NCAP

NATIONAL CARDIAC AUDIT PROGRAMME

NICOR

National Adult Cardiac Surgery Audit (NACSA)

Annual Report 2025

(2024/25 and 2022/25 data)

Report at a glance

All data are for 2024/25 and comparisons with 2023/24 unless otherwise stated

27, 537 - Total number of cases increased 3% but still not back to pre-pandemic levels of activity.

8% - Increase in individual consultant activity but there is probably scope to improve this further.

Large variability between units in terms of activity, complications and readmissions.

97.6% - Unadjusted survival rates following cardiac surgery remain ‘as expected’ for all units in England, Wales and Northern Ireland.
This includes all adult cardiac cases including emergencies.

52% - National mitral valve repair rate has increased slightly.

15% / 18% - Minimally invasive surgery used in 15% of aortic valve and 18% mitral valve cases.

>99% - Survival following low risk aortic valve replacement

>80% - Ten-year survival following aortic valve replacement for patients under 60 years; 65% for those between 61 – 70 years at the time of surgery.

<2% - Post-operative complication rates following coronary artery bypass are low:1.8% for bleeding and 0.2% deep wound infections, but better data collection is needed.

66% - Cardiac surgical units performed fewer than 24 emergency aortic cases.

<50% - Patients undergoing elective or urgent surgery are discussed at a multi-disciplinary meeting.

Recommendations

1.Cardiothoracic surgical centres should continue to support measures which increase the number of cases performed and the number of procedures performed per consultant, to address the waiting times for surgery.

2.Hospitals should prioritise implementation of GIRFT recommendations, in particular discussing patients at MDT meetings and achieving a 50% day of surgery admission for elective cases.

3.Hospitals should ensure that they submit data for all the NACSA data fields to capture the true picture of activity and outcomes.

4.Hospitals should look to increase the volume of minimally invasive cases being performed.

5.Cardiothoracic surgical centres should identify emergency aortic surgery surgeons and ensure support to develop this approach, so that each unit does over 20 cases/year and/or each specialist surgeon can perform over 4 cases/year (http://dx.doi.org/10.1016/j.jtcvs.2017.02.015).

Introduction

The National Adult Cardiac Surgery Audit (NACSA) is part of the National Cardiac Audit Programme (NCAP) which is run by the National Institute for Cardiovascular Outcomes Research (NICOR). The audit aims to drive quality improvement in adult cardiac surgery by tracking trends in activity and outcomes, and benchmarking hospital performance against peers and guidelines/standards.

This report principally focuses on data from the last three years (2022/23 to 2024/25). Earlier years are also included where helpful in illustrating longer-term trends. Previous reports highlighted the impact of the COVID-19 pandemic on the provision of cardiac surgery. The current report demonstrates that service delivery remains lower than pre-pandemic levels but has increased over the last year.

The audit has operated in one format or another since 1977, including reporting outcomes at both hospital and surgeon levels since 2005. Scottish hospitals no longer participate in the audit (instead submitting data to the Scottish Cardiac Audit Programme). Consequently, any data labelled as 'UK' in this report represents England, Northern Ireland and Wales.

This report is of value to a wide range of stakeholders but importantly it allows patients and their relatives to better understand adult cardiac surgical care and its outcomes in the UK. The slides in the report are interactive so you can select and explore the data that interest you. The regularly reported outcome and quality improvement metrics are described here. Together with this report, these give a comprehensive picture of the current state of UK cardiac surgery.

All participating hospitals have contributed data for 100% of their NHS patients undergoing cardiac surgery. We are indebted to the local clinical and audit teams for their dedication and engagement with the data collection, without which this report would not have been possible. We will continue to work closely with hospitals, patients and other stakeholders to improve the quality of audit data and how these are used to improve the delivery of high quality cardiac surgery in the UK.

The NICOR NACSA audit team

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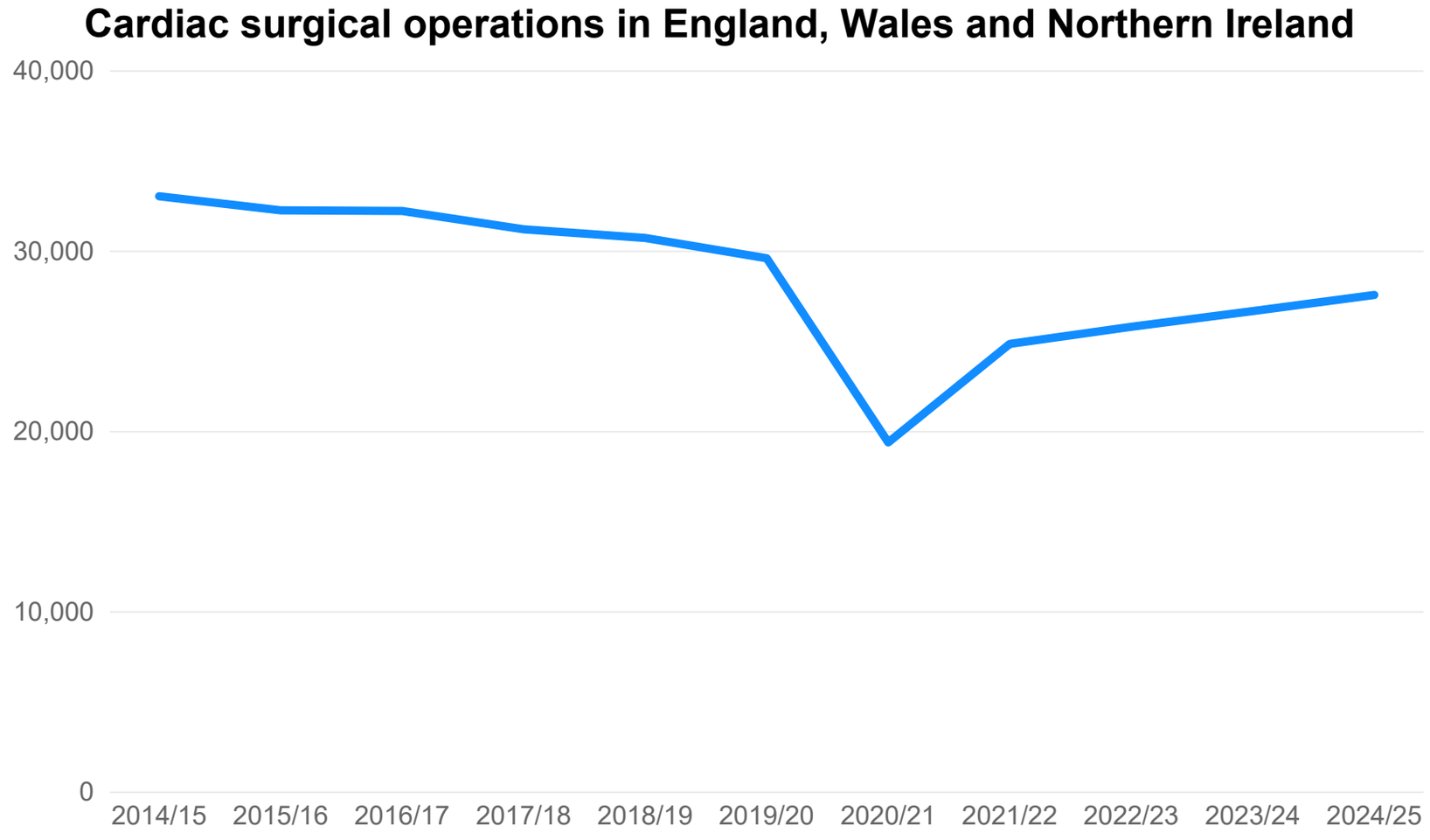
The number of cardiac surgical cases is rising slowly following a long-term downward trend

In 2024/25, the number of cardiac surgical cases in the UK rose by 3% compared to the previous year.

However, this increase follows a longer-term trend of declining activity. In the decade leading up to the COVID-19 pandemic, the annual number of cardiac surgeries had been gradually decreasing. The pandemic then triggered a significant drop in procedures, and activity has yet to fully recover.

In fact, the total number of operations in 2024/25 (27,537) remains 7% below the 2019/20 level and approximately 15% lower than in 2015/16.

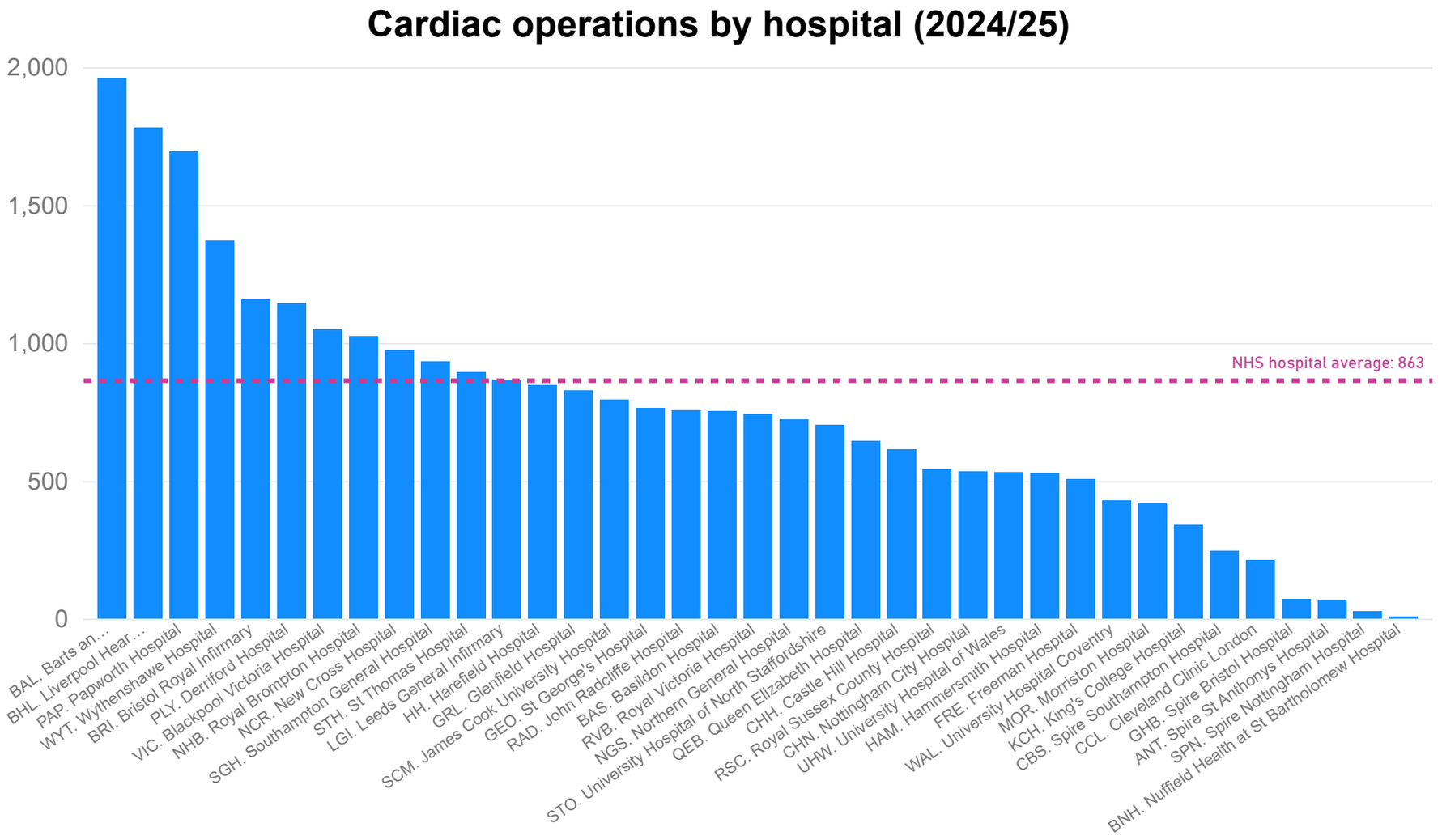


NHS hospitals performed between 340 and 1,961 cardiac operations in 2024/25

On average, each NHS hospital performed 863 adult cardiac operations in 2024/25.

The highest number of operations was 1,961, while the fewest operations performed by an NHS hospital was 340.

Four NHS hospitals performed fewer than 500 operations.



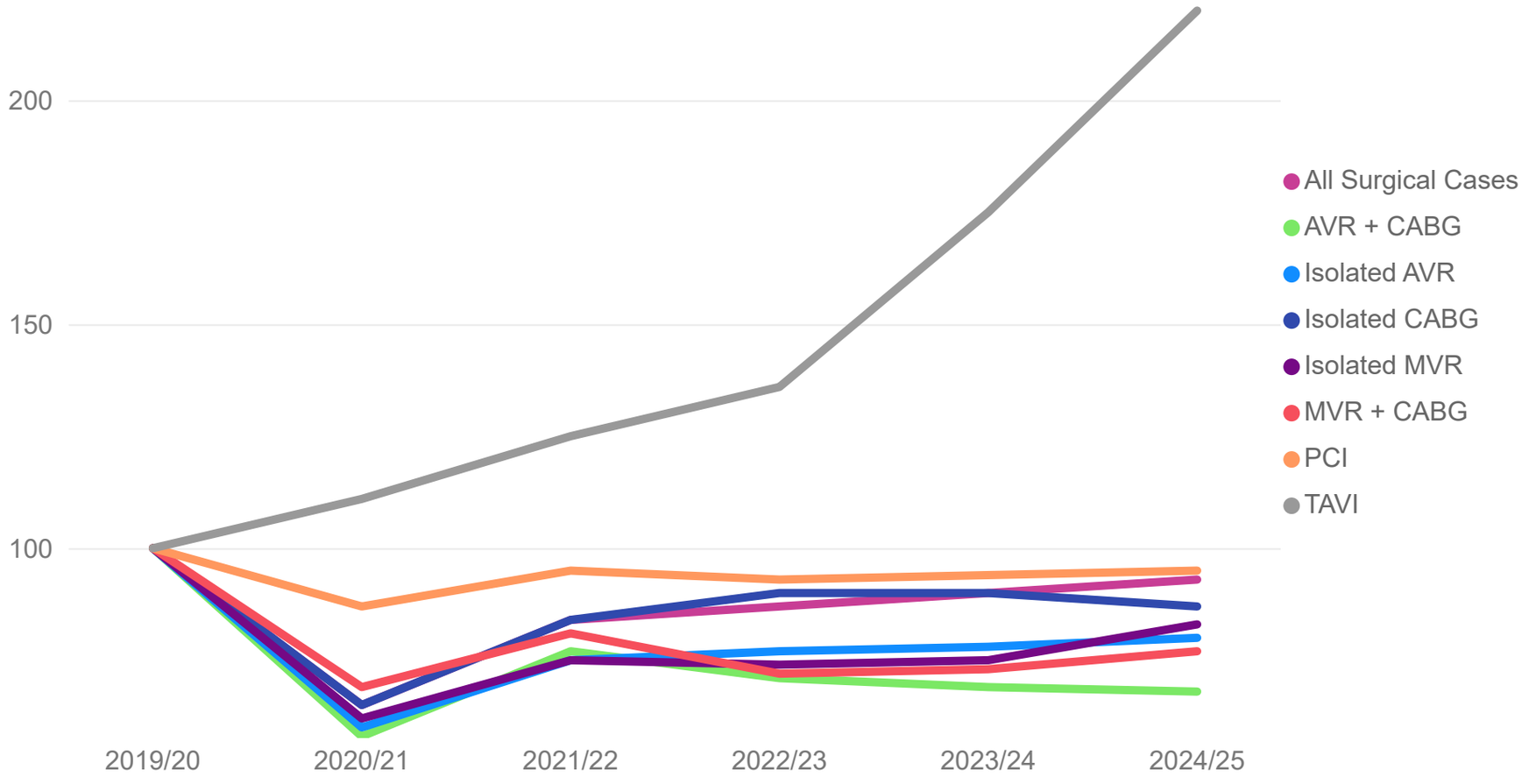
The reduction in cardiac surgical activity since the COVID-19 pandemic can still be seen across all types of procedure

The decline in cardiac surgical activity since the COVID-19 pandemic remains apparent across all types of operations, including both isolated and combined procedures such as:

- Coronary artery bypass grafting (CABG)
- Aortic valve replacement (AVR)
- Mitral valve (MV) surgery.

In contrast, transcatheter aortic valve implantation (TAVI) procedures have risen sharply, increasing by 220% between 2019/20 and 2024/25.

Percentage of cases each year compared to 2019/20

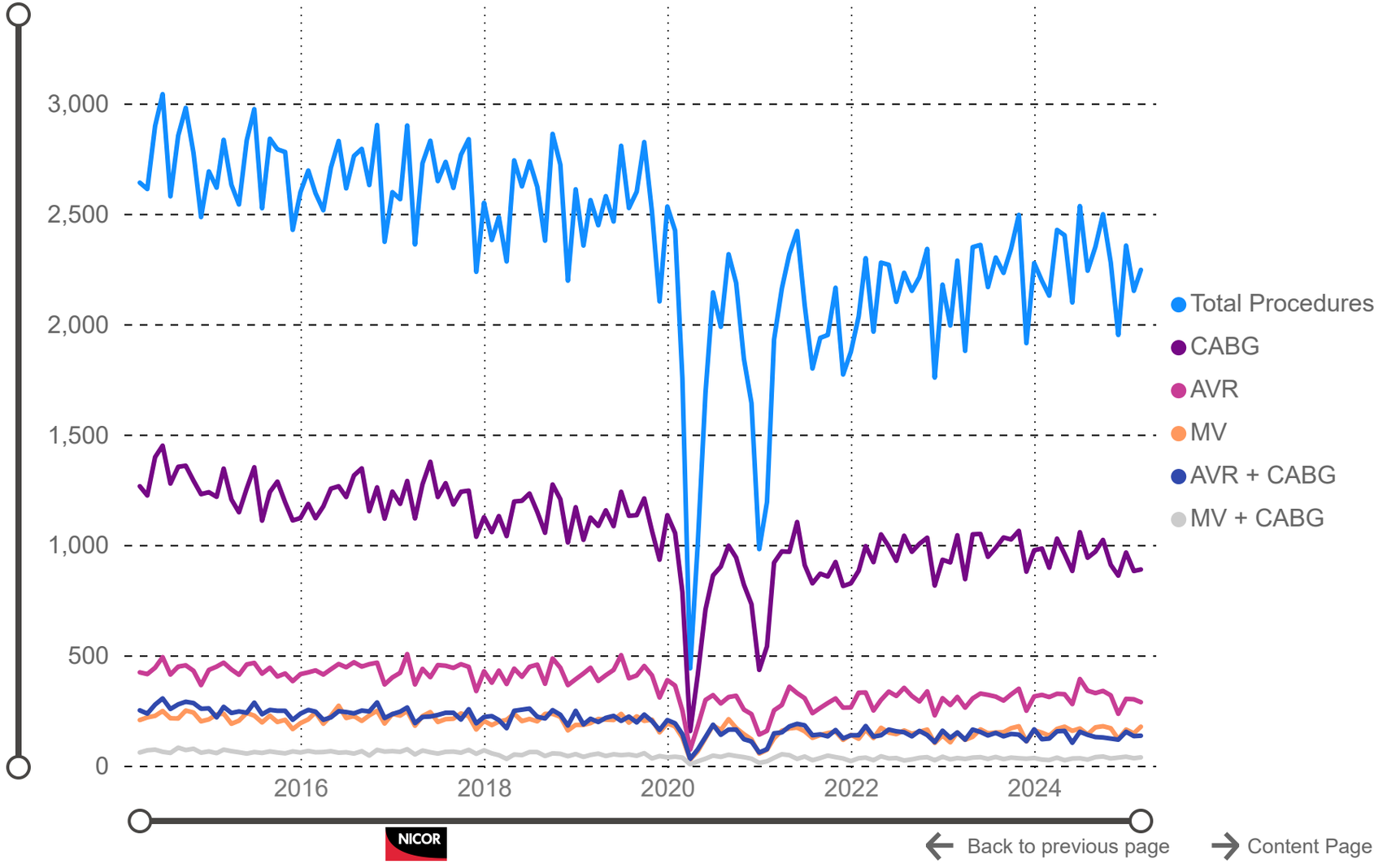


Monthly activity data highlights the impact of the COVID-19 pandemic and the partial recovery thereafter, especially for coronary artery bypass graft procedures

On a monthly basis, operation volumes in 2024/25 still remained largely below pre-pandemic levels for coronary artery bypass grafting (CABG), aortic valve replacement (AVR) and mitral valve (MV) operations.

The monthly data also highlight the dramatic impact of the pandemic during the first two waves in March 2020 and the winter of 2020/21.

Monthly number of cardiac surgical operations by procedure type



Hospitals on average undertook 93% of the number of procedures they performed in 2019/20 prior to the COVID-19 pandemic

In 2024/25, individual NHS hospitals performed between 36% and 157% of the procedures carried out in 2019/20.

The average activity across all hospitals was 93% of pre-pandemic levels.

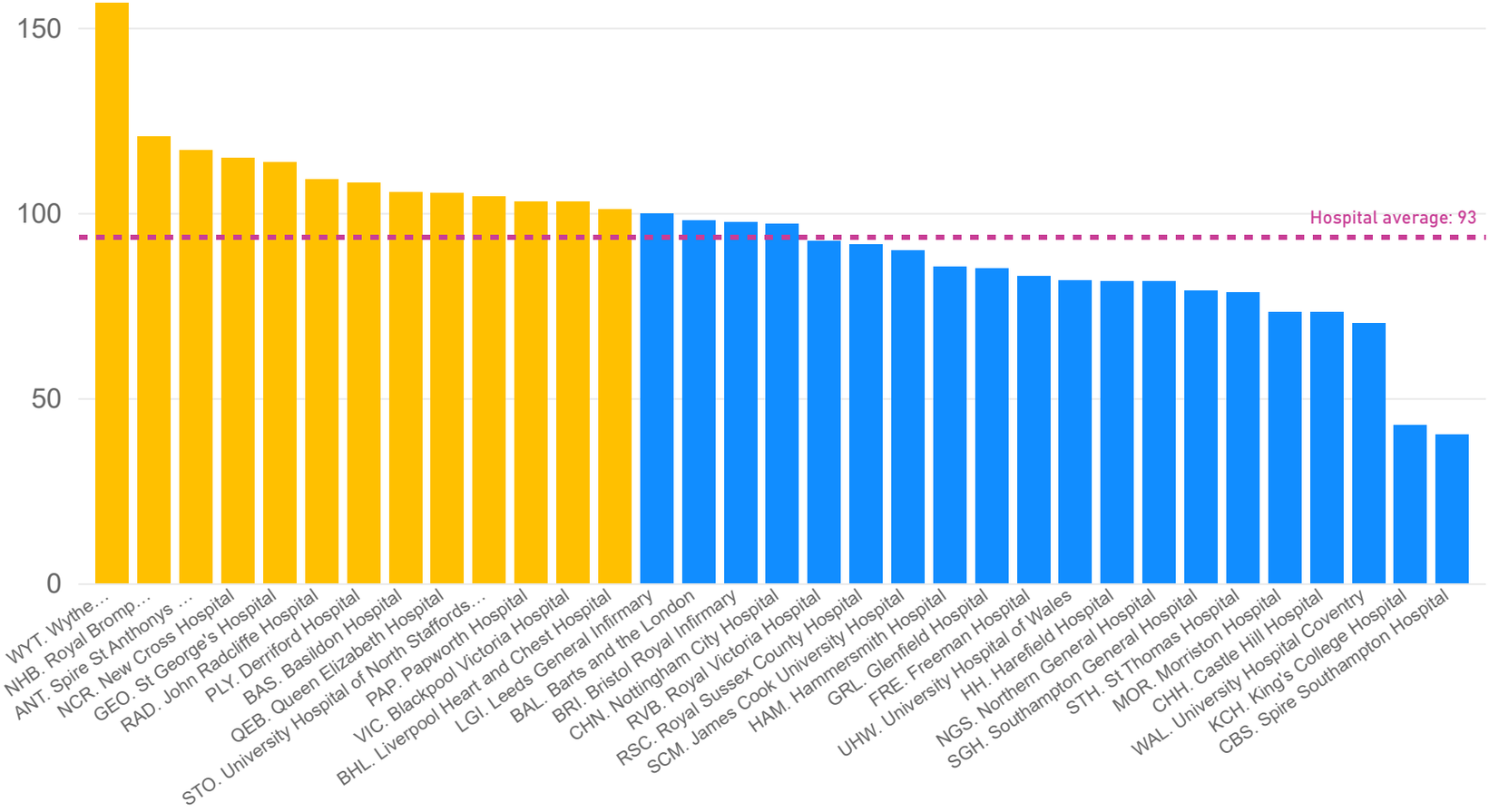
Thirteen NHS cardiac centres exceeded their pre-COVID-19 case volumes — up from seven centres in the previous year.

Twenty hospitals (including nineteen NHS sites) continued to operate below pre-pandemic levels, with five hospitals performing less than 75% of their 2019/20 activity.

The 157% figure for Wythenshawe Hospital reflects the merger of two cardiac centres into a single unit.

Note: Two private centres have only submitted data for two years. Reported activity at the Cromwell Hospital increased from 15 cases in 2019/20 to 90 in 2023/24 (not included in chart).

Percentage of cases performed by individual hospitals in 2024/25 compared to 2019/20



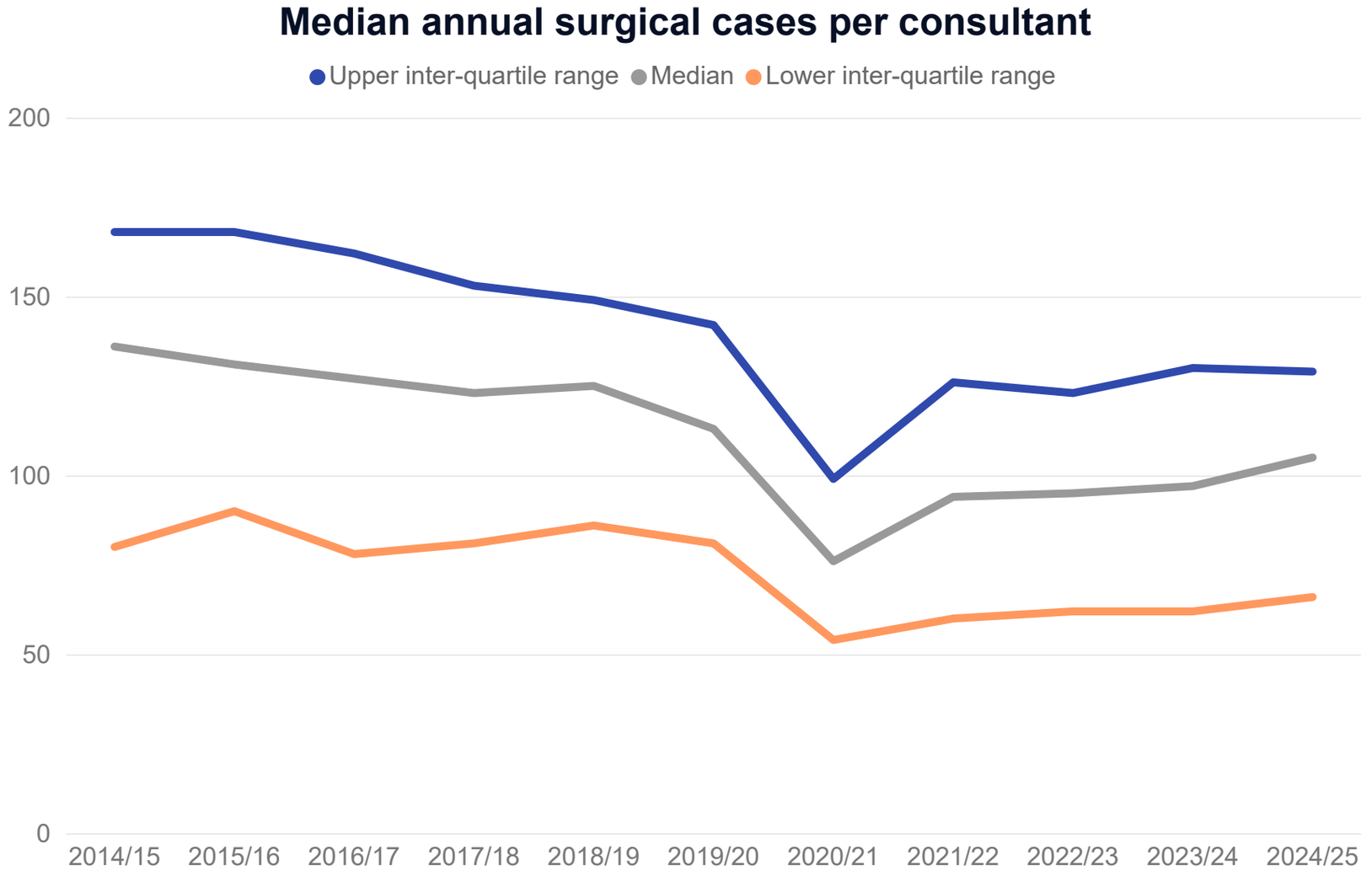
The number of cases per consultant cardiac surgeon shows a slight increase but reamains below numbers recorded a decade ago

Consultant surgical activity continues to fall significantly short of expected levels. A typical consultant is expected to complete around 168 cases per year, based on two operating lists per week, two cases per list, and no cancellations. Surgeons undertaking highly complex procedures may, however, perform only one case per day.

In 2024/25, the median caseload was 105 operations per consultant — a modest increase from 97 in 2023/24, but still 23% below the 136 cases recorded in 2014/15. Consultants in the top quartile performed at least 129 cases in 2024/25, compared with 168 or more in 2014/15.

Multiple factors may contribute to the shortfall in expected throughput, with the lack of infrastructure being among the most common.

Note: Only consultants performing over 100 cases per 3-year audit cycle are used in these figures (including emergencies but excluding dual consultant cases).



Isolated CABG operations continue to decline, but there is some post-pandemic recovery

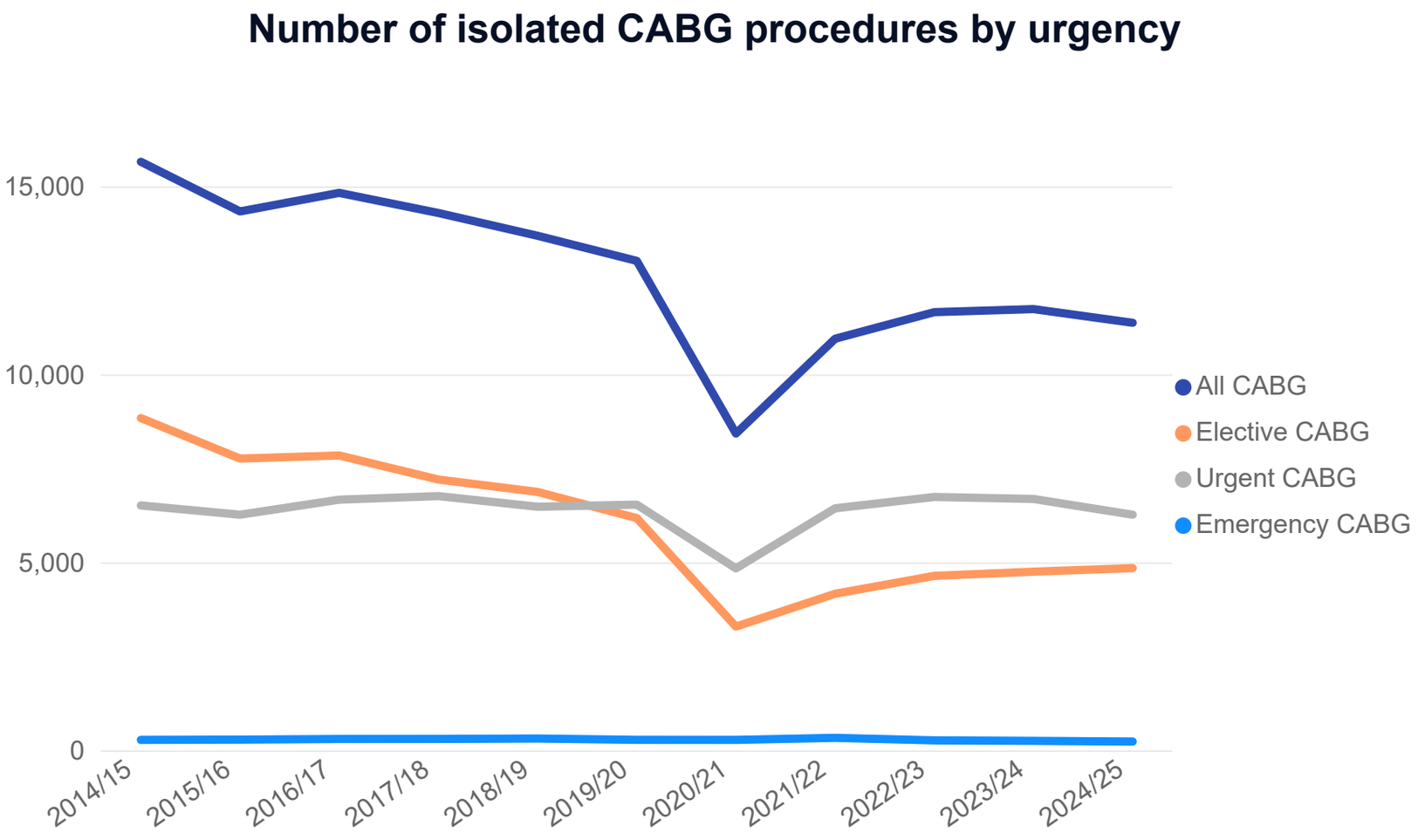
The slight decrease in coronary artery bypass graft (CABG) procedures in 2024/25 — from 11,712 to 11,371 — continues the downward trend observed over the past decade.

