British Heart Foundation

the untold heartbreak

Cancelled procedures. Missed appointments. Lost lives.
Covid-19's devastating impact on cardiovascular care and the case for building a stronger and more resilient health system

the untold heartbreak

Data and insight used in this report

The insight and data used to inform this report has been collected from across all four nations of the UK, with the aim of illustrating the impact of Covid-19 on cardiovascular services. However, it is important to note that due to differences in the types of data collected, varying national targets and methodologies for data collection, data from the four nations are not directly comparable with each other. For this reason, all graphs and data figures presented in this report are based on English data (due to a greater availability of robust data throughout the pandemic) with discussion of available information and data for Scotland, Wales, and Northern Ireland in the main body of the text and in relevant appendices. More information about the range of data used from across the UK can be found in Appendix 1.

The recommendations from this report are intended for the UK Government and health and care systems in England. The BHF will continue to work with the devolved governments in Scotland, Wales and Northern Ireland to support the restoration and future transformation of services based on the needs of each nation.

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Foreword

Professor Sir Nilesh Samani
Medical Director
BHF

Despite the great strides that have been made over the past several decades, cardiovascular disease (CVD) remains a major cause of morbidity and mortality in the UK, accounting for 1 in 4 deaths. 7.6 million people in the UK are currently living with CVD. We know CVD causes an enormous socioeconomic burden and personal suffering and continues to be a significant driver of inequality and the growing life expectancy gap between different parts of the UK.

Since March 2020 when the pandemic hit, this reality has only worsened. Millions of people have not been able to access the care they need to stay well. Cancelled procedures, missed appointments and growing waiting lists have all undoubtedly contributed to the more than 6,000 excess cardiovascular deaths in the first year of the pandemic in the UK. Despite the heroic efforts of everyone across the health and care system to respond to the needs of all patients, the enormous pressures of the pandemic on a system that was already under strain resulted in the findings that are captured in this report.

Fast on the heels of the pandemic, the health service is already grappling with its next challenge; clearing the backlog in care that has been accumulating while it has been focusing on saving lives from Covid-19. BHF modelling suggests that between 350,000-400,000 people could be waiting for a heart procedure or operation in England by March 2022. These procedures are not a luxury. In many cases, clinicians are placed in the unenviable position of making decisions about delaying treatment and ultimately, people living with heart disease stand to suffer. Additionally, our modelling suggests that it will take between 2.5 to 5 years to return to pre-pandemic waiting times in England (which by no means should be our aspiration – they were arguably too long already).

While this report paints a challenging picture, there are green shoots of recovery and there is incredible will within the NHS to address current problems with speed. By acting now, we can make sure the modelling scenarios do not turn into long-term reality.

This will require strong Government support and leadership with targeted interventions at key points in the health system. We urgently need a workforce strategy that grows our current health and care workforce where it is most needed. For CVD, this means more cardiologists, specialist cardiac nurses and cardiac physiologists. We need a long-term cardiovascular plan that prioritises diagnostics services both in the community and in secondary care. We must build on the innovation that has emerged in the pandemic to empower patients to self-manage where they can and get the help they need when they need it. And all of this must be met with sustained, long-term investment that allows the health service to adequately increase capacity and plan for the future.

CVD did not stop for the pandemic. On behalf of the millions of people who live with these conditions in the UK, we at BHF believe that by acting now, we can build a stronger, better, and more resilient health system, giving doctors and nurses the tools they need while empowering patients with the support that they seek to turn the tide on CVD.

Professor Simon Ray
Past President
British Cardiovascular Society

Staff right across the NHS have worked incredibly hard to care for patients during the Covid-19 pandemic. Healthcare professionals have demonstrated an admirable willingness to work flexibly and innovate, and many have worked longer hours than usual to maintain essential clinical services. Tragically, despite the best efforts of staff, the Covid-19 pandemic has had a dramatic impact on cardiovascular care.

Cardiovascular services were already under immense pressure before the pandemic and there were substantial staff vacancies in some areas and specialities. There was also significant unwarranted variation in the provision of cardiovascular care across the patient pathway, from primary care to cardiac rehabilitation. The Covid-19 pandemic has exacerbated pre-existing issues in the health system and undermined the progress services were making on national ambitions for CVD, such as those captured in the NHS Long Term Plan. It is vital that services now have the time and space to take stock of what has happened over the course of the pandemic, so they can truly understand the impact of Covid-19 on cardiovascular care and what will be needed to drive future improvements.

The planned changes to NHS structures and legislation offer a unique opportunity for healthcare services to build back better than before. In England, for example, the upcoming Health and Care Bill will give Integrated Care Systems (ICSs) statutory footing and greater autonomy over budgets. NHS England and Improvement (NHSE/I) is also investing in the development of cardiac networks across the nation, with a vision to improve outcomes and reduce variations in care. These changes have the potential to support collaboration across the NHS and improve how services manage resources and care for people with heart and circulatory diseases. To make this vision a reality, we must ensure that health systems across the UK are appropriately resourced, and that healthcare professionals and other NHS staff are supported in both the immediate and long term.

Before the Covid-19 pandemic struck, CVD was the major cause of avoidable premature illness and death in men, and the second most common cause in women. Even in the context of the pandemic, CVD continues to be a significant driver of ill health and inequality in the UK. But if we act now, we can make a difference. CVD is largely preventable, and most conditions can be treated successfully. If we act now to address the backlog of cardiovascular care, we can avoid preventable deaths and improve the quality of life of the millions of people living with CVD in the UK.

Context

Impact of cardiovascular disease in the UK

An estimated 7.6 million people in the UK are living with a heart or circulatory disease,[1] more than twice as many people as cancer and Alzheimer's combined.[2] The impact of these cardiovascular diseases on the health and care system, as well as wider society, is vast. They were the cause of 164,000 deaths across the UK in 2019, with 43,000 of these deaths classed as premature (occurring in the under 75s).[3] There are also millions of people living with high blood pressure, high cholesterol and atrial fibrillation (AF) which, left undiagnosed or unmanaged, could lead to increased CVD as well as a higher incidence of heart attacks and strokes.

This major health challenge is compounded by the fact that an estimated 80 per cent of people living with a heart or circulatory disease in the UK are also living with at least one other long-term condition,[4] contributing to a complex landscape of multimorbidity that can increase people's care needs. The economic cost of CVD to the UK is estimated to be £19 billion each year, including direct health and care costs as well as the impact of premature deaths, disability, and the informal costs associated with carers providing unpaid care for those affected.[5]

Over the past 60 years the UK death rate from CVD has declined by three quarters. This falling cardiovascular mortality rate has been one of the biggest contributors to increased life expectancy for men and women across the UK and is something for the NHS and researchers to be proud of. But there can be no room for complacency. Demographic shifts mean that, even prior to the Covid-19 pandemic, cardiovascular mortality trends had stalled or even reversed in some areas, and the benefits of improvements in care were not being experienced equally across the UK.

Striking geographical variations in the impact of CVD are driven by inequalities experienced by people from socioeconomically disadvantaged and minority ethnic backgrounds, who more often live in environments that negatively influence their health and who typically have poorer access to and experience of healthcare services. These inequalities have been laid bare and are likely to have been significantly exacerbated by the Covid-19 pandemic. This has led to calls for a greater focus on supporting those most in need and closing the gap in health outcomes between different regions and demographic groups across the UK.

Well before the pandemic struck, cardiovascular services were already under significant pressure, caused by workforce shortages and infrastructure that did not match the large numbers of people with cardiovascular needs. Clinicians were already working ever harder to meet rising demand, and service provision was often variable and fragmented across the country. Prior to the pandemic, the four nations of the UK were at different stages in striving to tackle these problems strategically, and the four different national approaches are summarised in Appendix 2. With systems now returning to delivering increasing amounts of care, it is vital that CVD is a priority for health and care systems across the UK.

The UK's health and care systems are now facing a significant challenge: addressing the backlog of care that has built up throughout the pandemic. This is going to require a clear plan, which should have CVD services at its heart, and significant and long-term investment across the whole health and care system.

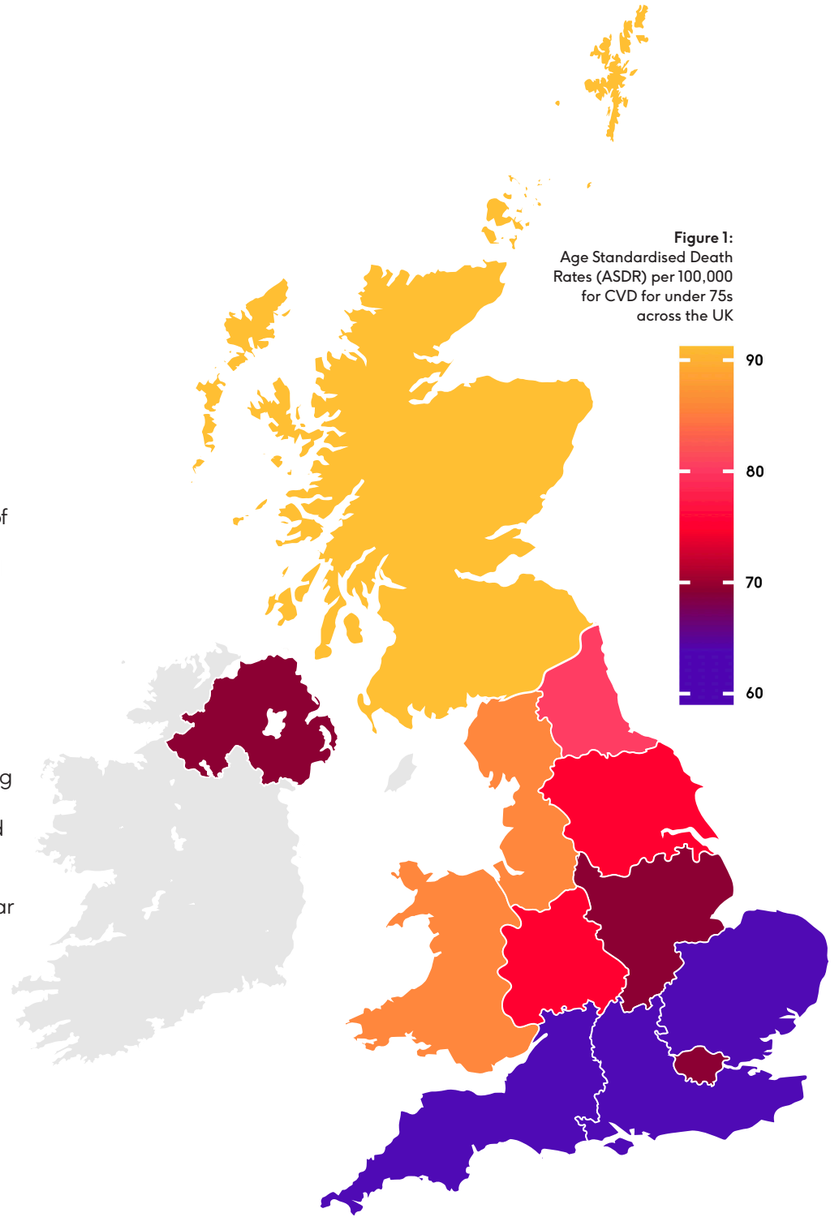


Figure 1: Age Standardised Death Rates (ASDR) per 100,000 for CVD for under 75s across the UK

> **"When it comes to heart disease, non-emergency care is far from 'routine.' Treatments like heart surgery aren't a luxury. Long waits put lives at risk**
>
> **Dr Sonya Babu-Narayan**
> **Associate Medical Director, BHF**

The impact of the pandemic on cardiovascular disease services

1. Disruption to the patient pathway

The Covid-19 pandemic has had a profound impact on all aspects of cardiovascular care – from prevention and diagnosis to treatment and support services. In England, 5,800 more people than expected died of heart and circulatory diseases in the first year of the pandemic – an average of 100 more people than we would usually expect dying of these conditions each week. Over 1,000 of these excess deaths did not mention Covid-19 on the death certificate.[6]

While the UK picture around excess deaths varied across the nations, every health system felt the impact of the pandemic on delivery of care. Excess deaths were also seen across Scotland and Northern Ireland, although this was to lesser extents than that seen in England. Reduced availability and access to cardiovascular services have almost certainly played a part in these deaths. In Wales, deaths from CVD were marginally lower than expected during the pandemic.[7]

Across the UK, others living with heart disease have experienced progressive worsening of their health whilst waiting for care, and this can result in missing the window of opportunity for treatments, leading to long-term disability from heart failure. With services now facing significant backlogs of care and increasing numbers of people waiting longer for routine procedures and treatment, these trends are likely to continue unless there is significant investment in the infrastructure and workforce needed to keep pace with the needs of patients.

The impact of Covid-19 has been felt across the full patient pathway, and this impact has been driven by a number of factors, including:

1. **Changes in help-seeking behaviour.**
2. **Reduced availability of cardiovascular services.**
3. **Changes in the way care is delivered, including a shift to 'digital first' healthcare.**
4. **Disruption to key programmes of work, such as the NHS Health Check in England.**

> **"As someone who is clinically extremely vulnerable, I initially felt very uncertain about attending hospital appointments. My local hospital now has clear messaging and signage about social distancing, which has helped me to feel safer**
>
> **Gail, focus group**

“I haven’t seen my GP or cardiologist since the pandemic began

Diane, interview

By following the journey of a patient from the point of detection of symptoms through to diagnosis, treatment and the support required for living with heart disease, it is possible to see how disruption in individual services soon compounds to create a significant and varied backlog of care and support for many of the 7.6 million people living with CVD across the UK.

Changes to help-seeking behaviour were particularly pronounced in the early months of the pandemic. In May 2020, a BHF survey of people living with heart and circulatory diseases showed that more than 50 per cent of people surveyed had put off accessing care, citing fear of infection or burdening the NHS as the main reasons. This was true for a wide range of conditions – even presentations for serious conditions were affected.

A similar trend was seen in primary care, with many patients choosing to postpone appointments and services offering fewer routine appointments and reviews than previously. Analysis by the Health Foundation showed that 31 million fewer primary care appointments were booked between April 2020 and March 2021 in England compared to the previous 12 months – a fall from 310 million to 279 million.[8] Importantly, this number includes nearly 5 million fewer face-to-face appointments in 2020 and 2021 when compared to 2019.

A recent online survey conducted by YouGov on behalf of the BHF showed that 66% of UK adults who have a heart condition have avoided accessing care during the pandemic despite their condition worsening. Amongst these patients, the main reasons for this continued to centre around wanting to avoid putting pressure on the NHS, and concerns about catching coronavirus in healthcare settings (reported by 29 per cent and 24 per cent of surveyed patients whose condition had worsened, respectively). In focus groups, patients also told us that fear of catching coronavirus in healthcare settings had been a major driver of their change in help-seeking behaviour. Many patients had instead accessed care remotely. Of those surveyed patients who reported receiving care for their condition since the start of the pandemic, 62 per cent had received care via phone call, and 4 per cent reported receiving care through online face-to-face methods, such as video calls.

66%

of patients with a heart condition avoided accessing care during the pandemic

2. Lost opportunities to prevent heart attack and stroke

Prevention by detection and management of high-risk conditions

Early detection and management of cardiovascular risk factors is vital for preventing the onset of disease and can help people live longer, healthier lives. But too many people are still living with undiagnosed 'high-risk conditions' – high blood pressure, raised cholesterol and atrial fibrillation (AF) – that significantly increase their risk of developing heart disease, stroke or vascular dementia. Addressing these (alongside smoking cessation, physical activity initiatives and weight management services) is key to reducing the incidence of CVD across the UK and is an existing commitment of the current NHS Long Term Plan.

- **An estimated 28 per cent of adults in the UK have high blood pressure – around 15 million adults – and at least half of them are either undiagnosed or not receiving effective treatment.**[9]
- **It is estimated that nearly half of adults in the UK are living with total cholesterol levels above national guidelines (greater than 5mmol/L).**[10]
- **It is estimated that at least 270,000 people over 65 have undiagnosed AF in the UK.**[11]

Through greater focus on finding and supporting those at risk of heart attack and stroke, we have a tangible opportunity to close the health inequality gap. This is now more important than ever to keep people out of hospital and reduce longer term pressures on the health and care system.

Lost opportunities to prevent cardiovascular disease during the Covid-19 pandemic

The Covid-19 pandemic has negatively impacted the prevention and detection of risk factors that drive the incidence of heart attacks and strokes. System leaders and health and care professionals are telling us that the detection gap may have increased and that limited capacity in primary care will compound the problem unless opportunities are taken to work differently. Detection efforts were disrupted for a number of reasons, including changes in peoples' help-seeking behaviour, reduced availability of CVD services and the suspension of important detection programmes like the NHS Health Check.

15m

estimated number of adults in the UK with high blood pressure

Significant amounts of routine care moving to remote models of care also created challenges. While this allowed for episodes of care that otherwise would have been cancelled to go ahead, the ability of healthcare professionals to identify and manage cardiovascular risk factors, for example by measuring blood pressure or taking blood for cholesterol, was hampered by a lack of in-person contact.

