CVD prevention during and after the COVID-19 pandemic

Guidance for integrated care systems

Community wide whole-system working that extends beyond the NHS is required to develop and deliver a comprehensive system-level cardiovascular disease (CVD) prevention plan that addresses the current and future impact of COVID-19 on CVD risk-factor management and health inequalities. This document sets out pragmatic guidance for starting or recommencing CVD prevention programmes during the COVID-19 pandemic. It is aimed at individuals and teams within integrated care systems (ICS), sustainability and transformation partnerships (STPs) and clinical commissioning groups (CCGs) who are responsible for planning and/or delivering CVD prevention programmes.

December 2020

Executive summary

The challenge

- Cardiovascular disease (CVD) is one of the leading causes of death and disability in the UK but is largely preventable through healthy lifestyle choices and detection and management of risk factors such as hypertension, atrial fibrillation (AF) and high cholesterol. Cardiovascular risk factors are also associated with an increased risk of dementia.
- The COVID-19 pandemic has negatively affected CVD prevention:
  - CVD risk factors are often picked up opportunistically during face-to-face contacts with healthcare professionals, but these interactions have significantly reduced during the pandemic.
  - New diagnoses of CVD and prescribing of new cardiovascular medications have reduced in the UK, and a Danish registry study suggests new diagnosis of AF reduced by nearly half.
  - Reviews for people with known CVD risk factors have been delayed, potentially reducing the proportion of people receiving optimal therapy.
  - Lockdown has negatively affected healthy behaviours such as activity levels and diet for some people.
  - Existing health inequalities have been exacerbated.
  - During the peak of the pandemic, there was a 40% reduction in hospital admissions in England for acute coronary syndrome and a 20% reduction in stroke admissions.
- Lost opportunities to detect and optimise CVD risk factors during the pandemic will inevitably lead to an increase in future CVD events and in the long term will lead to the increase in the diagnosis of CVD-related dementia.
  - Disruption of routine care for people with hypertension over the 9 months to date could result in around 12,000 additional strokes, myocardial infarctions or deaths over the next 3 years.

Systems urgently need to develop plans to restart and amplify CVD prevention initiatives.

Key system-level recommendations

- **Make CVD prevention a system ambition**: Work with partners, citizens and communities to develop and implement a whole-system strategy that promotes uptake of healthy behaviours and improves detection and management of risk factors such as AF, hypertension, high cholesterol and type 2 diabetes. Identify an individual to lead on this work on behalf of the system, working with all organisations, including public health teams and primary care leaders.
- **Cross-sector working**: Set up a cross-sector board for CVD prevention at integrated care system (ICS) level, involving partners from different organisations and sectors to develop explicit locally relevant shared goals and encourage ICS-level commitment to achieve the ambitions for CVD set out in the NHS Long Term Plan.
- **Intelligence and evaluation**: Use GP practice- and primary care network-level data to identify local issues. Use national data, e.g. PHE Fingertips and CVDPrevent, to identify variation and best practice.
- **Link with other strategies**: Ensure the CVD prevention plan is clearly linked back to the system's Health and Wellbeing Strategy and Integrated Stroke Delivery Network (ISDN) stroke prevention strategies. Act on the eight urgent actions in the NHS England Phase 3 letter.
- **Healthy behaviours:** Work with local government partners on plans to address lifestyle issues such as stopping smoking, improving diet and increasing activity levels.
- **CV risk factors:** Encourage the restart of NHS Health Checks and other structured reviews to detect CV risk factors, prioritising invitations to those most at risk and tailoring invitations to increase uptake.
- **Inequalities:** Address barriers to CVD prevention for all communities by working with public sector and voluntary organisations and directly engaging communities and community leaders, including those in difficult-to-reach and vulnerable groups, in the planning and delivery of services.
- **Governance and reporting**: Agree a clear governance and reporting structure, with regular review of metrics and key performance indicators meaningful to healthcare professionals, organisations and citizens. Use health equity audits to identify whether a strategy is meeting inequality goals.
- **Shared learning:** Encourage sharing of good practice and ideas to spread innovation and reduce variation. Consider how the system can learn from events such as potentially preventable strokes or missed opportunities to intervene.

The main document provides further detail on these recommendations and specific actions.

Questions for system leaders

1. Do you know how many cardiovascular disease (CVD) checks (NHS Health Checks and structured long-term condition [LTC] reviews) have been missed across your local system since the start of the COVID-19 pandemic?
2. Do you understand the likely impact of the COVID-19 pandemic on the risk of future CVD events for your population?
3. Do you understand the contribution of health inequalities to CVD within your population and how these can be addressed?
4. What steps will you take to restart and amplify CVD prevention initiatives across your system?
5. How will you maximise the use of data and intelligence to inform your plan?
6. How will you engage with communities and what tailored resources will you require for engagement?
7. What quantified goals will you set for CVD prevention over the next 12 months?
8. How will you ensure you achieve them?
9. What indicators will you use to measure progress, report to your public and hold yourselves to account?

1. The importance of cardiovascular disease prevention

The impact of cardiovascular disease

Cardiovascular disease, such as stroke, coronary heart disease and myocardial infarction (MI), is a significant, preventable cause of death and disability in the UK. One in every four premature deaths are attributed to CVD, and CVD risk factors contribute to the subsequent development of vascular dementia. CVD is intrinsically linked to health inequalities with the risk of death from CVD in the most deprived 10% of the population being almost double that of the least deprived 10% of the population. Those from ethnic minority groups are at a greater risk of CVD.

Behavioural risk factors

Smoking is a major preventable cause of CVD. It is a driver of health inequalities and remains the leading modifiable risk factor for preventable premature death. The cardiovascular (CV) risks associated with smoking increase with the amount smoked and the duration over which an individual has smoked. In 2013, the European Cardiology Society (ESC) reported that smoking increases the risk of heart disease and stroke fivefold in people younger than 50 years and doubles the risk in the over 50s.[1]

Obesity is a public health concern, as it is linked with reduced life expectancy and risk factors for chronic diseases. In the UK, about two-thirds of adults are overweight and half of those are obese, while one in three children leaving primary school are already overweight and one in five is obese.[2] Obesity is more common in people living in deprived areas: children in the most deprived parts of the UK are twice as likely to be obese as those living in the richest areas.[2] Obesity is also common among people with serious mental illness whose life expectancy is 15–20 years less than that of the general population, with CVD being the most common cause of their premature death. Some people from ethnic minority group are susceptible to obesity-related diseases such as type 2 diabetes at a lower weight status than white populations.[2]

Management of behavioural risk factors is a critical part of any CVD prevention strategy. Achieving and maintaining a healthy weight can result in a reduction in blood pressure (BP): 5–20 mmHg per 10–14 kg weight loss. A healthy balanced diet is critical to maintaining a healthy weight, and dietary factors, such as salt and saturated fat intake, also influence CV risk, independent of their impact on weight. Studies have shown that a low sodium diet can lead to a significant reduction in BP, with greater impact in people who have hypertension.[3] As well as supporting maintenance of healthy weight, regular exercise can also reduce BP and cholesterol levels.

NHS systems need to work with local government partners on plans to address lifestyle issues such as stopping smoking, improving diet and increasing activity levels. Influencing behavioural risk factors is important for preventing disease, reducing treatment required and delaying the need for care.

## Atrial fibrillation, Blood pressure, Cholesterol (ABC)

Cardiovascular disease is a priority within the NHS Long Term Plan, with a clear ambition to prevent 150,000 strokes, heart attacks and cases of dementia over the next 10 years.[4] Each NHS system should know the contribution expected from them to achieve this national target. To help achieve this, the National CVD Prevention Senior Leadership Forum developed a set of CVD ambitions[5] that focus on improved detection and management of three high-risk conditions for CVD – atrial fibrillation (AF), BP (hypertension) and high cholesterol - the 'ABC' (Figure 1). Tackling these will be important but will not be sufficient. Systems will need a wider, more comprehensive plan.