This long-term decline is primarily driven by a reduction in elective CABG operations, with 22% fewer performed in 2024/25 compared with 2019/20.

It remains unclear whether this reflects a slower post-pandemic recovery or a change in clinical demand for elective procedures. Notably, a modest rise in elective cases since last year coincided with a decline in urgent cases.

Note: "Isolated CABG" refers to a Coronary Artery Bypass Graft procedure performed without any other major cardiac surgery during the same operation. In other words, the CABG is the only major procedure carried out. This classification excludes cases where CABG is performed in combination with other cardiac procedures, such as:

- *Valve surgery (e.g., aortic valve replacement)*
- *Surgery on the thoracic aorta, or other significant cardiac interventions.*
- *AF ablation and/or Left atrial occlusion.*



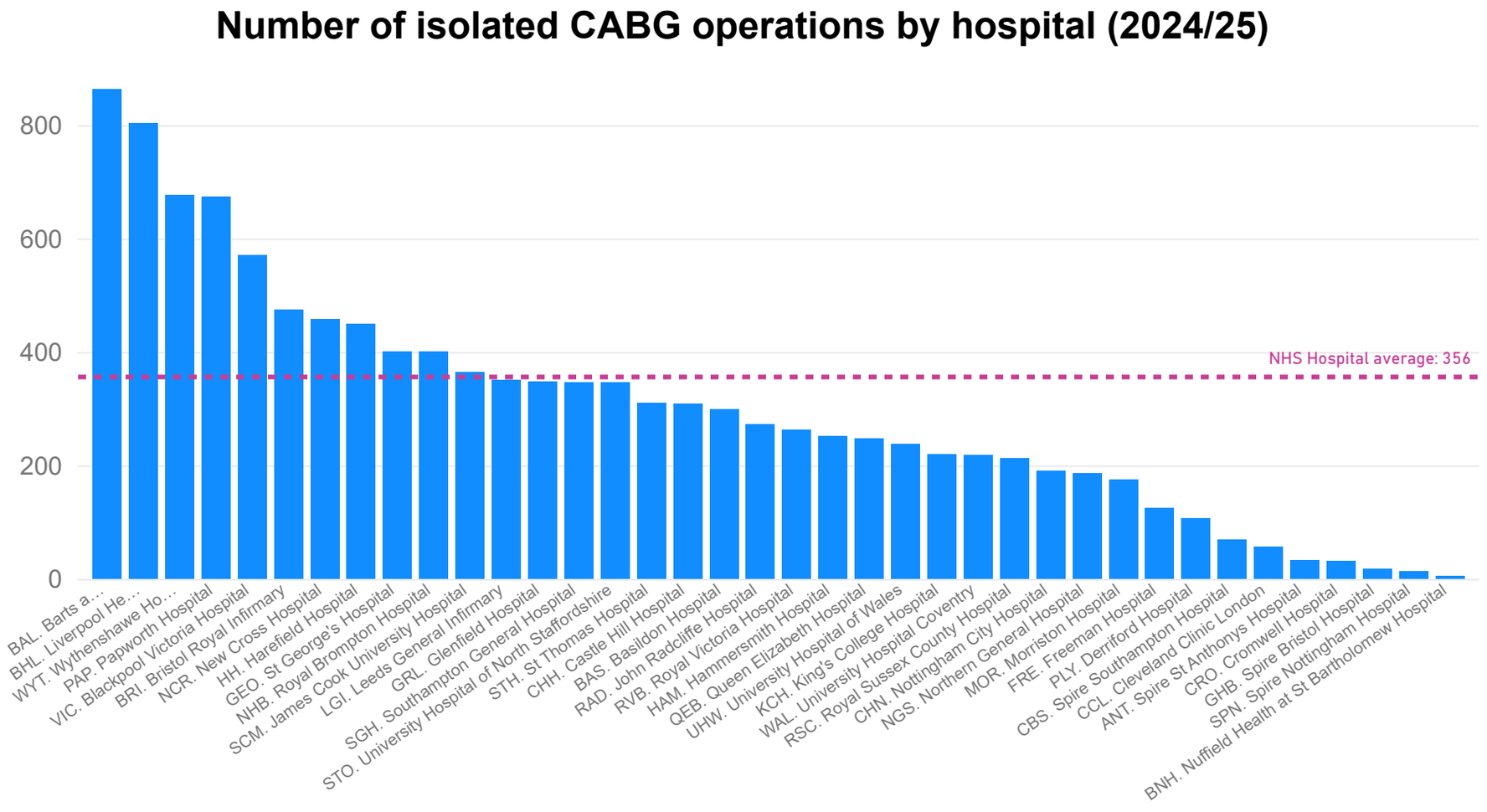
The average number of isolated CABG operations was 356 per NHS hospital (ranging from 106 to 863)

In 2024/25, 11,371 isolated coronary artery bypass grafting (CABG) operations were performed in England, Wales and Northern Ireland.

CABG remains the most common procedure in adult cardiac surgery.

On average, NHS hospitals carried out 356 CABG cases, with the highest total at 863 and the lowest at 106.

Five hospitals performed more than 500 cases, while 11 hospitals (including five NHS sites) carried out fewer than 200 isolated CABG operations.



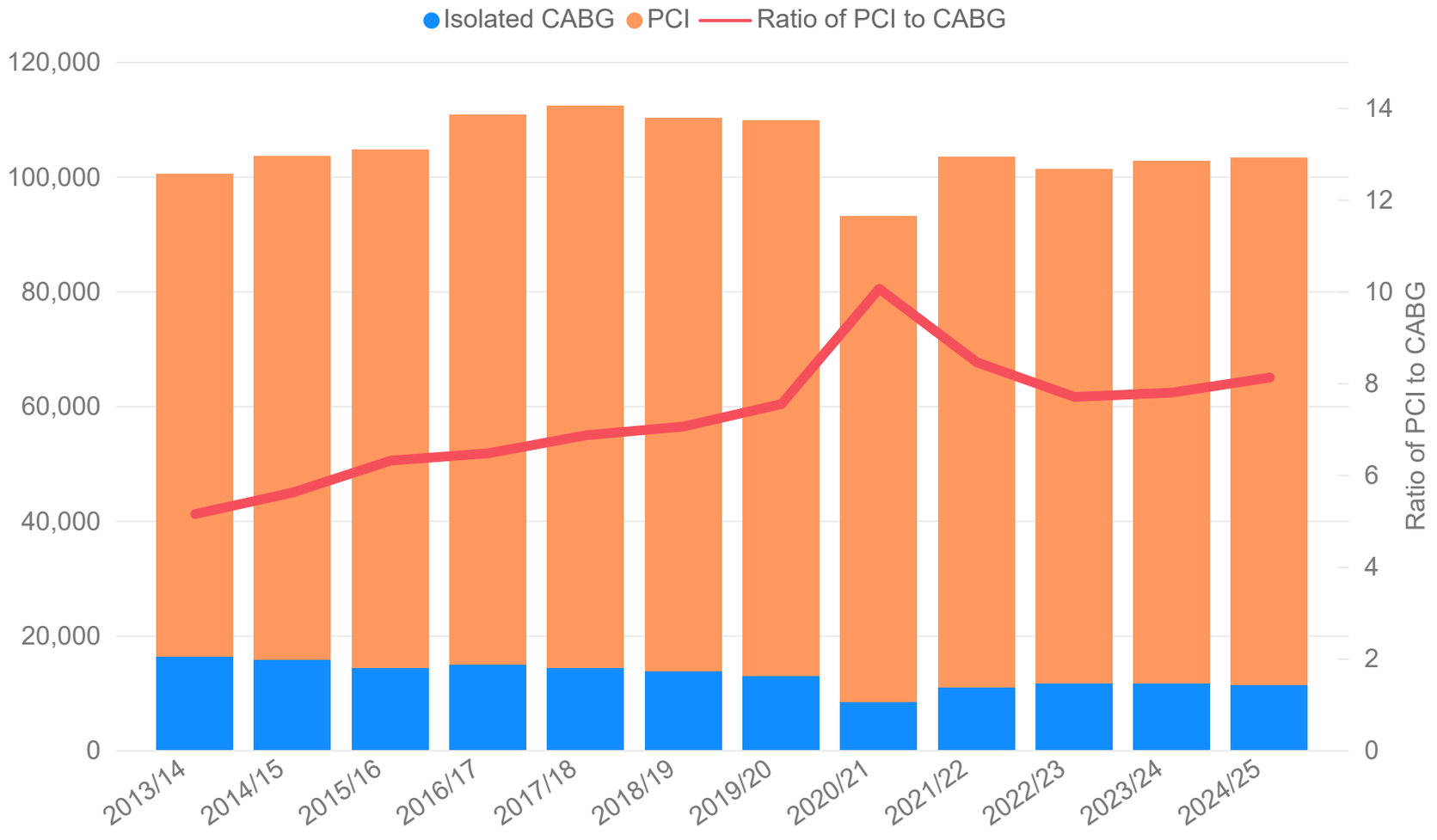
PCI continues to be the major form of revascularisation relative to CABG, despite the reduction in PCI since the COVID-19 pandemic

The total number of patients undergoing revascularisation procedures — including percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG) — increased slightly compared with 2023/24, but remains below pre-pandemic levels.

The PCI-to-CABG ratio had been rising prior to the pandemic, reaching a peak of almost 10:1 in 2020/21, when surgical activity was most disrupted by COVID-19.

In the past two years, this ratio has declined to around 8:1, indicating a partial rebalancing between interventional and surgical revascularisation.

Numbers of PCI and CABG procedures and ratio of PCI to CABG



AVR operations for low-risk patients have fallen sharply compared with pre-pandemic levels, and that TAVI is being frequently considered for this group

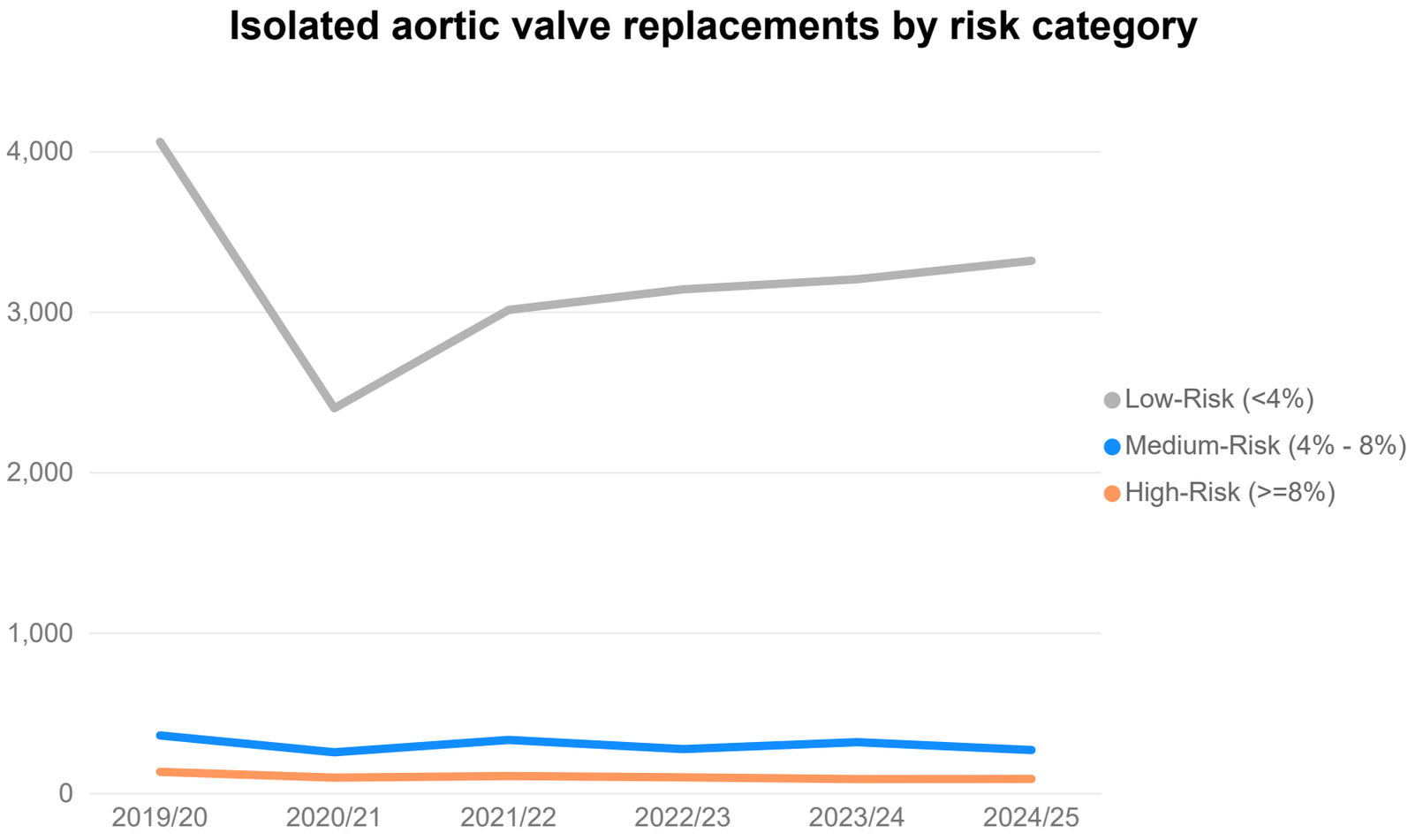
In 2024/25, a total of 3,776 isolated aortic valve replacement (AVR) procedures were performed.

According to NICE guidance from 2021, patients at low or medium surgical risk are recommended to undergo AVR rather than transcatheter aortic valve implantation (TAVI).

Since 2019/20, AVR activity has declined across all three risk groups, with the largest absolute reduction seen in the low-risk group (EuroSCORE2 <4%). In 2024/25, the low-risk cohort accounted for 90% of all isolated surgical AVR cases.

Recent studies on TAVI in low-risk patients are challenging the NICE guidance, and there is growing evidence that TAVI is increasingly being considered for this group.

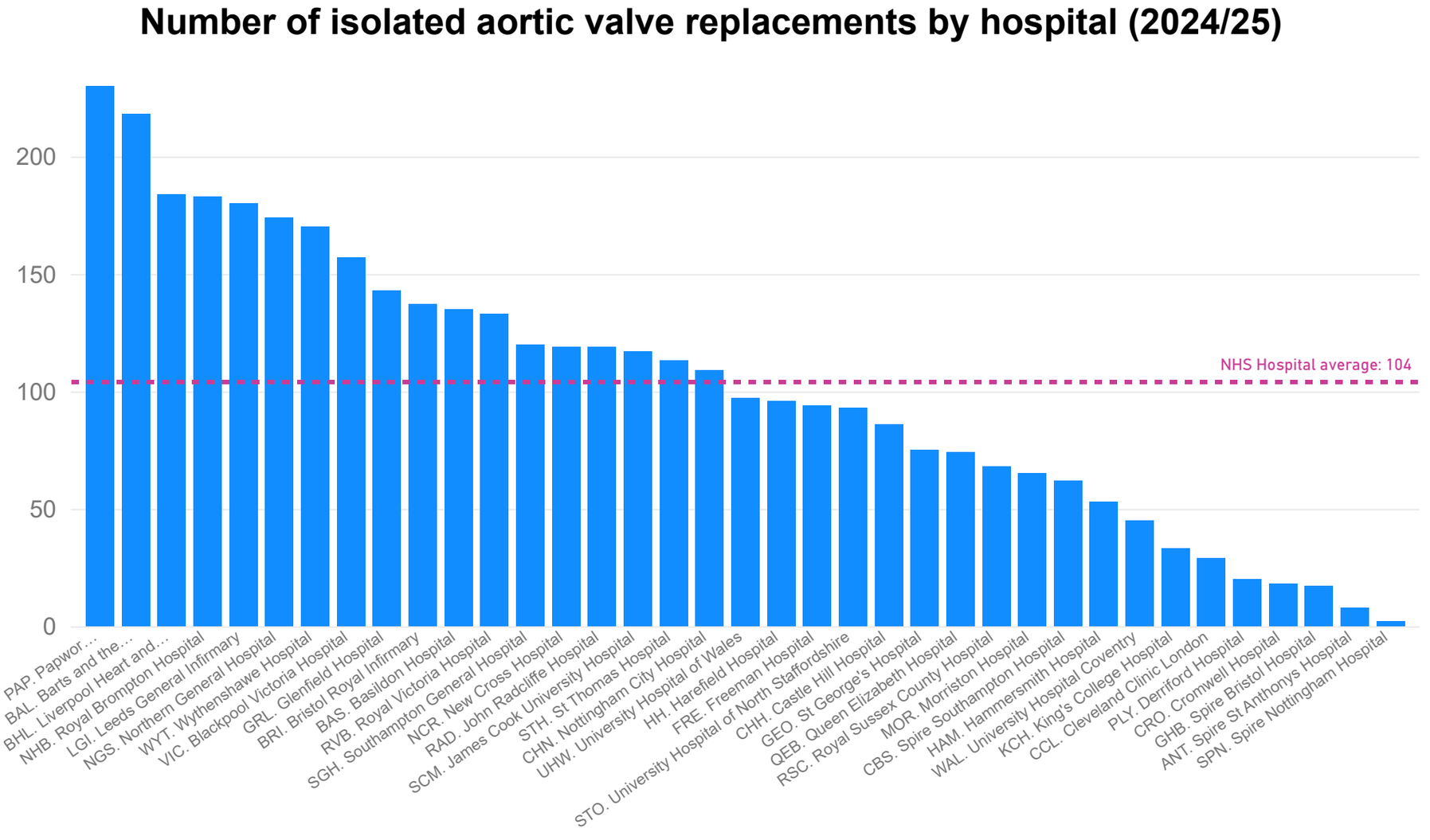
In 2024/25, only 2.4% of AVR cases were in the high-risk category (EuroSCORE2 ≥8%), likely reflecting patients for whom TAVI was unsuitable, such as those with endocarditis or vascular access issues.



Huge variability in the number of isolated aortic valve replacements performed by individual NHS hospitals

The number of isolated AVR procedures in NHS hospitals in 2024/25 ranged from 20 to 230.

The average per hospital was 104.



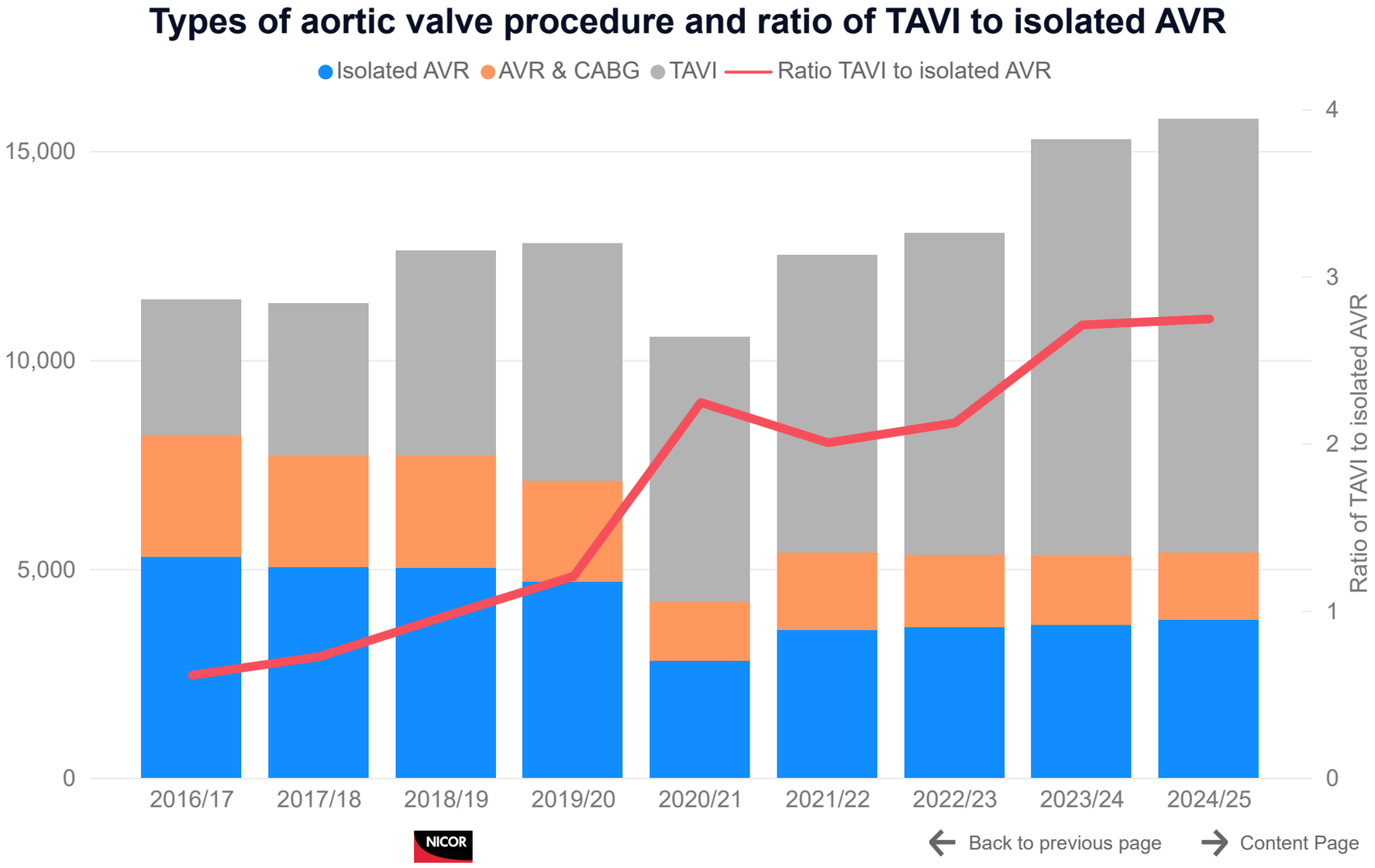
In 2025/25, a record number of patients with aortic valve disease were treated. TAVI procedures performed at three times the volume of surgery.

The total number of patients receiving aortic valve intervention of any type (surgery and TAVI combined) was at its highest ever level in 2024/25.

More than 15,000 aortic valve (AVR + TAVI) procedures were performed last year, an increase of nearly 20% since 2019/20.

The use of TAVI has continued to rise and its delivery capacity was less affected by the COVID-19 pandemic compared with cardiac surgery,

In 2024/25, the number of TAVI procedures was nearly three times the number of isolated AVR operations (which have declined since COVID).



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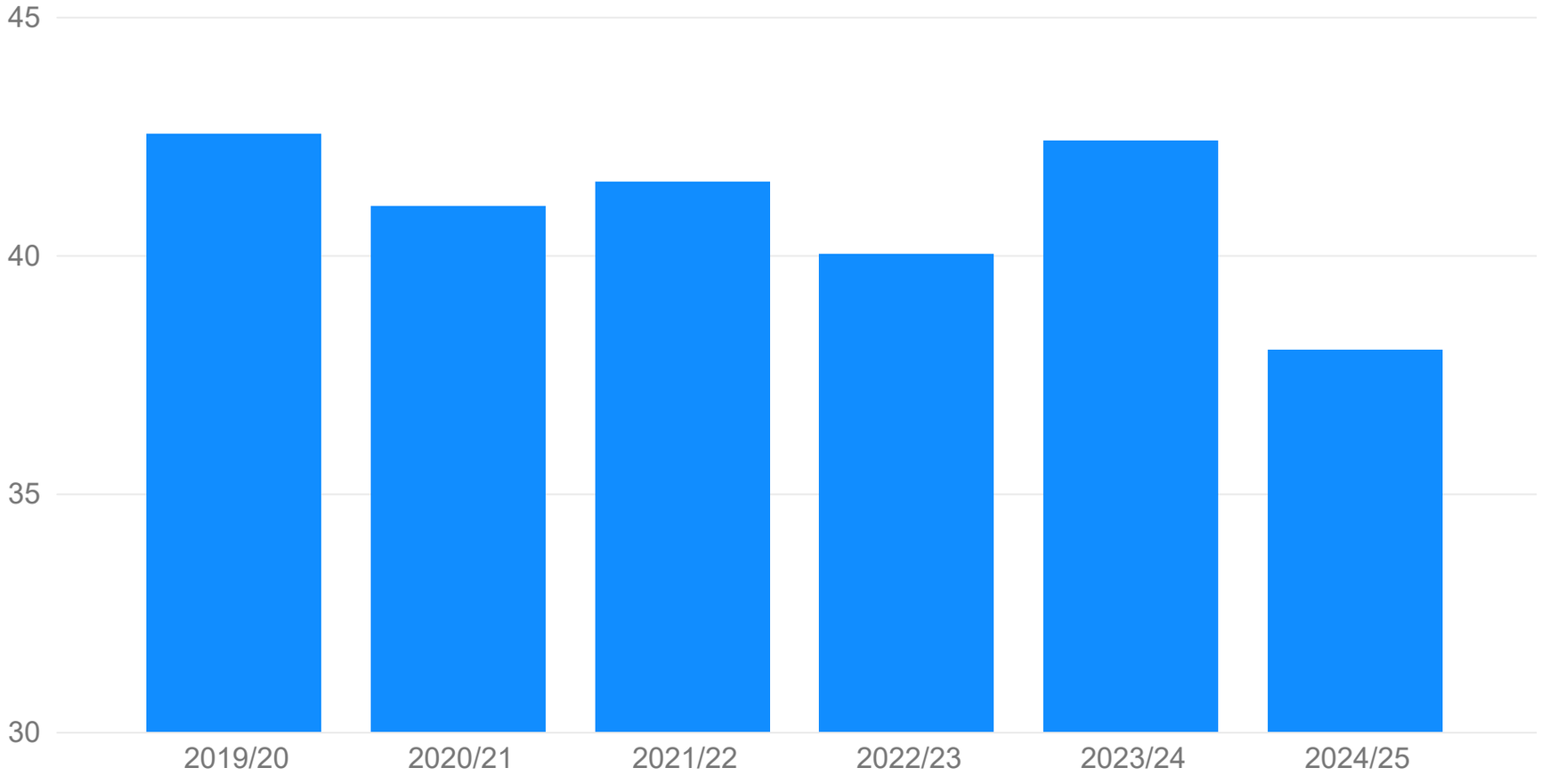
A significant proportion of patients under 60 years old receive a biological valve which is contrary to guidelines

Guidelines recommend that patients under 60 years of age should have a mechanical valve replacement.

Over the past 6 years an average of 41% of younger patients have had a bioprosthetic aortic valve replacement.

The rate has varied from 40-43% over the last few years but was 38% in 2024/25.

Proportion (%) of patients <60 years old undergoing isolated AVR receiving a bioprosthetic valve



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Contrary to current recommendations, over 20% of younger patients undergoing aortic valve replacement receive a biological valve

Biological ('tissue') valves are more prone to long term-structural failure than mechanical ('metal') valves. Potentially resulting in the need for either repeat AVR surgery or TAVI.

While there is evidence that mechanical valves give younger patients better life expectancy when compared to tissue valves, there is a need for lifelong anticoagulation, meaning patients are more prone to bleeding/thrombosis-related complications.

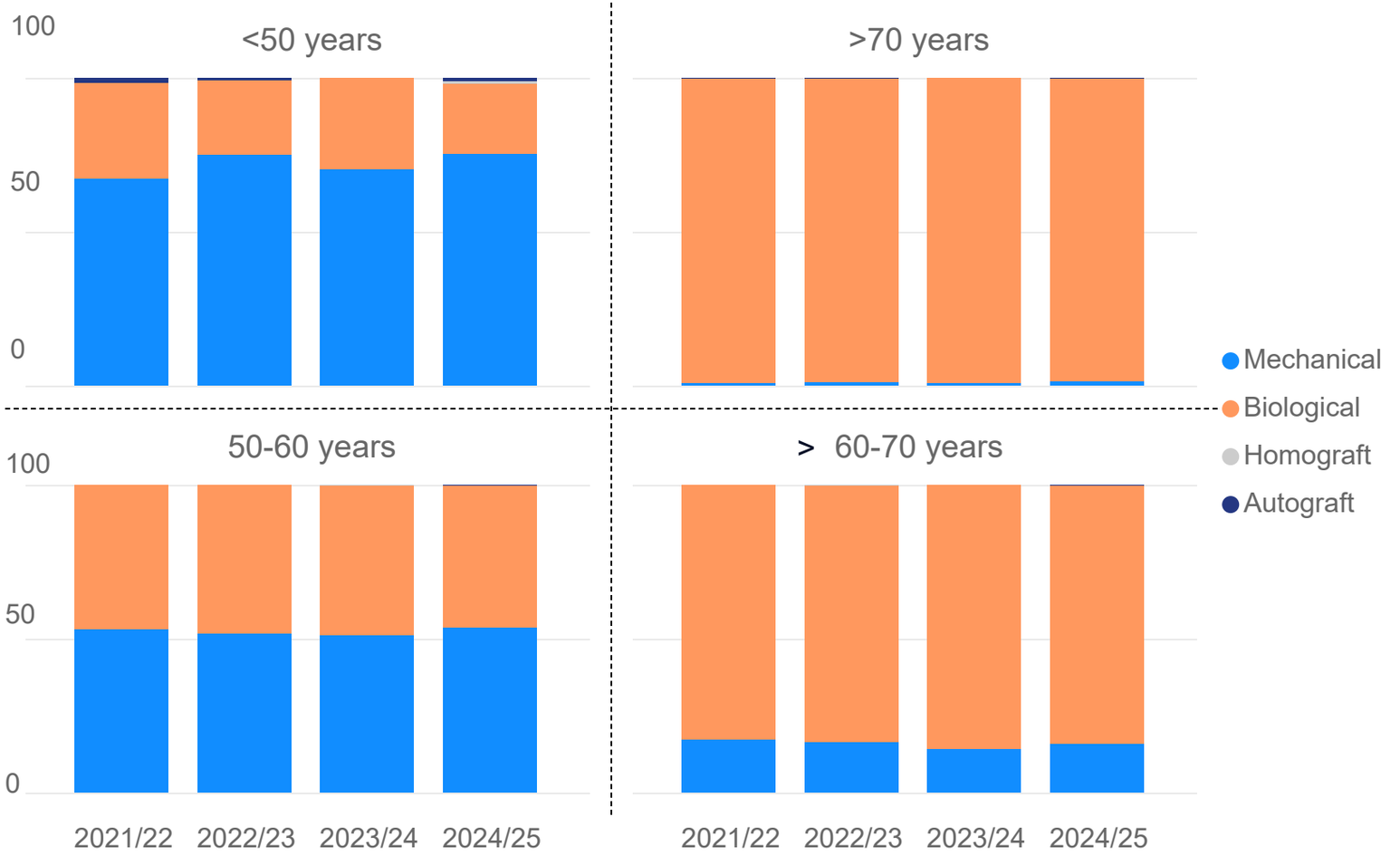
Current guidelines recommend:

- Mechanical valves in younger patients (< under 50 years).
- biological valves in older patients (over 70 years).

For patients between 50-70 years, there is debate as to which is better, especially since the advent of TAVI, which provides an option for a 'redo' procedure over time.

