National Cardiac
Audit Programme

NICOR

National Cardiac Audit Programme (NCAP)

2024 Report

(2022/23 and 2020/23 data)

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Annual Report at a glance

The report covers the 12 months from 1 April 2022 to 31 March 2023 and explores what could be potentially important post-pandemic shifts in the demand for cardiovascular services, how these are provided, and the variability experienced in different locations. NCAP now includes 11 cardiovascular audits and registries, eight of which provide results to this 2024 report.

Post-pandemic shift: admissions and procedures

The icon colours indicate the different sub-specialty sources of the data.

The number of confirmed heart attacks has fallen **8.4%** since 2017/18.

In 2022/23, the number of heart attacks per 100,000 people was **4** times higher in Merseyside and Wales compared with areas with lower rates.

1 in 10 people with higher risk heart attacks are 'self-presenting' to hospital rather than travelling by ambulance, potentially delaying life-saving medical treatment.

The median Call-To-Balloon time for higher risk heart attack patients undergoing primary angioplasty has worsened by **28%** since 2013/14

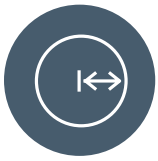
The average waiting time for elective coronary artery bypass graft (CABG) surgery in England, Wales and Northern Ireland is **119 days**, the target is under 84 days.

There has been a **32%** drop in the average number of CABG procedures performed annually by each cardiac surgeon since 2013/14.

Alternatives to surgery are growing for valve disease cases. There has been a **36%** growth in transcatheter aortic valve implantation (TAVI) procedures since 2019/20.

43% of patients aged 75 and over who undergo a TAVI procedure are female (a lower proportion than might be expected).

Surgical procedures for congenital heart disease have fallen **23%** over 10 years, with interventional procedures rising by **9%**.



74% of patients undergoing a complex percutaneous coronary intervention (PCI) did not have this checked with intracoronary imaging.

63% of acute coronary syndrome patients (with sudden, reduced blood flow to the heart) were not prescribed either prasugrel or ticagrelor, contrary to medication guidelines.

82% of patients with heart failure were seen by a specialist heart failure team, but only **15%** of patients cared for on a cardiology ward were referred for cardiac rehabilitation.

There has been a **17%** increase in the use of implantable loop recorders for diagnostic and monitoring purposes since 2017/18.

15% increase in the use of more 'complex' cardiac resynchronisation therapy pacemakers (CRT-P) to improve heart function since 2017/18.

Executive summary

NCAP now includes 11 cardiovascular audits and registries, eight of which provide results to this 2024 report

The National Cardiac Audit Programme (NCAP) aims to drive quality improvement (QI) in the design and delivery of cardiovascular services. This 2024 NCAP report covers quality of care outcome measures across seven cardiovascular domains. Each of these sub-specialty audits is concerned with a particular area of cardiovascular disease (CVD) treatment:

- National Congenital Heart Disease Audit (NCHDA)
- Myocardial Ischaemia National Audit Project (MINAP)
- National Audit of Percutaneous Coronary Interventions (NAPCI)
- National Adult Cardiac Surgery Audit (NACSA)
- National Heart Failure Audit (NHFA)
- National Audit of Cardiac Rhythm Management (NACRM)
- UK Transcatheter Aortic Valve Implantation (TAVI) Registry

This is the first year that the TAVI Registry has reported as part of the NCAP. In addition:

- The National Audit of Cardiac Rehabilitation (NACR) has been aligned to the NCAP, though continues to report separately for the moment
- Three new structural heart intervention registries will also be added – the Transcatheter Mitral and Tricuspid Valve (TMTV) Registry, Patent Foramen Ovale Closure (PFOC) Registry and Left Atrial Appendage Occlusion (LAAO) Registry. Data collection has started for these and some preliminary data from TMTV are included in this report.

The National Institute for Cardiovascular Outcomes Research (NICOR) is now part of the NHS Arden & Greater East Midlands Commissioning Support Unit and is commissioned directly by NHS England and NHS Wales (GIG Cymru) to run NCAP.

This report focuses on the 12 months from 1st April 2022 to 31st March 2023. Last year's report described the initial recovery from the COVID-19 pandemic and the problem of growing delays to treatment. This year's report explores what could be potentially important post-pandemic shifts in the demand for cardiovascular services, how these are provided, and the variability experienced in different locations.

New interactive reports are now available for each sub-specialty

As well as this summary report, which considers collectively the results across the whole programme, individual reports for each sub-specialty are produced with more detailed domain-level analyses and commentary. This year, these reports are provided in a new interactive format. This allows clinicians, patients and members of the public, commissioners, and others to focus on the information that is of most interest to them (e.g. drilling down to explore the performance of different parts of the country and individual hospitals). These reports can be found on the NICOR website.

Separately, a NICOR online portal enables hospitals and commissioners to access contemporary data, interrogate trends, and identify unwarranted variation in order to implement improvements.

Key messages

Blue headline figures = positive results

Red headline figures = adverse results

Black headline figures = changes where interpretation is less clear

All data for 2022/23 unless otherwise stated

Recorded heart attacks are falling	
↓8.4%	Confirmed heart attacks since 2017/18
↓10%	Higher-risk ST-elevation myocardial infarction (STEMI) heart attacks since 2017/18
↓13%	Lower-risk non-STEMI (NSTEMI) heart attacks in people aged 65 and older since 2017/18
x 4	Heart attacks per 100,000 people in the north, around Merseyside and in Wales in 2022/23 compared with areas with the lowest rates
The time taken to treat heart attack patients continues to worsen	
↑28%	Time from calling for an ambulance (or 'self-presenting' at hospital) to a primary percutaneous coronary intervention (PPCI) to restore blood flow compared to 2013/14
+28 mins	The median time for heart attack patients to reach hospital after calling for an ambulance compared with 2013/14
32%	Proportion of hospitals achieving target to treat at least 70% of higher-risk STEMI patients within 60 minutes of arrival at hospital
+14%	The extra time higher-risk STEMI heart attack patients of non-White ethnicities wait for their primary PCI procedure

The time taken to treat heart attack patients continues to worsen	
1 in 10	Higher-risk STEMI heart attack patients are 'self-presenting' to hospital rather than going by ambulance
13%	Proportion of 'self-presenting' higher-risk STEMI heart attack patients who have their PCI procedure within 60 minutes of arriving at hospital
Fewer patients with heart disease are being treated with stent and surgical procedures	
↓20%	Elective PCI procedures for patients with stable coronary artery disease since 2019/20
33%	Higher-risk STEMI heart attack patients who are female and aged over 75 who do not receive some form of reperfusion therapy
↓29%	Coronary artery bypass graft (CABG) procedures over the last 10 years
119 days	Average waiting time for elective CABG surgery in England, Wales and Northern Ireland (the target is under 84 days)
13 days	Average waiting time for urgent CABG surgery in England, (target is within seven days) and waits in Wales and Northern Ireland are even longer
↓32%	Drop in the average number of CABG procedures performed annually by each cardiac surgeon since 2013/14
Alternatives to surgery are growing faster for valve disease cases, though there is variation in following guidelines	
↓25%	Aortic valve replacement (AVR) surgery cases since 2019/20
↑36%	Growth in transcatheter aortic valve implantation (TAVI) procedures since 2019/20
0 – 50%	Percentage spread across individual hospitals of TAVI procedures that are performed as urgent cases
x6	TAVI procedures per 100,000 people in North London Cardiac Network compared with Humber and North Yorkshire Cardiac Network
43%	Of those patients aged 75 and over who undergo a TAVI procedure, 43% are female (a lower proportion than might be expected)
25%	Percentage of AVR patients aged under 50 years being given a 'tissue' rather than a 'mechanical' valve, contrary to current guidance
↓25%	Mitral valve surgical procedures since 2019/20

Surgical activity for patients with congenital heart disease is also on a downward trend while interventional procedures are rising	
↓23%	Surgical procedures for congenital heart disease (CHD) over ten years, whilst interventional procedures have increased by 9%
↓12%	All paediatric CHD procedures since 2019/20
x4.8	Higher antenatal CHD diagnosis rate in Leicester, Leicestershire and Rutland Integrated Care Board compared with Cornwall and the Isles of Scilly Health and Social Care Partnership
Providing angiography for lower-risk NSTEMI heart attack patients is taking longer and females are less likely to get this	
↓13%	Fall in the proportion of lower-risk NSTEMI heart attack patients undergoing angiography within 72 hours of admission since 2017/18
1 – 100%	Percentage spread across individual hospitals of lower-risk NSTEMI heart attack patients undergoing angiography within 72 hours of admission
51%	Percentage of female lower-risk NSTEMI heart attack patients aged 75 or older undergoing angiography within 72 hours of admission (lower than younger males at 62%)
There is considerable variation in the use of newer drug therapies and intracoronary imaging across PCI services	
63%	Percentage of acute coronary syndrome patients (with sudden, reduced blood flow to the heart) who DO NOT get either prasugrel or ticagrelor against medication guidelines
74%	Percentage of patients undergoing a complex PCI who DID NOT have this checked with intracoronary imaging

Arrhythmia treatment increasingly involves more complex options though concerning variations exist across all procedures	
↓15%	Use of more 'complex' cardiac resynchronisation therapy pacemakers (CRT-P) to improve heart function since 2017/18
↑17%	Use of implantable loop recorders for monitoring for diagnostic and monitoring purposes since 2017/18
x3	Percentage of arrhythmia patients per million people receiving a CRT-P device in South West (Peninsula) Cardiac Network compared with North London Cardiac Network
x5	Percentage of complex atrial fibrillation (AF) ablations per million people in South London Cardiac Network compared with in Wales
0.5 - 8%	Percentage spread across individual hospitals of initial pacemaker implantation procedures requiring re-intervention within one year
The rise in heart failure admissions appears to be slowing and the use of disease-modifying drug treatments is improving	
↓8.6%	63,500 confirmed cases of heart failure (HF) compared to 69,500 in 2019/20
x3	Percentage of HF admissions per 100,000 population in South London Cardiac Network compared to South Yorkshire Cardiac Network
40%	HF patients cared for on a cardiology ward
82%	Patients seen by a specialist HF team
↓7%	Percentage of HF patients investigated by echocardiography since 2015/16
59%	Eligible HF patients prescribed package of disease-modifying drugs (improving but still well below 90% target)
59%	Patients with heart failure with reduced ejection fraction now prescribed a sodium glucose co-transporter 2 inhibitor
15%	Patients cared for on a cardiology ward referred for cardiac rehabilitation

1. Introduction

1.1 NCAP now includes 11 cardiovascular audits and registries, eight of which provide results to this 2024 report

This 2024 National Cardiac Audit Programme (NCAP) report covers quality of care outcome measures across seven cardiovascular domains. Each of these sub-specialty audits is concerned with a particular area of cardiovascular disease (CVD) treatment:

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1.2 New interactive reports are now available for each sub-specialty

As well as this summary report that considers collectively the results across the whole programme, individual reports for each sub-specialty are produced with more detailed domain-level analyses and commentary. These reports can be found on the NICOR website, including links to methodology and explanatory documentation.

The reports are provided in a new interactive format, enabling different readers – clinicians, patients and members of the public, commissioners, and others – to focus on the information of most interest to them. This includes, for the first time, the ability to drill down more comprehensively to explore performance at different levels:

- by country
- by Integrated Care Board (ICB) in England or University Health Board in Wales (service commissioning organisations)
- by Cardiac Network (service delivery networks)
- by individual hospital.

The aim of showing differences across and within these levels is to stimulate local discussions on ways to remove unwarranted variation in the care provided and the patient outcomes achieved. This report contains a selection of examples.

Many of the variations are dramatic and some of these certainly warrant immediate consideration and action. However, caution is required in interpreting the data where all the relevant demographic and clinical variables have not been adjusted for in the results. Future data collection and analysis will attempt to account for these differences between organisations and places.

Separately, NICOR also provides an online portal with contemporary data where individual hospitals can interrogate trends, identify unwarranted variation and prioritise areas for improvement.

1.3 The report includes data from 2022/23 and explores post-pandemic trends, challenges and opportunities for cardiovascular services

The data in this report include the latest available yearly figures from 1st April 2022 to 31st March 2023 (which also form part of three-year rolling data where that is used for some of the analyses). Longer-term time series are also provided to illustrate the evolution of cardiovascular care, its quality and outcomes.

The report explores what could be potentially important post-pandemic shifts in the demand for cardiovascular services, and the challenges and opportunities that developments in practice and technology present for clinicians and commissioners.

Levels of activity for most cardiovascular sub-specialties have continued to increase from the low points in 2020/21 during the COVID-19 pandemic. Some areas remain below pre-COVID levels, most clearly adult and paediatric cardiac surgery. The impact of industrial action in healthcare largely followed the period covered by this report (though preliminary data suggest this may have had additional impacts in early 2023/24).

In what has been a turbulent time for the NHS, areas of excellent practice are seen, with improved quality of care across many areas of clinical practice. This is not universal however, and the report sheds light on the variability experienced by patients in different parts of the country and individual hospitals. This remains the case especially for patients suffering a heart attack and those in need of either urgent or elective cardiac bypass surgery.

As implementation of NHS England's Urgent and Emergency Strategy takes hold, it is hoped that unwarranted variation in care is reduced. Integrated Care Boards (ICBs) and Cardiac Networks (CNs) have a crucial role to play in this, leading a localised approach to implementing improvements.

The following sections of this report each have a key message for different aspects of cardiovascular care.

Section	Key message
2	Recorded heart attacks are falling
3	The time taken to treat heart attack patients continues to worsen
4	Fewer patients with heart disease are being treated with surgical procedures
5	Alternatives to surgery are growing faster for valve disease cases, though there is variation in following guidelines
6	Surgical activity for patients with congenital heart disease is also on a downward trend while interventional procedures are rising
7	Providing angiography for lower-risk NSTEMI heart attack patients is taking longer and females are less likely to get this
8	There is considerable variation in the use of newer drug therapies and intracoronary imaging across PCI services
9	Arrhythmia treatment increasingly involves more complex options though concerning variations exist across all procedures
10	The rise in heart failure hospital admissions appears to be slowing and the use of disease-modifying drug treatments is improving

A final section emphasises the importance of hospitals providing complete and accurate data for all the NCAP audit and registry metrics to support its role in driving evidence-based quality improvement.

2. Recorded heart attacks are falling

Many patients with heart disease rely at some stage on two important therapeutic interventions to improve the flow of blood to the heart:

- percutaneous coronary intervention (PCI) improves blood flow and relieves heart disease symptoms by inserting a stent (a small expandable tube) or by stretching a narrowing with a balloon
- coronary artery bypass grafting (CABG) uses healthy vessels from the patient's body to create alternative routes for the blood, bypassing the blocked arteries.

These treatments can be provided for a patient either as an urgent procedure (for example, when someone has very recently had a heart attack) or as an elective procedure, where the intention is to relieve symptoms and/or prevent a heart attack occurring for a first or subsequent time.

The latest audit findings suggest that the number of PCI and CABG cases are both falling.

The number of PCI and CABG procedures undertaken in any one year is dependent on several factors:

- The number of people in the population who have heart disease, especially those who suffer a heart attack or other serious symptoms or who continue to have symptoms despite previous medical treatment
- The shift in medical practice driven by emerging evidence that supports the use of newer medical therapies which can stabilise the heart condition and achieve better outcomes for patients
- The shift in practice to offer less invasive alternatives
- The capacity of NHS hospitals to provide each available treatment
- The length of waiting lists for different surgical or medical procedures.

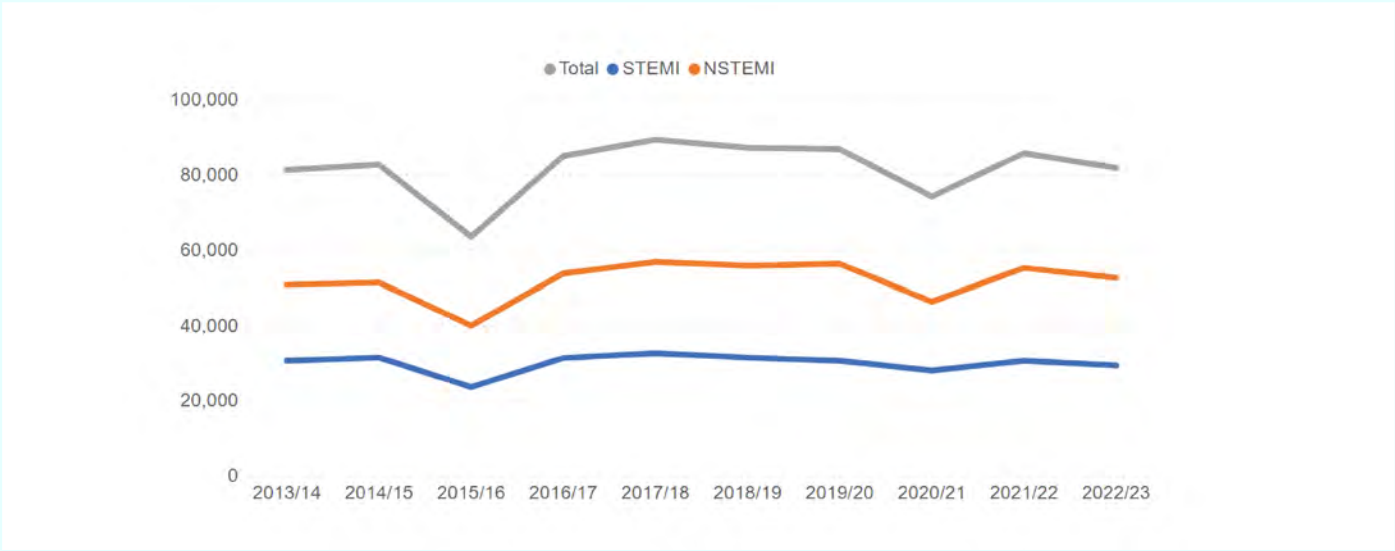
The COVID-19 pandemic has also had a substantial impact and there continue to be knock-on effects.

The rest of this section considers in turn how these factors may be affecting the number of patients treated with PCI and CABG, both now and into the future.

2.1 Fewer hearts attacks are being recorded in people aged 65 or over

The number of recorded heart attacks has been falling steadily over the last few years. Confirmed heart attacks in 2022/23 were down 4% on the year before and 8.4% down on 2017/18 [Figure 2.1]. The five-year decline is made up of a 10% fall in patients with higher-risk ST-elevation myocardial infarction (STEMI) heart attacks and a 7.5% reduction in non-ST-elevation myocardial infarction (NSTEMI) heart attacks.

Figure 2.1: Call-To-Door (CTD) time (minutes) for higher-risk STEMI heart attack patients (2013/14 – 2022/23) [MINAP data]

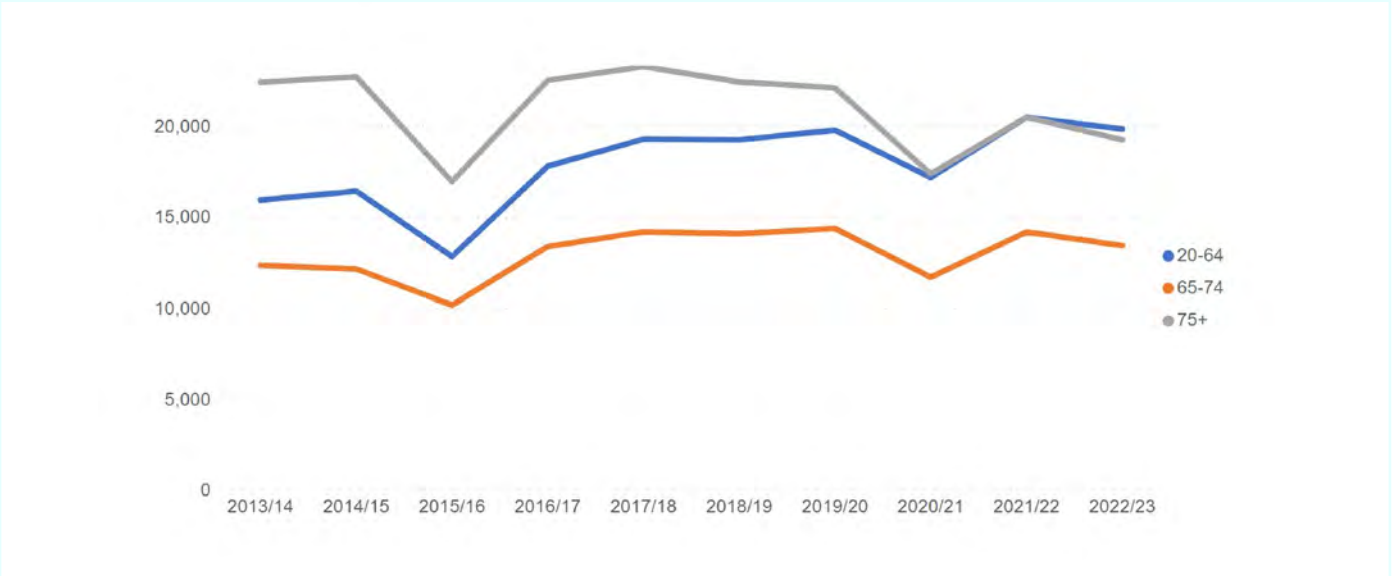


STEMI = higher-risk ST-elevation myocardial infarction heart attacks
NSTEMI = lower-risk non-ST-elevation myocardial infarction heart attacks
2015/16 data were only for 9 months rather than a complete year

The decline in recorded heart attacks is especially pronounced in lower-risk NSTEMI patients aged 75 and older (down 17% in five years), and 65 and older (down 13%) [Figure 2.2]. This is despite the introduction of high-sensitivity troponin testing which potentially increases the likelihood of making a heart attack diagnosis, especially in NSTEMI cases. Cases dropped during the COVID-19 pandemic (most dramatically amongst those aged 75 or older) and have not returned to pre-pandemic levels.