Figure 1. Public Health England's cardiovascular disease ambitions.[5]
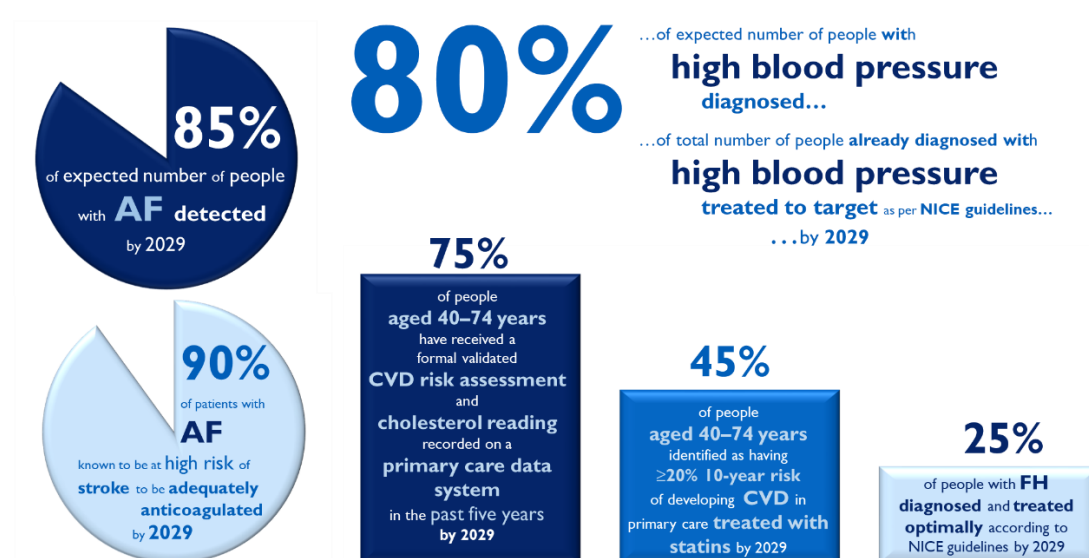
Despite improvements in the past decade, CVD continues to be the highest contributor to preventable deaths in the UK (Figure 2).[6] It has a strong association with health inequalities, with higher prevalence in areas of higher socioeconomic deprivation, as well as in ethnic minority groups and those with severe mental illness. Cardiovascular disease is the largest contributor to the gap in life expectancy between those in the most and least deprived quintiles in the UK.

Figure 2. Top 10 causes of total number of deaths in 2019 and percent change 2009–2019, all ages combined.[6]
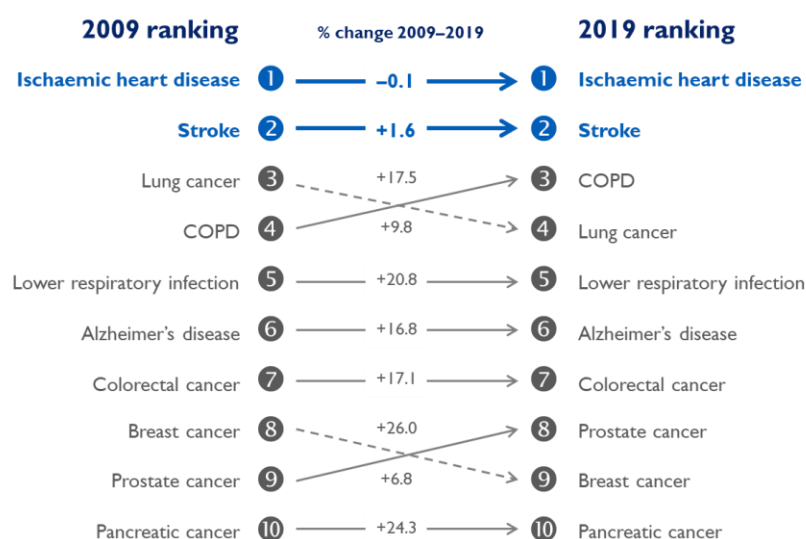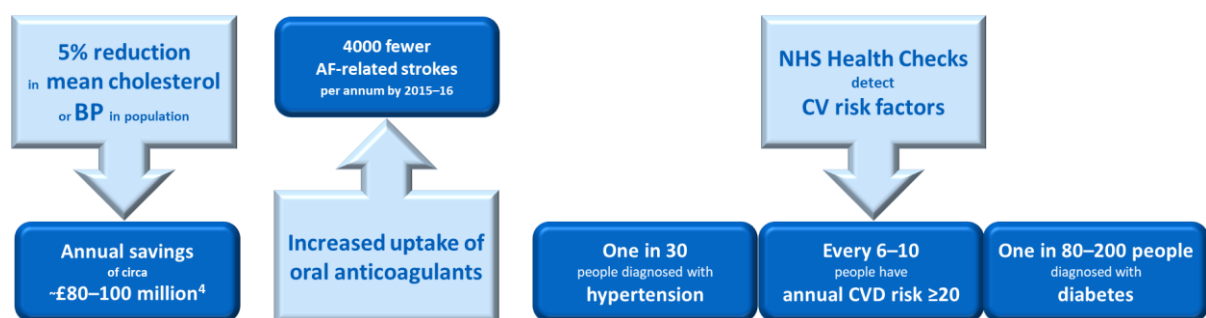
The effectiveness of CVD prevention

Daily habits and actions powerfully affect the risk of CVD in general and coronary heart disease (CHD) in particular.[7] Regular physical activity, sound nutrition, weight management and not smoking cigarettes have all been demonstrated to significantly reduce the risk of CVD,[7] and targeting multiple modifiable risk factors is more effective than targeting one.[7]

- In two large cohort studies, individuals who followed a cluster of *these lifestyle practices achieved risk reductions of >80% for CVD and >90% for diabetes*.[7]
- In a study from 2006 of 2,183 incident cases of non-fatal myocardial infarction and fatal CHD, men at low risk for five lifestyle factors (healthy diet, moderate-to-low alcohol consumption, exercising regularly, managing weight and not smoking) had a lower risk of CHD (relative risk 0.13 [95% confidence interval (CI) 0.09 to 0.19]) compared with men who were at low risk for no lifestyle factors.[8] Overall, *62% of coronary events in this cohort may have been prevented with better adherence to these five healthy lifestyle practices.* Among men taking drugs for hypertension or hypercholesterolaemia, *57% of all coronary events may have been prevented with a low-risk lifestyle*. Compared with men who did not make lifestyle changes during follow up, those who adopted ≥2 additional low-risk lifestyle factors had a 27% lower risk of CHD.
- A recent study from the UK found that increased numbers of unhealthy lifestyle factors were associated with a higher risk of incident AF.[9] Lack of regular exercise was the most powerful factor to be associated with a higher risk of AF as a single factor, with an adjusted hazard ratio of 1.11. For two factors combined, current smoking with heavy drinking, lack of regular exercise with heavy drinking, and lack of regular exercise with current smoking were associated with 6%, 15% and 20% higher risks of AF, respectively, and a cluster of three of these unhealthy lifestyle components was associated with a 22% higher risk of AF. These findings support the promotion of a healthy lifestyle that addresses multiple risk factors to lower the risk of new-onset AF.