In 2024/25, nearly all AVR procedures in patients over 70 used biological valves. However, over 20% of AVR procedures in patients under 50 involved biological valves, contrary to guidance (though some small subgroups may warrant this). The use of homografts or autografts remains rare in adults, limited to those under 50 years.

Percentage of different valve types used in isolated AVR by age group



The majority of hospitals are implanting a biological valve in a high proportion of patients under 60 years old undergoing isolated AVR surgery

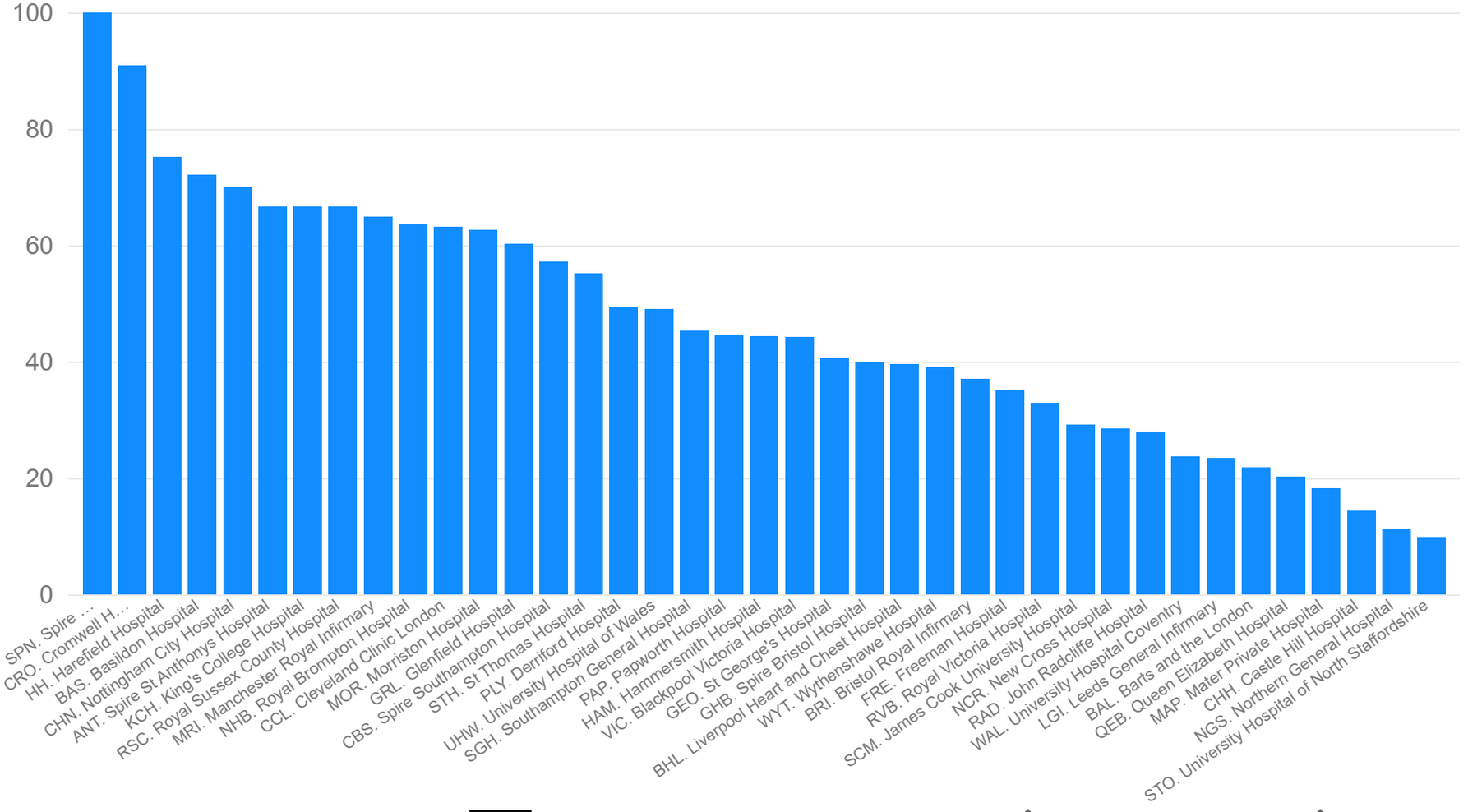
According to current guidelines, most patients under 60 years undergoing isolated aortic valve replacement (AVR) are expected to receive a mechanical valve.

However, there is considerable variation across the UK in the proportion of these patients who instead receive a biological valve.

In NHS hospitals in 2024/25, this proportion ranged from 7% to 83%.

Note: three private hospitals have a high percent due to the low number of isolated AVR cases.

Percentage of patients under 60 years receiving a biological valve during an isolated AVR operation in 2024/25



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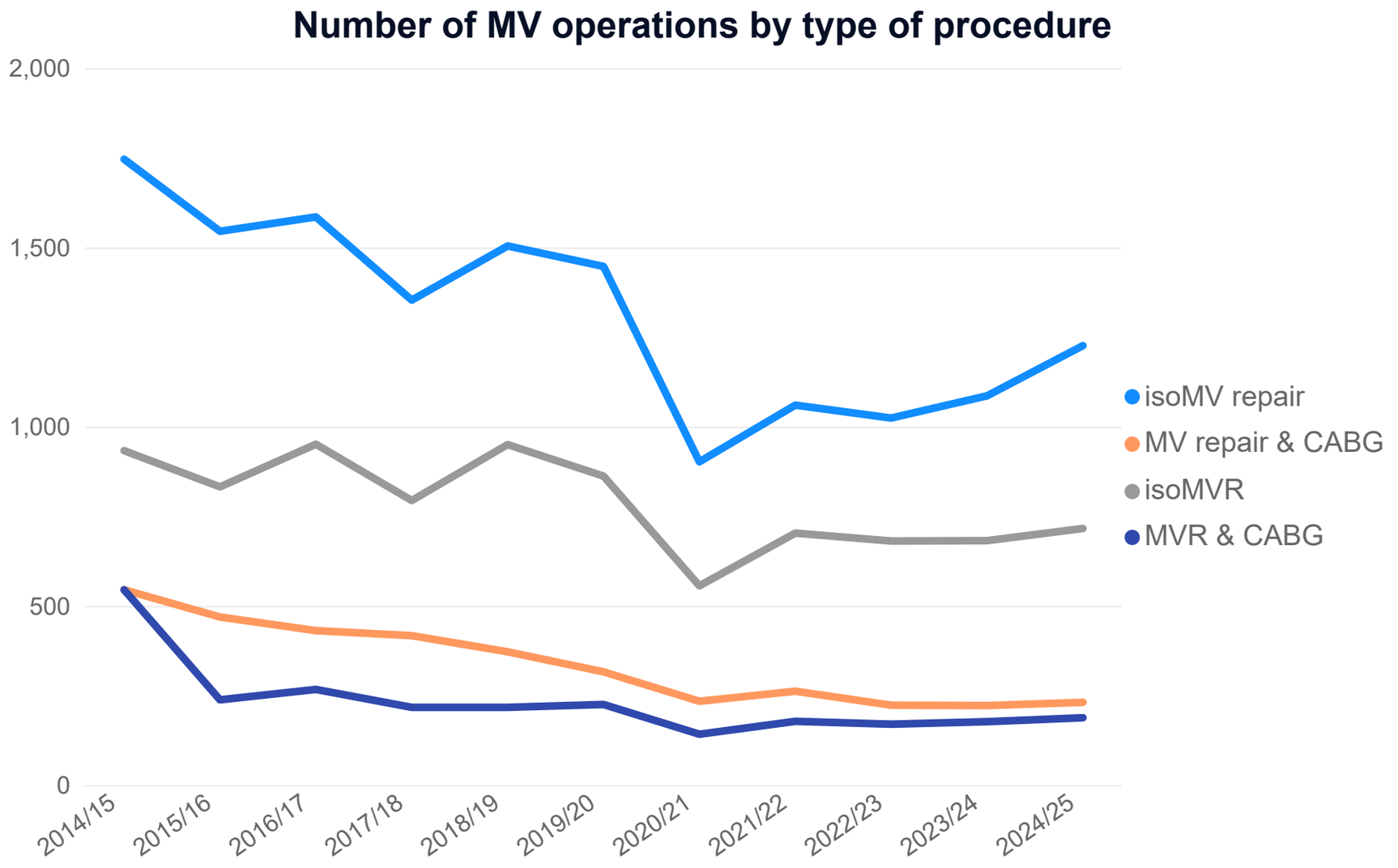
The number of mitral valve operations remains below pre-pandemic levels

Mitral valve replacement (MVR) and mitral valve repair (MV repair) can be undertaken either as isolated operations or in conjunction with CABG.

In 2024/25, a total of 1,942 mitral valve procedures were carried out, but the overall trend over the past decade has been downward. Following a significant drop during the COVID-19 pandemic, the 2024/25 total was 499 fewer procedures than in 2019/20, and 1,418 fewer than in 2014/15.

It is unclear whether this reflects ongoing post-pandemic recovery issues or a new baseline for clinical demand. One contributing factor may be that more patients are undergoing concurrent tricuspid valve procedures, which are not included in these figures.

Other options are also now available to treat MV disease (such as MitraClip™), but their recent introduction is unlikely to explain the longer-term reduction in surgical activity.



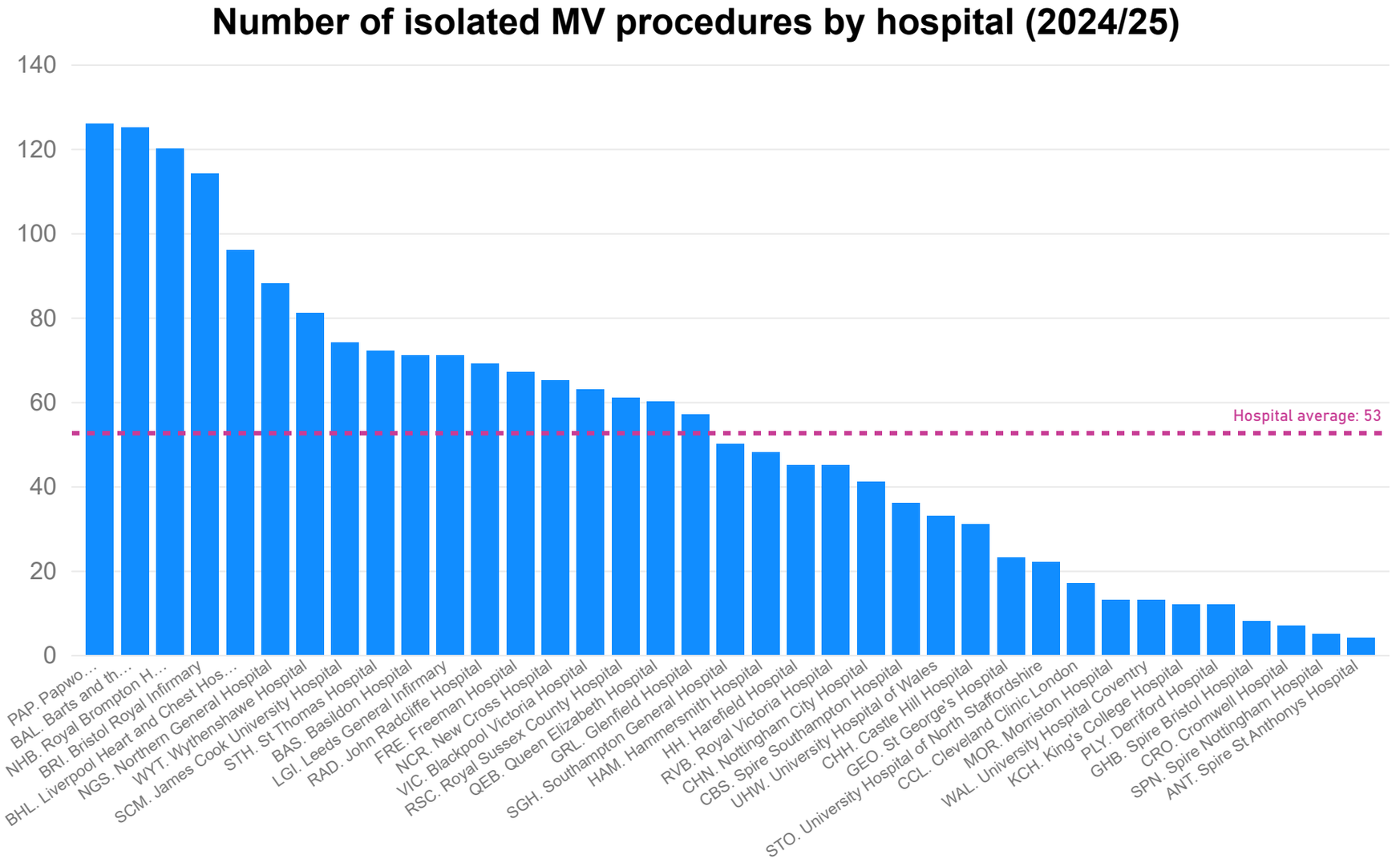
In 2024/25, the number of mitral valve procedures performed varied ten-fold across individual NHS hospitals

A total of 1,942 isolated mitral valve (MV) procedures (including both replacements and repairs) were performed in 2024/25.

The average, hospitals carried out 52 MV procedures each.

The busiest NHS hospital performing 126 MV procedures, while the least active centre undertook only 12.

These cases include patients who had a concomitant procedure for atrial fibrillation.

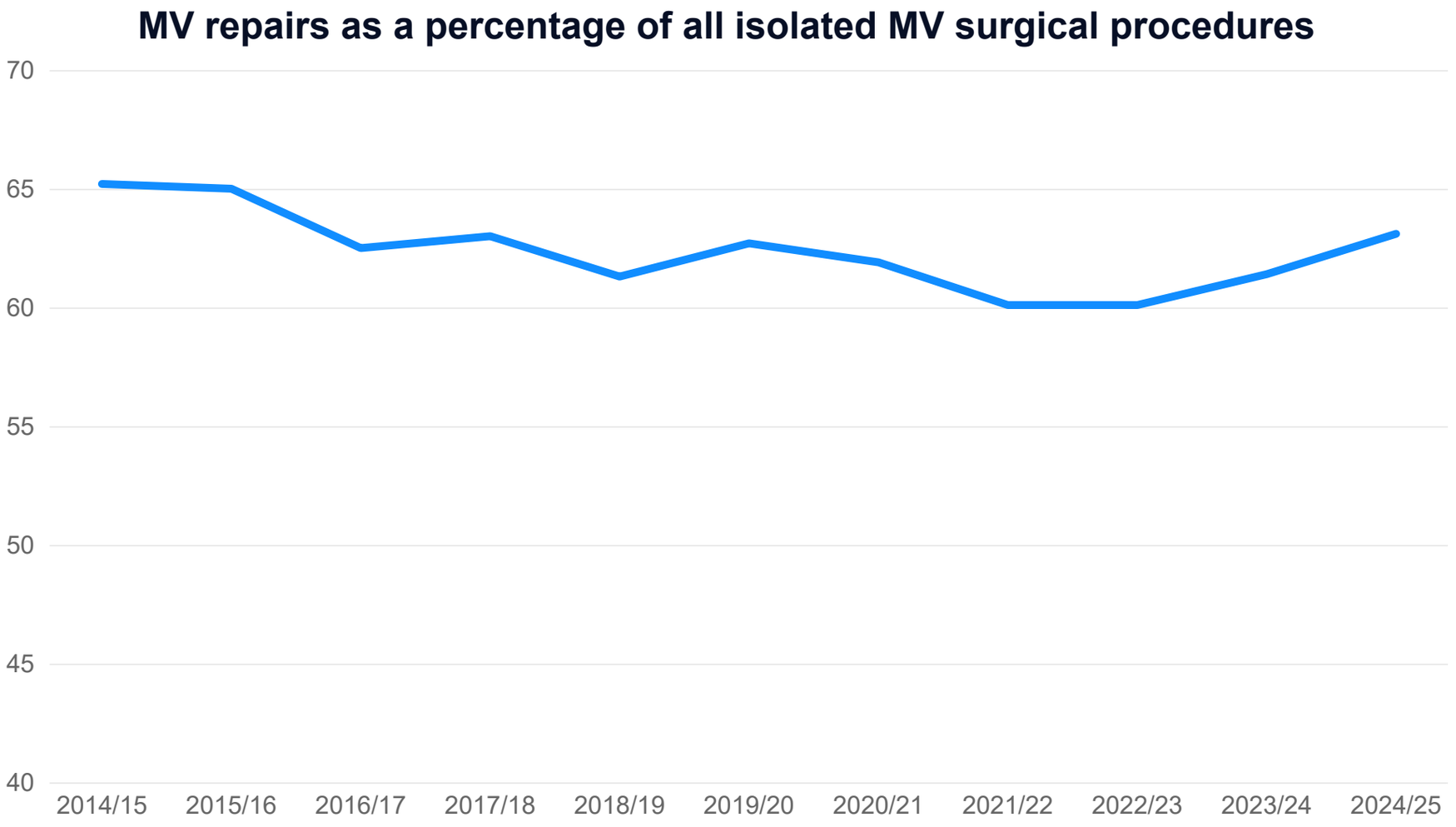


The rate of mitral valve repair remains realtively unchanged over the past decade

The preferred treatment for suitable patients with degenerative mitral valve (MV) disease is mitral valve repair over mitral vale replacement (MVR).

Between 2014/15 and 2018/19, the proportion of MV repairs declined, but this trend has partially reversed since 2021/22.

The proportion of MV repairs has increased compared to the low values during the pandemic.

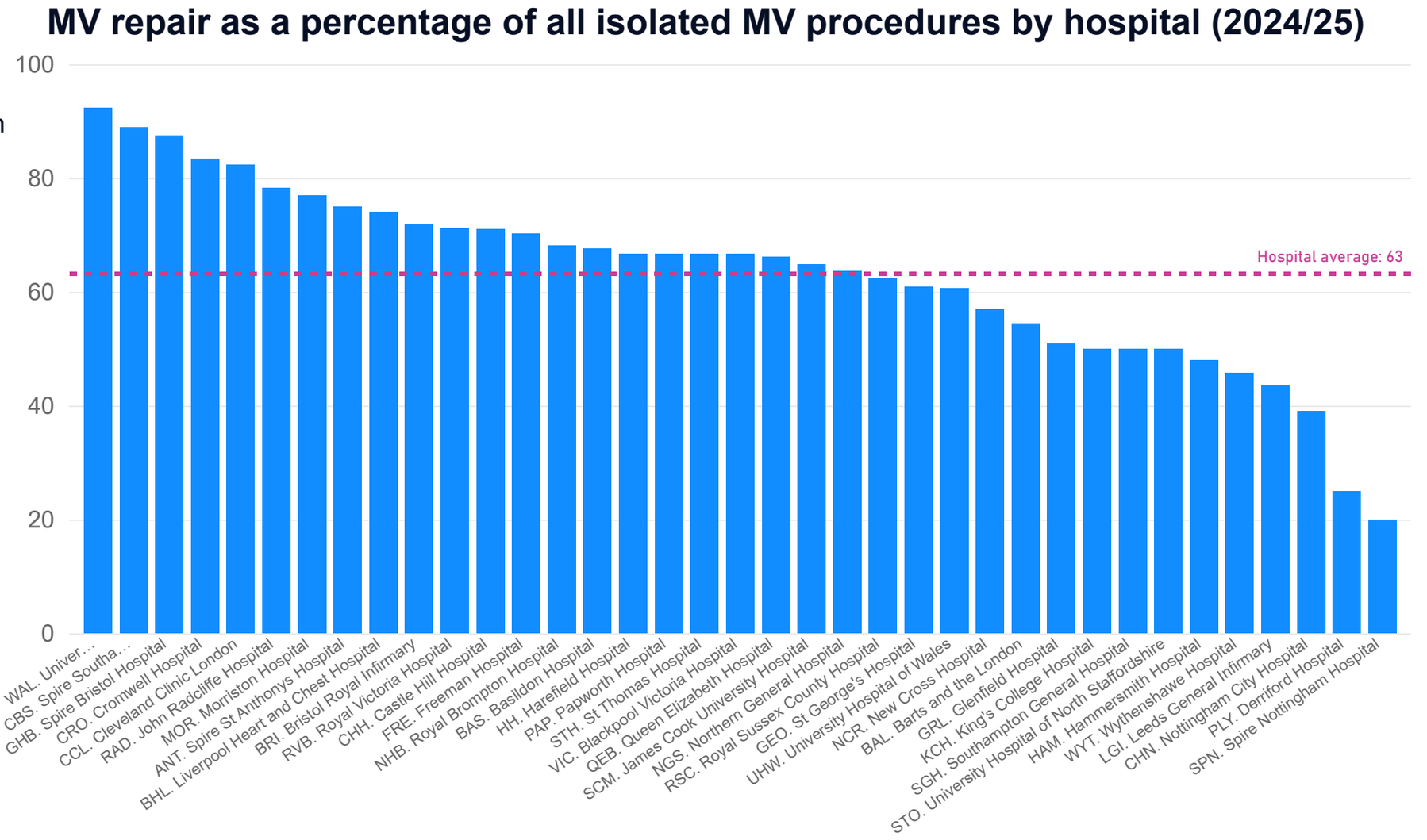


Mitral valve repair rates vary significantly between centres

There is substantial variation between hospitals in the proportion of mitral valve (MV) repairs relative to all isolated MV surgical procedures.

In 2024/25, this ranged from 25% to 92% among NHS hospitals.

Across all hospitals, including private centres, the average proportion of MV repairs was 63%.



The proportion of isolated CABG, AVR and MVR cases are performed using minimally invasive surgery is low

Cardiac surgery can be performed on patients without the need for a full sternal incision.

This use minimally invasive surgery is slowly increasing but the rates remain low and vary according to the type of operation.

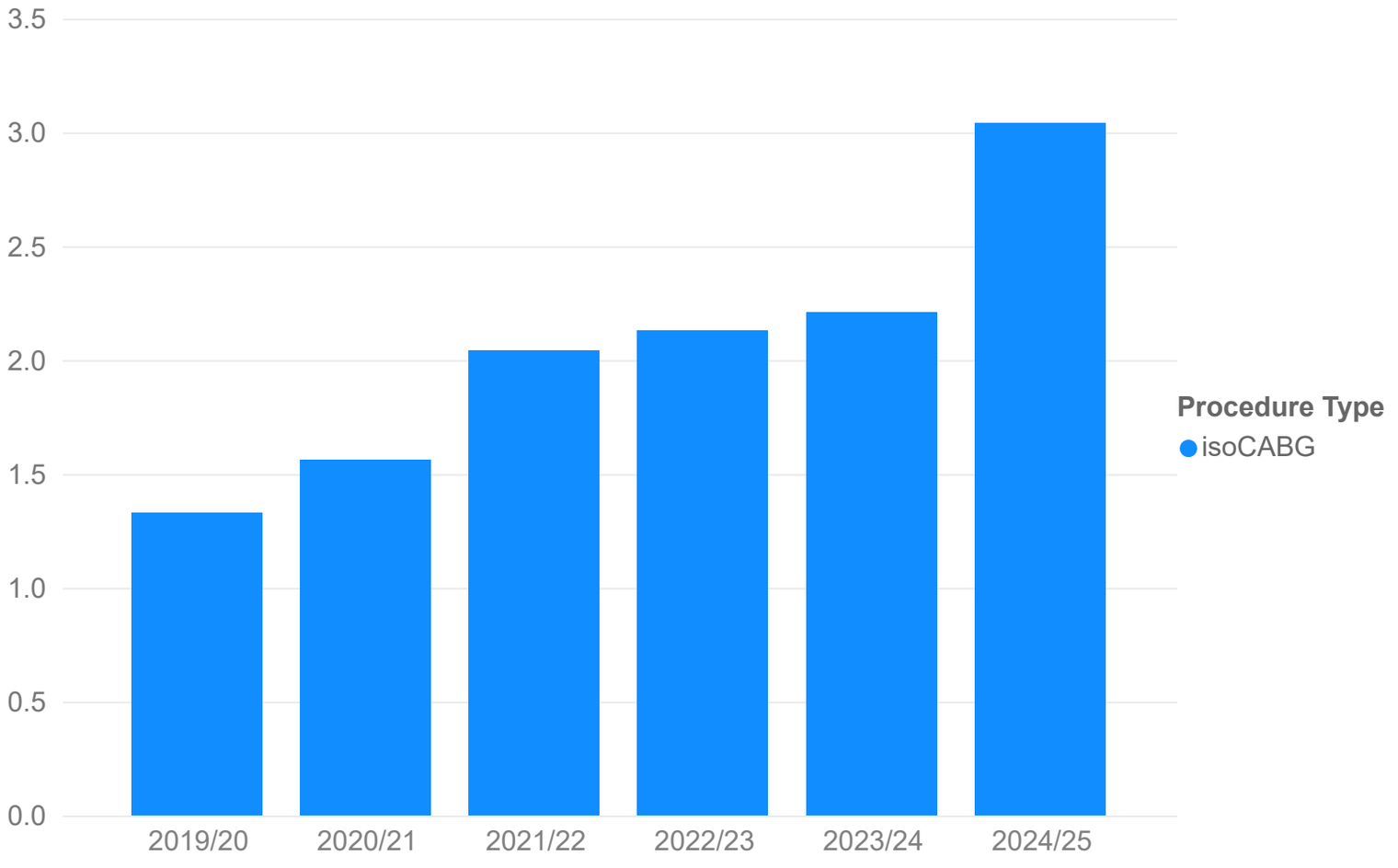
In 2024/25, 15.3% of isolated aortic valve replacements (isoAVR) and 17.8% of isolated mitral valve replacements/repairs (isoMVR) were performed using minimally invasive methods.

The use of minimally invasive methods for isolated coronary bypass surgery (isoCABG) in 2024/25 was very low at 3%.

Select a type of procedure below to see different rates.

Procedure Type

isoCABG



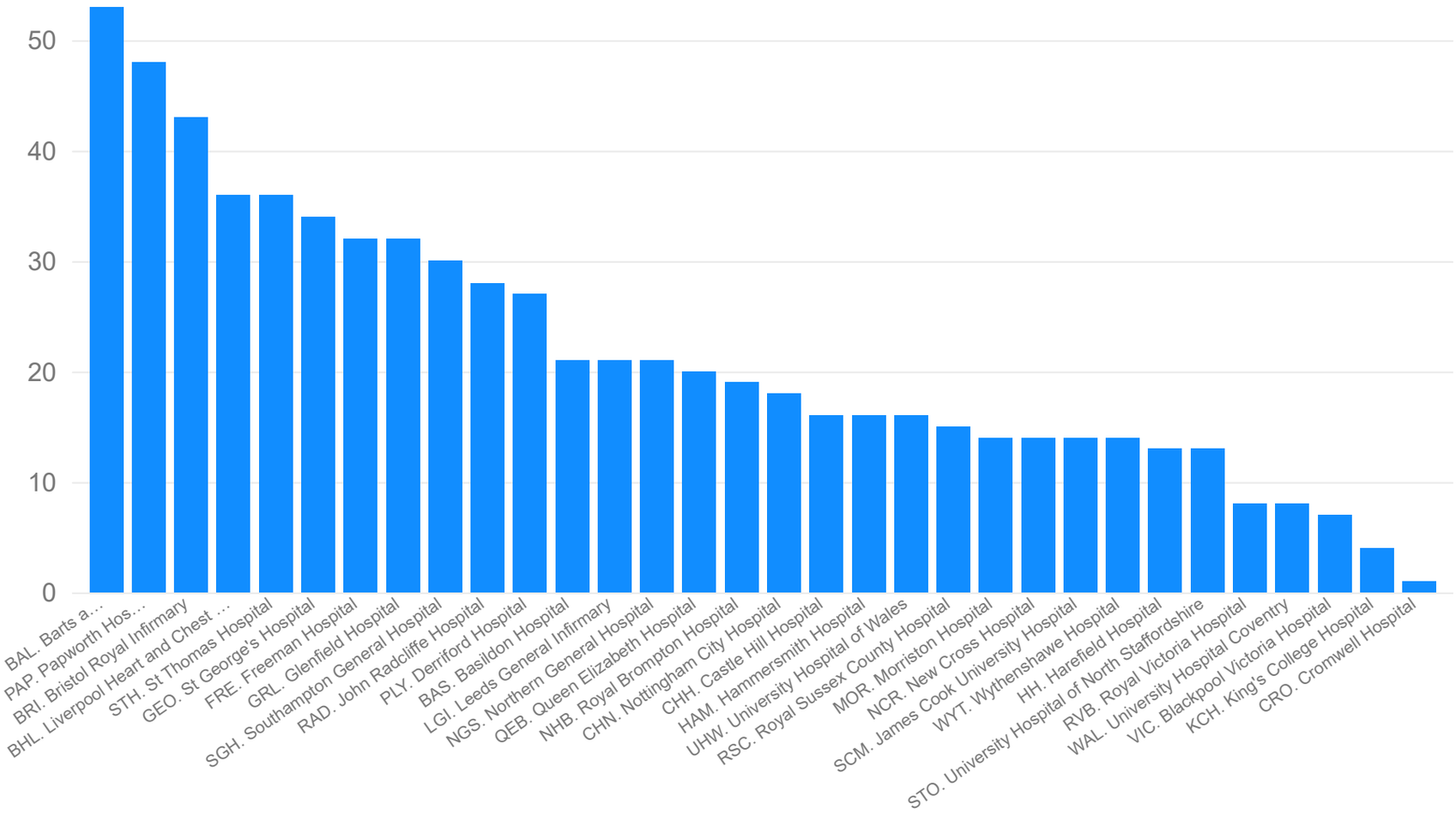
The majority of hospitals performing emergency operations on the aorta carried out fewer than 24 procedures

In 2024/25, a total of 692 emergency thoracic aortic operations were performed, most of which were for acute aortic dissection.

The 2023 NACSA audit report suggested that mortality outcomes are possibly improved if centres undertake 24 or more operations per year (based on UK results from the last decade).

In 2024/25, only 11 hospitals met or exceeded this threshold. The remaining 21 hospitals fell short, with the lowest-volume NHS centre performing just 4 cases.

Number of emergency operations on the aorta by hospital (2024/25)



Concomitant left atrial appendage occlusion (LAAO) procedures during cardiac surgery have risen significantly

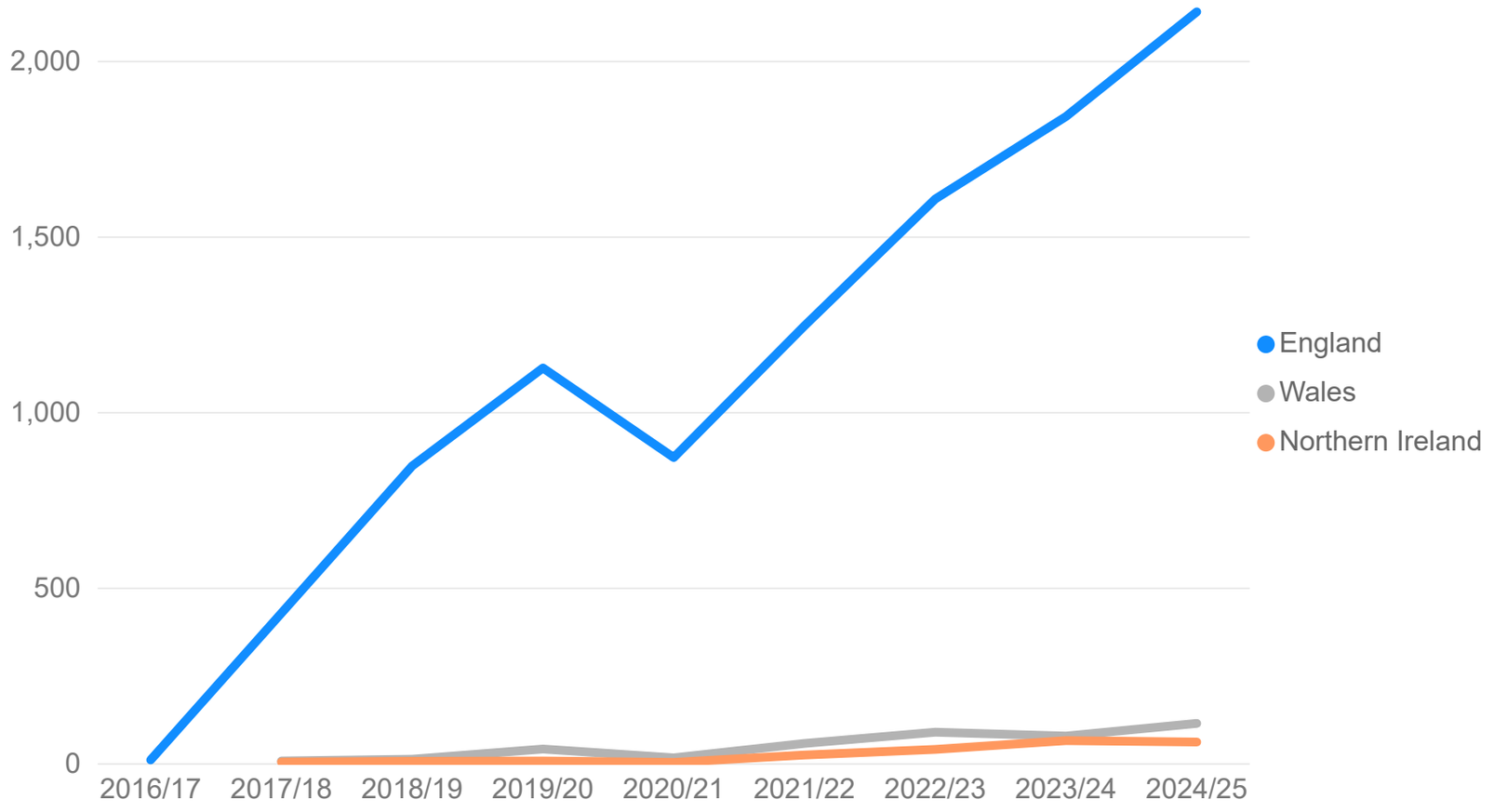
Left atrial appendage occlusion (LAAO) is a simple and quick procedure that can be performed concomitantly during surgery, typically by placing a clip across the atrial appendage.

