NICE National Institute for Health and Care Excellence

NICE impact

Cardiovascular disease prevention

September 2021

Contents

Insight from John Maingay

John Maingay is Director of Policy and Influencing at the British Heart Foundation.

"We've come a long way, but cardiovascular disease (CVD) still causes a quarter of all deaths in the UK, and it remains a major driver of health inequalities. But it doesn't have to be this way.

Cardiovascular health is determined in part by a range of modifiable factors. So, by focusing on CVD prevention, we have a tangible opportunity to close the health gap.

We can do this in 2 ways.
First by reducing the risk of developing CVD for millions more people with population-level interventions to create a healthy environment.

And second, by detecting, diagnosing, and effectively managing high-risk conditions as early as possible to help prevent acute cardiovascular events and associated long-term conditions."

Why focus on CVD prevention?

Cardiovascular disease (CVD) is a general term for all heart and circulatory diseases, including coronary heart disease, angina, heart attack, congenital heart disease, hypertension, stroke and vascular dementia. It's usually associated with a build-up of fatty deposits inside the arteries (atherosclerosis) and an increased risk of blood clots.

There are over 6 million people living with CVD in England (British Heart Foundation statistics) and it is responsible for 1 death every 4 minutes (Public Health England, Health Matters). CVD's combined cost to health, social care and the wider economy is estimated to be almost £16 billion per year.

There are several risk factors that increase a person's chances of developing CVD, such as the environment they live in, modifiable factors and high risk conditions, which are discussed in this report.

24,700
preventable CVD deaths in 2001

13,400
preventable CVD deaths in 2019

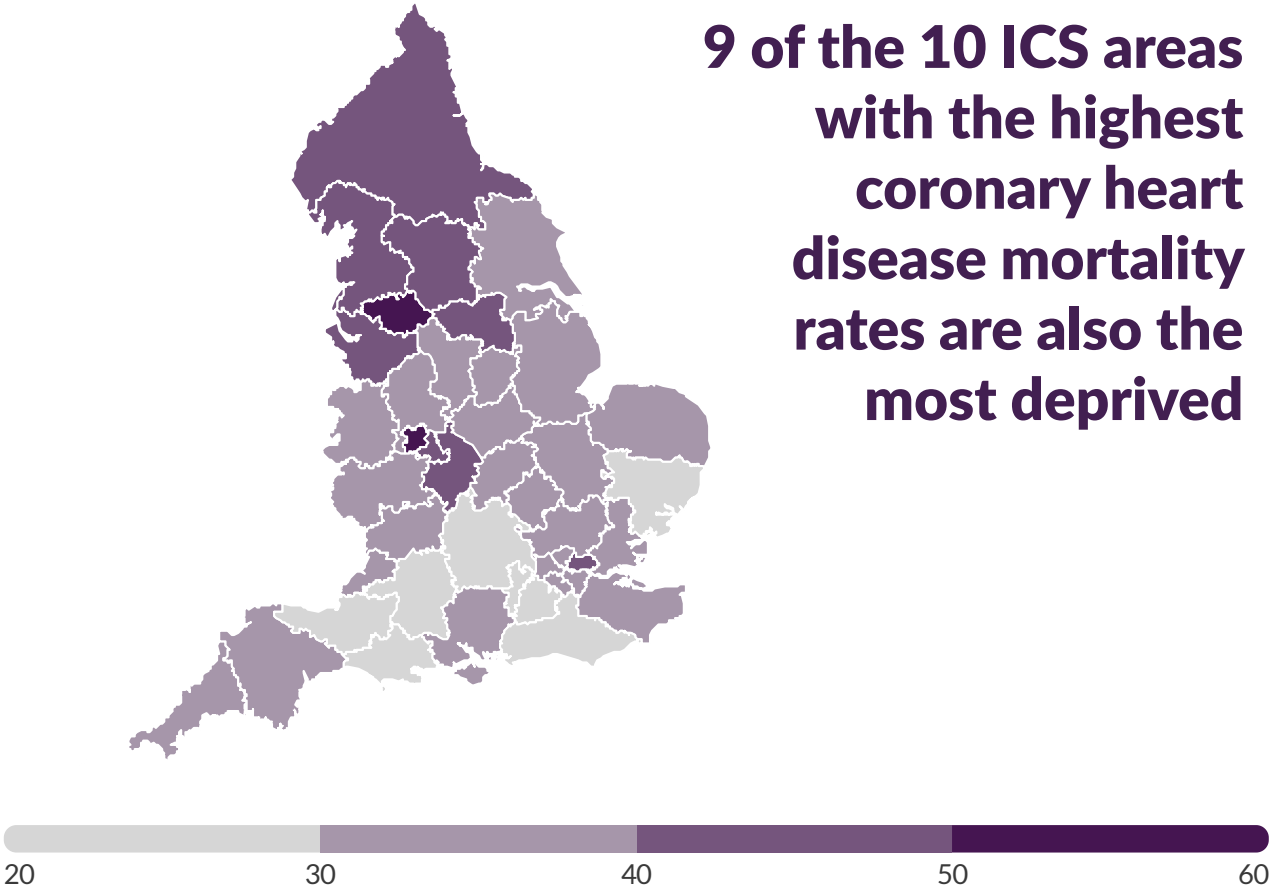
Source: Office for National Statistics avoidable mortality data, 2019.