Targeted CVD prevention initiatives directly reduce health inequalities and are highly cost effective in preventing CV events. A 2011 modelling exercise showed that an intervention that achieved even a modest population-wide reduction in any major CV risk factor would produce a net cost saving to the NHS, as well as improving health (Figure 3).[10] A UK study showed an association between an increase in oral anticoagulant uptake and a decline in AF-related strokes in England between 2006 and 2016 (Figure 3).[11] NHS Health Checks are a systematic opportunity to detect CV risk factors in those who attend (Figure 3). For every four NHS Health Checks, one person is found to be at risk of CVD or have high BP or obesity. For every three checks, one person is identified to have an abnormal cholesterol result.[12]

'Size of the prize' factsheets have been produced by NHS Health Checks. These illustrate the improvement opportunities for CVD prevention in each area.

Figure 3. Effectiveness of CVD prevention.[10-12]

The effect of the COVID-19 pandemic on CVD and health inequalities

Reduction in CVD risk factor detection and treatment reviews
The NHS urgently needs to address CVD prevention as part of the response to COVID-19. Many CVD risk factors are picked up through standard face-to-face primary care appointments, and these have been significantly reduced during the pandemic. NHS Health Checks were also paused for several months.

A recent UK study in a deprived urban population showed a 43% reduction in new diagnoses of CVD between March and May 2020 and a 30–52% decrease in the prescription of new CV medications during the same period.[13] For AF, a Danish study showed a 47% drop in registered new-onset AF cases during the national lockdown. Patients with undiagnosed AF are likely to have poorer outcomes than patients in whom AF is diagnosed and managed according to evidence-based guidelines.

A 2015 UK study highlighted that the timely achievement of BP targets and regular follow up may be an important factor in minimising the risk of adverse CV outcomes.[14] Delays of more than 6 weeks before uptitration of antihypertensive medication after systolic BP elevation and delays of greater than 11 weeks before BP follow up after uptitration of antihypertensive medication were associated with an increased risk of an acute CV event or death.

Evidence shows that every month of disruption to proactive hypertension management and intensification of medication where needed will likely result in additional acute CV events. NHS England modelling projections have estimated that a 9-month period of disruption to the delivery of routine care for those diagnosed with hypertension could result in around 12,000 additional acute CV events (stroke and heart attacks) or deaths over 3-year follow up compared to what might have been expected from pre-COVID-19 levels.[14, 15]

Effect of 'lockdown' on cardiovascular health

Social distancing measures such as the partial lockdown may have had a negative impact on the CV health of the population.[16] Limited social interactions increase the risk of CVD itself.[16] During lockdown, people have an increased likelihood of depression, poor diet, being sedentary and increased BP.[16] Such effects are liable to be most pronounced in those from poorer socioeconomic backgrounds, who are more likely to lose jobs and less likely to have gardens in which to exercise.[16] A rapid evidence review found that people who drank the most alcohol prior to lockdown are more likely to be drinking alcohol more often and in greater quantities.[17] The review also found that although some groups have continued to be physically active during the pandemic, those who were least active before lockdown are finding it harder to take activity.

It has been well documented that fewer patients presented with heart attack and stroke during the early phase of the pandemic. Late treatment or no treatment for these conditions will negatively affect disease outcomes.

Effect of CVD risk factors on COVID-19 outcomes

Patients with CVD and related comorbidities are more likely to be severely affected by COVID-19 and more likely to have poor outcomes.[18] Patients with severe COVID-19 have high rates of CVD and related comorbidities, including hypertension, diabetes, CVD/coronary artery disease (CAD), obesity and heart failure (Figure 4).[17-22] In Wuhan, China, approximately 50% of patients with COVID-19 had one or more comorbidity, rising to 72% in patients admitted with severe COVID-19 infection.[18, 23] Data from China also revealed a fivefold higher risk of mortality (10.5%) in patients with COVID-19 and CV comorbidities.[18, 24] Figure 5 shows the differences between rates of deaths involving COVID-19 between individuals with and without CV comorbidity in the UK.[25] A recent analysis from the UK found that hypertension was associated with a higher risk of mortality up to the age of 70 years but a lower risk above the age of 70.[26]

Effect on cardiovascular events

Not only do CVD comorbidities contribute to worse outcomes from COVID-19, but a considerable proportion of patients with COVID-19 may develop cardiac injury.[27] Long-term effects are anticipated in patients who survive COVID-19 infection as the pandemic continues.[28] Overall, about 80% of patients with severe COVID-19 have cardiac involvement, and nearly 25% have evidence of ongoing myocardial inflammation 3 months after diagnosis.[27] Patients with COVID-19-associated myocardial injury are likely to remain at risk for CV events following hospital discharge.[27]

Worsening health inequalities

Cardiovascular disease is strongly associated with health inequalities and has a higher prevalence in areas of higher socioeconomic deprivation, as well as in ethnic minority groups and those with severe mental illness. The COVID-19 pandemic has exposed these health inequalities, and individuals in these communities are likely to face widening disadvantages going forward.

Figure 4. Comorbidities among patients with COVID-19 in China, hospitalised patients in the USA, and two cohorts from the UK.[18-22]
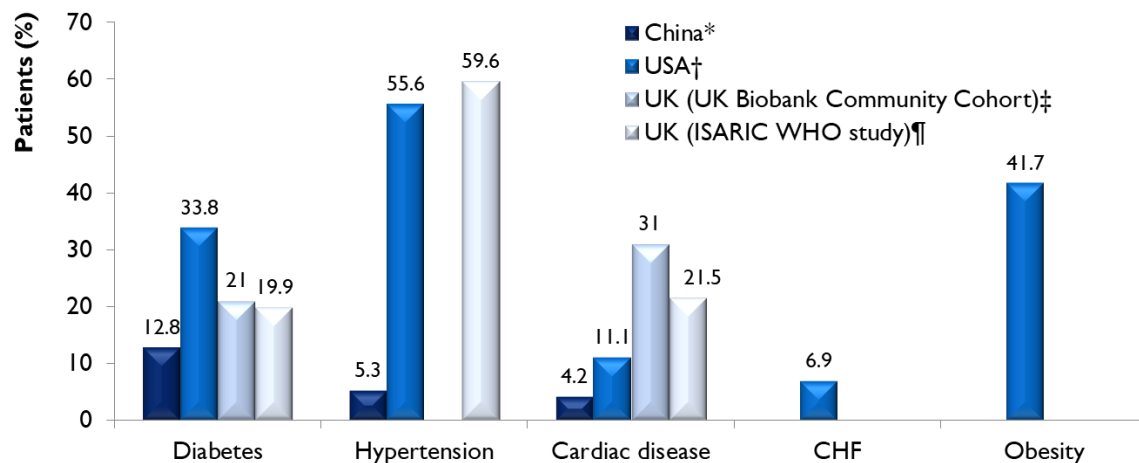
*All COVID-19 cases reported through 11 February 2020 extracted from China's Infectious Disease Information System, including 72,314 patient records comprising 44,672 (61.8%) confirmed cases, 16,186 (22.4%) suspected cases, 10,567 (14.6%) clinical diagnosed cases (Hubei only), and 889 (1.2%) asymptomatic cases.[19] †Case series of 5,700 patients sequentially admitted to 12 hospitals in New York City, Long Island, and Westchester County, New York, within the Northwell Health system with confirmed COVID-19 between 1 March and 4 April 2020 inclusive.[20] ‡UK Biobank (England) participants with baseline assessment 2006–2010, followed in hospital discharge records to 2017 and death records to 2020. Demographic and pre-existing common diagnoses association tested with hospitalised laboratory-confirmed COVID-19 (16 March–26 April 2020), alone or with mortality, in logistic models.[21] Of 269,070 participants older than 65 years, 507 (0.2%) became COVID-19 hospital inpatients, of whom 141 (27.8%) died. ¶20,133 hospital patients admitted to hospital with COVID-19 in UK during growth phase of first wave of coronavirus outbreak who were enrolled in International Severe Acute Respiratory and emerging Infections Consortium (ISARIC) World Health Organization (WHO) Clinical Characterisation Protocol UK (CCP-UK) study in 208 acute care hospitals in England, Wales, and Scotland between 6 February and 19 April 2020.[22]