The incidence of heart attacks in younger people aged 20 to 64 also fell in 2022/23, although it is now about 3% higher than in 2017/18.

Figure 2.2: Lower-risk NSTEMI heart attacks by age group (2013/14 – 2022/23) [MINAP data]



Several factors might be affecting this reduction in recorded heart attacks, especially amongst older patients:

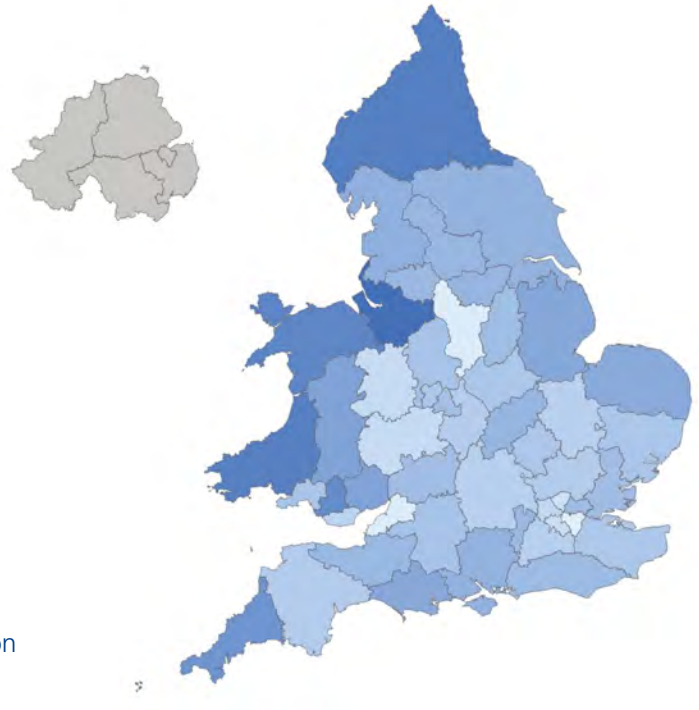
- People may still be unwilling to call for help based on their fears of acquiring a COVID-19 infection in hospital, especially if they are uncertain about the cause and potential severity of their symptoms. This might result in more individuals dying of a heart attack before they reach hospital (and hence not being recorded in the audit).
- There may have been a disproportionate death rate during the pandemic in the older age groups (from both cardiac and non-cardiac causes) which has altered the number of people in the population at risk of a serious heart condition.
- Primary and secondary public health programmes may be having a preventative impact on heart disease, especially for the older age groups.

The relative effect of these factors is not clear, and more evidence is needed to determine the exact reasons for the decline in cases.

2.2 There are sizeable differences in the rate of heart attacks around the country

There were nearly four times more heart attacks per 100,000 population in the north, around Merseyside, in Wales and in the southwest than in those areas with lowest rates. The data are not adjusted for sex, age and ethnicity or other factors that may skew the results. Nonetheless, additional investment in primary and secondary prevention programmes in these areas could be warranted [Figure 2.3].

Figure 2.3: Heart attack cases per 100,000 population (based on patient home location) by ICB in England and UHB in Wales(2022/23) [MINAP data]



ICB = Integrated Care Board
UHB = University Health Board
Darker areas represent a higher incidence
Lightest areas represent <70/100,000 population
Darkest represent >195/100,000 population

3. The time taken to treat heart attack patients continues to worsen

To achieve the best possible outcomes for those suffering the symptoms of a heart attack, after the initial call for help patients must be rapidly assessed and an ECG performed. Patients should then receive a Primary PCI (PPCI) if a 'higher risk' STEMI heart attack is confirmed. The overall time taken is known as the Call-To-Balloon (CTB) time. The CTB can then be broken down into two components:

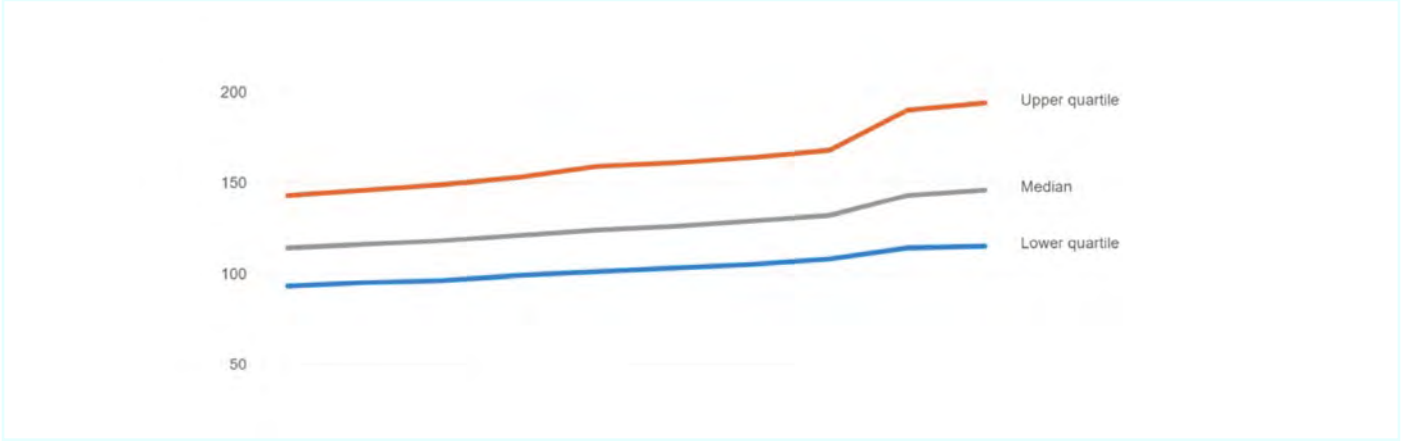
- The Call-To-Door (CTD) time covers the period when the patient is brought to hospital by the ambulance services
- The Door-To-Balloon (DTB) time measures how long it takes the hospital to admit a patient and start PPCI treatment. Hospitals not set up to deliver PPCI transfer patients directly to the catheter laboratory of the nearest hospital able to do this. This is known as an inter-hospital transfer (IHT). For patients who present themselves to hospital (usually to the A&E department), the DTB period covers the arrival at the hospital to the start of treatment.

3.1 The 25% of patients with the longest treatment times have seen the delay to their treatment worsen considerably in the last two years

NCAP reports have repeatedly shown that these times have worsened over the last 10 years. It was also predicted that the challenges posed by the COVID-19 pandemic would probably lead to further deterioration before the trend could be reversed.

NHS England has been addressing treatment times for heart attack patients over the last two years. In 2022/23, although there was as expected a further worsening of the CTB overall treatment time, the rate of deterioration slowed [Figure 3.1].

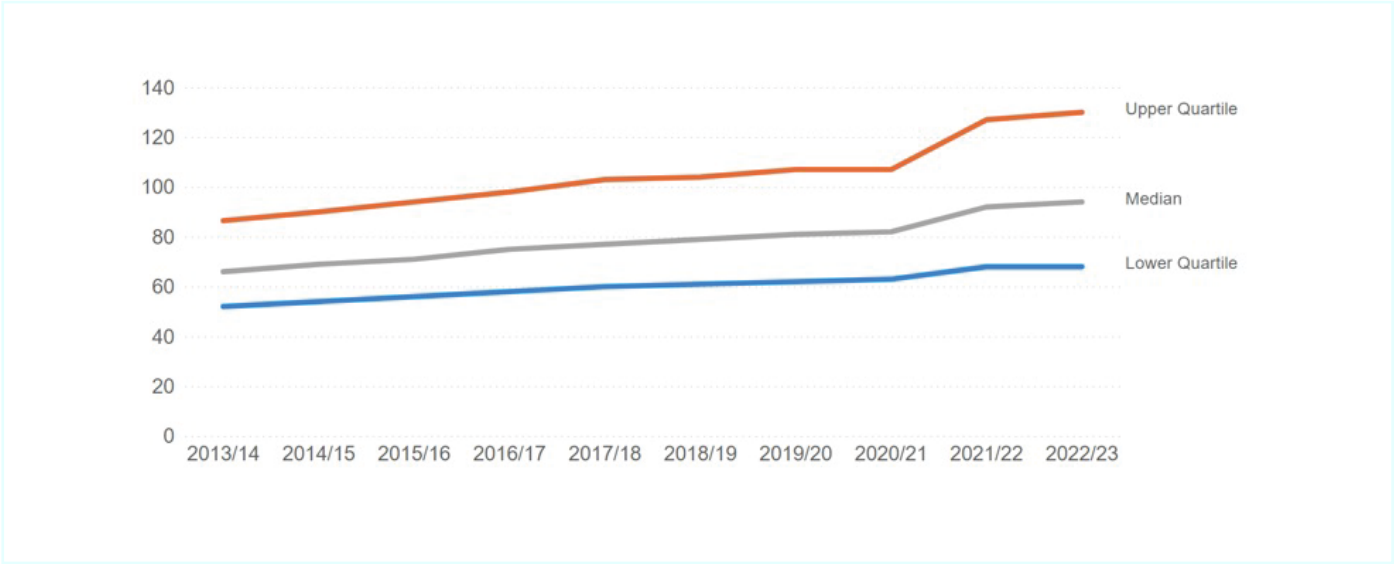
Figure 3.1: Call-To-Balloon (CTB) times (minutes) for higher-risk STEMI heart attack patients (2013/14 – 2022/23) [MINAP data]



Upper quartile = minimum treatment time for 25% of patients experiencing longest delays
Lower quartile = maximum treatment time for 25% of patients experiencing shortest delays

As in previous years, this mostly resulted from lengthening CTD times, representing the time taken between a call for help, the arrival of the ambulance and the transfer to a hospital able to perform a PPCI. The median CTD time is now 28 minutes longer than in 2013/14, a rise of 42% [Figure 3.2]. The impact is greatest on the 25% of patients experiencing the longest delays, for whom the CTD time was 130 minutes or more.

Figure 3.2: Call-To-Balloon (CTB) times (minutes) for higher-risk STEMI heart attack patients (2013/14 – 2022/23) [MINAP data]



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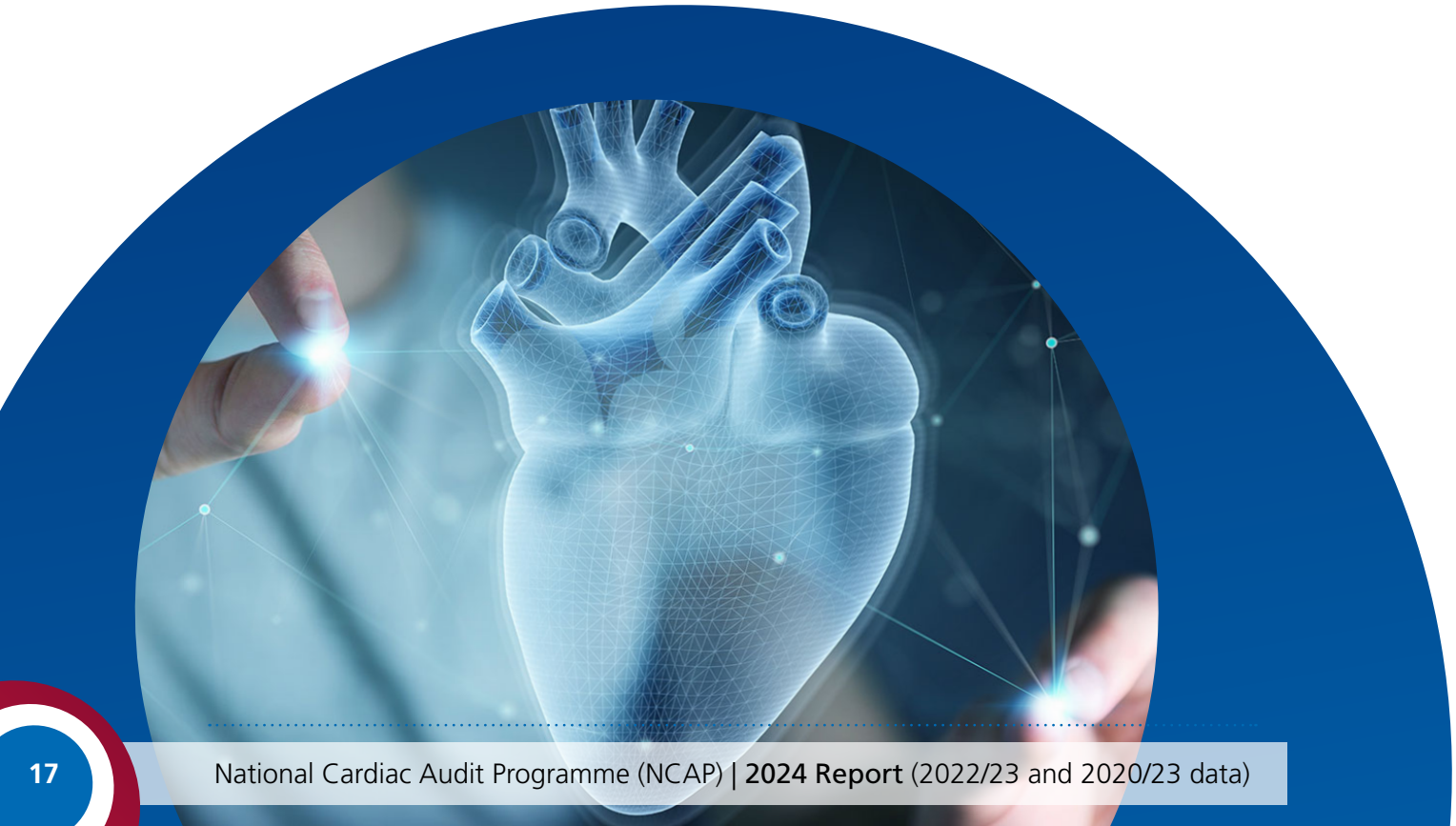
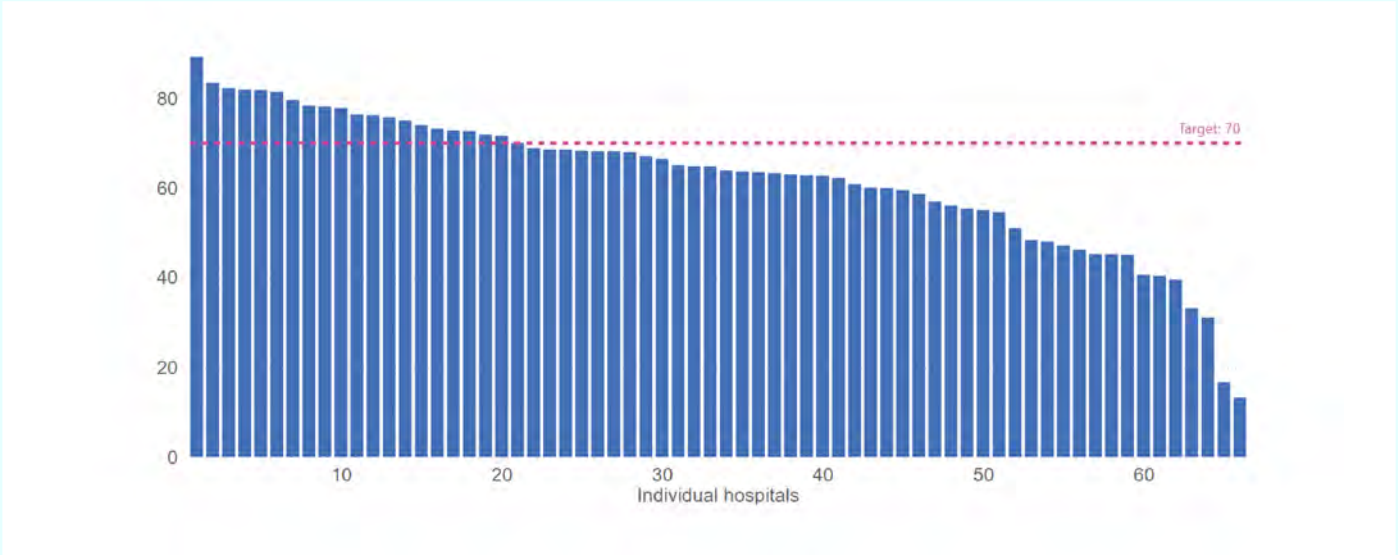


3.2 Evidence suggests that DTB times are getting longer

It is taking patients slightly more time to move through a hospital to receive their PPCI procedure. The median DTB time in 2022/23 was up three minutes from five years before. Again, the biggest problem is with the 25% of cases who experience the longest delays, where delays of 71 minutes or more occur.

A new, more stringent target has been set to treat at least 70% of higher-risk STEMI patients within 60 minutes of arrival time at hospital. In 2022/23, most hospitals (45 in total) did not meet this target [Figure 3.3].

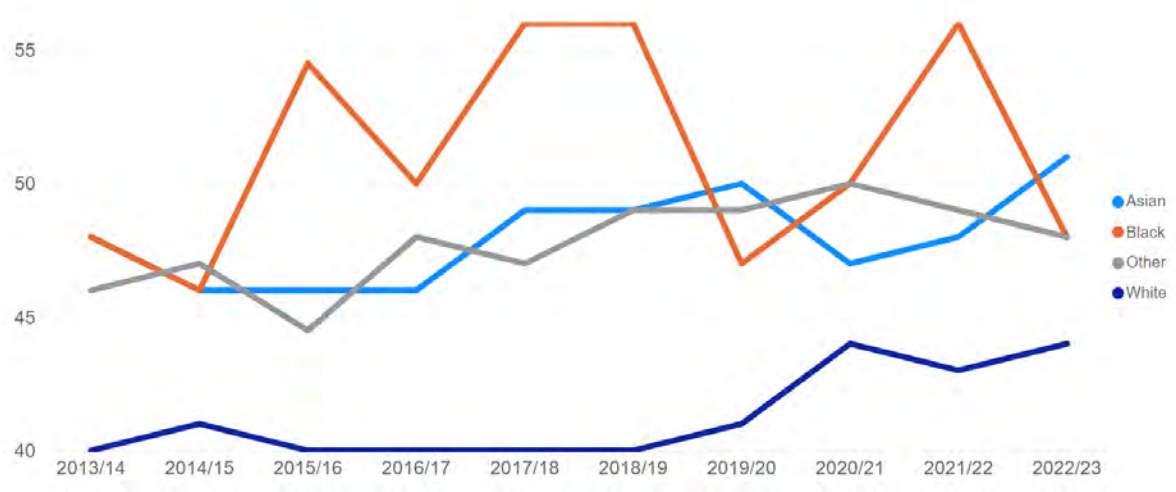
Figure 3.3: Percentage of higher-risk STEMI heart attack patients who undergo primary PCI within 60 minutes of arrival time, by hospital (2022/23) [MINAP data]



3.3 Higher-risk STEMI heart attack patients of non-White ethnicities have longer DTB times

There is a noticeable difference in the DTB time for those of non-White ethnicities (median of 51, 48 and 48 minutes for those of Asian, Black or Other ethnicities compared to 44 minutes for those of White ethnicity) [Figure 3.4]. Health systems and individual hospitals should recognise that diagnoses may not be so evident in patients of different ethnic groups and consider earlier use of ECGs and troponin testing to ensure speedy treatment.