The 2021 LAAOS III trial recommended that all patients with atrial fibrillation (AF) undergo LAAO to reduce their future risk of stroke.

Following this evidence, practice in England has shifted, with the number of procedures increasing annually since 2016/17, aside from the pandemic year 2020/21.

In 2024/25, a total of 2,312 LAAO procedures were performed across England, Wales, and Northern Ireland.

Number of left atrial appendage occlusion procedures at the time of cardiac surgery



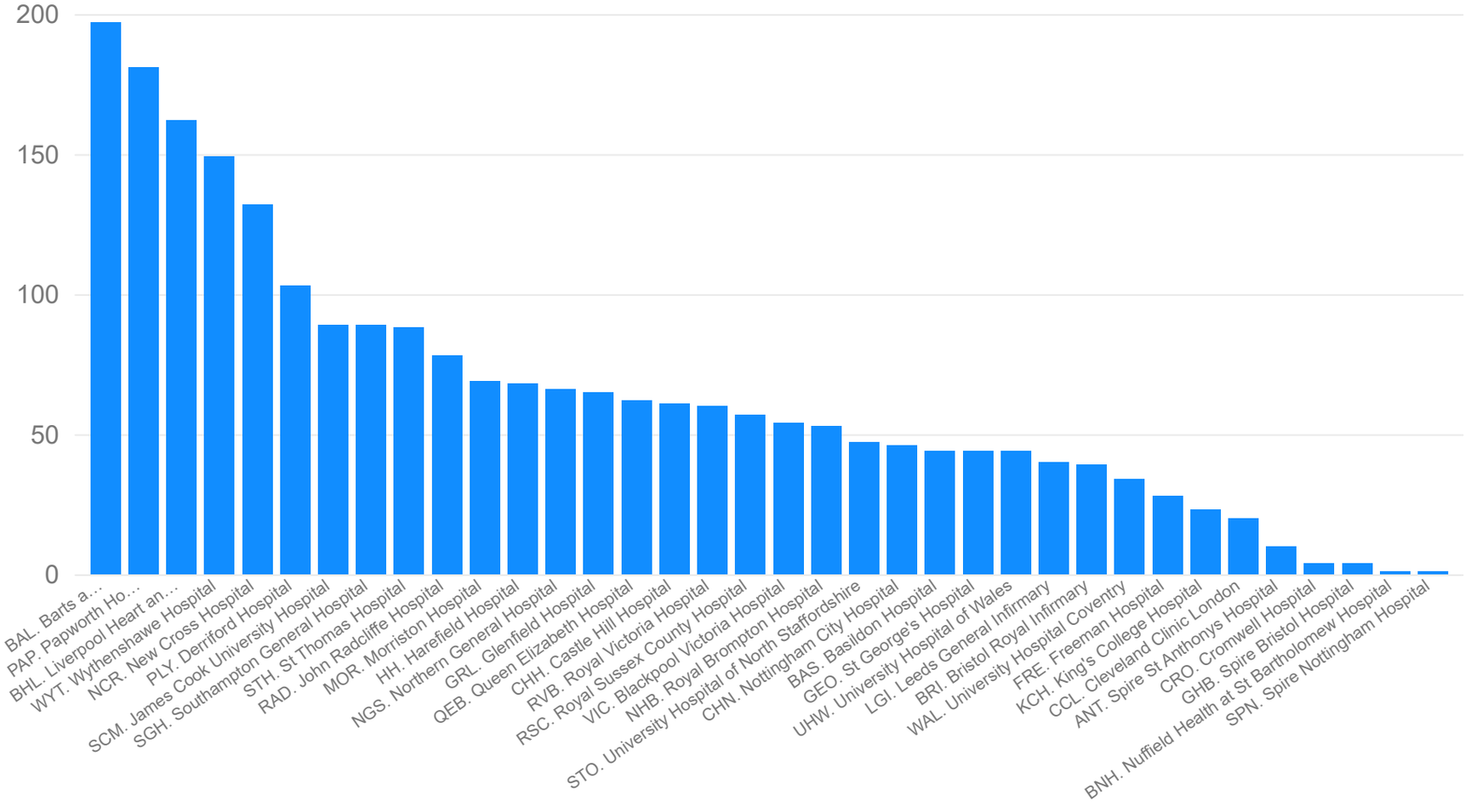
The number of left atrial appendage occlusion (LAAO) procedures varied from 23 to 197 in NHS hospitals

The most active NHS hospital performed 197 left atrial appendage (LAAO) procedures in 2024/25.

Across all the centres, there was considerable variation in procedural volumes. Sixteen hospitals performed fewer than 50 LAAO procedures, highlighting a substantial difference in activity levels between centres. The lowest-volume NHS hospital carried out only 23 procedures.

Note: Reliable data on pre-operative rates of AF are not available, although NHS units undertaking higher numbers of LAAO procedures are performing it in around 10-12% of all their cases (see next page).

Number of left atrial appendage occlusion procedures during cardiac surgery by hospital (2024/25)



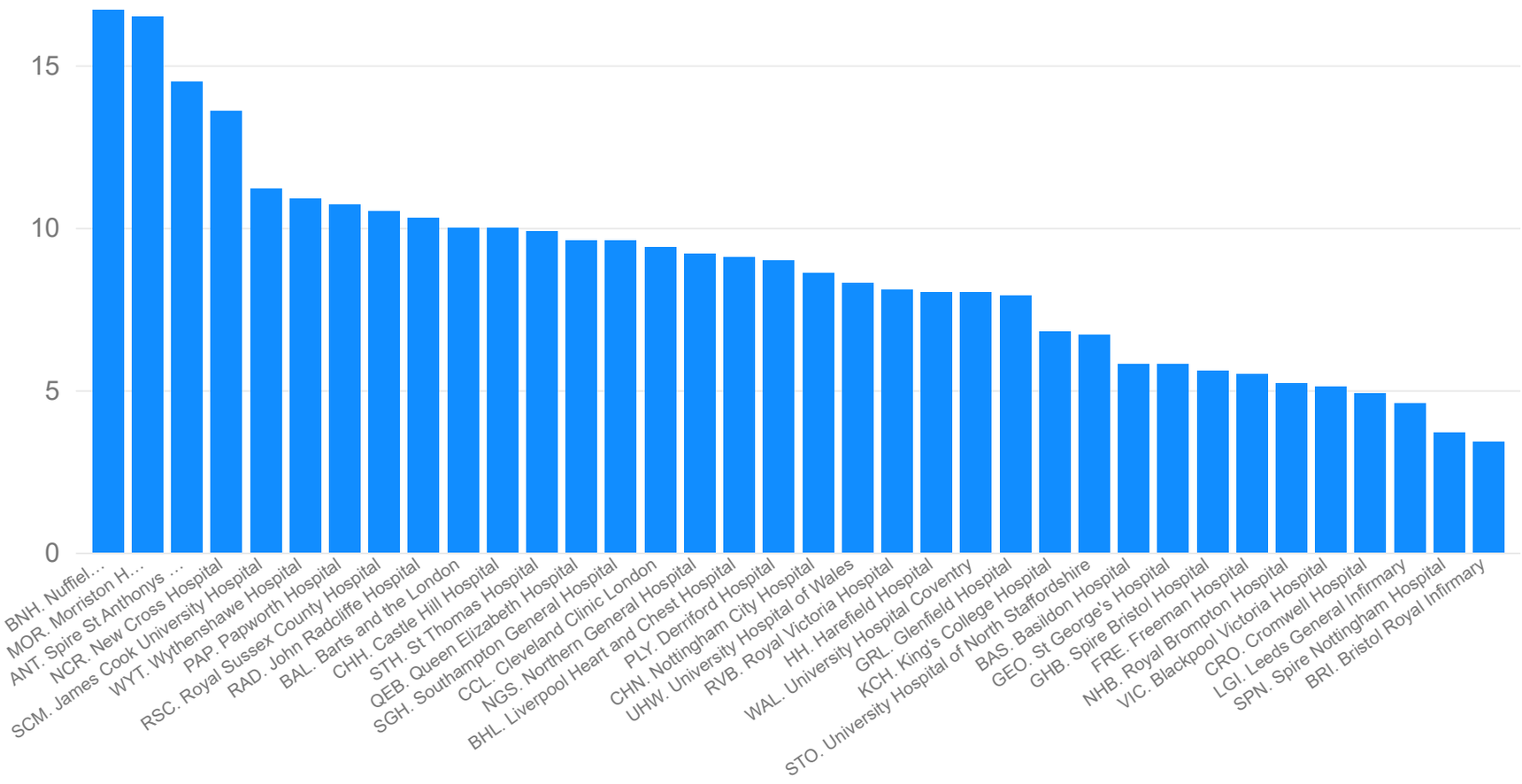
The proportion of cardiac operations involving a left atrial appendage occlusion (LAAO) procedure varies from 16.5% to just over 3% in NHS hospitals

Guidelines recommend that all patients with atrial fibrillation (AF) undergo left atrial appendage occlusion (LAAO) during cardiac surgery whenever feasible.

In 2024/25, the uptake of LAAO across NHS hospitals showed a fivefold variation, ranging from 16.5% at the hospital with the highest rate to just 3.4% at the lowest.

Note: Reliable rates of preoperative AF are not available within the data collected. No data from Hammersmith hospital.

Percentage of left atrial appendage occlusion procedures during cardiac surgery by hospital (2024/25)



Actual and age-standardised rates of isolated CABG by area based on patients' home location for both men and women

The map illustrates the rates of isolated CABG (isoCABG) operations for men and women, showing both actual and age-standardised rates based on patients' postcodes. Data are presented for the 42 Integrated Care Boards (ICBs) in England and 7 University Health Boards (HBs) in Wales that commission these services.

In 2024/25, the actual isoCABG rates ranged from 64 to 272 cases per million men and 6 to 62 cases per million women.

Even after adjusting for differences in age profiles across regions, substantial regional variation persists, highlighting that factors beyond age continue to influence adult cardiac surgery rates.

Select a time period and type of procedure below to see the relevant data.

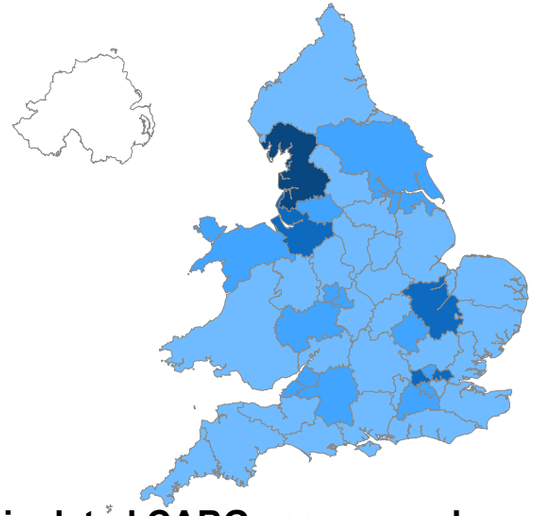
Gender

Male

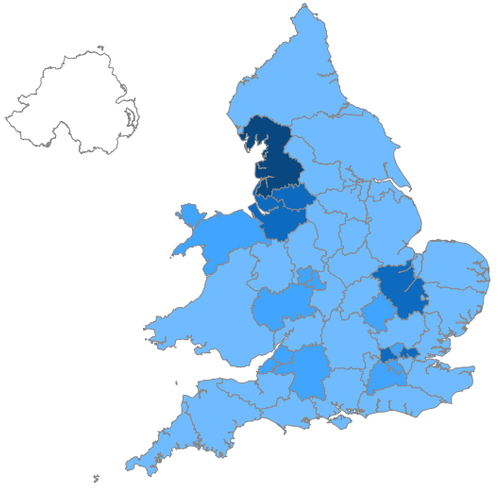
Financial Year

2024/25

Actual rate of isolated CABG cases pmp based on patient home location by ICB/HB



Age-standardised rate of isolated CABG cases pmp based on patient home location by ICB/HB



Actual and age-standardised rates of isolated AVR by area based on patients' home location for both male and female

The map displays the rates of isolated aortic valve replacement (isoAVR) operations for men and women, showing both actual and age-standardised rates based on patients' postcodes. Data cover the 42 Integrated Care Boards (ICBs) in England and 7 University Health Boards (HBs) in Wales responsible for commissioning these services.

In 2024/25, the actual isoAVR rates ranged from 8 to 67 cases per million men and 5 to 42 cases per million women.

Even after adjusting for regional differences in age, substantial variation remains, indicating that factors beyond age continue to influence adult cardiac surgery rates.

Select a time period and type of procedure below to see the relevant data.

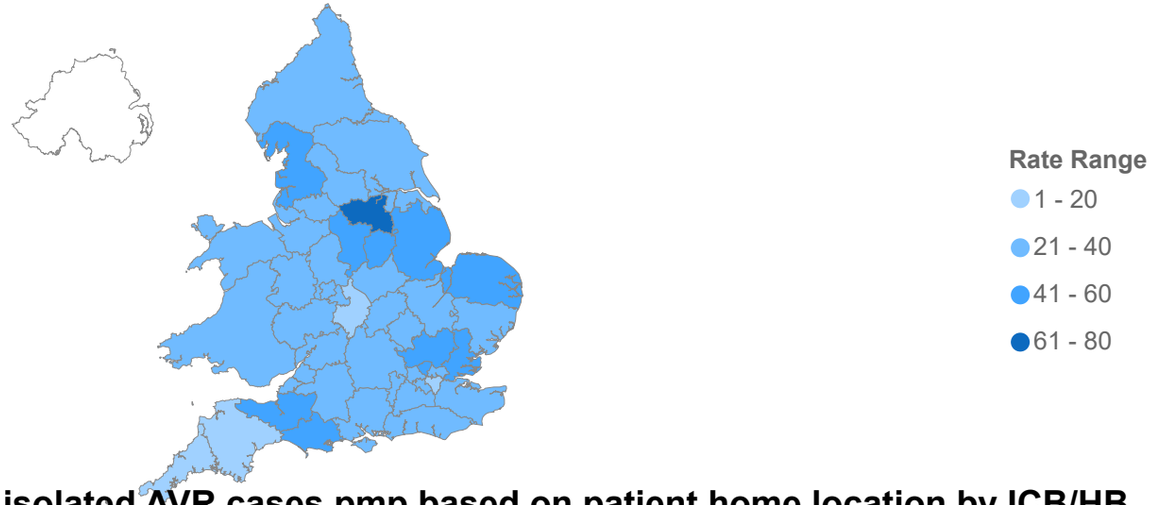
Gender

Male

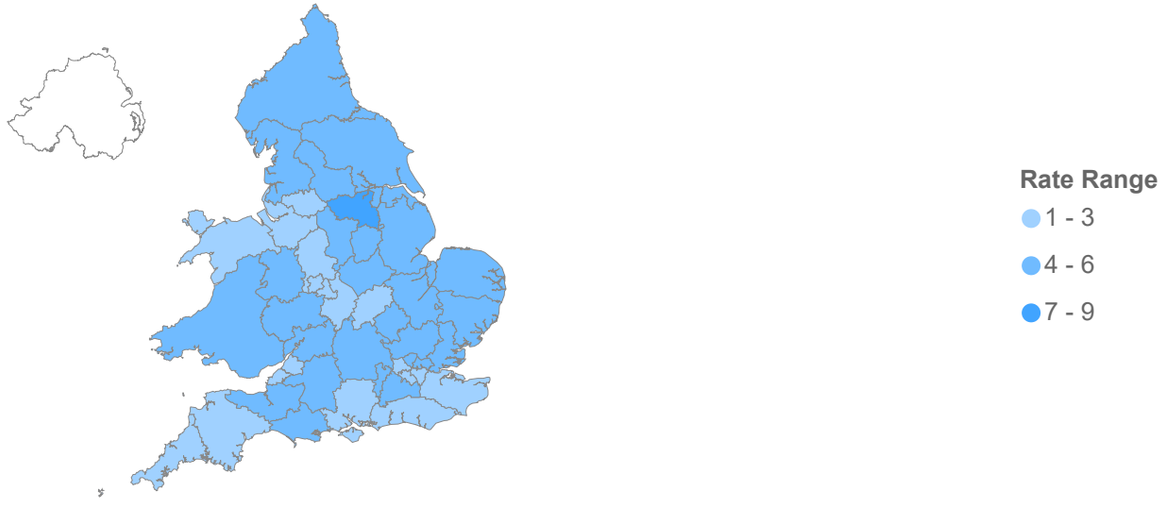
Financial Year

2024/25

Actual rate of isolated AVR cases pmp based on patient home location by ICB/HB



Age-standardised rate of isolated AVR cases pmp based on patient home location by ICB/HB



Actual and age-standardised rates of emergency major aortic surgery by area based on patients' home location for both male and female patients

The map shows the rates of emergency major aortic operations for male and female with (actual) and without age adjusted rates (age standardized) according to postcode of the patient's residence for the 42 Integrated Care Boards (ICBs) in England and 7 University Health Boards in Wales (HBs) which commission services.

For all emergency major aortic, the actual rate varied between 2 and 14 cases in men per million men and between 1 and 12 cases in women in 2024/25.

Significant regional differences remains even when age-standardised rates are used to adjust for the different age profiles of each area (age being a factor in adult cardiac surgery.

Select a time period and type of procedure below to see the relevant data.

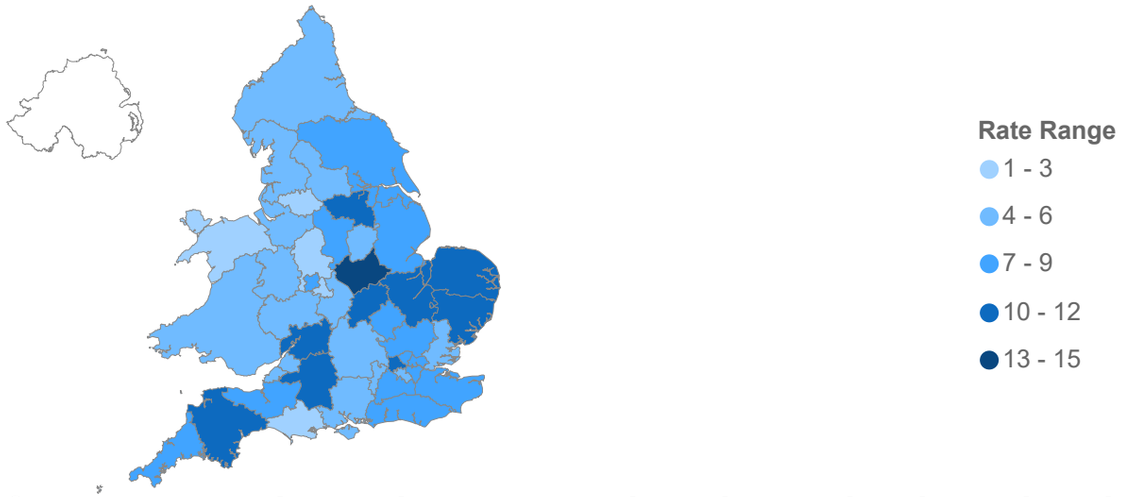
Gender

Male

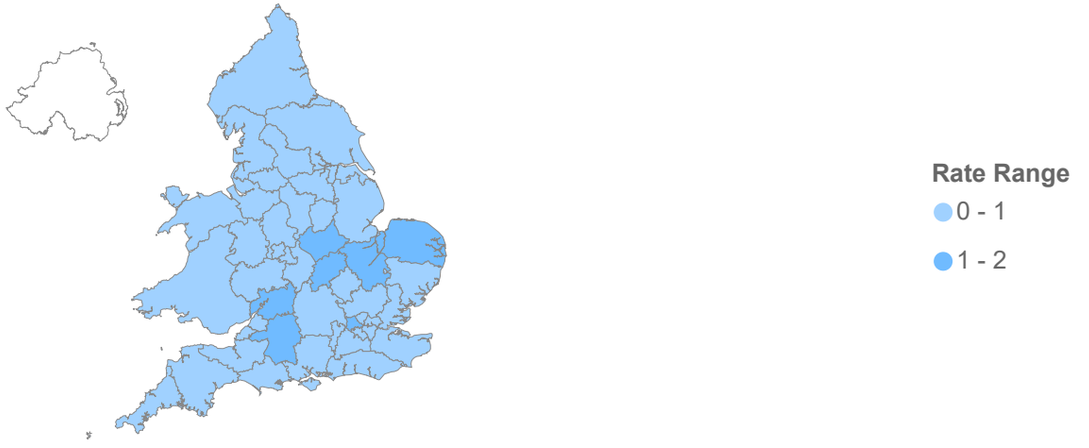
Financial Year

2024/25

Actual rate of emergency major aortic cases pmp based on patient home location by ICB/HB



Age-standardised rate of emergency major aortic cases pmp based on patient home location by ICB/HB



Off-Pump Coronary Artery Bypass (OPCAB) procedure rates have seen a slight increase in 2023/24, but overall they have declined over the past decade

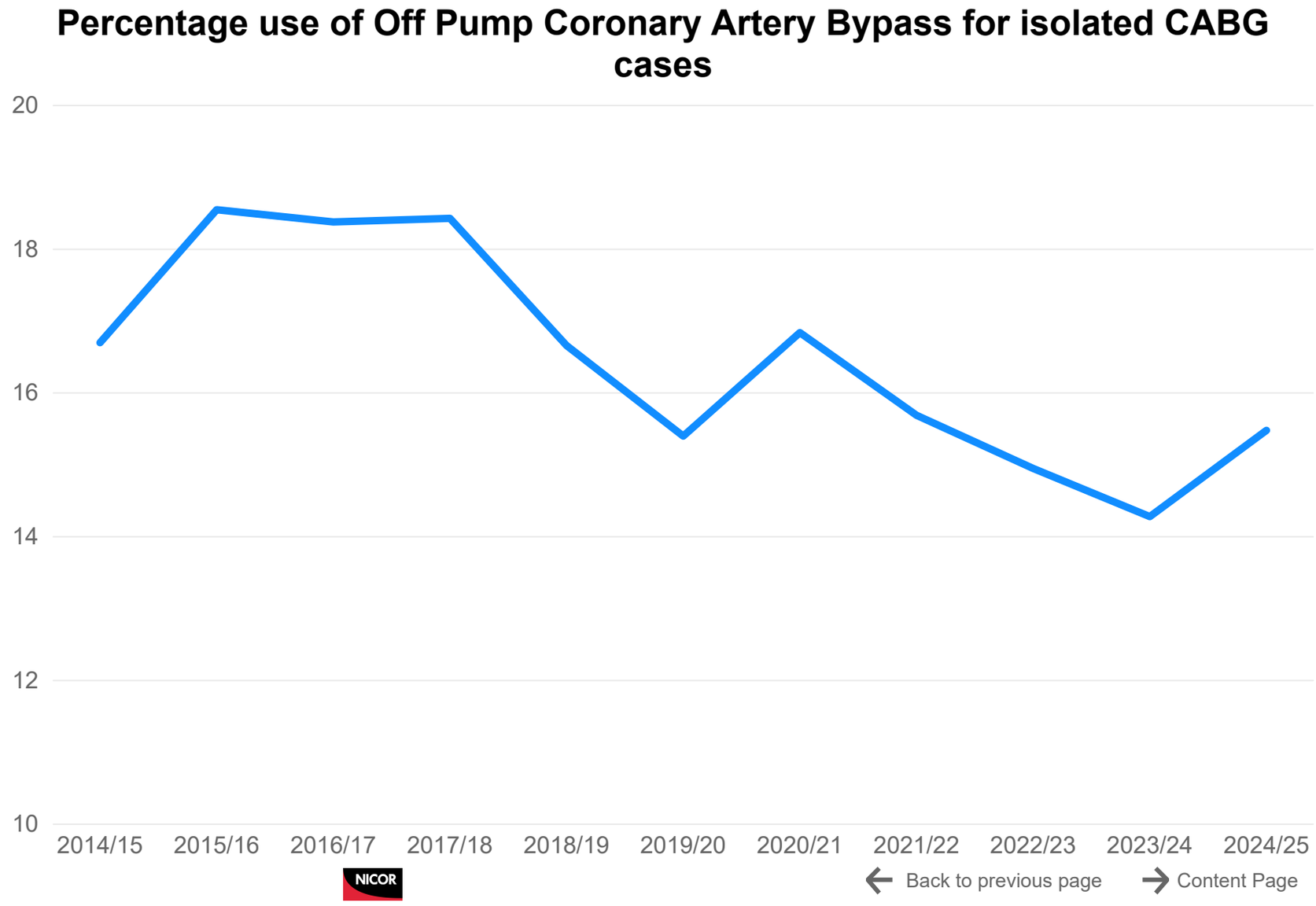
Isolated CABG surgery can be performed without the use of a cardiopulmonary bypass machine, otherwise called Off Pump Coronary Artery Bypass (OPCAB).

OPCAB rates in the UK have declined steadily since peaking in 2008.

While debated, evidence suggests there is likely no significant difference in outcomes between OPCAB and conventional on-pump CABG.

In 2024/25, 15.4% of all isolated CABG operations in the UK were performed using the OPCAB approach.

Note: These rates also include all cases where no bypass time is recorded, so may be an overestimate.



There is considerable variation in the use of Off Pump Coronary Artery Bypass (OPCAB) by hospital

OPCAB rates vary hugely between different hospitals across the UK (from under 0.5% to 56% in the NHS).

In 2024/25 there were seven hospitals (three NHS) where it was used in more than 40% of CABG operations.

In 20 hospitals the OPCAB rates were <10% of isolated CABG cases.

Select a year below to see the relevant data.

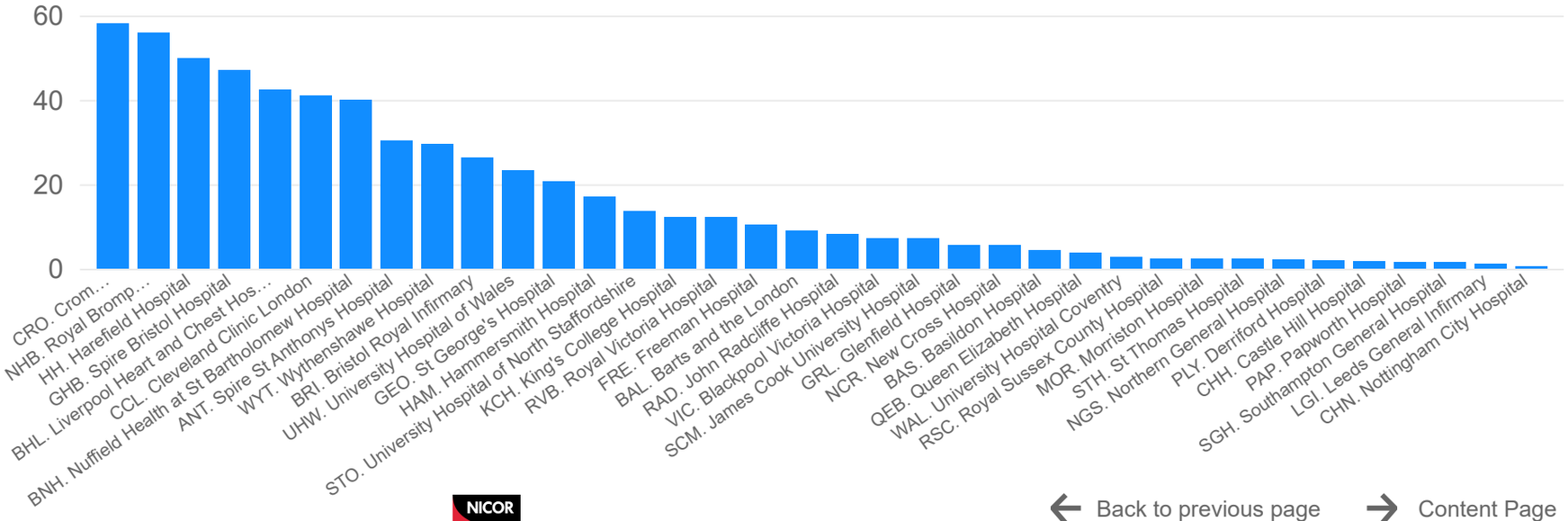
Note: MRI. Manchester Royal Infirmary has no data for 2024/25.

Financial Year

2024/25

Percentage use of OPCAB procedures (by financial year selected)

Percentage use of OPCAB procedures by hospital (by financial year selected)



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The number of bypass grafts performed during isolated CABG is consistent across hospitals

During isolated CABG, three bypass grafts is the most common number performed, accounting for 50% of patients in 2024/25.

The median number of grafts has remained stable at three across England, Wales, and Northern Ireland over the past decade.

At the hospital level, there is some variation, with the number of grafts per patient typically ranging from 1 to 5. In 2024/25, 5.8% of patients received a single graft, while 1.9% had five or more grafts.

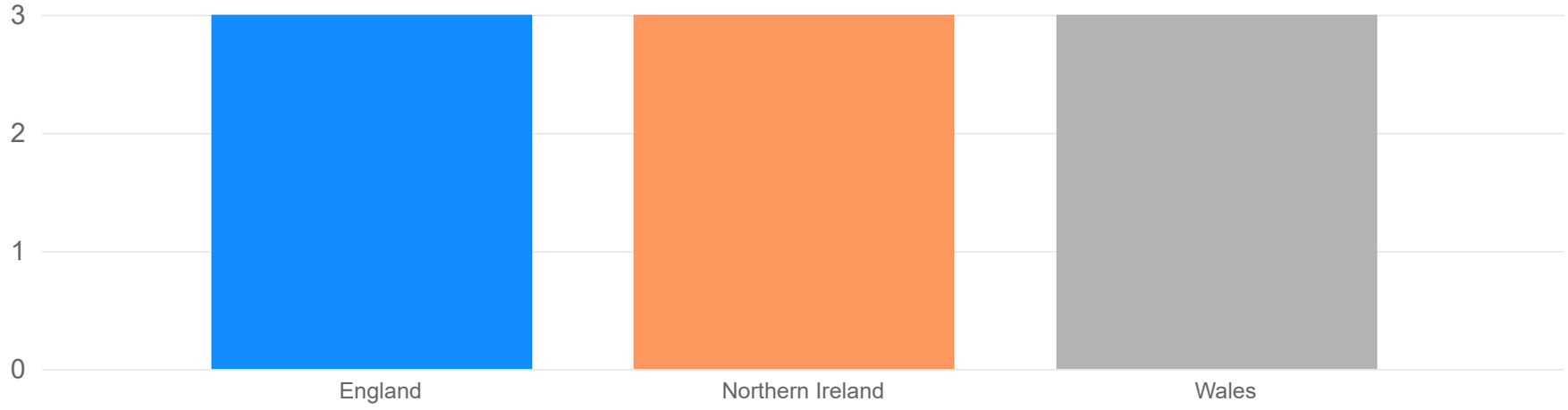
Select a year below to see the relevant data.