In recent years, CVD prevention has improved and, through effective public health and primary prevention, CVD related deaths have fallen. However, there has been a slowdown in improvements in mortality rates in the last 10 years (Office for National Statistics changing trends in mortality).

The NHS Long Term Plan suggests that CVD is the biggest single area for potential life-saving changes during the next 10 years and prioritises improvements in CVD prevention and management.

We recognise throughout the report that the health and social care system is complex and there are many factors which influence changes in practice and outcomes, including increased uptake of NICE guidance. We work with partners including NHS England and NHS Improvement to support these changes.

Deaths from coronary heart disease in people under 75 in England by Integrated Care System (ICS) area (directly standardised rate per 100,000 people)



9 of the 10 ICS areas with the highest coronary heart disease mortality rates are also the most deprived

Source: Public Health England, Public health profiles, 2017 to 2019.

People who are from deprived communities or who have a learning disability or mental health condition are disproportionately affected by CVD.

Prevalence of risk factors for CVD such as type 2 diabetes and high blood pressure is higher in people from African and Caribbean family backgrounds. Also, the rate of coronary heart disease is higher in people from South Asian family backgrounds compared with people from white European family backgrounds. The reasons for this variation are likely to be complex and are not yet fully understood.

In this report we update the 2018 NICE impact report on CVD prevention, where new data are available, including data collected during the COVID-19 pandemic.

Living healthy lives

Most cases of CVD are preventable. CVD can be prevented through population based interventions and through individual lifestyle changes. We have produced guidance for the government, the NHS, local authorities, schools and workplaces that aims to create a healthier environment. We have also produced guidance aimed at healthcare professionals and members of the public to help them make healthier lifestyle choices.

Smoking

Smoking increases the risk of death from CVD. Smoking statistics from NHS Digital show that, in 2019 to 2020, there were over 120,000 hospital admissions for circulatory disease attributed to smoking. Between 2017 and 2019 there were almost 28,000 deaths from heart disease attributed to smoking, according to Public Health England's local tobacco control profiles for England.

6.1 **million adults smoked in 2019.**
Source: Public Health England, Public health outcomes framework, 2019.

We have published a range of guidance and advice on smoking and tobacco that aims to prevent people taking up smoking, reduce harm and help people quit.

Smoking habits vary across ages, genders and socioeconomic status. In 2019, the Office for National Statistics' adult smoking habits in the UK reported significantly higher rates of smoking among people who work in routine and manual jobs compared with people in intermediate or managerial positions.

Smoking rates in children and young people aged 11 to 15 have decreased. In particular, the number of people aged 15 who regularly smoke has decreased from 14% in 2008 to 5% in 2018. However, the proportion receiving lessons and information on smoking as recommended by NICE has also declined, according to NHS Digital's Smoking, drinking and drug use among young people.

Our guideline on smoking in acute, maternity and mental health services promotes smokefree policies. We recommend that, during the first face-to-face contact, healthcare professionals should record people's smoking status. We recommend that people who smoke should be encouraged to quit completely and be offered advice and support.

Smoking status, discussions about smoking and referral to smoking cessation services in hospital

	2016	2019
People who have a smoking status recorded	73%	77%
People who stated that they smoked	25%	24%
People who were asked if they would like to quit	28%	44%
Referrals to hospital smoking cessation services	20%	16%

Source: British Thoracic Society smoking cessation audit, 2019.

In secondary care, the proportion of people who have their smoking status recorded has increased but referral to smoking cessation services has decreased. Over the last 5 years, the budget allocated to a local authority for smoking cessation (excluding pharmacotherapies) has decreased by almost £200,000 on average, according to NHS Digital's Statistics on NHS stop smoking services in England. This decrease in budget may have affected the availability of smoking cessation services.

