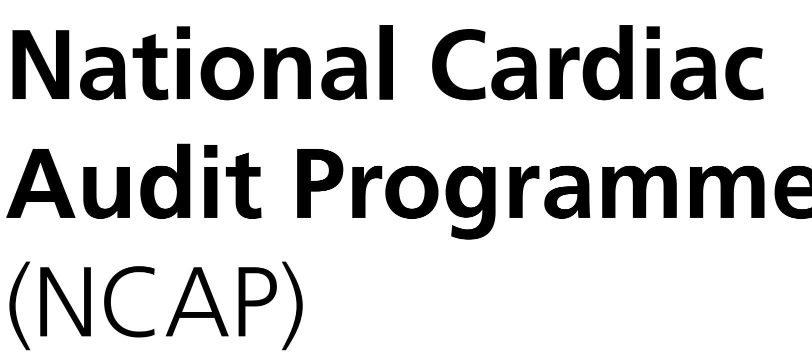
National Cardiac
Audit Programme



National Cardiac Audit Programme (NCAP)

2025 Report

(2023/24 and 2021/24 data)

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Report at a glance

(See page 6 for explanation of acronyms)

The National Cardiac Audit Programme (NCAP) consists of 11 different sub-specialties (or 'domains'). This report covers 10 of the 11 domains over 12 months from 1 April 2023 to 31 March 2024 or, where metrics cover a three-year period, from 2021/22 to 2023/24.

Blue headline figures = positive results **Red headline figures** = adverse results

Black headline figures = changes where interpretation is less clear

Shifts in demand and delivery of different treatments

Recorded heart attacks are down

↓8.3% Fewer confirmed heart attacks since 2017/18

↓10% Fewer higher-risk ST-elevation myocardial infarction (STEMI) heart attacks since 2017/18

Revascularisation procedures are reducing

↓7% Fewer percutaneous coronary intervention (PCI) cases compared with 2017/18 (driven by a 25% drop in elective procedures)

↓18% Fewer CABG procedures compared with 2017/18 (driven by a 34% fall in elective operations)

Heart failure admissions still below pre-pandemic levels

↓5.5% Fewer confirmed heart failure admissions compared with 2019/20 (but up 7% on 2022/23)

Rapid growth in aortic valve procedures, especially TAVI

x1.9 More patients treated for aortic valve disease over the last 10 years

x5 More TAVI procedures over the last 10 years

↓26% Fewer aortic valve replacement (AVR) surgery cases over the last 10 years

26% More TAVI cases treated urgently (over 50% in 3 hospitals, under 20% in 9 hospitals)

↓24% Fewer mitral valve surgical procedures since 2019/20

Shift from surgery to catheter-based treatments in CHD cases

↓16% Fewer surgical procedures for congenital heart disease (CHD) since 2017/18 (but up 5% on 2022/23)

↑6% More catheter-based treatments for CHD since 2017/18

↑10% More pacing, ICD and ablation procedures for CHD patients compared with 2017/18

Fewer pacing and defibrillator procedures, more ablation

↓12% Fewer pacemaker procedures since 2015/16 (26% increase in generator change procedures); new implant rates are below the European average

↓25% Fewer implants of devices with defibrillator function (ICDs, CRT-Ds) since 2015/16 (15% increase in CRT-P procedures during that time)

↑9% More ablation procedures since 2015/16 (driven by 32% increase in complex atrial ablations, mainly for AF)

Delays to treatment

Delays to treatment for high-risk heart attacks begin to reduce

+22 mins Longer median time for higher-risk STEMI heart attack patients to reach hospital after calling for an ambulance compared with 10 years ago (but an improvement of 3 minutes on 2022/23)

41% Increased proportion of hospitals achieving the target to treat at least 70% of higher-risk STEMI heart attack patients within 60 minutes of arrival at hospital (up from 31% in 2022/23)

1 in 10 There has been a rise in the number of higher-risk STEMI heart attack patients who 'self-presented' to hospital rather than going by ambulance

84 mins The extra time from symptom onset to treatment for STEMI patients who self-present to hospital compared with those who are brought in by ambulance

Delays increasing for urgent PCI and for all CABG cases

↓24% Fall in the proportion of lower-risk NSTEMI patients who underwent angiography within 72 hours of admission compared to 2017/18 (now only 51%)

130 days Increased average waiting time for elective CABG surgery in England (35% longer than in 2016/17)

13 days Increased average waiting time for urgent CABG surgery in England (30% longer than in 2016/17)

Productivity and efficiency

Blocks to be overcome to achieve optimal care

96 Operations on average performed by cardiothoracic surgeons (compared to 140 in 2013/14)

16% Day-of-surgery admissions for elective cardiac surgery, well short of the 50% target

+4 days Admitted HF patients stay 4 days more in hospital if seen by a specialist but are more likely to receive evidence-based care and have better outcomes

2 days Median length of stay for an elective TAVI procedure has fallen

Quality of care

Variable performance in the effectiveness of drug prescribing

↓5% Fewer heart attack patients were discharged on optimal secondary preventive medication compared to 2019/20 (may represent a shift to community care)

68% Too few eligible heart failure patients with reduced ejection fraction received an MRA (should be 100%)

70% Increased use of sodium glucose co-transporter 2 inhibitor drugs for heart failure patients with reduced ejection fraction

~20% Heart failure patients with atrial fibrillation who were NOT prescribed an anticoagulant

Unexplained variations and possible inequalities

Variable prevalence of heart attacks and admissions for heart failure and variations in care by age, ethnicity and sex

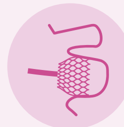
24% Male
32% Female
Proportion of male and female higher-risk STEMI heart attack patients aged ≥75 NOT receiving reperfusion therapy

134 mins Median Call-To-Balloon time for Asian higher-risk STEMI heart attack patients (shorter than patients of other ethnicities)

↑3-5% Greater numbers of older lower-risk NSTEMI patients undergoing early angiography (within 72 hours of admission) compared with 2019/20 (but still only 49% are treated in this timeframe)

20% Admitted heart failure patients NOT seen by a specialist HF team

41% Proportion of TAVI patients who are female (lower than might be expected for the age group treated)

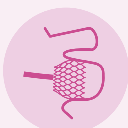


75% Proportion of left atrial appendage occlusion (LAAO) patients to date who are male (more should be female)

New structural heart disease interventions

Early evidence from new registries is encouraging

98% Proportion of mitral transcatheter edge-to-edge repair (TEER) procedures where severe mitral regurgitation was reduced after the procedure (TMTV Registry)



126 Left atrial appendage occlusion (LAAO) procedures submitted with very low complication rates (LAAO Registry)

1.4% Device embolisation reported in >2200 patent foramen ovale closure (PFOC) procedures over three years (PFOC Registry)

Key

AF: atrial fibrillation;
AVR: aortic valve replacement;
CABG: coronary artery bypass grafting;
CHD: congenital heart disease;
CRT-D: cardiac resynchronisation therapy with defibrillator function;
CRT-P: cardiac resynchronisation therapy with pacemaker function;
HF: heart failure;
ICD: implantable cardioverter-defibrillator;
LAAO: left atrial appendage occlusion;
MRA: mineralocorticoid receptor antagonist;
NSTEMI: non-ST-elevation myocardial infarction;
PCI: percutaneous coronary intervention;
PFOC: patent foramen ovale closure;
STEMI: ST-elevation myocardial infarction;
TAVI: transcatheter aortic valve implantation;
TEER: transcatheter edge-to-edge repair.

Executive summary

This 2025 NCAP report sets out quality of care and outcome measures across 11 cardiovascular audits and registries

The National Cardiac Audit Programme (NCAP) informs hospitals and commissioners of the quality of care provided in their delivery of cardiovascular services. Consisting of 11 different sub-specialties (or 'domains'), this 2025 NCAP includes information on service delivery for the financial year 2023/24 or, where metrics cover a three-year period, from 2021/22 to 2023/24.

- 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

Three new structural heart intervention registries have been introduced over the last two years. There are insufficient cases yet to provide a full set of quality improvement (QI) outputs, but the current state of play is summarised in the reports from:

- The Transcatheter Mitral and Tricuspid Valve (TMTV) Registry
- The Left Atrial Appendage Occlusion (LAAO) Registry
- The Patent Foramen Ovale Closure (PFOC) Registry.

The National Audit of Cardiac Rehabilitation (NACR) is aligned to the NCAP, though continues to report with a separate timetable.

Online interactive reports are available for each sub-specialty domain

In addition to this summary report highlighting key messages from across the NCAP, each domain has an online interactive report available through the NICOR website (alongside documents with additional background information and results).

These reports enable patients, members of the public, clinicians, hospital and health system managers, and healthcare commissioners to explore in detail the specific findings that are of most interest to them.

Key messages

Blue headline figures = positive results

Red headline figures = adverse results

Black headline figures = changes where interpretation is less clear

All data for 2023/24 unless otherwise stated

Shifts in demand and delivery of different treatments

Recorded heart attacks are down	
↓8.3%	Confirmed heart attacks since 2017/18
↓10%	Higher-risk ST-elevation myocardial infarction (STEMI) heart attacks since 2017/18
↓7.4%	Lower-risk non-STEMI (NSTEMI) heart attacks in people aged 65 and older since 2017/18
x3	Heart attacks per 100,000 people in the northeast and in Wales in 2023/24 compared with areas with the lowest rates (Derbyshire, Coventry and Warwickshire)
Revascularisation procedures are reducing	
↓7%	Percutaneous coronary intervention (PCI) cases compared with 2017/18 (driven by 25% drop in elective procedures)
↓18%	CABG procedures compared with 2017/18 (driven by a 34% fall in elective operations)
↓8.5%	Total coronary revascularisation procedures since 2017/18 (driven by 27% fewer elective procedures)

Heart failure admissions still below pre-pandemic levels	
↓5.5%	Heart failure admissions since 2019/20 (up 7% on 2022/23)
>x3	Heart failure admissions per 100,000 people in NHS Dorset ICB compared with lowest rates (Cornwall and Isles of Scilly ICB, Cardiff and Vale HB, and Bath, NE Somerset, Swindon and Wiltshire ICB)
~50%	Proportion of HF patients with reduced Ejection Fraction (HFrEF) confirmed on echocardiography

Rapid growth in aortic valve procedures, especially TAVI	
↓1.9%	Patients treated for aortic valve disease over last 10 years
x5	TAVI procedures over last 10 years
↓26%	Aortic valve replacement (AVR) surgery cases over last 10 years
x3	TAVI procedures per million people in West Yorkshire Cardiac Network compared with Hull and North Yorkshire Cardiac Network
26%	TAVI cases treated urgently (over 50% in 3 hospitals, under 20% in 9 hospitals)
↓30%	Proportion of AVR patients aged under 50 years given a 'tissue' rather than a 'mechanical' valve
↓24%	Mitral valve surgical procedures since 2019/20

Shift from surgery to catheter-based treatments in CHD cases	
↓16%	Surgical procedures for congenital heart disease (CHD) since 2017/18 (up 5% on 2022/23)
↑6%	Catheter-based treatments for CHD since 2017/18
↑10%	Pacing, ICD and ablation procedures for CHD patients compared with 2017/18

Fewer pacing and defibrillator procedures, more ablation	
↓12%	Pacemaker procedures since 2015/16 (26% increase in generator change procedures) and new implant rates are below the European average
↓25%	Implants of devices with defibrillator function (ICDs, CRT-Ds) since 2015/16 (15% increase in CRT-P procedures during that time)
↑9%	All ablation procedures since 2015/16 (driven by 32% increase in complex atrial ablations, mainly for AF)

Delays to treatment

Delays to treatment for high-risk heart attacks begin to reduce	
↓2.1%	Time from calling for an ambulance (or 'self-presenting' at hospital) to a primary PCI compared to 2022/23 (still 23% longer than in 2014/15)
+22 mins	Median time for higher-risk STEMI heart attack patients to reach hospital after calling for an ambulance compared with 10 years ago (an improvement of 3 minutes on 2022/23)
41%	Proportion of hospitals achieving target to treat at least 70% of higher-risk STEMI heart attack patients within 60 minutes of arrival at hospital (up from 31% in 2022/23)
1 in 10	Higher-risk STEMI heart attack patients 'self-presenting' to hospital rather than going by ambulance
84 mins	The extra time from symptom onset to treatment for those who self-present to hospital compared with those who are brought in by ambulance
15%	Proportion of 'self-presenting' higher-risk STEMI heart attack patients who have their PCI procedure within 60 minutes of arriving at hospital (up from 13% in 2022/23)

Delays increasing for urgent PCI and for all CABG cases	
↓24%	Proportion of lower-risk NSTEMI patients who undergo angiography within 72 hours of admission compared to 2017/18 (now only 51%)
130 days	Average waiting time for elective CABG surgery in England (35% longer than in 2016/17)
13 days	Average waiting time for urgent CABG surgery in England (30% longer than in 2016/17)

Productivity and efficiency

Blocks to be overcome to achieve optimal care	
96	Operations per year on average by cardiothoracic surgeons (compared to 140 in 2013/14)
16%	Day-of-surgery admissions for elective cardiac surgery, well short of the 50% target
+4 days	Admitted HF patients stay 4 days more in hospital if seen by a specialist but are more likely to receive evidence-based care and have better outcomes
2 days	Median length of stay for an elective TAVI procedure

Quality of care

Variable performance in the effectiveness of drug prescribing	
↓5%	Proportion of heart attack patients who are discharged on optimal secondary preventive medication since 2019/20 (may represent a shift to community care)
↑9%	Proportion of heart attack patients with significantly impaired heart pump function being prescribed a mineralocorticoid receptor antagonist (MRA) since 2019/20
68%	Eligible HF patients with reduced ejection fraction receiving an MRA (should be 100%)
70%	Use of sodium glucose co-transporter 2 inhibitor drugs for HF patients with reduced ejection fraction
~20%	HF patients with atrial fibrillation who are NOT prescribed an anticoagulant

Unexplained variations and possible inequalities

Variable prevalence of heart attacks and admissions for heart failure and variations in care by age, ethnicity and sex	
24% 32%	Proportion of male and female higher-risk STEMI heart attack patients aged ≥75 NOT receiving reperfusion therapy
134 mins	Median Call-To-Balloon time for Asian higher-risk STEMI heart attack patients (shorter than patients of other ethnicities)
↑3-5%	Older lower-risk NSTEMI patients undergoing early angiography (within 72 hours of admission) compared with in 2019/20 (still only 49% are treated in this timeframe)
20%	Admitted HF patients NOT seen by specialist HF team
<0.1 to 5	Ratio of CRT-D to CRT-P devices for patients undergoing cardiac resynchronisation therapy
41%	Proportion of TAVI patients who are female (lower than might be expected for the age group treated)
75%	Proportion of left atrial appendage occlusion (LAAO) patients to date who are male (more should be female)

New structural heart disease interventions

Early evidence from new registries is encouraging	
98%	Proportion of mitral transcatheter edge-to-edge repair (TEER) procedures where severe mitral regurgitation was reduced after the procedure
126	Left atrial appendage occlusion (LAAO) procedures submitted with very low complication rates
1.4%	Device embolisation reported in >2200 patent foramen ovale closure (PFOC) procedures over three years

1. Introduction

1.1 This 2025 NCAP report sets out quality of care and outcome measures across 11 cardiovascular audits and registries

The National Cardiac Audit Programme (NCAP) supports hospitals and commissioners to make their cardiovascular services more effective and efficient by providing information to enable quality improvement (QI).

This 2025 National Cardiac Audit Programme (NCAP) report highlights some key findings on the quality of care and outcomes across 11 cardiovascular sub-specialty audits and registries. Each of these 'domains' 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
- The Transcatheter Mitral and Tricuspid Valve (TMTV) Registry
- The Left Atrial Appendage Occlusion (LAAO) Registry
- The Patent Foramen Ovale Closure (PFOC) Registry
- The National Audit of Cardiac Rehabilitation (NACR).

TMTV, LAAO and PFOC are three new structural heart intervention registries introduced over the last two years. As yet, they cover insufficient cases to provide a full set of outputs to support quality improvement, but the current state of play is summarised in this report.

The National Audit of Cardiac Rehabilitation (NACR) is aligned to the NCAP, though continues to report with a separate timetable.

The NCAP reports are delivered by the National Institute for Cardiovascular Outcomes Research (NICOR), which is hosted by the NHS Arden & Greater East Midlands Commissioning Support Unit. The reports are commissioned directly by NHS England and NHS Wales (GIG Cymru).

1.2 Online interactive reports provide detail for each sub-specialty domain

In addition to this summary report highlighting key messages from across the NCAP, each domain has an online interactive report available through the NICOR website (alongside documents with additional background information and results).

These reports enable patients, members of the public, clinicians, hospital and health system managers and healthcare commissioners to explore in detail the specific findings that are of most interest to them.

Interactive data is provided data at different levels:

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

Our aim is to support improvement in care. Considerable variation is seen for most metrics and those local health systems and individual hospitals that are performing less well can learn from those providing better levels of care (accepting any limitations when adjustment for key variables has not been possible). To support this, hospitals have direct access via the NICOR data portal to assess their relative performance and identify areas where they should be investing in QI programmes to improve.

1.3 The report includes data from 2023/24 and highlights trends in service delivery and current challenges for cardiovascular services

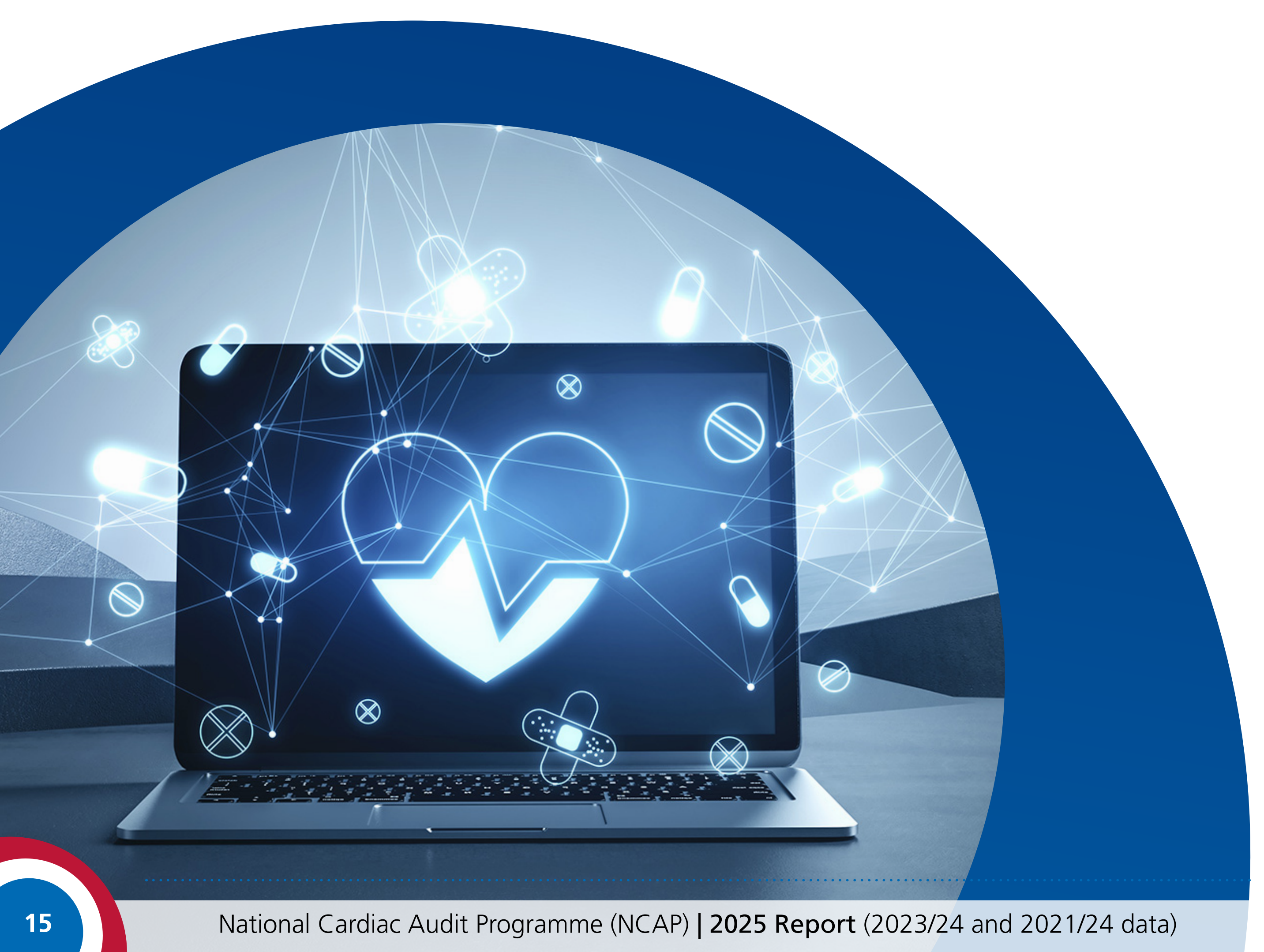
The data in this report include the latest validated yearly figures from 1st April 2023 to 31st March 2024. Where metrics cover a three-year period, the data period is from 2021/22 to 2023/24.