Figure 3.4: Median Door-To-Balloon (DTB) times (minutes) for higher-risk STEMI heart attack patients, by ethnicity (2013/14 – 2022/23) [MINAP data]



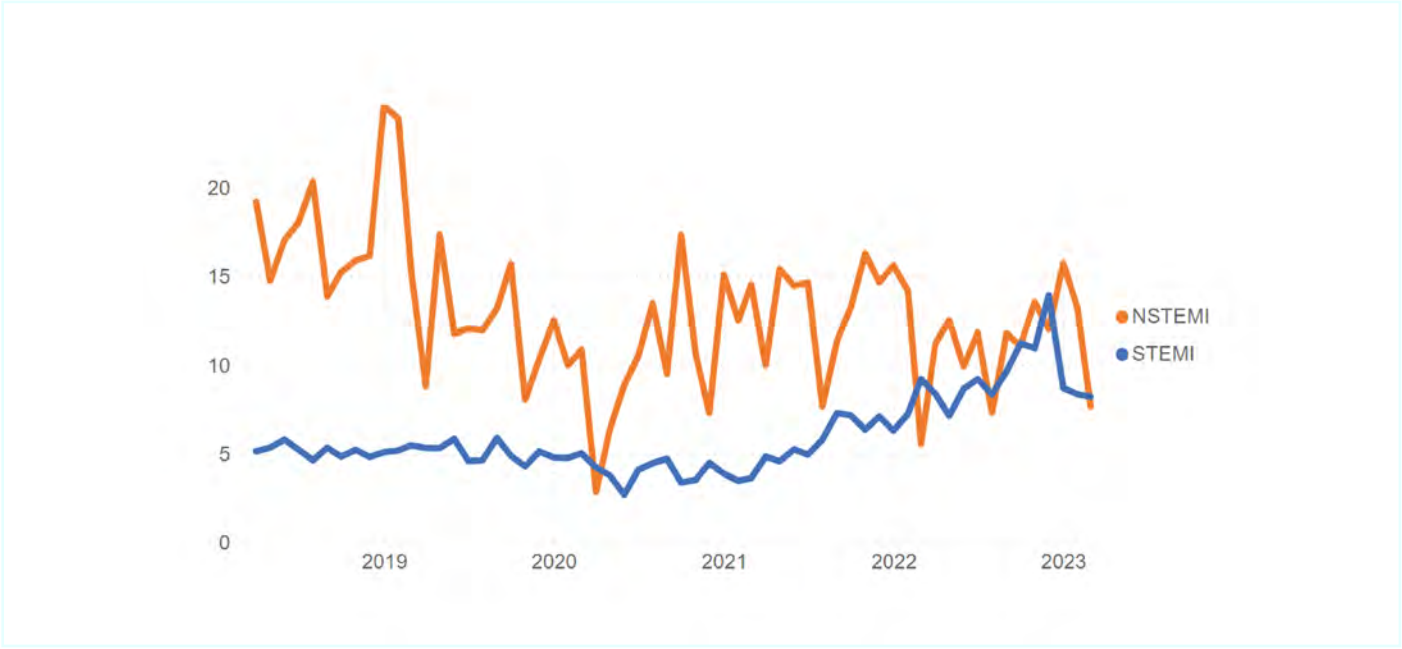
3.4 Increasingly, heart attack patients are going directly to hospital rather than waiting for an ambulance

Patients have consistently been told to call for an ambulance should they be experiencing heart attack symptoms. An ambulance team can take a patient with higher-risk STEMI heart attacks directly to the treatment room at a local hospital capable of performing a PPCI procedure. This bypasses:

- any delays inherent in triage through an Accident & Emergency department
- the need of a time-consuming transfer to the PCI centre should the patient present to a hospital without PCI facilities.

In addition, the ambulance team can provide cardiac resuscitation should that become necessary. Worryingly, despite this advice, the number of STEMI patients who go themselves to hospital ('self-present') is increasing [Figure 3.5]. This includes patients who present directly to a hospital with PPCI capability (rather than calling for an ambulance) or those who present to a hospital that does not have facilities for PPCI and hence require transfer to the PCI centre. Moreover, higher-risk STEMI patients are self-presenting as often as those with lower-risk NSTEMI heart attacks, something that did not happen before. It is not known how many self-presenting patients first called for an ambulance.

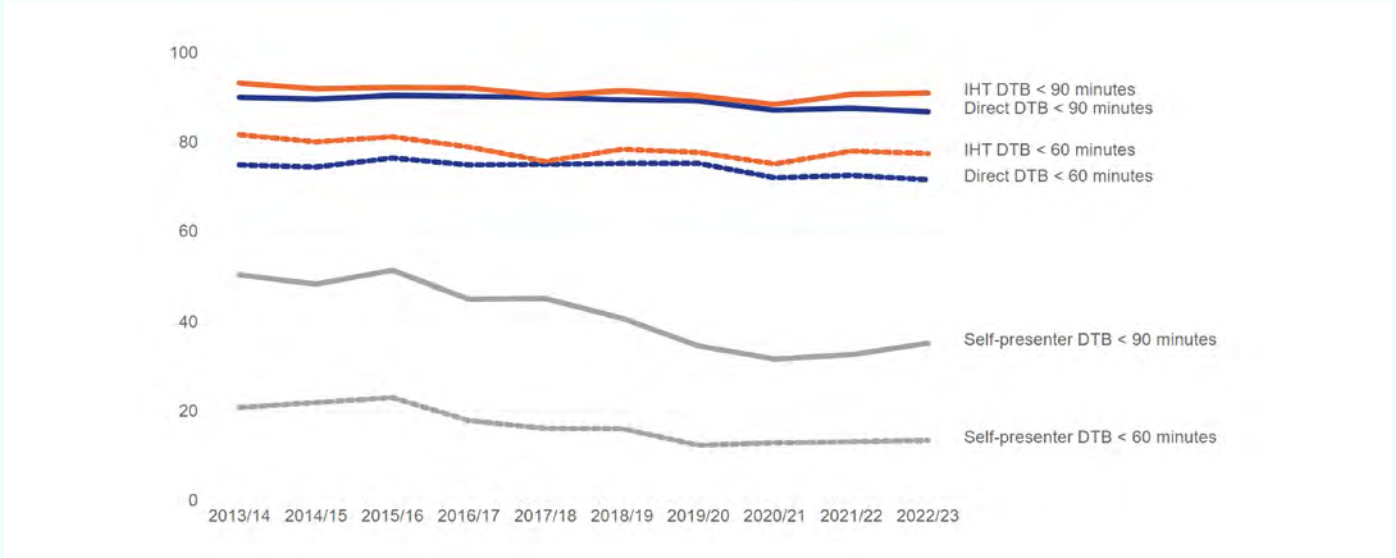
Figure 3.5: Monthly percentage of higher-risk STEMI heart attack patients who self-present to hospital (2018/19 – 2022/23) [MINAP data]



3.5 Self-presenting heart attack patients face longer delays to their treatment once they have arrived at hospital

Patients who self-present to the heart attack centre have longer DTB times than those who are brought in by ambulance as is evident from the lower percentage of patients who are treated within the PCI centre DTB target times [Figure 3.6]. This is because of the delays in A&E whilst a diagnosis is made, and the PCI team activated.

Figure 3.6: Percentage of higher-risk STEMI heart attack patients treated within DTB target times, by mode of admission (2013/14 – 2022/23) [MINAP data]



DTB = Door-To-Balloon time
IHT = Inter-hospital transfer

Over the last few years, around 64% of those patients who have self-presented to the PPCI centre were treated within the overall Call-To-Balloon (CTB) target times. For the last two years, this has been a greater proportion compared with those who were transported by ambulance directly to the PPCI hospital [Figure 3.7]. However, caution is needed in how these data are interpreted. Crucially, the components of the CTB time are different for patients who call for an ambulance and for those who self-present.

Of patients calling for an ambulance:

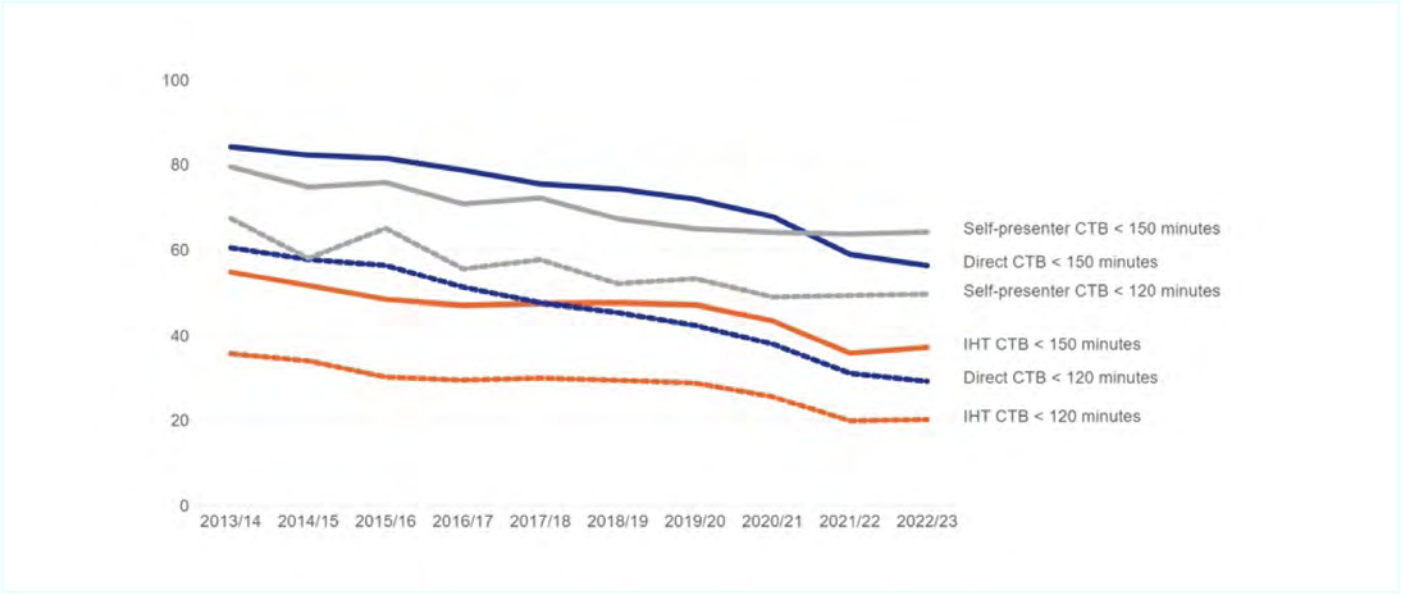
- The majority will be taken straight to a hospital with PPCI capabilities ('direct admissions'). The CTB time covers the period between the call to the emergency services and when the PPCI treatment is started
- A much smaller number will be taken to a hospital that does not offer PPCI so will then require a further journey to a PCI Centre (this is known as an 'inter-hospital transfer' or IHT). Consequently, the CTB time for these patients includes the additional time for the IHT.

For patients who self-present to hospital, the CTB time starts when they arrive at a hospital, whether this is capable of offering PPCI or not (so some will also require an IHT). Their CTB times do not capture how long it takes for them to arrive at hospital after symptom onset, during which their condition could deteriorate. The audit does not collect information on patients who die prior to admission.

Consequently, it is not known whether this apparent CTB advantage is at the expense of some patients not surviving prior to arriving at hospital, or reaching hospital in a worse condition than they would have done had they called an ambulance.

In Figure 3.7, the self-presenter CTB time data refer only to those who self-presented at the PPCI centre, as patients who went to a non-PCI centre would have required an inter-hospital transfer (and are included in the IHT target time data).

Figure 3.7: Percentage of higher-risk STEMI heart attack patients who are treated within CTB target times, by mode of admission (2013/14 – 2022/23) [MINAP data]



CTB = Call-To-Balloon time IHT = Inter-hospital transfer
CTB times for self-presenters are for patients who arrive at a hospital with PPCI capabilities and do not include data for those who require an IHT

3.6 Local health systems and hospitals must prioritise reducing treatment times for heart attack patients to the levels seen when PPCI was first established

To counter the worrying trend of heart attack patients self-presenting to hospital, the aim should be to improve overall treatment times. Ideally, these should be returned to the excellent levels that were seen shortly after PPCI services were first established in the early 2000s. This involves local health systems ensuring that ambulance and hospital services are coordinating to improve the CTB times and individual hospitals taking steps to halt any deterioration in DTB times, including bringing down the waits faced by the patients experiencing the longest delays.

To minimise the risk faced by waiting patients, international guidelines suggest that the use of thrombolysis ('clot-buster drugs') should be considered if a PPCI procedure cannot be performed within 120-150 minutes of first medical contact (whether by an ambulance crew or at A&E for self-presenters). This is the time when a decision needs to be made as to how likely it is that PCI can be achieved within the next 2 to 2.5 hours. The first point of contact is not currently captured by the audit.

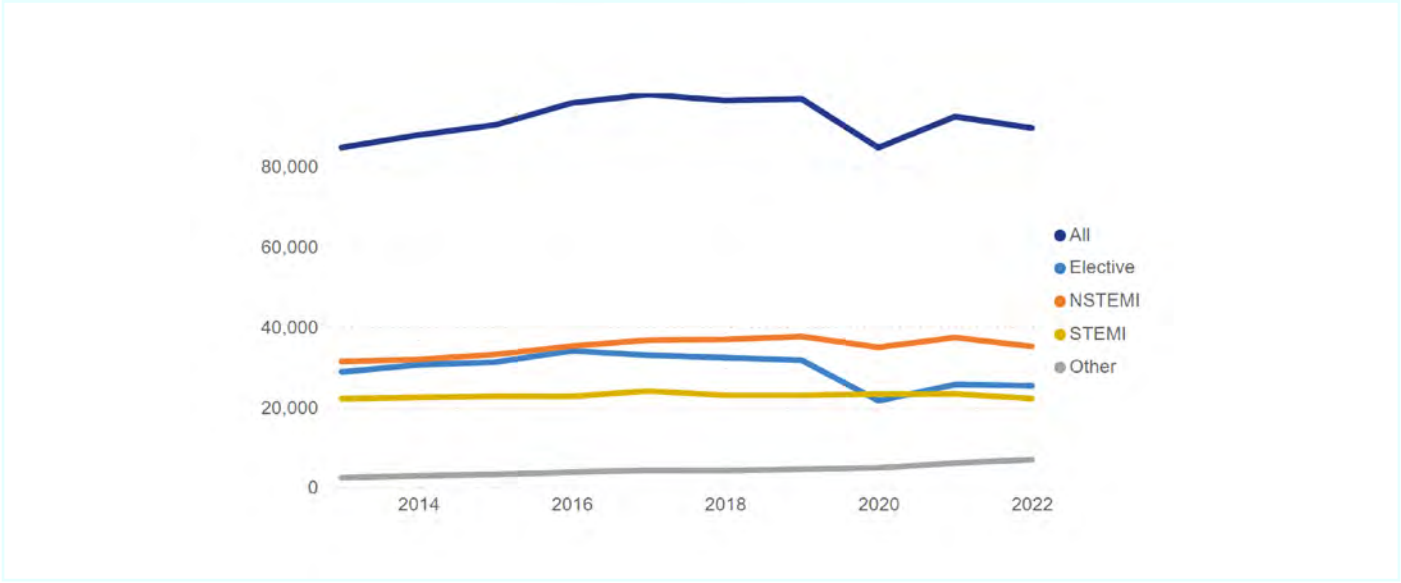
For patients being taken directly to a hospital that can perform a PPCI, it is very likely patients will be within those guideline times. On balance, the remaining patients (both those being transferred between hospitals and those self-presenting) should also still be able to gain the benefits of PCI over thrombolysis. Above all, any lengthening treatment times almost certainly adversely affect patient outcomes, and every effort must be made to improve these.

4. Fewer patients with heart disease are being treated with stents or surgical procedures

4.1 The number of PCI procedures is falling as more patients are treated with therapeutic drugs

The number of PCI procedures has dropped at the same time as recorded heart attack cases have declined [Figure 4.1]. However, the largest fall has been in elective PCI for patients with stable coronary artery disease (down 21% since 2019/20), rather than those who have been admitted with a heart attack as urgent or emergency cases.

Figure 4.1: Annual number of PCI procedures by category, 2013/14 – 2022/23 [NAPCI data]



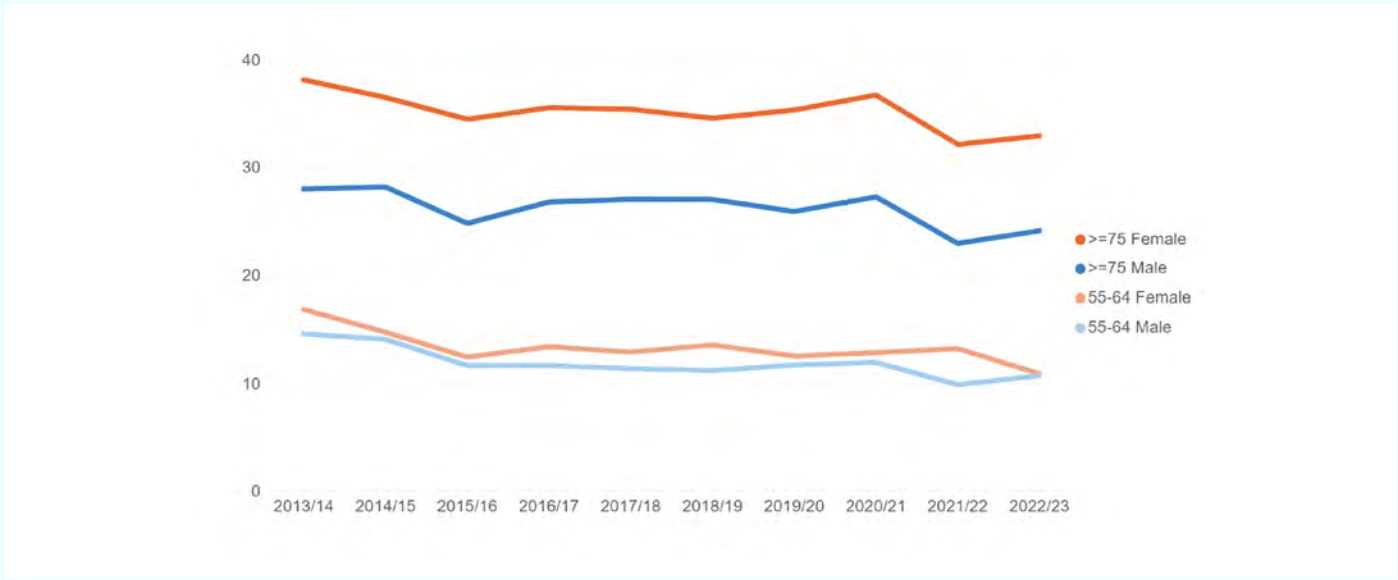
STEMI = higher-risk ST-elevation myocardial infarction heart attacks
NSTEMI = lower-risk non-ST-elevation myocardial infarction heart attacks

Recent trials have shown that in less urgent cases, prescribing drugs can achieve survival rates in many patients as good as those where revascularisation using PCI has been used (although the latter has a more immediate impact on a patient's symptoms). The therapeutic drugs involved include beta blockers, angiotensin-converting enzyme (ACE) inhibitors, statins and mineralocorticoid antagonists (MRAs). New drugs such as sodium glucose cotransporter-2 (SGLT2) inhibitors are also evidenced to improve outcomes for patients with diabetes or heart failure.

4.2 Older females are less likely to receive reperfusion therapy for a higher-risk STEMI heart attack

Higher-risk STEMI heart attack patients who are female and aged over 75 are much less likely to receive some form of reperfusion therapy (either thrombolysis, primary PCI, or both) [Figure 4.2]. A proportion of these patients present with symptoms that clinicians currently do not immediately associate with a heart attack. This may then delay the correct diagnosis beyond the point at which reperfusion therapy provides benefits. Clinical teams (both in hospitals and across primary and community care) need to ensure they understand when symptoms other than chest pain might represent a heart attack.

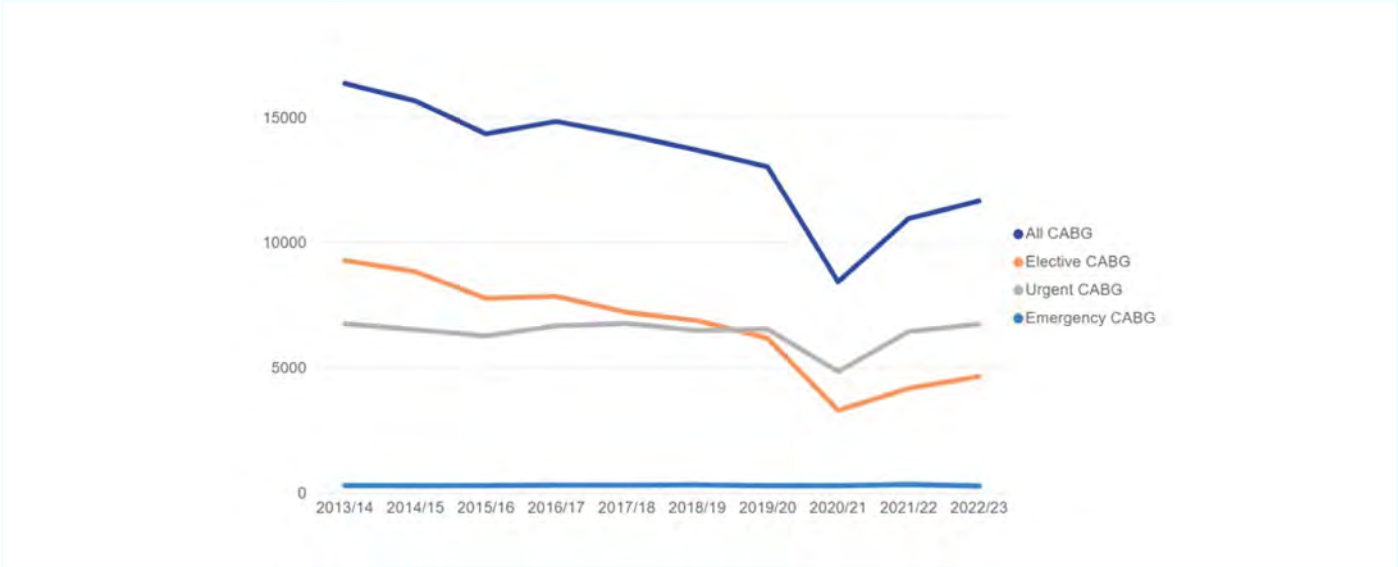
Figure 4.2: Percentage of higher-risk STEMI heart attack patients who DO NOT receive reperfusion therapy, by age and sex (2013/14 – 2022/23) [MINAP data]



4.3 The number of CABG cases is falling, partly because of using PCI for a higher proportion of cases

There has also been a steady drop in the number of elective CABG procedures which have fallen by more than a third since 2017/18 [Figure 4.3].