Effects of the COVID-19 pandemic on smoking cessation services

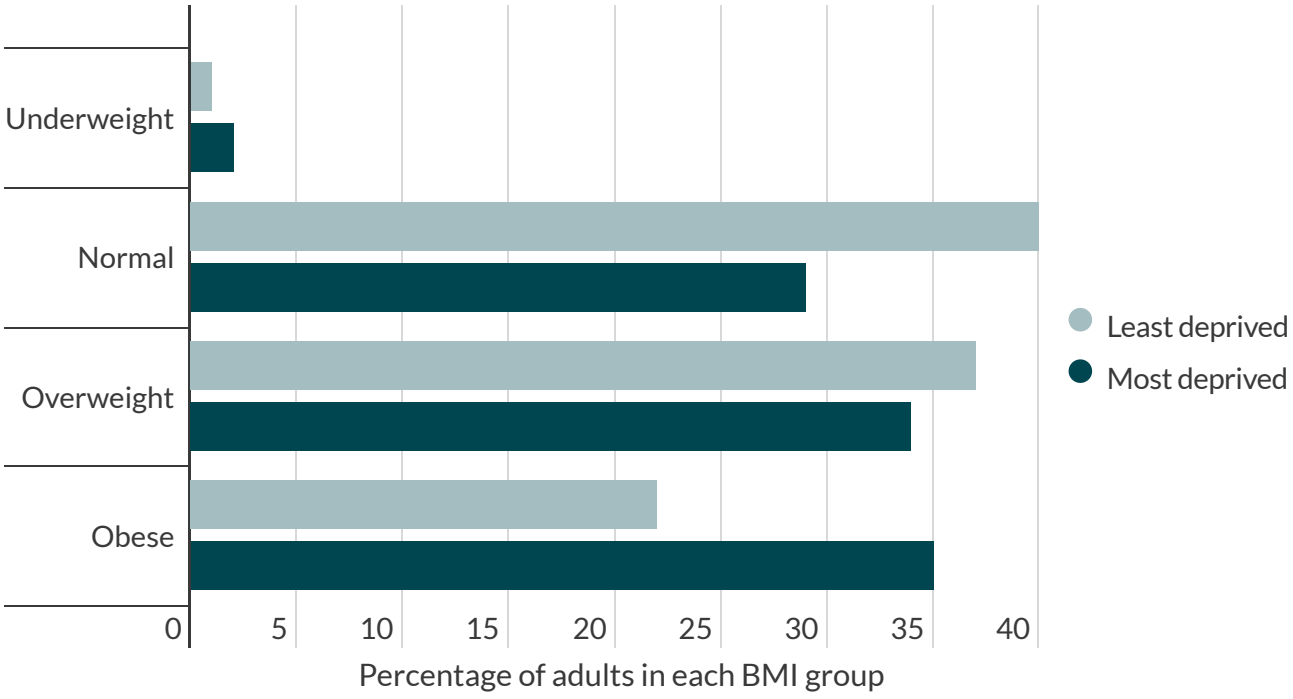
In some areas the use of innovative virtual consultations has increased the uptake of smoking cessation services during the COVID-19 pandemic. Hertfordshire stop smoking service has moved to supporting people through a telephone service with additional text message and email support. There have been over 500 additional referrals into the service.

Diet and obesity

Risk of developing CVD can be increased by dietary factors, such as excess salt, sugar and saturated fat consumption, and low fibre intake. Having a weight classed as overweight or obese can also impact on CVD risk. Between 1993 and 2001, there was a sharp increase in weights classed as overweight and obese, from 53% to 62% of all adults. The rate of increase has since slowed and the proportion of people with a weight classed as overweight or obese has stayed between 60 and 64%, according to NHS Digital's Health Survey for England.

In 2019, over 60% of adults in England had a weight classed as overweight or obese.
Source: NHS Digital, Statistics on obesity, physical activity and diet, 2020.

Body mass index of adults living in the most and least deprived areas of England



Source: NHS Digital, Health survey for England, 2019.

The National Child Measurement Programme reports that around 1 in 10 children starting primary school have a weight classed as obese. There has also been a steady increase in obesity in children in their final year of primary school, from almost 18% in 2007 to just over 20% in 2019. In the most deprived areas of the country, rates of obesity in both age groups were more than double those in the least deprived areas.

Addressing the issue of obesity is not just about the effort individuals make to lose weight. It is also about improving the environment we live in, the information we are given to make choices, the choices that we are offered, and the influences that shape those choices.