These data highlight how the landscape for cardiovascular disease is changing. Some of these changes stem from the impact of COVID-19. This has had a significant impact on the ability of local health systems and individual hospitals to deliver treatments, with increased waiting times for elective treatment and delayed admissions for urgent cases. Some of these negative impacts are now beginning to be reversed. Other trends pre-date the pandemic. These include shifts in clinical practice and the use of certain types of cardiovascular procedure.

The following sections each report on different aspects of cardiovascular care.

Section	Key message
2	Demand for certain forms of cardiovascular care seem to be falling while the use of some types of procedure is increasing
3	Delays to PPCI treatment for heart attacks have begun to improve but waiting times for CABG and angiography have lengthened
4	HF and TAVI patients are experiencing shorter lengths of stay but productivity in adult cardiac surgery has declined
5	Quality of care is improving on a range of metrics though there are some areas of concern
6	Substantial inequalities and variances persist across the country
7	Three new structural heart disease registries require comprehensive and timely data submission from hospitals

A final section emphasises the requirement for hospitals to provide comprehensive, accurate and timely data for all the NCAP audit metrics to support its role in driving evidence-based quality improvement.

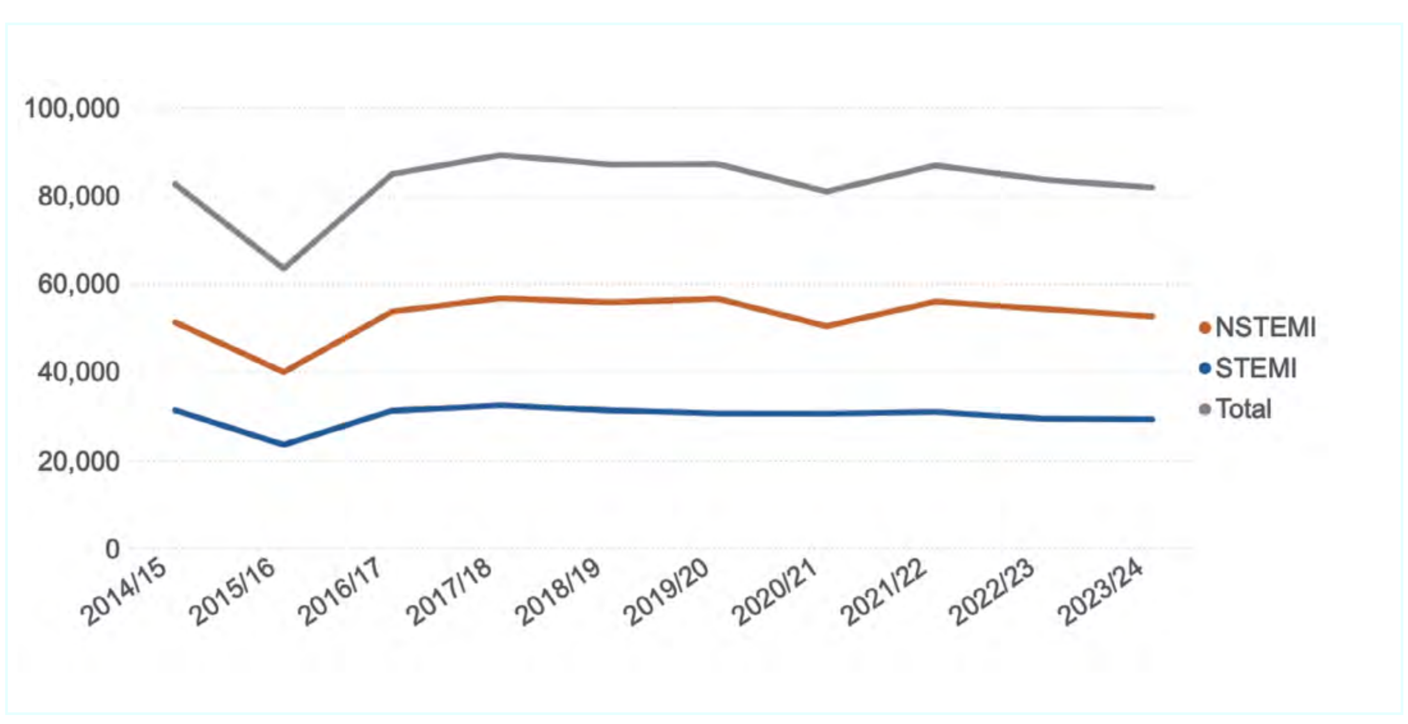


2. Demand for certain forms of cardiovascular care seems to be falling while the use of some types of procedure is increasing

2.1 The number of confirmed admissions with a heart attack continues to drop

The number of people admitted to hospital with a heart attack has been falling slowly over the last six years. Just under 82,000 were admitted in 2023/24, down 2.2% on the previous year and over 8% compared with 2017/18 [Figure 2.1].

Figure 2.1: Total number of confirmed heart attack admissions, 2014/15 to 2023/24 [MINAP data]



STEMI = ST-elevation myocardial infarction; NSTEMI = non-ST-elevation myocardial infarction

The number of higher-risk ST-elevation myocardial infarction (STEMI) cases was very slightly down on 2022/23 but 10% lower than in 2017/18. The number of lower-risk non-ST-elevation myocardial infarction (NSTEMI) cases fell 3.1% from 2022/23 and was over 7% below the 2017/18 figure.

The drop in admissions may reflect:

- some heart attack patients being reluctant to call for help fearing a delay in help arriving or the possibility of contracting COVID-19 in hospital (both of which have been suggested as possible pandemic effects)
- the impact of anti-smoking campaigns, clean air policies, programmes to identify and manage risk factors for heart disease and prescription of secondary prevention medications (countering the increasing prevalence of diabetes and obesity).

The rate at which people are admitted to hospital with a heart attack varies considerably across the country. Those ICBs/HBs with the most admissions per 100,000 population (North East and North Cumbria ICB and Hywel Dda University Health Board) have rates that are three times higher than in those with the least (NHS Coventry and Warwickshire ICB and NHS Derby and Derbyshire ICB).

2.2 The number of PCI and CABG revascularisation procedures has also fallen

A total of 91,092 percutaneous coronary intervention (PCI) procedures to improve artery blood flow were undertaken in 2023/24, down 7% since 2017/18. This has been driven by improved prescribing of optimal secondary preventive medications, resulting in a 25% reduction in elective PCI for stable angina.

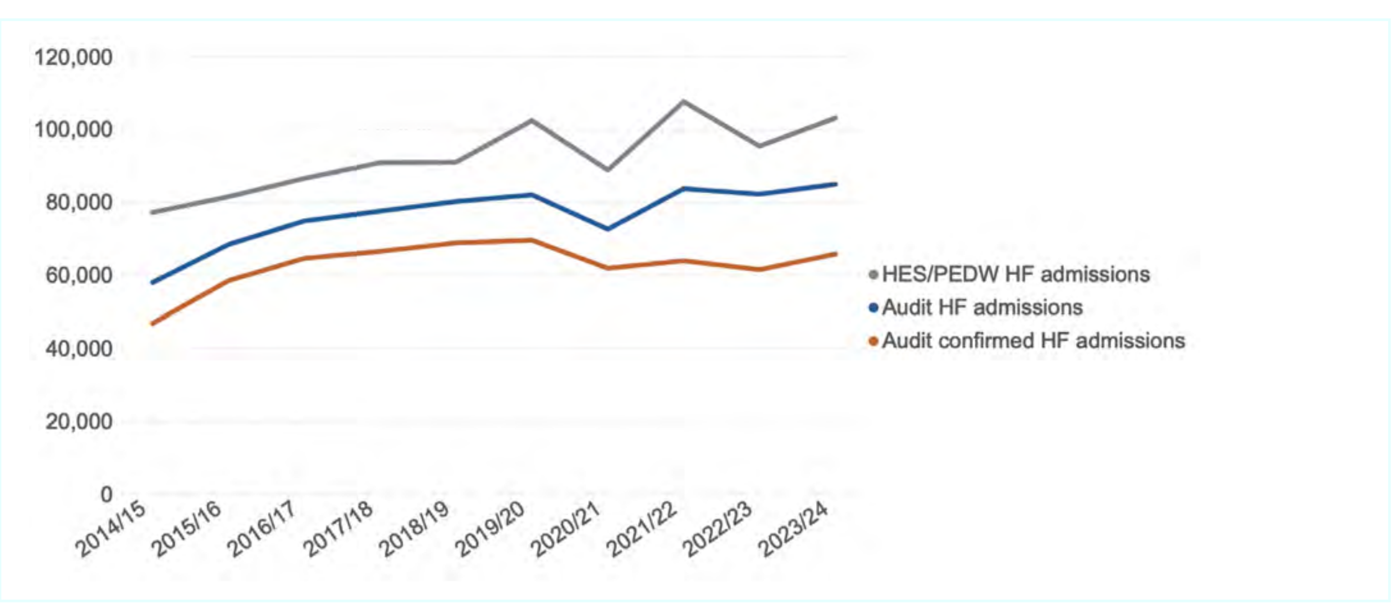
There were small increases in the number of primary PCI (PPCI) procedures for patients suffering heart attacks during 2023/24 (2.8% for higher-risk STEMI cases and 3.2% for NSTEMI) but these are still lower than the level they were in 2017/18.

Similarly, there has been a 28% fall in the total number of coronary artery bypass graft (CABG) operations since 2013/14 (down from 16,350 to 11,694 in 2023/24). As with the use of PCI, this is largely driven by an almost 50% reduction in elective CABG procedures. It is unclear whether this reflects falling demand, service delivery issues or other factors.

2.3 The number of confirmed heart failure patients admitted to hospital remains below the peak in 2018/19

In 2023/24, the number of primary (or index) HF admissions confirmed by the National Heart Failure Audit (NHFA) was 7% higher than the previous year [Figure 2.2]. Despite this, HF admissions are still more than 5% down on the pre-pandemic figure and it is possible that the flattening in patient numbers since 2019/20 is continuing.

Figure 2.2: Confirmed primary heart failure cases admitted to hospital, 2014/15 to 2023/24 [NHFA data]



HES = hospital episode statistics; PEDW = Patient Episode Database for Wales; HF = heart failure

Two factors might be expected to increase the number of accurate HF diagnoses over time amongst patients admitted to hospital:

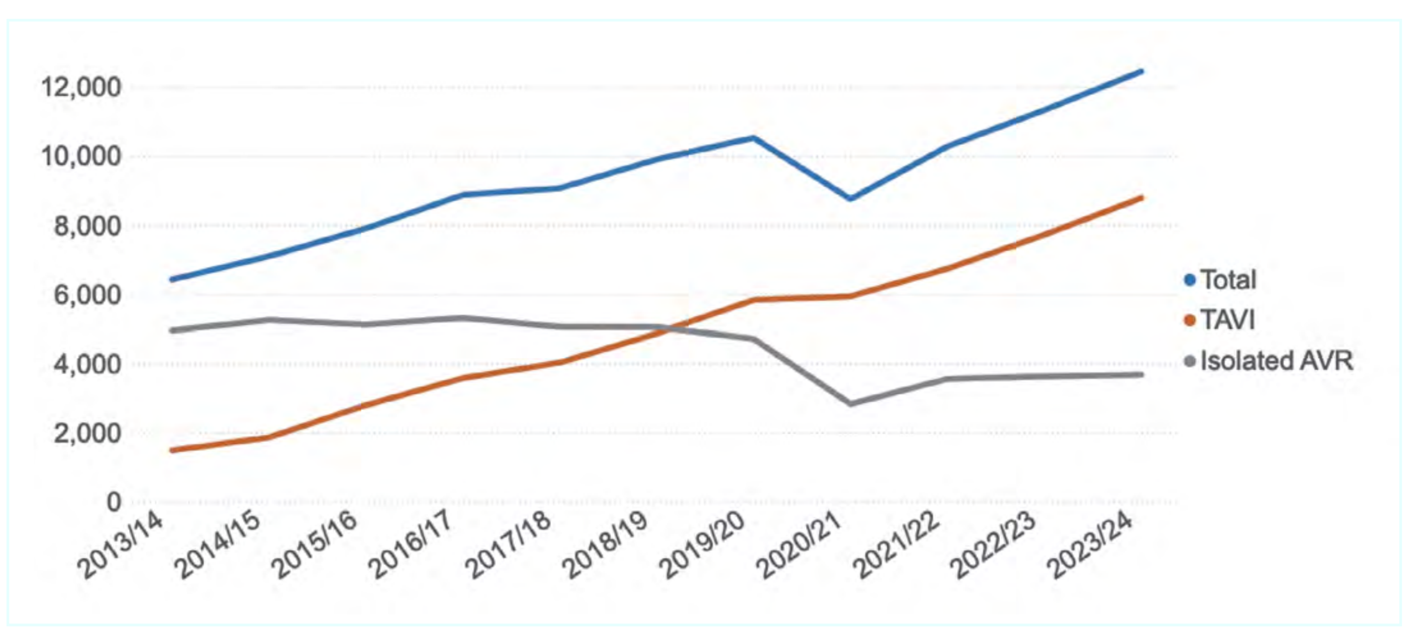
- Easier access to echocardiography (echocardiography was used in 87% of cases following admission, only slightly down on the high of 90% in 2014/15)
- Increasing use of the N-terminal pro-B-type natriuretic peptide (NT-proBNP) blood test for acute admission patients with no former diagnosis (this group representing around 50% of the cases in the audit). This use of this test has risen rapidly over the last few years to 53% of all confirmed cases.

Whether there is any significant change in the prevalence of heart failure in the population is uncertain and NICOR does not capture primary care data. Diagnosis of heart failure and delivery of treatment is more frequently performed in primary or community care as well as outpatient departments, and this almost certainly reduces the need for acute hospitalisation.

2.4 TAVI has driven a rise in aortic valve disease procedures, but the use of TEER has not arrested the drop in treatment of mitral valve disease

Transcatheter aortic valve implantation (TAVI) is increasingly used for patients with aortic stenosis (when the valve becomes stiff or narrowed, making it hard for blood to flow out of the heart) who are high-risk for surgery. A five-fold increase in TAVI procedures over the last 10 years has contributed to a near doubling in the overall number of aortic valve disease patients treated [Figure 2.3]. At the same time, there has been a 26% fall in the number patients undergoing surgical aortic valve replacement (AVR).

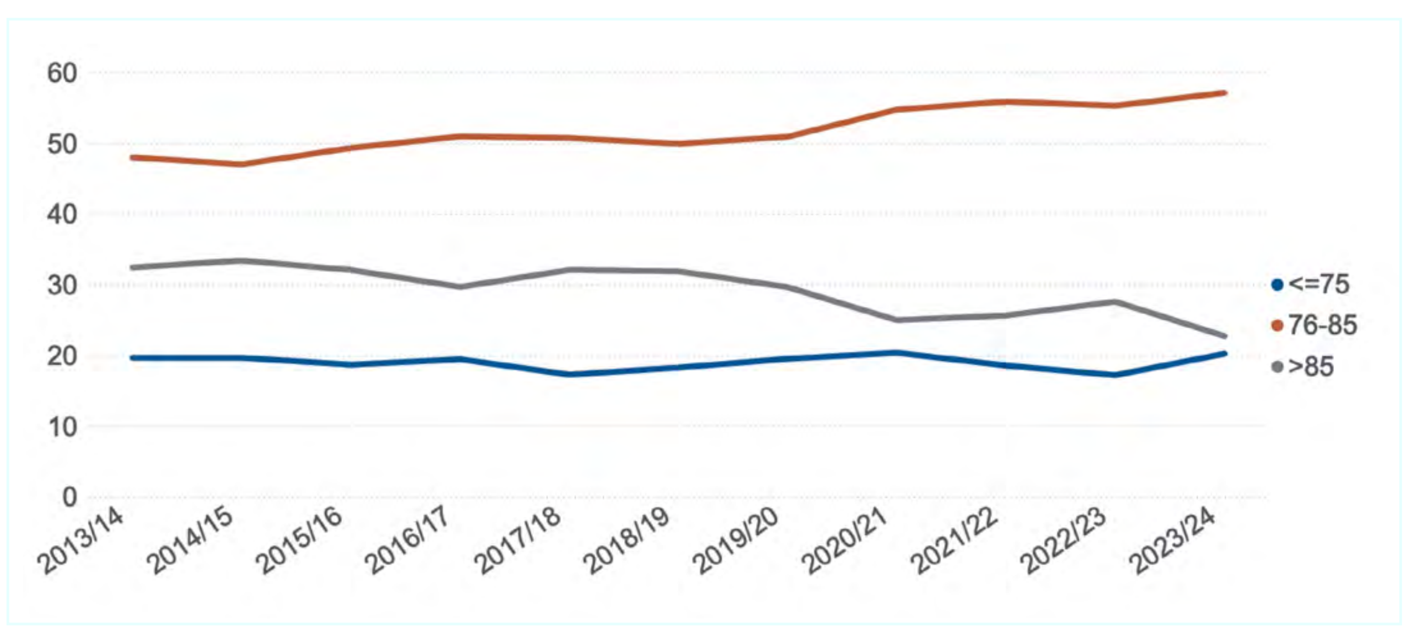
Figure 2.3: **Aortic valve surgery cases and TAVI procedures for aortic stenosis, 2013/14 to 2023/24 [NACSA and UK TAVI Registry data]**



TAVI – transcatheter aortic valve implantation; AVR = aortic valve replacement

Most elderly patients with aortic stenosis are offered TAVI, but very elderly patients (>85 years old) now account for a lower overall proportion of those receiving treatment [Figure 2.4]. The median age of TAVI patients has fallen from 83 to 81 years old over the last 10 years. While the proportion of patients aged ≤75 years of age increased slightly in 2023/24, these generally lower-risk younger patients still account for around 20% of all TAVI patients, the same as in 2013/14.

Figure 2.4: **Percentage of TAVI cases by age group [UK TAVI Registry data]**

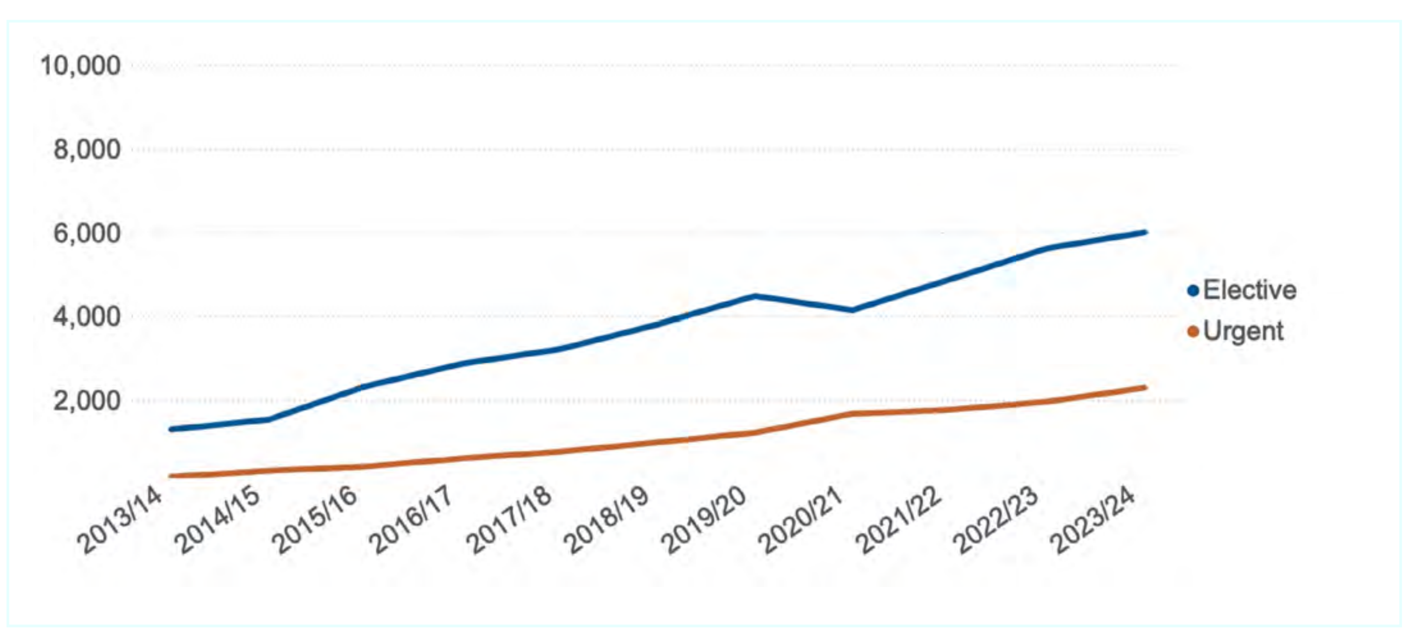


TAVI = transcatheter aortic valve implantation

TAVI is increasingly performed urgently during the time a patient presents to hospital with chest pain, syncope (passing out) or heart failure, rather than as an elective procedure following discharge [Figure 2.5 and Figure 2.6].