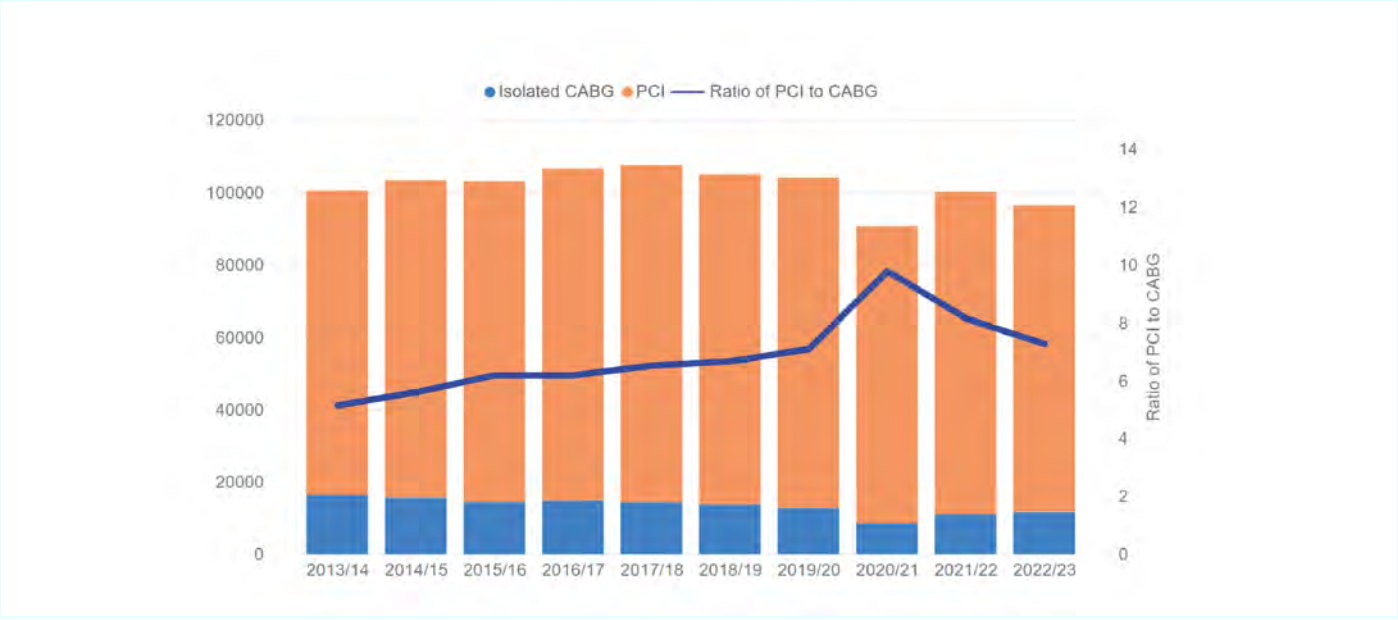
Figure 4.3: CABG procedures by type (2013/14 – 2022/23) [NACSA data]



CABG = coronary artery bypass graft

The decline in CABG cases may partly be a result of changes in clinical pathways. During the pandemic, when it was more difficult to provide CABG, a higher proportion of patients underwent PCI. This is evident in the ratio of PCI to CABG procedures which has grown over the last 10 years and rose sharply during 2020/21 [Figure 4.4].

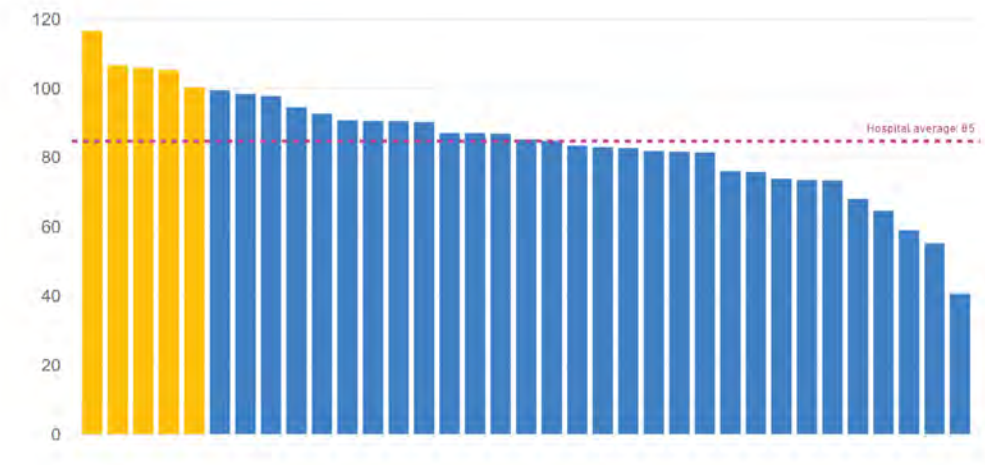
Figure 4.4: PCI and CABG procedures and PCI:CABG ratio (2013/14 – 2022/23) [NAPCI and NACSA data]



As services have recovered, the PCI:CABG ratio has fallen back but is still higher than pre-pandemic levels, indicating that the shift from CABG to PCI pathways continues for the moment. It is likely, though, that discussions within multi-disciplinary cardiology and cardiac surgery teams will increase the overall number of patients treated with CABG rather than PCI.

On average, hospitals undertook in 2022/23 only 85% of the CABG procedures they carried out in 2019/20, the year before the COVID-19 pandemic [Figure 4.5]. Cross-referral between hospitals and greater use of the private sector for NHS patients remain options to increase the available capacity.

Figure 4.5: CABG operations in 2022/23 as a percentage of those in 2019/20 [NACSA data]



4.4 Lengthening waiting times for CABG operations may result from capacity constraints in hospitals that reduce the overall number of procedures

Lengthening CABG waiting lists are probably another factor affecting the number of CABG procedures in any given year. The audit does not capture NHS waiting list data, but several of the findings point to potential issues in the time patients are waiting for an operation.

- Following the diagnostic angiogram, it took an average of 119 days in 2022/23 for a patient in England, Wales and Northern Ireland to have their elective CABG operation (the target is under 84 days) [Figure 4.6].
- Average waiting times within hospitals for urgent CABG also increased to 13 days across England in 2022/23 (from 10 days in 2019/20) and are now almost double the target time of seven days [Figure 4.7].

Figure 4.6: Waiting time (days) between diagnostic coronary angiogram and an elective CABG operation (2013/14 – 2022/23) [NACSA data]

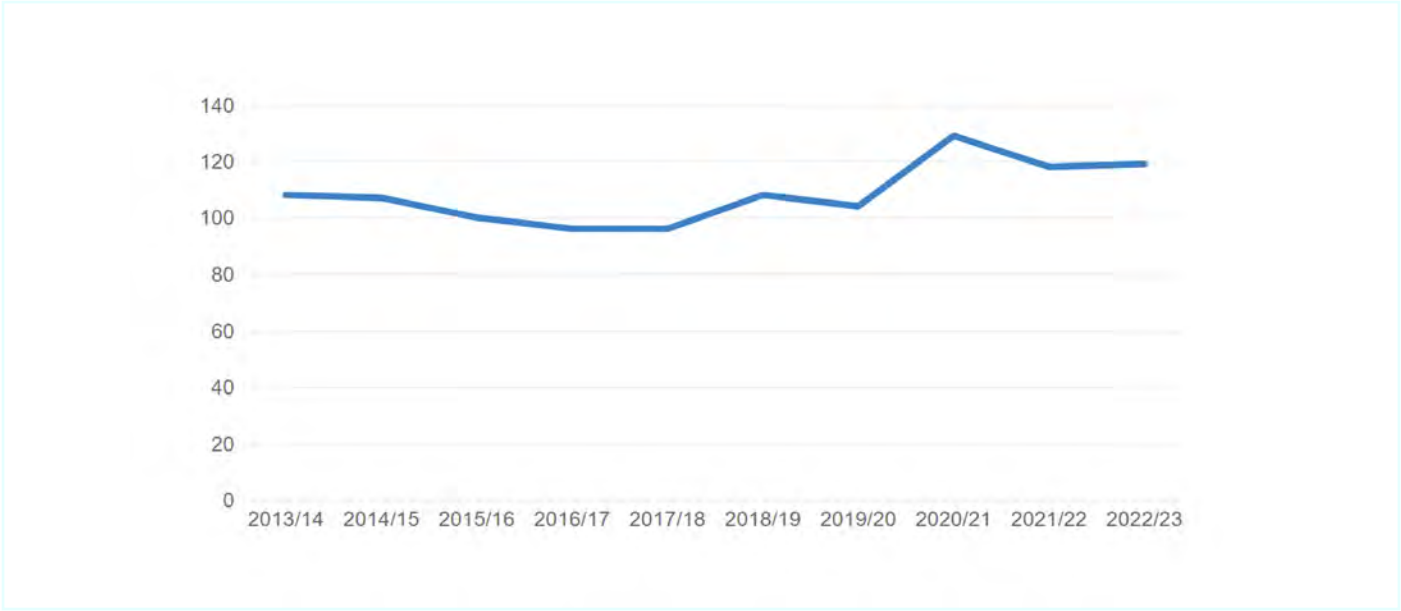
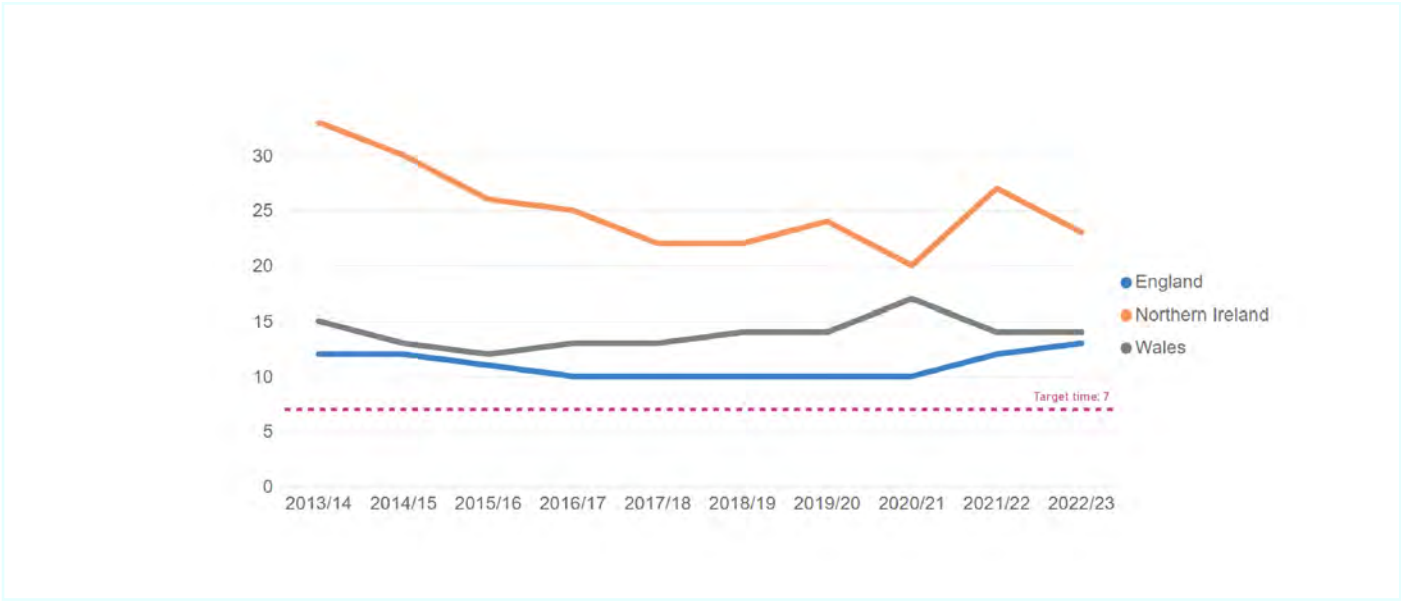
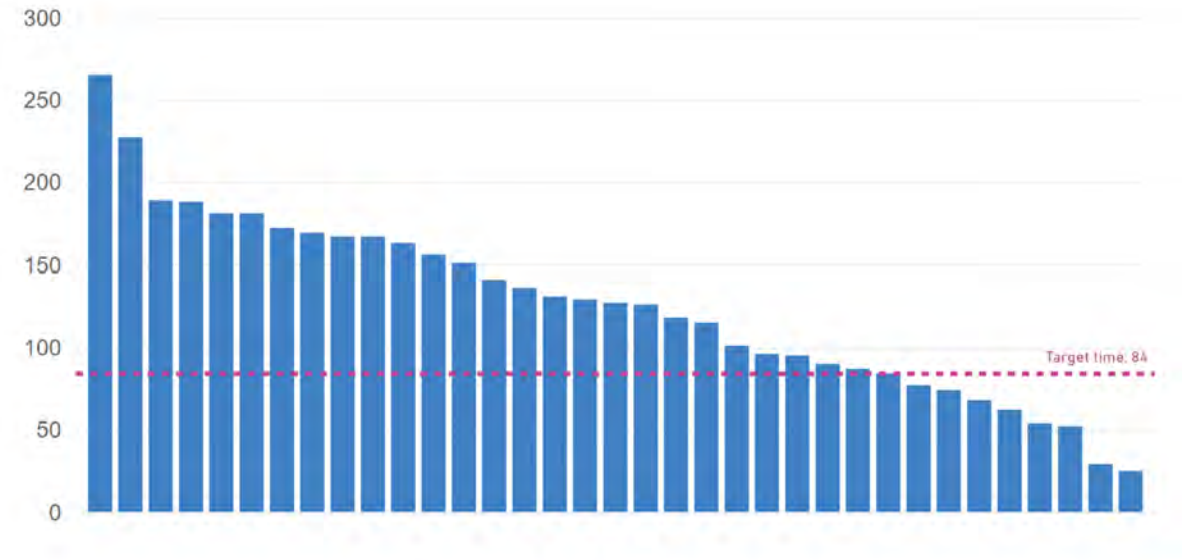


Figure 4.7: Waiting time (days) between diagnostic angiogram and in-house urgent CABG by country (2013/14 – 2022/23) [NACSA data]



The rise in average waiting times for elective CABG procedures comprises a very wide variation between individual hospitals, with patients waiting over 150 days for their operation in 13 hospitals [Figure 4.8].

Figure 4.8: Variation in waiting times for elective coronary artery bypass grafting between cardiac centres, 2022/23 [NACSA data]



4.5 Cardiac surgeons undertaking fewer cases may also point to capacity constraints that limit the number of CABG procedures

Individual cardiac surgeons are each undertaking fewer CABG procedures on average, falling from a median of 140 cases per year in 2013/14 to 95 in 2022/23 [Figure 4.9].

Figure 4.9: Annual CABG procedures per cardiac consultant (2013/14 – 2022/23) [NACSA data]

Upper quartile = minimum number of cases per year for 25% of consultants undertaking most cases
Lower quartile = maximum number of cases per year for 25% of consultants undertaking least cases

The number of CABG cases each cardiac consultant undertakes is likely to be a function of several factors, all of which are being reviewed by an NHS England working group formed in 2023 to review waiting lists for cardiac surgery:

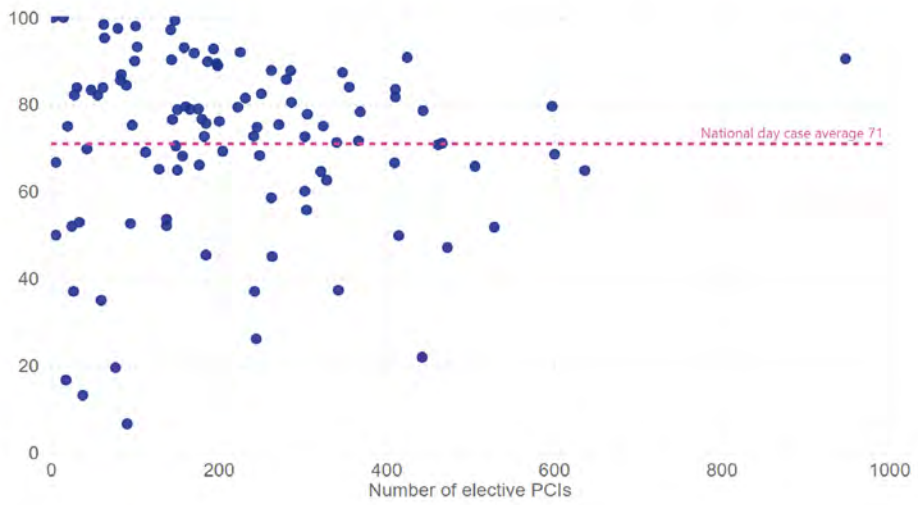
- lack of specialist intensive care unit (ICU) nurses
- lack of anaesthetic support staff
- lack of protected ICU beds
- prioritisation of urgent over elective cases.

The pandemic has undoubtedly compounded these problems and re-establishing elective cardiac surgery service capacity will take time. Several options to reduce waiting lists are being explored alongside action to ensure that patients remain safe in the period before their operation.

4.6 Undertaking more day cases could boost the number of PCI procedures that hospitals can perform as would day of surgery admissions for cardiac surgery

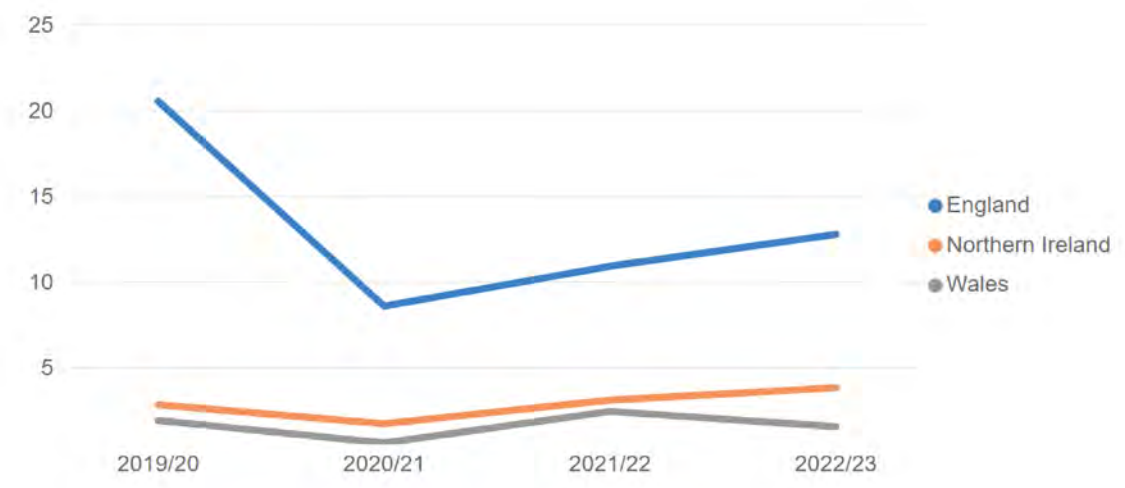
Admitting and discharging patients on the same day as their PCI procedure and admitting patients on the same day of their cardiac surgery operation would enable hospitals to treat more patients, provided appropriate facilities are available for use on the day of admission. There has been a slow increase in day cases for PCI (71% of all elective procedures in 2022/23) but there is significant variation between hospitals in the use of this [Figure 4.10].

Figure 4.10: Percentage of PCI day cases compared with overall number of elective procedures in different hospitals (2022/23) [NAPCI data]



Day of surgery admissions for cardiac surgery has increased prior to 2020/21, but the necessary services (for example pre-admission clinics) needed to support this were compromised by the pandemic [Figure 4.11]. Some hospitals are now restoring these but others have yet to establish their day of surgery programme alongside action to ensure that patients remain safe in the period before their operation.

Figure 4.11: Percentage of day of surgery cases for elective cardiac surgery (2019/20 – 2022/23) [NAPCI data]



5. Surgical procedures for valve disease are declining relative to other options, though there is variation in practice

Valve replacement or repair surgery is performed to treat heart valves that do not open or close properly. This improves blood flow passing from the heart to the body using artificial valves or by repairing the existing ones.