Healthcare professionals and system leaders have told us that there has been widespread disruption to the services typically used to detect people with risk factors for CVD and optimally manage their conditions. The majority also felt that this disruption was likely to continue in the longer term. While the number of in-person face-to-face appointments is again starting to increase, the initial drop in primary care attendances has reduced opportunities for case finding (detection of treatable heart disease risk factors) and Making Every Contact Count.[12]

The stalling of strategic cardiovascular planning and delivery board meetings, as well as concerns around infection control, led to the de-prioritisation of a range of programmes designed to detect high risk conditions. Many community blood pressure detection programmes, including BHF-funded community programmes, were also halted throughout the pandemic. Likewise, in England, NHS health checks were largely stopped throughout the pandemic. A report by the Institute of Public Policy Research (IPPR) into the impact of Covid-19 on cardiovascular care in England found that there was a 97 per cent drop in NHS health checks in quarter two of 2020 compared to the equivalent period in 2019.[13]

The shift to 'digital first' primary care was also significant. In England, in the period from April 2020 to March 2021, 54 per cent of all appointments in general practice were face to face. In the previous year, 78 per cent of appointments in general practice were face to face. The biggest growth has been in telephone appointments (15 per cent up to 41 per cent, peaking at 48 per cent in the first wave), with minimal changes in the number of online and video appointments, according to data from NHS Digital.[14] While many patients we surveyed were happy with the quality of care they received remotely, including 54 per cent who had phone appointments. Work undertaken by the Royal College of GPs (RCGP) found a similar shift in engagement with primary care in England and Wales, and found, anecdotally, a similar pattern across the rest of the UK.[15] When care is delivered digitally or on the telephone, opportunities to collect information usually gained through clinical examination, such as high blood pressure and abnormal heart rhythms, are lost.[16] This means that even when patients did access care, they were not always able to benefit from in-person tests and diagnostics.

These combined service changes within primary care, hospitals and the wider community, amount to millions of lost opportunities to identify and manage people with high-risk conditions.

The longer-term impact of delayed detection of risk factors for cardiovascular disease

The impact of missed or delayed detection of CVD risk factors may not all be immediately obvious, as conditions like high blood pressure are not always accompanied by noticeable symptoms. But this disruption could have devastating long-term effects. In England, IPPR analysis found that 470,000 fewer new prescriptions of preventative cardiovascular drugs (including anti-hypertensives, statins, anti-coagulants, and oral antidiabetics) were issued between March and October 2020 compared to the previous year. This entailed a 30 per cent drop in the number of patients initiated on statins for the first time, and a 16 per cent drop in the number of patients initiated on anticoagulants. If these 'missing' patients with risk factors for CVD are not found, diagnosed, and commenced on treatment, the IPPR forecast that an additional 12,000 heart attacks and strokes will occur in England in the next five years.[17] This will not only cause unnecessary harm and distress to those affected, but also stretch NHS resources further. A failure to manage AF in the population could also lead to an increase in life-threatening and debilitating strokes.

It is important that innovative virtual and remote approaches are maintained and expanded where appropriate. For example, home blood pressure monitoring has great potential both for patient self-management and informing virtual clinical decision-making. However, novel approaches to identifying risk factors face-to-face in the community are also needed for those less likely or less able to engage with digital healthcare. This should be accompanied by the necessary resources and links to primary care to allow such approaches to translate into meaningful improvements in outcomes. Community-based approaches, such as measuring blood pressure in churches and barbershops,[18] provide improved ways to reach people.

97%

drop in NHS health checks in England in quarter two of 2020 compared with the equivalent period in 2019

12,000

additional heart attacks and strokes in England in the next five years, according to IPPR forecasts

This could help to prevent a future rise in deaths caused by CVD and may also have important implications for Covid-19 mortality rates. A recent umbrella review commissioned by Public Health England highlighted that any cardiovascular risk factor is a significant predictor of Covid-19 case fatality rate. Hypertension has particularly significant implications: it is associated with 2.6 times higher odds of severe Covid-19 and 2.5 times higher odds of mortality.[19]

As services strive to return to delivering planned cardiovascular care, and increasing numbers of in-person face-to-face appointments return, it will be vital to ensure that approaches to identifying and managing those at risk of developing CVD once again become a priority. Initiatives such as Scotland's BP Scale-Up approach to helping high risk patients manage their hypertension are a welcome way of ensuring that patients can access the support they need.[20] Greater investment in equitable access to home monitoring technology (such as blood pressure monitors) will be necessary to empower patients so they can better self-manage in the community.

System leaders we spoke to considered the rapid identification of people with high blood pressure and AF as important priorities for the future, highlighting a number of areas across the country where remote monitoring and use of digital approaches has allowed them to successfully identify and manage patients with these conditions during the pandemic. A stronger focus on mainstreaming these approaches, including expanding the NHSE Blood Pressure at Home programme, will play an important part in narrowing the detection gap both now and in the longer term.

New developments such as the CVDPrevent audit in England also offer the opportunity to ensure that resources are targeted at those most at risk of developing CVD. This, combined with the review and restart of the NHS Health Check programme, will be important for preventing future increases in heart attacks, strokes, and cases of vascular dementia. Commitments in England to use future vaccinations to offer health checks to those most at risk also offer a significant opportunity to address the backlog in health checks and ensure those at risk of CVD are quickly identified and suitably managed. Pilots in Suffolk and Slough, as part of research supported by the Oxford Academic Health Science Network, have already been successful in integrating testing for risk factors for CVD into vaccination appointments, identifying those at risk without impacting vaccine throughput.[21]

Preventing CVD is often straightforward, but it can save many lives. If action to improve the early detection of high-risk conditions is not taken soon, CVD deaths could continue to rise in both the medium and longer term. We need a clear plan not only for resuming services, but for rapidly identifying those who have been missed during the pandemic.

3. Delayed diagnosis of cardiovascular diseases

An early and accurate diagnosis is vital for improving outcomes from disease, requiring healthcare professionals with specialist expertise, access to NTproBNP blood testing and a wide range of diagnostic heart imaging. The Covid-19 pandemic has significantly impacted access to heart investigations, exacerbating issues with a system that was already understaffed and under-resourced across the UK.

Longstanding issues with diagnostic capacity

Prior to the pandemic, across the UK there was already patchy accessibility and uptake of simple blood tests such as the NTproBNP test used to identify people with heart failure, as well as longstanding workforce shortages impacting access to echocardiography.[22] This meant that many people with conditions like heart failure were already waiting far too long for a diagnosis, with significant consequences for their longer-term survival and quality of life. Access to heart imaging is key to the diagnosis of heart disease in symptomatic patients. Heart imaging is also required for long-term monitoring of people with heart conditions to diagnose deterioration that means surgery or another treatment is needed, regardless of symptoms, for example in children and adults with congenital heart disease.

It is well known that there were significant issues facing the diagnostic cardiology imaging workforce and heart imaging capacity in England prior to the pandemic.[23] There was a longstanding and significant deficit in cardiologists, cardiac physiologists, radiologists and radiographers to support the expansion of echocardiography, computed tomography coronary angiography (CTCA) and cardiovascular magnetic resonance imaging (CMRI).

In a report published in October 2020, Professor Sir Mike Richards recommended that the wider radiology workforce in England increase by 2,000 and radiographers by 4,000, as well as other support staff, to meet growing demand and support the development of community diagnostic hubs. Increases in the workforce and a hub-based approach to diagnostics are now needed more than ever.[24] This must include an increase in the workforce with the specific expertise required for the diagnosis of CVD.

In Scotland, work carried out by NHS Education for Scotland's Healthcare Science Team highlighted that over the last five years there has been a 46 per cent increase in the demand for cardiac physiology services in NHS Scotland, but vacancies in half of cardiac physiology units across Scotland are at 15 per cent, with a comparable amount within five years of retiring.[25]

Finding new ways to improve throughput for heart scans and imaging will be vital for addressing the backlog of care. Some changes to diagnostic pathways previously considered too difficult have been made within weeks during the Covid-19 pandemic. Continuing to innovate to diagnose patients efficiently will be critical to address the growing waiting lists for vital diagnostics.

Integral to this aim will be the need for greater access to blood tests such as NTproBNP tests and echocardiography in emerging community diagnostic hubs. However, this must also be accompanied with increased capacity for echocardiography, CTCA and CMRI in secondary care in existing cardiac centres or as part of hubs or standalone facilities. This will require investment in the necessary equipment and specialist workforce to efficiently diagnose CVD.

Reduced referrals and increasing waiting times

Covid-19 has exacerbated existing issues with CVD diagnosis, leading to delays in care for countless patients.

One way we can see delays in care is through the significant drop in referrals, both in general and for heart disease services specifically. In April 2020 in England, GP referrals for consultant-led outpatient appointments were 75 per cent lower than the same period in the previous year. In February 2021, referrals were still 25 per cent lower than in February 2020.[26] Referrals to cardiovascular specialists followed a similar pattern and in 2020 were 29 per cent below 2019 in England.[27]

At the same time there have been fewer diagnostic heart tests, such as echocardiograms, being carried out in England. In the first wave of the pandemic, completed echocardiograms fell dramatically in England, and have struggled to recover since. The number fell by 29 per cent over the pandemic year to February 2021, compared with the year before.[28] These figures point to significant delays at the start of many patient pathways, leading to delayed diagnosis, delayed treatment, and ultimately poorer outcomes. It also suggests a substantial unmet need residing in communities, with people feeling concerned or unable to seek help with their heart symptoms. A recent study by the IPPR estimates this has led to 23,000 missed diagnoses of heart failure in England during the pandemic.[29] Heart failure has a worse five-year survival rate than many cancers and early diagnosis is the key to better outcomes.

In Wales, an average of approximately 5,000 cardiology referrals per month reduced to just under 2,000 in April 2020. However, this figure has recovered gradually month on month to March 2021, where referrals returned to pre-pandemic levels. A similar pattern was also seen for CT scans in Wales, though this affected much smaller numbers of patients.[30]

The time that people are waiting for echocardiography services has also increased drastically over the course of the pandemic across the UK, with 37 per cent of people in England waiting over 6 weeks for diagnostic echocardiograms at the end of April 2021, compared to just 4 per cent in February 2020.[31]

In Northern Ireland, in quarter one of 2020, before the impact of the pandemic was fully felt on the health service, 28 per cent of patients were seen before the 9-week target. However, in quarter two this dropped to 16 per cent, and by the end of quarter four, only 17 per cent of patients were seen within the 9-week target.[32]

75%

drop in referrals for consultant-led outpatient appointments in England in April 2020 compared with 2019

23,000

estimated missed diagnoses of heart failure in England during the pandemic, according to the IPPR

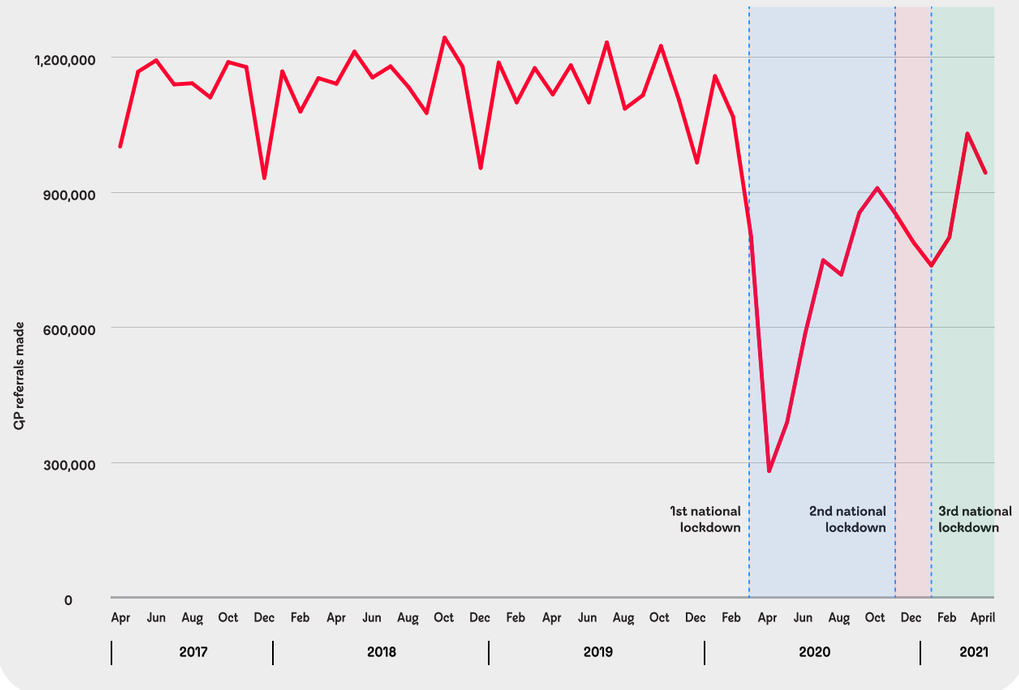
133%

increase in patients waiting over a year for an echocardiogram in Northern Ireland from 2019 to 2020

Compared to 2019, the average percentage of patients seen before the 9-week waiting time in 2020 was 20 per cent less and that increased to 44 per cent compared to the 5-year average preceding the pandemic. Northern Ireland saw a 133 per cent increase from 2019 to 2020 of patients waiting over a year for an echocardiogram (12 per cent up to 28 per cent). By the end of 2020, over one third of all patients waiting on an echocardiogram in Northern Ireland had waited longer than a year.[33]

Similar trends have been seen in Wales. The number of people waiting for diagnostic cardiology tests in Wales rose from 13,853 in March 2020 to a high of 22,814 in August 2020. Since then, the number of patients waiting for diagnostic tests has been steadily declining to reach 20,568 in April 2021.[34] There has evidently been an increase in waiting times for diagnostic tests in cardiology and fewer patients receiving diagnostic tests. Diagnostic imaging services in Wales have been severely impacted by the pandemic. In February 2020, there were 7,652 people on the list waiting for an echocardiogram in Wales, none of whom were waiting more than 24 weeks. By the end of April 2021, there were 12,048 people on the list, 11 per cent of whom had already waited 24 or more weeks as part of the longest waiting list since the data series began in October 2009.[35] Clinicians are reporting that the main problem in Wales and across other nations of the UK lies in the increased times that patients are now waiting for diagnostics, and the potential negative implications this will have on their outcomes.

Figure 2 Number of GP referrals in England, 2017-2021



Specific data for echocardiography are not available in Scotland but wider data for eight diagnostic procedures show a reduced performance against the six-week standard from 85 per cent pre-pandemic to 61 per cent in March 2021, suggesting that there is significant pressure on Scotland's broader diagnostic services.[36]

Throughput in CT and MRI scanning was also reduced during the pandemic, because of the need for deep cleaning between patients of uncertain Covid-19 status. MRI and echocardiography are vital not only for the diagnosis of heart disease in new, often symptomatic patients, but also for the regular long-term monitoring and management of heart failure, cardiomyopathy, valve disease and for children and adults with congenital heart disease. Not only will this reduced throughput continue to increase waiting lists for tests, but patients recovering from Covid-19 with longer term respiratory and cardiac problems will also likely place additional demands on a range of diagnostic services including chest X-ray, CT scanning, cardiac MRI and echocardiography in the future.

Despite the challenges, some positives highlighted by healthcare professionals include better communication between primary and secondary care to support diagnosis of patients and the ability to refer diagnostic heart tests directly without the need for attending a secondary care appointment. These more efficient approaches should be maintained, where appropriate, to improve time to diagnosis of CVD and improved patient experience of care.

Increasing demand for diagnostic heart assessment

Healthcare professionals and system leaders told us they were already seeing a large wave of patients returning to seek primary care and community services from as early as April 2021, many with more severe symptoms of existing conditions as well as symptoms and signs leading to new diagnoses of heart and circulatory diseases. Following many months of staying largely at home, patients who have managed to avoid hospital may have severely deteriorated.

2,000

cardiac referrals in Wales in April 2020, down from a monthly average of 5,000 before the pandemic

37%

patients in England waiting over 6 weeks for echocardiograms in April 2021, up from 4% in February 2020

Investment in the necessary infrastructure and workforce for diagnostic tests, particularly heart investigations, in the UK is long overdue. An already strained system is now under increasing pressure from a backlog of patients who have been unable or reluctant to access care. Plans in some nations across the UK to develop hubs for diagnostics are welcome and will likely play a significant role in addressing the backlog of patients. However it is vital that these hubs come with the necessary investment, both in terms of specialist equipment and workforce to allow them to drive improvements, and that the appropriate specialist expertise and breadth of imaging to diagnose CVD is included. These improvements should focus not only on improving the throughput of heart investigations for patients, but also improve patient experience by reducing unnecessary steps in the patient pathway.

Assessment and diagnosis of CVD should be at the heart of any plans for diagnostic hubs, with clear measures and accountability for reducing the time to diagnosis. In the short term, hubs should be given clear guidance from relevant healthcare professionals on how to prioritise patients based on need, to minimise the number of excess deaths and poor outcomes driven by delayed diagnosis of diseases such as heart failure.

