid


About Public Health England

Public Health England exists to protect and improve the nation’s health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

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