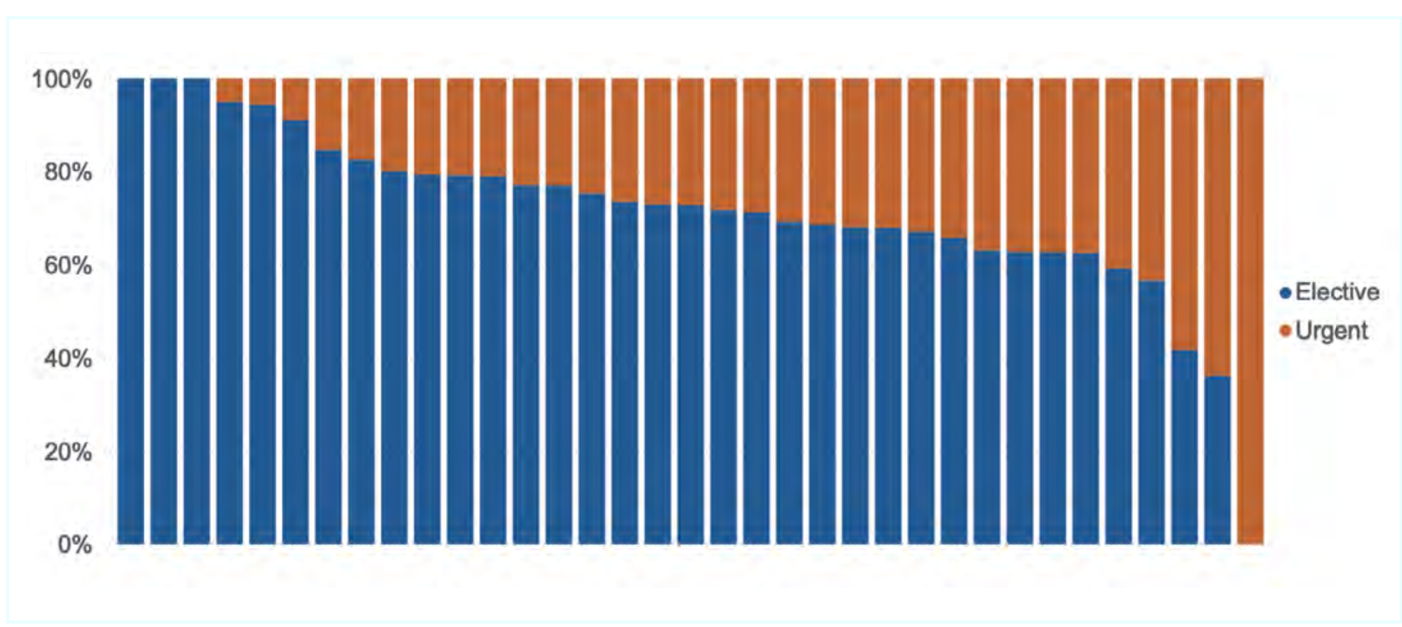
Treating a patient early after presentation avoids the potential for a major complication whilst on a waiting list and reduces the elective waiting list for a procedure. However, wherever possible, time is required to optimise the patient's treatment (e.g. by treating heart failure) before treatment is delivered since patients requiring urgent treatment do worse than those where the procedure is planned.

Figure 2.5: Elective and urgent TAVI procedures, 2013/14 to 2023/24 [UK TAVI Registry data]



TAVI = transcatheter aortic valve implantation

Figure 2.6: Percentage elective and urgent TAVI procedures, 2023/24 [UK TAVI Registry data]



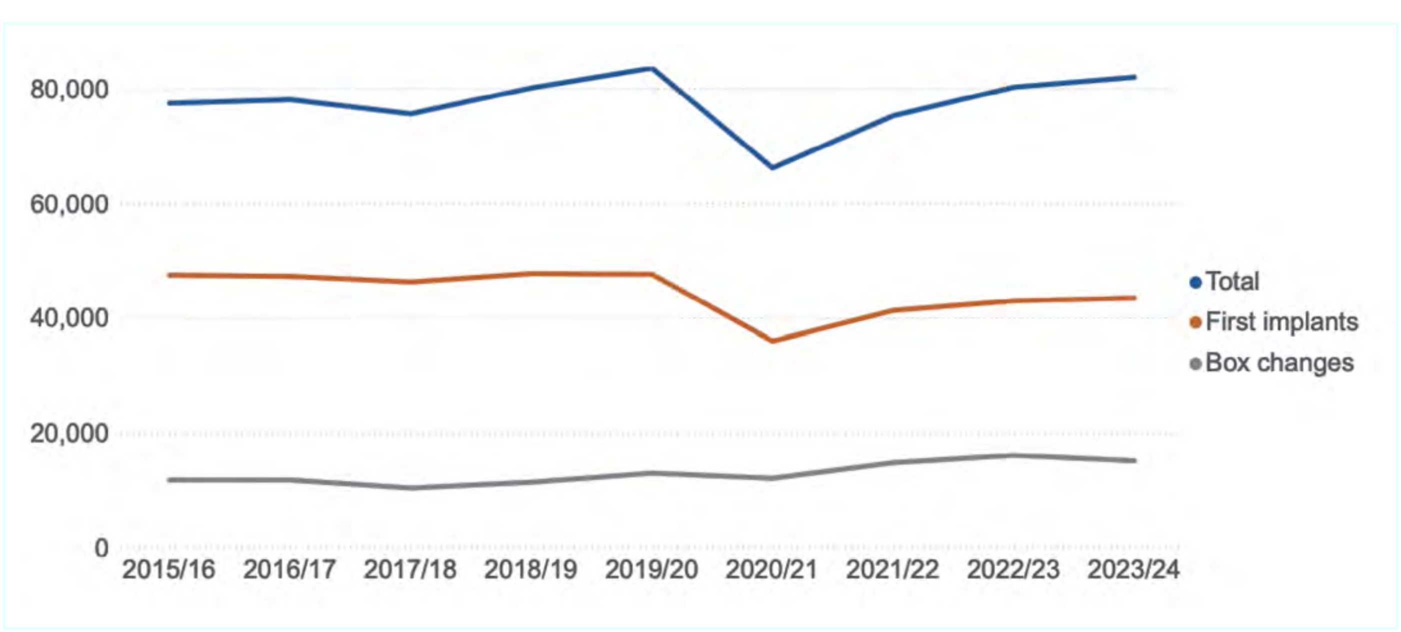
TAVI = transcatheter aortic valve implantation

Unlike the rise in TAVI procedures to treat aortic valve disease, the number of cases involving treatment of mitral valve disease (which can impact the control of blood flow from the lungs to the heart's main pumping chamber) has been falling. Although mitral valve transcatheter edge-to-edge repair (TEER) procedures may be an alternative to surgery for higher-risk patients (see section 7.1), these have not yet compensated for the drop in surgical mitral valve repair or replacement procedures.

2.5 Cardiac rhythm management has seen the implantation of fewer devices and greater use of ablations

The total number of cardiac implantable electronic device (CIED) procedures rose slightly in 2023/24 but the requirement for first pacemaker implants has fallen by 8.4% since 2015/16 (from over 47,000 to just over 43,000) [Figure 2.7]. The number of 'box changes' to replace generators has increased by 28% over the same period.

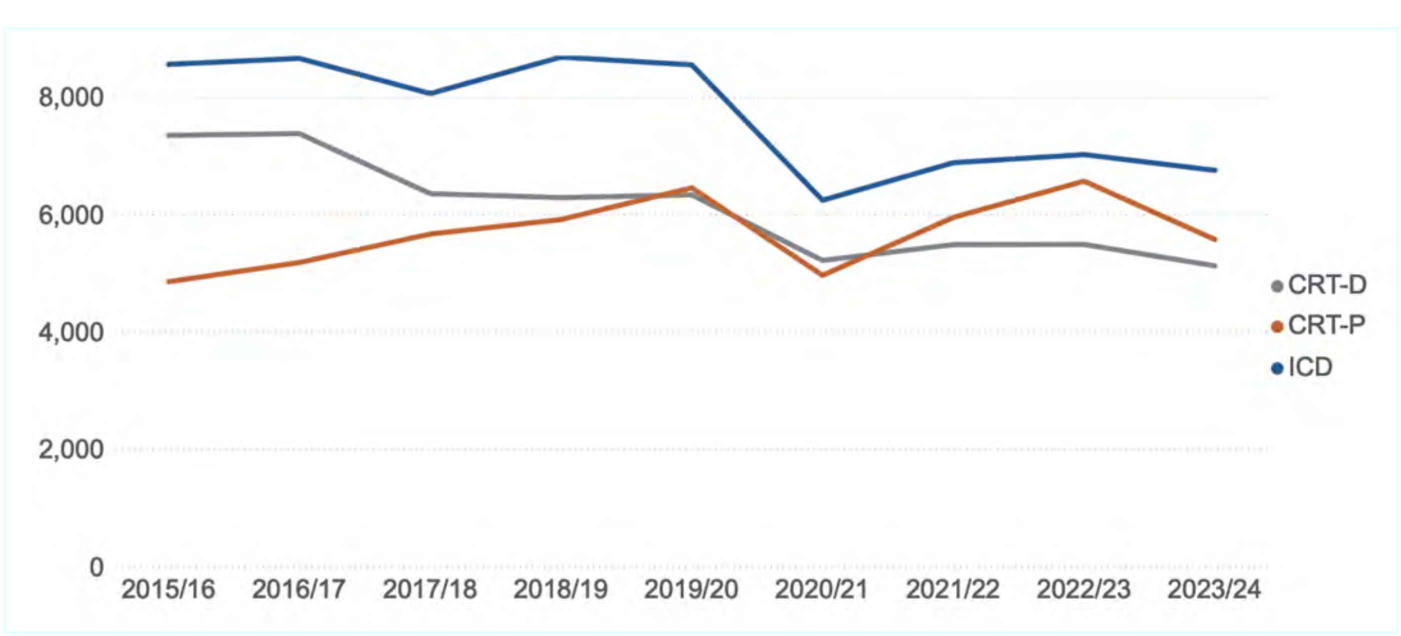
Figure 2.7: Pacemaker first implants and 'box changes' 2015/16 to 2023/24 [NACRM data]



For complex devices, there has been a continuing reduction in the use of implantable cardioverter-defibrillators (ICDs) and cardiac resynchronisation therapy devices with defibrillator function (CRT-Ds). Procedure numbers in 2023/24 were 6,748 and 5,120 respectively, a drop of 21% and 30% since 2015/16) [Figure 2.8].

The fall in CRT-D numbers had been offset by a gradual rise in the use of cardiac resynchronisation therapy devices with pacemaker function (CRT-Ps) but these procedures fell in 2023/24. There was a slight reduction (to 5.6%) in the number of re-do procedures within the first year of an initial complex device implant.

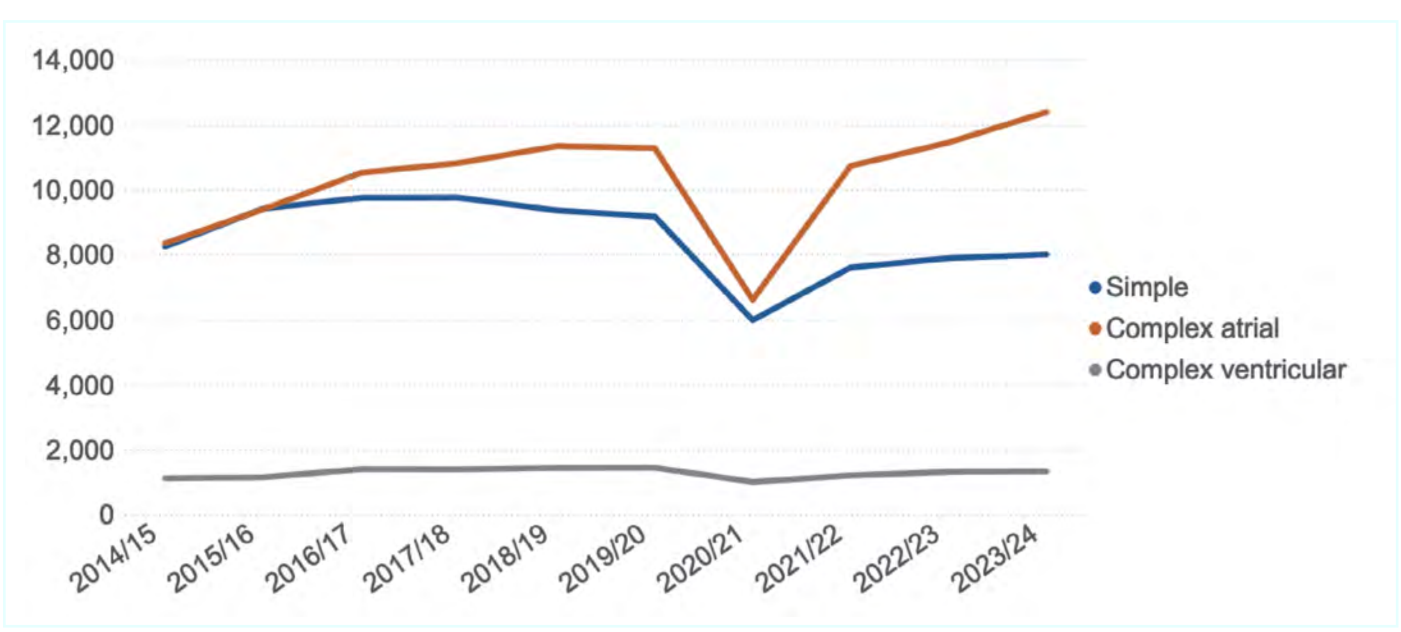
Figure 2.8: Complex cardiac implantable electronic device (CIED) procedures, 2015/16 to 2023/24 [NACRM data]



CIED = cardiac implantable electronic device; CRT-D = cardiac resynchronisation therapy with defibrillator function; CRT-P = cardiac resynchronisation therapy with pacemaker function; ICD = implantable cardioverter-defibrillator.

In contrast to device implants, there has been a gradual rise in ablation procedures, as the evidence base around the benefits of treatment increases [Figure 2.9]. Most of this increase is for patients with the heart rhythm irregularity called atrial fibrillation (AF) which has a significant impact on quality of life, increases the risks of stroke and is associated with a worse longer-term prognosis.

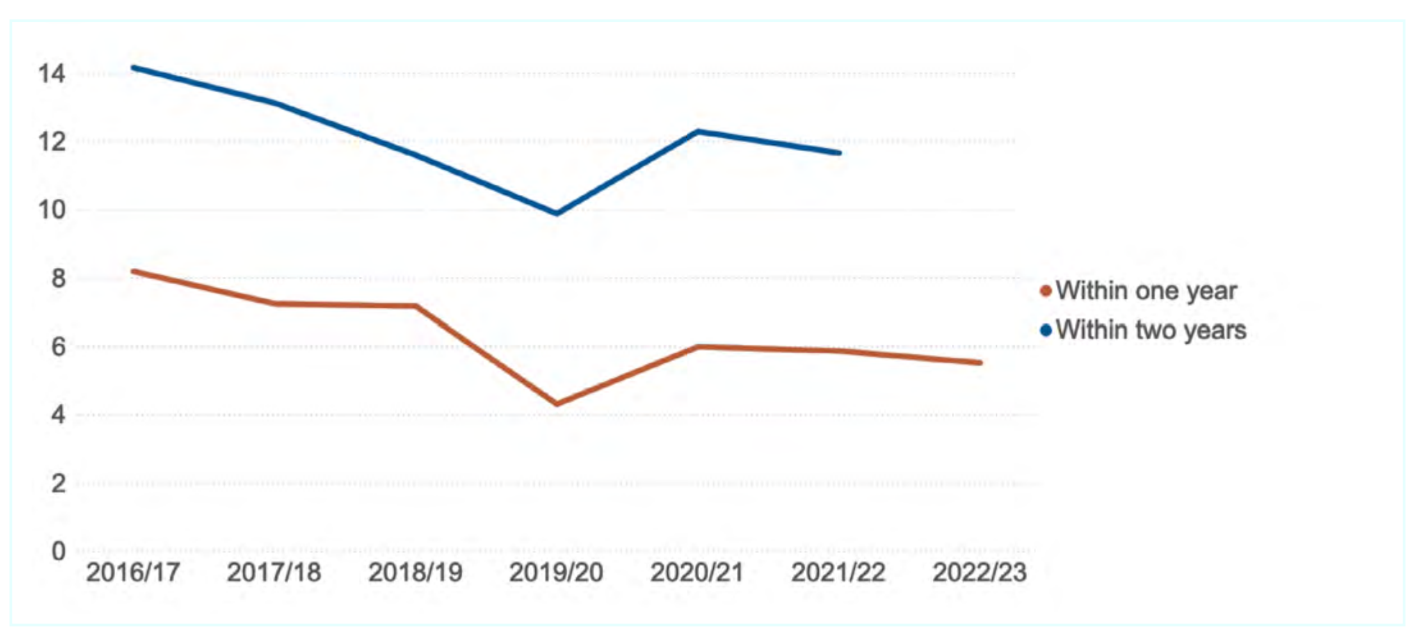
Figure 2.9: All ablation procedures by complexity, 2014/15 to 2023/24 [NACRM data]



The requirement for repeat procedures after an initial ablation of many arrhythmia pathways is falling to very low levels as a result of technical and procedural improvements (the nature of AF often requires two and sometimes three procedures to gain optimal control of the rhythm). Repeat ablation within two years of the initial AF ablation procedure is performed in just under 12% of cases [Figure 2.10].

Some caution may be needed though, as this rate is lower than seen in randomised trials and may suggest that not enough repeat procedures are being undertaken to provide optimal rhythm control for all patients.