Figure 5. Rates of deaths involving COVID-19 in patients with and without cardiovascular comorbidities* in the UK (2 March–28 July 2020).[25]
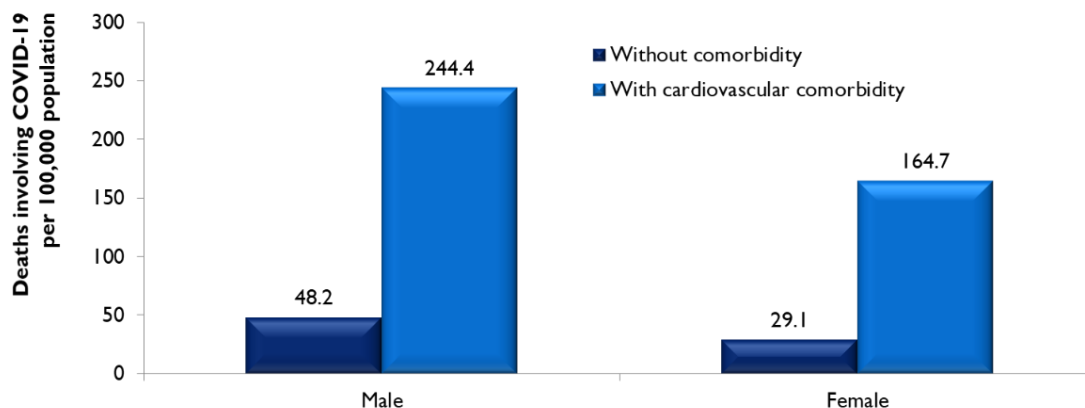
*CV morbidities comprised ischaemic heart diseases, heart failure, cerebrovascular diseases, atrial fibrillation and hypertension. Cause of death defined using International Classification of Diseases, Tenth Revision (ICD-10) codes U07.1 and U07.2. Figures include deaths where COVID-19 was the underlying cause or mentioned on the death certificate as a contributory factor. Figures do not include neonatal deaths (deaths under 28 days). Those having no research-specific hospital-based comorbidities are defined using diagnoses (ICD-10 codes) in the Hospital Episode Statistics Admitted Patient Care and Outpatients datasets between April 2017 and May 2020. Figures are for persons usually resident in England, based on 2011 Census enumerations updated with 2019 patient register information, and not known to have died before 2 March 2020. Figures are for deaths occurring between 2 March 2020 and 28 July 2020. Figures only include deaths that were registered by 24 August 2020. Age-standardised mortality rates expressed per 100,000 population and standardised to the 2013 European Standard Population.

There is a risk that the COVID-19 pandemic will exacerbate existing inequalities and lead to worse CVD outcomes. People with CVD, hypertension, obesity and diabetes are at higher risk of poor outcomes from COVID-19 and the risk is higher in ethnic minority groups and in deprived communities. Increases in all-cause deaths during the first wave of the pandemic were also highest among those born outside the UK and Ireland, those in caring occupations such as social care and nursing, those who drive passenger vehicles, those working as security guards and related occupations, and those working in care homes. Furthermore, a recent study of the effects of Down syndrome on COVID-19 outcomes estimated a fourfold increased risk for COVID-19-related hospitalisation and a 10-fold increased risk for COVID-19–related death in persons with Down syndrome, in whom the risk of cerebrovascular events such as ischaemic and haemorrhagic stroke is high.[29]

Mental health inequalities are often linked with wider cultural and societal systems of disadvantage that impact on a person's wellbeing.[30] People living with severe mental illness already experience significant health inequalities, including life expectancy 15–20 years lower than the general population, a 53% higher risk of

having CVD, and an 85% higher risk of death from CVD.[31] With the COVID-19 pandemic leading to pauses in CVD prevention services, the potential to affect physical wellbeing is even greater. Health inequalities in this population are therefore only likely to increase[32] without specific intervention.

Given the greater incidence of CVD in deprived populations and some ethnic groups – and at an earlier age – there are opportunities to target these groups earlier. NHS England highlighted the need to address health inequalities in their phase 3 letter, which identified eight urgent actions:[33]

- Protect the most vulnerable from COVID-19
- Restore NHS services inclusively
- Develop digitally enabled care pathways in ways that increase inclusion
- Accelerate preventative programmes that proactively engage those at risk of poor health outcomes
- Particularly support those who suffer mental ill health
- Strengthen leadership and accountability
- Ensure datasets are complete and timely
- Collaborate locally in planning and delivering action.

2. Whole-system approach, underpinned by data and intelligence

Why do we need a community-wide system-level approach?

Figure 6 illustrates the inequitable attrition along care pathways between the least deprived and most deprived population quintiles (Bentley C, personal communication, 2020). At every stage, a greater proportion of the least deprived population achieve their targets. As depicted in Figure 6, issues with awareness, access, optimisation and adherence are all exacerbated by health inequalities and are likely to have been negatively affected by the COVID-19 pandemic. In order to address these barriers for all communities, the health service will need to work in partnership with organisations across the system, particularly local government, the third sector and citizens themselves. True 'whole-system working' goes beyond working with statutory and voluntary organisations and involves working directly with communities to maximise self-care and self-management. It makes a real difference if patients and citizens are meaningfully involved at every level of planning and service design.

Figure 6. Implementation decay between least deprived and most deprived population quintiles (Bentley C, personal communication, 2020).
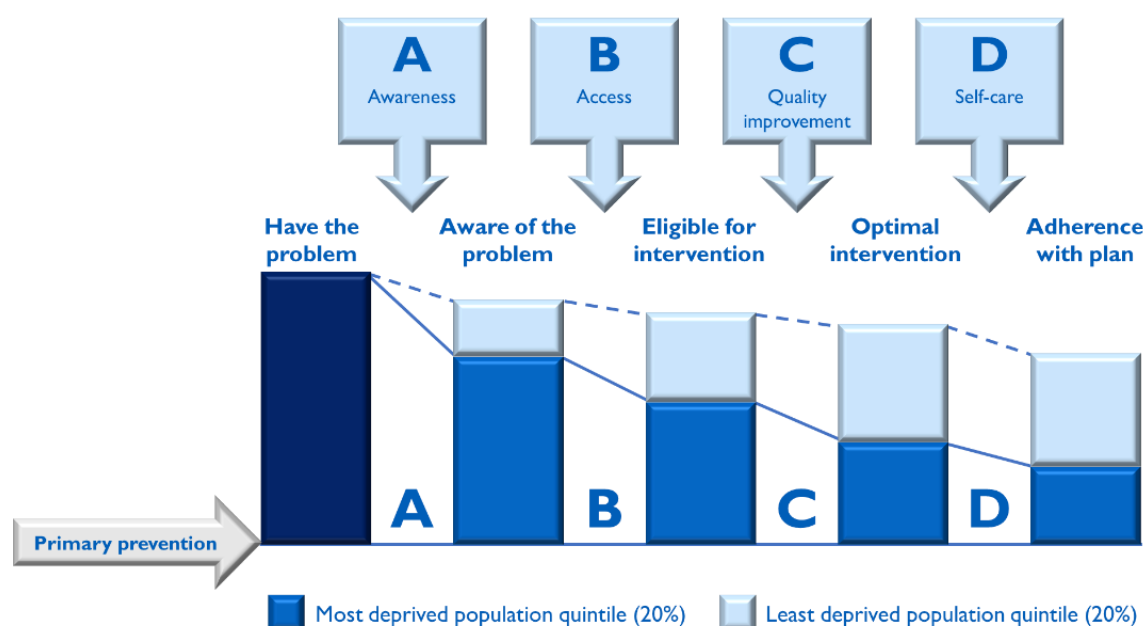
Relevant partners include:
- primary care
- secondary care
- community care providers
- community pharmacy
- mental health and learning disability providers
- CCGs and primary care networks (PCNs)
- integrated stroke delivery networks (ISDNs) and emerging cardiac networks
- local authorities – public health and other departments such as social care and community engagement teams
- Public Health England
- national charities – BHF, Stroke Association, Heart UK, AF Association
- local community or voluntary groups
- large local employers
- Healthwatch
- health and wellbeing boards.