> "The one-stop clinic approach is going to be vital for clearing the backlog, but even these were stopped during the pandemic. We may have to go back to a waiting list system initially so that those attending one-stop clinics do not jump the queue for diagnostics, putting people who have been waiting back further
>
> Cardiologist

UNTOLD STORY

Diane's delayed follow-up

Diane is 62 years old and lives in Wiltshire. She has high blood pressure and aortic stenosis (a condition where the aortic valve becomes narrowed, reducing blood flow to the rest of your body).

I was diagnosed with aortic stenosis in 2019 and prescribed medication. I was due to have a follow-up check in March 2020 to see if I need surgery to replace or repair my valve, but that was delayed due to the pandemic. Over a year later, in May 2021, I received a letter letting me know that my appointment is being rescheduled but I still don't have a date confirmed.

I feel fine physically, but I need an echocardiogram to know what's going on inside. I was told that my valve may need to be replaced almost a year ago, and I'm concerned that it may be getting worse, but I just don't know.

I'm not really an anxious person but I have been getting a little worried because I feel like I've just been forgotten. I understand there is a huge backlog of heart patients like me waiting for tests and procedures due to Covid-19 – I just want to know what the situation is and prepare myself mentally if I do need surgery. It's quite scary waiting for an echocardiogram without any contact from my cardiologist. I generally try not to think about it.

I haven't seen my GP or cardiologist in person since the pandemic began. I spoke to my cardiologist once on the phone when my appointment was cancelled and had some contact with my GP via email, but other than that I've had very limited communication with my healthcare team. I'd like face-to-face appointments to resume as soon as possible – I miss that human touch.

> "I feel like I've just been forgotten

I feel that heart patients have been a little bit neglected during all this. For many people lockdown is over, and life is returning to some normality but for those like me with a heart condition that needs monitoring it has left us worried and with uncertainty over what happens next. I understand that Covid-19 has placed a huge pressure on the health system, but there are thousands of people with heart conditions who still need care.

4. Reduced access to treatments

Heart and circulatory diseases require a diverse range of treatments and interventions to allow patients to live well for longer, covering everything from invasive procedures including surgery through to longer-term pharmaceutical interventions and lifestyle changes. Delays caused at the start of the patient pathway have been compounded by delays in treatment, with planned procedures and surgeries hit particularly hard. The situation has been exacerbated by reduced access to specialist care in the community, as well as significant reductions in patients presenting at hospital for urgent and emergency care.

Delays to surgeries and other procedures

Throughout the pandemic, services have worked hard to ensure that emergency surgery and other invasive procedures went ahead, and remaining patients were prioritised by clinical urgency. In those early, uncertain months, resources were diverted away from elective (planned) services, as health and care leaders focused attention and capacity on treating Covid-19 patients.

In the summer of 2020, hospitals began to reinstate elective care, but enhanced infection prevention and control measures reduced operating efficiency. New waves of Covid-19 in the autumn and winter of 2020/21 hindered the restoration of elective care further still, with demand on the system exceeding that seen in the first wave across much of the UK.[37] This has resulted in a sharp increase in people waiting for low-priority high-volume (priority 3 and 4) procedures.[38]

There are now significant waiting lists for a range of conditions, including CVD. According to the NHS Confederation, the official waiting list recorded in December 2020 – 4.52 million people, then the largest on record – fell far short of the actual number of people waiting for treatment. In 2020, there were 5.9 million fewer referral-to-treatment pathways started compared with 2019 in England. This represented a significant hidden group of people who were yet to join the official waiting list. Modelling by the NHS Confederation suggests that the backlog of elective care could continue to grow for some time, potentially reaching up to 8 million by October 2021.[39] A recent statement by the new Secretary of State for Health and Social Care has indicated that even this modelling may be optimistic, and that the waiting list could grow to 13 million. Data for May 2021 show waiting lists of more than 5.3 million people in England, the first time such volumes have been recorded.

There were 133,000 fewer heart procedures and operations carried out in the first year of the pandemic compared to the previous year in England.[40] The amount of time patients are waiting for heart treatment following referral has increased significantly.

170x

more people in England were waiting more than a year for heart procedures in April 2021 than in February 2020

“After the fifth cancellation, my surgeon warned me the operation could be cancelled again

UNTOLD STORY

James's cancelled surgeries

James is 47 years old and lives in West Yorkshire. He had endocarditis in 2019, which damaged his aortic valve.

I was diagnosed with endocarditis in 2019 but hadn't had any problems with my heart before that. After I recovered, I found out that the infection had damaged my heart valve and that I would need to have an aortic valve replacement. My operation was initially scheduled for May 2020, right at the start of the first national lockdown. Two weeks before it was due, I was told my operation had been cancelled due to the pandemic, which wasn't a surprise given everything that was going on with Covid-19.

My surgery was rescheduled for early October 2020. I prepped for surgery, was showered, and shaved and was waiting for my anaesthetic, when I was told that an emergency had come in so my operation would need to be rescheduled. The surgery was rescheduled for the middle of October but was cancelled again at the last minute because there wasn't an ICU bed available for me after my operation. My operation was then rescheduled for the end of October but was cancelled again because there weren't enough staff. My surgeon was brilliant, and very apologetic. I could see his frustration every time he personally came to tell me I wouldn't be having my surgery that day. I'm not faulting the NHS for the cancellations. All the staff I interacted with were brilliant – it was just an unfortunate situation to be in.

After the fifth cancellation my surgeon told me that we could reschedule the operation again but warned me that it could get cancelled. At that point I just wanted to get it done so decided to go private, which I was able to do thanks to the health insurance my wife has through her work. I made the decision to go private for a few reasons. First and foremost, I didn't want to delay any longer and risk my health deteriorating further. But I was also keen to get back to work. I'm self-employed and had budgeted for the three months I would likely need to be off work to recover from the surgery, but the cancellations and subsequent delay meant that I was eating into my savings before I'd even had my operation, so that financial side was a serious consideration. It was also emotionally important to me that I had the surgery, I was really messed up after the first two cancellations and found it hard to explain what was going on to my two children.

After I had my surgery, I made a good recovery, but had limited communication from my healthcare team. It would have been good to have some more opportunities to speak to my healthcare team during my recovery, including what to expect after my operation. I sometimes get chest pain, which I find concerning. It would be good to be able to talk to a professional just to check there's nothing to worry about.

I recognise how lucky I was to be able to have my operation privately. I know that this isn't something that's possible for everyone, so it's important that the NHS is supported to ensure that more people are able to get the care they need at an appropriate time. Waiting several months for surgery not only has health implications, but it also has a significant emotional and financial impact on people like me.

The proportion of people on the waiting list who are waiting for more than 18 weeks started increasing at the beginning of the pandemic in March 2020, peaking in July, with a growing proportion of people waiting for over a year. Analysis of April 2021 waiting lists were extended to include patients in England who have had a two-year wait. After the peak of the waiting list, the number of people waiting for more than 18 weeks remains substantially higher than pre-pandemic in England.[41] In April 2021 there were 170 times more people waiting more than a year for heart procedures, including surgery, in England than there were in February 2020.[42] Patients who are waiting for such a long time for treatment inevitably run the risk of their symptoms worsening, possibly requiring emergency care. This is in addition to the concern and anxiety that delays to such important procedures and tests can cause.

Increasing waiting times for procedures and treatment have also been seen across the rest of the UK, though the types and methods of data collection make them difficult to compare (see Appendix 3).

Long waiting times can be stressful and anxiety-inducing for patients, impacting their overall wellbeing, and there are also potential implications for their long-term health outcomes. Given the size of the backlog, this is not necessarily an issue that can be solved overnight, so it will be important for health services to ensure that patients are supported to stay well while they wait for treatment. This could include offering psychological support and opportunities to talk to healthcare professionals between episodes of care, as well as opportunities for prehabilitation that could help improve their longer-term outcomes.

> **“You can get neurotic at every twinge when you have heart disease, so just to get to speak to someone is reassuring**
>
> **David, focus group**

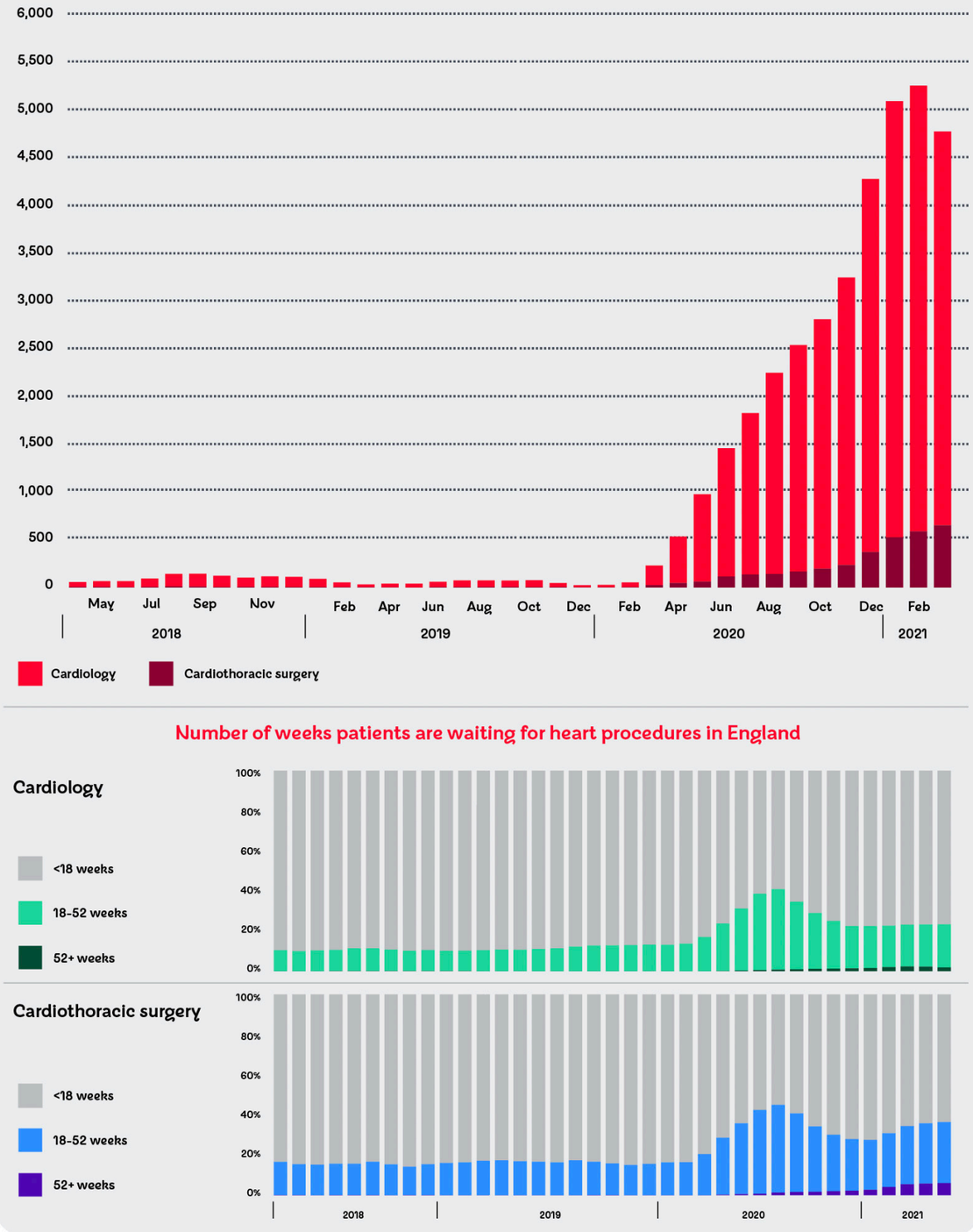
Lengthening waiting lists have been further exacerbated by reduced available capacity in hospitals, in part due to Covid-19 patients requiring treatment and beds within intensive care, but also because of the need for social distancing and the impact of the pandemic on staffing. For many cardiac surgeries and other procedures, access to intensive care is vital for the early stages of recovery. Social distancing measures have not had an equal impact across all services. For example, systems with outdated or physically small premises have struggled to create additional or larger waiting areas, or one-way systems.

In conversations with service providers, people told us that some services prioritised high-risk surgeries and cancer diagnostics, with a significant impact on their ability to perform cardiac surgeries and procedures. The waiting lists for procedures and surgeries varies significantly across regions, with some areas having considerably further to go to return to normal waiting times for procedures and surgeries. Varying approaches to hospital discharge will also have impacted the experience of patients and their longer-term outcomes.

It will be vital to consider this regional variation as the Government commits resources to addressing the backlog, ensuring that existing inequalities are not exacerbated. Regional systems will also need to increasingly work together across geographies to mitigate against a postcode lottery for those most in need of treatment.

These patterns were broadly seen across the other nations of the UK, based not only on available data but feedback from clinicians and system leaders across the country. Clinicians across the UK were particularly concerned that people were waiting longer for their care, with potentially negative impacts on their future outcomes and quality of life. Further data on this from across the rest of the UK can be found in Appendix 3.

Figure 3 Number of patients waiting for heart procedures for over a year in England



Reduced hospital attendances and admissions

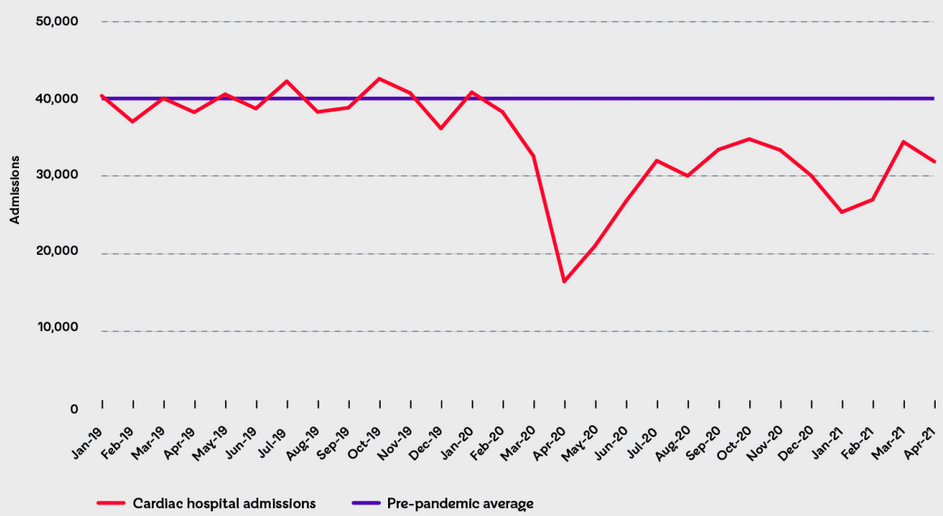
The emergency care pathway has also been affected by the pandemic with significant reductions seen in attendances for urgent and emergency care for heart attacks and strokes across the UK. During the first peak in 2020, the BHF observed a 50 per cent reduction in the number of people presenting to Accident and Emergency (A&E) in England with the symptoms of a heart attack.

A BHF survey of cardiologists at the time suggested that this was due to a drop in patients presenting themselves at A&E due to fear of catching coronavirus. Those who did present at hospital were often presenting later than usual, with implications for their survival and longer-term outcomes. The BHF worked closely with the NHS in England to encourage people experiencing symptoms of a heart attack to call 999, and presentations have now largely returned to expected levels despite a second dip in attendances observed in the second wave of Covid-19 infections.

In England, there was also a 22 per cent drop in heart failure hospital admissions between January and September 2020 compared to the same period in 2019.[43] Such changes in patient behaviour, coupled with pressure on the healthcare system, have combined to create a huge potential burden of unidentified and untreated cardiac disease. These figures were further supported by a recent study that also reported a decrease in heart failure admissions, accompanied by an increase in heart failure deaths at home and in the community. While it appears that standards of care for those admitted with heart failure were largely maintained, reduced survival of patients after discharge suggest that post-discharge care may have been more significantly impacted for these patients, as well as potentially more people choosing to die at home.[44]

When the pandemic worsened again in Autumn 2020, we saw another drop in cardiac hospital admissions. Overall, cardiac hospital admissions in England dropped 28 per cent in the first year of the pandemic compared to the previous year (343,000 between March 2020 and February 2021, compared with 475,000

Figure 4 Cardiac hospital admissions in England



Source: HES activity data. Cardiac hospital admissions are defined using 6 cardiac treatment function codes in finished admission episodes

> **“We are unable to give even approximate dates for valves or coronary artery bypass grafts. This is mainly due to ICU capacity and theatre space**
>
> **Cardiologist**

in the previous year).[45] Cardiac hospital admissions are not just for planned procedures and tests but are often a result of patients needing access to urgent inpatient care due to an exacerbation of their condition.