Figure 2.10: Re-intervention rates within 1 and 2 years after complex atrial ablations, 2016/17 to 2022/23 [NACRM data]



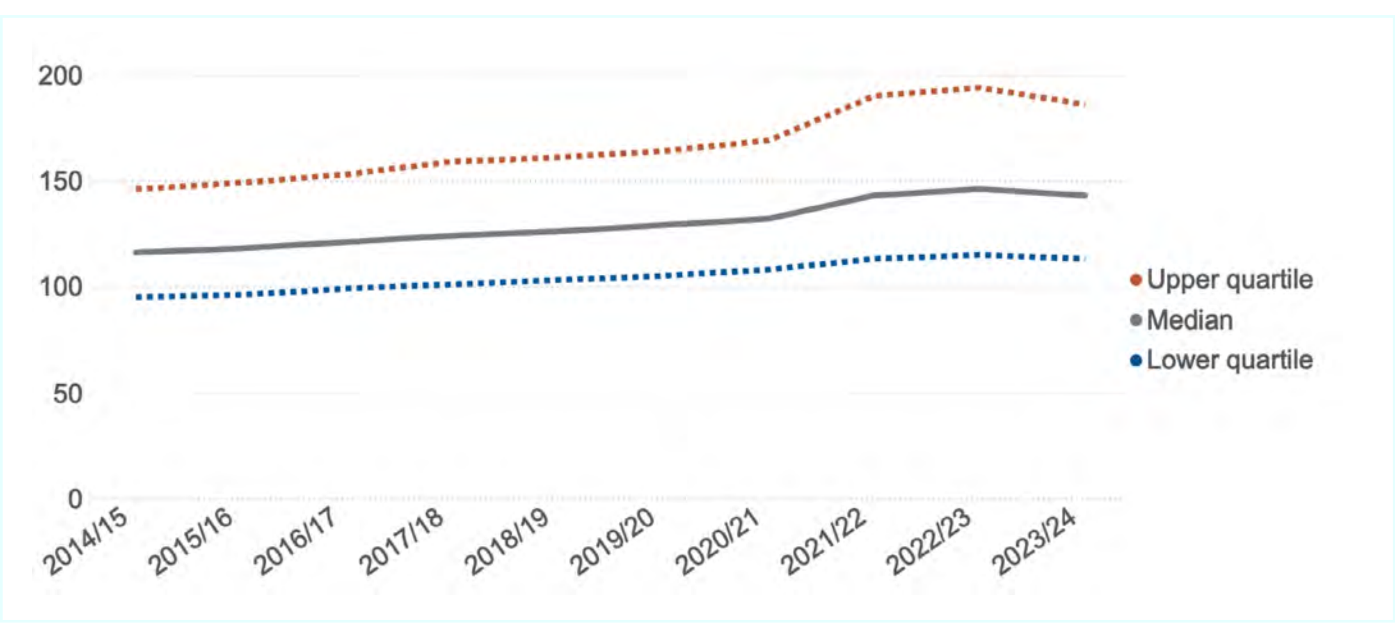
3. Delays to PPCI treatment for heart attacks have begun to improve but waiting times for CABG and angiography have lengthened

3.1 The long-term deterioration in treatment times for patients with higher-risk STEMI heart attacks may be reversing

Patients with higher-risk ST-elevation myocardial infarction (STEMI) heart attacks need urgent treatment with primary percutaneous coronary interventions (PPCI) to improve blood flow to the heart. The shorter the time to treatment, the greater the chances of survival and achieving a good recovery.

Over the last decade, there has been a year-on-year rise in the Call-To-Balloon (CTB) times measuring the point at which help was sought (usually from emergency services) and when the PPCI procedure is undertaken. In 2023/24 a welcome reversal in this trend was seen [Figure 3.1], albeit the reduction in treatment time is only back to the levels seen in 2021/22. Overall CTB times are still 27 minutes longer than in 2014/15.

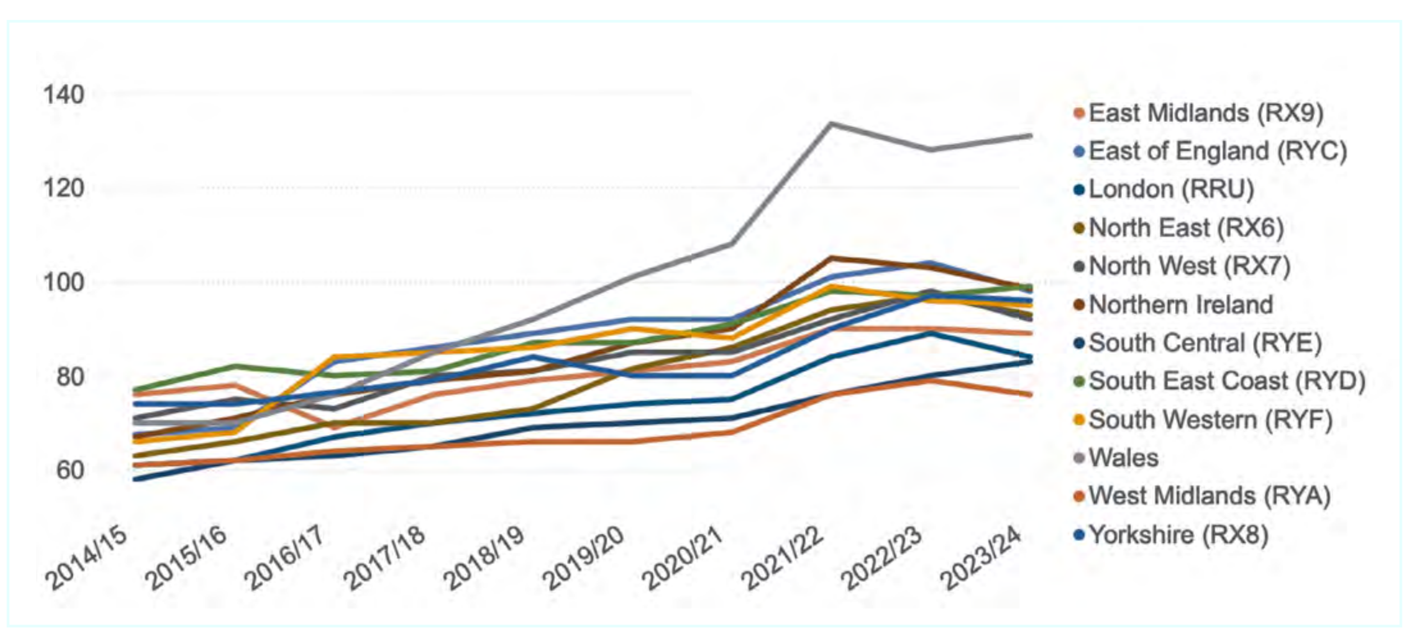
Figure 3.1: CTB times for PPCI patients with higher-risk STEMI heart attacks, 2013/14 to 2023/24 [MINAP data]



CTB = Call-To-Balloon; STEMI = ST-elevation myocardial infarction

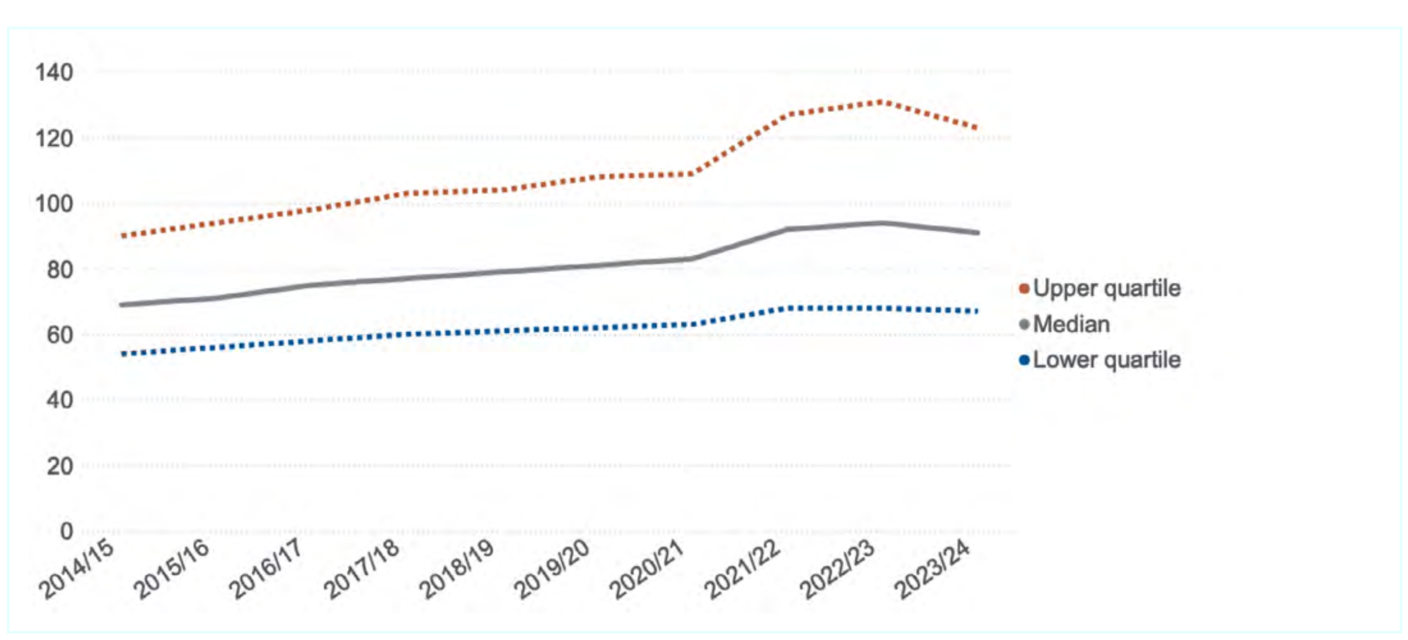
Most of the delay to treatment occurs prior to hospitalisation. While many ambulance trusts have shown progress on the Call-To-Door (CTD) times (when the patient first arrives at hospital), a few are still struggling to improve on this metric [Figure 3.2]. Nonetheless, the overall CTD time has fallen slightly [Figure 3.3].

Figure 3.2: Median CTD times for PPCI patients with higher-risk STEMI heart attacks, by ambulance trust, 2014/15 to 2023/24 [MINAP data]



CTD = Call-To-Door
Data for Isle of Wight Ambulance Trust not included because of low numbers

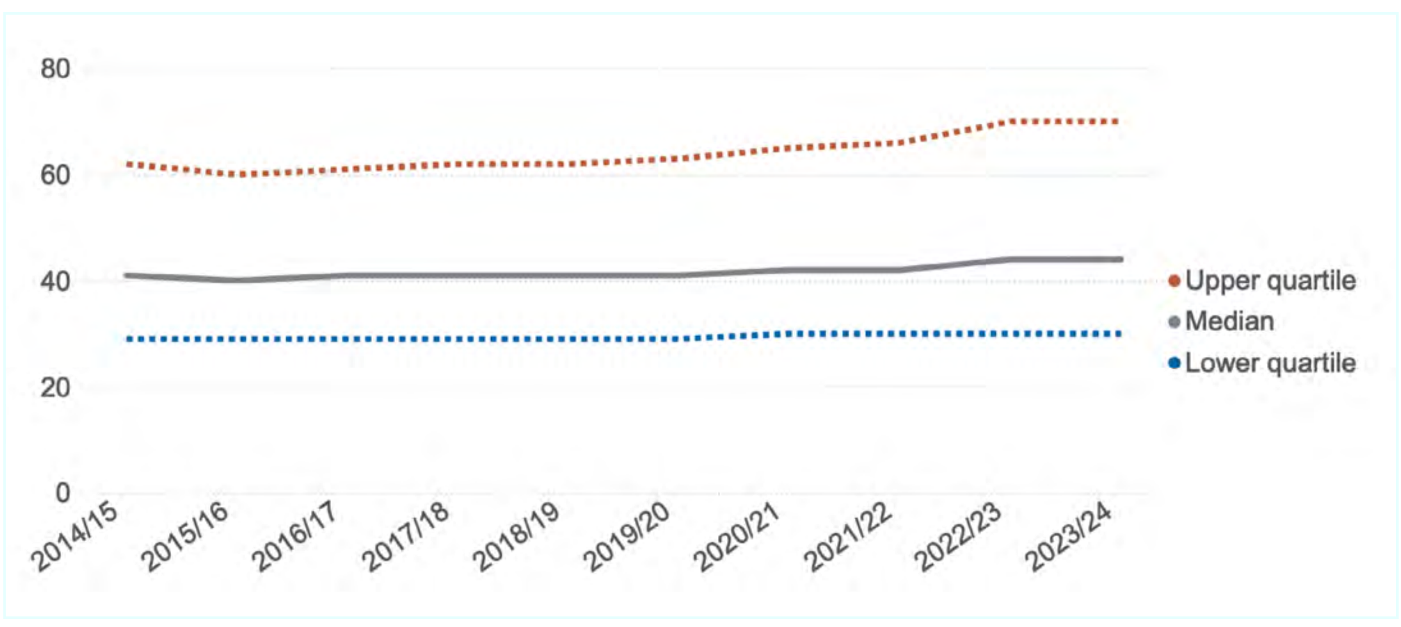
Figure 3.3: Median CTD times for PPCI patients with higher-risk STEMI heart attacks, 2014/15 to 2023/24 [MINAP data]



CTD = Call-To-Door; STEMI = ST-elevation myocardial infarction

Once the patient arrives at hospital, PPCI treatment should start as soon as possible. Some centres are not able to conform to the target times set and there has been a slight deterioration in the overall Door-To-Balloon (DTB) time [Figure 3.4]. This is despite more hospitals reaching the target of 70% of patients to be treated with a DTB time of <60 minutes. Those hospitals not reaching this target have more to do to change their clinical pathways to expedite care.

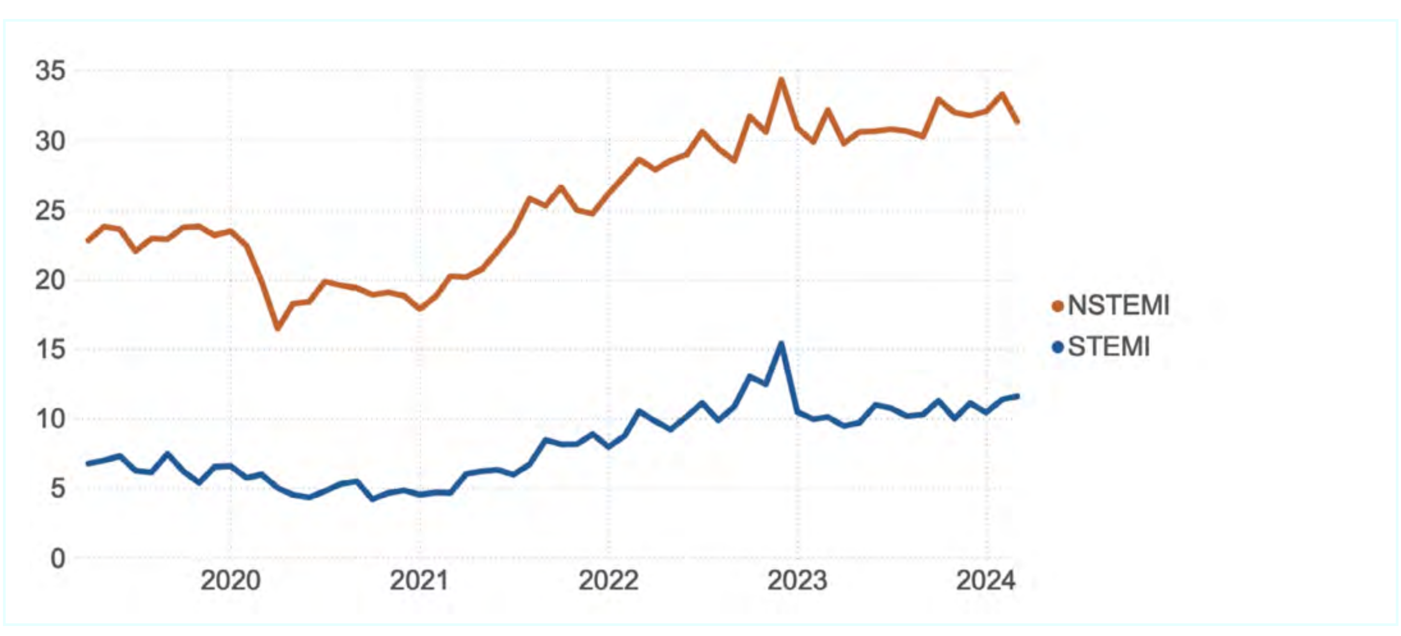
Figure 3.4: Median DTB times for PPCI patients with higher-risk STEMI heart attacks, 2014/15 to 2023/24 [MINAP data]



DTB = Door-To-Balloon; STEMI = ST-elevation myocardial infarction

The rise in CTB times also results in part because of an increase in number of patients who 'self-present' to hospital rather than waiting to be taken there by ambulance. These now represent around 1 in 10 cases compared to 5-6% prior to the pandemic [Figure 3.5].

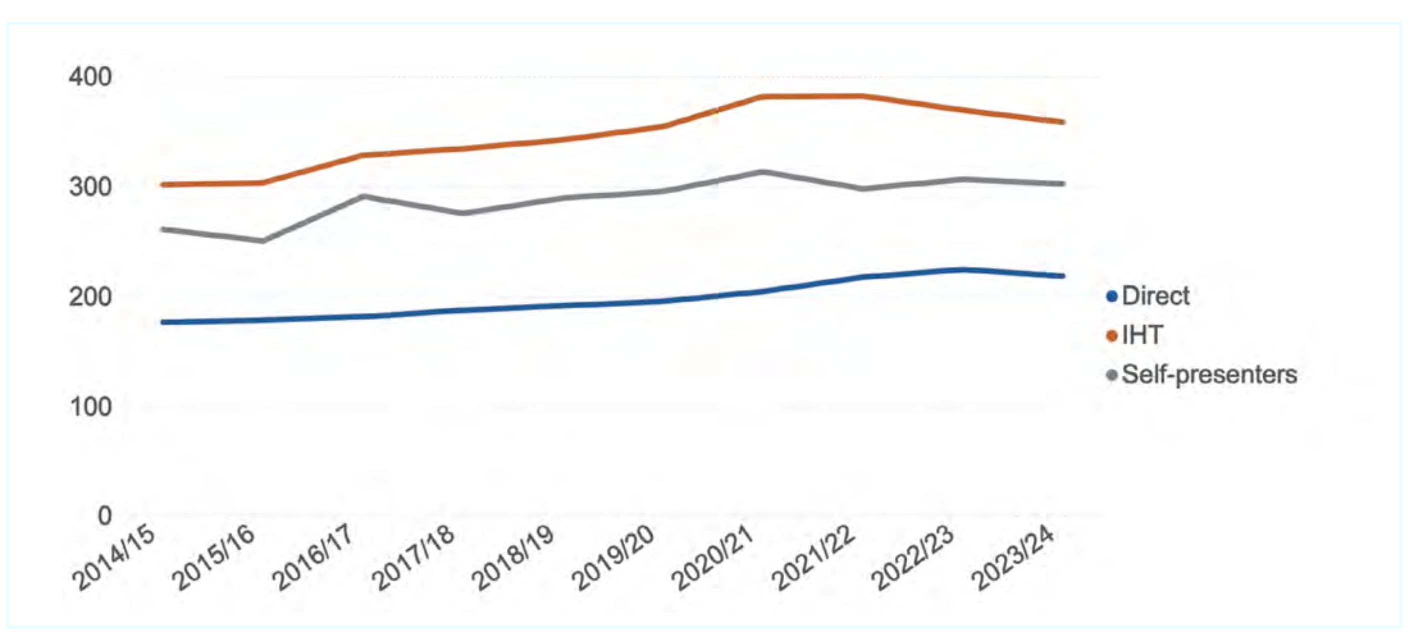
Figure 3.5: Percentage of higher-risk STEMI heart attack patients self-presenting to hospital by month, April 2019 to March 2024 [MINAP data]



DTB = Door-To-Balloon; STEMI = ST-elevation myocardial infarction

Self-presenting patients face delays as they are triaged in A&E departments, so have considerably longer Symptom-To-Balloon (STB) times [Figure 3.6]. This underscores the recommendation for all patients who think they might be suffering a heart attack to call 999 and allow the ambulance services to assess them and, if the diagnosis is confirmed, take them directly to the catheter laboratory of the local heart attack centre so that immediate PPCI treatment can be delivered. It also avoids such patients turning up at a hospital that does not have PPCI facilities and then requiring an inter-hospital transfer (IHT) to a centre that can deliver the procedure.