In our obesity prevention guideline, we recommend that healthy eating choices should be promoted and supporting information should be provided. In our cardiovascular disease prevention guideline, we set a policy goal to ensure children and young people are protected from all forms of marketing, advertising and promotions that encourage an unhealthy diet. One way we recommend this can be done is to ban advertisements for food and drink high in fat, salt or sugar before 9pm. The government's 2020 obesity strategy states that more businesses will be required to add calorie labels to the food that they sell and that foods high in fat, salt or sugar will not be advertised on television before 9pm.

The NHS digital weight management programme was launched in July 2021 to support adults who also have a diagnosis of diabetes or high blood pressure. The provision of mainstream weight management services varies across the country (NHS England's menu of evidence-based interventions and approaches for addressing and reducing health inequalities). Where they are provided, NHS England highlights that they are not always designed or targeted to meet the needs of population groups such as people with a learning disability or those with low incomes. This can affect access to and retention within these services.

Effects of the COVID-19 pandemic on dietary health inequalities

The National Institute for Health Research Applied Research Collaboration's East of England's interim report suggests that COVID-19, the 'lockdown' and social distancing measures put in place from March 2020 have amplified existing dietary health inequalities. People who are more secure financially have been able to spend time addressing and improving their dietary health. People who are struggling financially or in economic hardship have experienced worsening diets.

Physical activity

Frequent physical activity is associated with a decreased risk of developing CVD. In June 2019, we published a quality standard on physical activity: encouraging activity in the community. It covers ways in which people of all ages and abilities can be supported and encouraged to be physically active.

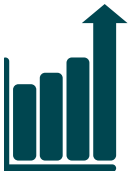
Around two thirds of adults aged 19 and over are physically active in line with the Chief Medical Officers' physical activity guidelines, according to Sport England's Active Lives Survey.

During the first national COVID-19 'lockdown', which started in March 2020, physical activities were restricted. People were encouraged to only leave their house once per day and only travel to work if they could not work from home. Sport England's Active Lives adult coronavirus (COVID-19) report indicates that the proportion of active adults was 7% lower in March to May 2020 compared with the same period in 2019.

Alcohol consumption

Regularly drinking too much alcohol can increase the risk of developing CVD. Our guideline on cardiovascular disease: risk assessment and reduction, including lipid modification recommends the benefits of changing modifiable factors, including reducing alcohol consumption.

According to NHS Digital's statistics on alcohol, in 2018 to 2019 there were over 350,000 hospital admissions where the main reason was alcohol. That's 19% higher than in 2008 to 2009.



20% increase

in alcohol-specific deaths between 2019 and 2020 in England

Source: ONS alcohol-specific deaths, 2021.

Public Health England's Wider impacts of COVID-19 on health monitoring tool shows that adults are drinking more since the COVID-19 pandemic began. In April 2020, 19% of adults were drinking at harmful levels compared with 12% in April 2019. The data also show that higher risk drinking is more prevalent in managerial, administrative, supervisory and clerical workers.

Our guideline on alcohol interventions in secondary and further education and quality standard on alcohol: preventing harmful use in the community recommend that schools and colleges include alcohol education in their curriculum. NHS Digital's smoking, drinking and drug use among young people in England 2018 shows a decline in the number of people aged 11 to 15 who have tried alcohol, from 62% in 1988 to 44% in 2018. This follows the general trend seen in attitudes towards alcohol, with fewer people in this age group considering it acceptable to drink.

Insight from John Maingay

"Although there have been major improvements in population health in recent decades, too many people remain at increased risk of developing CVD. We need to create an environment that supports health and gives everyone the opportunity to live healthy lives. This will help to reduce the risk of developing CVD for millions of people.

The Government's 2020 obesity strategy made some important commitments to creating a healthier environment, including pledging to introduce restrictions on the marketing and advertising of foods high in fat, salt and sugar, as well as investing in weight management services. But there's much more we need to do, and for long-term, positive impact on obesity in the UK, comprehensive action across multiple areas is needed. Further action to reduce smoking rates is also still needed. It is vital that the upcoming Tobacco Control Plan sets out bold, tangible and forward-thinking policy steps to achieve the government's Smokefree 2030 aim. This is especially important in population groups where smoking rates remain stubbornly high. Social prescribing also has great potential to improve the health and wellbeing of individuals in non-clinical community settings. These interventions need to be realised equitably, so that those with the greatest risk of developing CVD can benefit.

Despite the devastating impact of the COVID-19 pandemic, our long-term health challenges are likely to be unchanged. It remains important that we work to improve the environment that people live in, so that everyone has the opportunity for good health."