Conversations with systems leaders have corroborated this. Some told us that people who were admitted during significant waves of Covid-19 cases were less likely to end up in Intensive Care Units (ICU) or an appropriate ward, with implications for their access to specialist input to their care. Some systems also told us they believed that many patients may have been discharged under sub-optimal conditions due to the extreme pressures on the system.

Unfortunately, a lack of joined-up data across primary, secondary and community care makes it very difficult to understand what happened to people with heart and circulatory diseases who did not require admission to hospital during the pandemic. Such data will be vital in the future to understand the true impact of Covid-19 on services and the patients that need them.

Reduced access to routine primary and community care

Early in the pandemic, insight gathered from healthcare professionals and system leaders told us that services in the community that people living with heart and circulatory diseases rely on to stay well were significantly depleted. This was in part due to redeployment of specialist nurses. As the pandemic has progressed, more services have managed to retain at least a skeleton service, and services have found innovative ways to manage patients remotely and in alternative settings where they may feel more comfortable accessing care.

Digitally enabled remote services play a vital role in supporting patients to self-manage and stay well, ultimately helping them to stay out of hospital at a time when it is more important than ever to reduce pressure on inpatient care. However, health systems have reported concerns about inequities between the demographic groups that are able to access and benefit from these approaches delivered virtually.

A recent BHF survey of people with heart and circulatory diseases showed that many patients had accessed care virtually during the pandemic. Of those patients who had received care during the pandemic, 62 per cent had received care over the phone, and 4 per cent had experienced a face-to-face appointment conducted online (for example via video call). Satisfaction with remote approaches to care was generally positive, with 54 per cent who had experienced appointments conducted via telephone expressing satisfaction with the care they received through this method. However, many expressed a desire to return to in-person face-to-face appointments as part of their routine care. It will be important for systems to adopt a hybrid or blended model of care to ensure that patients are able to access services that best suit their individual needs in the future.

‘I don’t mind using technology for appointments – in fact I think it could be the way forward. I want more reliable access to the health service and think modern technology can support this.’
David, focus group

Specialist services in primary care and the community are now starting to experience the hidden impacts of the pandemic on people with heart and circulatory diseases. As services are restored and public confidence in accessing the NHS increases, healthcare professionals have told us they are seeing large numbers of patients who have experienced significant physical deconditioning over the past 18 months, including many with

progressively worsening heart disease, which may negatively impact their outcomes even after they receive treatment. Patients whose conditions have deteriorated significantly during this time are now seeking help for increasingly complex issues with both their physical and mental health. A concerted effort to understand this demand for services is needed now to help them plan for the future.

'The increase in demand now for heart failure services is not because there are more patients with heart failure. I think it is more due to the reduced care patients received in the first wave.'
Heart failure nurse

The impact of long waiting times

With waiting lists continuing to grow and patients waiting increasingly long times for treatment, it is vital that services are not only upfront with patients about waiting times but are also resourced to support patients while they wait. A recent BHF survey showed that 18 per cent of people with a heart or circulatory disease or risk factor had at least one appointment for their condition cancelled or postponed throughout the pandemic. These appointments were most commonly reported to have been postponed for 3 to 6 months, but 19 per cent of respondents who had an appointment postponed reported that they had been pushed back by more than a year. A significant proportion of those respondents who had an appointment cancelled or postponed had multiple appointments affected, with 42 per cent having multiple routine appointments cancelled or delayed (including rehabilitation sessions). A majority of people surveyed for whom cancellations or delays had impacted a surgery or planned procedure also reported experiencing multiple cancellations and delays. For those respondents who had experienced cancellation and rescheduling of appointments, 39 per cent also felt they had received insufficiently clear communication about what would happen next with respect to their care. This continues to contribute to significant anxiety for patients, with many describing the sense of not knowing what is going on as having a significant impact on their wellbeing. Regular communication with patients as they wait for care will be increasingly important as the health and care system works to address the backlog of patients waiting for treatment.

'I was due to have an intravenous infusion in March 2020, just as the pandemic hit. This was cancelled with little information about what was happening next. I had no communication from my healthcare team about when the next appointment would be and was not given any advice about how to self-manage my condition in the meantime.'
Francesco, focus group

As systems work to address their backlogs of care, they should also be suitably resourced to support patients on waiting lists to understand the reasons for their waits and optimise their general physical and mental health and future outcomes.

'I think "prehab" should be more of a focus for people who are about to undergo major cardiac surgery as it helps to build trust and confidence, both in your cardiac rehabilitation team and in yourself. I feel like I really benefitted from the work I did before my surgery, and think it helped me recover more quickly.'
Chandni, interview

It is vital that patients not only receive clear communication about waiting times but also the support they need while they wait to know when and how to get help if their heart disease worsens to ensure treatment is given in time to result in optimal outcomes.

Sharing the load – a networked approach to delivering services

What we know about the backlog of care from readily available data is just the tip of the iceberg. With significant unknowns about the level of demand on services over the coming years, systems will have to adapt and work together to keep pace with the needs of patients who have not been accessing routine care. In light of these challenges, the Royal College of Surgeons of England is calling for a "new deal for surgery", highlighting the need for continued significant investment in services to address the backlog of care alongside a hub approach to rapidly work through growing waiting lists of patients.[46]

As cardiac networks are developed across England, they will play a significant role in improving standards of care and driving regions to work together to best address their backlog of care. Working with the nascent ICS structures as well as emerging community diagnostic hubs, cardiac networks will be important players in restoring services while reducing unwarranted variation across the country. If properly supported and resourced, networks will provide an important mechanism for delivering care across a broad footprint allowing for pooling of waiting lists and sharing of resources and workforce to clear the backlog of care with optimal efficiency. Investment in networked approaches to diagnostics and treatment for CVD patients is needed to reduce variation in care, as well as building the capacity needed in services to address the backlog of care.

This will require investment in more specialist facilities for cardiovascular care to meet the full range of demand for heart imaging and diagnostics, as well as for cardiac surgery and other invasive procedures such as stents, pacemakers and defibrillator implantation. This will need investment in infrastructure in existing cardiovascular specialist centres and new units, as well as the necessary investment in specialist equipment and workforce.

> "I find telephone appointments quite difficult, and often find I forget important things. I would much prefer seeing my healthcare team face to face, but if that isn't possible, I think video would be better than just telephone
> **Anne, focus group**

UNTOLD STORY

Chandni's delayed heart surgery

Chandni is 37 and lives in London. She has valve disease and had open heart surgery in September 2020.

I was born with a bicuspid aortic valve, which means my aortic valve had two cusps instead of three, but wasn't diagnosed with valve disease until 2015, when I was 32. I was meant to have an operation to replace my heart valve in March 2020, but that was cancelled due to the emerging situation with Covid-19. My cardiologist called to tell me that my operation would be delayed, then I didn't hear from them again until June 2020.

My operation was rescheduled for September 2020, as my case was deemed to be urgent. The surgery itself went well, and my healthcare team tried to put me at ease. Catching coronavirus was the least of my worries while in hospital. The hospital was clearly taking precautions.

However, waking up after the surgery was the most frightening thing I've ever been through. I didn't know where I was. I was confused and everything was hazy. I found the period after my surgery really lonely as I wasn't allowed to have visitors because of Covid-19. I understand why that was necessary, but it was a really difficult thing to go through a major surgery without the support of my family.

After my surgery I was given a lot of different materials to read, but I had no idea what to expect about my recovery in the immediate or longer term. I had lots of questions and wasn't sure what I should or shouldn't be doing – I was worried about doing something wrong and was desperate for clarity.

My aftercare has been limited and delayed. I haven't yet had an echocardiogram to check that my valve replacement is working properly, and my chest stitches were removed later than planned, by which time they were embedded in my skin and very painful.

I was invited to join a cardiac rehabilitation programme in my local area, six months after my surgery. By that point it was too late. I was lucky enough to secure a place with a private cardiac rehabilitation specialist just after my surgery. The rehabilitation itself was focused almost entirely on my physical recovery, but it was helpful to have someone to answer my questions as I found it difficult to speak to my NHS healthcare team.

I think I would have benefitted from some psychological support or cardiac counselling. The surgery had a significant emotional impact on me and my family that I'm still coming to terms with, and it would have been good to have some more support with this aspect of my recovery.

Social media has been a real saving grace throughout this whole experience, and has allowed me to connect with people my own age who are going through similar things. People with heart conditions tend to be much older than me, and I don't always find that the NHS support offer is tailored to people my age.

I recognise how lucky I am that I was able to have my surgery last year, as I know there are still lots of people with heart conditions who are waiting to be seen, but I found the whole experience really difficult. I felt uninformed, unconfident and uncared for both during and after my time in hospital. I know that NHS staff are under a lot of pressure at the moment, but I think more needs to be done to ensure that patients like me have access to the care and support they need.

5. Disruption to cardiac rehabilitation

Supporting people with heart and circulatory diseases to recover and live well

Cardiac rehabilitation services offer a range of support to patients, including exercise to improve cardiac function, advice on diet and exercise, and psychological and peer support. Cardiac rehabilitation can help save lives, improve quality of life and reduce hospital readmissions. But access to and uptake of cardiac rehabilitation services across England, Wales, and Northern Ireland (the nations which contribute to the National Audit of Cardiac Rehabilitation, or NACR) has historically been limited. Even before the Covid-19 pandemic, only around 52 per cent of eligible patients took up offers of cardiac rehabilitation.[47] Uptake among certain demographic groups was lower still, including in women, people with Black, Asian, and minority ethnic backgrounds, and people with low incomes. Some services also routinely exclude patients with certain cardiovascular conditions, like heart failure. Access to and uptake of cardiac rehabilitation in Scotland is, unfortunately, not currently quantifiable, as programmes there do not formally participate in NACR, so the data we have access to is limited and fragmented. Qualitative insight and conversations with rehabilitation programmes across Scotland, however, point to a similar trend.

The impact of Covid-19 on cardiac rehabilitation services

The Covid-19 pandemic resulted in a significant drop in people attending cardiac rehabilitation, especially during the first wave, with two main drivers for this trend. First, the pandemic resulted in fewer people attending hospital with heart attacks, and thousands of surgeries being postponed leading to fewer referrals to rehabilitation services. Second, many rehabilitation services were significantly disrupted by staff redeployment, and the vast majority of services moved to remote models of care.

This disruption to cardiac rehabilitation was not experienced equally. The varied and changing nature of staff redeployment from cardiac rehabilitation services and access to workspaces likely exacerbated existing local and regional variations in care.

Also, NACR data shows that people with Asian and Asian British, Black, African, Caribbean and Black British ethnic backgrounds experienced the largest drop in participation in cardiac rehabilitation when compared to White populations.[48] This has reinforced the pre-existing reduced delivery of cardiac rehabilitation to people with minority ethnic backgrounds. A concerted effort is now needed to address this inequality in care.

> It was a hard slog, but I enjoyed looking at virtual models and it is exciting that we have been able to achieve so much under difficult circumstances. But face-to-face rehab needs to return, as I think all virtual approaches in the long term will decrease morale
>
> **Cardiac Rehabilitation Team**

'Although I believe that it is very important to see patients face to face again in the gyms, and to offer face-to-face clinic appointments, I do think that patients wishing to use our new online features should still have the chance to do this. I believe that more patients may be likely to take up cardiac rehabilitation due to the flexibility of the online virtual service that we now offer.'
Community Allied Health Professional

Conversations with system leaders have already revealed several novel approaches to providing rehabilitation and wider recovery and support services. For instance, the use of apps and livestreamed exercise classes have allowed some services to better target patients in need. Services have also adapted to the need to remain outdoors, with regions trialling activities such as walking groups with multi-disciplinary team (MDT) support. Such approaches have been popular with patients while facilitating the opportunity for broader peer support alongside physical activity, and the opportunity to ask questions of healthcare professionals to improve patient self-management. It will be important to learn from the adaptations to traditional rehabilitation that have worked well, without embedding changes that may have unintended longer-term consequences.

For example, while the uptake of online cardiac rehab services has been encouraging, patients have told us that a face-to-face delivery mode is best for vital components of services, such as psychological support. Digital care also poses the risk of reducing accessibility for some despite increasing access for others. Older cardiac rehabilitation patients are more likely to be unable to access digital content and face digital exclusion. There are also particular problems in some rural communities where internet speeds are too slow stream online video content.

'When the pandemic first hit, the support group I attend stopped. Eventually it restarted via Zoom, which I really appreciated as I had really missed social events and contact with my peers.'
Mohinder, focus group

the untold heartbreak

> I used to do phase four cardiac rehabilitation at my local leisure centre, but this closed down and didn't go online. I've now restarted cardiac rehabilitation but have noticed that my fitness levels have dropped, and I feel less well than I did around 15 months ago, before the classes stopped
>
> **John, focus group**

UNTOLD STORY

Nina's virtual care

Nina is 35 years old and lives in North London. They live with heart failure.

I was diagnosed with heart failure in 2018, but had already been seeing a cardiologist for a few years before that to try to manage a condition I have called postural orthostatic tachycardia syndrome (POTS). I also have Ehlers-Danlos syndrome, which is a genetic connective tissue disorder. My conditions can cause a range of symptoms, but day to day I struggle the most with fatigue. I am easily exhausted after normal activities and, unfortunately, this has got a lot worse in the last five years or so.

Before the pandemic I saw my cardiologist every three months for a face-to-face appointment, but since the pandemic started, I've only had one in-person appointment. Most of my care has been delivered virtually, which I find concerning as my I'm now being treated based on how I feel rather than what's going on inside. I would usually have regular echocardiograms and other diagnostic testing just to check how things are going, but in the last fourteen months that's stopped and instead I've just had one routine blood test to monitor my iron levels. I take an iron supplement so usually have a test every six months or so to make sure I don't have too much iron in my system.

Likewise, before the pandemic I would usually see my GP four or five times a year, but since Covid-19 hit I've only had one call from my primary care team. I've been shielding, so a phone call from my GP is preferable to visiting the practice in person at the moment, as it's a 45-minute journey in my wheelchair from where I live.

> "I would usually see my GP four or five times a year, but since Covid-19 I've only had one call

During the pandemic I've put a lot of non-urgent medical issues like medication reviews on the back burner as it's so difficult to get through to my GP. Sometimes when I call my practice I have to sit through several minutes of pre-recorded messages to then just be directed to websites rather than speaking to anyone, which is frustrating.

I recognise that everyone is in the same boat with these changes, so I don't necessarily feel aggrieved, but I'd like to get back to having more regular check-ins with my medical team when possible.

6. The considerable toll on the workforce

Increased workloads, staff shortages and new ways of working have placed staff under immeasurable pressure throughout the health service, in particular affecting cardiovascular care.

Workforce capacity before Covid-19

Prior to the pandemic, cardiology services already had significant staff vacancies across the UK, with significant regional variation in access to cardiologist-led care. This issue is further exacerbated by a lack of National Training Numbers (posts for doctors to train and specialise) across the country.

There are also vacancies across the wider workforce, with sub-optimal numbers of both advanced clinical practitioners (ACPs) and specialist nurses in England. ACPs and specialist nurses play a vital role in delivering care, with many fulfilling extended roles that are not only vital to delivering quality care to patients, but also in delivering the ambitions of the NHS Long Term Plan in England. For instance, current estimates are that between three and four (WTE) heart failure specialist nurses or ACPs are needed per 100,000 population to deliver the requirements of the Long Term Plan, as opposed to the one per 100,000 previously recommended. This should also be increased in areas with higher demand, such as areas with a larger elderly population or areas of high deprivation with a greater prevalence of CVD.[49] In 2017, 84 per cent of heart failure services employed one heart failure specialist nurse per 100,000 population, and there is continued evidence that they struggle with large caseloads.[50]

These widespread staff vacancies, combined with the extensive diagnostic workforce shortages detailed above, reveal a system already working at reduced capacity. This meant that health and care systems across the UK entered the Covid-19 pandemic with an already overworked and exhausted workforce.

In Wales, there have been long term shortages in the workforce across the patient pathway. The 2005 Hackett report outlines that Wales needs between 40 and 60 cardiologists per 1 million people. Measured against the current population this would be around 140 to 180 cardiologists.[51] Wales currently has only 70. There are also shortages in specialist nursing, particularly in heart failure. The cardiac physiologist workforce has also been a long-standing problem in Wales. Though most health boards are 'fully staffed', many are heavily reliant on locums, which is expensive and unsustainable. The pre-existing workforce capacity problems were exacerbated by the pandemic and now risk Wales's recovery from Covid-19.

Workforce issues in Scotland have existed since long before the pandemic. Shortages in the cardiac physiology workforce limit the capacity to provide timely and equitable diagnostic tests such as electrocardiography and echocardiography. Work carried out by NHS Education for Scotland's Healthcare Science Team highlighted that over the last five years there has been a 46 per cent increase in the demand for cardiac physiology services in NHS Scotland, but vacancies in half of cardiac physiology units across Scotland are at 15 per cent, with a comparable fraction within five years of retiring. Most departments (70 per cent) have one or more vacancies.[52] These pre-pandemic shortages were undoubtedly compounded by the pandemic and the increased demand on services throughout Scotland.