Figure 3.6: **STB times for PPCI patients with higher-risk STEMI heart attacks, 2019/20 to 2023/24 [MINAP data]**



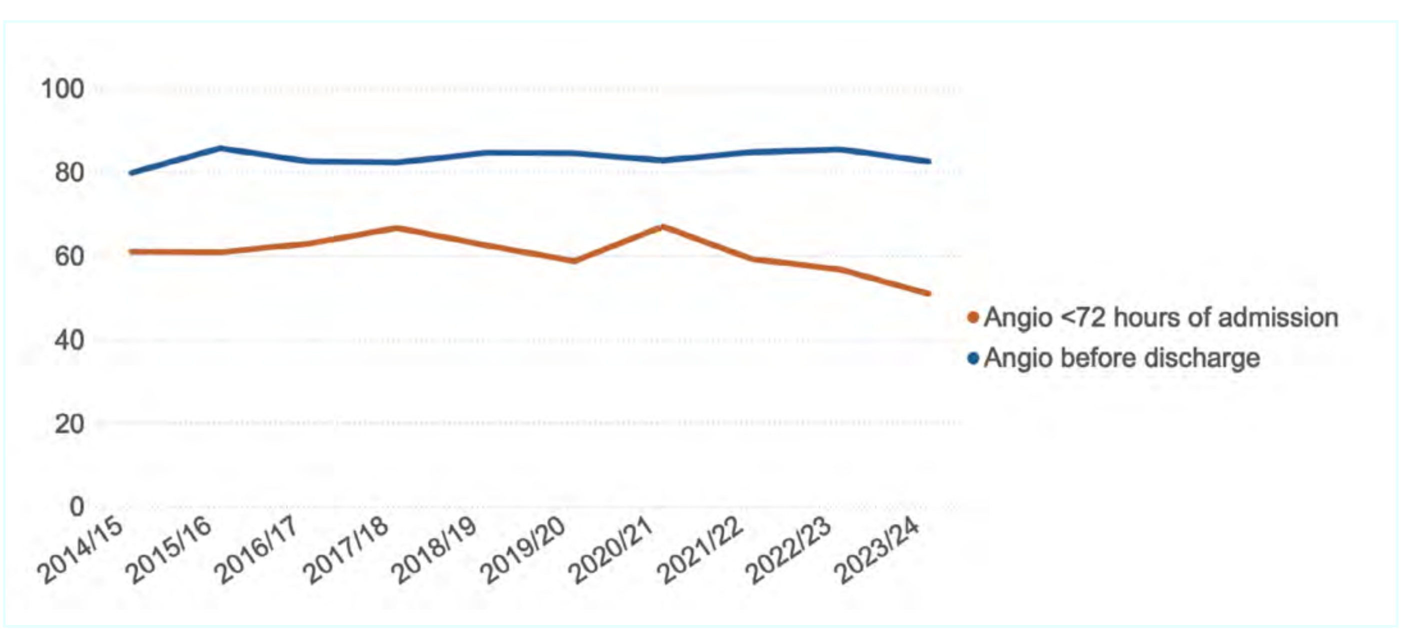
STB = Symptom-To-Balloon; IHT = inter-hospital transfer

3.2 Patients with lower-risk NSTEMI heart attacks are waiting longer for investigation

For patients with lower-risk non-ST-elevation myocardial infarction (NSTEMI) heart attacks, the percentage undergoing angiography before being discharged fell by 3.4% in 2023/24 [Figure 3.7]. The proportion of patients undergoing this investigation within the target time of 72 hours continues to worsen (down from 67% in 2020/21 to 51% in 2023/24).

Pre-discharge angiography peaked during the pandemic as catheter laboratory availability for urgent cases increased following the deferral of elective cardiology procedures. Since then, the volume of elective cases has grown.

Figure 3.7: **Percentage of patients with lower-risk NSTEMI heart attacks undergoing angiography within 72 hours of admission and before discharge, 2014/15 to 2023/24 [MINAP data]**

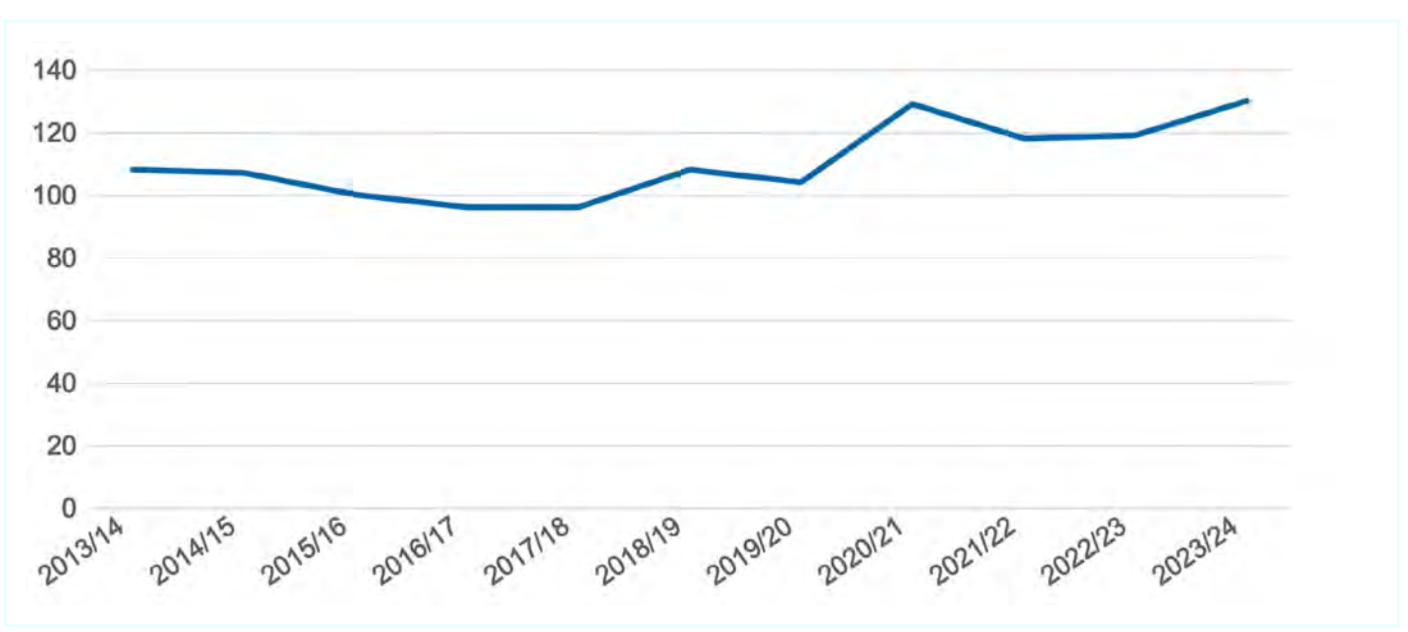


NSTEMI = non-ST-elevation myocardial infarction; Angio = coronary angiography

3.3 CABG patients are waiting longer for their operations

Delays to surgery for elective coronary artery bypass graft (CABG) patients reached 130 days in 2023/24 [Figure 3.8]. This is the time between undergoing angiography to determine treatment and having the CABG procedure.

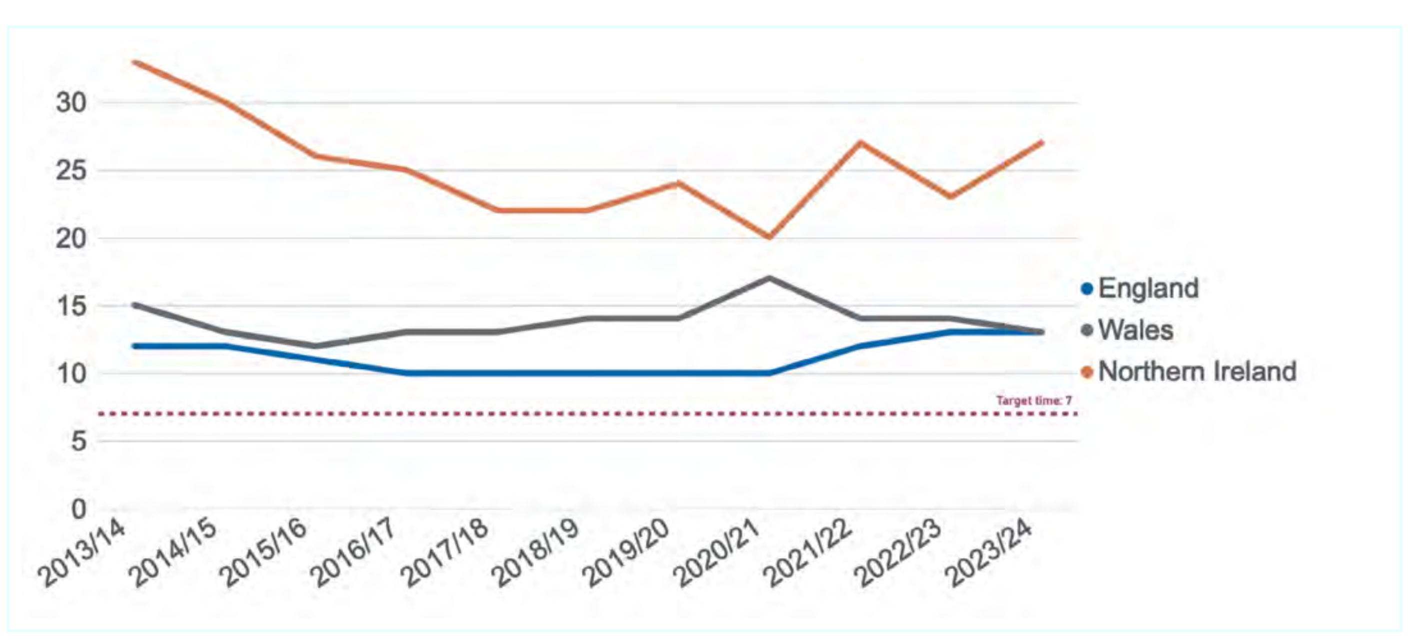
Figure 3.8: **Average waiting times (days) from angiography to elective CABG surgery, 2013/14 to 2023/24 [NACSA data]**



CABG = coronary artery bypass graft

For urgent cases, average waiting times improved in Wales to 13 days during 2023/24 while they rose in England (also 13 days) [Figure 3.9]. Waiting times in Northern Ireland have deteriorated to 27 days. All hospitals should improve their care pathways to reach the target of delivering urgent CABG surgery within seven days of angiography.

Figure 3.9: Waiting time (days) from angiography to urgent CABG surgery, 2013/14 to 2023/24 [NACSA data]



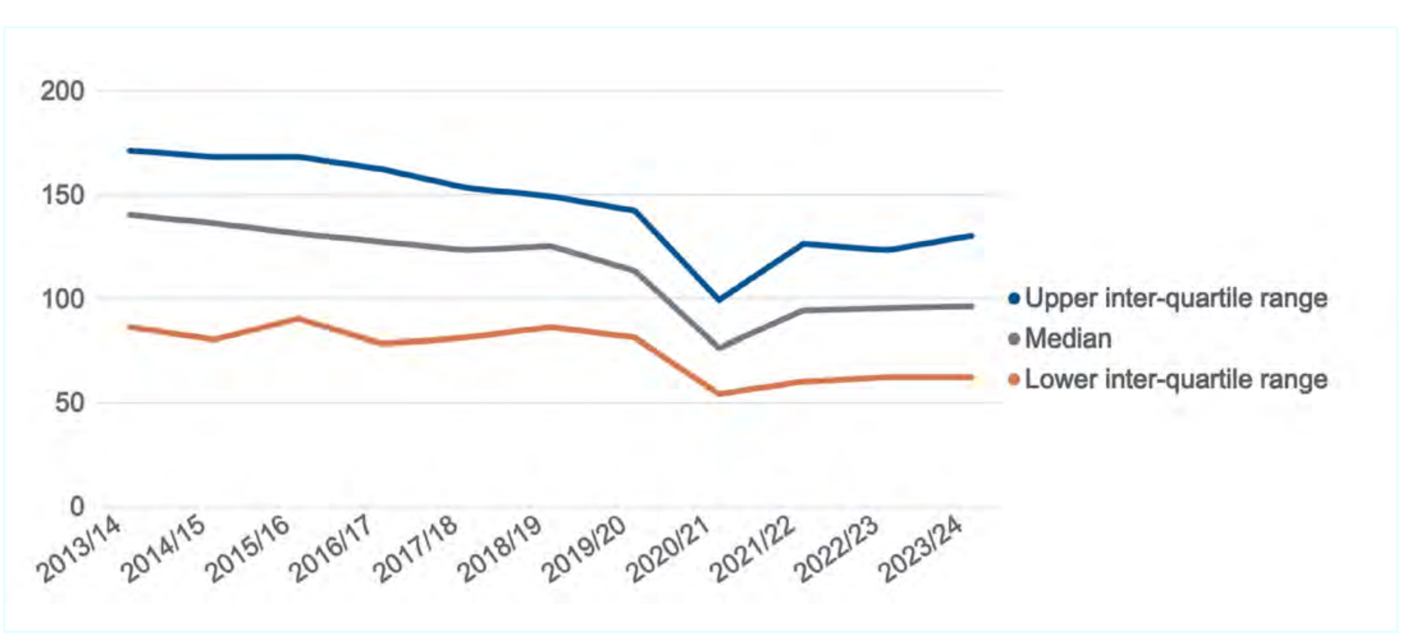
CABG = coronary artery bypass graft

4. HF and TAVI patients are experiencing shorter lengths of stay but productivity in adult cardiac surgery has declined

4.1 Average cases per cardiothoracic surgeon have fallen

Most cardiac surgeons should be able to perform >150 operations a year. Accepting the growing requirement for two-consultant procedures and a proportion of complex operations that may take many hours, a median of 96 procedures per consultant in 2023/24 is much lower than the 140 cases per consultant reported in 2013/14 [Figure 4.1]. Analysis of data from the NAPCI also shows a fall in the mean number of cases amongst consultant interventional cardiologists who specialise in PCI and other minimally-invasive procedures, from 145 cases a year in 2005 to 116 cases a year in 2023/24.

Figure 4.1: Median surgical cases per cardiothoracic surgeon, 2013/14 to 2023/24 [NACSA data]



This reduction in average cases per consultant may be associated with:

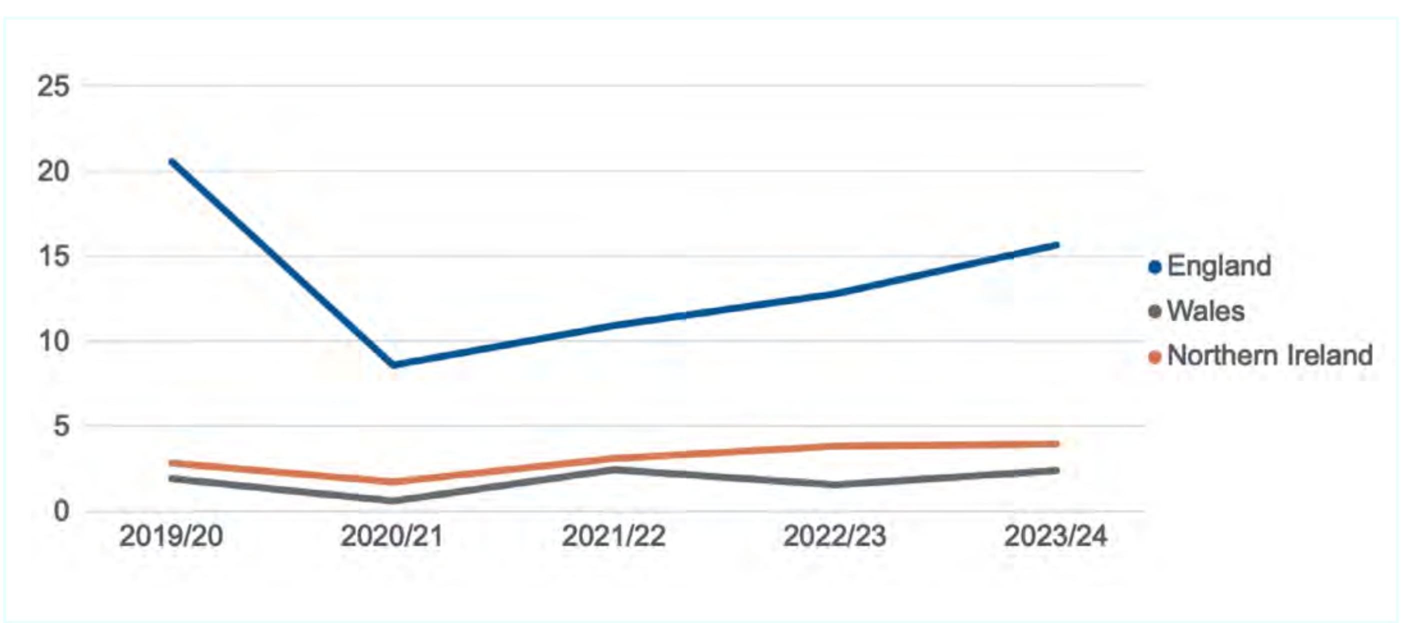
- a lack of nursing or anaesthetic support
- insufficient access to ITU beds
- increased complexity of cases
- the need to increase the number of PCI consultants, largely to ensure sustainability of emergency on-call rotas which would be expected to reduce average cases per consultant
- catheter laboratory time being used to accommodate the growth in TAVI and other structural heart disease procedures as well as the rise in AF ablation procedures.

NHS England waiting list figures show increases for both diagnostic and interventional procedures and it is likely that evening clinics, weekend working and additional NHS activity in the private sector will be needed to tackle these. However, this can only be achieved if consultants are freed up to take on this work and where the necessary infrastructure and support from other staff is available.

4.2 The use of day-of-surgery admissions for elective cardiac surgery could be substantially higher

The efficiency of cardiac services is improved by reducing the time between cases (to ensure operating theatre and catheter laboratory capacity is used to best effect) and by minimising how long patients remain in hospital (to free up beds). The use of day-of-surgery admissions (DOSA) contributes to both these aims and was a major recommendation of the 2018 GIRFT report on cardiothoracic surgery. Progress was hindered by the pandemic and still falls a long way short of the GIRFT target for 50% of all cases to be day cases [Figure 4.2].

Figure 4.2: Percentage of day-of-surgery admissions (DOSA) for elective cardiac surgical operations by country, 2019/20 to 2023/24 [NACSA data]



DOSA = day-of-surgery admission

Successfully delivering booked procedures on the day of admission requires:

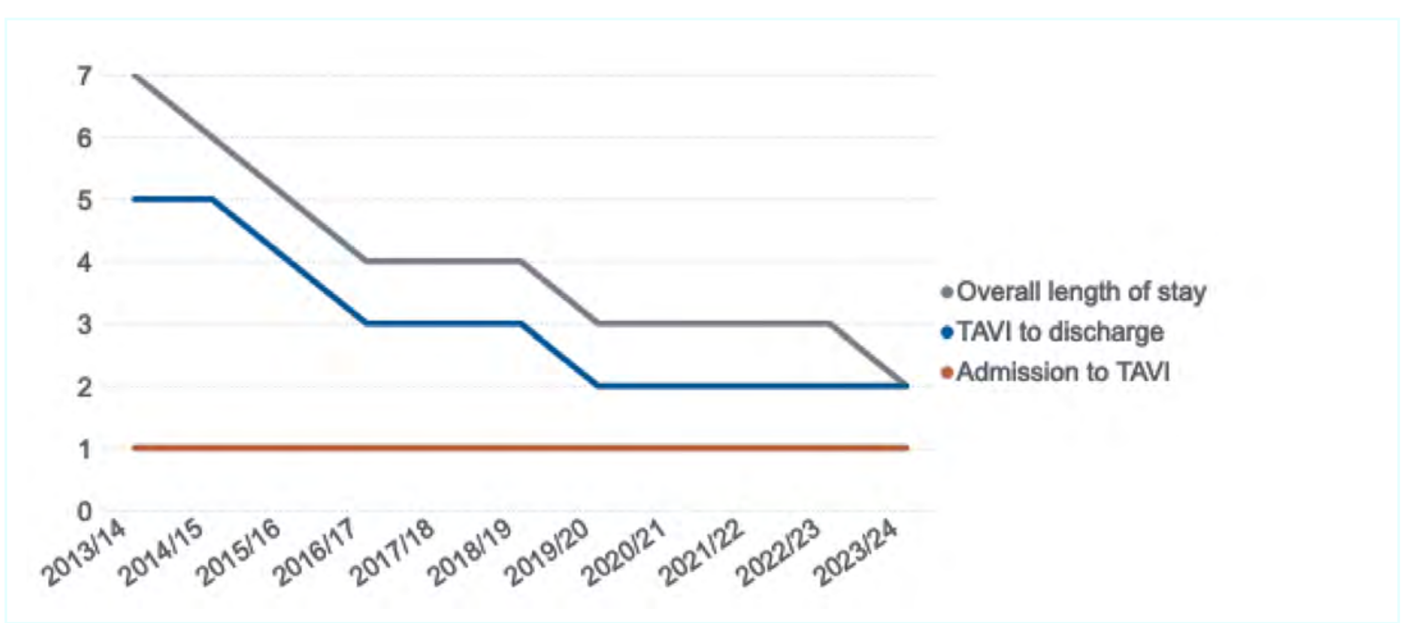
- careful pre-admission processes
- consideration of how to ensure patients are on optimal secondary prevention therapy and have had a referral to cardiac rehabilitation
- good post-discharge planning of outpatient or community services.