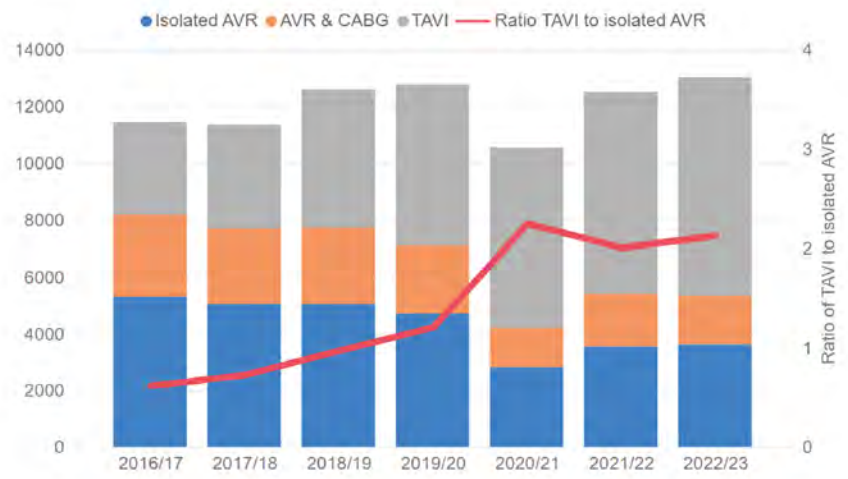
5.1 AVR procedures are 25% below pre-pandemic levels but, when combined with TAVI, more patients with aortic valve disease are being treated

For patients with aortic valve disease, surgical aortic valve replacement (AVR) can be done in isolation (i.e. separately to any other procedure) or in conjunction with CABG. The COVID-19 pandemic had a significant negative impact on the delivery on AVR surgery as well as on CABG procedures. The total number of AVR procedures fell slightly in 2022/23 and remained 25% down from 2019/20 [Figure 5.1].

An alternative to AVR is transcatheter aortic valve implantation (TAVI). This is a less invasive procedure, replacing a narrow heart valve without open-heart surgery by using a catheter to insert a new valve, and is considered appropriate for an increasing proportion of cases. TAVI cases have doubled since 2017/18 and in 2022/23, almost 7,700 TAVI procedures were carried out, twice the number of isolated AVR cases.

Overall, the total number of interventions for patients with narrowing of the aortic valve grew to its highest-ever level. Given that aortic stenosis occurs more in older age groups, the need for these treatments is likely to expand as the number of older patients increases. Importantly, both AVR and TAVI procedures achieve impressive outcomes for patients, with low mortality and complication rates. Complications following a TAVI procedure (for example, the need for a pacemaker or damage to the blood vessels where a catheter is inserted) have fallen considerably as the technique has been modified and technology improved.

Figure 5.1: Isolated AVR, AVR & CABG and TAVI procedures and the ratio of TAVI to isolated AVR procedures (2016/17 – 2022/23) [NACSA and UK TAVI Registry data]



5.2 TAVI is increasingly used for urgent aortic valve cases and offers a shorter length of stay for patients

When first introduced, TAVI was performed predominantly on elective patients. More urgent cases, with heart failure or symptoms of poor blood flow from the heart to the brain, were often treated temporarily with drugs or an aortic balloon valvuloplasty to widen the valve before being re-admitted later for an elective TAVI procedure.

Hospitals are now offering a more definitive TAVI treatment to these urgent patients, often performed during the initial admission [Figure 5.2]. This avoids a patient having to go on a waiting list for a future elective treatment. There is, though, considerable variation in the use of urgent TAVI procedures, with these accounting for half of all TAVI cases in some hospitals and not being performed at all in others [Figure 5.3].

Figure 5.2: TAVI procedures by urgency (2013/14 – 2022/23) [UK TAVI Registry data]

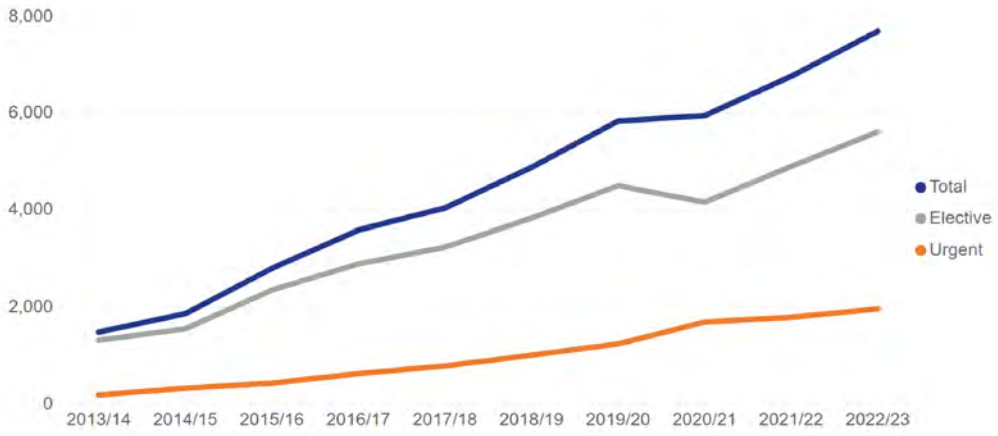
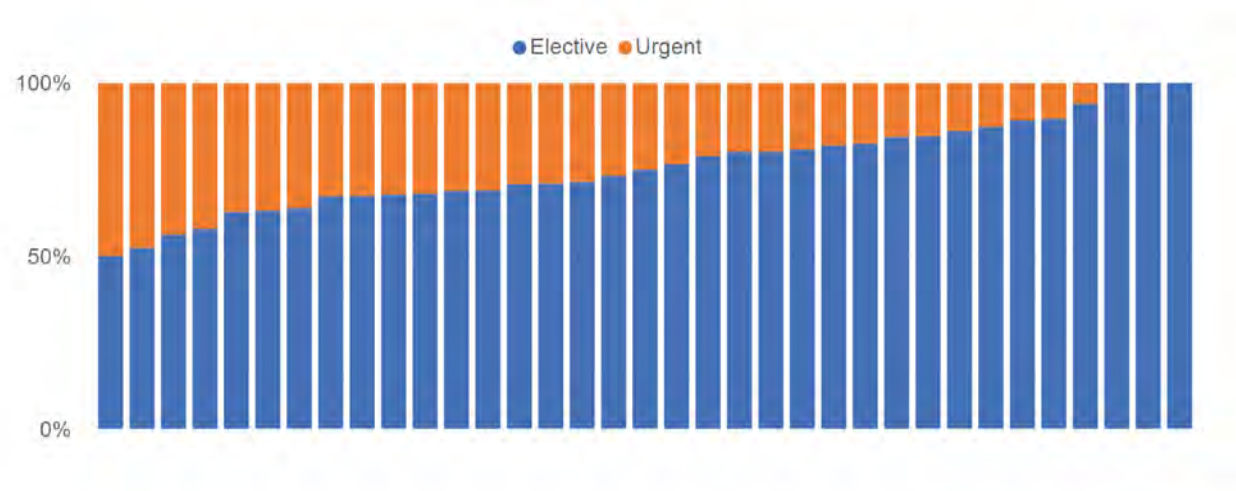


Figure 5.3: Percentage of urgent and elective TAVI procedures by hospital (2022/23) [UK TAVI Registry data]



The length of stay (LOS) for elective TAVI patients has fallen considerably in recent years. In 2022/23, the median LOS was three days, with some patients in hospital only having a one-night stay [Figure 5.4].

For urgent TAVI patients, the median time to discharge after their TAVI procedure is one day. Prior to the TAVI procedure there is a necessary preparation time in hospital which would not differ significantly for other treatment options [Figure 5.5].

Figure 5.4: Median length of stay (days) from admission to TAVI, TAVI to discharge and overall length of stay for elective TAVI cases (2013/14 – 2022/23) [UK TAVI Registry data]

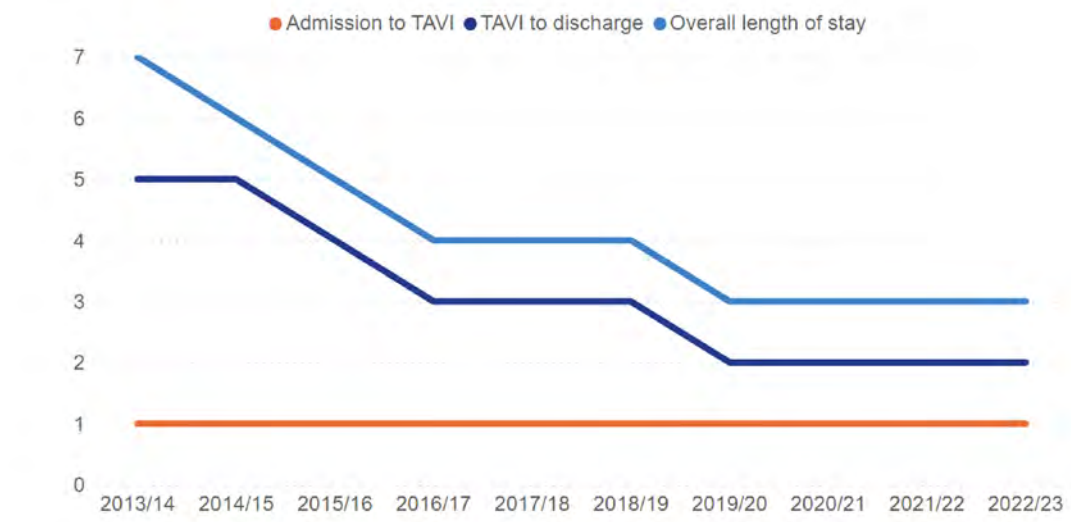
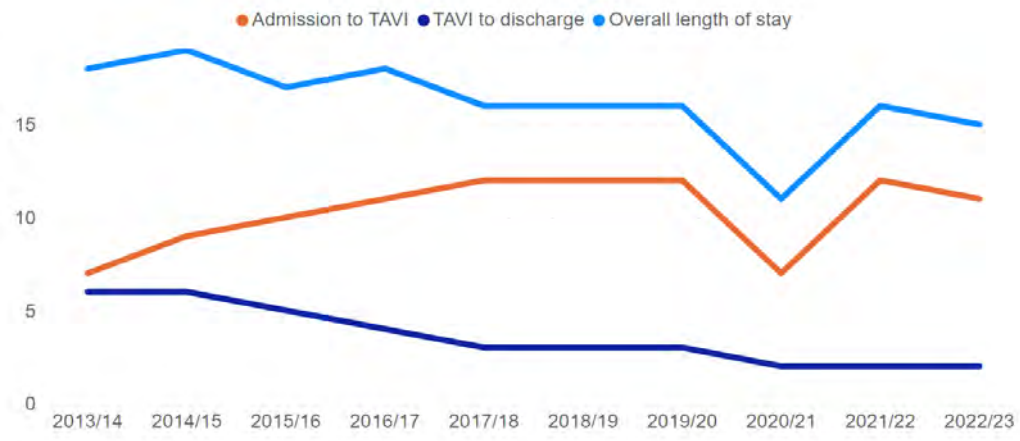


Figure 5.5: Median length of stay (days) from admission to TAVI, from TAVI to discharge and overall length of stay for urgent TAVI cases (2013/14 – 2022/23) [UK TAVI Registry data]



5.3 The rate of TAVI procedures varies substantially across the country suggesting some patients have poorer access to services

There is a five-fold difference in the number of TAVI procedures performed per million people across the different Cardiac Networks [Figure 5.6]. These differences are not likely to be fully explained by demographic and clinical differences in each population and suggest that clinical pathways and referral patterns lag behind others.

Figure 5.6: Number of TAVI procedures per million population based on patient home location, by cardiac network, 2022/23 [UK TAVI Registry data].

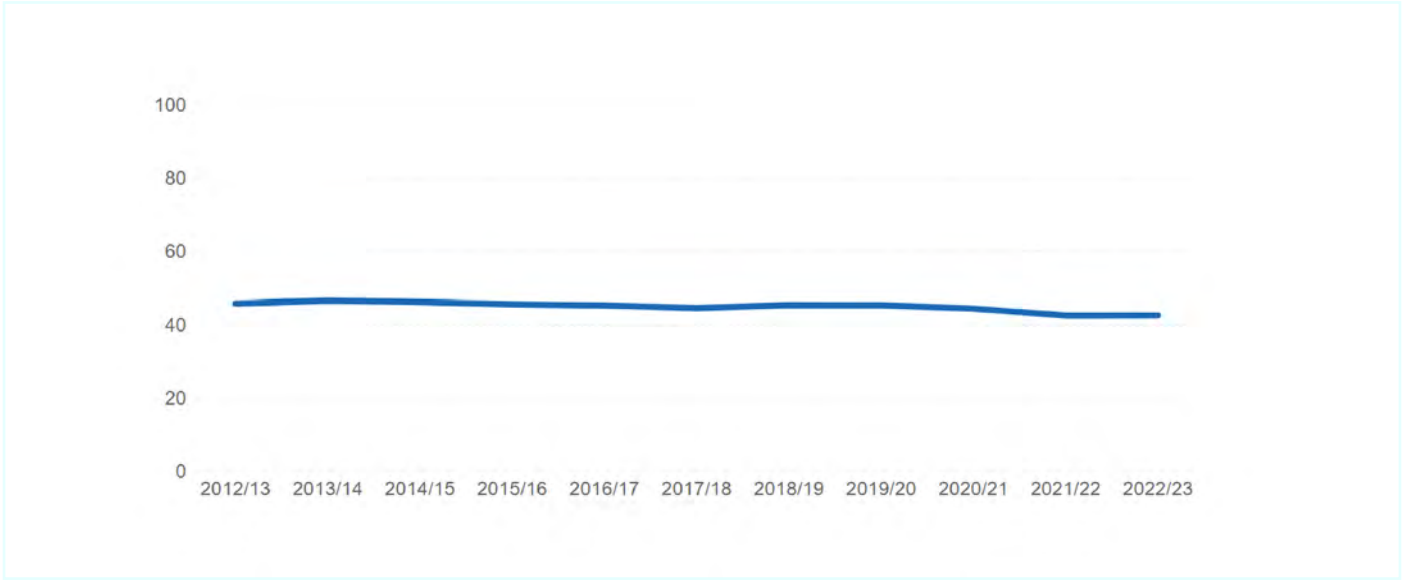
Darker areas represent a higher level of activity
Lightest colour = <40 per million population
Darkest colour = >200 per million population

5.4 Fewer females than might be expected are treated with TAVI

People aged over 75 are the most likely to need treatment for the restricted blood flow that results from narrowing of the aortic valve. Females represent 57% of this age group (Census 2021) but accounted for only 43% of TAVI procedures in 2022/23 [Figure 5.7].

Whether this represents under-provision of treatment for females or differences in the incidence, severity or presentation is unclear but further evaluation is certainly warranted.

Figure 5.7: Percentage of urgent and elective TAVI procedures by hospital (2022/23) [UK TAVI Registry data]



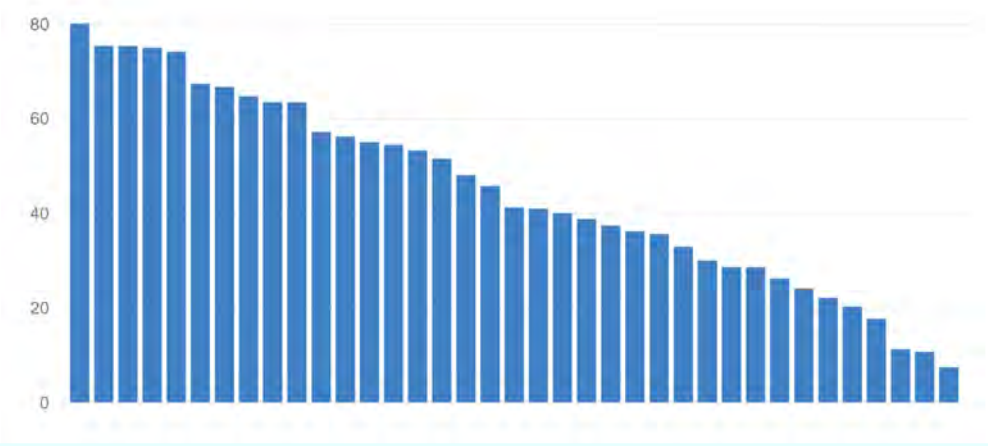
5.5 Younger patients requiring surgery for aortic valve disease are not receiving the type of valve recommended by guidelines

Surgical patients requiring a new heart valve may be given a metallic ('mechanical') valve or they might be treated with a tissue valve ('bioprosthesis'). Once implanted, tissue valves are more prone to gradual structural failure than mechanical valves. For patients who have been treated with a new aortic valve, this may result in the need for either repeat aortic valve replacement (AVR) surgery or transcatheter aortic valve implantation (TAVI).

On the other hand, while there is some evidence that mechanical valves can improve life expectancy for younger patients when compared to tissue valves, there is a need for lifelong anticoagulation meaning patients are more prone to bleeding-related complications.

Given these pros and cons, international guidelines recommend mechanical valves in younger patients (<50 years) and biological tissue valves in older patients (>70 years). In 2022/23, almost all AVR procedures in patients over 70 years old used tissue valves. However, 25% of AVR procedures in patients under 50 years old were performed using tissue valves, against the current guidance (accepting some small sub-groups where this might be appropriate). There is very considerable variation in adherence to the standard between hospitals [Figure 5.8].

Figure 5.8: Percentage of isolated AVR patients aged under 60 who receive a tissue valve, by hospital (2022/23) [NACSA data]

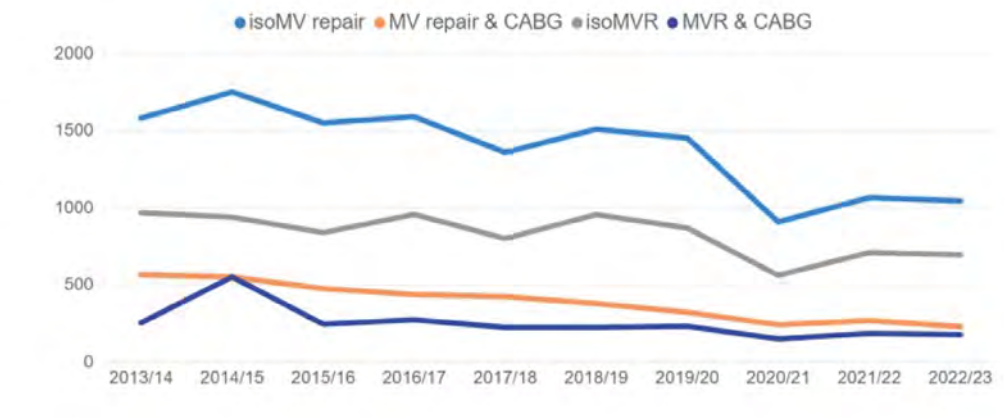


5.6 Fewer patients with mitral valve disease have received surgical treatment

Mitral valve (MV) procedures (both replacements and repairs and whether done in isolation or in conjunction with CABG), totalled just under 3,000 in 2022/23, 25% lower than in 2019/20 [Figure 5.9]. This reduction had been happening for some time but was certainly accelerated by the COVID-19 pandemic.

The reduction is not likely to be the result of new catheter-based interventions being used for mitral valve disease. The trend pre-dates these and the number of transcatheter procedures in the UK is currently very low. Moreover, these techniques are largely intended for patients who are not suitable for surgery and so they should not impact on surgical procedure numbers (more detail on these can be found in the TMTV report).