System leadership

In order to tackle CVD prevention, partners from different organisations and sectors will need to work closely together to agree and work towards common goals. Many people will have multiple CVD risk factors, and the prevention, detection and management of CVD risk factors is interlinked with inequalities. Addressing all of these elements requires a cross-sector approach, including partners from a wide range of sectors to make it easier for people to make healthy choices e.g. in the way that they travel and the food that they eat.

Systems should ideally consider setting up a cross-sector board for CVD prevention at integrated care system (ICS) level, develop explicit locally relevant shared goals and encourage ICS-level commitment to achieve the long-term plan ambitions for CVD. The board should include a nominated senior responsible officer for CVD prevention. During the COVID-19 pandemic, many frontline clinicians have found their clinical responsibilities have increased and their time available for meetings has subsequently decreased. However widespread adoption of virtual meeting during the COVID-19 pandemic makes multidisciplinary team meetings much easier to attend. Systems should make every effort to have frontline clinician input into CVD prevention meetings at system level. This may mean having to run parallel meetings if it is difficult to coordinate one meeting to suit different clinicians. Consider setting up working groups for primary care, secondary care, community pharmacy and community care providers.

A clear governance and reporting structure, supported by agreed and regularly reviewed key performance indicators, is essential to monitor progress and address barriers to delivery. Any CVD prevention plan should be clearly linked back to the system's Health and Wellbeing Strategy, which will have been developed by the Health and Wellbeing Board to support healthy choices on smoking, diet, physical activity and alcohol. The Association of Directors of Public Health (ADPH) report on what good CVD prevention looks like at a system level can be found here.

Population-level interventions

The ADPH report highlights a range of interventions that can delivered at population level. These include:
- Make a healthy diet the easy choice – reduce the salt and saturated fat content of food consumed both inside and outside the home.
- Improve air quality – take action to reduce emissions.
- Make physical activity the easy choice – develop an environment that encourages active travel and physical activity in public spaces.

Leaders across the system should identify practical actions that deliver these goals locally, paying particular attention to ensure they impact on those with the greatest need.

Intelligence and evaluation

A baseline dataset that illustrates the nature and scale of the challenge for cross-sector partners is required. Data from across the system can be used to inform understanding of the challenges faced, to drive action and to monitor the effect of action taken.

Data could include:
- a comparison of expected prevalence against actual prevalence for AF and hypertension
- the proportion of people with a diagnosis of AF and hypertension who are receiving treatment
- emergency admissions and premature mortality from CHD and stroke.

Understanding variation across the system is crucial if health inequalities are to be addressed. Insight from system partners can be used to understand what might be driving variation and how this may be addressed. Useful data sources include:
- QOF data on diagnosed prevalence and treatment rates
- PHE Fingertips data showing expected *versus* diagnosed prevalence
- NHS RightCare.

Local directors of public health will also be able to provide expert advice on the local epidemiology of CVD.

Systems should encourage general practice and primary care networks to engage with the CVDPrevent audit and sign up to data extractions, as this will allow them to track progress on CVD prevention in real time and will also enable practices to stratify their results by ethnicity and deprivation.

Goals and metrics

To create an effective strategy, the system should develop a shared understanding of the challenge of CVD prevention during the COVID-19 pandemic. The strategy should involve co-design with the public and patients, particularly those from difficult-to-reach or vulnerable groups. Common goals should be identified and underpinned by metrics that are relevant and meaningful for all parties. Goals can link through to other strategies, such as tobacco control.

A local dashboard should be used to understand the progress being made. This should be shared and discussed regularly with key local stakeholders. Metrics are most effective at measuring progress and identifying variation when they can be measured at different levels, e.g. ICS, CCG, PCN and practice. Example metrics include:
- progress against long-term plan ambitions (ABC detection and management)
- CVDPrevent audit (from April 2020)
- emergency admissions and premature mortality from heart attack and stroke
- metrics around healthy behaviours – obesity/smoking/physical inactivity
- proportion of the eligible population receiving an NHS Health Check
- NHS Health Check outcomes
- level of variation between best and worst performance.

Progress against the strategy should be regularly monitored, and attention should be paid to variation in performance across practices and communities, as well as absolute numbers.

Health equity audits can be used to find out whether a strategy is meeting goals around reducing inequalities. Public Health England has developed a Health Equity Assessment Tool (HEAT).

Learning across the system

Systems should encourage the sharing of good practice and ideas to spread innovation and reduce variation.

It is important that systems learn from adverse events. Consider how the system can learn from events such as potentially preventable strokes or missed opportunities to intervene. Is there an area that needs strengthening? Is there evidence of practical change on the ground that has happened as a result of local learning. Some systems have feedback mechanisms in place to make clinicians aware when potentially preventable CVD events have occurred. Other systems use quarterly or annual data on missed opportunities as part of education sessions.

Brighton and Hove carried out a Preventing Premature Mortality Audit to identify and develop plans for addressing preventable mortality from CVD, chronic obstructive pulmonary disease (COPD) and diabetes.[34] As a result, the system moved to a proactive system of care using risk profiling and focused interventions.

Health trainers were employed to provide more coordinated support for individuals with chronic conditions to improve their health behaviours.

Case study 1: Cross-sector approach to hypertension detection and management

Cheshire and Merseyside STP (C&M STP) have developed and delivered a cross-sector approach to hypertension detection and management since 2015. The relationships and trust that had already been developed meant that they were able to respond quickly and as one system to adapt CVD prevention activities during COVID-19, and a cross-sector subgroup continued to support CVD prevention across C&M STP throughout the COVID-19 pandemic.

'Happy Hearts' (www.happy-hearts.co.uk) is an example of one of the group's cross-cutting workstreams, bringing together local and national websites, information, guidance and resources for patients, carers and healthcare professionals, supporting CVD prevention during and beyond the pandemic. It includes translated, easy-read and video resources to improve inclusivity, and an upstream approach is supported practically by links to local council health and wellbeing and COVID-19 support service webpages.

Education and training

Consider what training needs exist across the cross-sector CVD prevention workforce. Training hubs can provide useful support across the system.

High-quality training materials for various aspects of CVD prevention are freely available and do not necessarily need to be recreated at system or organisational level. A list of training materials, including brief interventions for behaviour changes, can be found in Appendix 1.

Voluntary sector organisations may also have training materials for training community ambassadors or people in the cross-sector workforce who will be giving holistic advice.

Addressing barriers 1: Awareness of CVD risk

Many people are unaware of their CVD risk factors. In England, it is estimated that 18% of people with AF and 43% of people with hypertension are undiagnosed. The percentage of people aged 40–74 years who have a cholesterol reading and CVD risk assessment is estimated to be 49%. The 'detection gap' is not equally spread across society, with larger gaps in areas of deprivation.

Improving awareness of CVD risk requires an effective community awareness plan that has been co-designed with communities. Engaging with communities can help develop an understanding of the barriers to accessing information and services. Many of these barriers will have existed previously but are likely to have been exacerbated during the COVID-19 pandemic.

Systems are encouraged to take all opportunities to educate and inform people about CVD risk factors, prevention and self-management. Encourage citizens to 'know their numbers' and understand them. For example, community engagement programmes could include:

- culturally competent prevention campaigns – for example, the Race Equality Foundation leaflet on blood pressure for African and African Caribbean men
- social marketing programmes
- community champions and ambassadors to act as trusted messengers.