4.3 Average length of stay for TAVI patients continues to fall

The growing use of TAVI procedures rather than open heart surgery allows for more rapid recovery, fewer complications and offers the potential for earlier discharge. For elective TAVI, 94% of procedures in 2023/24 were performed using conscious sedation rather than a general anaesthetic, and technical advances now mean that 95% of patients can be treated by the transfemoral approach (with smaller catheters) with fewer complications.

This has enabled early discharge, providing for a very efficient service. The median length of stay is only two days for elective cases [Figure 4.3] and urgent cases are being discharged two days after the TAVI procedure.

Figure 4.3: Median time (days) from admission to elective TAVI, TAVI to discharge, and overall length of stay in hospital, 2013/14 to 2023/24 [UK TAVI Registry data]



TAVI = transcatheter aortic valve implantation

While generally desirable, shorter stays are only appropriate when this does not impact on the care provided. When TAVI was introduced, some patients suffered a disturbance of the electrical impulses of the heart ('heart block') after the procedure which then required a pacemaker to be fitted.

The heart block could occur several days after the TAVI procedure and patients were therefore kept in hospital for observation. Following technical improvements, fewer patients now have this problem, and a pacemaker implant is required after TAVI in fewer than 6% of cases.

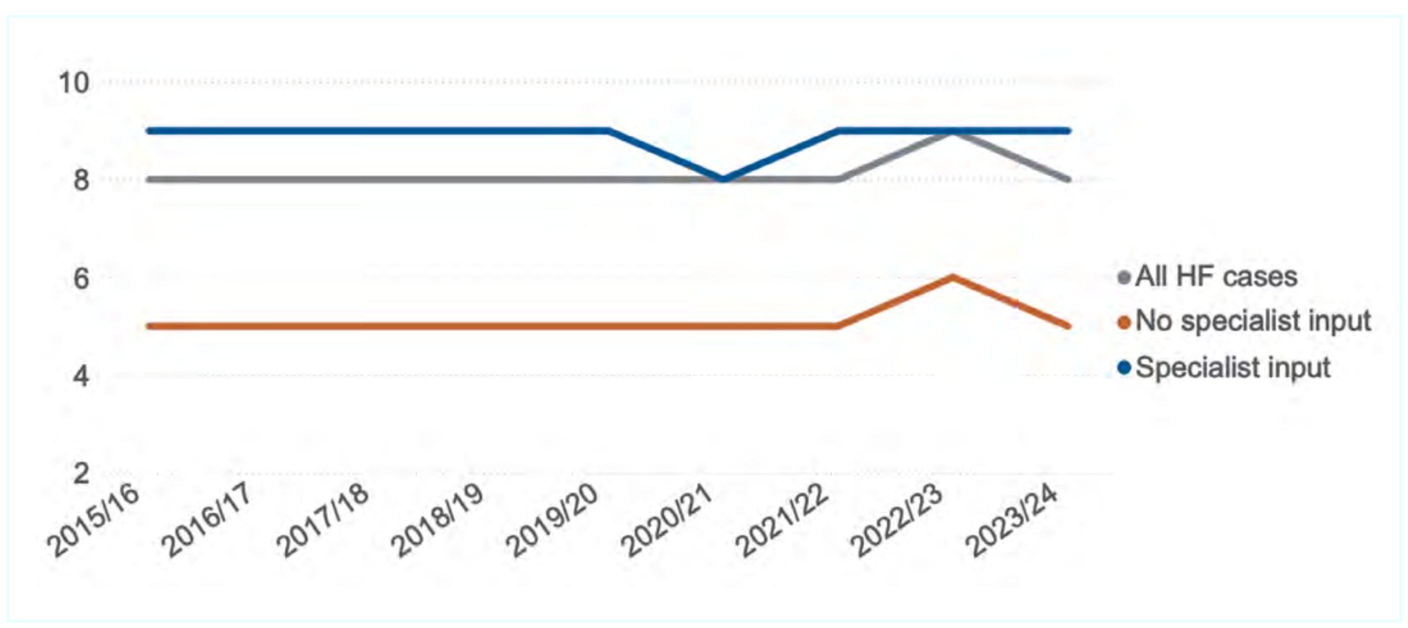
However, the 30-day mortality for both elective and urgent TAVI cases is higher than the in-hospital mortality (1.6% versus 0.6% for elective cases and 2.7% versus 1.3% for urgent cases). As both urgent and elective TAVI cases involve two days from the TAVI procedure to discharge, it will be important to investigate that these early deaths do not arise because opportunities to recognise and manage early rhythm problems are missed.

4.4 Length of stay for HF patients is falling but this might not always be justified clinically

As with TAVI cases, it is important to ensure that shorter stays for HF patients do not affect the quality of care provided. [Figure 4.4] shows that in-patient stays for HF patients are four days longer when specialist care is provided (wherever the patient is nursed). The length of stay is also two to three days longer for those treated on a cardiology ward compared with general medical wards.

Those treated on the cardiology wards or receiving specialist input are more likely to have been prescribed the appropriate secondary prevention drugs, more likely to have been referred to rehabilitation and have better outcomes. Shorter stays for HF patients may be justified when additional community support services are put in place that effectively replace what may have been achieved during the primary hospital admission.

Figure 4.4: Median length of stay for HF patient by access to specialist care, 2015/16 to 2023/24 [NHFA data]



HF = heart failure

5. Quality of care is improving on a range of metrics though there are some areas of concern

5.1 Progress is being made on a range of quality metrics

Across the domains of the NCAP there is evidence of good performance and individual hospitals with outstanding results for specific quality metrics, including:

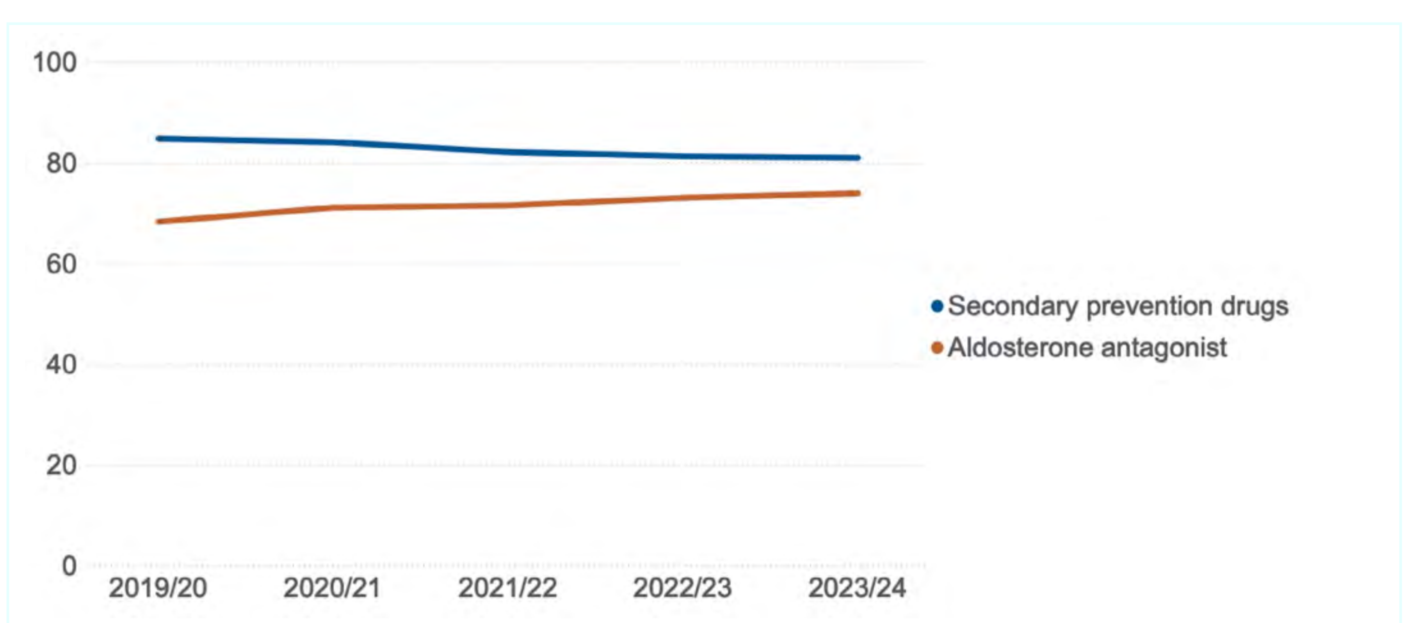
- very low mortality rates for cardiac surgery in adults and in children with congenital heart disease alongside low complication rates across all procedures
- more heart attack patients being managed on a cardiac ward and most of such patients being seen by a specialist team, receiving appropriate care and having referrals to cardiac rehabilitation on discharge
- more higher-risk STEMI heart attack patients being prescribed the newer P2Y12 antiplatelet drugs rather than clopidogrel
- most hospitalised HF patients being seen by a specialist team and many receiving appropriate care (though too many still do not receive specialist input or the treatments for which they are eligible)
- increasing use of intracoronary imaging, associated with better outcomes in PCI cases for left main coronary lesions and for complex PCI cases
- the majority of TAVI procedures being performed under conscious sedation using the percutaneous transfemoral approach, alongside fewer complications and falling in-hospital and 30-day mortality rates
- low re-intervention rates because of complications in the first year after a cardiac rhythm management device implant.

The rest of this section highlights some specific areas though where work is needed to improve performance.

5.2 There has been a slight deterioration in secondary prevention treatment after a heart attack

There has been a slight drop off in prescribing of the four core drugs for secondary prevention in heart attack patients (aspirin or equivalent, a beta blocker, a statin and, for patients with impaired left ventricular function, an ACE-inhibitor or equivalent) [Figure 5.1].

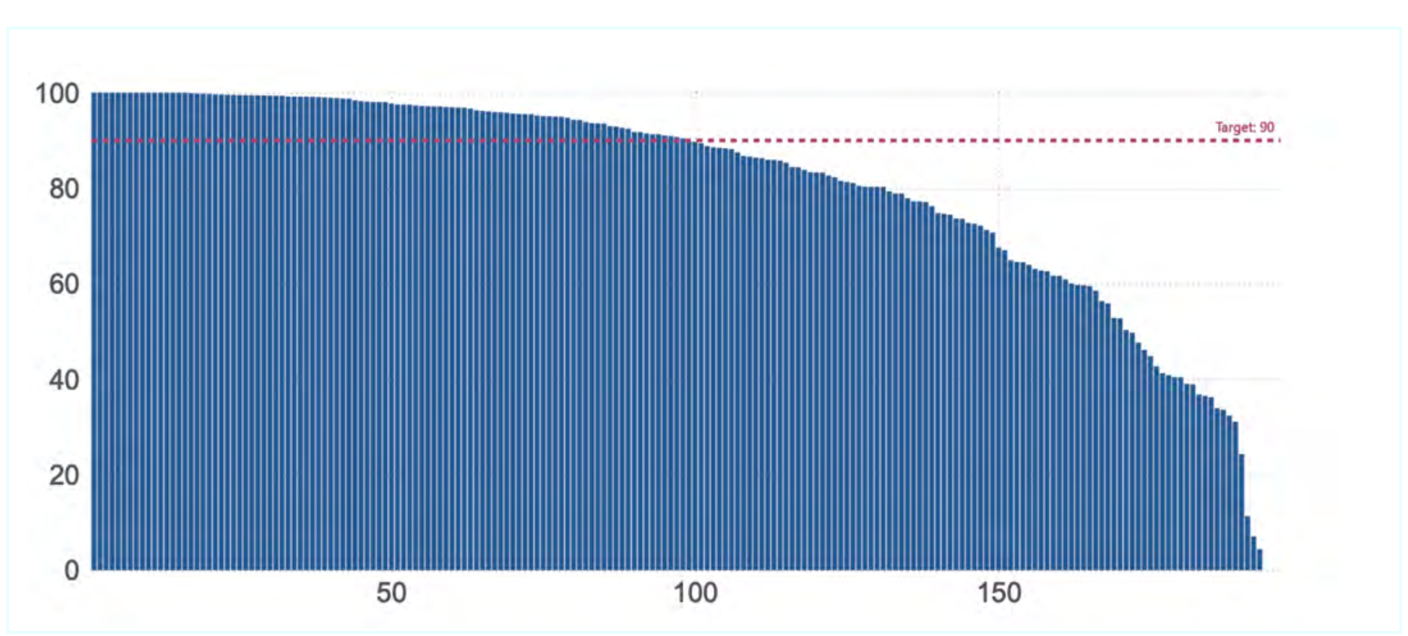
Figure 5.1: Percentage of eligible heart attack patients receiving the recommended drugs, 2019/20 to 2023/24 [MINAP data]



There is also considerable variance between hospitals in the use of these secondary prevention drugs compared with the targets set [Figure 5.2]. The effectiveness of drug prescribing may be impacted by:

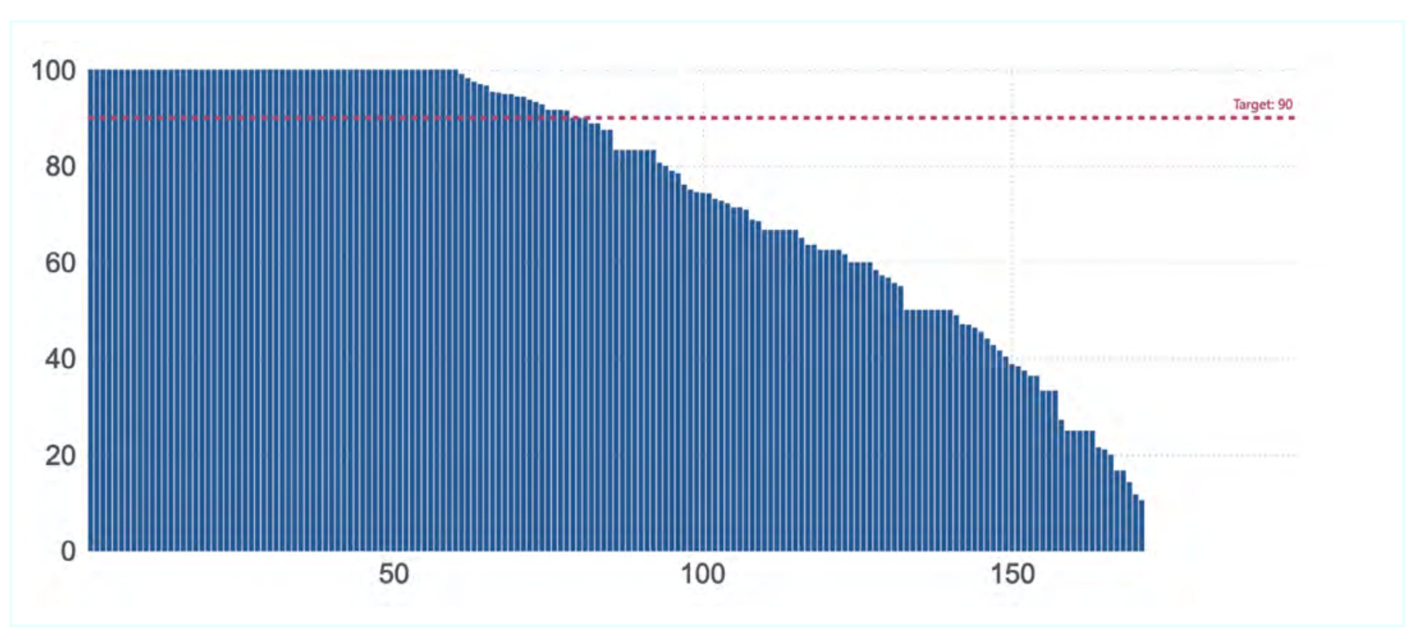
- pressure for early discharge, with initiation and up-titration of drug treatment happening after discharge
- uncertainty around the blanket use of beta blockers for all patients, with some clinicians now less likely to prescribe these drugs to those with good ventricular function (ongoing studies will help shape future guidelines)
- significant differences between hospitals in their use of echocardiography prior to discharge (as this identifies the patients with impaired ventricular function).

Figure 5.2: Percentage of all eligible patients receiving secondary prevention medication by hospital, 2023/24 [MINAP data]



There has, though, been an encouraging increase in the proportion of patients prescribed a mineralocorticoid receptor antagonist (MRA), although there is more variation between hospitals than seems warranted [Figure 5.3].

Figure 5.3: Percentage of all eligible patients receiving an MRA, 2023/24 [MINAP data]

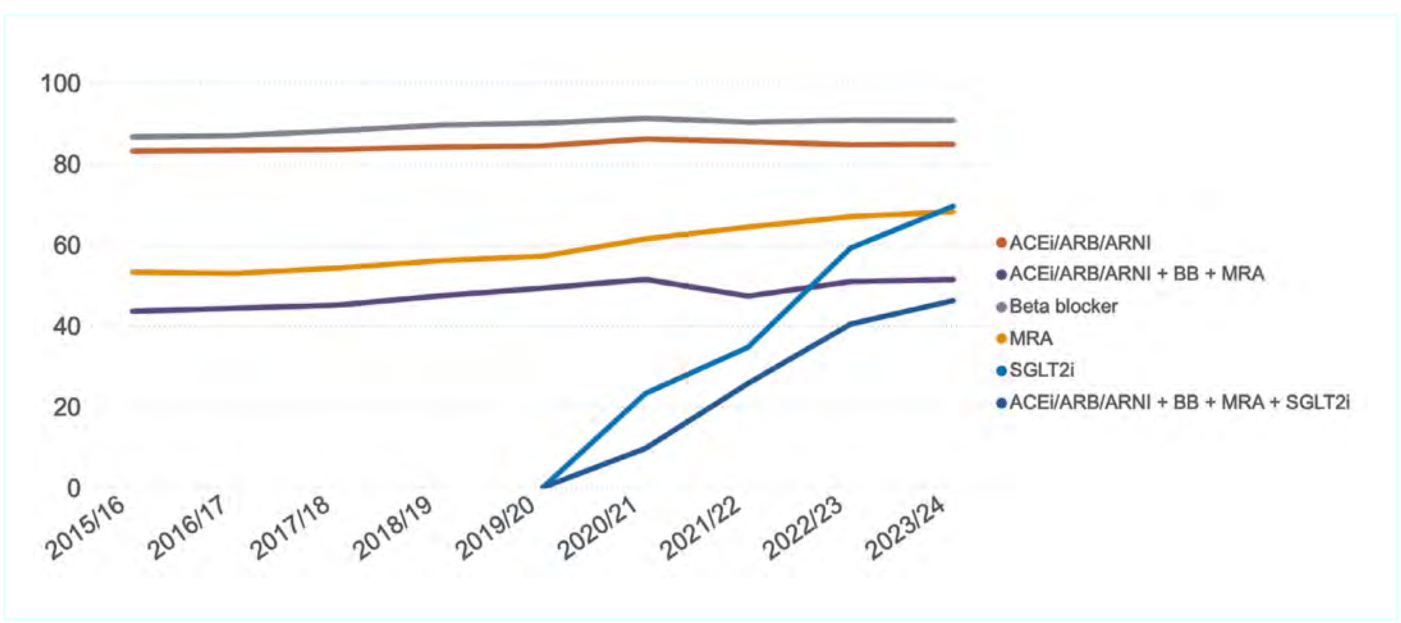


5.3 A shift to post-discharge care may also explain changes in the drug management of HF patients

There has been a rapid rise in the proportion of hospitalised HF patients being prescribed the relatively new class of drugs called sodium glucose co-transporter 2 inhibitors (SGLT2is) [Figure 5.4]. These have been shown to lead to symptomatic and prognostic benefits and their use has now overtaken that of mineralocorticoid receptor inhibitors (MRAs).

The growth in SGLT2i prescribing is encouraging but the plateauing of MRA use is a cause for concern, as the evidence for these less expensive and well-tolerated drugs has been available for many years.

Figure 5.4: Percentage of HF patients with reduced ejection fraction (HFrEF) prescribed different drug treatments, 2015/16 to 2023/24 [NHFA data]



HFrEF = heart failure with reduced ejection fraction; ACEi = angiotensin converting enzyme inhibitor; ARB = angiotension receptor blocker; ARNI = angiotension receptor / neprilysin inhibitor; BB = beta blocker; MRA = mineralocorticoid receptor antagonist; SGLT2i = sodium glucose co-transporter 2 inhibitor

Following new evidence, there has also been a rapid increase in the use of SGLT2is for HF patients with preserved ejection fraction (HFpEF) or mildly reduced ejection fraction (HFmrEF). The combined prescribing rate for these groups was 39% in 2023/24 compared with 5% in 2021/22.