Diagnosis and management of 3 high-risk conditions

The NHS Long Term Plan aims to prevent 150,000 heart attacks, strokes and cases of vascular dementia over the next 10 years. The plan is to do this by improving the detection and treatment of high-risk conditions that increase CVD risk. The National CVD Prevention Programme has been set up to develop targeted interventions that concentrate on 3 high-risk conditions: atrial fibrillation, high blood pressure and high cholesterol.

To support primary care in understanding how many cases of these high-risk conditions are undiagnosed, under treated or over treated, NHS England and NHS Improvement commissioned a national audit called CVDPREVENT. Alongside partner organisations, NICE is part of the implementation steering group for this audit. The first report is due later in 2021.

High blood pressure – hypertension

People with hypertension often have no symptoms. According to the Health Survey for England 2019, 30% of men and 25% of women have hypertension. This includes 14% of men and 11% of women with untreated hypertension. By 2029, the National CVD Prevention Programme aims to diagnose 80% of people with hypertension and then treat 80% of those diagnosed to targets set out in NICE guidelines.

In people with diagnosed hypertension, NHS Digital's Quality and Outcomes Framework (QOF) 2019 to 2020 data shows that 67% of people under 80 and 82% of people over 80 achieved their clinic blood pressure target, as set out in our guideline on hypertension in adults: diagnosis and management.

Hypertension review clinics

A shared learning example from City and Hackney CCG details how pharmacists were trained to provide hypertension review clinics for people from Black African or Caribbean family backgrounds. NICE guidance was used to help improve uptake of NICE recommended treatment. Of the people who had a follow-up hypertension review, 56% had reduced their systolic blood pressure and 48% had reduced both their systolic and diastolic blood pressure.

Our guideline on hypertension was updated in 2019. This guideline lowers the threshold for starting antihypertensive drug treatment from a 20% or more 10-year risk of CVD, recommended in the 2011 guideline, to a 10% or more 10-year risk. More people are therefore eligible for treatment.

We also produced a patient decision aid to help people talk with their healthcare professional about hypertension, and decide what treatment is right for them. The impact of the COVID-19 pandemic may affect how and when this change is implemented.

Blood pressure monitoring at home

Home blood pressure monitoring has been set up through NHS @home to enable people to measure and share their blood pressure readings with their GP from their home. This has been important during the COVID-19 pandemic for people who are vulnerable to becoming seriously ill with COVID-19. It allows them to better manage their hypertension without having to attend GP appointments.

Home monitoring of blood pressure has been shown to reduce heart attacks, strokes and deaths.
Since October 2020, over 45,000 blood pressure monitors have been delivered to people's homes.
Early data from pilot areas indicates that the level of home-based blood pressure monitoring, measured by the number of readings submitted, is 3 times higher than pre-pandemic levels.

High cholesterol – hypercholesterolaemia

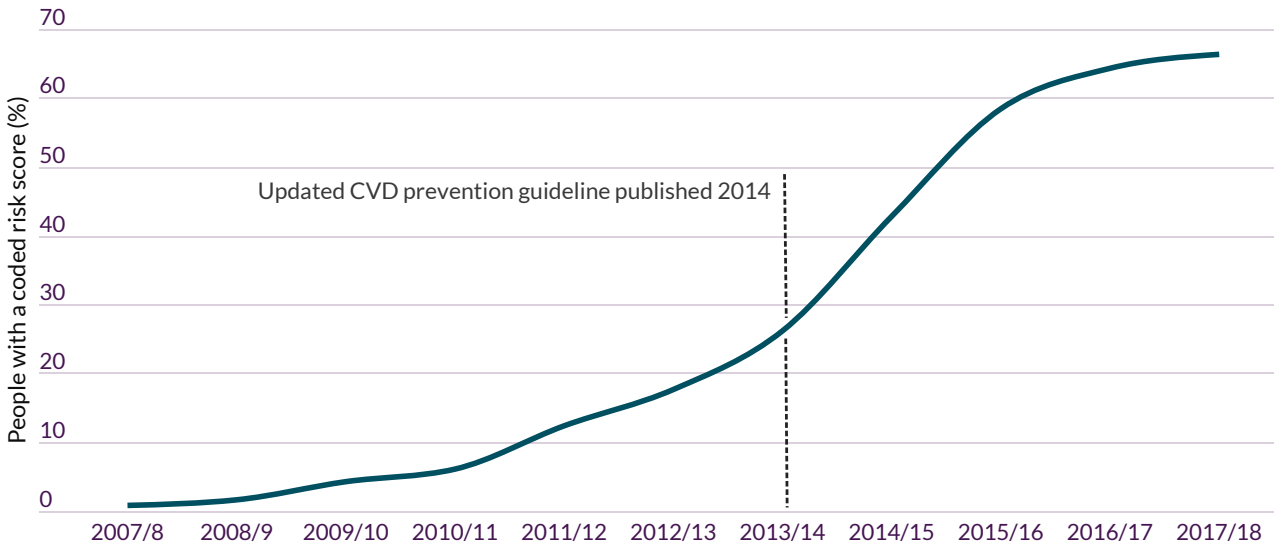
High cholesterol can be caused by many different factors, like having too much saturated fat in your diet or smoking, or it can be a result of other conditions, like kidney or liver disease. It can also be inherited, which is a condition called familial hypercholesterolaemia.