Similarly, in Northern Ireland Covid-19 exacerbated existing workforce challenges and has put additional pressure on staff working in hospital services. The Elective Care Framework published by the Department of Health in June 2021 acknowledged that to support the delivery of sustainable improvements in waiting times, across all specialities, it will be necessary to ensure that the workforce is of sufficient size and has the necessary skills and support to carry out their roles effectively.[53]

The geographic separation of Northern Ireland from the rest of the UK means that it can be harder to attract specialist staff to services. A lack of readily available data makes it challenging to understand any pre-existing workforce challenges specific to cardiovascular disease services prior to the Covid-19 pandemic.

An exhausted workforce

To combat the pressure that the NHS has faced throughout the pandemic, many staff were redeployed to Covid-19 hospital wards and to administer the vaccine. Cardiology staff have been no exception. In Wales, cardiologists were placed on Covid-19 and General Internal Medicine rotas, and cardiac specialist nurses were redeployed to intensive care units.[54] This led to an 11 per cent decrease in cardiology staff in Wales between March 2020 and September 2020.[55]

There has also been a large drop in productivity, mainly due to infection prevention and control measures. Putting on and removing personal protective equipment (PPE), increased cleaning of treatment areas and one-way systems have all impacted how many patients clinicians can see, as well as making work more difficult for the workforce.

While the pandemic has undoubtedly presented some unique challenges, the issues facing healthcare practitioners today are not entirely new. Concerns about excessive working hours, workforce shortages, and mental health support for staff, for example, stretch back several decades. The pressures of delivering care during a pandemic have compounded pre-existing health and wellbeing trends. The NHSE Staff Survey 2020 found 44 per cent of respondents reported feeling unwell as a result of work-related stress.[56] More recently, a survey by the British Medical Association (BMA) found that 32 per cent of respondents to a survey said that they or clinical colleagues in their department had been on sick leave due to anxiety, stress, depression or post-traumatic stress disorder caused by the pandemic.[57] Around half of those surveyed by the BMA also reported feelings of anxiety, depression or burnout, with 40 per cent saying that such feelings are worse as a result of Covid-19.[58]

The pandemic has also created new challenges, including Covid-19 itself – a new disease with initially few treatment options – and redeployment into new areas with little time for training. As described earlier in this report, the first wave of the Covid-19 pandemic saw substantial redeployment of cardiology specialist, heart failure, and cardiac rehabilitation nurses. Many clinical cardiac physiology staff were also redeployed to coronary care units, cardiology wards and acute medical wards to support existing nursing staff.

The unique circumstances created by the Covid-19 pandemic have resulted in a rise in 'moral injury', a phenomenon previously experienced mostly by military personnel that relates to the harm done to a person's moral compass when they witness and fail to prevent an act that transgresses their ethical code of conduct.[59] For medical staff, moral injury can stem from being forced to make or act on decisions that are not ideal for patients, as a result of intense pressure on the healthcare system.[60]

Conversations and survey responses from healthcare professionals and system leaders across the UK indicate that these broader trends are reflected in the workforce that supports people with heart and circulatory conditions.

44% proportion of NHSE Staff Survey respondents who reported feeling unwell as a result of work-related stress

32% of respondents to a BMA survey who said they or colleagues had been on sick leave due to anxiety, stress, depression or PTSD

40% of those with anxiety, depression or burnout said such feelings were worse as a result of the Covid-19 pandemic

11% decrease in cardiology staff in Wales between March and September 2020

1/11 One in 11 NHS workers in England are considering leaving the sector, due primarily to poor pay and benefits and the pandemic

Rising staff vacancies

There is now a real concern that the NHS could be facing a workforce exodus in the coming years because of the intense pressures and stress brought about by the pandemic. Given the challenges that lie ahead in terms of recovering NHS services in the medium and long term, it is expected that some staff may decide to leave the NHS, compounding existing workforce shortages. Polling in May 2021 by YouGov of 1,009 NHS workers in England across all roles found that one in eleven (9 per cent) are considering leaving the sector.[61] Respondents said that dissatisfaction with pay and benefits was the primary motivator for leaving the sector (57 per cent). Covid-19 was the second most significant factor that respondents said played a part in their decision to leave the healthcare sector (39 per cent), while 38 per cent of respondents said they were planning to leave the NHS to improve their work-life balance.

Strong data on how this will specifically affect CVD services is not readily available, but insight from healthcare professionals suggests that many are considering moving organisations or retiring from the service in the next five years, with a significant minority suggesting they are less likely to work for the NHS in the future.

This is a serious concern given the significant pre-existing vacancy rates across cardiology services. If expected staff retention trends are borne out, this could lead to even greater staff shortages in cardiology, compounding existing issues with waiting times and increasing pressure on remaining staff. In the coming years, it will be imperative for governments across the UK to support a sustained expansion of the health and care workforce.

Even as the burden of the Covid-19 pandemic begins to recede, demand for services will continue to grow due to our ageing population and associated rise in complex health needs. A long-term and sustainable strategy that prioritises recruitment, training, and retention of skilled NHS workers is urgently needed.

Conversations with system leaders suggested that there is significant concern that many people later in their careers are now considering earlier retirement. This is of particular concern for the future of clinical leadership in the system. With significant changes approaching in health and care systems across the UK, large numbers of strategic and clinical leadership roles will need to be filled to drive the improvements in services that are so desperately needed.

Supporting the workforce

Action to support the mental and emotional health of the NHS workforce must address longstanding structural and resourcing shortfalls. It will also be important for systems to introduce formalised support networks and safe spaces, where healthcare staff can talk about the emotional impact of their work and learn from others' experiences. This could be achieved by introducing regular discussion groups for staff like Schwarz rounds or Balint groups, which provide a forum for healthcare staff from all backgrounds to discuss and reflect on the emotional and social challenges of caring for patients in a supportive setting.[62]

While national initiatives to support the wellbeing of NHS staff, such as NHS Practitioner Health,[63] have played an important role in supporting staff during the pandemic, it will also be necessary for systems to put support in place at local and regional levels, like that described above.[64] When the immediate coronavirus crisis begins to recede, it will be important for services to create space and time for staff to reflect on and learn from the difficulties experienced during the pandemic. Staff must also be given some respite before jumping from the immediate challenges of Covid-19 to the longer-term issues associated with the backlog of care.

Modelling the future demand for cardiovascular services

The health and care services across the UK has another mountain to climb to address the backlog of routine care, but there remain significant unknowns about the speed at which demand for services will return, and the capacity that will be available to the system to support people in the context of Covid-19.

BHF modelling of waiting lists for cardiology treatment in England show a number of scenarios for the impact on services as public confidence in accessing care increases, and services begin to build back capacity for delivering routine care. While health systems cannot control the rate at which demand increases, governments and system leaders have some power over the future capacity and resources available to the NHS to ensure that people are able to access the care they need in the longer term.

Unfortunately, it is not possible to create similar models for Scotland, Wales and Northern Ireland using readily available data. Real-time, continuous data is needed to establish how the system is functioning in order to identify areas of best practice and drive improvements. This should be an area of focus for systems as we move through and beyond the Covid-19 pandemic.

The following models describe the likely impact on waiting lists for cardiology treatment (which may include cardiothoracic surgery, pacemaker implantation, angiography and percutaneous interventions, advanced imaging or simply a consultation with a cardiology specialist) under three potential scenarios.

It is important to note that the pre-pandemic baseline for waiting lists in England is by no means an aspirational place for the future of the health and care system. System leaders told us that maintaining waiting lists at the levels seen prior to the pandemic had required steadily increasing activity from staff, with little room in the system for any future increase in demand. While we illustrate the time to returning to pre-pandemic waiting lists in these models as a useful indicator of future scenarios, reducing waiting lists further than the baseline in the long term is vital not only for patient safety and outcomes, but also for the future resilience of the service against pandemics. A detailed description of the modelling described below can be found in Appendices 4 and 5.

the untold heartbreak

Scenario 1
Return to pre-pandemic activity and demand

As the burden of the direct impact of Covid-19 on the NHS recedes, model one shows the potential impact on waiting lists if demand for services and service capacity were to return to pre-pandemic levels. The model also includes the impact of a third wave and potential winter pressures from November 2021 to January 2022, where demand and NHS capacity are both supressed but to a lesser extent than previous waves of the pandemic, given the apparent success of the vaccine programme to date.

Under this scenario, demand continues to outstrip capacity, the backlog caused by the first two major waves of Covid-19 is not addressed, and the waiting list for cardiology procedures continues to rise beyond March 2022. In March 2022, there would be 288,915 people waiting for procedures – a significant increase from the pre-pandemic baseline. Returning to pre-pandemic waiting list size in this scenario would take until around October 2024, with waiting lists peaking around December 2022 at 334,977 on the total cardiology waiting list (Figure 5).

When separating out the waiting list into referral to decision (an approximate measure of the number of people waiting for a diagnosis) and the time from a decision to treat to the treatment occurring (a measure of the number of people waiting for treatment, typically in the context of a hospital admission), this includes 247,577 people on waiting lists for a diagnosis and 41,338 people waiting for their treatment to take place While the greatest increase in terms of numbers is driven by the rise in people waiting for a diagnosis, it is notable that the number of people waiting for treatment nearly doubles.

When looking at the impact on cardiothoracic surgery, model one shows a peak in the waiting list around April 2021 of 10,772 people waiting (Figure 6). At this point, the waiting list plateaus and starts to decrease slowly, with 9,129 people waiting by March 2022. This pattern is driven by an early and small peak in people waiting for a diagnosis that then decreases consistently (after peaking at 5,134 in June 2021) while the waiting list of people waiting for their surgery plateaus around May 2021 with 5,665 people waiting by March 2022.

Figure 5
Projected cardiology waiting list in England

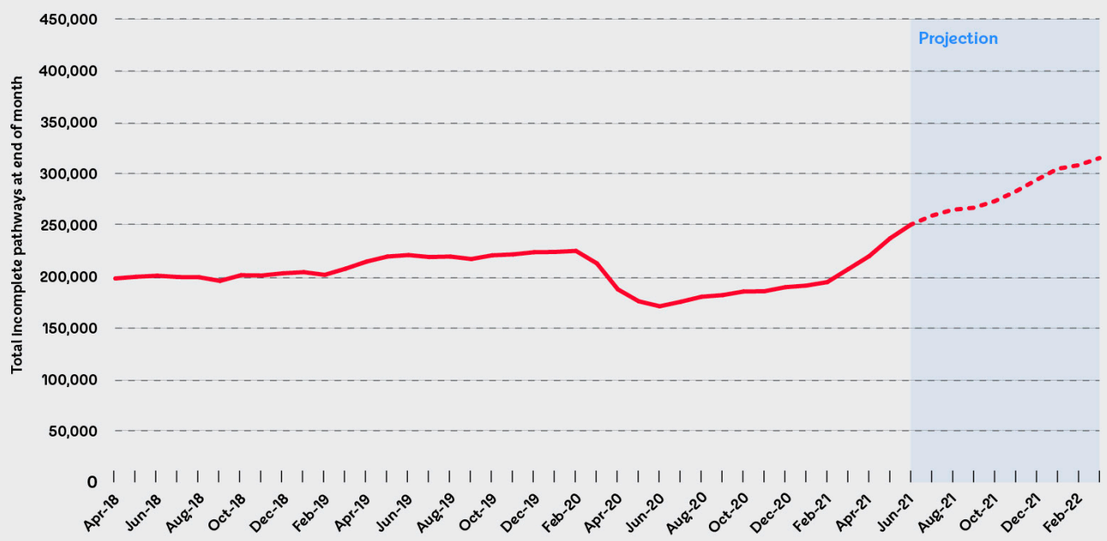
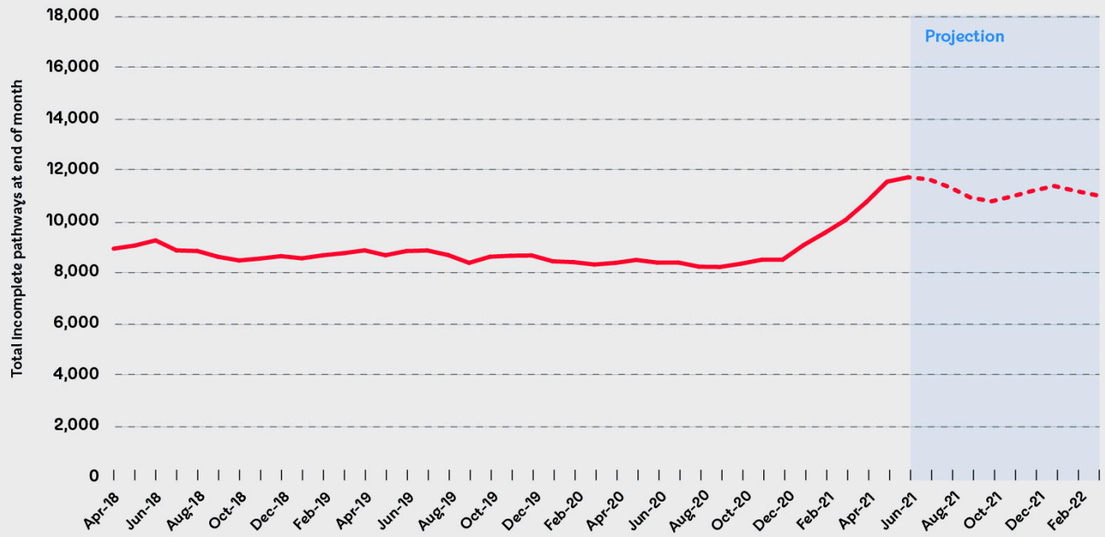


Figure 6
Projected cardiothoracic surgery waiting list in England



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Scenario 2
Worst case

A sharp increase in demand and below expected growth in health service activity

As confidence in accessing care improves, it is challenging to predict the speed at which demand on the health service will increase. Scenario two models the potential impact of a sudden and rapid increase in demand coupled with non-admitted activity (activity not requiring a hospital admission) remaining below the targets set out by NHSE in planning guidance, and admitted activity remaining supressed due to infection control measures. The model also includes a suppression of demand and activity from November 2021 through to January 2022, driven by an increase in Covid-19 cases and winter pressures.

In this scenario, the impact on cardiology waiting lists is substantial. The number of people waiting for cardiology procedures would increase rapidly, with 405,627 people waiting by March 2022 and minimal signs of plateauing. This equates to a waiting list almost twice that seen before the pandemic (Figure 7). This increase is driven by people waiting for a diagnosis, reflecting the increasing numbers of 'new' patients coming on to the list, but it is notable that the number of people waiting for treatment (though smaller) would be more than twice the pre-pandemic baseline. Under these disastrous conditions, it would take until around November 2026 to return to a waiting list equivalent to before the pandemic, with a peak around January 2024 at 550,385 people on the total waiting list – more than twice the pre-pandemic baseline.

A similar dramatic increase in those waiting would be seen for cardiothoracic surgery, though notably, the waiting list would peak at 15,384 people in February 2022 before early signs of decreasing (Figure 8). In the case of cardiothoracic surgery, this increase is driven predominantly by those who have already been diagnosed waiting for surgery, which increases two-fold (to 9,172 people waiting) due to the decreased capacity for admitted care driven by infection control measures.