Kent and Medway carried out a piece of work with ethnic minority groups to understand the barriers to engaging with NHS Health Checks and used these insights to develop plans to increase engagement. This included finding out which information sources were trusted and determining the format, images and languages that were most appropriate for information sharing.

NHS Health Checks

The UK Government's COVID-19 Recovery Strategy highlights the NHS Health Check Programme's clear role in delivering preventative and personalised solutions to ill health and empowering individuals to live healthier and more actively. Considerations when restarting NHS Health Checks may include:

- prioritising invitations for NHS Health Checks to those most at risk of poor CVD outcomes (e.g. ethnic minority groups and low socioeconomic groups)
- tailored approach to invitation and delivery (e.g. outreach, partial virtual delivery) to increase uptake
- approaches to community engagement and social marketing with target groups
- aligning NHS Health Checks with other health checks delivered locally, including:
  - physical health checks for people with severe mental illness
  - annual health checks for people with learning disabilities
  - locally commissioned COVID-19 health checks instigated in response to the pandemic.

The *NHS Health Check: Restart Preparation* document was published to support systems in preparing for restart.

Case study 2: Medway Council

With increasing evidence demonstrating links between CVD risk and poorer outcomes from COVID-19, Medway were keen to restart the NHS Health Check programme as soon as possible. It was decided to take a proportionate universalist approach to target resources where they could have greatest impact. A survey was completed with primary care to establish which GP practices were willing to restart delivery and who would need support from the outreach team; circumstances differed across the locality. For practices restarting, reassurance was obtained that they were able to do so safely, and an audit was implemented into GP clinical systems to identify target groups.

Outreach NHS Health Checks are delivered at Medway's Smokefree Advice Centre, which was made COVID-19 secure by installing sanitising stations and signage, enhanced cleaning, and extended appointment times. Additionally, processes for restart and delivery were detailed in a standard operating procedure (SOP) to ensure staff were fully informed. This had the added benefit of increasing confidence among team members. The SOP includes information on national guidance, rationale for restarting, equipment considerations, staff training, invitation and booking processes, triage, a front-of-house process and the NHS Health Check appointment itself. After 6 weeks of outreach delivery, 203 checks had been completed.

Case study 3: East Sussex

East Sussex NHS Health Check commissioners developed and completed a practice consultation to explore how best to relaunch the NHS Health Check programme in a way that is safe, sensible, flexible and supports practices to deliver the service. This feedback, in conjunction with a local commitment to use the programme as an opportunity to address the health inequalities that COVID-19 had exposed, has informed the restart delivery model. As a result, the local team is working to align NHS Health Checks with other locally delivered checks, such as the annual learning disability check, serious mental illness checks and the assessment part of the COVID-19 Black and Minority Ethnic Locally Commissioned Service.

All practices were sent a restart email outlining NHS England and NHS Improvement's 'phase 3 letter' and confirming commissioner support for a practice-led, slow, flexible restart of the programme. This flexible approach to delivery recognised that practices may need to offer the service through short face-to-face appointment for BP, body mass index and bloods, with telephone follow up. A digital results booklet was also developed to allow results and advice to be completed over the phone and emailed to the patient. In addition to NHS Health Checks in practices, community checks have restarted, and different delivery models are being tested.

To support practices restart NHS Health Checks, templates, searches, an eligible 'patient notice' and a reminder about 'business as usual' resources and support available were issued. To ensure a high standard of delivery, 90-minute online 'restart training' sessions have been delivered alongside promoting the NHS Health Check 'E-Mentor E-learning'. Providers have also been supported to re-enrol with a point-of-care testing external quality assurance scheme.

The Local Medical Committee and Clinical Commissioning Group have been engaged in the development of this work, and both staff and patients are being asked for feedback so that the acceptability and effectiveness of changes can be understood. Some practices have restarted and reported activity for the second quarter of 2020; others plan to restart in April 2021.

Community pharmacy

Community pharmacy has an important role in CVD prevention, offering BP testing, smoking cessation advice and pulse checks. Some community pharmacies are commissioned to do the full NHS Health Check. Although face-to-face contacts with other areas of the health system may decrease during the COVID-19 pandemic, many people will still visit their community pharmacist to collect medications.

A UK study from 2010 showed that targeted CV risk assessment can be successfully provided through community pharmacies, widening access and choice, particularly for men and people in deprived areas.[35]

Community services

A significant proportion of AF and hypertension is detected opportunistically in primary care, when a patient attends for an appointment and a clinician takes the opportunity to feel a pulse or take a BP reading. During the COVID-19 pandemic, face-to-face primary care appointments have decreased in order to reduce the spread of the virus and keep patients and staff safe.

Any face-to-face interaction with a member of the healthcare team could be considered as an opportunity to check for CVD risk factors or give brief lifestyle advice. For eligible patients, this could be part of a wider NHS Health Check, severe mental illness, or learning disability health check. Examples include:

- pulse/BP checks when patients attend for blood tests, vaccinations or dressing changes
- pulse/BP checks in podiatry clinics
- pulse/BP checks by district nurses

Increasing public awareness

Cheshire and Merseyside STP developed a public awareness campaign encompassing primary, secondary and tertiary CVD prevention messages. This included a paid-for Facebook campaign directed to the most deprived areas in order to direct public to a website and promote key messages. A leaflet reflecting key messages was also published to support inclusivity for less digitally active groups (see Appendix 2).

Local news and social media campaigns can be used to inform the public of the signs of stroke and heart attack and the importance of seeking immediate help should they experience these. The Royal Berkshire NHS Foundation Trust developed a series of videos, with senior stroke and cardiology consultants explaining that local acute services have steps in place to minimise the risk of contracting COVID-19 and that the risk of not seeking immediate help for a stroke or heart attack outweighs the risks of contracting COVID-19.

Vaccination clinics

The UK COVID-19 vaccination programme is underway. This poses a logistical challenge to the NHS but also presents a rare opportunity to interact with the vast majority of adult patients. Systems should consider whether they can utilise this opportunity to increase awareness of CVD risks. This could be as simple as providing patients with a leaflet (see Appendix 2 for a suggested leaflet) with information about risk factors or could involve targeted interventions to assess CVD risk such as BP or pulse checks while people wait before/after vaccination.

Addressing barriers 2: Improving access and uptake of intervention

Significant improvements in rates of anticoagulation therapy for AF have been made in recent years (87% of high-risk patients receive therapy),[36] but there is a risk that this rate may decrease due to the impact of the pandemic and a reduction in proactive review of disease registers. Currently Quality Outcomes Framework (QOF) data do not measure the proportion of people with hypertension who are on antihypertensive medicine or the proportion of people with high cholesterol taking lipid-lowering therapy such as a statin. A range of local search tools are available and can be found in Appendix 3.

Primary care

Support CCGs and PCNs to:
- use searches and risk-stratification tools to identify patients for preventative support and LTC management
- maximise any face-to-face encounters
- promote self-monitoring using digital technology – but also ensure that those who are unable to access digital technology have appropriate routes of access
- ensure patients are on optimal medication
- use the wider primary care team to support CVD prevention
- encourage patients to access NHS Health Checks
- embed action to address behavioural risk factors across CVD pathways to ensure frontline professionals have the skills and opportunity to promote behaviour change
- use social prescribers and lifestyle advisors under the additional roles reimbursement scheme for PCNs.

Our previous guide describes how primary care can support CVD prevention during the COVID-19 pandemic.

Community partners

Community partners, including local authorities, voluntary sector organisations and large employers, can provide support by improving access to information, measurement and signposting. Voluntary sector partners and small community groups may be able to provide support to target hard-to-reach or vulnerable groups.