Around 40% of men and 45% of women have a diagnosis of high cholesterol, according to the Health Survey for England 2019.

In 2014, we published an updated guideline on cardiovascular disease: risk assessment and reduction, including lipid modification. It includes recommendations on identifying and assessing CVD risk and using statins to lower cholesterol.

Study results show that over 66% of people starting statin treatment in 2017 to 2018 had a coded risk score in their medical record, a significant increase from just over 4% in 2009 to 2010 (Pate et al. 2020 Impact of lowering the risk threshold for statin treatment on statin prescribing).

More people who started on statins have a coded risk score



Source: Pate et al. (2020).

The National CVD Prevention Programme is aiming for 75% of people aged 40 to 74 to have received a formal CVD risk assessment with a cholesterol test within the previous 5 years by 2029. Data on the uptake of NHS Health Checks, which include a formal risk assessment and cholesterol test, show that around half of those eligible have had the health check in that time. The NHS Health Check programme is based on NICE guidance.

Our 2014 guideline on cardiovascular disease recommended a reduction in the threshold for starting statins, to a 10% or more 10-year CVD risk score. This meant that many more people were eligible for treatment. We also recommend that the decision whether to start statin therapy should be made after an informed discussion between the clinician and the person about the risks and benefits of statin treatment, taking into account additional factors such as potential benefits from lifestyle modifications.

Results from Patel et al. 2020 Evaluation of the uptake and delivery of the NHS Health Check programme in England suggest that statin prescriptions increased with an increased 10-year CVD risk score. The study found that 16% of people with a 10-year CVD risk score between 10% and 19.9% were started on statins, increasing to 39% in those with a risk score of 20% or more.

"When it comes to statins, I often find that people are more inclined to try and make healthier lifestyle choices to reduce their cholesterol rather than start taking a new medication. There seems to be a lot of negativity around statin use and, ultimately, dietary changes can have a bigger impact."
GP Trainee, North West

Some people have high levels of the protein PCSK9, which causes high cholesterol and can lead to them developing heart disease early. PCSK9 inhibitors are a newer treatment for hypercholesterolaemia or mixed dyslipidaemia and work by targeting PCSK9 and reducing the levels of low-density lipoprotein cholesterol (LDL-C) in the blood.

In June 2016, we published a technology appraisal on alirocumab and a technology appraisal on evolocumab, both of which are PCSK9 inhibitors. We recommend their use for people who are unable to reach LDL-C goals with the maximum tolerated statin dose, or for people who cannot have statins. Prescribing levels for these medications have increased year on year since publication of the appraisals, but are still lower than expected. Prescribing trends for NICE appraised medicines can be found in the NHS Digital's Innovation Scorecard.

Atrial fibrillation

Atrial fibrillation (AF) is a common condition that occurs when there is a problem with the electrical impulses in the upper chambers of the heart. This causes an irregular and often abnormally fast heartbeat. Having AF increases the risk of blood clots in the heart, which can cause a stroke.

1.5 million people
are estimated to have atrial fibrillation in England
Source: Public Health England, 2020.

By 2029, the National CVD Prevention Programme is aiming for 85% of people with AF to be diagnosed and for 90% of people who have both a diagnosis of AF and have a high risk of stroke to be offered anticoagulant treatment.

In April 2021, we published updated guidance on atrial fibrillation: diagnosis and management. We recommend the CHA_2DS_2-VASc tool to assess stroke risk and that people with a score of 2 or more should have anticoagulants. NHS Digital's QOF data show that the proportion of people with AF who have been assessed using the CHA_2DS_2-VASc tool has remained steady at around 93% and that those with a score of 2 or more who are treated with anticoagulants has increased, from 81% in 2017 to 87% in 2020.