Figure 7
Projected cardiology waiting list in England

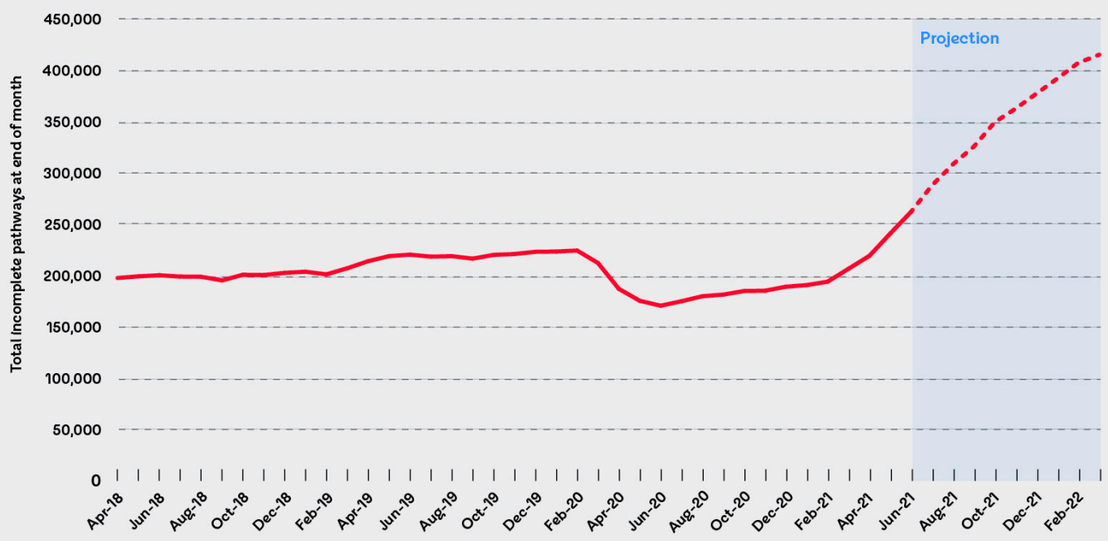
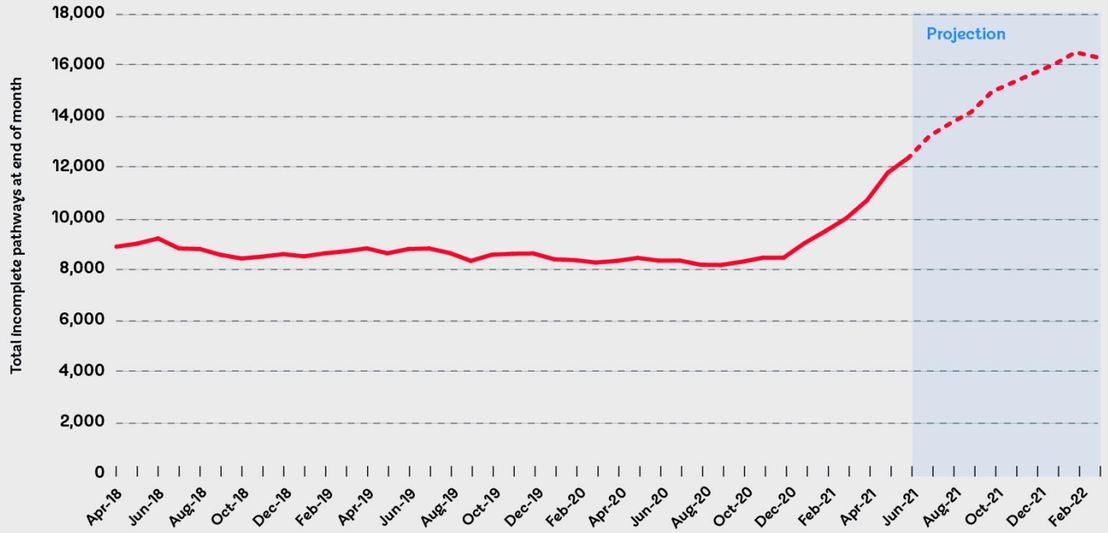


Figure 8
Projected cardiothoracic surgery waiting list in England



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Scenario 3
Best case

Investment rises alongside demand

While it is not possible to accurately predict the level of demand that will return to the NHS over the coming months, there are a number of factors that will limit the speed of referrals, and it is within the power of the government to give the NHS the resources it needs to build capacity and address the backlog of care both now and in the longer term.

Scenario three describes a more optimistic set of circumstances where demand for services rises in line with confidence in the roll out of the vaccination programme and the available capacity in primary care services. In this scenario, investment in diagnostic hubs for CVD and innovative approaches in outpatient care allow for activity to increase above what has been set out in NHS planning guidance, but activity in admitted care remains either supressed due to infection control measures or at the pre-pandemic baseline. The third wave present in the other scenarios is also present but mitigated due to the success of innovative approaches to care and the effect of the vaccine roll out. Discussions with system leaders suggested that this scenario was optimistic but possible as services are restored.

In this scenario, the impact on waiting lists in cardiology is still substantial, but with the green shoots of recovery appearing around March 2022. This would see the waiting list peak in February 2022, with 352,660 people waiting for cardiology procedures, before signs of a decrease appearing in March (Figure 9). As with the previous models, the bulk of the waiting list consists of those who have been referred and are waiting for a diagnosis (304,601), though it is notable that the waiting list for those waiting for treatment increases by nearly two-fold to 48,059 at the peak in February 2022. Under this scenario, returning to waiting lists equivalent to before the pandemic will take until around May 2024, with a peak around September 2022 of 368,689 people on the total waiting list.

In this scenario the waiting list for cardiothoracic surgery also increases, peaking at 11,842 people waiting in November 2021 (Figure 10). This number then begins to plateau and slowly fall in the coming months. The increases seen in the waiting list are consists largely of those waiting for treatment, driven by the continued suppression of inpatient care by infection control measures. By March 2022, there are 7,180 patients waiting for surgery, though the rate of increase appears to be plateauing. However, patients waiting for a diagnosis peak at 5,151 in May 2021, and then plateau and slowly fall as the year progresses. By March 2022, the list includes 4,375 people, close to the pre-pandemic baseline.

Figure 9
Projected cardiology waiting list in England

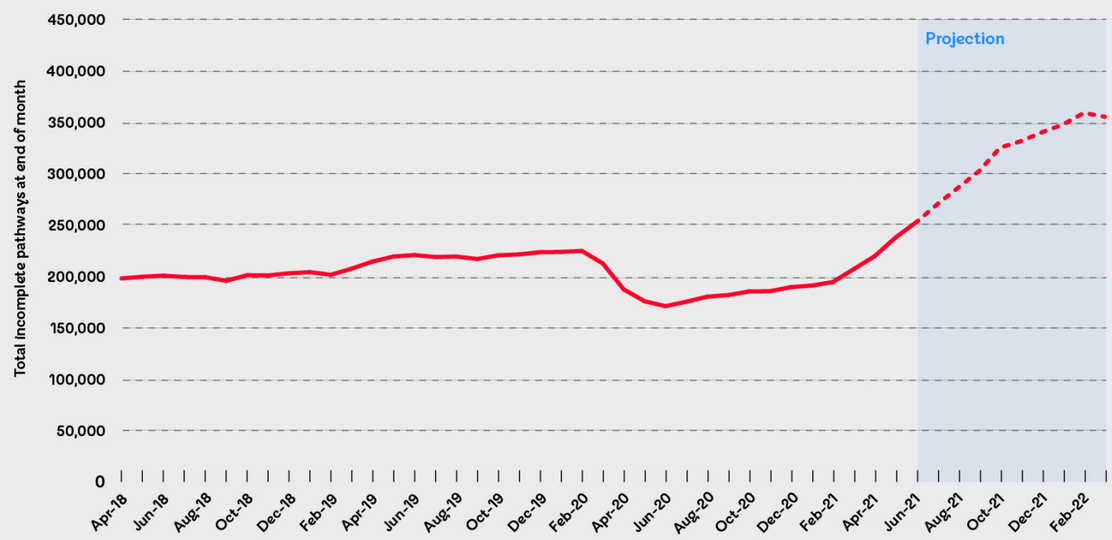
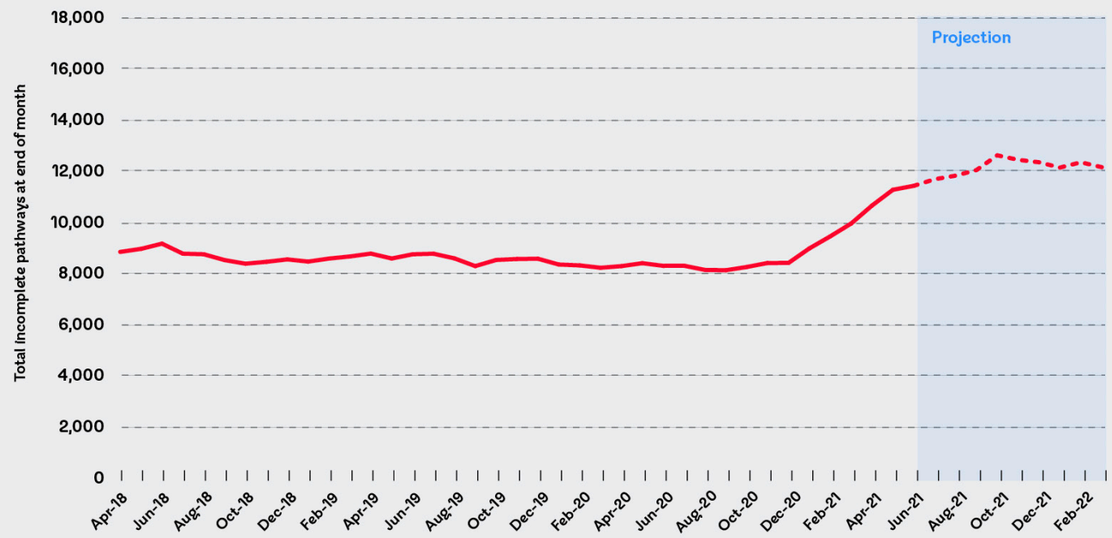


Figure 10
Projected cardiothoracic surgery waiting list in England



What does this mean for the future health and care system?

It is important to acknowledge the limits of the above models of future waiting lists. It is not possible to accurately predict the increase in demand that will return to the health and care system in the coming months and years. It is also increasingly difficult to predict future impacts on health system capacity caused by further waves of Covid-19, the threat of new variants to the success of the vaccine, and unpredictable winter pressures. The data is also representative of the system in England, rather than all four nations of the UK.

However, using such models of future demand and capacity paint a picture of the potential pressure points and bottle necks as the system begins to recover and seeks to deliver more routine care. Such increases in demand and changes to services will be needed across the whole UK, and while patterns and approaches will vary, pinch points will likely be likely similar across systems. By separating out the waiting lists for cardiology diagnostics and treatment, we can more easily visualise the impact that increases in demand will have on different parts of the pathway.

One thing that is clear from comparing the above models is the importance of acting quickly to address the backlog of care. Early and sustained action can mean a difference of years in returning the system to pre-pandemic numbers on waiting lists and the eventual reduction of pressure on the system. This is all while considering that the pre-pandemic waiting lists were only being maintained by a workforce that was already working with minimal spare capacity.

All of the above models show significant pressure on the early part of the patient pathway, suggesting increased capacity in diagnostics (both in terms of specialist workforce and equipment across both primary and secondary care) will be integral. Innovative methods for diagnosing patients remotely and in the community can play a significant role in reducing footfall in more traditional healthcare settings. Ensuring fast throughput of diagnostics for heart assessment is also vital for rapidly identifying the cohorts of patients most in need, so investments further down the pathway are appropriate for the demand.

All the models show that even where innovation makes outpatient care and diagnostics more efficient, suppression of inpatient activity due to infection control will continue to be a significant challenge for addressing the backlog of procedures and surgeries far into the future. This not only speaks to a need for rapid investment in infrastructure and workforce to build capacity in these services, but a clear need for services to be resourced to support patients who will inevitably face longer and potentially anxious waits for treatment. Appropriately supporting patients while they wait for treatment will help to improve wellbeing and quality of life, but it could also have an impact on both short and longer-term health outcomes. Approaches such as prehabilitation should be widely adopted to optimise outcomes and reduce the need for long stays in hospital. There is a need to address deconditioning as people wait for treatment and to ensure processes are able to correctly identify those at risk of deteriorating with progressively worse heart disease whilst waiting – these patients could miss the window of opportunity where treatment can avoid disability and harm or even die while waiting.

Importantly, all scenarios show significant lengths of time before we return to the waiting lists seen before the pandemic. In other words, the impact of Covid-19 will be with us for years to come. As such, we need long-term solutions, including a significant increase in funding for the wider health and care system at the upcoming Comprehensive Spending Review. Without long-term support and a clear plan for delivering increases in infrastructure and cardiovascular workforce capacity in the short and medium term, long waiting lists could return as an accepted feature of care in the NHS in England and across the UK.

It is also vital to remember that these models only cover care that is well represented by available data sets, and there are significant gaps in our understanding of hospital services, such as follow up outpatient appointments. As services switch back on and patients regain the confidence and ability to access care, demand for services will increase across the whole patient pathway, including long-term follow up care. Through talking to healthcare professionals, we can already see the early signs of a surge of demand returning to primary care. Capacity in primary care is likely to remain stretched for some time, as the backlog of people with a range of conditions return to seek help before waiting for referrals and relevant diagnostics. Similar increases in demand are also being seen in specialist community services.

A lack of readily available, timely data across the whole pathway means it is vital we listen to patients and healthcare professionals to understand the pressures on systems, often before data becomes available.

What services want

In conversation with healthcare professionals and system leaders, many people expressed concerns about all elements of the patient pathway, acknowledging that no aspect of care had been untouched by the pandemic. However, many people felt that a strong focus on addressing the backlog of heart diagnostics, procedures and surgeries would be the best start to a concerted recovery. When asked about the longer-term plans for the health service, many expressed a desire to put more focus on the earlier parts of the pathway. System leaders emphasised the importance of identifying and managing patients with risk factors for heart and circulatory diseases to reduce future pressures on the system and address longstanding inequalities in outcomes. This area of focus is also supported by the modelling of future waiting lists and the need to rapidly diagnose patients to understand their treatment needs and the subsequent impact on services.

Across much of the UK a significant barrier to early diagnosis is lack of uniform availability and use of diagnostics such as NTproBNP blood tests and a shortage of cardiac physiologists, such as echocardiographers. The lack of an adequate and sustainable cardiac physiologist workforce is longstanding and will require a nationally directed plan to improve training, extend training places and ensure proper clinical experience while training. Clinicians report that the recovery of services in Wales up to and beyond pre-Covid levels very much depends on an increase in the numbers of cardiac physiologists working in Wales. Investment in diagnostic hubs and the infrastructure and specialist equipment needed for them, will need to be matched with concerted action on the workforce to deliver the increase in throughput to improve outcomes for patients.

Services acknowledged that despite the challenges, many positive changes have occurred as part of the response to the pandemic across the UK. Access to remote models of care has increased dramatically and workforce confidence in delivering these types of care is increasing. Services must now work to understand where innovation has occurred and ensure that it is embedded in instances where it has been proven to be effective. Where new models of care have been successful, these should be adopted to improve patient choice, particularly in aspects of care where uptake has previously been challenging (such as cardiac rehabilitation). People told us that hybrid models of delivering care, blending remote methods with face-to-face based on need should remain a feature of services going forward, but acknowledged this will need to be accompanied by clear communication with patients about why certain changes are being maintained. Such approaches will also be vital for supporting patients to manage their conditions and improve their wellbeing while waiting longer for treatment. As services seek to embed new models of care, it will be vital to ensure that healthcare professionals are supported to have ownership over new ways of working, reducing the impact of top-down directives on a workforce that is already suffering from change fatigue.

Staff working across a range of CVD services are exhausted, and recovery plans need to acknowledge this and provide resources to allow people to recover from the ordeal of the pandemic, while still growing in their roles and building their future career.

What patients want

Through surveys and focus groups, patients have expressed a desire for greater reassurance that the healthcare system has the time to support them, and that they will be seen and treated away from Covid-19 patients as services are restored,

Patients told us that they would value more frequent communication with their healthcare team, and a clearer picture of what will happen next when appointments or procedures are delayed. Many of the people we spoke to also said that they would like more advice about self-management, to increase their confidence managing their condition at home during and beyond the pandemic. Participants in our focus group said this could help to support the psychological and emotional health of patients while they wait for care.

While many of the patients we talked to told us that they liked some aspects of remote care, especially for routine appointments, there was broad consensus that digital and telephone appointments are not suitable in all circumstances. Lots of the people we spoke to said that they would welcome the introduction of a hybrid model of care but would like to ensure they still had the option to book a face-to-face appointment when necessary.

There was broad agreement among the patients and carers we spoke to that improving access to general practice will be important in the short and medium term. Many of our focus group participants described difficulties booking appointments with their GP and having to wait for extended periods for routine and outpatient care. Patients told us that access to general practice is important to ensure they remain well, and several said that they would like to see greater utilisation of the wider primary care and community workforce to make that possible.

One theme cut across all our engagement with patients and the public: the importance of co-production. Many of the people we spoke to said that they felt that decisions about their care and the way they live had been taken entirely out of their hands during the pandemic and said that they were keen to ensure that patients are more involved in national policy and local system change going forward. There was broad agreement about the need for this engagement to be wide-ranging and inclusive, to ensure those most affected by the pandemic can meaningfully inform decision making. This should form an integral part of the future health and care system, with greater responsibility placed on health and care systems to co-create services with their local populations.

the untold heartbreak

Ending the heartbreak

People working in health and care systems have worked heroically over the past 18 months to rapidly adapt and redeploy services to save the lives of those affected by Covid-19. During this time, they have also strived to maintain urgent and emergency care services for patients, while working to support others in the community in new and innovative ways. Without immediate action this could have all been in vain if thousands more people die from cardiovascular diseases as a result.

Now is the time for the UK Government to commit to a long-term and substantial investment in health and care systems to build the capacity and workforce needed to address the backlog of care and transform and improve services. This investment must be accompanied by clear leadership and governance to drive improvements in services and a plan for the long-term sustainability and wellbeing of the workforce. Systems must also be supported to rapidly evaluate and adopt new ways of working, requiring new approaches to collecting and synthesising data and finding new ways of sharing insight and approaches between systems. Lastly, systems must consider the broader impact the pandemic has had on their patients and embed new ways of working that support them to live well in the context of a system that will continue to be under pressure for some time.

As innovation throughout the pandemic has allowed for a significant shift towards self-management and remote models of care for patients, the health and care systems must now treat patients as true partners in their care, allowing them to take responsibility and action where appropriate while providing information and support where needed.