Figure 5.9: Mitral valve surgical procedures (2013/14 – 2022/23) [NACSA data]



isoMV = isolated mitral valve
MV = mitral valve
CABG = coronary artery bypass graft
isoMVR = isolated mitral valve replacement

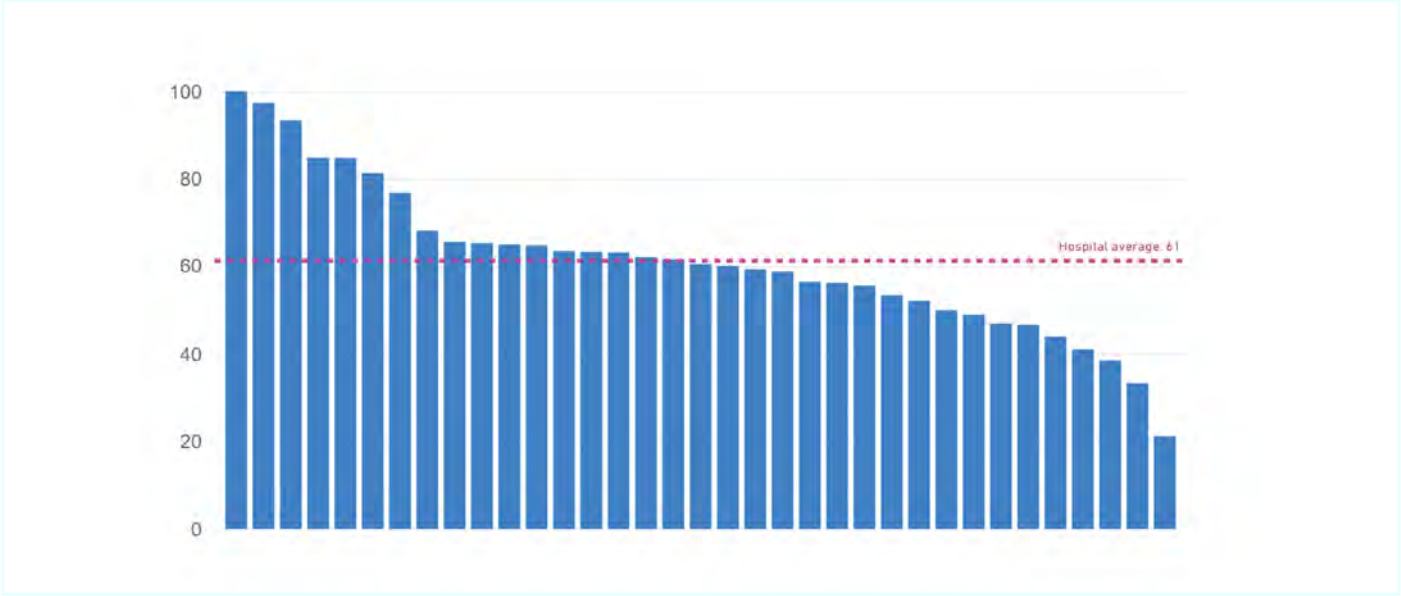
It is possible that the number of surgical cases over the last decade included dealing with patients who had not previously been treated for many years. If that is the case, the volume of cases in more recent years is probably a reflection of newly presenting patients.

5.7 Mitral valve repairs are performed less often than expected

The proportion of MV repairs relative to replacements has also fallen, which is surprising given that many patients with degenerative mitral valve disease are deemed eligible for a repair as opposed to a replacement.

It is recommended that the majority of patients whose degenerative MV disease results in a leaky valve (as opposed to a narrowed valve) are considered for a repair of the valve rather than a replacement. Over the last few years, the proportion of those with an isolated MV procedure who undergo a repair has fallen. Again, there is considerable variation between hospitals in the rate at which repairs are undertaken relative to replacements [Figure 5.10].

Figure 5.10: Percentage of isolated MV surgery patients who have a repair, by hospital (2022/23) [NACSA data]



6. Surgical activity for patients with congenital heart disease is also on a downward trend while interventional procedures are rising

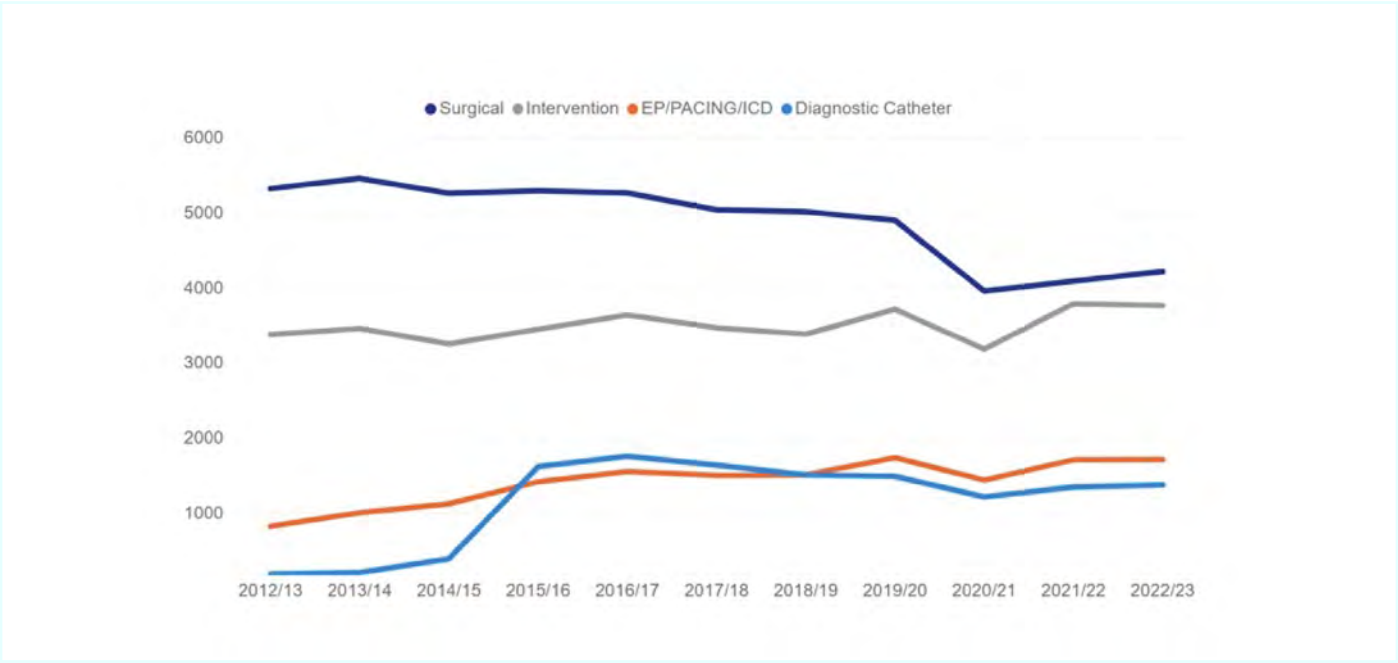
A similar pattern of declining surgical cases and an increased use of interventional procedures can be seen for patients with congenital heart disease. In 2022/23, surgical procedures were around 20% lower than in 2019/20 while interventional procedures are up on pre-pandemic levels [Figure 6.1].

The decline in surgical activity is particularly evident in the paediatric population, where only the children group has not seen overall procedure volumes return to the level they were in 2019/20 [Figure 6.2].

As well as the growing use of catheter-based interventions, the decline in surgical numbers may result from clinicians choosing to use corrective surgery earlier for a patient rather than doing this later following one or more initial procedures that are largely intended to stabilise the child's condition.

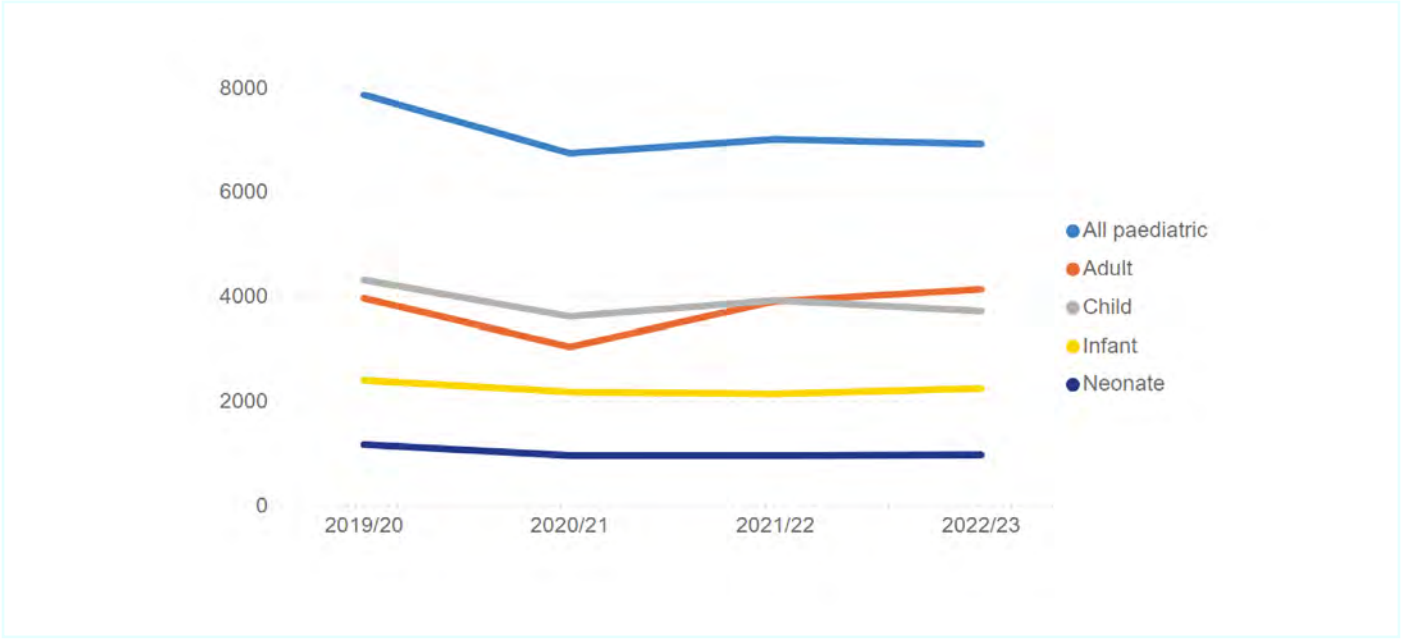
However, this can account for only some of the shift and it is likely that COVID-19 has had a negative impact on the infrastructure required for a successful surgical programme (especially access to protected beds, sufficient intensive care unit nurses and availability of anaesthetic support teams). These factors are now being addressed but any correction in surgical numbers will take time.

Figure 6.1: Cardiac procedures by category for patients with congenital heart disease, 2012/13 – 2022/23 [NCHDA data]



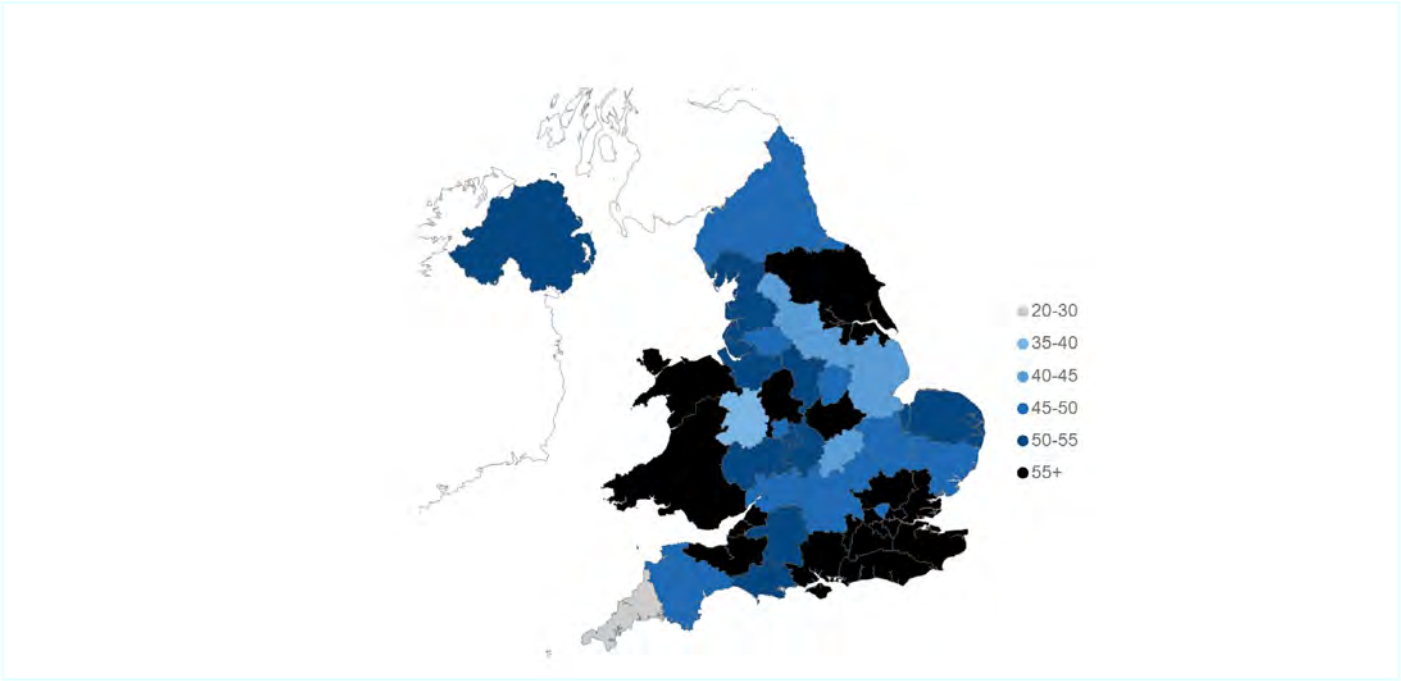
EP = electrophysiological procedures (e.g. ablations)
ICD = implantable cardioverter defibrillator
PACING = pacemaker

Figure 6.2: Procedures for congenital heart disease, by age group (2019/20 – 2022/23) [NCHDA data]



For those infants requiring a procedure in the first year of life, prenatal diagnosis rates have steadily improved over time although seem to have plateaued recently. However, the rate of prenatal diagnosis varies threefold across Integrated Care Boards (ICBs) in England and University Health Boards (HBs) in Wales (note that these are not the 'true' prenatal diagnostic rates for all congenital heart disease abnormalities because not all patients require or survive to undergo a procedure) [Figure 6.3].

Figure 6.3: Percentage of CHD in the first year of life for infants that had a prenatal diagnosis (2020/2023) [NCHDA data]



7. Providing angiography for lower-risk NSTEMI heart attack patients is taking longer and females are less likely to get this

Most patients with lower-risk NSTEMI heart attacks should have their blood vessels investigated by coronary angiography (which uses dyes and X-rays). Guidelines recommend that this is done within 72 hours of admission to hospital (and within 24 hours for patients with more serious symptoms).

For patients who are admitted to a hospital with no or limited hours angiography and PCI facilities, the challenge of meeting the target times can be overcome by ambulance services taking the patient to a designated heart attack centre, and by local arrangements for rapid inter-hospital transfers where necessary. The designated hospitals should ensure they have beds and catheter laboratory slots available for these priority patients.

7.1 The proportion of patients undergoing coronary angiography within 72 hours of admission to hospital is falling

During the COVID-19 pandemic, when there was a reduction in elective care programmes, more catheter laboratory time was available to investigate the smaller number of patients who presented with NSTEMI heart attacks. Since then, it has once again been difficult to investigate these patients within target times [Figure 7.1]. In 2022/23, there were also very substantial differences between hospitals in meeting the 72-hour angiography targets [Figure 7.2].

Figure 7.1: Percentage of lower-risk NSTEMI heart attack patients investigated by coronary angiography prior to discharge or within 72 hours (2013/14 – 2022/23) [MINAP data]

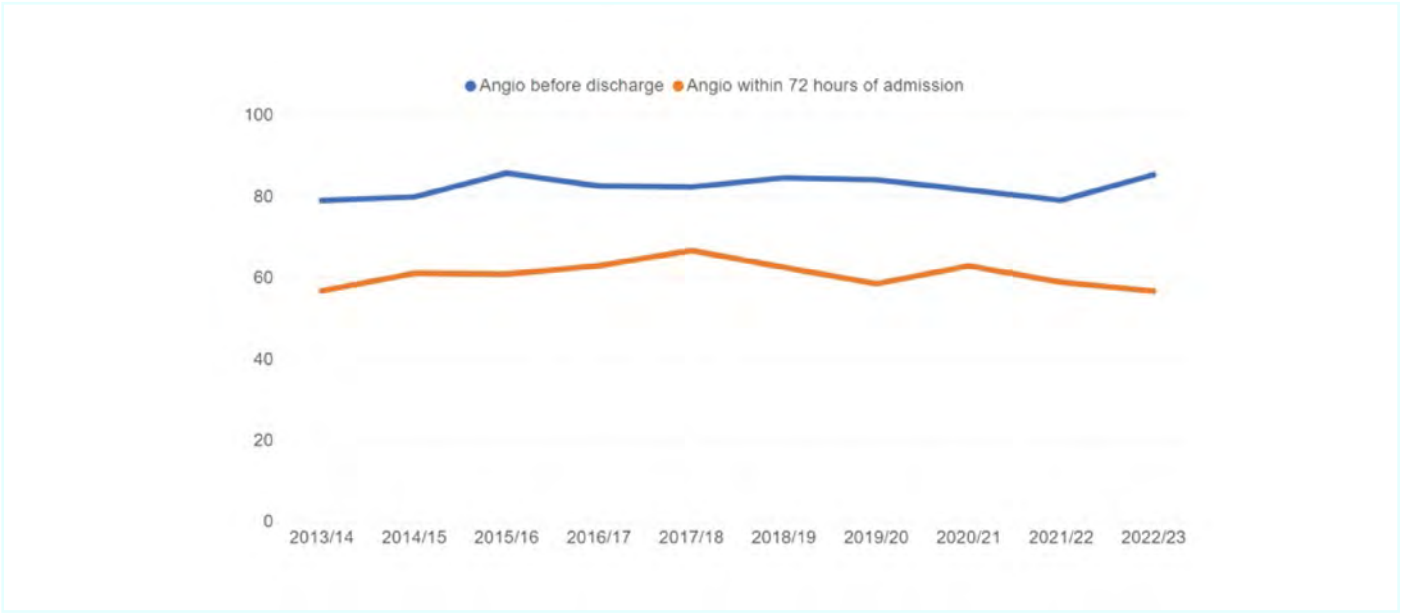
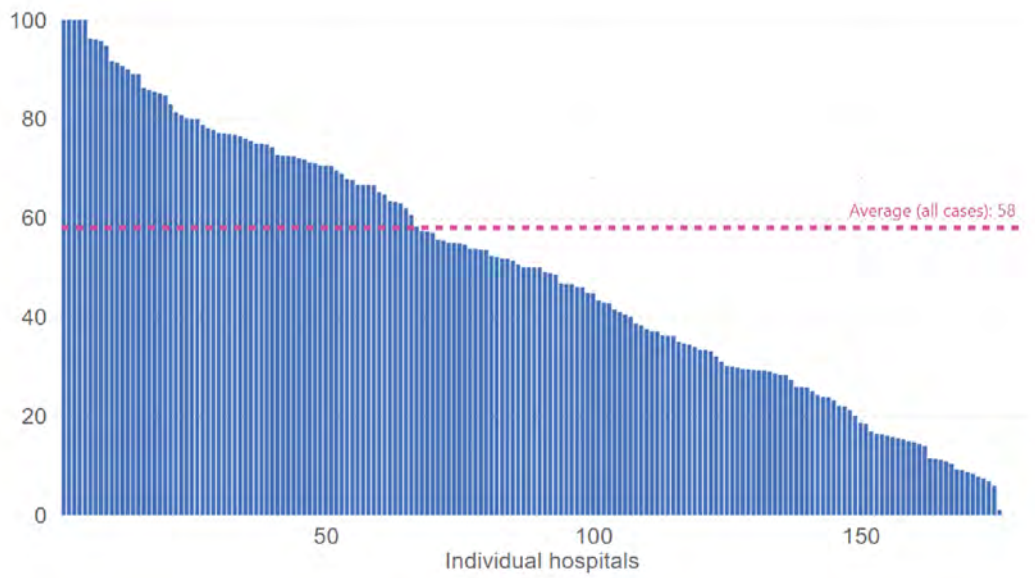


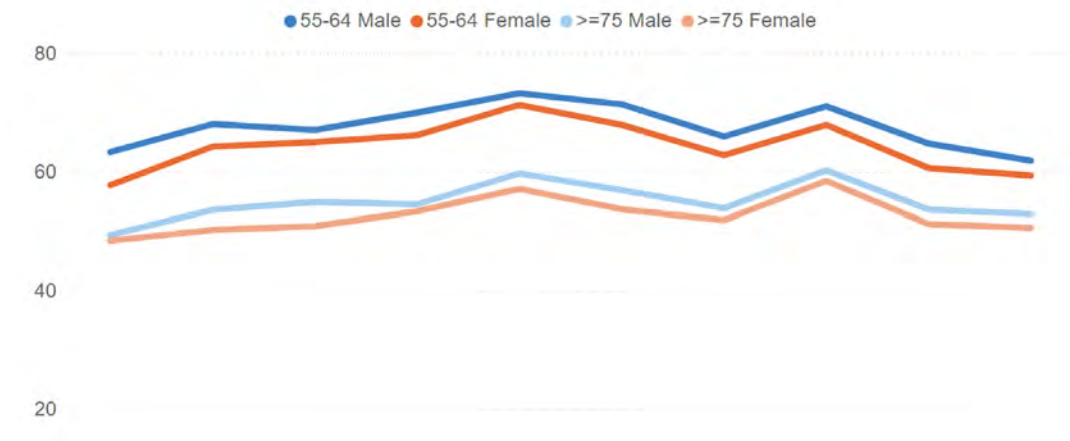
Figure 7.2: Percentage of lower-risk NSTEMI heart attack patients investigated by coronary angiography within 72 hours of admission, by hospital (2022/23) [MINAP data]



7.2 Fewer females with a lower-risk NSTEMI heart attack undergo timely investigation with coronary angiography

Fewer females than males are investigated early by coronary angiography after being admitted to hospital with lower-risk NSTEMI heart attacks, although the differences between the sexes are small. For those aged ≥75 years, 52.9% of males and 50.6% of females were investigated within 72 hours; for those aged 55-64 years, 61.9% of males and 59.4% of females were investigated within the target time. As with higher-risk STEMI heart attack cases, this may result from uncertainty amongst clinicians about what is causing the symptoms and delays in making the correct diagnosis [Figure 7.3].