Results of a 10-year study of hospitalised atrial fibrillation-related stroke in England indicate that detection of AF has improved, with the prevalence of known AF increasing from 1.3% to 1.7% from 2006 to 2016. Use of anticoagulant therapies in people with a CHA_2DS_2-VASc score of 2 or more also increased in this time, from 48% to 79%. This has resulted in a reduction in hospital admissions for AF-related stroke.

A shared learning example from the Kent Surrey and Sussex Academic Health Science Network (AHSN) details how they increased anticoagulant therapy rates and prevented strokes by following 3 key focus areas:

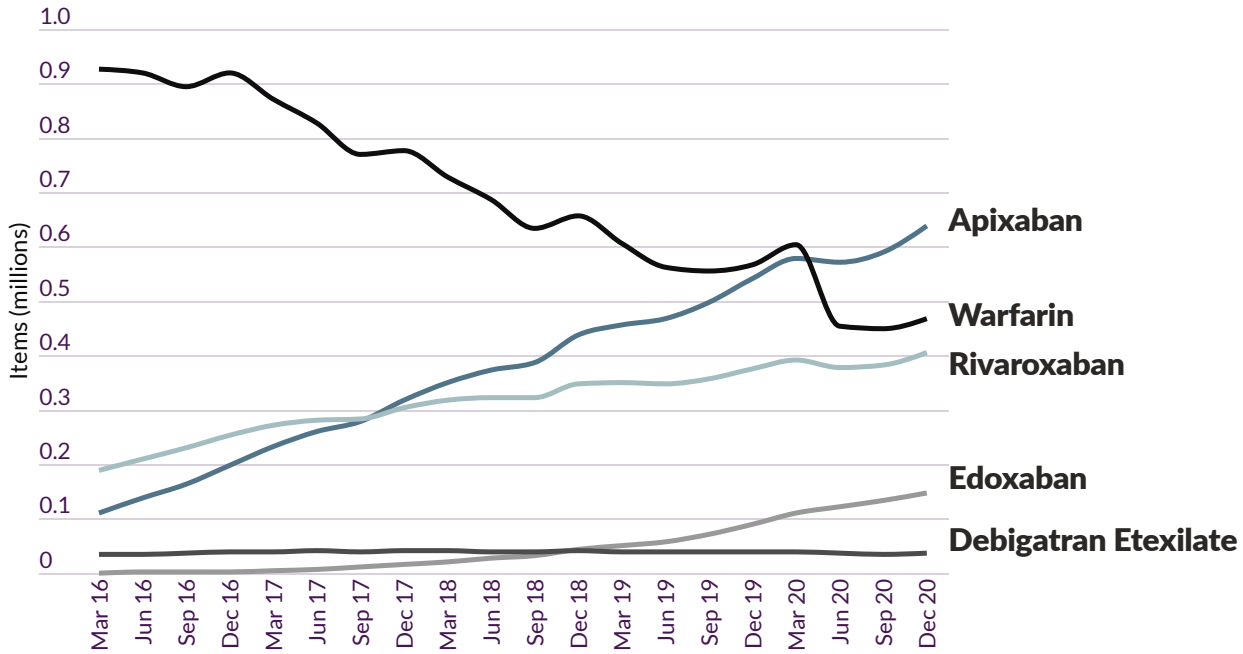
- Detect – checking for irregular pulse
- Protect – reviewing and giving anticoagulant therapy
- Perfect – optimising treatment and monitoring.

New technologies that use artificial intelligence are being rolled out to help detect and manage conditions like AF that increase CVD risk. In our medical technologies guidance on Zio XT for detecting cardiac arrhythmias, the Zio XT is recommended as an option for people with suspected cardiac arrhythmias who would benefit from ambulatory electrocardiogram (ECG) monitoring.

"I was given a Zio XT to help identify the root cause of my recent fainting, as the normal process to get an ECG was always too late – the fainting had happened and it was very likely my heart rhythm would be normal again by the time the ECG was completed. It was very easy to fit and remove. The results of the 14-day trial were known very quickly and I had a pacemaker fitted within 3 days of the results."
Zio XT user, 48

For a long time, warfarin was the most widely prescribed anticoagulant. People who take warfarin must regularly attend clinics to check their blood clotting time and if necessary have their dose adjusted. In response to the COVID-19 pandemic, some people receiving warfarin were switched to direct-acting oral anticoagulants (DOACs), which do not need regular blood tests. Those who continued taking warfarin therapy were considered for self-testing of blood clotting time.

Primary care prescribing of warfarin has decreased while DOACs have increased



Source: OpenPrescribing.net, EBM DataLab, University of Oxford, 2021.