Secondary care can act as a community partner as well as a healthcare partner. Patients attending outpatient sessions could be given information on or directed to information about CVD risk factors and staying healthy (a suggested leaflet that can be modified for local use can be found in Appendix 2).

Suggested ways in which community partners could support improved access and uptake include:
* providing an enhanced focus on target communities
* supporting single points of access/helpline/community hubs
* making every contact count (MECC)
* ensuring there is 'no wrong door' for health queries
* providing peer support – through champions, navigators and advocates.

Examples of interventions to direct people towards include:
* Better Health – promotes the use of evidence-based tools and apps with advice on how to lose weight and keep it off and includes a number of key actions and activities that can be introduced at a system level, including a free NHS 12-week weight loss plan to help people start their weight loss journey; this includes a website and an app
* information for patients and professionals on reducing the amount of salt and saturated fat in the diet:
    – Checklist on salt consumption for nurses
    – Cutting down on salt leaflet for patients
    – Checklist on saturated fat for nurses
    – Cutting down on saturated fat leaflet for patients
* Smokefree
* NHS Diabetes Prevention Programme
* Exercise programmes that target flexibility and mobility and so are suitable for most people: www.howfittoday.co.uk/.

Addressing barriers 3: Improving the number of people on optimal CVD prevention therapy

For adults younger than 80 years with diagnosed hypertension, only 67% achieved BP ≤140/90 mmHg (QOF 19/20).[36] Patients prescribed anticoagulants for stroke prevention in AF require regular monitoring to ensure that they remain on the correct dose.

Suboptimal CVD prevention therapy will not be effective at preventing stroke or heart attack and may, in some cases, be harmful (e.g. increased risk of major bleeding). Measuring the quality of prescribing can be difficult, but it is important that systems are put in place to ensure that patients are being prescribed the optimal medication to prevent both a CVD event and medication-related harm. This should include monitoring of time in therapeutic range for patients on warfarin.

The CVDPrevent audit may help identify variation in prescribing quality and frequency of patient monitoring (e.g. creatinine clearance for patients prescribed direct oral anticoagulants [DOACs] between areas).

Addressing barriers 4: Supporting self-care, patient empowerment and patient compliance

The extent to which patients are able to follow their agreed medication regimen is an important component of CVD management. A study has shown that only half of patients with chronic conditions take their medications as prescribed.[37, 38]

The World Health Organization[37] describes a series of factors that influence a person's ability to adhere to a treatment regimen:

- social and economic
- healthcare team and system related
- condition related
- therapy related
- system related.

Social and family support (either formal or informal) is an important factor that affects patient adherence. Peer support in particular can improve adherence to therapy.[37] Patients' understanding of their condition and why the medication is necessary is also important.

Counselling and shared decision making

Community pharmacies offer a New Medicines Service (NMS) for newly initiated medications, including antihypertensives, anticoagulants and antiplatelet therapies. This provides an opportunity for patients to discuss any queries or concerns about their medication with a pharmacist.

Oxford AHSN has created a counselling course for initiation of anticoagulation therapies. Guidance for the safe switching of warfarin to DOACS can be found here. UCL Partners has created resources to support patient adherence, with an emphasis on using the wider healthcare team.

Group and peer support

Virtual group consultation by social prescribers or health and wellbeing specialists can enable peer support and structured self-management.

Case study 4 – Woodley Centre Surgery, Wokingham North PCN, Berkshire

Measures that needed to be undertaken for the COVID-19 pandemic mean that routine face-to-face appointments are no longer possible without appropriate triage so patients at high risk of CVD requiring assessment, medication and lifestyle intervention are not able to be seen and counselled in the usual way. With Woodley Centre Surgery in Wokingham, Berkshire already struggling to get the number of patients to have their blood pressure taken even before the pandemic, alternative ways of addressing CVD prevention were needed, particularly for patients who had stayed away due to fear of catching COVID-19 or putting further pressure on GPs during this difficult time.

The practice had already been running a series of face to face group consultations in other disease areas, such as diabetes, fibromyalgia, chronic pain and paediatric asthma for 18 months. These had been very popular and successful, with data from the paediatric asthma cohort showing reductions in emergency department attendances, practice appointments, and use of inhalers. The practice therefore decided to embark on turning the face to face group consultations to virtual group consultations (VGCs), using MS teams and extend VGCs to CVD prevention.

Patients on the practice CVD register were invited to join a VGC via text message. Seventy-nine patients initially expressed an interest, making it impossible to run a straightforward VCG through MS Teams, so the format was switched to a webinar, the first of which was attended by 49 people. The webinars are led by a health and wellbeing coach, Maria Goncalves, supported by Rupa Joshi, the lead GP on the project, who currently volunteers Wednesday mornings to these sessions. The health and wellbeing coach is funded for one day a week through the Primary Care Network Additional Roles Reimbursement Scheme (ARRS) Directed Enhanced service (DES) scheme, running webinars and patient education sessions in the morning and one-to-one support sessions in the afternoon.

The identities of all patients who attended were verified before the webinar, and patients were asked to be respectful of the clinicians and each other. Although patients had the option to switch off their camera during the sessions, many choose to participate with the video active. Older patients were unexpectedly adept at using video software, having become familiar with the software to stay in contact with family and friends during lockdown. The tone of the webinar was non-judgemental, instead encouraging patients to take ownership of their own health and wellbeing. The content covered a variety of topics useful for CVD prevention, including self BP monitoring, diet and nutrition (e.g. rainbow diet, vitamins D and C, omega 3 oils, salt, potassium, and glucose spikes), recommended exercise levels, stress reduction and breathing techniques, and sleep hygiene. Patients are also encouraged to join a Facebook group, through which the clinicians share useful resources.

This approach has proved so popular and successful that the practice has further broadened the reach to other topics useful during the pandemic, including severe asthma, anxiety/depression, shielding, postnatal care, children's mental health and minor illness in under 5s. The practice aims to organise sessions for COVID-19 rehabilitation and support for carers.

Self-monitoring

Digital technologies can support a shift towards prevention, self-care and self-management for engaged patients. For example:

- digital platforms to support self-monitoring and self-management of hypertension
- telehealth for LTCs
- remote clinics
- AF detection using single-lead ECG, apps or wearable patches
- online patient education programmes.

When commissioning service models that allow for self-monitoring using digital technology, consider purchasing devices to give or loan to patients who are not able to purchase their own. Not everyone is able to use digital technology, so it is important to make provision for non-digital options, such as BP monitors, that enable patients to self-monitor.

Case study 5 – Liverpool Heart and Chest Hospital NHS Foundation Trust

Liverpool Chest and Heart Hospital (LHCH) is a tertiary-level referral centre, which has been assessed by the Care Quality Commission (CQC) as outstanding in its latest two inspections. After Professor Gregory Lip was appointed Director of the Liverpool Centre for Cardiovascular Science at the University of Liverpool and LHCH, he established a specialist hypertension clinic for referral of complex patients. Professor Lip had previously run such a specialist hypertension clinic in his previous post in Birmingham, where there was a steady stream of referrals for middle-aged and elderly patients at risk of stroke and diabetes, often from ethnic minority groups.

The new LHCH specialist hypertension service was set up and led by Professor Lip as the sole consultant, supported by nursing, administrative and IT staff in a typical hospital clinic setting. Services such as primary care and community cardiology clinics were informed of the new service through newsletters, which encouraged referral of complex patients, including those with uncontrolled hypertension, suspected dilated aortic root, atrial fibrillation (another clinical and research interest of Professor Lip and team), etc. During the first 18 months of the service, it became apparent that the patient profile being referred was a little different to that in the previous hypertension service in Birmingham, with many patients in their late 20s and 30s, resistant hypertension and some young hypertensives with diagnoses of renal artery stenosis and adrenal adenomas being identified.