Figure 7.3: Percentage of lower-risk NSTEMI heart attack patients investigated by coronary angiography within 72 hours of admission, by sex (2013/14 – 2022/23) [MINAP data]



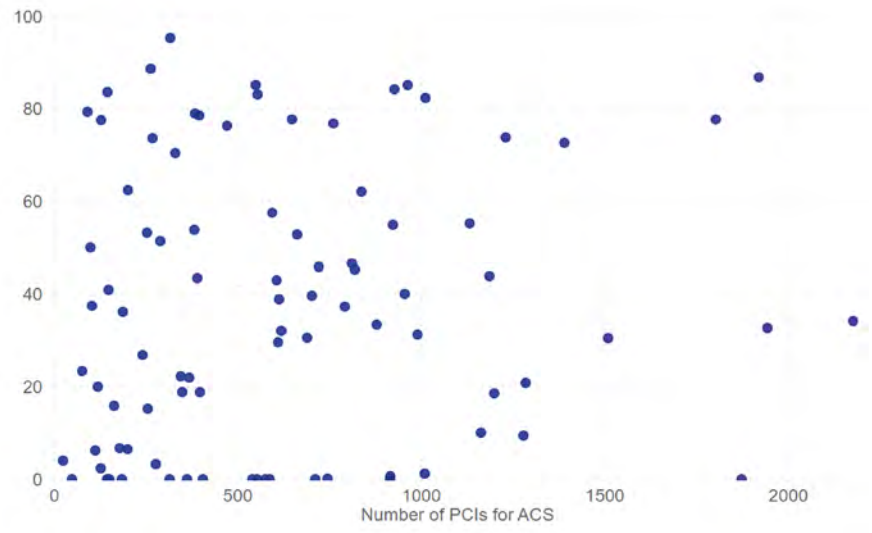
8. There is considerable variation in the use of newer drug therapies and intracoronary imaging across PCI services

After patients have received a stent from a PCI procedure, they receive two drugs ('dual anti-platelet therapy') to prevent blood clots and reduce the risk of heart attack and stroke. Typically, this comprises aspirin and one of a class of drugs referred to as P2Y12 inhibitors. While clopidogrel was initially used as the P2Y12 inhibitor, trials have shown that outcomes are better using newer drugs called prasugrel and ticagrelor.

In 2022/23, far fewer patients than expected received these medications, with very considerable variation between hospitals [Figure 8.1]. Hospitals could easily change their care protocols to address this issue or should otherwise explain their decision to continue using clopidogrel.

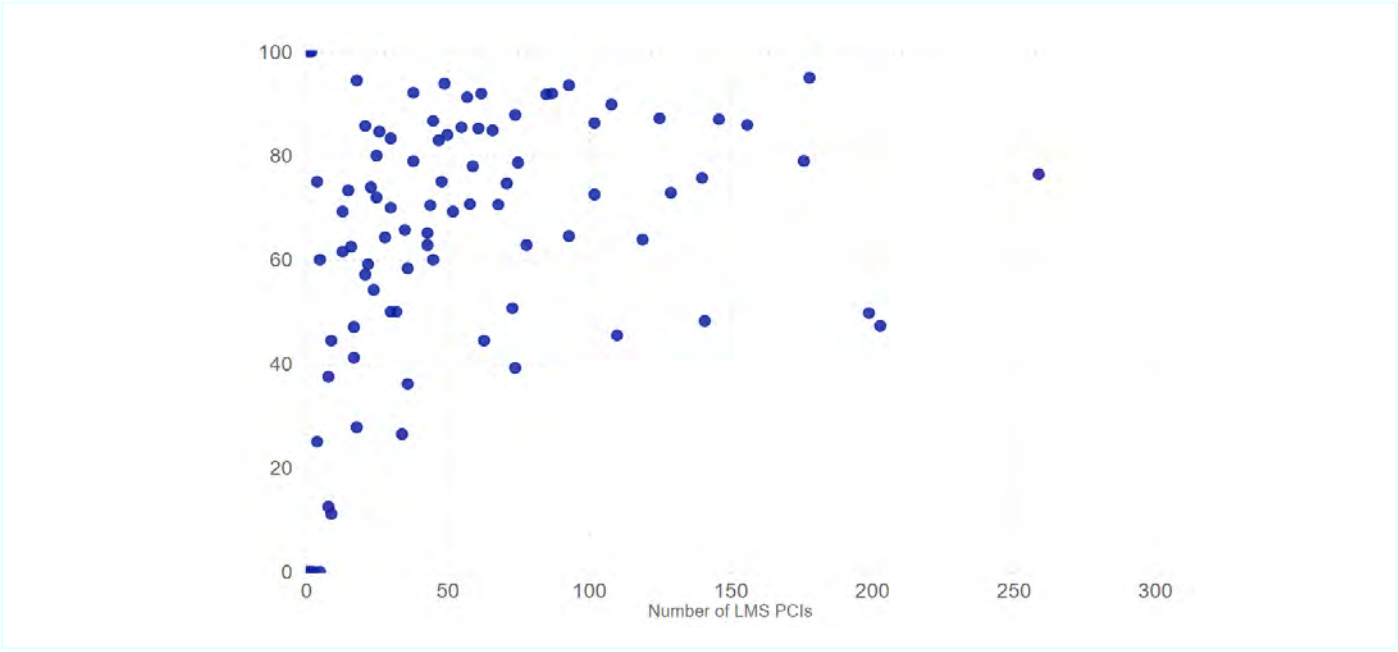
Trials have also shown better outcomes for patients when the results of a complex PCI are checked using intracoronary imaging (especially with procedures performed on the left main stem artery of the heart). While overall this is increasing, there is still very considerable variation in the rate for each hospital, with many hospitals using this imaging in over 80% of procedures while others are well below half [Figure 8.2].

Figure 8.1: Percentage use of either prasugrel or ticagrelor after PCI for ACS, by hospital (2022/23) [NAPCI data]



PCI = percutaneous coronary intervention
ACS = acute coronary syndrome

Figure 8.2: Percentage use of intracoronary imaging for left main stem PCI procedures, by hospital (2022/23) [NAPCI data]



PCI = percutaneous coronary intervention
ACS = acute coronary syndrome

9. Arrhythmia treatment increasingly involves more complex options though concerning variations exist across all procedures

Patients with arrhythmia (irregular heartbeats that can be too fast, too slow, or erratic) can be investigated with implantable heart monitors or treated with either:

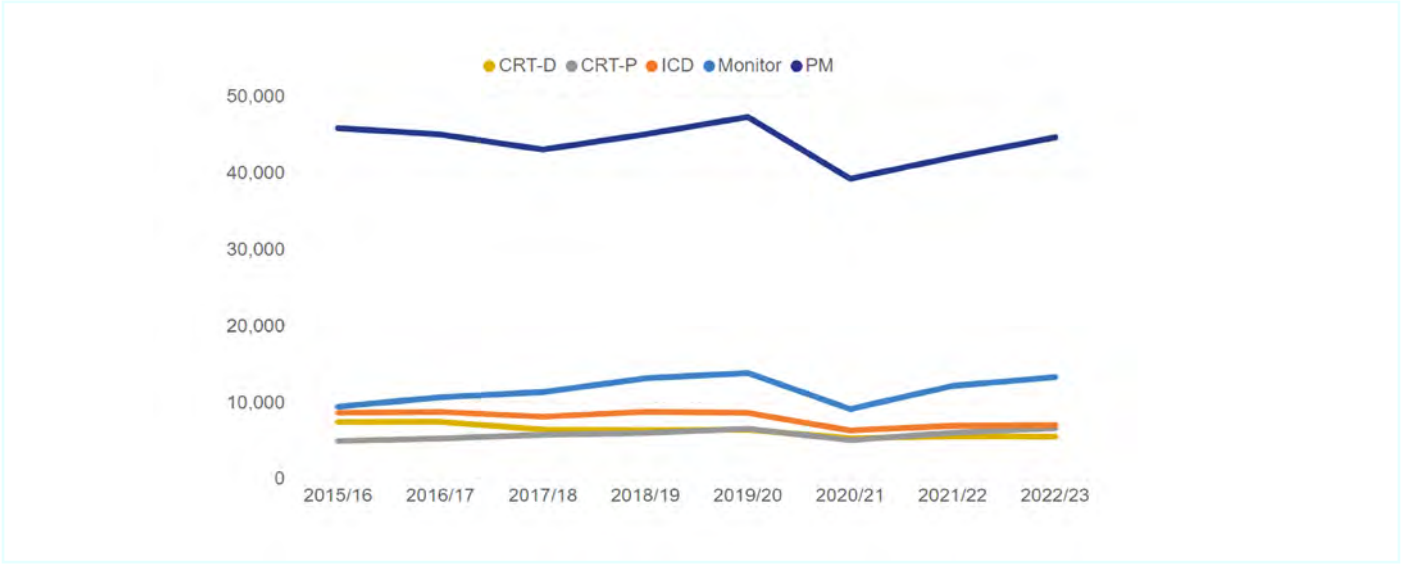
- cardiac implantable electronic devices (CIEDs) such as pacemakers and defibrillators
- ablation procedures to restore normal heart rhythms by destroying the abnormal tissue causing irregular heartbeats.

9.1 There is a gradual shift to more resynchronisation pacemakers and fewer ICDs as well as a greater use of implantable heart monitors

There has been a gradual increase in the use of implantable loop recorders that are used for diagnostic and monitoring purposes [Figure 9.1].

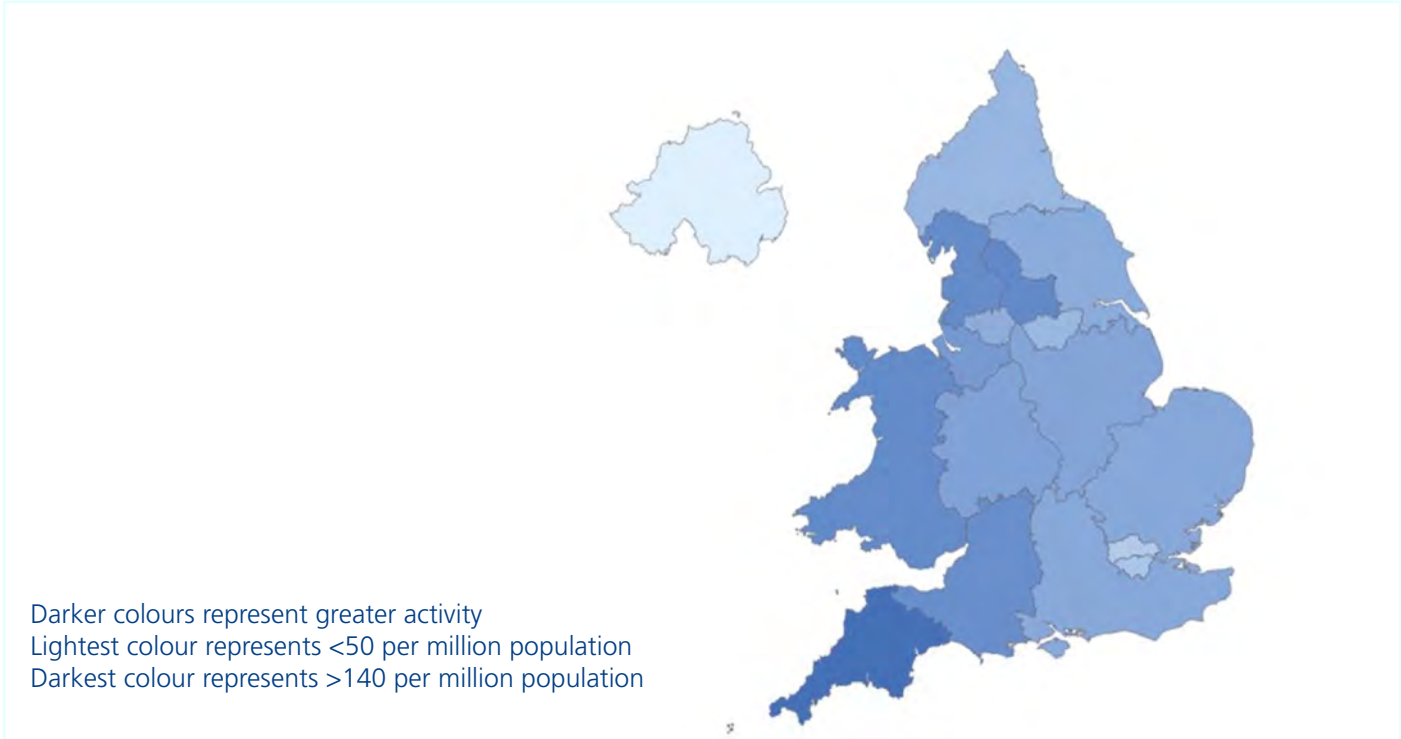
There has also been a growth in the use of cardiac resynchronisation therapy pacemakers (CRT-P) which are given to patients when their heart is not able to pump blood effectively. However, there is up to a three-fold difference in the use of these devices across Cardiac Networks [Figure 9.2]. These differences are not likely to be explained by large variations in the numbers of patients with heart failure and suggest sub-optimal identification and referral rates in some networks.

Figure 9.1: Cardiac rhythm device implants (2015/16 – 2022/23) [NACRM data]



CRT-D = cardiac resynchronisation therapy defibrillator
CRT-P = cardiac resynchronisation therapy pacemaker
ICD = implantable cardioverter defibrillator
Monitor = implantable loop recorder
PM = pacemaker procedure

Figure 9.2: CRT-P procedures per million population based on the location of the hospital undertaking the procedure, by Cardiac Network (2022/23) [NACRM data]



Darker colours represent greater activity
Lightest colour represents <50 per million population
Darkest colour represents >140 per million population

9.2 There is a trend towards more complex ablations

The number of 'simple' ablations in 2022/23 was much lower than in 2019/20 prior to the COVID-19 pandemic [Figure 9.3]. This may be because, prior to the pandemic, these were being used for large numbers of patients in the population who had previously been untreated when the procedures were not available. It may be that the new level of activity is now more representative of new cases eligible for this treatment. In contrast, more complex ablations are increasing, especially atrial ablations which are used mainly for patients with atrial fibrillation (AF).

There is, however, a five-fold difference in the rate of complex atrial ablation cases between Cardiac Networks. Similar variations can also be seen amongst Integrated Care Boards (ICBs) in England and University Health Boards (HBs) in Wales. This variation is unlikely to be explained by differences in requirement for treatment and suggests considerable work is needed to ensure appropriate patients are identified and referred [Figure 9.4].

Figure 9.3: Ablation procedures by category (2014/15 – 2022/23) [NACRM data]

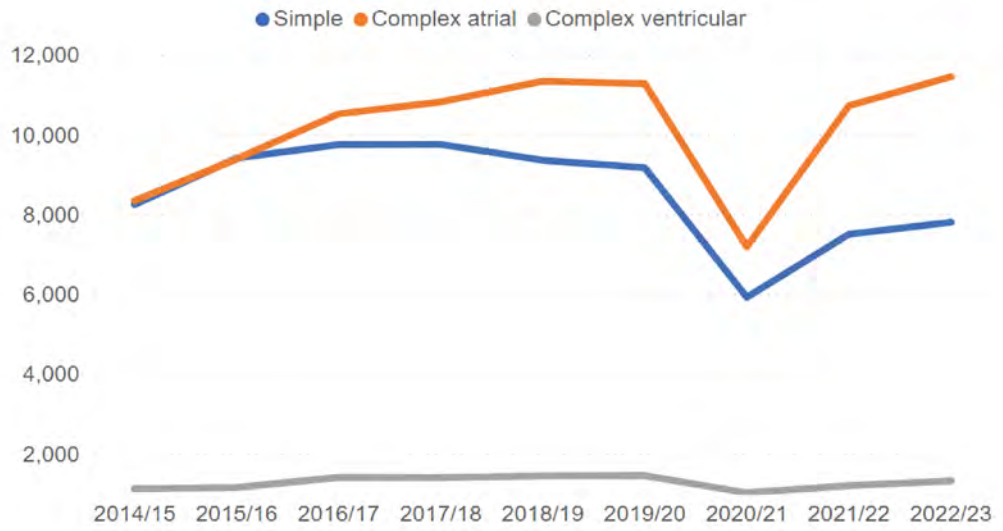
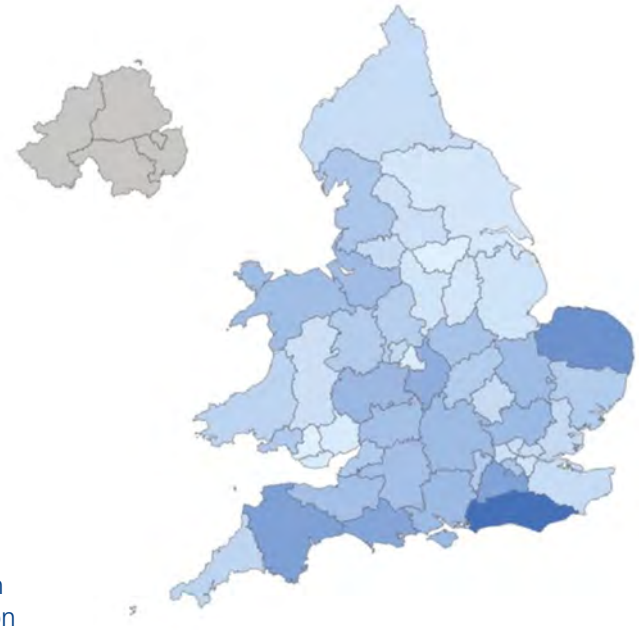


Figure 9.4: Complex atrial ablations per million population based on patient home location, by ICB/HB, 2022/23 [NACRM data]

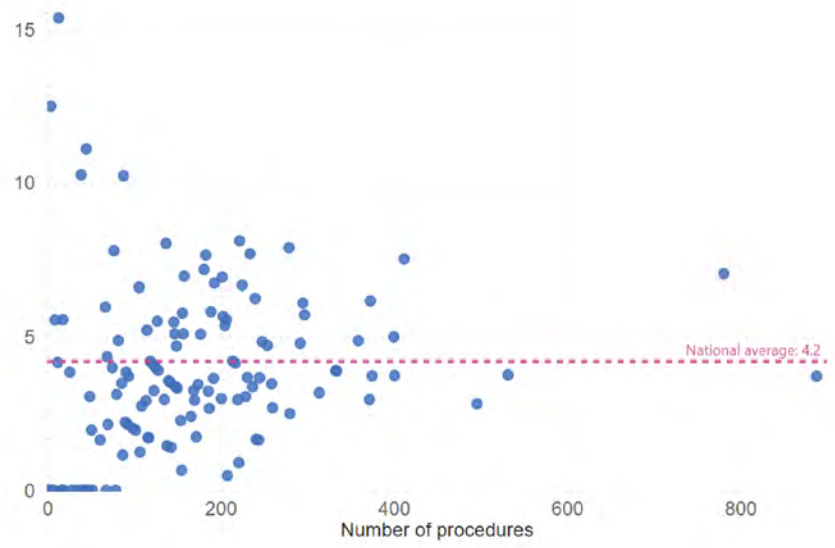


Darker colours represent greater activity
Lightest colour represents <75 per million population
Darkest colour represents >400 per million population

9.3 Some hospitals have high re-intervention rates in the first year after implantation of pacemaker devices

After a pacemaker implantation, a second procedure is occasionally needed because of displacement of an electrode or other complications (e.g. bruises or blood clots under the skin or, less frequently, infections). The rate of first year re-interventions in some hospitals is much higher than in others [Figure 9.5].