"Changing from warfarin to one of the DOACs made my life more manageable. Warfarin management can bring a lot of instability to your life, especially when you are out of therapeutic range. Now I have a drastically reduced visiting regime, I didn't have to pay for transport and hospital parking costs. I believe the DOACs can not only help with patient adherence to their medication but also give them confidence".
Nick

When asked what the benefits of changing from warfarin to a DOAC were, almost three quarters of respondents noticed a difference in their quality of life. The main benefits stated were:

- fewer blood tests and less associated travels and anxiety
- less worry about diet
- less bleeding and bruising
- fewer episodes of AF.

Source: HealthUnlocked online forum, 51 respondents to questions posted by the Arrhythmia Alliance, 2021.

Insight from John Maingay

"Early detection and treatment of CVD can help people live longer, healthier lives. But too many people are still living with undiagnosed conditions that significantly increase their risk of CVD, such as high blood pressure, raised cholesterol, and AF.

In 2019 the NHS Long Term Plan committed to preventing 150,000 heart attacks, strokes, and dementia cases in England by 2029. Improving the diagnosis and treatment of high-risk conditions is central to this aim.

The COVID-19 pandemic has meant that we are now in an entirely different position to where we were when the Long Term Plan was drafted, and emerging insight appears to suggest that the detection and diagnosis gap has increased. The COVID-19 pandemic has necessitated a shift to 'digital first' healthcare. This has had a significant impact on the detection of high-risk conditions, which largely relies on in-person health checks and opportunistic identification during routine appointments.

It is important that in-person detection and diagnosis efforts resume as soon as it is safely possible and services should consider innovative approaches where appropriate, like home blood pressure monitoring.

Digital and remote health interventions can offer people a more convenient and better experience of healthcare. But too many people are still locked out. 'Digital first' healthcare risks excluding those without digital access or skills. It is important that efforts are made to ensure that everyone can access the care they need, and that alternative solutions are offered where necessary, so that digital healthcare does not create or perpetuate health inequalities."

What is NICE doing next?

NICE engaged with the following external stakeholders to identify implementation challenges and available support across the healthcare system while developing this report:

- NHS England and Improvement
    - CVDPrevent team
    - Long Term Plan team
    - Accelerated Access Collaborative (AAC) Lipid Management Working Group
- Public Health England
- Regional CVD prevention boards
- Academic Health Science Networks (AHSNs)
- British Heart Foundation

There is a lot happening in the area of CVD prevention, at all levels. Stakeholders identified hypertension, atrial fibrillation and cholesterol as the key priority areas for CVD prevention, with specific focus on tackling inequalities in detection, management and outcomes. Effective implementation of NICE guidance will help to address this. To help the wider system address these priority areas NICE will:

- continue to engage with all external stakeholders, including patient groups, during the development of the following key CVD prevention guidelines:
    - Hypertension in adults: diagnosis and management (update)
    - Cardiovascular disease: risk assessment and reduction, including lipid modification (update)
    - Weight management: preventing, assessing and managing overweight and obesity (update)
    - Tobacco: preventing uptake, promoting quitting and treating dependence (update)

- publish guidance recommending the novel anti-cholesterol drug inclisiran for people with primary hypercholesterolaemia or mixed dyslipidaemia who have already had a cardiovascular event such as a heart attack or stroke. NHS England have said that this drug could save about 30,000 lives within a decade.

- engage with NHS England and Improvement to support:

    - the quality improvement work of CVDPrevent by having NICE representation at the CVDPrevent audit steering group and considering how NICE can use the data that the audit will provide.

    - the work of the Accelerated Access Collaborative (AAC) through membership of the Rapid Uptake Product (RUP) working group for lipid management and any future CVD prevention related products.

- when engaging with local and regional systems and partners, for example Integrated Care Systems (ICSs) and AHSNs, take the opportunity to:

    - provide guidance and advice on the use of related NICE guidance

    - advise on how NICE products can support a population health management approach to CVD prevention

    - support local action on health inequalities and obtain intelligence on where NICE can best add value.

- work with the British Heart Foundation to explore further opportunities to engage with their developing work on health inequalities.

- strengthen our approach to considering health inequalities in all we do and ensure we are providing support to the health and care system, where we can best add value. See our new strategy for 2021 to 2026 for more information.

We would like to thank John Maingay for his contributions to this report.
We would also like to thank the policy team at the British Heart Foundation, NHS England and Improvement, Public Health England, the Academic Health Science Networks, Arrhythmia Alliance and Diabetes UK for their input.

Published September 2021

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