Note: MRI. Manchester Royal Infirmary has no data for 2024/25.

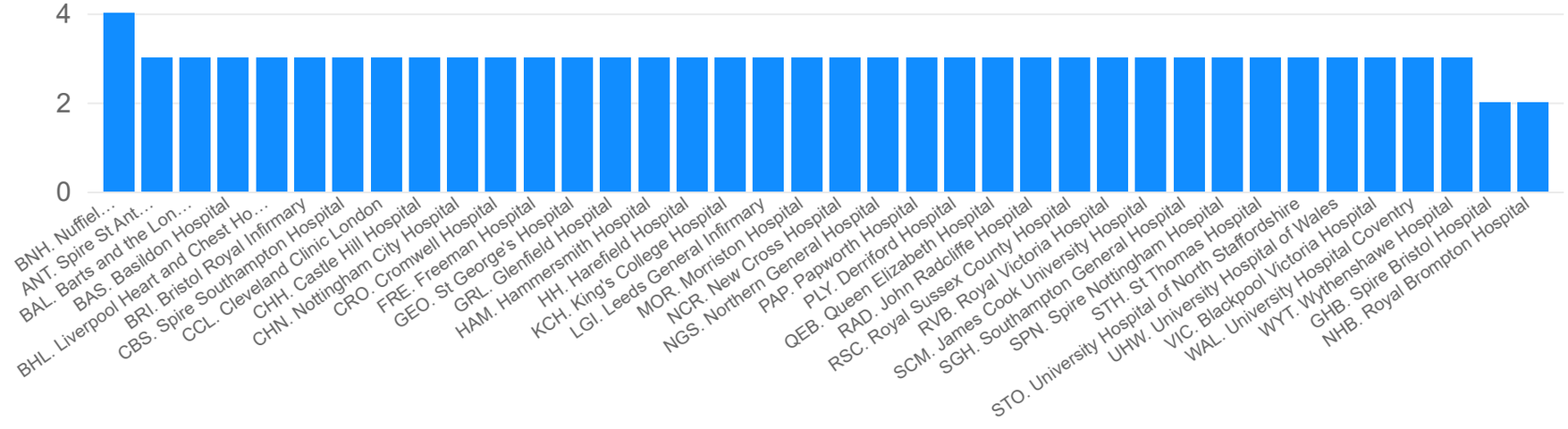
Financial Year

2024/25

Median number of bypass grafts during isolated CABG (by financial year selected)



Median number of bypass grafts during isolated CABG by hospital (by financial year selected)



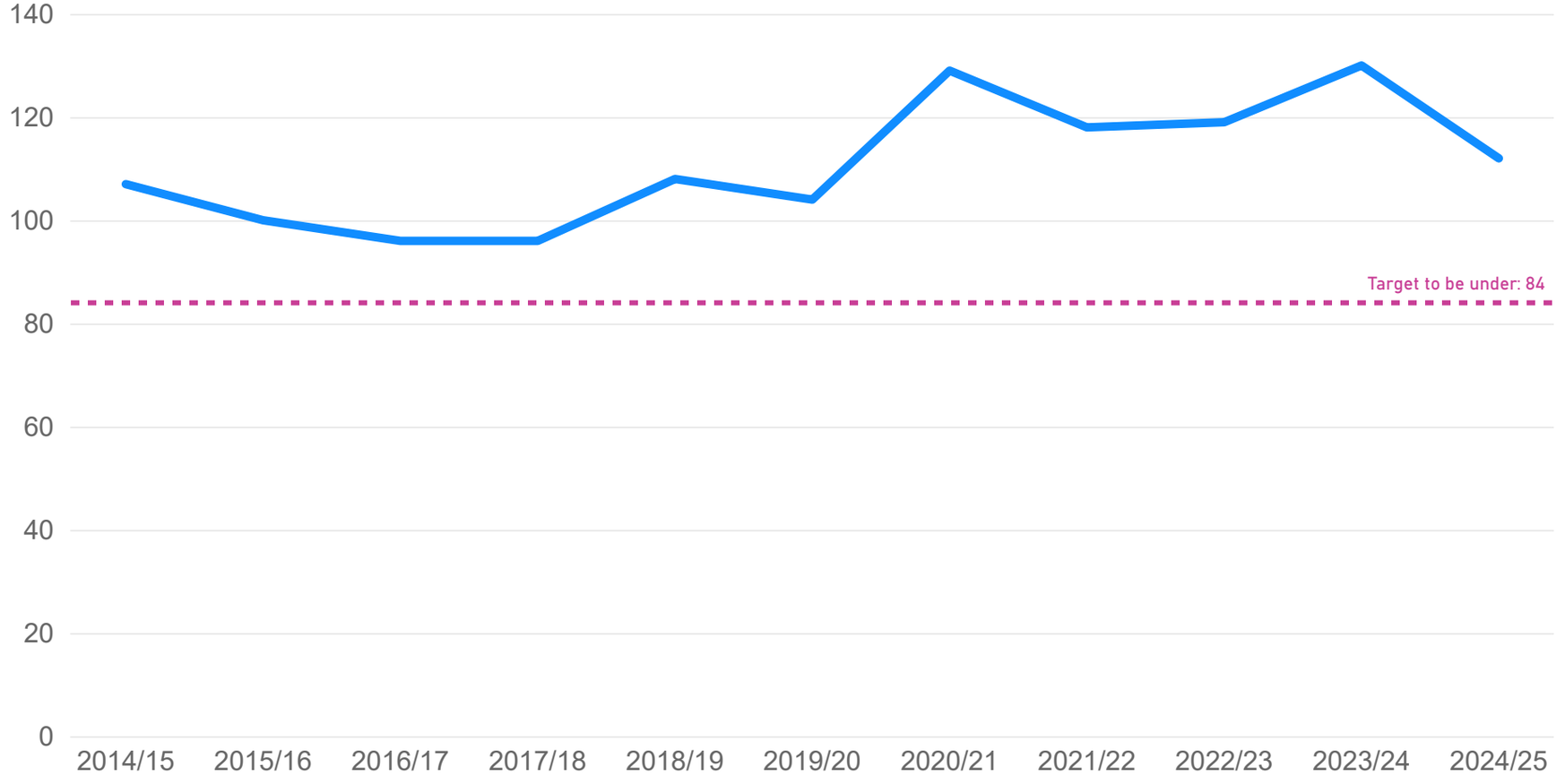
The average waiting time for elective CABG decreased slightly in 2024/25, but it remains well above the recommended target

NHS hospitals aim for a 12-week target (under 84 days) for patients awaiting elective coronary artery bypass grafting (CABG), measured from the date of coronary angiography.

In 2024/25, the average waiting time improved to 112 days, but it remains well above the target.

Waiting times had previously fallen to 96 days in 2017/18 before rising again, with a sharp increase during the COVID-19 pandemic, peaking at an average of 129 days.

Average waiting time (days) from angiography to elective CABG operation



In 2024/25, only six NHS hospitals hit the target waiting time for elective CABG

In 2024/25, the average waiting time for elective coronary artery bypass grafting (CABG) from angiography improved by 14%, decreasing from 130 days in 2023/24 to 112 days.

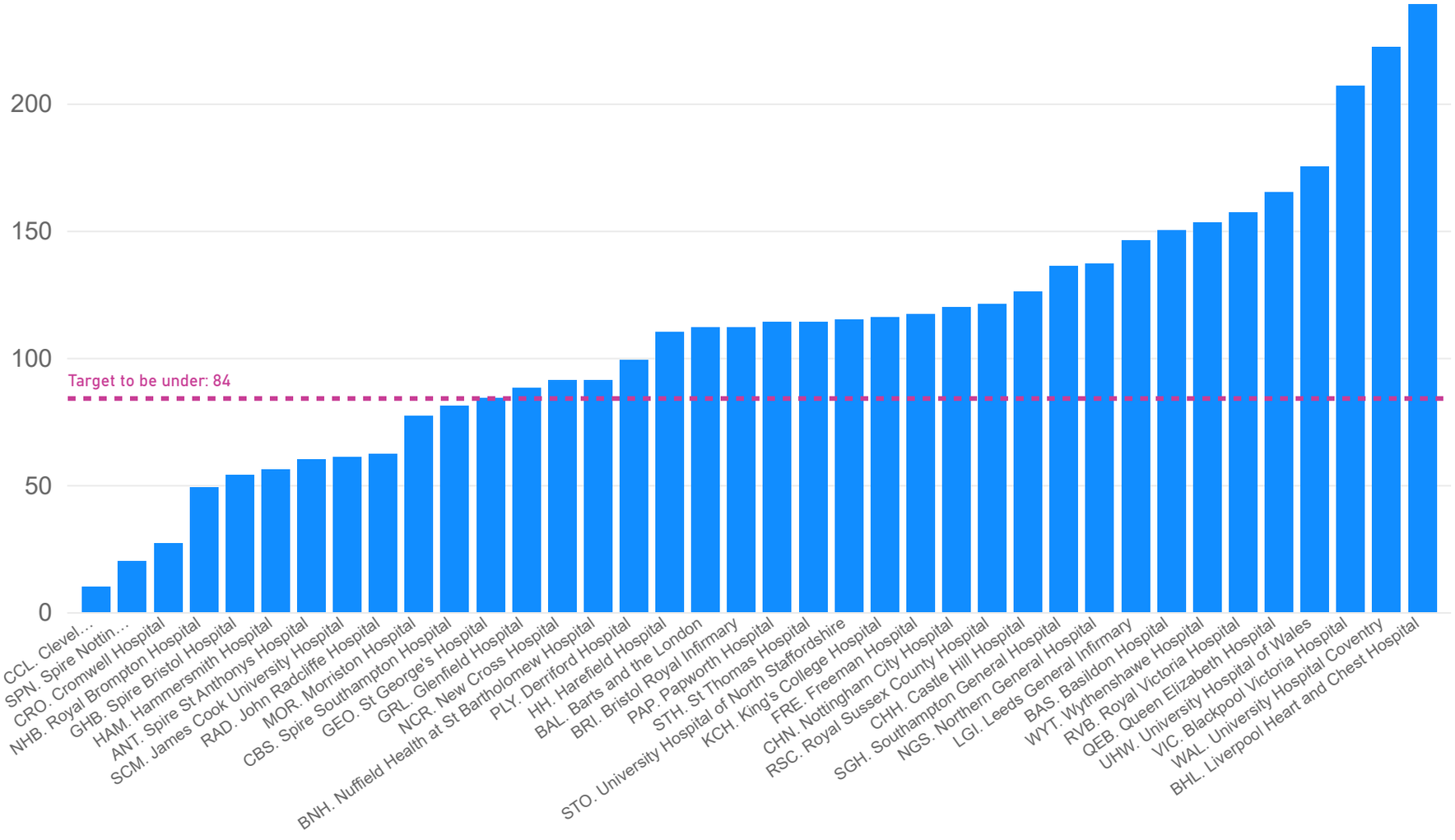
Six NHS hospitals met the 12-week target (84 days), with the shortest average waiting time being 49 days.

Conversely, eight hospitals had average waiting times of 150 days or more.

The longest average waits by hospital were 239 days in England, 157 days in Northern Ireland, and 116 days in Wales.

Note: MRI. Manchester Royal Infirmary has no data for 2024/25.

Waiting times (days) from angiography to elective CABG by hospital (2024/25)

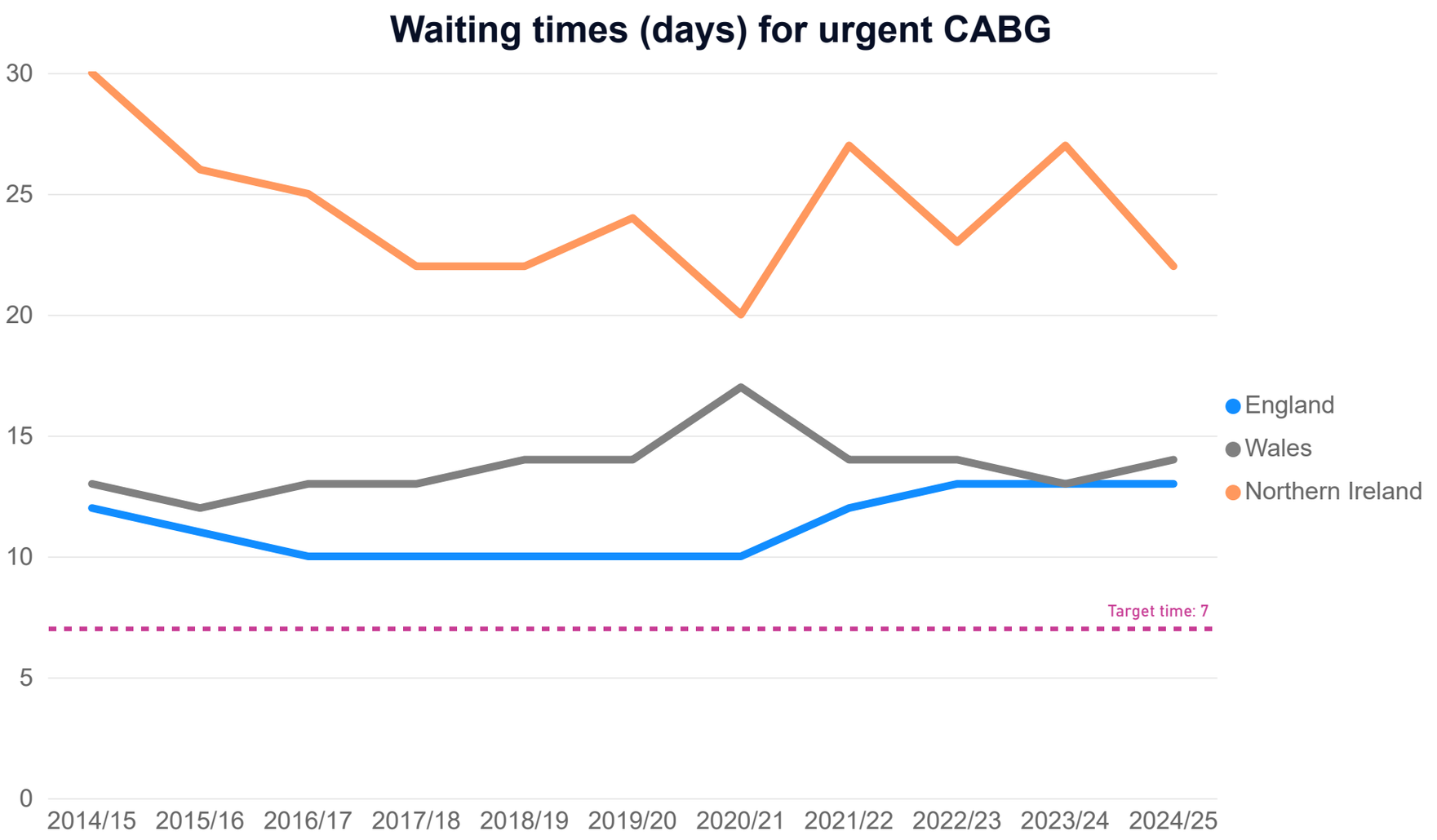


Urgent CABG surgery waiting times are significantly longer than the NHS target

Current NHS targets state that patients needing urgent coronary artery bypass graft (CABG) surgery should receive treatment within 7 days of diagnostic angiography.

In England, the average wait for urgent CABG increased to 13 days in 2022/23 and has remained at that level, compared with 10 days before the COVID-19 pandemic.

In 2024/25, waiting times were longest in Northern Ireland at 22 days, while in Wales the average wait increased by one day to 14 days.



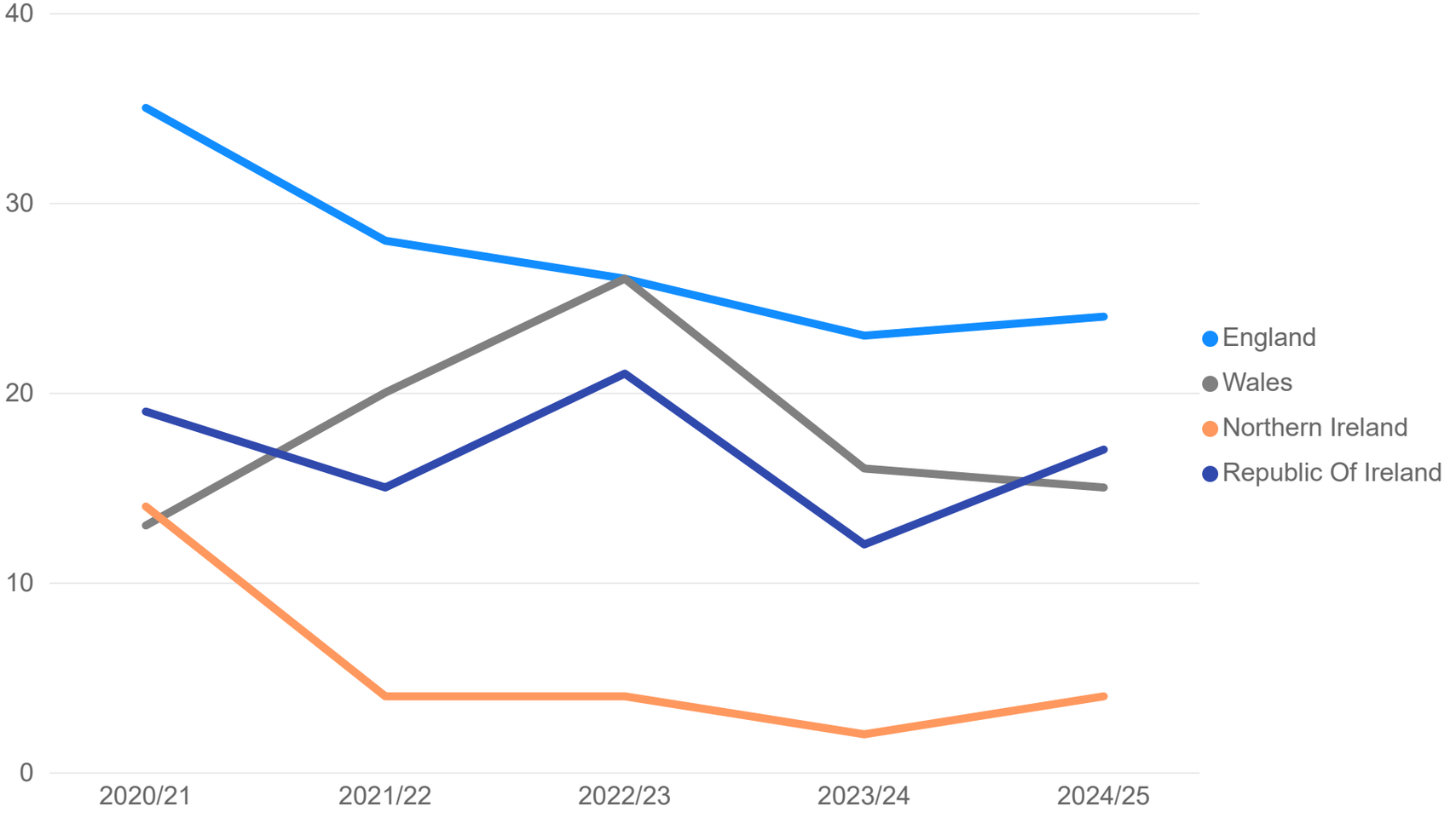
In England only 1 in 4 patients requiring urgent CABG are operated on within 7 days, and fewer in Wales (1 in 6) and in Northern Ireland (1 in 25)

In 2024/25, there were modest improvements in England, Northern Ireland, and the Republic of Ireland in the proportion of patients receiving urgent coronary artery bypass graft (CABG) surgery within the 7-day target.

However, overall performance remains low:

- In England, 24% of patients were treated within 7 days, down from 35% in 2020/21.
- In Wales, performance declined further, with only 16% treated within the target timeframe.
- In Northern Ireland, just 4% of patients underwent surgery within 7 days of angiography.

Percentage of patients undergoing urgent CABG within 7-day target by country



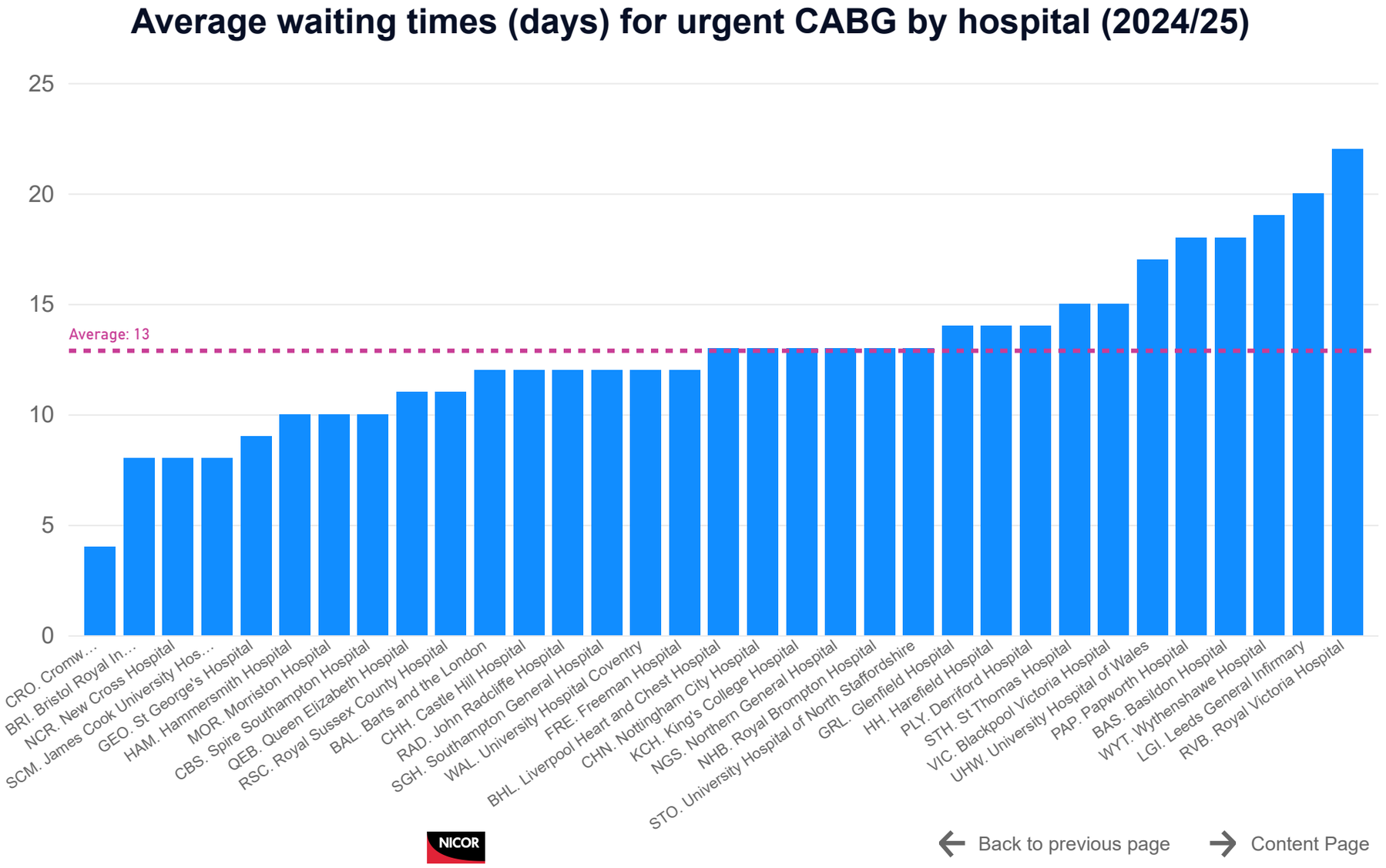
In 2024/25 the 7-day target for performing urgent CABG operations was not met by any hospital

In 2024/25, no NHS hospitals achieved the target of performing coronary artery bypass grafting (CABG) for urgent patients within 7 days on average from time of angiography to surgery.

The best hospital achieved an average wait of 8 days.

The average UK hospital waiting time was 13 days.

There remains significant variation between hospitals, with 17 NHS hospitals recording average waiting times of 13 days or longer for urgent CABG - an increase from 7 hospitals the previous year.



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In 2024/25, no hospital achieved the target of operating on 75% of patients requiring urgent CABG within 7 days of angiography

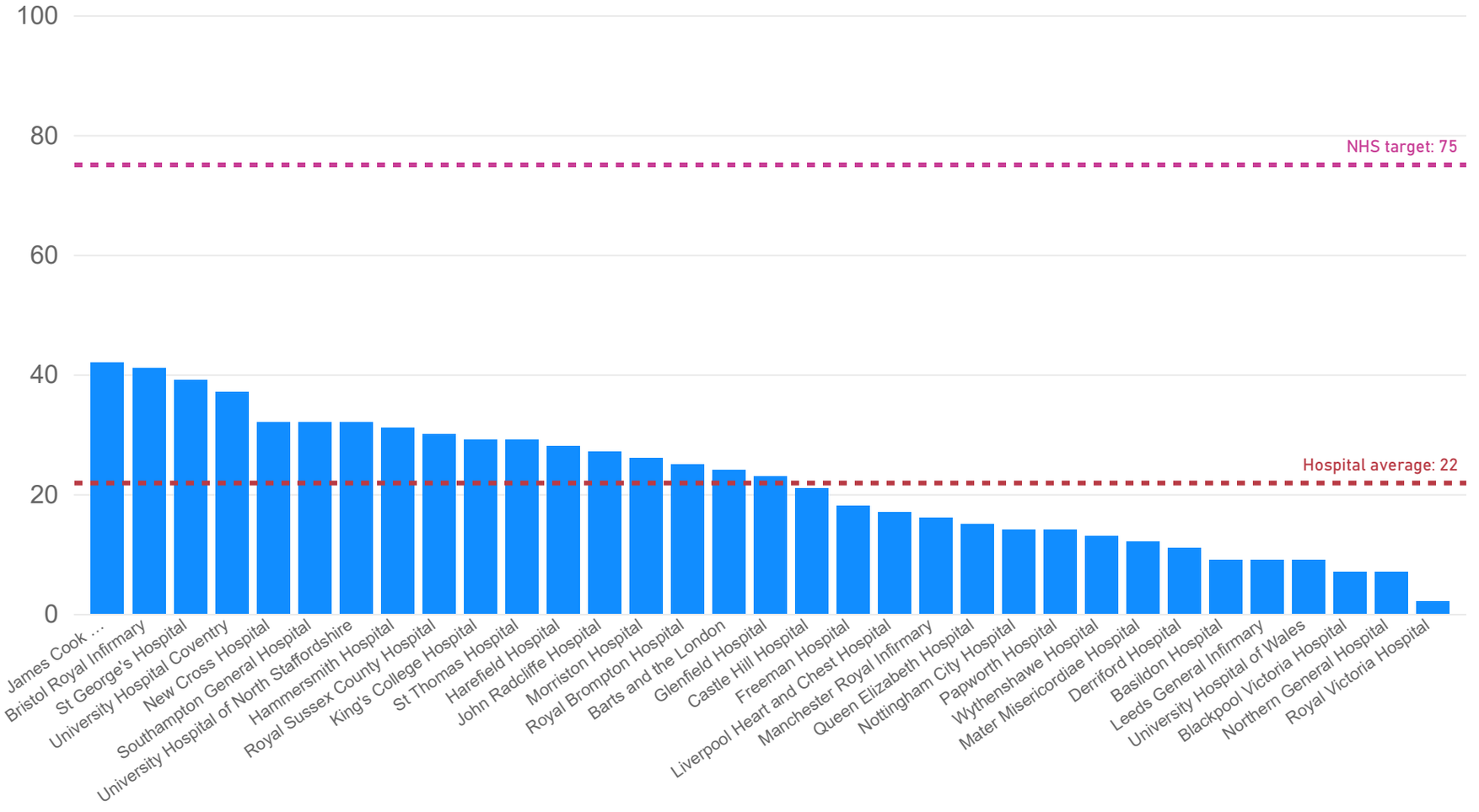
In 2024/25, no hospital achieved the waiting time target of having 75% of patients requiring urgent CABG operated on within 7 days of angiography.

This has been the situation for a number of years.

The best performing hospital achieved this for 42% of patients while the average across all hospitals was 22%.

15 hospitals performed 20% or less of their urgent operations within 7 days last year - up from 12 in 2022/23.

Percentage of patients undergoing urgent CABG within 7-day target by hospital (2024/25)



Following the pandemic, there has been a slow rise in the proportion of patients with 'day of surgery admission' (DOSA) for elective cardiac surgery in England

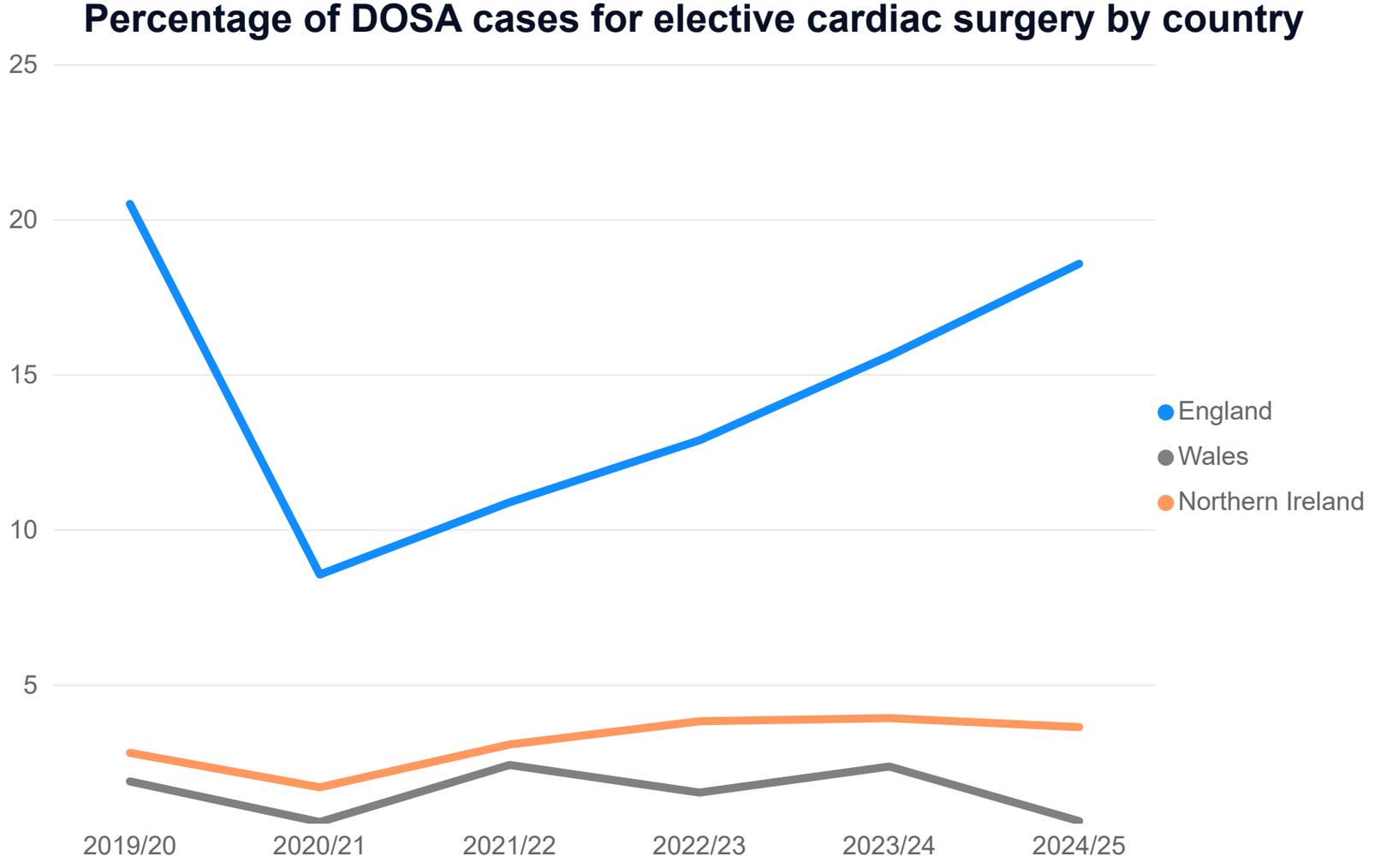
The 2018 Getting It Right First Time (GIRFT) report recommended that half of all patients undergoing elective cardiac surgery should have day of surgery admission (DOSA).