The following recommendations are intended for the UK Government and health and care systems in England. The BHF will continue to work with the devolved Governments in Scotland, Wales and Northern Ireland to support the new heart disease plan, quality statements and taskforce to support the restoration and future transformation of services based on the needs of their populations.

Recommendations

Ensuring appropriate funding and resources

Developing clear cardiovascular leadership roles across the system

Ensuring a robust cardiovascular workforce

Evaluating and sharing good practice

Supporting patients as partners in their care

1. Ensuring appropriate funding and resources

HM Treasury should commit in the upcoming Comprehensive Spending Review to a substantial and long-term increased investment in the health and care system to address the backlog of cardiovascular care and support the future transformation of services.

This should include:

- Increased targeted funding for tackling the backlog of care, including heart surgeries and other procedures, based on future demand.
- An increase in health service funding of at least 4 per cent a year on average for the next ten years to bring health spending in the UK in line with other G7 countries, as advised by the recent Lancet commission.[65]
- Rapid front-loaded investment in the cardiovascular infrastructure, equipment and workforce to facilitate the setup of community diagnostic hubs and secondary care-based systems for early detection of cardiovascular disease (CVD) and cardiovascular imaging. This should include the specialist equipment and workforce needed to deliver NTproBNP testing, echocardiography in the community and secondary care as well as improving access to specialist cardiac imaging such as advanced echocardiography, cardiac computed tomography (CT) and cardiac magnetic resonance imagery (CMRI).
- Rapid investment in hub-based models to increase throughput of heart surgeries and other procedures, including new infrastructure to deliver more cardiovascular interventions including surgery, and to embed innovations developed throughout the pandemic.
- An immediate investment and long-term sustainable funding plan for social care to provide the broader support needs of people living with heart and circulatory diseases and multiple long-term conditions.
- Equitable and sustainable restoration of the public health grant, to allow local authorities to provide vital services like stop smoking services and weight management support to all those who need them. This has seen real term cuts of 24 per cent – equivalent to £1 billion – on a real term per capita basis compared to 2015/16.

Funding allocations at the regional and local level should be weighted based on local need, with direct funding where it is needed most. This should be decided with a strong focus on the reduction of health inequalities associated with CVD that have been exacerbated by the Covid-19 pandemic.

2. Developing clear cardiovascular leadership roles across the system

Leadership for CVD services (clinical and managerial) should be present at all levels of the health and care system, including at the national, regional and local level.
In England, clear leadership for CVD in emerging integrated care systems (ICSs) as well as a CVD lead in every primary care network (PCN) will be vital for a full pathway approach to the prevention and treatment of heart and circulatory diseases. ICS and PCN leadership should work closely with cardiac networks and patients in their area to co-create and develop services that address the backlog of care and improve patient outcomes and experience. with a focus on addressing inequalities.

Cardiac networks should be resourced and held accountable for driving improvements in outcomes for CVD patients and reducing variation in care across England.
Networks should take a full pathway approach, ensuring that patients are able to access multidisciplinary team-led care across all care settings. Networks should work with leadership across the system (including in ICSs and PCNs). In the short term, networks should support local efforts to address the backlog of cardiovascular care brought about by the pandemic and support local systems to embed innovative practice developed during this time and address inequalities in care.

ICSs will need to rapidly develop strategies for improving the detection and management rates of risk factors for CVD, including hypertension, atrial fibrillation and high cholesterol, in their local population.
Resources should be provided for varied approaches, including community-based detection and the wider roll out of remote monitoring programmes like the NHSE Blood Pressure at Home programme. ICSs should draw on expertise in their local authority partners to ensure that these approaches work to address inequalities in their local populations.

3. Ensuring a robust cardiovascular workforce

The Department of Health and Social Care (DHSC) should work with Health Education England (HEE) and NHS England (NHSE) to develop a national plan for England to expand and address gaps in the cardiovascular health and care workforce.
This should include expansion of the number of cardiac nurses, cardiac physiologists, radiographers, and radiologists with interest in heart disease, cardiologists, and other specialist roles to deliver the expert care needed for patients and to support new allied health professional roles. The plan should be informed by demand at cardiac network and ICS level to deliver multidisciplinary team (MDT)-led cardiovascular care. NHS trusts in England should be supported to employ newly trained staff in the longer term and support them in developing advanced roles. The Secretary of State should be held accountable for progress on implementation of the plan with regular updates to parliament.

NHSE should work with HEE to ensure that staff are able to access the training needed to expand their roles and skills to support in delivering improvements set out in the NHS Long Term Plan.
HEE should prioritise leadership training for healthcare and managerial staff taking a lead in new system structures and cardiac networks to prepare them for the challenges of driving improvements in care.

NHSE should invest in support services for NHS staff facing burnout and requiring psychological support as they recover from the pandemic, as well as allowing the workforce to work more flexibly in the future to improve job satisfaction and staff retention.

ICSs and cardiac networks should work together to allow staff to work across a number of settings in their area, allowing for pooling of workforce and waiting lists where appropriate to reduce variations in care and make efficient use of resources.

Primary Care Networks (PCNs) and ICSs will need to make use of additional roles in primary care (through the Additional Roles Reimbursement Scheme) to best support the needs of patients with long-term conditions, such as heart failure.
This will create greater capacity of specialist staff to support patients with the most complex needs while increasing avenues of support for patients for both their physical and mental health.

4. Evaluating and sharing good practice

NHSX should work with DHSC, NHSE, NHS Digital and the National Institute for Cardiovascular Outcomes Research (NICOR) and other cardiovascular data providers to join up CVD data across settings to fully understand the impact of the pandemic on people living with heart and circulatory diseases.
This should include comprehensive demographic data linked to national registries, administrative and other clinical datasets to understand inequalities in access to care and equity of healthcare outcomes to drive a population health approach to the future design of services. ICSs and cardiac networks should be supported with resources and analysts to understand the impact of Covid-19 in their area and use this data to inform recovery plans. NHSX's draft data strategy sets out many ambitions and commitments that would support our recommendation. It is therefore imperative that this strategy is effectively supported both politically and financially once its final iteration is published in the Autumn.

Cardiac networks and ICSs should be given the resources and expertise needed for rapid-cycle evaluation of innovative approaches to care that have been developed throughout the pandemic.
Cardiac networks, NHSE and academic health science networks will then need to work with system partners like professional societies, Public Health England (PHE) and the voluntary sector to share good practice and novel approaches to care to allow services to benefit from each other's success. This should initially focus on new approaches to self-management for patients, novel approaches to diagnosing heart and circulatory diseases in the community and hybrid models of care for support services such as cardiac rehabilitation.

Measures of success for the future health and care system will need to focus on outcomes, not only activity, with an increased focus on what matters to patients including measure of patient experience and quality of life.
Such measures should be developed in partnership with heart and circulatory disease patients and included in national registry datasets.

5. Supporting patients as partners in their care

NHSE should be given the necessary resources and staff to support patients to self-manage and improve their wellbeing while they wait for treatment.
This will need to include regular points of contact to inform patients about delays to their care, support with self-management and signposting to relevant services and resources for prehabilitation. Communication should set realistic expectations for patients as the system continues to be under pressure but also give clear and actionable advice about when and how to ask for help.

NHSE should be appropriately resourced to identify and manage those at risk of CVD through opportunistic detection of conditions such as hypertension and atrial fibrillation (AF) during routine NHS contacts.
This should be encouraged across all care settings. Opportunities associated with Covid-19 vaccination should be used to signpost patients to further services and resources to reduce their risk of CVD.

Cardiac networks, ICSs and PCNs will need representation from patients with lived experience of CVD in their local area to ensure that the needs of patients are at the heart of changes to the health and care system.
Involving patients and the public in the co-creation of services should be mandated at all levels of the health and care system as part of the Health and Care Bill.

PCNs need to be resourced to identify and support patients in their local area who will be empowered to self-manage their condition remotely, providing the necessary equipment and support take control of their own healthcare.
This will not only empower patients to play a more active role in their care but will also free up time for healthcare professionals to support patients with more complex needs. These efforts can be supported by the continued development of the CVDPrevent audit, and the use of PCN-Level CVD Prevention packs created by PHE.

Conclusion

As the immediate impact of Covid-19 on the NHS subsides, now is the time for action. The challenge for the health and care system is significant but not insurmountable. We need swift and significant action from Governments across the UK, investing in services and setting a clear course for the future of the service and the health and care workforce.

A substantial long-term investment is needed to not only address the backlog of care, but to deliver the ambitions of strategies like the NHS Long Term Plan. If we fail to act now, we risk turning back the clock on 60 years of progress on heart and circulatory diseases in the UK. To do so would be failing not only our health and care systems, but also the 7.6 million people currently living with heart and circulatory diseases across the UK and the many millions who will develop them in the coming years.

Appendix
1. Data and insight used in this report

This report was built on insight and data collected from a range of sources throughout the pandemic. This included:

- Insight collected from CVD services throughout the pandemic, including conversations with healthcare professionals and system leaders.
- A patient survey of more than 3,000 people with heart and circulatory diseases and associated risk factors across the UK, commissioned from YouGov. All figures, unless otherwise stated, are from YouGov Plc. Total sample size was 3048 adults that have suffered from a heart or circulatory condition or been diagnosed with a risk factor for a heart and circulatory condition. Fieldwork was undertaken between 24th June - 3rd July 2021. The survey was carried out online.
- Qualitative insight taken from the BHF Heart Helpline throughout the pandemic, as well as interviews and focus groups with people living with heart and circulatory diseases.
- Readily available data from health and care systems across the UK.
- A review of publications relevant to the impact of Covid-19 on CVD services and the broader health and care system.
- Two roundtables to sense check the report's findings with health and care system leaders across the UK, and engagement with senior leadership of relevant societies and representative bodies for the health service and CVD specialist professionals.

A significant gap in our findings was clear data and patient testimony about the impact of Covid-19 on people with a minority ethnic background or a socioeconomically deprived background. As a result, the BHF is working in partnership with relevant organisations to better understand the experience of these groups and ensure they inform future work on the needs of CVD services. Initially, our work in this space will focus on engagement with people with Black, Asian and minority ethnic backgrounds, which we are doing in collaboration with the Race Equality Foundation.

Appendix
2. National strategies and policy context for cardiovascular disease services across the UK

The NHS Long Term Plan in England

In 2019, NHSE published the Long Term Plan, a 10-year strategy backed by an initial five-year funding commitment from UK Government enshrined in law. This plan, as well as signalling a move towards more integrated care and greater investment in primary care and mental health services, highlighted CVD as a significant priority. The plan describes cardiovascular diseases as the most significant area where lives could be saved over its 10-year lifespan, with an aim to prevent 150,000 heart attacks, strokes, and cases of vascular dementia.[66]

The Long Term Plan signalled a renewed focus on CVD that would transform services for years to come. The Plan commits to improvements across the full patient pathway, including a greater focus on the treatment and management of risk factors of heart and circulatory diseases, better diagnosis and management of heart failure in primary care, and an ambition to increase uptake of vital cardiac rehabilitation services to 85 per cent of those eligible by 2028.

The outbreak of Covid-19 has slowed progress in reaching these aims and has potentially jeopardised the future success of the Long Term Plan. As healthcare systems in England return to delivering the ambitions of the Plan in the context of Covid-19 and a skyrocketing backlog of care, new ways of working will now be vital for its success.

As the health service recovers from the pandemic, it is also undergoing significant change. With a Health and Care Bill currently passing through parliament, ICSs will be given statutory footing and greater control over their approaches to care and associated budgets.

This increase in autonomy will be an important change for systems looking to address the needs of their local populations. To improve services for heart disease patients, NHSE is also investing in the development of cardiac networks across England.

The formation of these networks and ICSs across the nation provides new opportunities for clinical leadership to drive improvements in services and address unwarranted variation in care, as well as opportunities to involve patients in the design of future services. This, combined with an increasing drive from the NHS to set up community diagnostic hubs, offers significant opportunities for CVD services to work differently across England to improve outcomes for patients in the longer term as well as addressing shorter-term issues associated with the rising backlog of care.

Throughout the pandemic, the Government has supported the health and care system with funding to address the direct impacts of Covid-19 as well as providing short-term funding for the backlog of care. Recent commitments to funding pilot sites for approaches to address the backlog of care in England are welcome, but the NHS will need long-term significant investment to truly restore services and return to the ambitions of the Long Term Plan.

A new heart disease plan for Scotland

Scottish Government's historic action on heart disease was set out in the Heart Disease Improvement Plan (2014).[67] This was a refresh of the Better Heart Disease and Stroke Care Action Plan (2009) and refocused the National Advisory Committee's attention on six key priority areas (including prevention, heart failure, heart disease management and rehabilitation).[68]

Prior to the pandemic, the BHF was already working across the sector and alongside the Scottish Government to understand and improve services across the pathway, from improved detection and diagnosis of CVD, through to rehabilitation and palliative care services. BHF Scotland published a new Heart Disease Plan for Scotland in early 2021 which, combined with the Government's Realistic Medicine approach, aims to put patients at the centre of decision making through meaningful conversations around what matters most to them.[69]

The BHF Scotland Heart Disease Plan was an influential driver in the development of the recently launched National Heart Disease Action Plan.[70] This new government plan is underpinned by the same key principles as BHF Scotland's Heart Disease Plan, with a focus on novel approaches of raising awareness and detection and management of risk factors for heart and circulatory disease, as well as nationally defined pathways to ensure timely access to diagnostics and treatment. The strategy underpins these ambitions with commitments to robustly model the future workforce requirements for CVD services and collect and better share data to measure and improve outcomes. The strategy will play an important role in building back services post-Covid, driving the improvements needed in care for heart and circulatory disease patients in Scotland.

The Scottish Government has also committed to publishing an NHS recovery plan, with an ambition of a 10 per cent increase in inpatient and outpatient activity as well as consulting on introducing a bill to establish a national care service. These ambitions are running alongside a significant policy shift towards improving access to diagnostics through diagnostic centres, which will play an important role in addressing the backlog of care.

A Healthier Wales – maintaining the focus on cardiovascular disease

In 2017 Welsh Government, through the Wales Cardiac Network and in collaboration with the Heart Conditions Implementation Group, released the Heart Conditions Delivery Plan. This was a 5-year plan for the delivery of cardiac services across Wales's local health boards. This plan was due to come to an end in 2021. However, because of the disruptive impact of Covid-19, it will continue in operation until 2022.

The NHS in Wales is due to change structure. Previously, it consisted of local health boards which were directly accountable to the Minister with other delivery bodies such as the Public Health Wales and the Heart Conditions Implementation Group acting as advisory bodies with minimal oversight. The new NHS structure will include the creation of an NHS Executive, which will encompass all delivery bodies. The aim of the new NHS Executive will be to provide better oversight of the local health boards, reduce variation in care and improve service delivery.

Instead of delivery plans, service delivery under the new NHS executive will now be underpinned by disease-specific quality statements which will inform clinically-led operational plans developed in line with the principles of prudent and value-based healthcare. BHF Cymru has worked closely with the Welsh Government to develop the quality statement for heart disease, which mirrors the priorities laid out in our 2021 election manifesto document, A New Heart and Circulatory Disease Plan for Wales.[71] BHF Cymru will continue to work with Welsh Government, the new NHS Executive, the Heart Conditions Implementation Group and the Wales Cardiac

Network to ensure that the priorities set out in the heart disease quality statement are reflected in the operational plan. Proper implementation of these priorities could support the restoration of cardiac services in Wales.

The Heart Disease Quality Statement, if properly implemented, has the potential to drive significant improvements in service delivery, including improved diagnosis, treatment and rehabilitation across Wales. This offers the opportunity to embed new ways of working and drive service transformation that has been accelerated by the pandemic.

Welsh Government also published a Health and Care Services Recovery Plan in March 2021. This plan is supported by an initial £100m funding commitment, to help the health and care system in Wales recover from the Covid-19 pandemic. This plan focuses on reducing health inequalities, building workforce capacity, improving digital support, improved community and secondary care, and a more joined up approach between different parts of the health service. The plan also recognises the need to build on innovations necessitated by the pandemic. Published under the last Welsh Government, it remains to be seen exactly how and when this plan will be implemented by the new Health Minister in Wales. It is vital, however, that the plan runs concurrently with disease-specific quality statements to address systemic issues, as well as problems identified in specialisms such as cardiology.

Systems not structures – developing a new strategy for Northern Ireland

Prior to the Covid-19 pandemic, the health and social care system in Northern Ireland was slowly but surely undergoing much-needed transformation. The 2016 review of the system, led by Rafael Bengoa, resulted in the Systems not Structures report.[72] Professor Bengoa's report concluded that the existing service model faced collapse if transformation was not embraced. The collapse of the power sharing government in January 2017 and the subsequent three-year political vacuum that ensued exacerbated the problems in the health service and hindered transformation of the system.