Figure 9.5: Percentage of pacemaker implantation procedures requiring re-intervention within one year, by hospital (2022/23) [NACRM data]



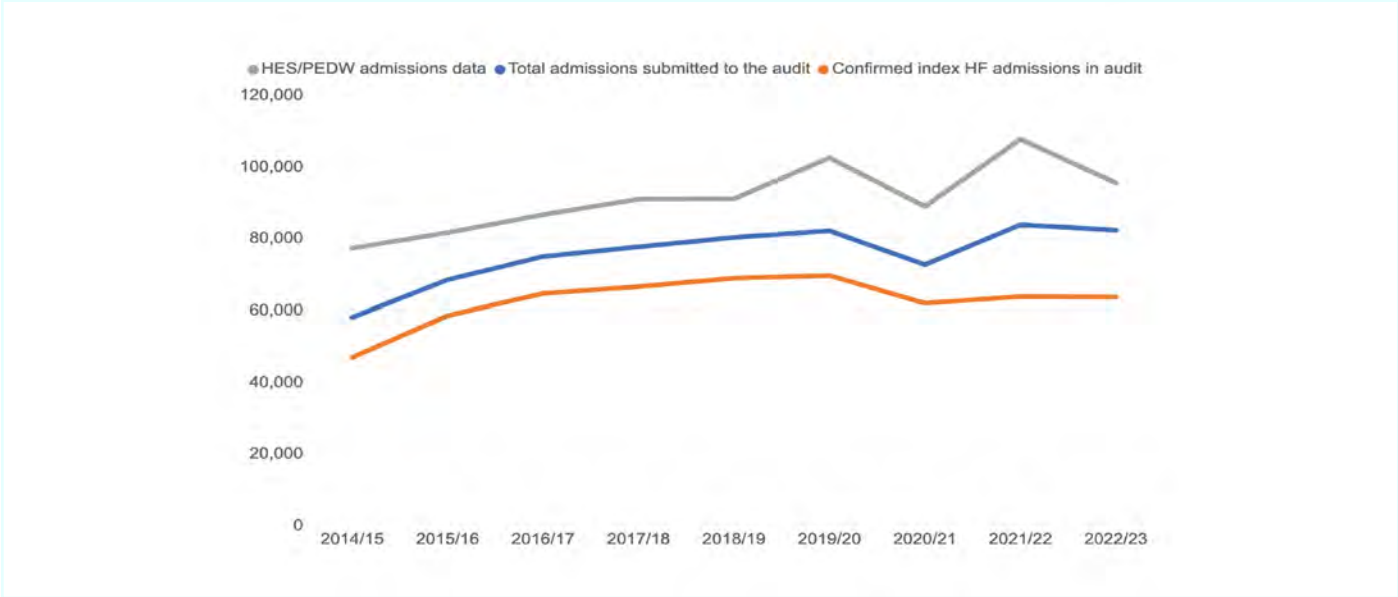
10.The rise in heart failure hospital admissions appears to be slowing and the use of disease-modifying drug treatments is improving

10.1 Heart failure cases did not increase in 2022/23, though there is significant variation in heart failure admission rates across different parts of England and Wales

The rapid rise in the number of patients admitted to hospital with heart failure (HF) since 2014/15 appears to be flattening out. In 2022/23, the number of primary (or index) HF admissions confirmed by the National Heart Failure Audit (NHFA) was very similar to the previous year [Figure 10.1]. The number of total submissions to the audit (including cases that were not subsequently confirmed as acute heart failure admissions) actually dropped slightly. A much bigger fall can be seen in the continually-collected hospital record data collected through the Hospital Episode Statistics (HES) system in England and the Patient Episode Database (PEDW) in Wales. This could partly be the result of more reliable HES/PEDW coding within hospitals.

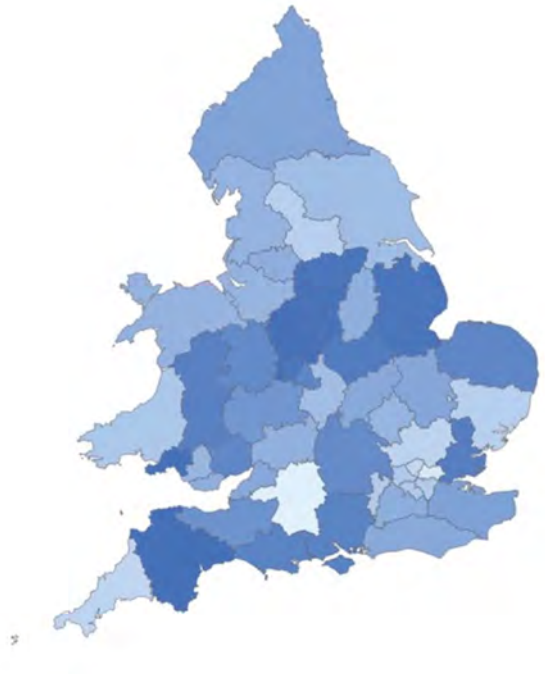
There is also considerable variation in the rates of admission for HF across different ICBs and HBs in England and Wales [Figure 10.2].

Figure 10.1: Number of heart failure cases in England and Wales according to NHFA submissions/confirmed cases and HES/PEDW data, 2014/15 - 2022/23 [NHFA data]



HES = Hospital Episode Statistics (NHS England data) PEDW = Patient Episode Database for Wales (NHS Wales data)
Confirmed index HF admissions = either the only acute HF admission for a patient, or the first HF admission when more than one was submitted in the audit year

Figure 10.2: Rates of heart failure admissions per 100,000 population by Integrated Care Boards (England) and University Health Boards (Wales), 2022/23 [NHFA data]



Darker colours represent higher admission rates
Lightest colour represents <40 per 100,000 population
Darkest colour = >140 per 100,000 population

10.2 Fewer patients were cared for on a cardiology ward but more were seen by specialist heart failure outreach teams

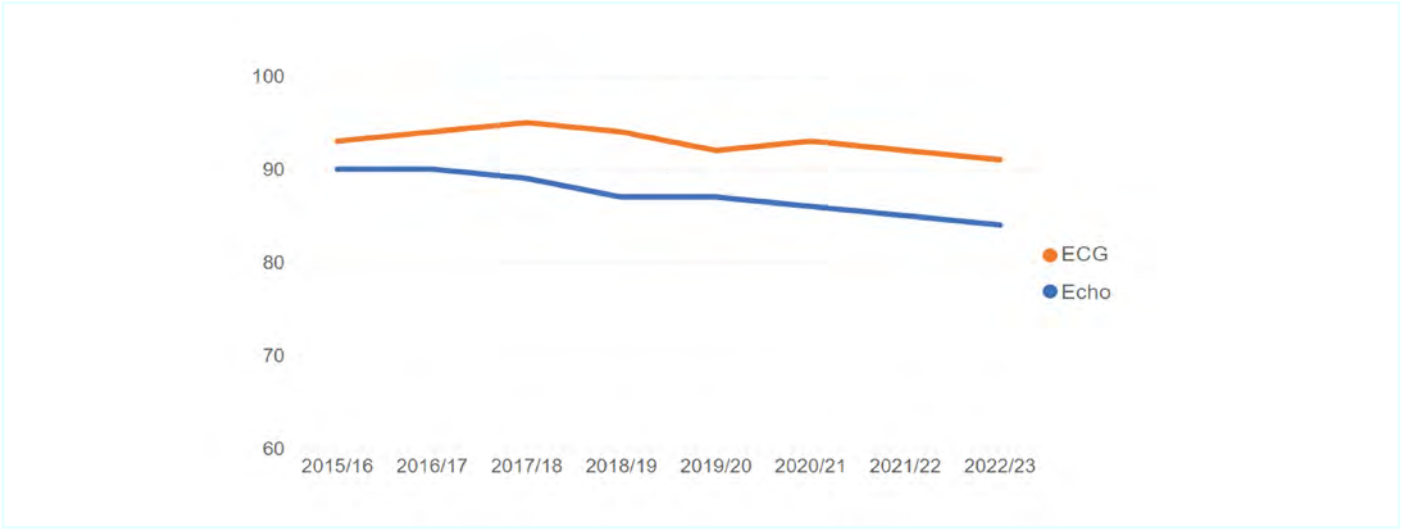
Patients who are managed on a cardiology ward, or who have been seen by a specialist HF team, are more likely to be investigated and are more likely to receive appropriate disease-modifying therapy. The proportion of patients managed on a cardiology ward fell to 40% in 2022/23 (down from 49% in 2015/16) with HF patients increasingly cared for on general medical and care of the elderly wards.

However, although fewer patients were seen by a consultant cardiologist there has been a rise in the proportion of patients (wherever cared for) who were seen by a specialist HF team (up to 82%), highlighting the importance of outreach teams.

10.3 Fewer heart failure patients were investigated with an electrocardiogram (ECG) or echocardiogram

Assessing HF patients with the use of an electrocardiogram (ECG) or echocardiogram is an important step in determining the cause of the heart failure and determining the best drug treatment. In 2022/23, the percentage of HF patients being investigated with either ECG or echocardiogram dropped, continuing a slow decline that started in 2017/18. [Figure 10.3]. As with all the performance metrics, there is considerable variation between hospitals in the use of ECG and echocardiogram.

Figure 10.3: Proportion of patients with heart failure investigated by an electrocardiogram or echocardiography, 2015/16 - 2022/23 [NHFA data]

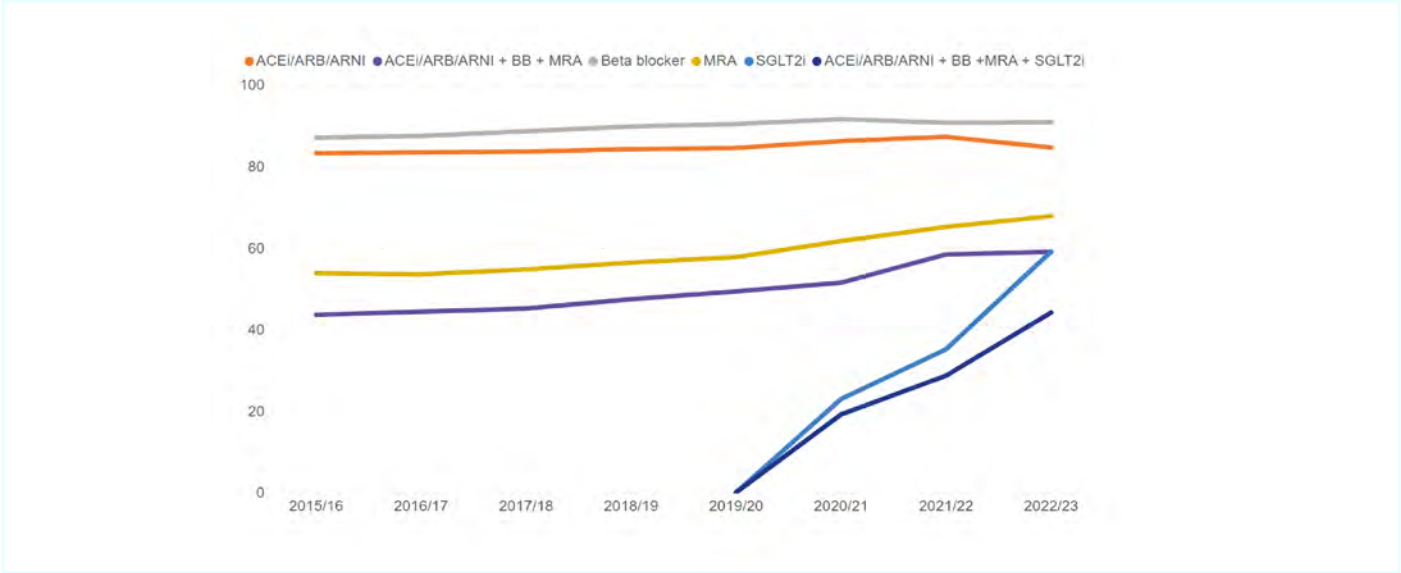


ECG = electrocardiogram
Echo = echocardiography

10.4 The prescribing of disease-modifying drugs for heart failure patients is improving

The audit tracks the prescribing of various types of drugs that have been shown to improve the health outcomes and quality of life for HF patients. This includes, since 2019/20, data on the number of patients treated by the sodium glucose co-transporter 2 inhibitor (SGLT2i) drugs dapagliflozin or empagliflozin. In 2022/23, these were prescribed to 59% of patients with heart failure with reduced ejection fraction (HFrEF) [Figure 10.4].

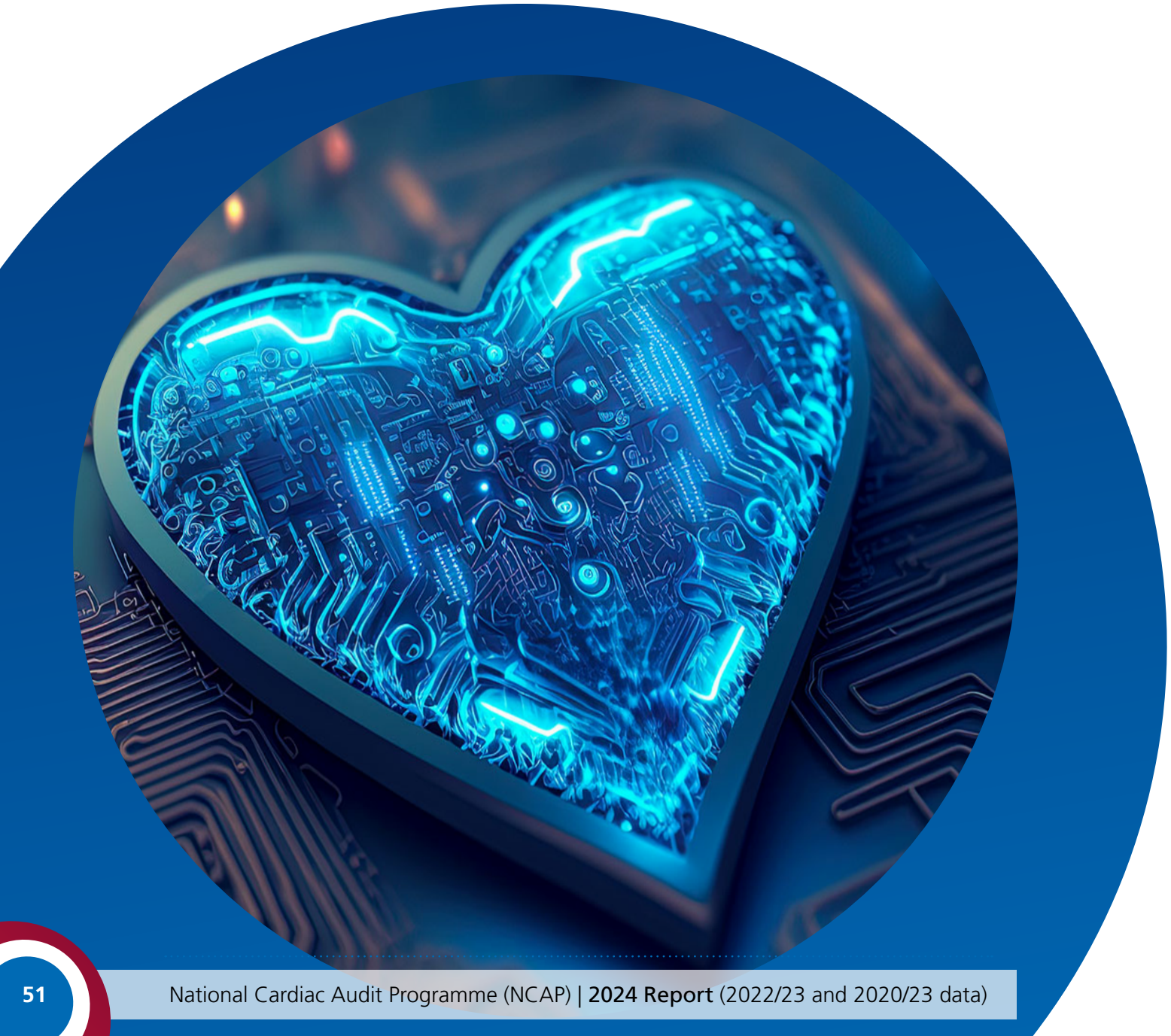
Figure 10.4: Proportion of patients with heart failure with reduced ejection fraction (HFrEF) prescribed prognosis-improving drugs or their combinations [NHFA data]



BB = beta blocker
ARB = angiotensin receptor blocker
MRA = mineralocorticoid receptor antagonist
ACEi = angiotensin-converting enzyme inhibitor
ARNI = angiotensin receptor/neprilysin inhibitor
SGLT2i = sodium glucose co-transporter 2 inhibitor (dapagliflozin or empagliflozin)

10.5 Very few heart failure patients are referred to cardiac rehabilitation prior to discharge

It is recommended that HF patients are referred to a cardiac rehabilitation team prior to discharge. Even for those admitted to a cardiology ward, only 15% are recorded as being referred to rehabilitation in 2022/23 (and just 5.5% from a general medical ward). These low rates might be explained by a higher rate of referral following discharge. This is an area of concern and additional work is being performed in collaboration with the National Audit of Cardiac Rehabilitation (NACR) to investigate this in more detail.



11. The power of the National Cardiac Audit Programme to drive quality improvement is enhanced by complete and accurate data

The power of the National Cardiac Audit Programme (NCAP) to drive quality improvement in the design and delivery of cardiovascular services is directly linked to the completeness and accuracy of the data across the range of performance standards, clinical factors and other metrics that hospitals are required to provide submissions on.

Data quality tends to be significantly better for both the audits and the metrics that have been in place for some years. Rates of data completeness and accuracy are often lower for newer registries and more recently introduced metrics. Although local clinical and audit teams may understandably concentrate on the data for those longer-standing metrics which are widely published or better-known to patients and peers, it is nonetheless important to place equal emphasis in providing all requested data.

The following table highlights some examples where more complete and accurate data would make a substantial contribution to NCAP's role in underpinning quality improvement through the best possible evidence on current clinical practice and its outcomes for patients.

Area and audit/registry name	Focus for data submission
Congenital heart disease (NCHDA)	Reducing variation in data quality between hospitals (although generally good overall) Adhering to the more precise definitions of complications following procedures (to support benchmarking between hospitals)
Adult cardiac surgery (NACSA)	Resolving deficiencies in ethnicity and similar patient variables Providing data on complications following surgery
Transcatheter aortic valve implantation (UK TAVI registry)	Reducing variance for several key variables, especially for ethnicity, post-implantation valve indices and date of discharge

Area and audit/registry name	Focus for data submission
Percutaneous coronary intervention (NAPCI)	Reconciling the lower numbers for the proportion of patients treated using drug-eluting balloons with responses to separate hospital surveys Increasing data completeness on ethnicity and similar variables
Transcatheter mitral and tricuspid valve (TMTV registry) procedures	Requiring all commissioned hospitals to contribute data and ensuring all who contribute provide complete information on all procedures
Heart attacks (MINAP)	Improving reporting on the use of secondary prevention drug therapies and certain other metrics
Heart failure (NHFA)	Improving reporting of all drug therapies prescribed to the patient on hospital discharge

The timeliness of data submission is also critical. NICOR is aiming to increase the frequency of NCAP outputs by providing quarterly updates of analyses. These will only be meaningful if hospital data are uploaded as soon as possible after a procedure. NHS England has recently underlined the importance of timeliness of data by including this in its commissioning arrangements with hospitals. Being aware of adverse trends as they occur enables hospitals, cardiac networks and commissioners to take corrective action speedily rather than having to rely on annual reports.

12. Thanks and acknowledgements

The NCAP is grateful to all participating hospitals for the efforts they make to provide data on the care they deliver.

We are especially indebted to our patient group, now renamed the Community Representative Group chaired by Sarah Murray, and the patients and carers who work with the domain expert groups to help shape our programme. In particular, our thanks go to Richard Corder and Richard Mindham, who work with Sarah Murray on the Patient, Public and Carer reports. We are also grateful to other patients and carers who contribute through our Virtual Patient Panel.

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13. Appendix: Glossary

A glossary of relevant terminology, abbreviations and acronyms is available here.

National Institute of Cardiovascular Outcomes Research (NICOR)

NICOR is a partnership of clinicians, IT experts, statisticians, academics and managers who, together, are responsible for the National Cardiac Audit Programme (NCAP) and a number of new health technology registries, including the UK TAVI registry. Hosted by NHS Arden and Greater East Midlands CSU, NICOR collects, analyses and interprets vital cardiovascular data into relevant and meaningful information to promote sustainable improvements in patient well-being, safety and outcomes. It is commissioned by NHS England and GIG Cymru /NHS Wales.

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NHS Arden and GEM

NHS Arden & GEM is a Commissioning Support Unit (CSU) working across the health and care sector in England to provide a range of services including procurement and contracting, service transformation, business intelligence, business support and clinical support. Its ability to draw upon expertise from over 1000 staff, working in multidisciplinary teams, enables the CSU to help healthcare commissioners and providers navigate and implement the change needed to improve patient care and outcomes. Arden & GEM's clients include more than 70 customers including Integrated Care Boards, NHS England, Integrated Care Systems, Primary Care Networks, NHS provider trusts and local authorities.

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NHS England

NHS England leads the National Health Service (NHS) in England. NHS England provides national leadership for the NHS. Through the NHS Long Term Plan, we promote high quality health and care for all, and support NHS organisations to work in partnership to deliver better outcomes for our patients and communities, at the best possible value for taxpayers and to continuously improve the NHS. We are working to make the NHS an employer of excellence and to enable NHS patients to benefit from world-leading research, innovation and technology

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GIG Cymru (NHS Wales)

NHS Wales is the public funded National Health Service of Wales providing healthcare to some 3 million people who live in the country. The Welsh Government sets the Health Care strategy and NHS in Wales delivers that strategy and services via the seven Local Health Boards, three NHS Trusts and two Special Health Authorities. The NHS has a key principle which is that good healthcare should be available to all.

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NICOR

National Cardiac Audit Programme (NCAP)

2024 Summary Report

(2022/23 and 2020/23 data)