This requires effective pre-operative pathways which would reduce the likelihood of operations being cancelled for medical reasons. It also allows greater efficiency in ward bed usage and reduces hospital costs.

The audit target is that 50% of elective patients should be DOSA cases.

In 2024/25, just over 18% of elective operations involved DOSA in England. Evidence from prior to the pandemic suggests that this could easily be improved.

Little or no progress has been made in implementing DOSA in Wales or Northern Ireland



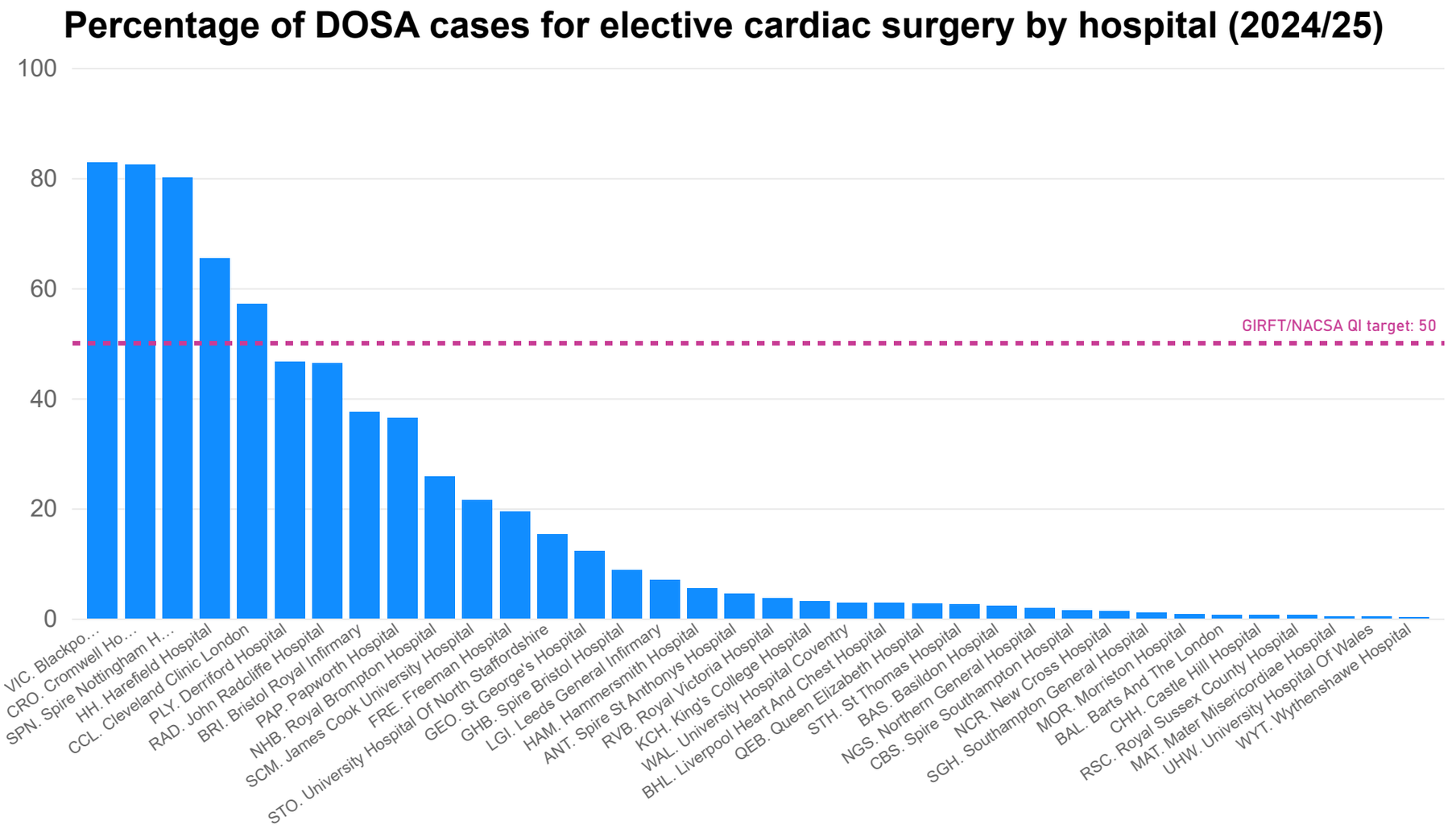
Only 1 NHS hospital achieved the audit target for 50% of elective cardiac surgery cases to have day of surgery admission (DOSA)

The audit promotes a target of 50% of elective patients to have day of surgery admission (DOSA).

In 2024/25, 2 NHS hospitals met this target.

16 NHS hospitals had DOSA rates below 5% compared to 20 in 2023/24.

Note: No data for Leicester and Nottingham City.



The average post-operative length of stay (LOS) after CABG is 8 days

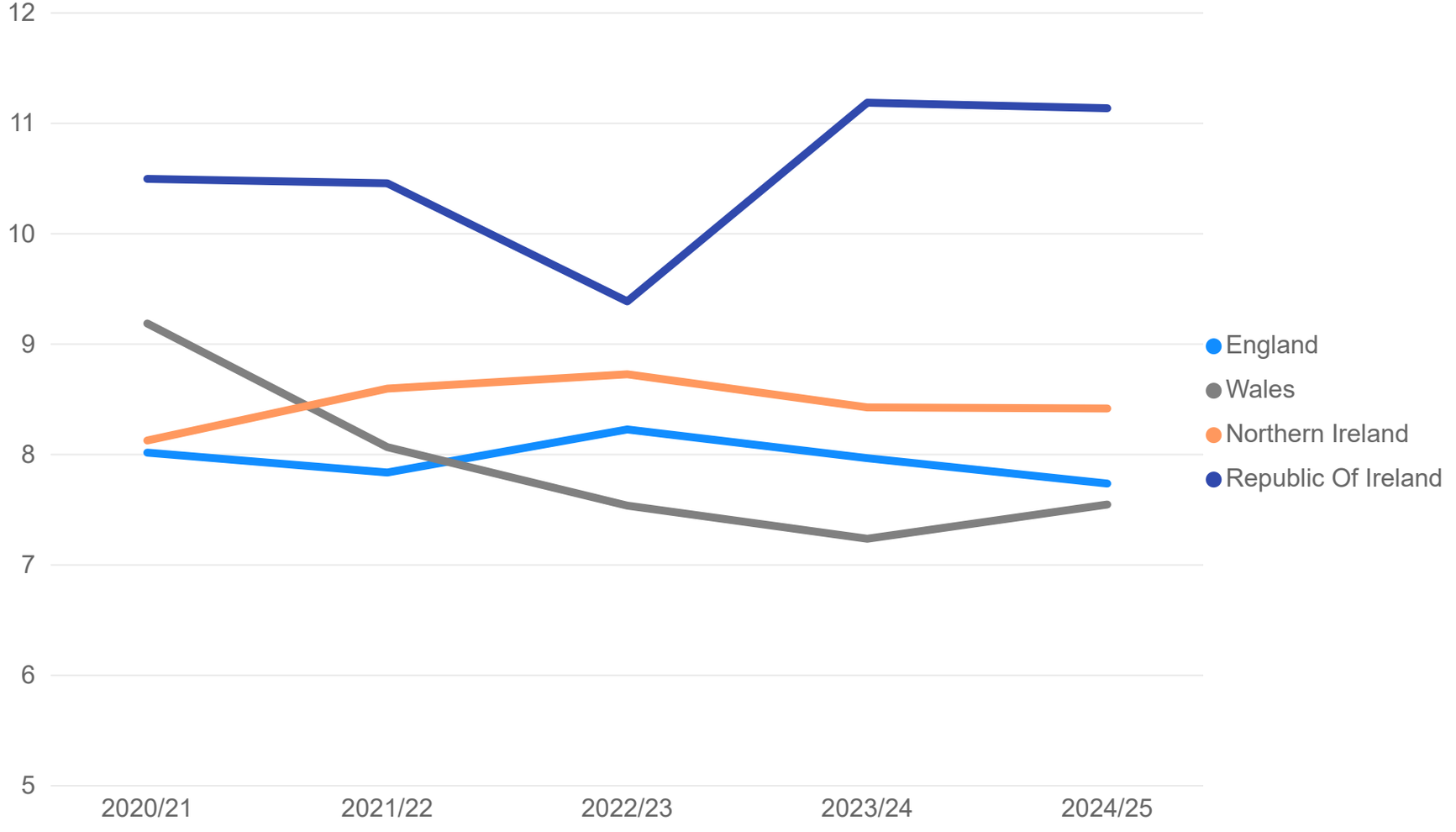
Post-operative length of stay (LOS) following CABG surgery is influenced by several factors, including patient age, co-morbidities, and the occurrence of complications such as heart rhythm disturbances, stroke, or wound infections, which can delay discharge.

A shorter post-operative LOS generally indicates more efficient bed use and lower complication rates after surgery.

In Wales, the average post-operative LOS has decreased from 9.2 to 7.5 days over the past five years.

In 2024/25, the average LOS was 8.4 days in Northern Ireland and 7.7 days in England, both showing little change compared with the previous five years.

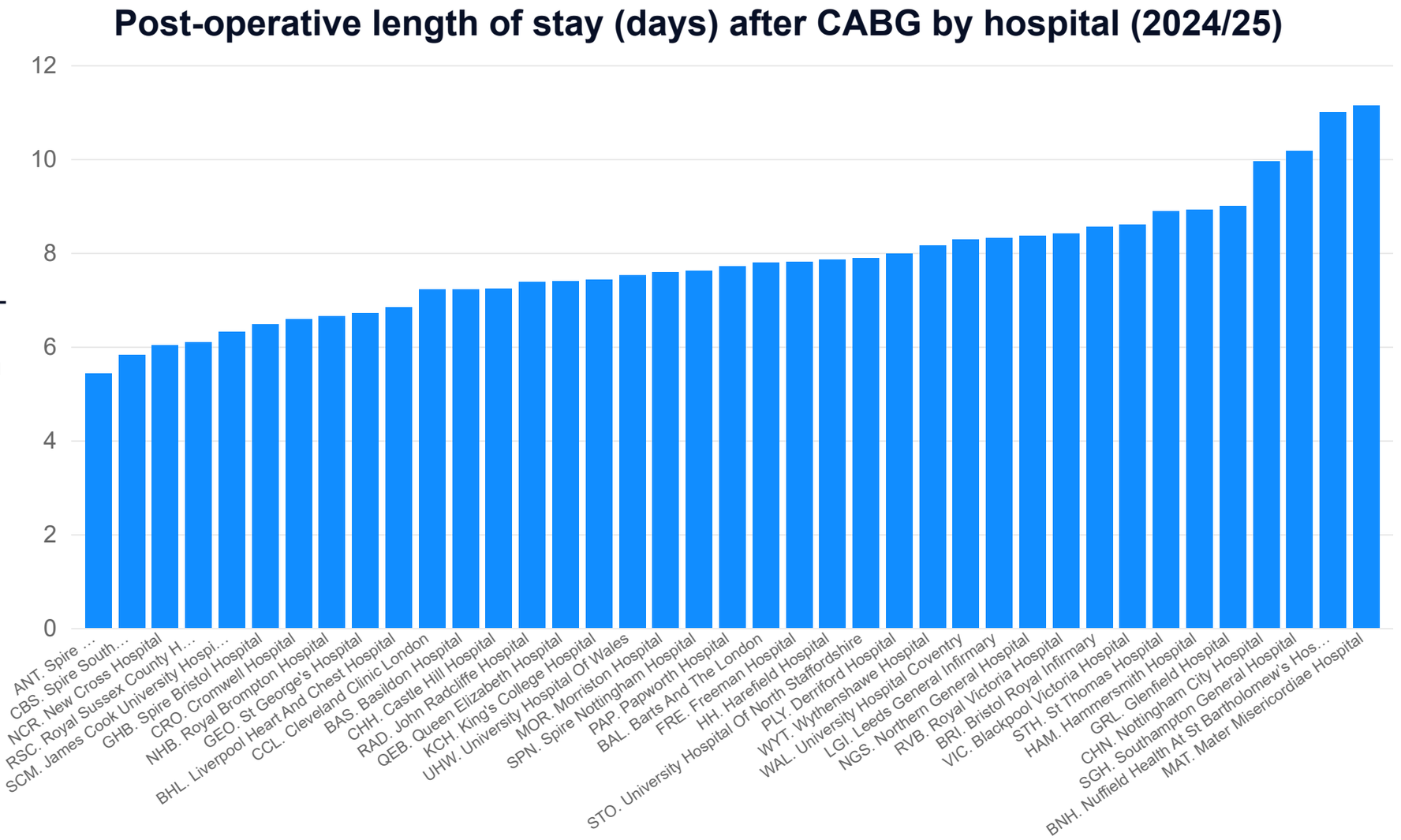
Post-operative length of stay (days) in hospital after CABG by country



Post-operative length of stay (LOS) for the best performing NHS hospitals is 40% shorter than those with the longest stays

The average post-operative length of stay (LOS) across all hospitals was 8 days.

There is considerable variation in post-operative LOS. The shortest average post-operative LOS following CABG in an NHS hospital was 6 days while the longest was 10 days (ie the best hospitals achieve 40% shorter post-operative LOS than the poorest performers).

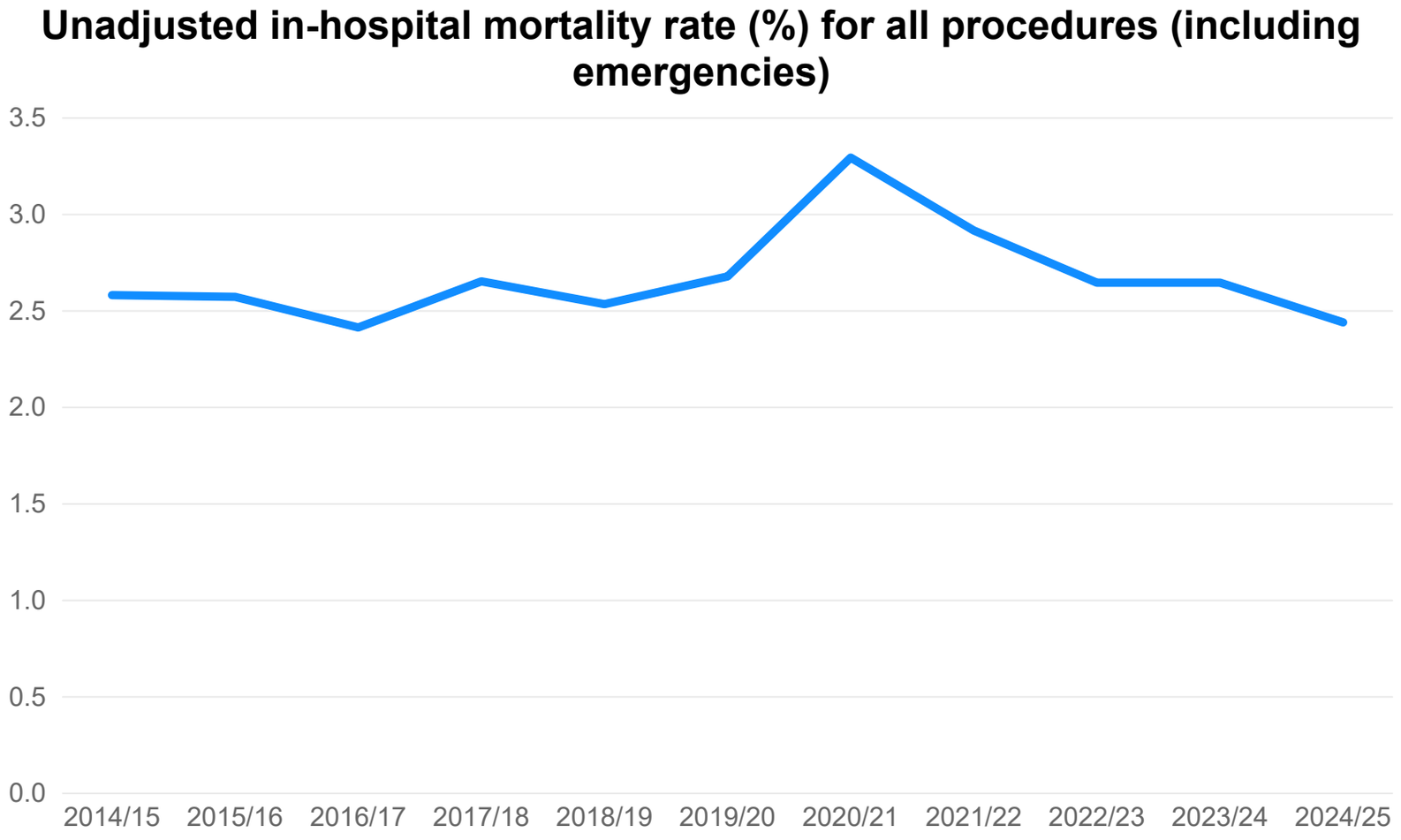


In 2024/25 the overall in-hospital mortality rate for all cardiac surgery cases returned to the pre-pandemic rate - 2.4%

Unadjusted (crude) mortality rates following all cardiac surgeries, including emergencies, had stabilised at around 2.5% up to 2019/20.

During the COVID-19 pandemic, this rate increased to 3.3%, reflecting a reduction in elective operations and a higher proportion of urgent and emergency cases.

By 2024/25, the crude mortality rate had fallen to 2.4%, returning to pre-pandemic levels.



All cardiac surgical centres are performing 'as expected' in relation to mortality rates

All UK hospitals in the UK have survival / in-hospital mortality rates after cardiac surgery that are 'as expected' during the last 3 years (2022/23 to 2024/25).

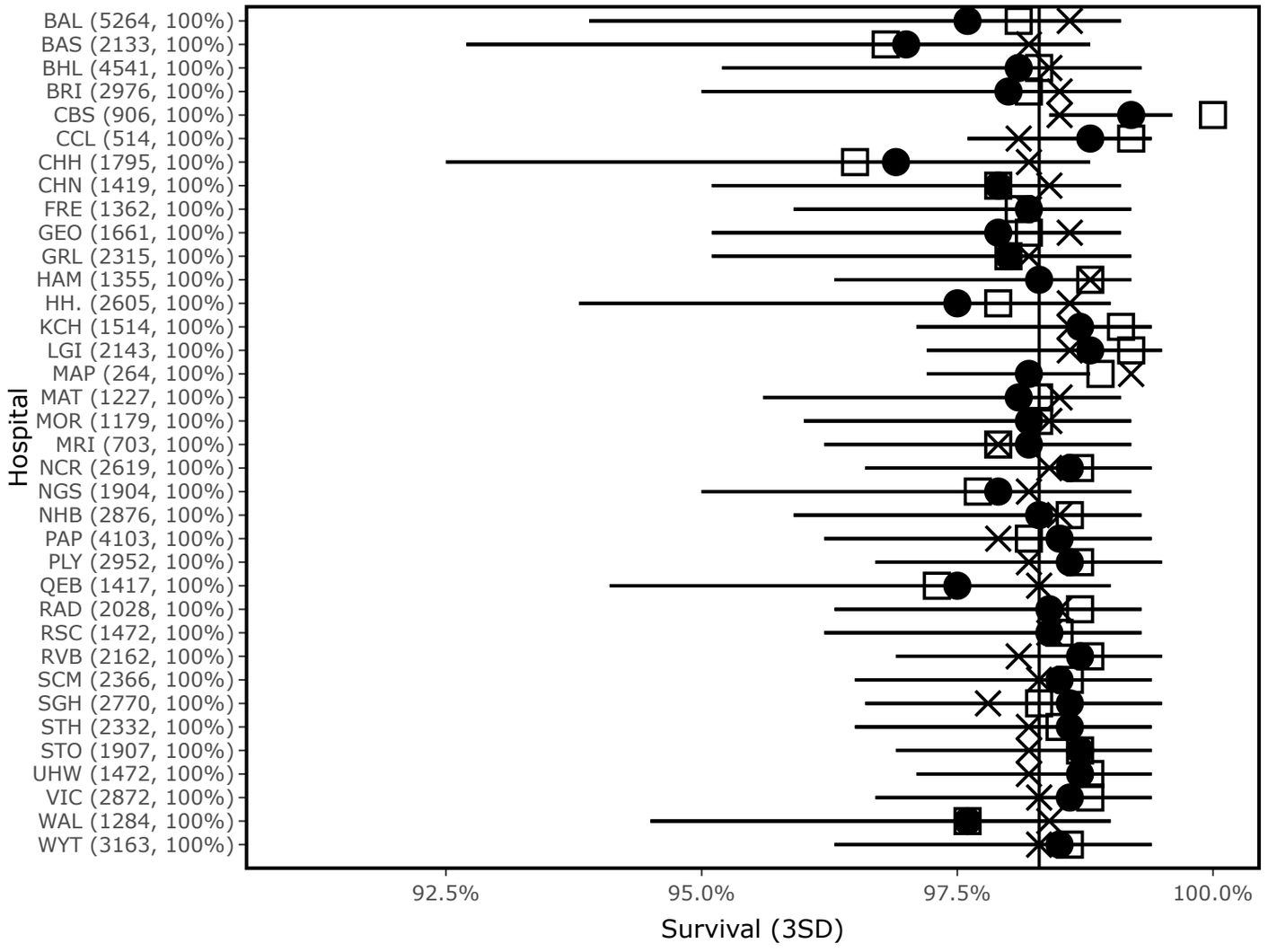
The UK average survival rate during this 3-year period was 98.3%. This figure applies to elective and urgent cases only. It excludes emergency cases and certain infrequent/rare procedures.

Key:
Black dot: Survival rate using random effects model is as expected
Open square: Actual survival rate
Black X: Predicted survival rate
Numbers in brackets after hospital code: Number of operations over three years and % data completeness

List of hospital names

Risk-adjusted mortality methods

Click here to Interactive Forest Plot



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The overall logistic EuroSCORE (predicted mortality rate) varies by hospital, suggesting case mix variation

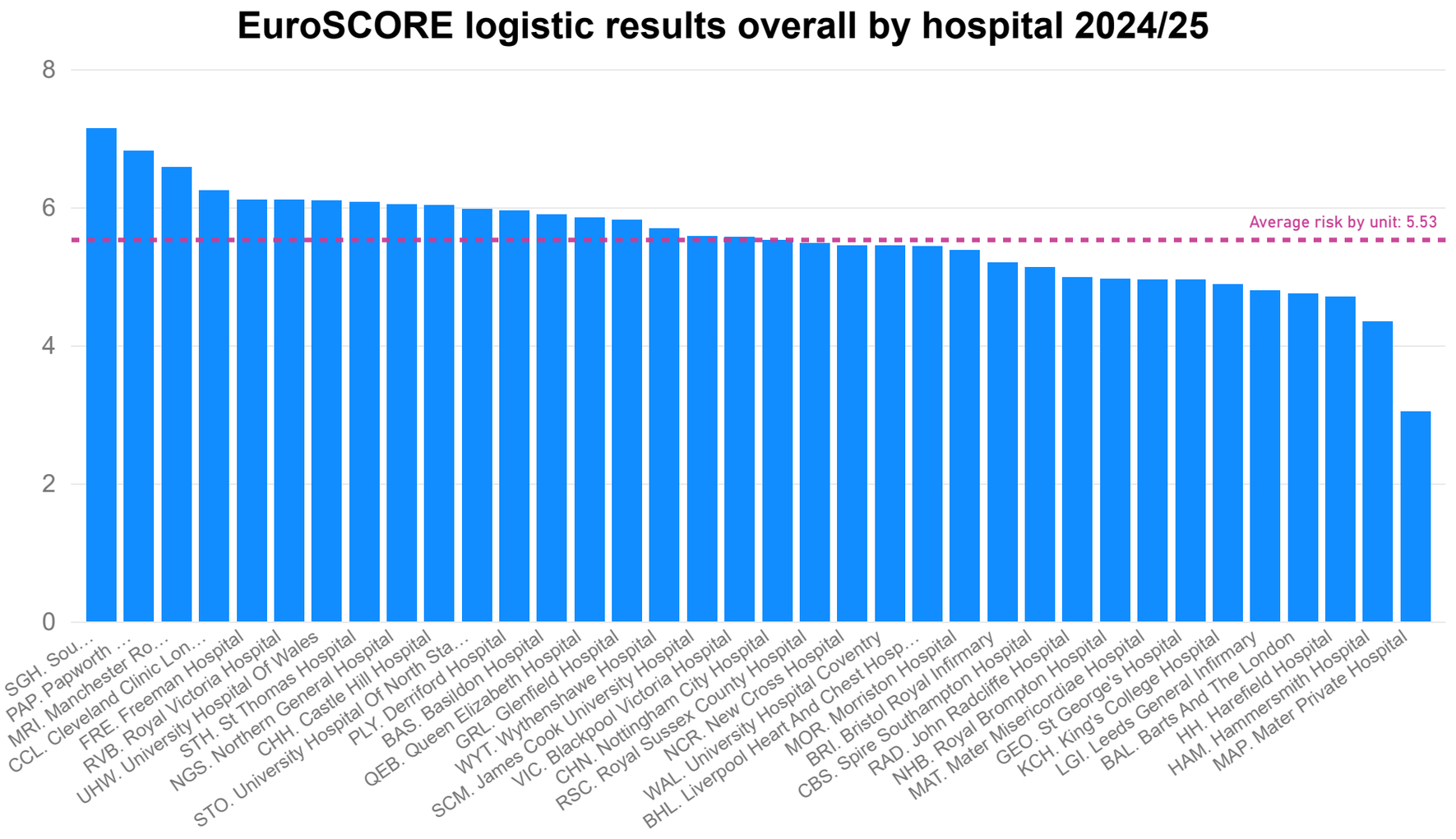
In order to compare surgical outcomes NACSA collects many risk factors that allow cardiac surgical operations to be risk stratified.

This chart shows the average calculated predicted risk (of death) for the operations at each hospital (using EuroSCORE logistic - without correction for modern surgical outcomes in the UK).

Actual mortality rates in the UK are very approximately a third of the calculated risk using this model. (The NACSA methodology takes this into account when performing outlier analyses).

The predicted risks of surgery at NHS hospitals varies considerably between 4.47% and 7.56%.

Note: Excludes emergency cases.

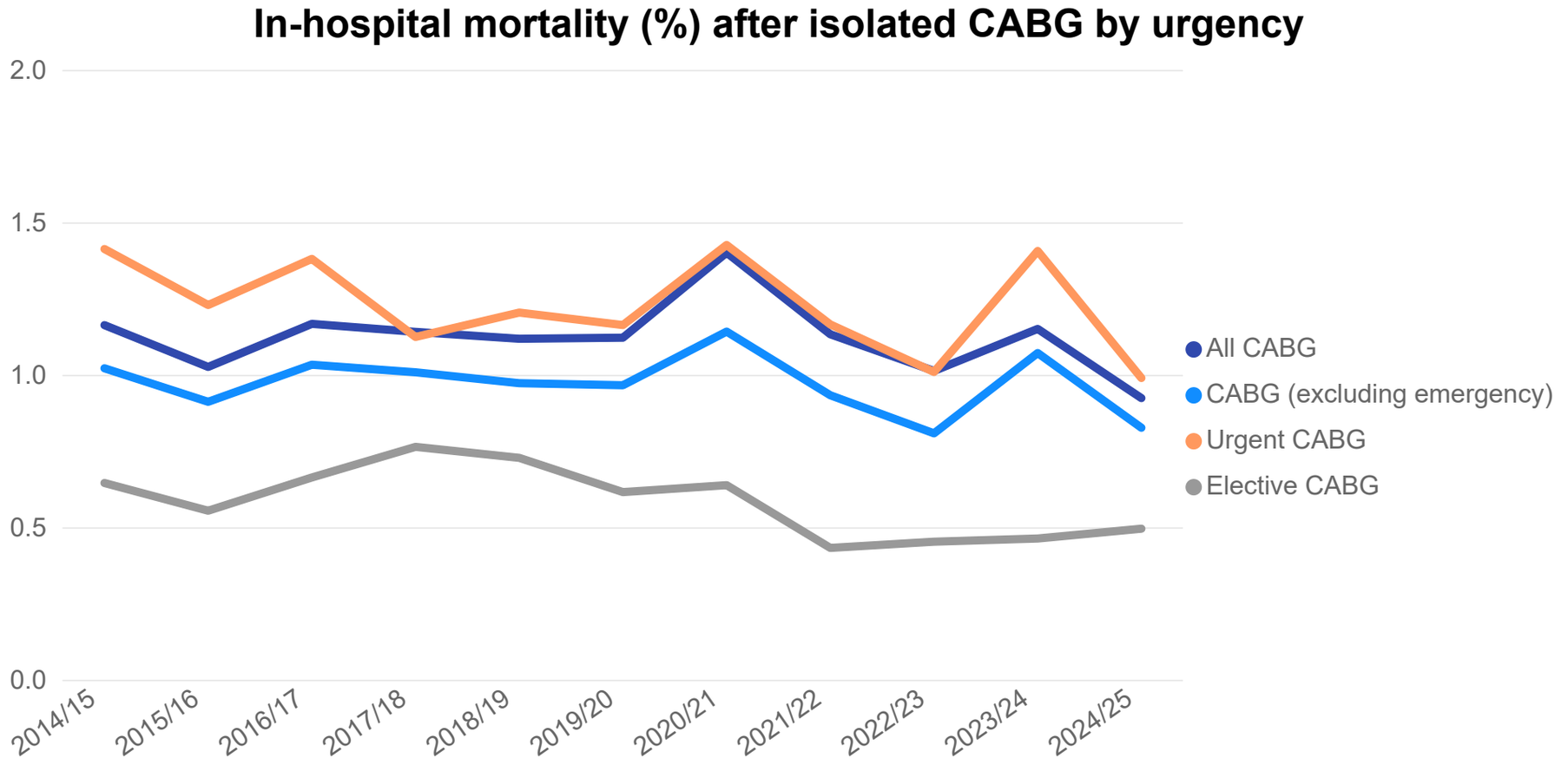


Unadjusted mortality rates following urgent isolated CABG are less than 1.0% and rates for elective surgery are less than 0.5%

In-hospital unadjusted mortality rates after isolated CABG have been declining over the last decade.

Despite a trend towards more operations being performed on an urgent basis, the overall CABG mortality rate fell from 1.5% in 2013/14 to 0.9% in 2024/25, possibly driven by a reduction in numbers of urgent CABG cases.

In-hospital mortality after elective CABG was 0.5% in 2024/25.



In-hospital mortality rates after aortic valve replacement (AVR) are low, even when combined with coronary artery bypass grafting (CABG)

In-hospital mortality after aortic valve replacement (AVR) has been falling over the last 10 years.