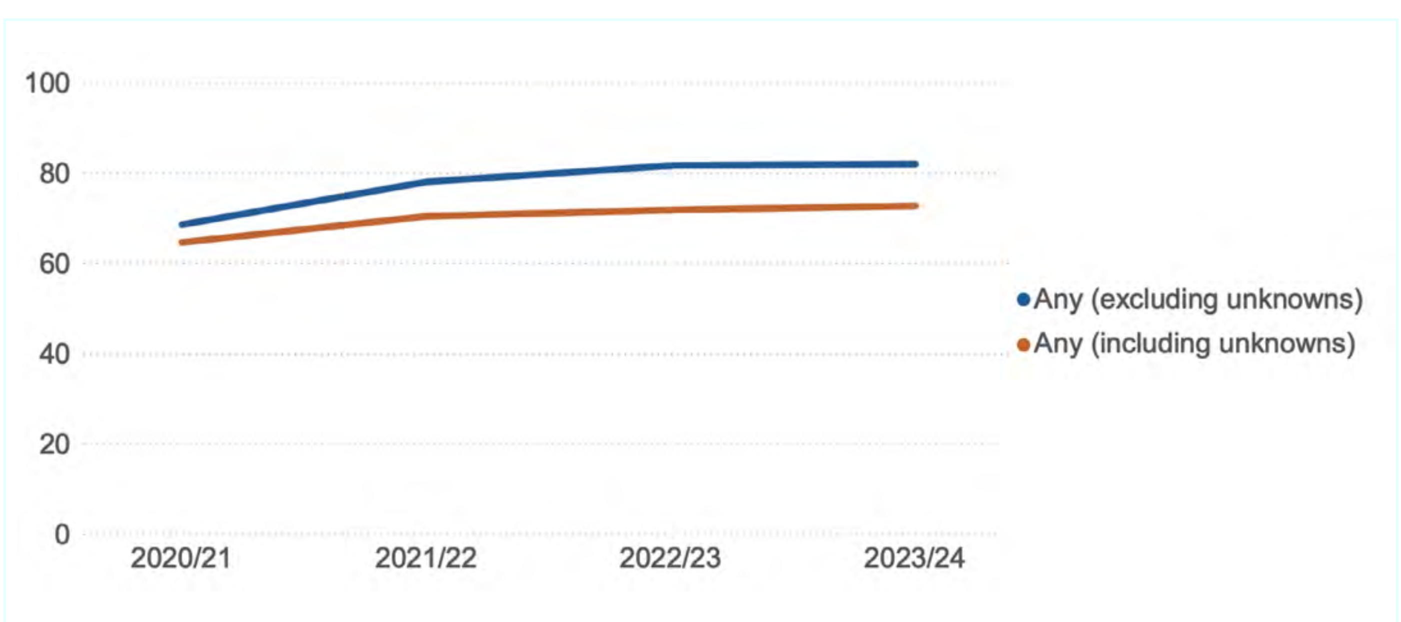
The proportion of patients who should be prescribed all recommended drug classes has increased but not to target levels. Hospitals have fed back that work on initiation and up-titration of these drugs is often performed following discharge.

5.4 Too few HF patients with atrial fibrillation are prescribed an anticoagulant

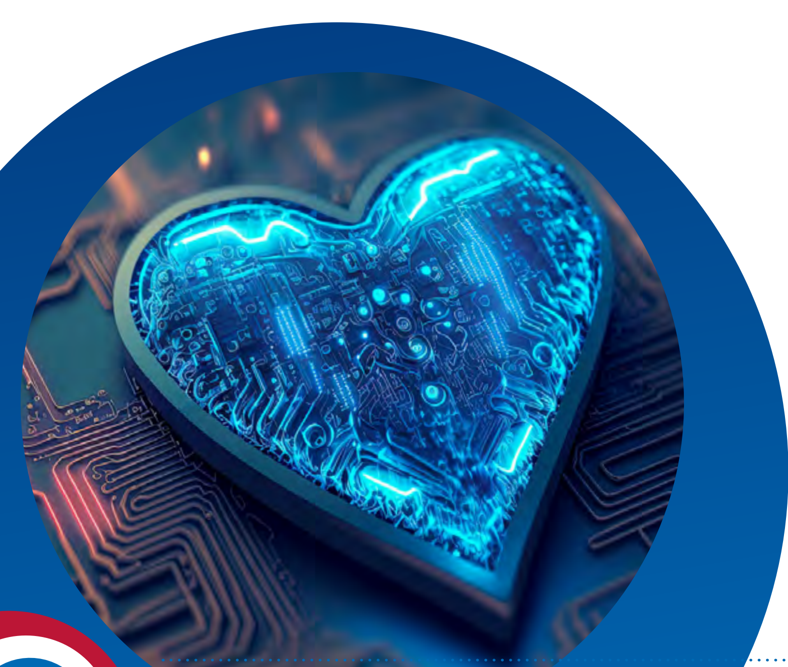
HF patients who develop atrial fibrillation (AF) are at particularly high risk of having a stroke due to embolism of a clot that forms in part of the left atrium (the back left chamber of the heart). These patients should receive anticoagulants ('blood thinners'), which provide better protection against strokes than other drugs such as aspirin.

It is encouraging that there has been a gradual increase in the use of anticoagulants but worrying that nearly 20% of those who appear to have no contra-indication are still not receiving these drugs [Figure 5.5].

Figure 5.5: Percentage of HF patients with atrial fibrillation prescribed an anticoagulant, 2021/22 to 2023/24 [NHFA data]



Note: reference to 'unknowns' relates to the treatment of data submitted to the audit where the prescribing of anticoagulant has not been completed. The rate 'excluding unknowns' does not include these cases in the denominator while the rate 'including unknowns' assumes the drug has not been prescribed.



6. Substantial inequalities and variances persist across the country

6.1 The rate of heart attack admissions differs markedly between areas

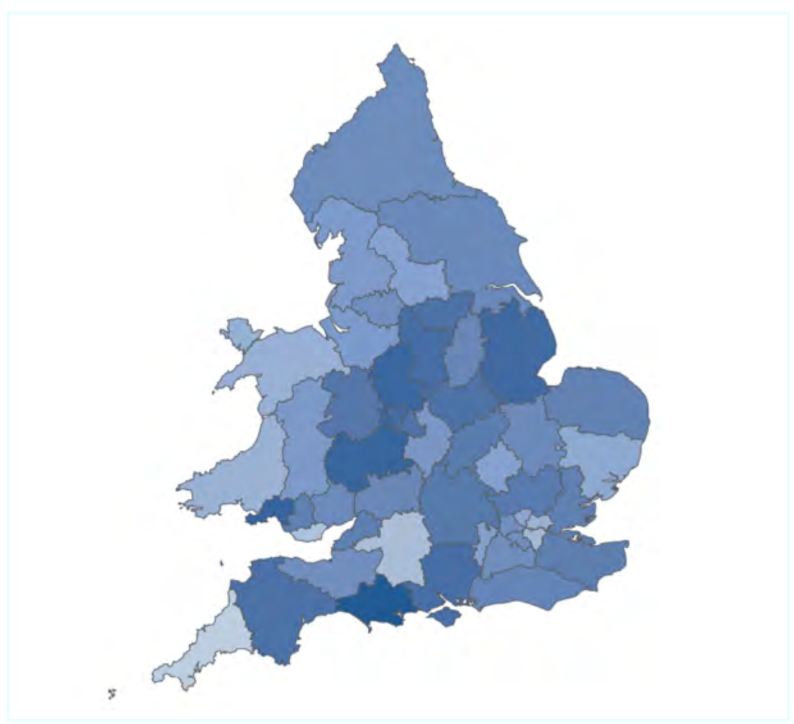
There is a three-fold difference in the rates of heart attack admissions across the Integrated Care Boards (ICBs) in England and University Health Boards (HBs) in Wales. Hywel Dda Local Health Board had the highest rate in 2023/24 (221 per 100,000 population based on the home location of patients) compared with Coventry and Warwickshire ICB which had the lowest rate of 69 per 100,000 population. These figures are not age- and sex-adjusted but the difference suggests that preventive strategies are particularly required in some parts of the country.

There are also considerable differences in the rate of admissions to hospital for heart failure:

- the highest rates in 2023/24 were in NHS Dorset ICB (177 per 100,000) and Swansea Bay University HB (161 per 100,000)
- the lowest in NHS Cornwall and Isles of Scilly ICB (41 per 100,000), Cardiff and Vale University HB (51 per 100,000), and NHS Bath, NE Somerset, Swindon and Wiltshire ICB (54 per 100,000) [Figure 6.1].

These variations may represent differences in the prevalence of heart failure in the population or variability in community care, but the reasons are not fully understood and require further study.

Figure 6.1: HF admissions per 100,000 population based on patient home location by area, 2023/24 [NHFA data]

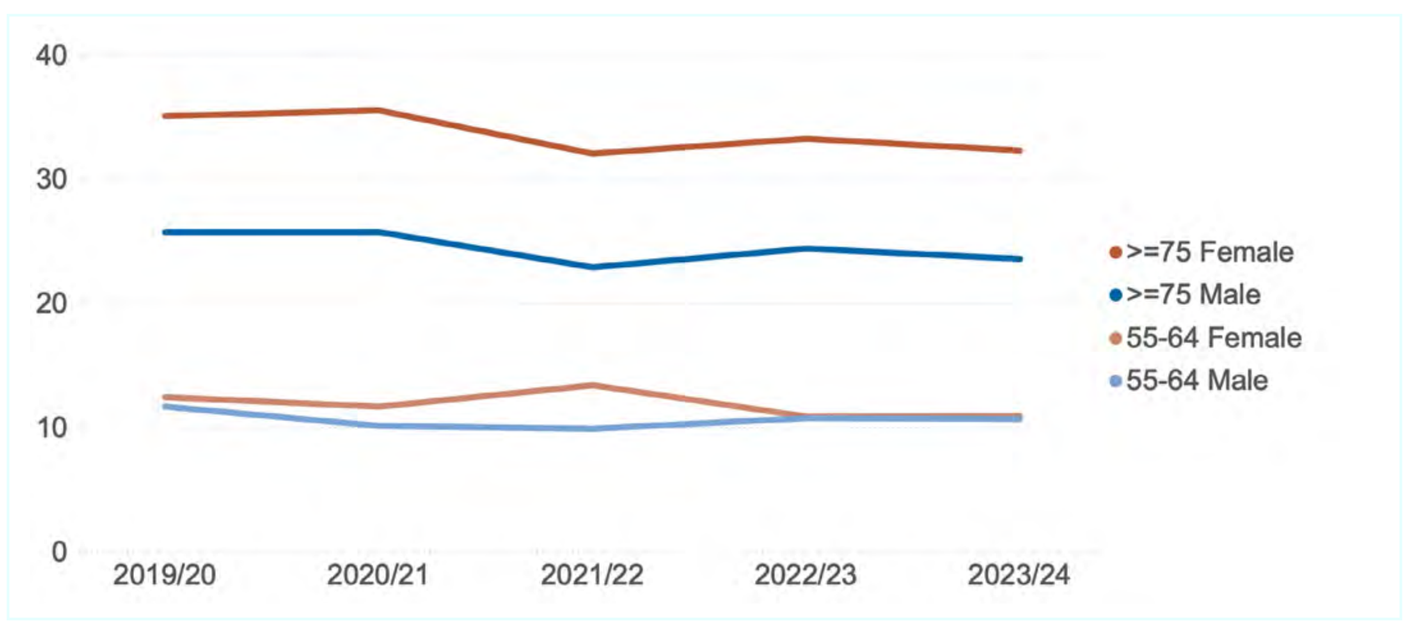


A darker colour represents a higher rate of admissions [darker shades represent numbers >150 per 100,000, the lighter shades represent numbers <75 per 100,000 and intermediate shades are between these figures]

6.2 Older females are less likely to receive reperfusion therapy and Asian patients receive PPCI treatment faster than other ethnicities

There are variations by age and sex in the provision of PPCI treatment to patients with higher-risk STEMI heart attacks. Older females are notably less likely to receive reperfusion therapy [Figure 6.2]. This may result from delays to diagnosis such that referral for PPCI cannot be made within the 12-hour window from symptom onset (e.g. older patients may present later than younger ones or with atypical symptoms and therefore may be more likely to attend A&E rather than calling for an ambulance).

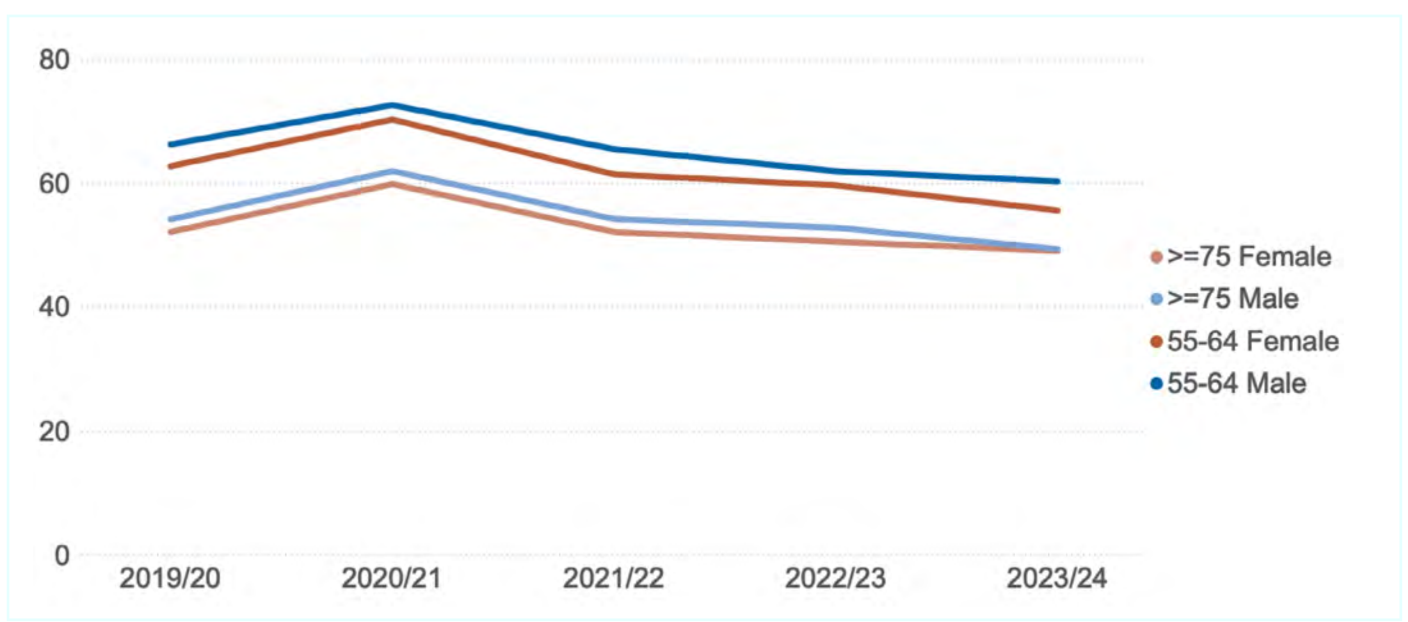
Figure 6.2: Percentage of patients with higher-risk STEMI heart attacks NOT receiving reperfusion therapy by age and gender, 2019/20 to 2023/24 [MINAP data]



STEMI = ST-elevation myocardial infarction

Older patients with lower-risk NSTEMI heart attacks are also least likely to be investigated by angiography within the target time of 72 hours from admission to hospital [Figure 6.3].

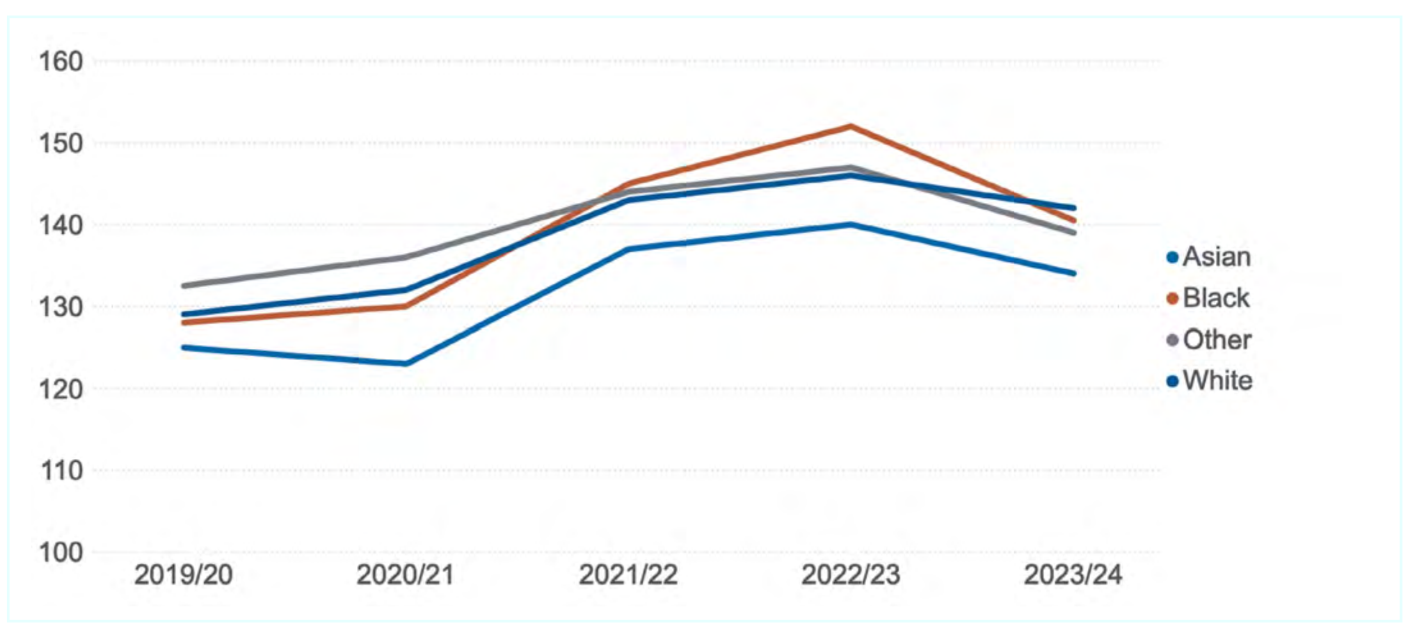
Figure 6.3: Percentage of patients with lower-risk NSTEMI heart attacks receiving angiography within 72 hours of admission by age and gender, 2019/20 to 2023/24 [MINAP data]



There are also differences in treatment by ethnicity. Overall Call-To-Balloon times are longer for white, black and mixed-race patients than for Asians once patients with higher-risk STEMI heart attacks have made a call for help or self-presented to hospital [Figure 6.4].

This may in part be age-related (Asians in general suffer heart attacks at a younger age) though other inter-related factors are almost certainly at play. A low diagnostic threshold should be maintained, and care delivered equally for all ethnicities.

Figure 6.4: CTB times for PPCI patients with higher-risk STEMI heart attacks by ethnicity, 2019/20 to 2023/24 [MINAP data]



CTB = Call-To-Balloon; STEMI = ST-elevation myocardial infarction

6.3 Prescribing of recommended heart failure drugs is lower in older people

Older people are the least likely to be prescribed evidence-based secondary preventive agents and are more likely to be prescribed diuretics which help with symptom control but have no prognostic advantage.

It may be that some elderly patients, faced with polypharmacy and information about possible side effects, choose not to take these drugs, preferring symptom control over the potential for prolongation of life. Even so, whether to use these drugs or not should be included in any shared decision-making discussions.

Older patients aged 75 or more are increasingly less likely to receive their care on a cardiology ward [Figure 6.5]. It may be entirely appropriate for elderly patients with multiple comorbidities to be cared for on an elderly care or general ward, but patients are more likely to receive optimum care (and have better survival) if they are cared for on a cardiology ward.

If not cared for on a cardiology ward, the quality of care for HF patients is improved by seeing a heart failure specialist team during their time in hospital. However, about 20% of patients are still not seen by a specialist team [Figure 6.6] and around two thirds of hospitals do not reach the audit target of 90% of patients to be seen by a specialist team.