The BHF has convened a taskforce with membership from across the health and social care sector in Northern Ireland to create a new strategic vision for cardiac care – a vision in line with the ambition for person-centred care that underpins the transformation agenda set out in Health and Wellbeing 2026 - Delivering Together.[73] The work of the taskforce aims to support the restoration of services and achieve longer-term improvements for those impacted by heart and circulatory diseases in Northern Ireland.

In June 2021, the Health Minister published the Elective Care Framework,[74] designed to be a roadmap for tackling Northern Ireland's hospital waiting lists. The plan requires £700m of additional investment over five years which is subject to commitment by the Northern Ireland Executive. Dependent on the funding commitment, the aim of the Elective Care Framework is that by March 2026, the gap between demand and capacity for elective care will be eradicated.

With significant historical issues with waiting times and a need to broadly transform the health and care system, the restoration of services offers an opportunity to rethink how care is delivered in Northern Ireland and secure a better future for people with heart and circulatory diseases.

This change offers the opportunity to embed new ways of working and drive service transformation that has been accelerated by the pandemic.

Appendix
3. The impact of Covid-19 on treatment waiting times in Scotland, Wales and Northern Ireland

Scotland

In Scotland, 32 per cent of cardiology inpatients were waiting 12 weeks or more for treatment in March 2021. In December 2019, only 17 per cent of cardiology inpatients in Scotland waited this long. The data also suggests that the number of people in Scotland waiting longer for outpatient appointments has increased, though this varies significantly by health board.

Wales

In Wales there was a dip in the number of people diagnosed with heart and circulatory diseases and waiting for cardiology treatment during the period between March 2020 and June 2020. This is due to fewer patients presenting with symptoms and health services focussing efforts on Covid-19. From June 2020 the number of patients being referred has steadily increased and has now exceeded pre-pandemic levels. Many people who have been waiting for treatment have experienced lengthy delays. During the pandemic, the number of patients waiting over 36 weeks for cardiac surgery or procedures increased from 210 in January 2020 to 5,595 in November 2020.

The NHS in Wales has started to address the length of time people are waiting for their treatment, and at the end of April 2021 the number of people waiting over 36 weeks had been reduced to 4,295. Although the NHS is working incredibly hard to reduce the amount of time patients are waiting for treatment, there are still delays. Therefore, patients should be offered support to wait well as a key part of NHS recovery in Wales. Attempts to clear diagnostic waiting lists account for the recent spike in patients waiting for treatment.[75]

Northern Ireland

In Northern Ireland there were 10,415 people on the cardiology outpatients list,[76] with 9 per cent of people waiting more than a year in December 2019. By March 2021, the waiting list had decreased slightly, but more than a third of people had been waiting over a year for treatment[77] Before the pandemic, only 4 per cent cardiology inpatients and day cases waited more than a year for treatment,[78] but by March 2021 this had increased to 31 per cent.[79]

In Northern Ireland there have been significant impacts on cardiac surgery and cardiology waiting times during the early stages of the pandemic. At the end of quarter one of 2020, 5 per cent of patients awaiting cardiac surgery waited longer than 26 weeks. At the end of quarter two the percentage of patients waiting more than 26 weeks had increased to 22 per cent with a further increase to 33 per cent by the end of quarter three. The increase in wating times was accompanied by an increase in the total number of patients awating cardiac surgery, with a 22 per cent increase in patient numbers from quarter one to quarter two.[80]

Equally, waiting times for cardiology treatment in Northern Ireland have seen worrying increases during the pandemic. From quarter one to quarter two of 2020 there was an increase in 18 per cent of patients awaiting a cardiology appointment. There was also an increase in patients waiting more than 52 weeks. In quarter one, 42 per cent waited more than 26 weeks for their appointment with 15 per cent of those waiting more than a year. These figures increased significantly in quarter two and quarter three as the impact of the pandemic on the health service in Northern Ireland increased, 48 per cent of patients waited more than 26 weeks with 20 per cent of patients waiting more than a year in quarter two and that increased to 49 per cent waiting more than 26 weeks, with 23 per cent waiting more than a year.[81]

Appendix
4. Details of waiting list modelling carried out for this report

Our BHF waiting list model was developed to provide an indication of the likely size of the waiting list in CVD-specific specialties (in this instance cardiology and cardiothoracic surgery) at a national level. The model utilises published data on elective waiting lists and activity from NHSE on referral to treatment waiting times. These measures represent the time taken from first referral to first definitive treatment; follow-up treatment for the same condition will not be included on these lists unless they are the result of a new referral. Note that emergency activity is also not included in these models as such urgent work is not included on waiting lists for obvious reasons.

Data are published monthly and consist of four key elements:

1. **The number of new treatment pathways started.**
   A new treatment pathway is generally started by a referral to a consultant-led specialist service. Referrals can come from GPs, other consultant-led services, or other health care professionals usually in primary or community care.

2. **The number of incomplete pathways.**
   This, in effect, is the waiting list. Pathways counted here are waiting for an element of care delivery along the pathway. This may be a diagnostic test, and admission to hospital or an outpatient appointment. There is a subset of this data element which is the number of incomplete pathways with a decision to admit (DTA); these are pathways where a decision has been made to admit a patient to hospital for their treatment. In the case of cardiology this is a small minority, in the case of cardiothoracic surgery those with a DTA are about half of the waiting list.

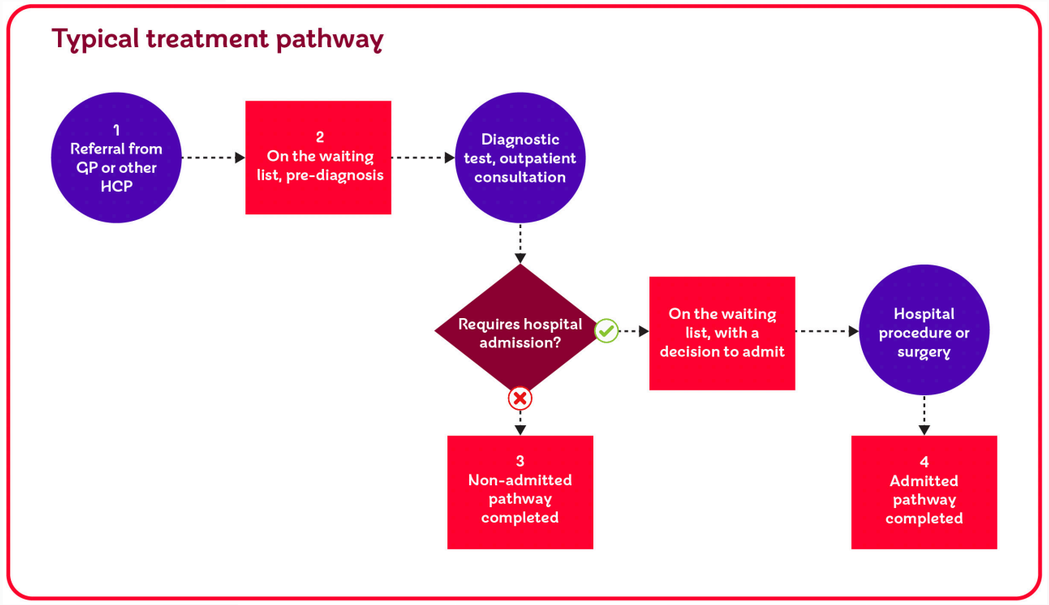
3. **The number of non-admitted pathways completed.**
   This is a measure of the number of treatment pathways that have been concluded without the need for admission to hospital. This can be through, for example, the patient receiving a diagnosis and being referred back to their GP for management in primary care or attending an outpatient clinic and being prescribed medication by a consultant-led cardiology team.

4. **The number of admitted pathways completed.**
   This is a measure of the number of treatment pathways that have been concluded by an admission to hospital for a procedure or surgery.

The diagram opposite shows, very generally, how each of the measures above, represented by the numbers in brackets, link to a typical treatment pathway. Please note this is very generalised and many patients will have multiple visits, tests, and appointments in complex pathways before being counted as having had their first definitive treatment.

Measures 3 and 4 taken together are an indicator of supply as they represent activity undertaken to move people off the waiting list. Measure 1 is a measure of demand on the system. At its simplest, a waiting list is the result of the balance between supply and demand. We can use this relationship to predict what the next month's waiting list might look like.

$$\text{Incomplete pathways}(\text{month}_n) = \text{Incomplete pathways}(\text{month}_{n-1}) + \text{New pathways started}(\text{month}_n) - (\text{Non-admitted pathways completed}(\text{month}_n) + \text{admitted pathways completed}(\text{month}_n))$$



We must also consider people who may be removed from the waiting list for reasons other than treatment (ROTT). This could be because treatment is no longer required, the person has died, or is unable to complete treatment for other reasons. This is accounted for in the BHF model using a blanket assumption based on previous years' data, and was set at 2 per cent ROTT for new pathways (referrals that never get to diagnosis), 22 per cent for non-admitted pathways where did-not-attend rates tend to be highest, and 5 per cent for admitted pathways.

This is the basis upon which the BHF model was built. The model goes up to March 2022, partly because this was a span of time where BHF had intelligence about measures the system was taking to address the backlog of care, so we could apply reasonable scenarios based on evidence. The other reason for this is that, as with all forecasting, the further ahead you look the more error is introduced. This is particularly true with this kind of model as each month beyond the end of 'actual' data is calculated from a forecast number, so any error in that is compounded in the next month, and the month after that and so on. This compound error, in the longer term, could lead us to make erroneous conclusions, so the decision was taken to forecast a relatively short period of time that was still relevant and illustrative of the issues in elective CVD services the pandemic has caused.

Building on this basic model, we are able to use the data that shows patients on the waiting list with a DTA to add nuance to the forecast by splitting the overall waiting list forecast into two:

- **People on the list waiting for a decision on whether they need an admission or not (referral – decision).**
- **People on the list who already have a DTA and are therefore waiting for inpatient treatment (decision – inpatient treatment).**

This is, of course, an oversimplification; those on the list without a DTA could be at any number of points in their pathway. For example, they could be waiting for a diagnostic test, waiting for a specialist team to review their diagnostic test results, or waiting to see a cardiologist or surgeon immediately following referral. However, even this simplified split provides a degree of insight into where the biggest future issues may lie.

For example, in cardiology the majority of treatment pathways are non-admitted. So for example, increasing outpatient and diagnostic capacity will impact the 'referral –decision' element of the forecast but not the 'decision – inpatient treatment' element. We can therefore explore how different scenarios impact on different parts of the waiting list and understand the scale of the issue.

Appendix 5 Scenario generation

BHF developed three scenarios to help us understand the potential impact on cardiac waiting lists in England. In all cases BHF used 2019 as the baseline year for comparison.

Scenario 1

Demand and activity returns to pre-pandemic (baseline) levels but there is no growth above baseline in any measure. The impact of a third wave and winter pressure suppresses activity and demand slightly but at a lesser level than seen previously.

Demand measure: new pathways starting (indicator 1)

- February 2021 suppressed as per actuals, March showing rapid improvement but still below baseline as per actuals.
- April demand at baseline level to reflect growing confidence in the vaccination programme and majority of at risk populations having first dose. Baseline level sustained through to October 2021.
- A third wave, winter pressures, and a booster vaccination programme depresses demand over peak winter period (November to January 2022) but only at 5 per cent below baseline to reflect improved public confidence following the successful completion of the vaccination programme for all adults and lower chance of significant lockdown measures.
- Return to a baseline demand in February and March 2022.

Non-admitted activity (indicator 3)

- February and March 2021 suppressed activity as per actuals.
- Remains at suppressed activity levels through April and May 2021 but above the 70% and 75% of baseline expected in planning guidance; due to the impact of diagnostic hubs, and outpatient innovations, non-admitted activity reaches and sustains at the baseline from June 2021 to October 2021.
- A third wave and winter pressure suppresses activity from November 2021 to January 2022 but at only 10 per cent below baseline to reflect sustained outpatient innovations allowing delivery to be maintained.
- Return to baseline level activity, supported by now established diagnostic hubs and the achievement of the faster diagnostic standard in some cases by end of quarter three.

Admitted activity indicator (indicator 4)

- February and March 2021 suppressed activity as per actuals.
- Due to in-hospital infection control measures, bed and ICU capacity is reduced, but activity grows towards baseline levels at the rate suggested in planning guidance, reaching baseline levels in August 2021 and sustaining to October 2021.
- A third wave and winter pressure suppresses activity from November 2021 to January 2022 at 15 per cent below baseline, similar to the level seen during the same period in 2020.
- Return to baseline in February to March 2022.

Scenario 2

Aggressive growth in demand as lockdown eases. Diagnostic hubs and innovation in outpatient care increase non-admitted activity but remains below planning guidance expectations. Due to ongoing impact of in-hospital infection control measures, admitted activity remains suppressed. The significant impact of a potential third wave and winter pressure are taken into account November 2021 to January 2022.

Demand measure: new pathways starting (indicator 1)

- February 2021 suppressed as per actuals, March showing rapid improvement but still below baseline as per actuals.
- April demand at baseline level to reflect growing confidence in the vaccination programme and the majority of the at risk populations having had their first vaccination. Rapid growth in demand from May to September in line with the lockdown easing roadmap, peaking at 20% above baseline in July, sustained into October.
- A third wave, winter pressures, and booster vaccination programme depresses demand over peak winter period (November 2021 to January 2022) back to baseline levels to reflect improved public confidence following successful completion of the vaccination programme for all adults and a low chance of significant lockdown measures.
- Rapid return to a 15 per cent above baseline demand in February and March 2022 to account for winter suppression.

Non-admitted activity (indicator 3)

- February and March 2021 suppressed activity as per actuals.
- Remains at suppressed activity levels through April and May 2021 but above the 70 per cent and 75 per cent of baseline expected in planning guidance; due to the impact of diagnostic hubs, and innovation in outpatient services, non-admitted activity reaches and sustains baseline June 2021 to October 2021.
- A third wave and winter pressure suppresses activity November 2021 to January 2022 but at 15 per cent below baseline, similar to level seen in the same period in 2020 and 2021.
- Rapid return to baseline activity post-winter, supported by slow-to-start diagnostic hubs and some achievement of the faster diagnostic standard by end of quarter three.

Admitted activity indicator (indicator 4)

- February and March 2021 suppressed activity as per actuals.
- Due to in-hospital infection control measures, bed and ICU capacity is reduced; activity grows slowly towards baseline levels at a rate slower than suggested in planning guidance, reaching at best 10% below baseline levels in August 2021, sustaining to October 2021.
- A third wave and winter pressure suppresses activity from November 2021 to January 2022 at 15 per cent below baseline, similar to the level seen during the same period in 2020 and 2021.
- Return to pre-winter levels, 10 per cent below baseline in February to March 2022

Scenario 3

Optimistic but within reach. Demand changes in line with public confidence in the vaccination programme, and pressure in primary care. Diagnostic hubs and innovation in outpatient care increases non-admitted activity beyond planning guidance expectations. Due to the ongoing impact of in-hospital infection control measures, admitted activity remains suppressed or at baseline levels. The impact of a potential third wave and winter pressure are taken into account for November 2021 to January 2022, mitigated by new innovations and success of the vaccination roll out.

Demand measure: new pathways starting (indicator 1)

- February 2021 suppressed as per actuals, March showing rapid improvement but still below baseline as per actuals.
- April demand at baseline level to reflect growing confidence in vaccinations programme and majority of at-risk populations having first dose. Growth in demand from May to September, peaking at 20 per cent above baseline, sustained into October; steady rather than rapid growth to reflect pressure on primary care limiting new referrals.
- A third wave, winter pressures and booster vaccination programme depresses demand over peak winter period (November 2021 to January 2022) but only at 5 per cent below baseline to reflect improved public confidence following successful completion of the vaccination programme for all adults and low chance of significant lockdown measures.
- Rapid return to 15 per cent above baseline demand in February and March 2022 to account for winter suppression.

Non-admitted activity (indicator 3)

- February and March 2021 suppressed activity as per actuals.
- Remains at suppressed activity levels through April and May 2021 but above the 70 per cent and 75 per cent of baseline expected in planning guidance; due to impact of diagnostic hubs, and innovation in outpatient services, non-admitted activity reaches and sustains baseline June 2021 to October 2021.
- A third wave and winter pressure suppresses activity from November 2021 to January 2022 but at only 10 per cent below baseline to reflect sustained outpatient innovations allowing delivery to be maintained.
- Rapid return to 5 per cent above-baseline activity, supported by now established diagnostic hubs and the achievement of the faster diagnostic standard for 75 per cent of cases by the end of quarter three.

Admitted activity indicator (indicator 4)

- February and March 2021 suppressed activity as per actuals.
- Due to in-hospital infection control measures bed and ICU capacity is reduced, but activity grows towards baseline levels at the rate suggested in planning guidance, reaching baseline levels in August 2021 and sustaining to October 2021.
- A third wave and winter pressure suppresses activity from November 2021 to January 2022 at 15 per cent below baseline, similar to the level seen during the same period in 2020 and 2021.
- Return to baseline in February to March 2022.

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