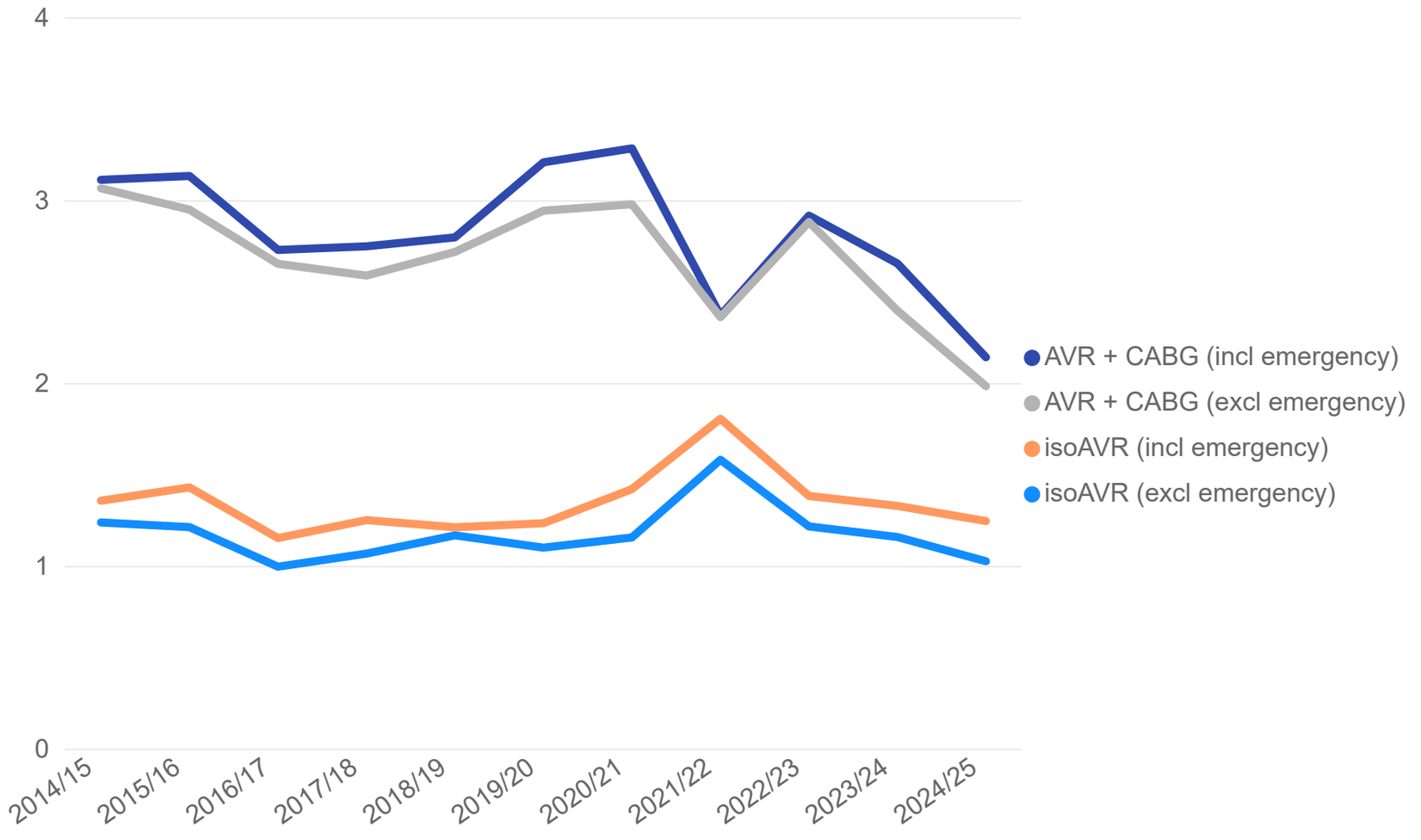
In 2024/25, the mortality rate for non-emergency cases dropped to 1.0% for isolated AVR and 2.0% for combined AVR & CABG surgery.

The improvement in mortality following AVR predates the widespread increase in transcatheter aortic valve implantation (TAVI) in recent years.

Recent changes in patient profiles, as more patients have TAVI (especially the elderly and higher-risk cases), will probably have contributed to improvements as well.

Greater use of pre-operative multi-disciplinary teams (MDTs) for deciding on the best treatment options for aortic valve disease may also explain better outcomes.

The temporary rise in mortality during the COVID-19 pandemic was likely due to a change in case mix, with more complex and urgent cases being prioritised



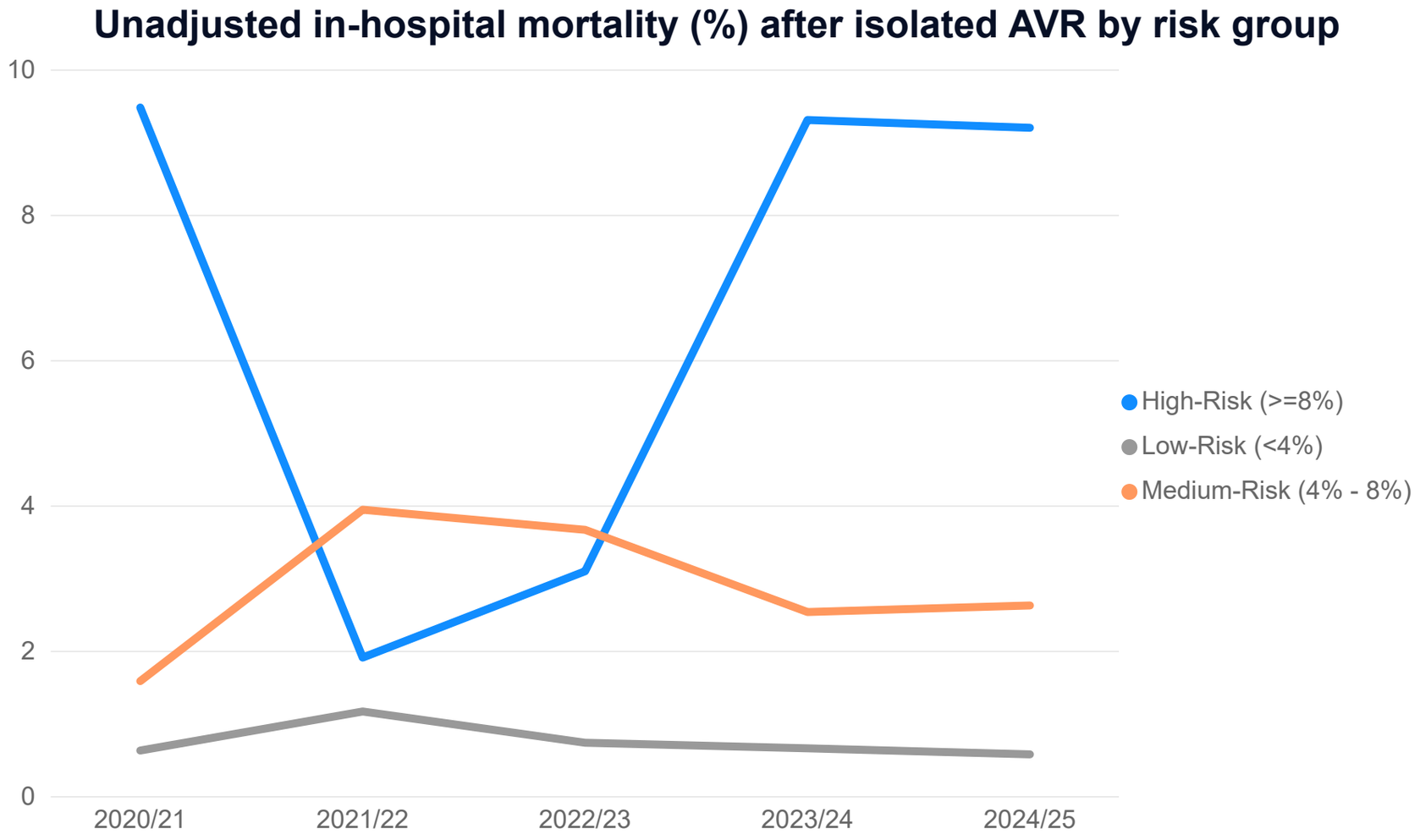
Mortality after isolated aortic valve replacement (AVR) operations is lower than predicted across all risk groups

Surgical treatment of aortic valve disease has excellent results.

In 2024/25, the mortality for aortic valve replacement (AVR) cases for low-risk patients (EuroSCORE2 <4%) was 0.6%.

This group makes up the large majority (89%) of all cases performed.

Mortality for medium-risk AVR cases (EuroSCORE2 4-8%) was 2.6% and 9.2% for high-risk (EuroSCORE2 >=8%).



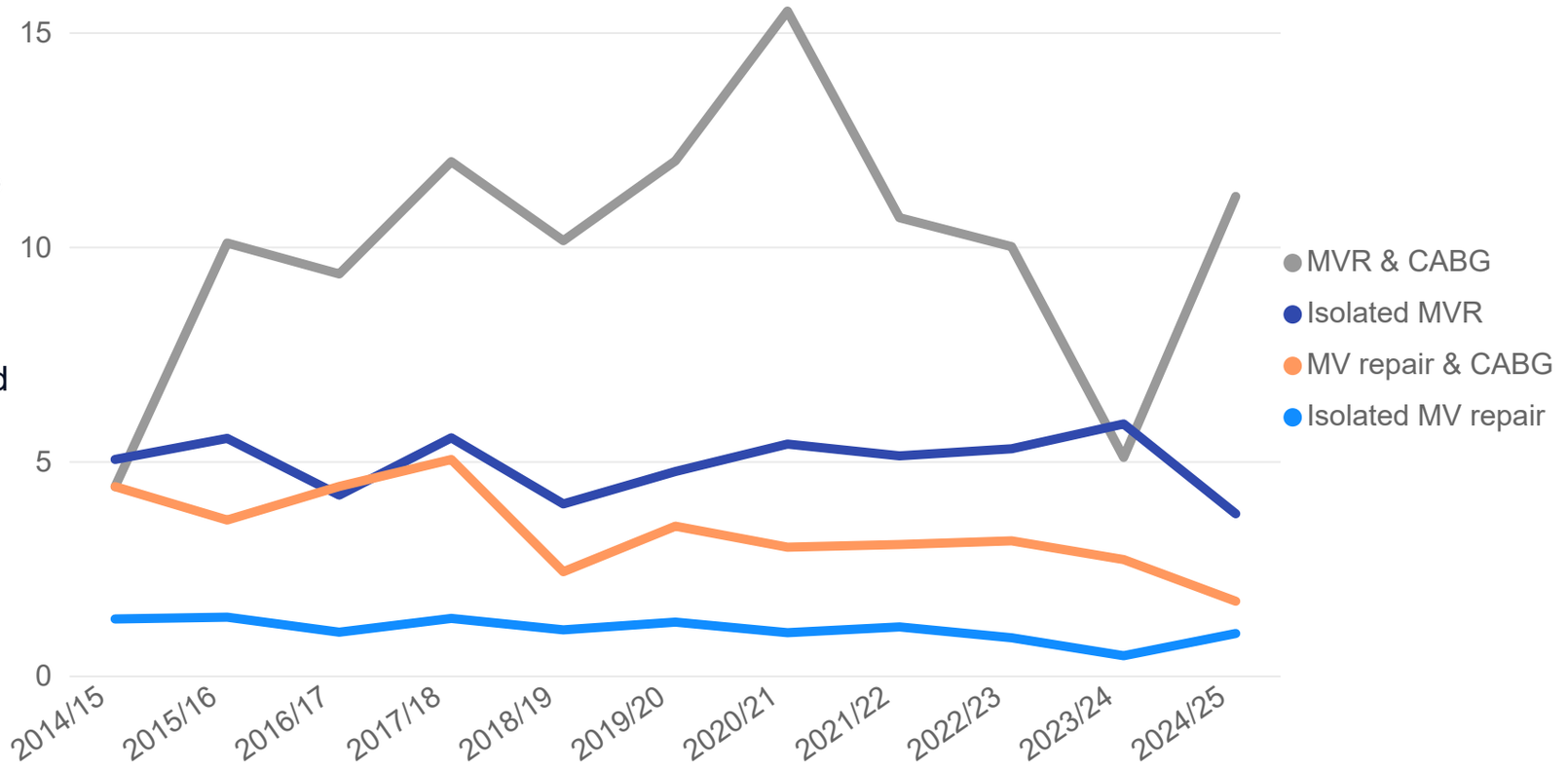
Unadjusted in-hospital mortality rates following mitral valve (MV) repair is lower than mitral valve replacement (MVR)

Unadjusted in-hospital mortality rates are higher after MV replacement (MVR) compared to MV repair.

Relatively fewer operations are performed where mitral valve surgery is combined with coronary artery bypass grafting.

The unadjusted mortality rates for these combined procedures are higher than for isolated MV operations, with mortality rates of 11.2% (MVR & CABG) and 3.8% (MVRepair & CABG) respectively in 2024/25.

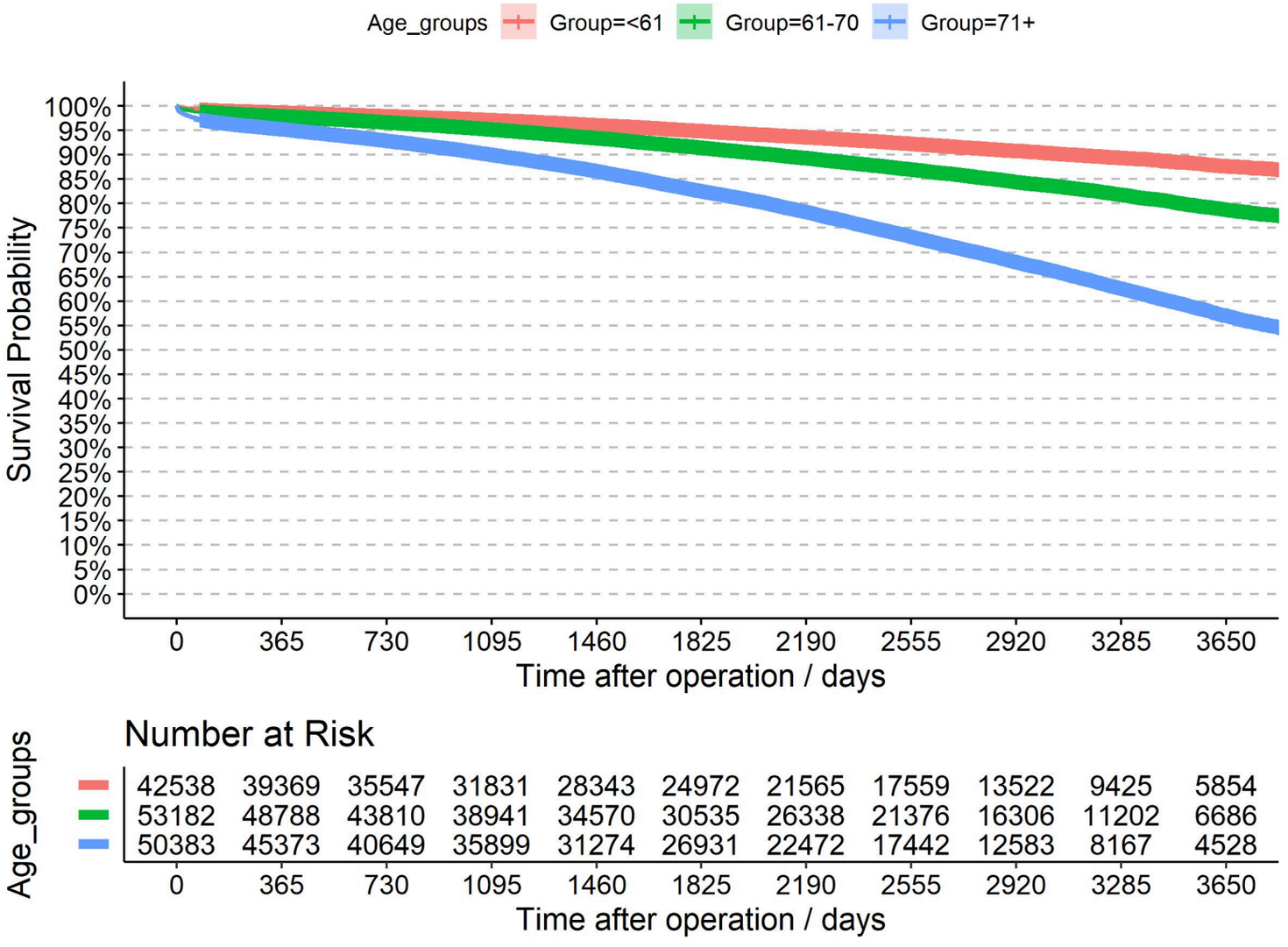
Unadjusted in-hospital mortality rates (%) after mitral valve operations (with and without CABG)



Long-term survival probability following isolated CABG by age group

Kaplan-Meier curve showing chance of survival up to 10 years following isolated CABG according to age group at the time of surgery.

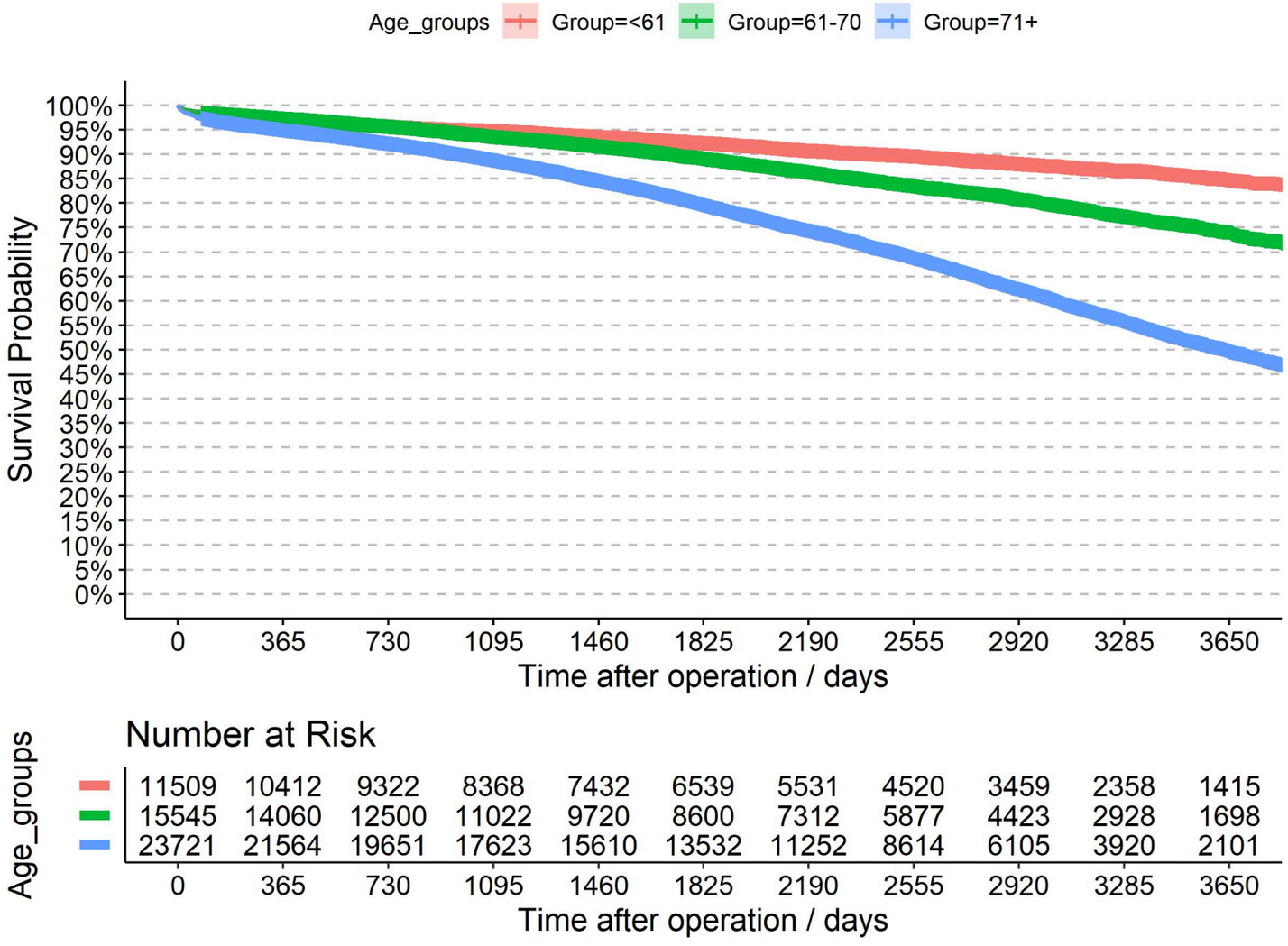
(Operations performed in UK since 2013.)



Long-term survival probability following isolated AVR by age group

Kaplan-Meier curve showing chance of survival up to 10 years following isolated AVR according to age group at time of surgery.

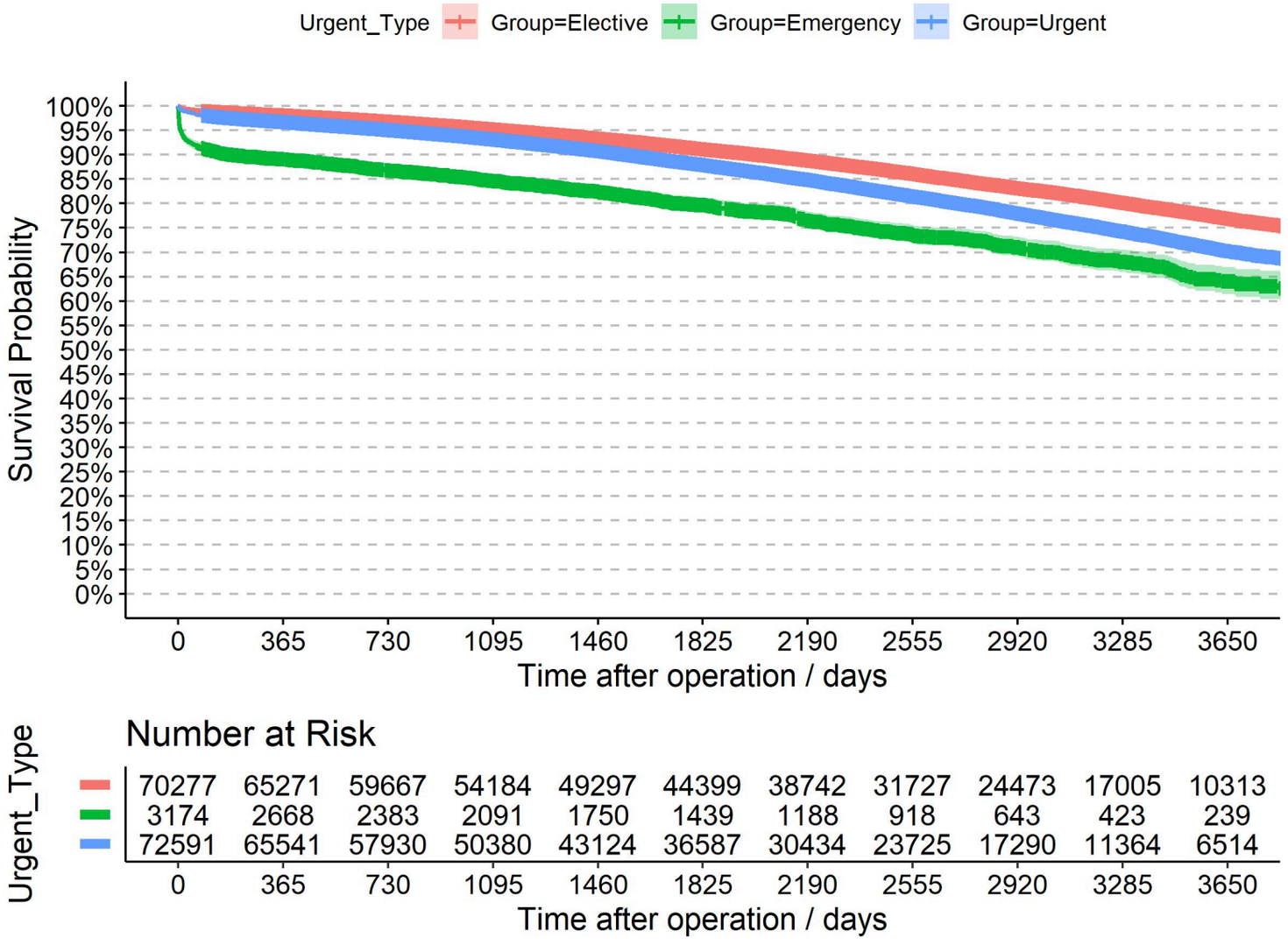
(Operations performed in UK since 2013.)



Long-term survival probability following isolated CABG by operative urgency

Kaplan-Meier curve showing chance of survival up to 10 years following isolated CABG according to the operative urgency of the procedure.

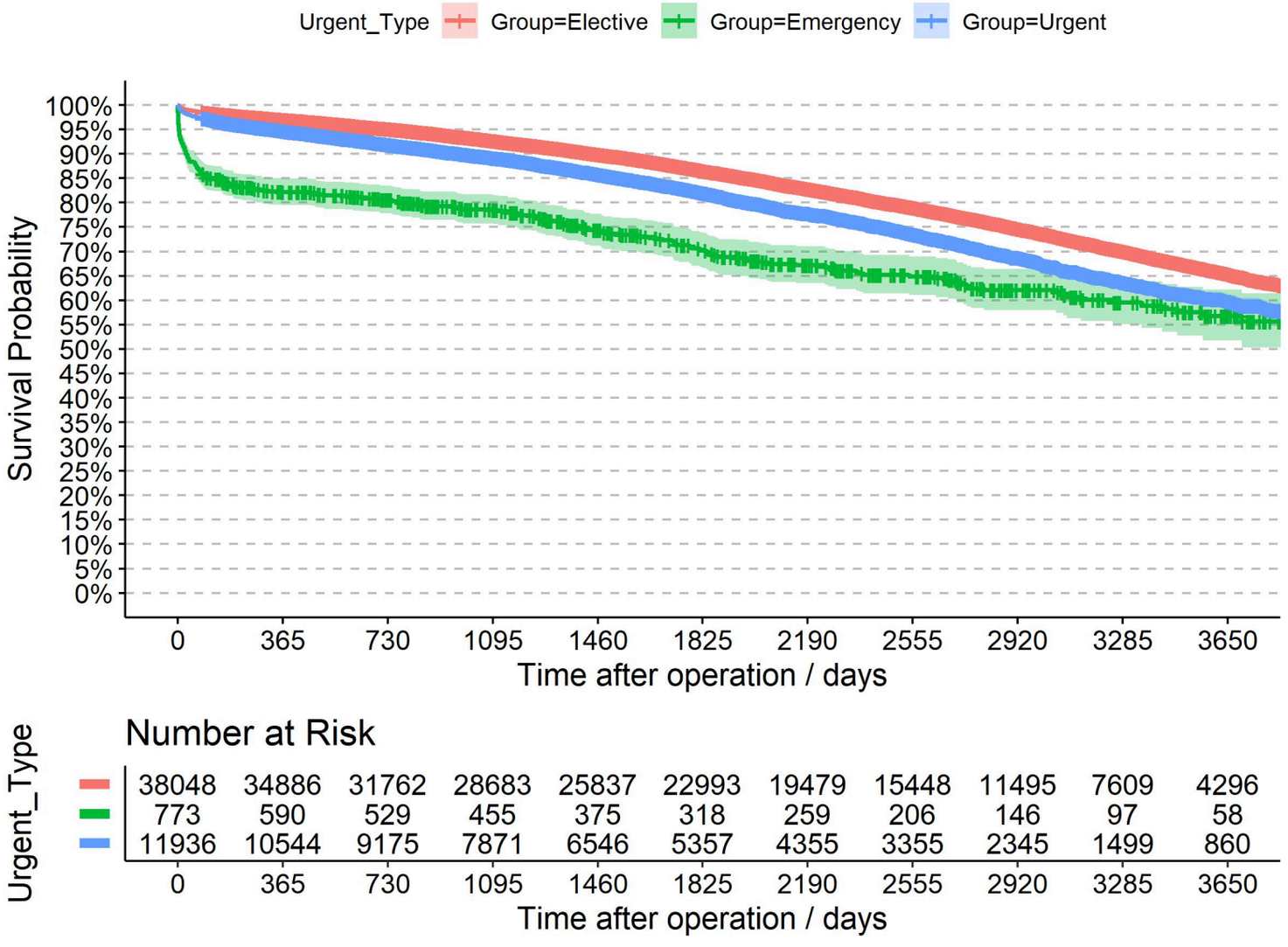
(Operations performed since 2013.)



Long-term survival probability following isolated AVR by operative urgency

Kaplan-Meier curve showing chance of survival up to 10 years following isolated AVR according to the operative urgency of the procedure.

(Operations performed since 2013.)

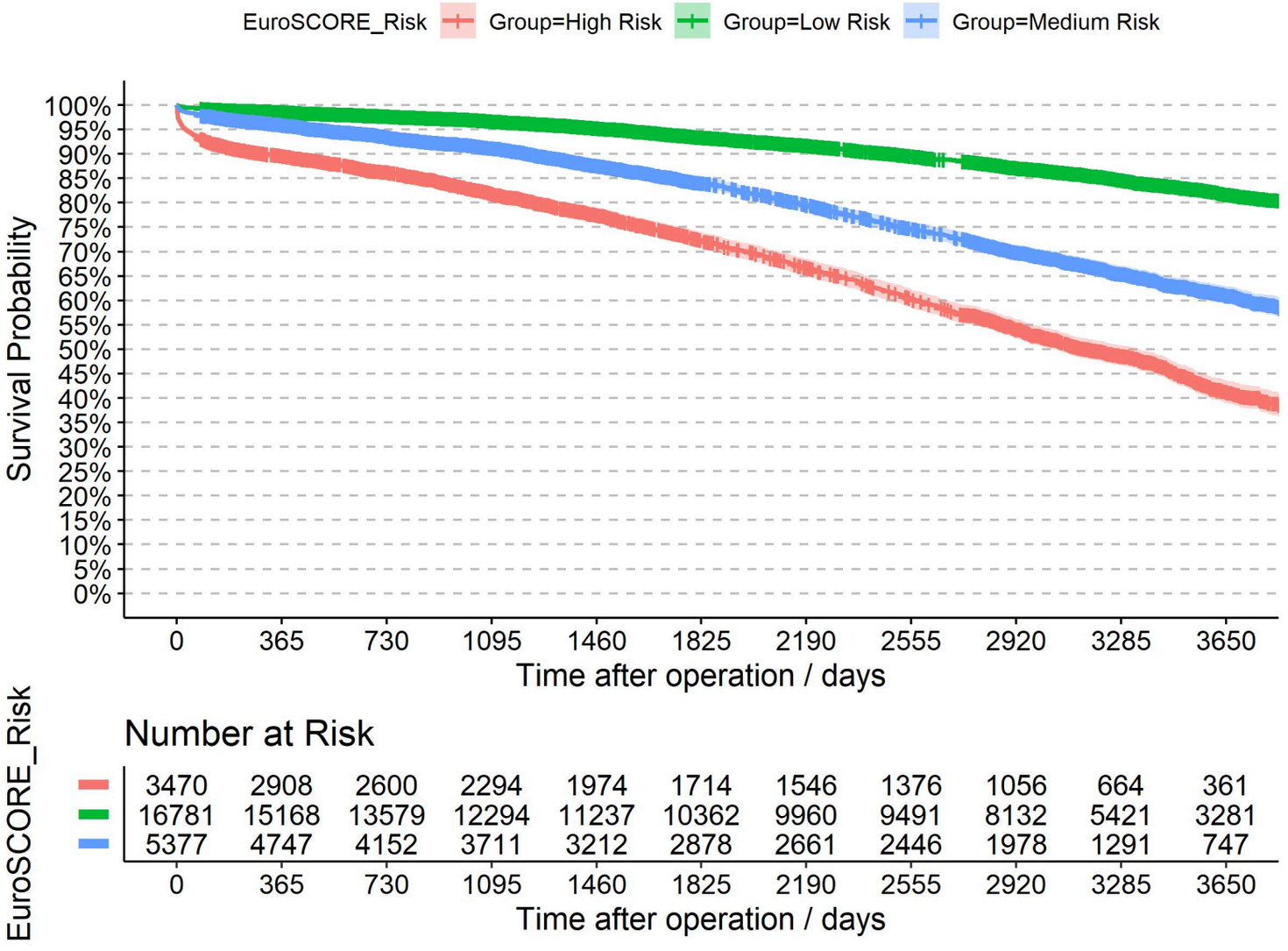


Long-term survival probability following isolated CABG by EuroSCORE predicted operative risk

Kaplan-Meier curve showing chance of survival up to 10 years following isolated CABG according to the pre-operatively predicted risk of surgery (using EuroSCORE logistic).

Low risk (EuroSCORE logistic predicted risk 0-4%), medium risk (4-8%), high risk (>8%).

(Operations performed since 2013.)