Figure 6.5: Percentage of admitted HF patients who receive care on a cardiology ward by age group, 2015/16 to 2023/24 [NHFA data]

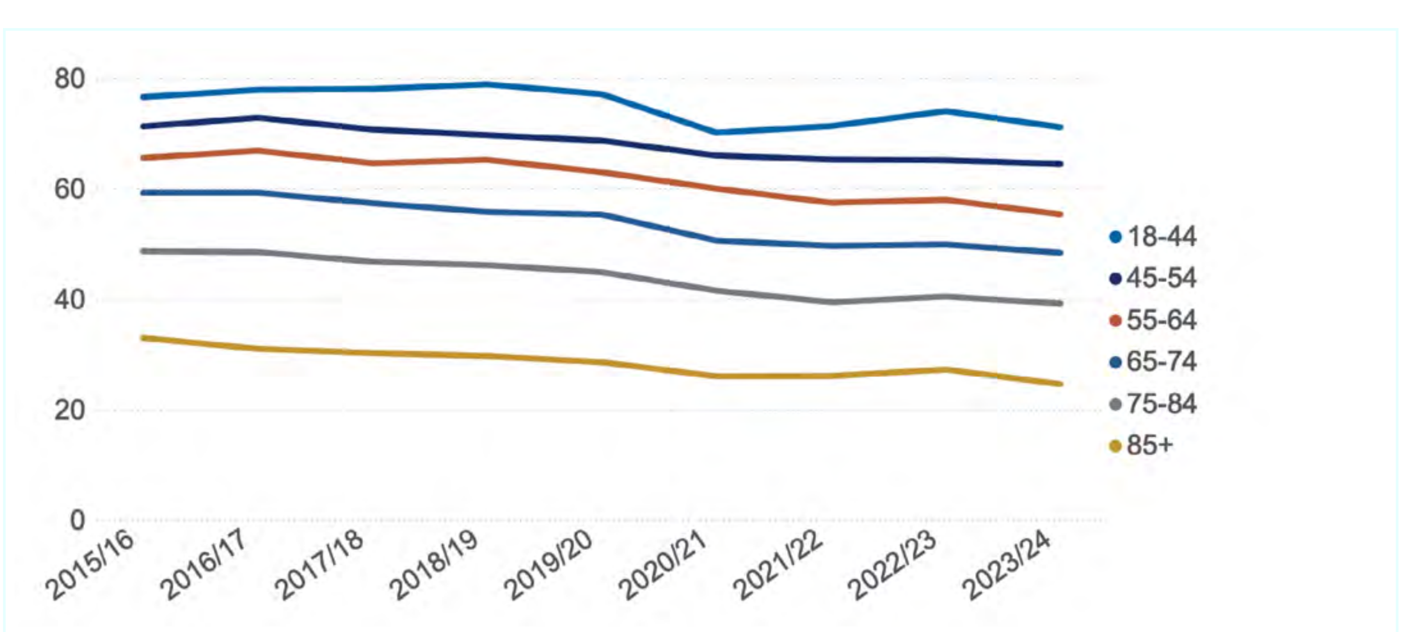
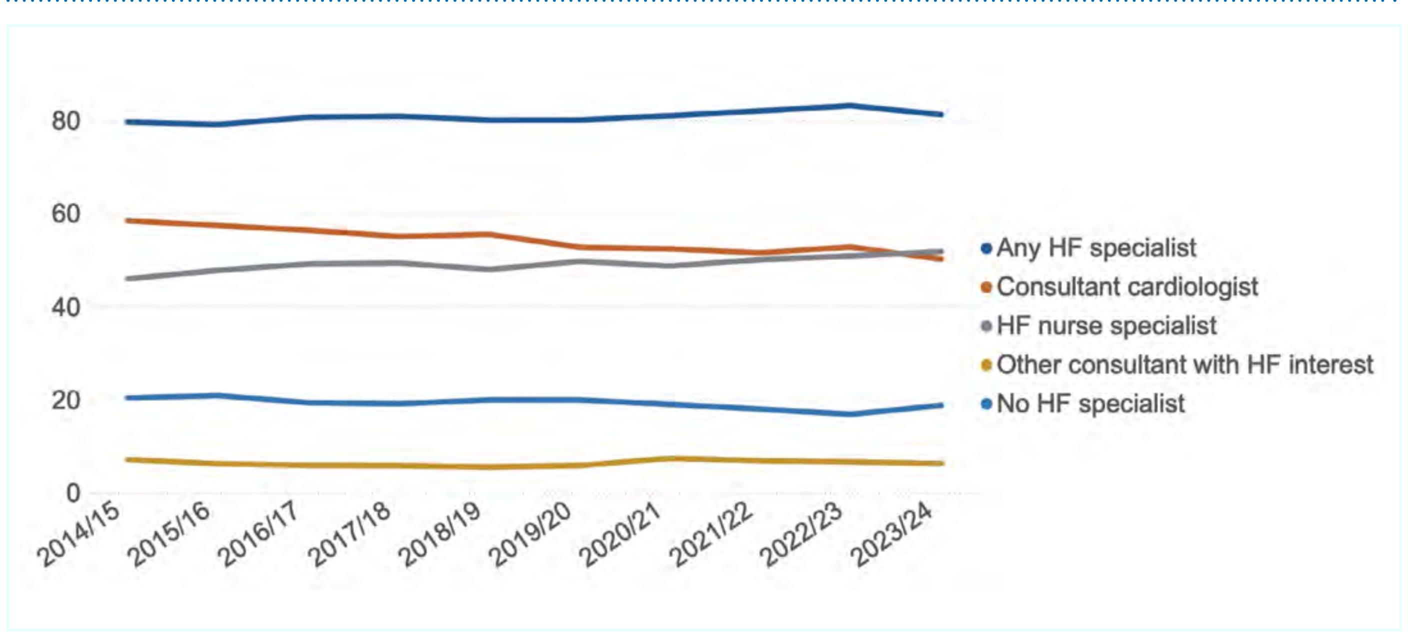


Figure 6.6: Percentage of HF patients who are seen by a heart failure specialist team, 2014/15 to 2023/24 [NHFA data]

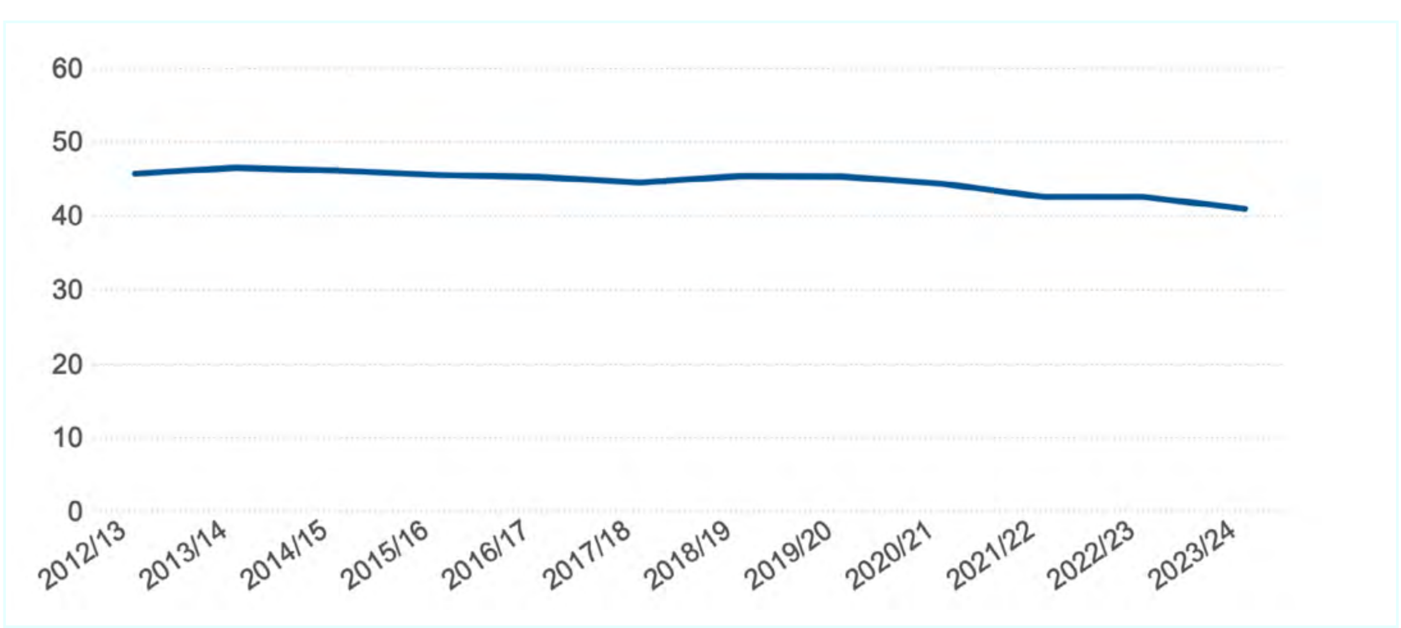


HF = heart failure

6.4 Female patients are less likely to receive TAVI procedures

Older female patients make up 41% of TAVI patients whereas the proportion of females aged over-75 in the population is 57% (Census 2021) [Figure 6.7]. This suggests eligible females may not be receiving appropriate TAVI treatment, although further research is needed into gender-specific natural histories and modes of presentation.

Figure 6.7: Proportion of TAVI patients by gender, 2012/13 to 2023/24 [UK TAVI Registry data]



TAVI = transcatheter aortic valve implantation

6.5 More males are being treated using the LAAO and PFOC structural heart procedures

Of all the cases submitted to the new LAAO registry, 75% have involved males. This is surprising given that female sex is a component of the risk scoring to predict the likelihood of stroke in untreated patients. No conclusions can be made at this stage regarding equity of access, as insufficient is known about the epidemiology of AF and associated co-morbidities and frailty in the elderly. As it develops, the LAAO Registry will provide useful insights into these issues.

Male-female differences in treatments do not always signify inequity of access. While 57% of PFOC procedures have been performed on males, females predominate in those aged under 50. This reflects the fact that higher oestrogen levels, the use of the oral contraceptive pill and pregnancy all predispose individuals to paradoxical embolism (the mechanism by which a stroke can occur in association with a patent foramen ovale).

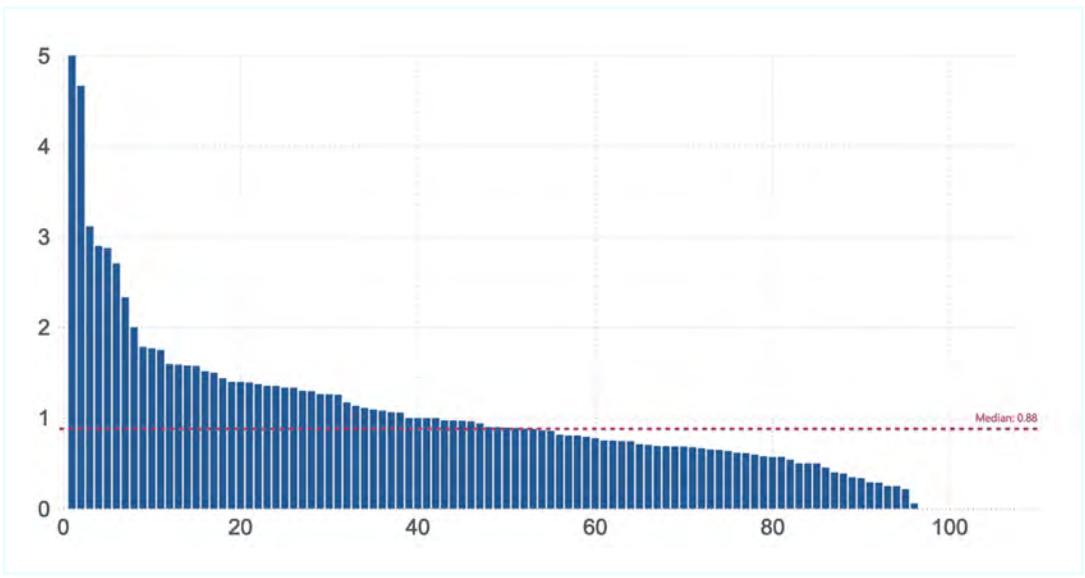
6.6 Clinical practice in the choice of resynchronisation therapy for HF patients varies significantly

Some HF patients benefit from the use of implanted devices to help optimise heart pump function. These devices, called cardiac resynchronisation therapy (CRT), come in two forms:

- CRT-P devices use the pacemaker function to improve heart function
- CRT-D devices have the additional capacity to defibrillate the heart in the event of a potentially lethal fast heart rhythm.

Current evidence suggests that many patients do not gain additional benefit from a CRT-D device compared to the use of a CRT-P device. While there has been a national trend towards greater use of CRT-P devices, there is very wide variation in this between individual hospitals [Figure 6.8]. This suggests considerable differences in clinical practice as it is unlikely that such differences are explained by case mix.

Figure 6.8: Ratio of CRT-D:CRT-P procedures for HF patients by hospital, 2023/24 [NACRM data]



CRT-D = cardiac resynchronisation therapy with defibrillator function;
CRT-P = cardiac resynchronisation therapy with pacemaker function

7. Three new structural heart disease registries require comprehensive and timely data submission from hospitals

7.1 Transcatheter Mitral and Tricuspid Valve (TMTV) Registry

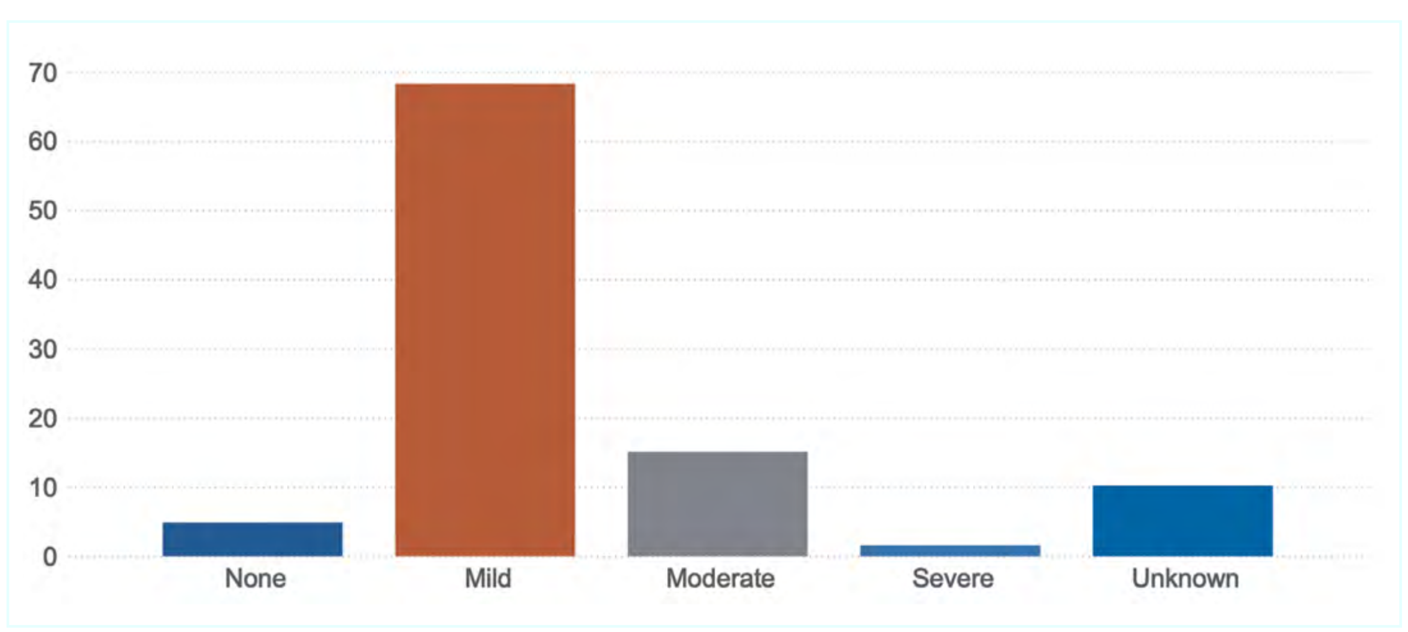
2023 and to date has collected data from 22 centres. NHS England has commissioned 20 hospitals to perform this procedure. A total of 530 procedures have been submitted to date, of which 391 are mitral transcatheter edge-to-edge repairs (TEERs).

Over 90% of TMTV procedures to date have been elective with a short (2-day) median length of stay. The median length of stay for urgent cases has been 12 days, with three days from the TMTV procedure to discharge.

Although the NHS England Commissioning Policy relates to procedures for degenerative problems with the mitral valve (when surgical repair is not recommended), 38% of mitral TEERs have been for cases with functional mitral regurgitation (MR). Overall procedural success in 2023/24 has been good, reducing severe MR from 85% pre-procedure to 1.5% after [Figure 7.1].

The rate of in-hospital mortality for TMTV cases has been 1.9% and other complications such as stroke (reported in 0.6% of cases) are infrequent.

Figure 7.1: Percentage of mitral TEER cases by post-procedure severity of mitral regurgitation, 2023/24 [TMTV Registry data]



TEER = transcatheter edge-to-edge repair

7.2 Left Atrial Appendage Occlusion (LAAO) Registry

LAAO procedures are used to counter the increased risk of stroke in patients with a heart rhythm disturbance called atrial fibrillation (AF), who either have had a complication caused by taking anticoagulants or are deemed to be at very high risk of bleeding. These issues are more common in older patients and 80% of LAAO patients are 70 years or older. Of these, 80% have an untreated estimated risk of stroke of 3% per year or higher.

The LAAO Registry opened for data submissions in early 2024. To date, 10 of the 14 commissioned hospitals in England have registered and are submitting data and work is ongoing to support other centres to start. So far, 126 procedures have been reported from these ten centres.

7.3 Patent Foramen Ovale Closure (PFOC) Registry

Previously, data on these procedures were submitted to the National Congenital Heart Rhythm Audit (NCHDA). Data for the vast majority of PFOC procedures are now to be submitted to the PFOC Registry, which captures more detail on patient co-morbidities, indications for treatment, the procedure itself and outcomes. Procedures on patients with associated congenital heart lesions (apart from variations in aortic valve pathology) should still be submitted to the NCHDA.

Whilst hospitals are registering for the new PFOC Registry, some preliminary analysis from three years of NCHDA data (~750 cases per year) show that most patients have been aged between 18 and 60 years old, consistent with the cohort of individuals randomised in the major trials that demonstrated the efficacy of the treatment.

Most PFOC procedures are performed either as a day case or with a one-night stay. A 1.4% device embolisation rate has been reported, which is a little higher than reported in the trials. Other complications have been very infrequent.

7.4 Hospitals undertaking TMTV, LAAO and PFOC procedures must improve the comprehensive and timely data to the new registries

Although at an early stage in their development, the completeness of data submitted by hospitals so far has been sub-optimal. The planned outputs from these registries require all hospitals to provide complete and timely data.

8. A continuing drive to improve data quality and data timelines

Hospitals and commissioners are keen to see contemporary data on their activity and performance. NICOR gives every hospital access to a series of on-line web-tools that allow them to investigate and validate their data accuracy, as well as examining their performance across the range of data metrics included in the NCAP programme. These data tools give access to the live database and there is an instantaneous 'data in – information out' capability.

NHS England has included timelines for data submission from hospitals to registries within its commissioning standards. Compliance with these will allow NICOR to offer more frequent reports based on complete and validated data. The information generated will provide reassurance around performance and, where required, will help point to actions that can improve the quality of care delivered and the outcomes for patients.

Understanding that there are limits on how rapidly data can be provided in some cases (e.g. for patients with a prolonged stay in hospital), hospitals should be reassured that the NICOR data management process allows for additional and/or corrected data to overwrite previous submissions. **On this basis, all hospitals are asked to submit an early, even if incomplete, submission on each patient treated within two weeks of a procedure or admission.**

9. Thanks and acknowledgements

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

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Following the completion of this report but prior to publication, we were sadly made aware of the deaths of Richard Corder (Patient and Carer representative) and Sheila Marcial (Technical Helpdesk Support Analyst). This report is dedicated to their many years of commitment and service to NICOR.

The NCAP is commissioned by NHS England and GIG Cymru (NHS Wales).

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10. 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. The NCAP is commissioned by NHS England and GIG Cymru /NHS Wales.

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NHS Arden and GEM

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NHS England

NHS England

NHS England leads the NHS in England. NHS England provides national leadership for the NHS. NHS England is creating a new 10-Year Health Plan, to be published in spring 2025. Though the plan, we will 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.

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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National Cardiac Audit Programme (NCAP)

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(2023/24 and 2021/24 data)