The clinic has been very successful, with plans to expand its capacity. Apart from optimisation of drug treatments, there is emphasis on patient education and lifestyle changes, including regular exercise, smoking cessation and reduced alcohol consumption. Following work up and optimisation of management, patients may be referred back to primary care or referred to other specialist clinics, such as the sleep clinic for assessment of sleep apnoea.

After the emergence of COVID-19, it became clear that, as with all hospital-based services, changes would need to be made to minimise face-to-face hospital attendances, so a virtual clinic was organised. Computers were set up with the necessary hardware and software to run telemedicine consultations, with support from the hospital's IT department. Professor Lip's secretary contacted patients to advise them that their consultation would be via remote teleconsultation. She asked them to check their blood pressure (BP) prior to the consultation, ideally by purchasing their own BP monitor for use at home and keeping a diary of measurements for a week. Over time, it became clear that some patients required a translator, and this was added to the secretary's checklist; however, telemedicine consultations proved challenging for patients with hearing difficulties. Essential investigations such as blood tests and specialist imaging were still arranged at the hospital. Once the initial COVID-19 surge subsided, some patients, particularly new referrals, were seen at the hospital in face-to-face clinics.

Key lessons for any hospital wishing to set up a similar specialist hypertension clinic include:

- Support from technical staff is needed to set up the necessary IT infrastructure for remote consultations.
- Support from administrative staff is essential to organise the clinic and arrange appointments and any special support.
- The needs of local patient populations may differ, and this should be considered during service development.

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Appendix 1: Training materials

- The Primary Care Cardiovascular Society (PCCS) has developed online learning bites on CVD prevention during the COVID-19 pandemic:
    - https://pccsuk.org/2020/en/page/covid-19-online-learning-bites

- Public Health England (PHE) has developed a range of videos entitled 'All our health':
    - www.e-lfh.org.uk/programmes/all-our-health/

- UCLPartners has developed a range of training materials to support practice staff in implementing a remote monitoring system for hypertension, including scripts for staff delivering reviews over the telephone:
    - https://uclpartners.com/long-term-condition-support/

- Oxford AHSN/HEE anticoagulation training resource:
    - https://portal.e-lfh.org.uk/Component/Details/649476

- E-Learning for health hypertension module:
    - www.e-lfh.org.uk/programmes/hypertension/

- Cheshire and Merseyside webinars:
    - Blood pressure refresher training for community pharmacies:
        - www.workcast.com/register?cpak=7717106618116691

    - Blood pressure refresher training for non-clinical community partners:
        - www.workcast.com/register?cpak=7517826546345232

- NHS Health Check Restart webinar:
    - www.healthcheck.nhs.uk/commissioners-and-providers/webinars/

- Making every contact count:
    - www.e-lfh.org.uk/programmes/making-every-contact-count/

Appendix 2: Leaflet and poster on CVD risk factors and staying healthy

Download a pdf of this A5 leaflet, which you can adapt locally, from [here](#).

Preventing heart disease and strokes during the COVID-19 pandemic

[Add your logo here]

Look after your health

Reduce the risk of heart attack and stroke by looking after your physical and mental health

- Eat well and drink sensibly
- Make time for yourself
- Get active and stop smoking

For information, support and services in your local area, scan here:

[Add a QR code or your local website here]

Or go to:
www.nhs.uk/live-well/

Look after your condition

Atrial fibrillation, high blood pressure (BP) and high cholesterol increase the risk of heart attack and stroke. Simple actions can reduce the risk.

- Know your BP and cholesterol
- Take prescribed medications
- Get checked annually

For information, support and services in your local area, scan here:

[Add a QR code or your local website here]

Or go to:
www.nhs.uk/conditions/cardiovascular-disease/

Stay safe from COVID-19

This is even more important if you have heart or circulatory disease. If you get COVID-19 symptoms, self-isolate and get tested.

- Hands
- Face
- Space

Help us to help you get the right healthcare

999	For symptoms of heart attack, stroke and other life-threatening emergencies call 999, even during COVID-19. **Time matters!** If possible, help emergency services to get in quickly. Go to hospital with the ambulance if advised.
111	NHS 111 online or phone service can give urgent medical advice for other issues.
GP	To contact your GP practice go to the practice website or contact by app or phone. Attend your NHS Health Check when invited (eligible 40–74-year-olds).
Pharmacy	For advice about medicines and healthy lifestyle.

- Dial 999
- Act FAST
- Keep your appointments

Heart attack

If you or your family member develop symptoms such as **heavy or tight chest pain** that may **spread to your arms, neck or jaw** or make you **breathless, sick, sweaty or lightheaded** and that doesn't go away, this could be caused by a heart attack. Dial 999 immediately.

Stroke

You can spot symptoms of a stroke using the FAST test:
- **Face** – is the arm dropping/fallen on one side? Can they smile?
- **Arms** – Can they raise both arms and keep them there?
- **Speech** – Is it slurred?
- Time to call 999 if you see any of the above signs

Need more information and advice?

- **Happy Hearts website**
  www.happy-hearts.co.uk
- **NHS website**
  www.nhs.uk
  search for
  'atrial fibrillation'
  'blood pressure'
  'cholesterol'
- **Arrhythmia Alliance/ AF Association**
  01789 867501/02
  weekdays 9 am–5.30 pm

- **British Heart Foundation helpline**
  0300 330 331
  weekdays 9 am–5 pm, Saturdays 10 am–4 pm
- **Blood Pressure UK helpline**
  020 7882 6218
  weekdays 9 am–5 pm, Saturdays 10 am–4 pm
- **Heart UK cholesterol helpline**
  0345 450 5988
  weekdays 10 am–3 pm
- **Stroke Association helpline**
  0303 3033 100
  Mon/Thu/Fri 9 am–5 pm, Tue/Wed 8 am–6 pm, Sat 10 am–1 pm

Flyer, including Happy Hearts illustrations, adapted with thanks and permission from Cheshire and Merseyside Health and Care Partnership (www.cheshireandmerseysidepartnership.co.uk) and Kaleidoscope (www.kadm.co.uk)

GIRFT
GETTING IT RIGHT FIRST TIME

Oxford Academic Health Science Network

Download a pdf of this A4 poster, which you can adapt locally, from here.

Leaflet and poster adapted with thanks and permission from Cheshire and Merseyside Health and Care Partnership (www.cheshireandmerseysidepartnership.co.uk) and Kaleidoscope (www.kadm.co.uk).

Appendix 3: System searches

UCLPartners has developed searches for EMIS and SystmOne. These can be accessed for free here. These searches will identify all patients with hypertension and stratify them into priority groups based on last recorded blood pressure, as well as comorbidities and ethnicity. Similar searches area available for type 2 diabetes.

The Clinical Digital Resource Collaborative (CDRC) has developed a suite of free tools for searching EMIS and SystmOne to identity patients with high cholesterol and familial hypercholesterolaemia who are undiagnosed or not on optimal treatment. More information can be found here.

A number of primary care record system tools are available to identify patients with AF not on anticoagulation therapy and, in some cases, advise on dosing. Search tools can be helpful in identifying patients for review. Dosing adjustments for any DOAC should always follow recommendations in the Summary Product Characteristics.

- GRASP-AF is a free tool that identifies patients with AF who are not anticoagulated. The tool also assists with case finding.
- Within the EMIS system a tool named 'AF advisor' can be activated which can assist with dosing and DOAC reviews. AF advisor can also be used to identify patients not on anticoagulation therapy.
- Practices can also access searches through commercial companies such as Oberoi (OBEROI-AF) and Interface Clinical Services (Attend2AF).

Local medicines optimisation teams may also have developed searches or may be able to help you design a local search.

Appendix 4: Contributors

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