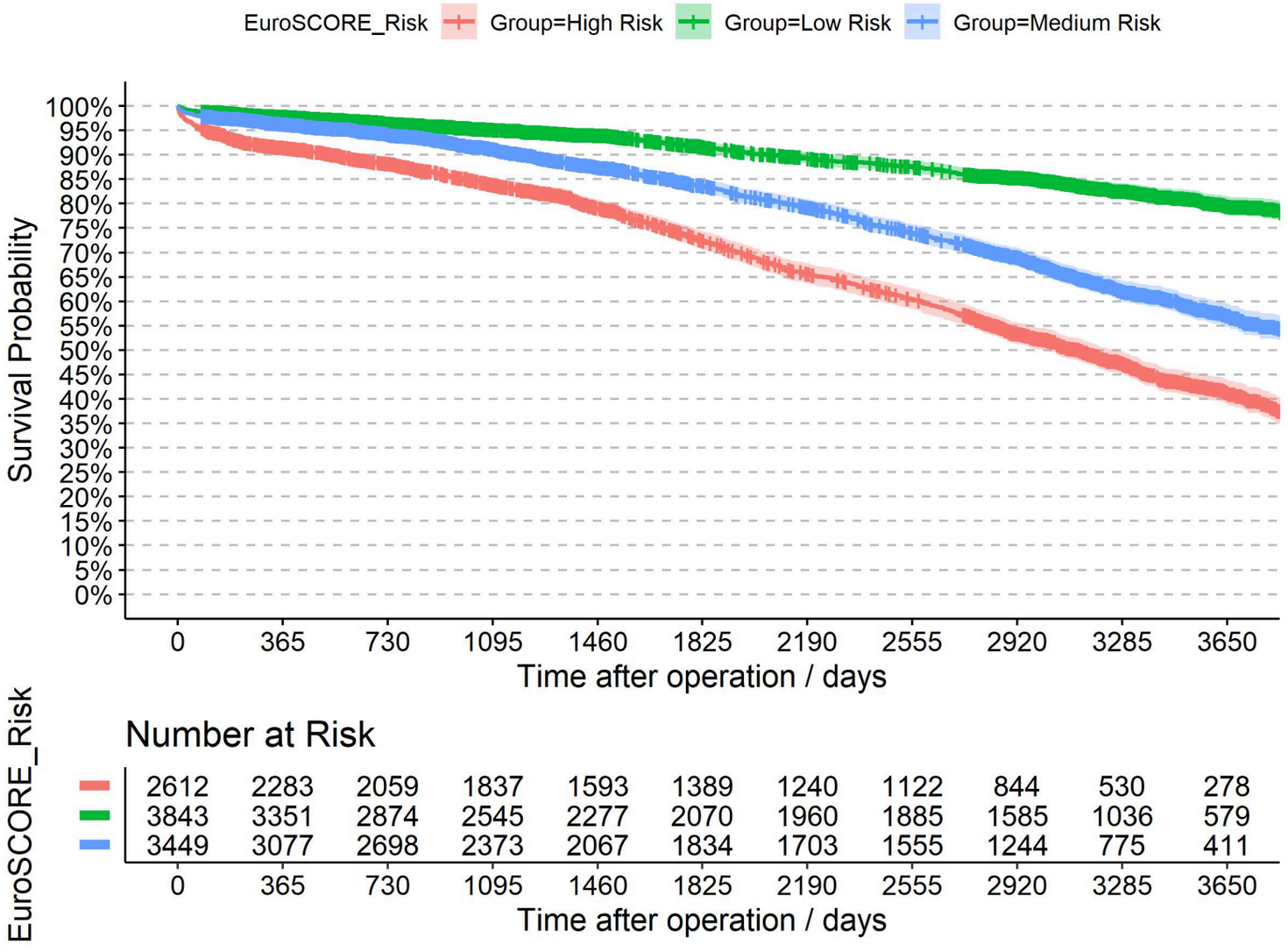


Long-term survival probability following isolated AVR by EuroSCORE predicted operative risk

Kaplan-Meier curve showing chance of survival up to 10 years following isolated AVR according to the pre-operatively calculated risk of surgery (using EuroSCORE logistic).

Low risk (EuroSCORE logistic predicted risk 0-4%), medium risk (4-8%), high risk (>8%).

(Operations performed since 2013.)



In 2024/25, the re-operation rate for bleeding following CABG ranged from 0.35% to 6.57%

On average, 1.8% of patients undergoing coronary artery bypass grafting (CABG) in England required re-operation for bleeding following their surgery compared with 2.4% in Wales and 3.1% in Northern Ireland.

Bleeding rates are influenced by multiple factors, including patient comorbidities and frailty, pre-operative medications (particularly anticoagulants and antiplatelets), the urgency of surgery, and surgical technique.

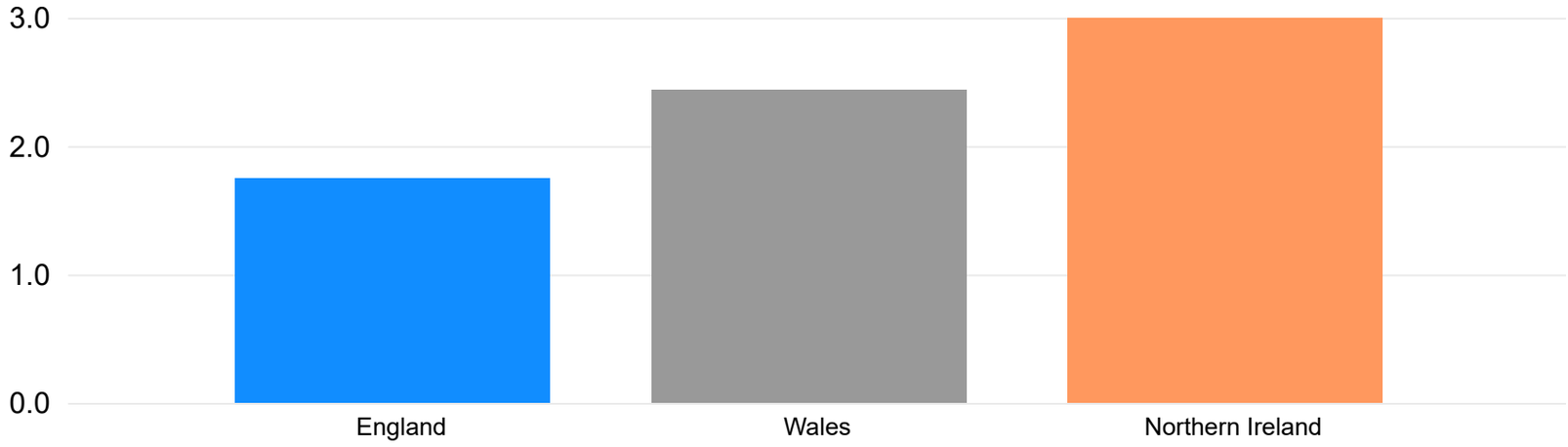
No NHS hospital reported zero re-operations for bleeding in 2024/25. The highest rate in an NHS hospital was 6.57%. Some hospitals did not provide data.

Select a year below to see the relevant data.

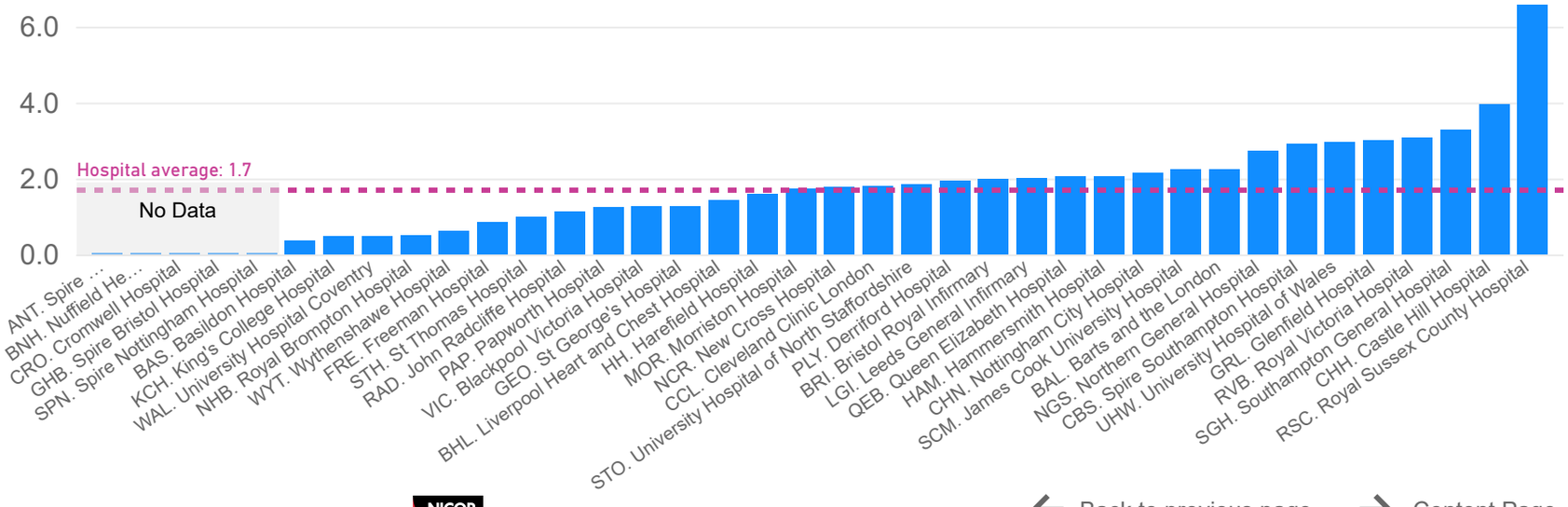
Financial Year

2024/25

Re-operation rates (%) for bleeding following CABG in financial year selected



Re-operation rates (%) for bleeding following CABG by hospital in financial year selected



Rates of deep sternal wound infection following isolated, first-time CABG are very low

Deep sternal wound infection (DSWI) following coronary artery bypass grafting (CABG) that requires further surgery or debridement is a very-serious complication of cardiac surgery. It can have long-term consequences for the individual.

Rates of DSWI in the UK are low at 0.2% in 2024/25. The overall rate from hospitals providing data across England was 0.19%, zero in Wales and 0.38% in Northern Ireland.

The is a significant lack of data from many centres.

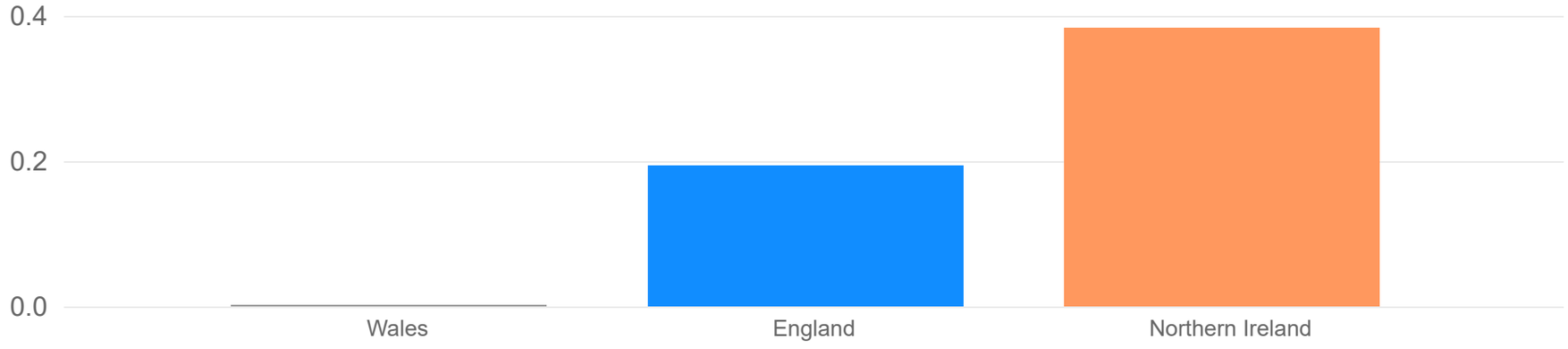
Select a year below to see the relevant data.

Note: There were 16 hospitals reporting 0% deep sternal wound infection rates in 2024/25 (displayed) and 17 hospitals have provided 'no or incomplete deep sternal wound infection data' in 2024/25 (not displayed).

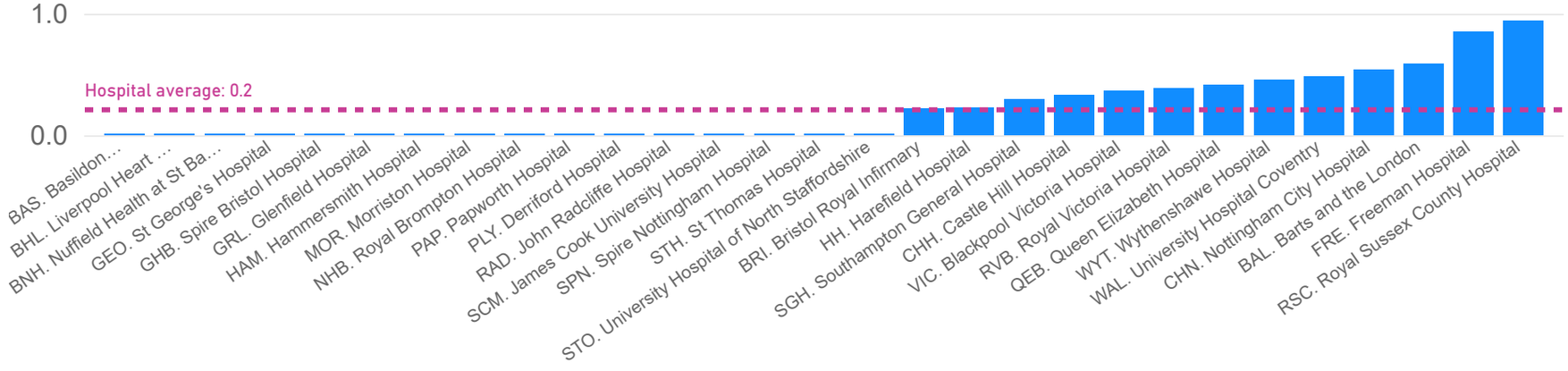
Financial Year

2024/25

Deep sternal wound infection rates (%) following CABG in financial year selected



Deep sternal wound infection rates (%) following CABG by hospital in financial year selected



Serious post-operative neurological events following CABG occur in less than 1% of cases

Serious post-operative neurological events following coronary artery bypass grafting (CABG) include a cerebrovascular accident (CVA, or stroke) and a transient ischaemic event (TIA).

The rate of these events has ranged from 1.03% to 0.79% in England over the last 3 years.

In 2024/25, 2 NHS hospitals recorded no post-operative events. The highest rate was 1.77%.

Caution is needed in interpreting these data.

Higher rates may reflect better detection and reporting of cases (e.g. use of peri-operative CT scanning and Stroke Team input may identify cases that are less clinically obvious).

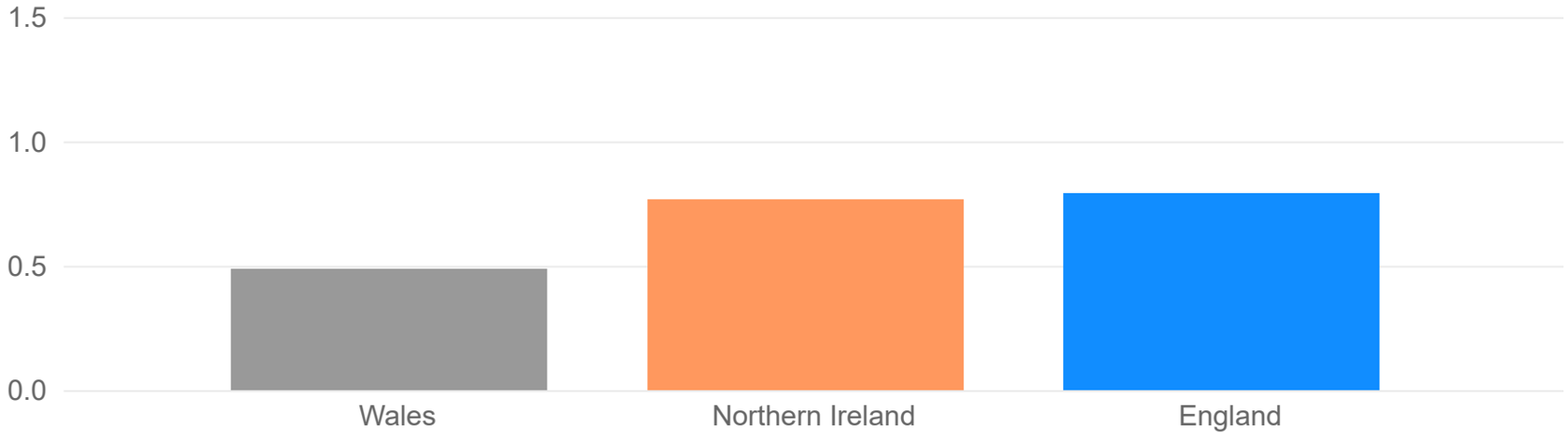
Select a year below to see relevant data.

Note: There are 19 hospitals with no data of neurological event in 2024/25, only 11 hospitals of which are displayed .

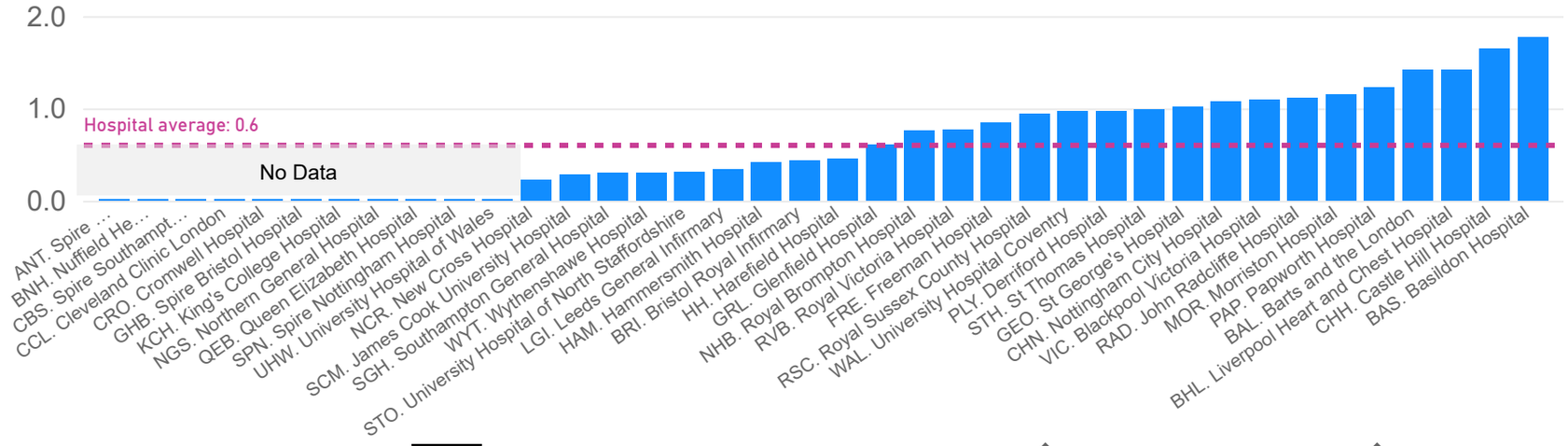
Financial Year

2024/25

Post-operative neurological event rates (%) following CABG in financial year selected



Post-operative neurological event rates (%) following CABG by hospital in financial year selected



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The need for renal support therapy following CABG surgery is low

Kidney failure following cardiac surgery usually resolves, but not always. It is associated with worse outcomes, including a higher mortality rate, following surgery.

The rate of serious kidney failure (requiring renal dialysis or support therapy) following coronary artery bypass grafting (CABG) in England over the last 3 years has ranged from 0.97% to 1.0%.

Rates in Northern Ireland and Wales have been slightly higher than this.

In 2024/25, 7 NHS hospital reported no requirement for renal support therapy. The highest reported rate was 2.55%.

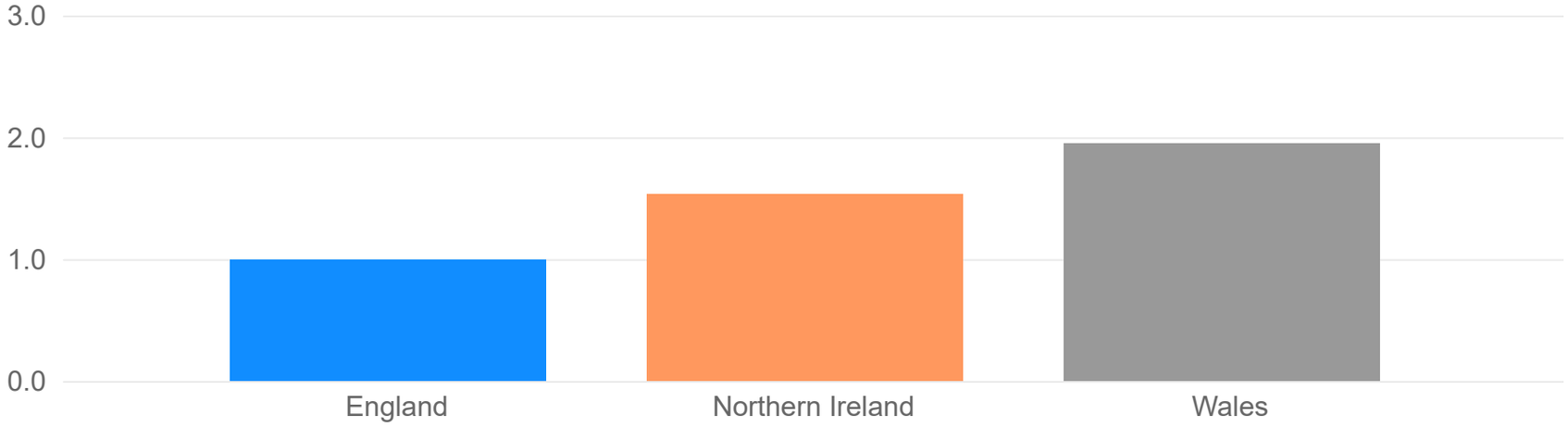
Select a year below to see the relevant data.

Note: 10 hospitals provided "no or incomplete" data in 2024/25 (not displayed).

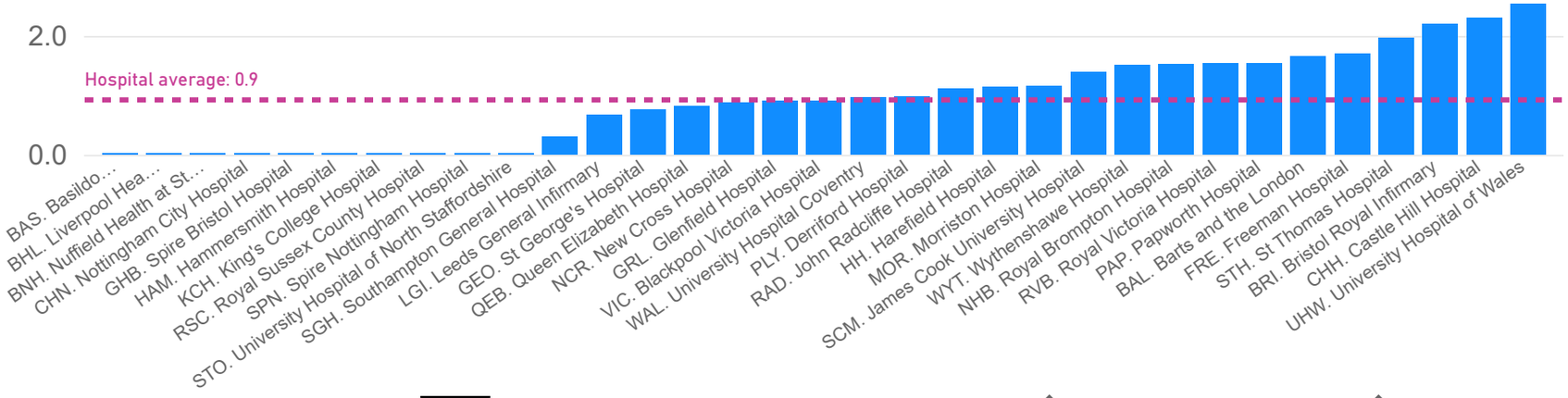
Financial Year

2024/25

Post-operative requirement for renal support therapy (%) following CABG in financial year selected



Post-operative requirement for renal support therapy (%) following CABG by hospital in financial year selected



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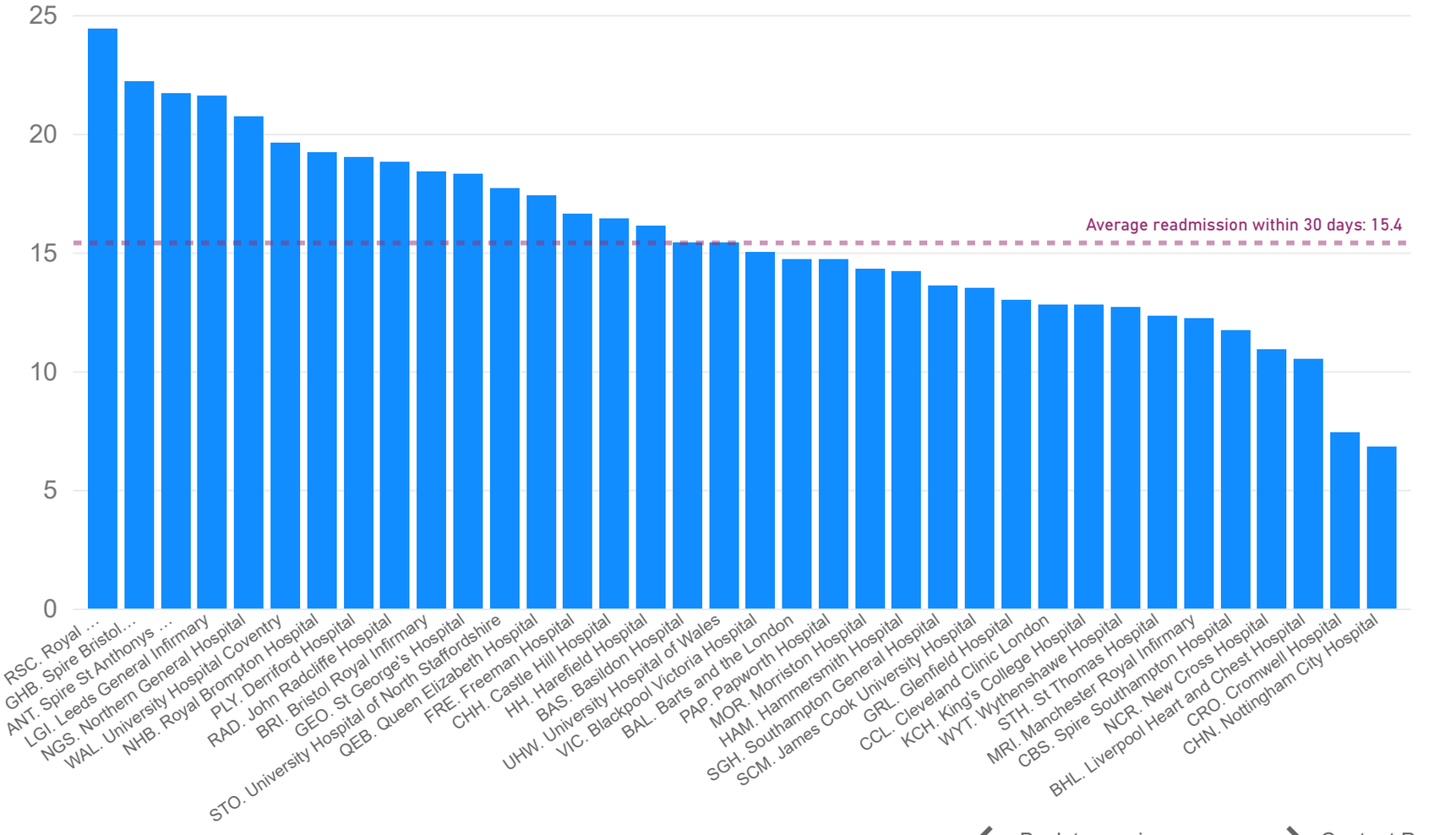
Readmission rates within 30 days of discharge range widely from 6-24%

In 2023/24, the average 30-day readmission rate across all hospitals was 15.4% based on Hospital Episode Statistics.

18 hospitals had readmission rates higher than national average. The highest readmission rate was 24% at the Royal Sussex County Hospital with an average length of stay of 8 days.

The lowest readmission rate was 6.8% at Nottingham City Hospital where the average length of stay was12 days.

Note: All the related data can be found in the appendix.



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A blood transfusion was required in 31% of patients undergoing isolated CABG

The 2018 GIRFT report recommended that all hospitals collect data on blood transfusion rates during or following cardiac surgery.

In 2024/25, 3,691 patients undergoing isolated coronary artery bypass grafting (CABG) had a blood transfusion, 31% of the total.

There is very considerable variation in performance between hospitals:

- 2 NHS hospitals reported rates of less than 10%
- 11 hospitals (7 NHS) reported transfusion rates of more than 50%.

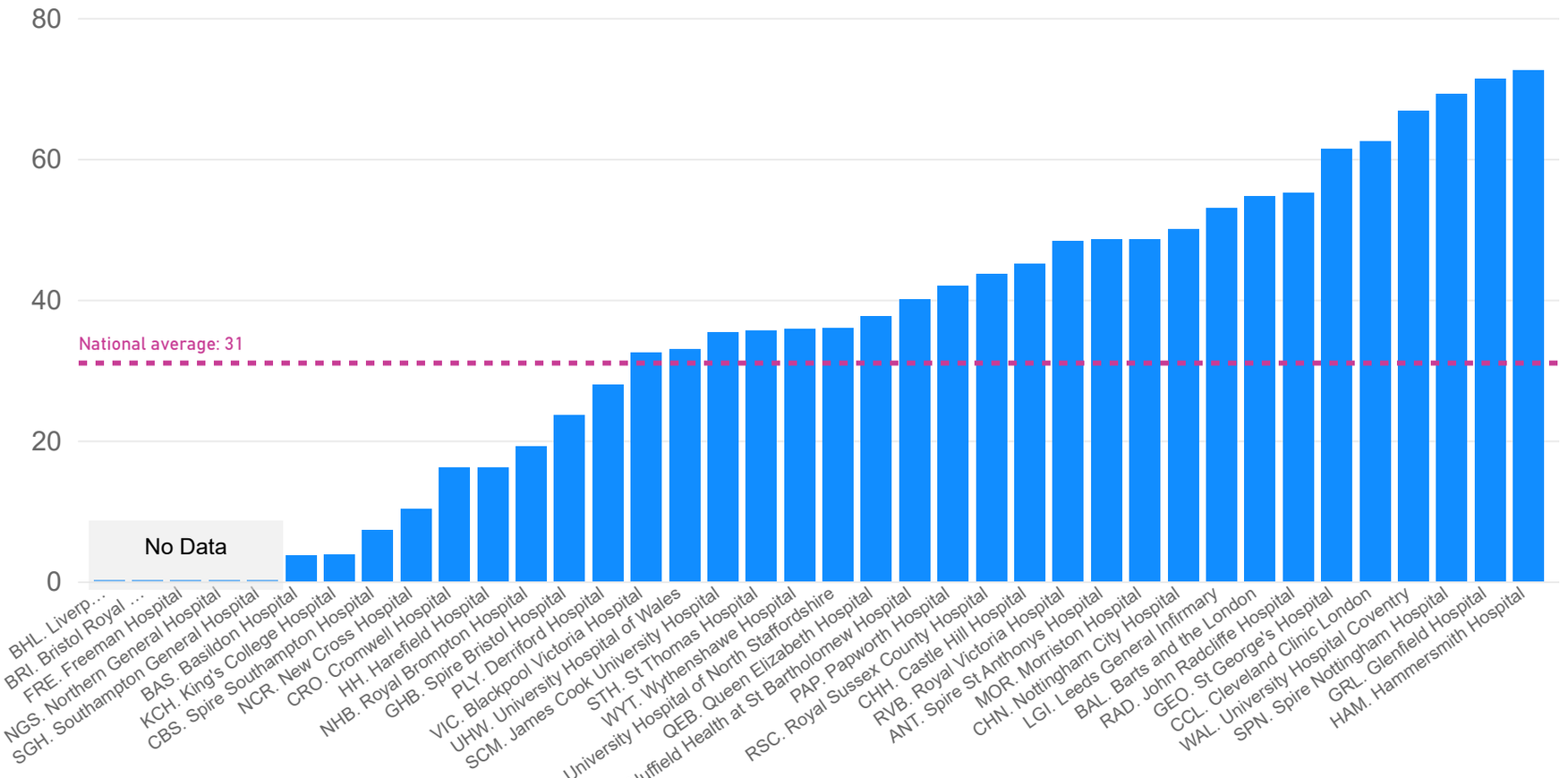
Select a year below to see the relevant data.

Note: This is a new metric and only 3 years of data are available (5 hospitals did not provide data).

Financial Year

2024/25

Percentage of patients undergoing isolated CABG who received a blood transfusion by hospital by year selected



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Of the patients undergoing isolated aortic valve replacement, 31% received a blood transfusion in 2024/25

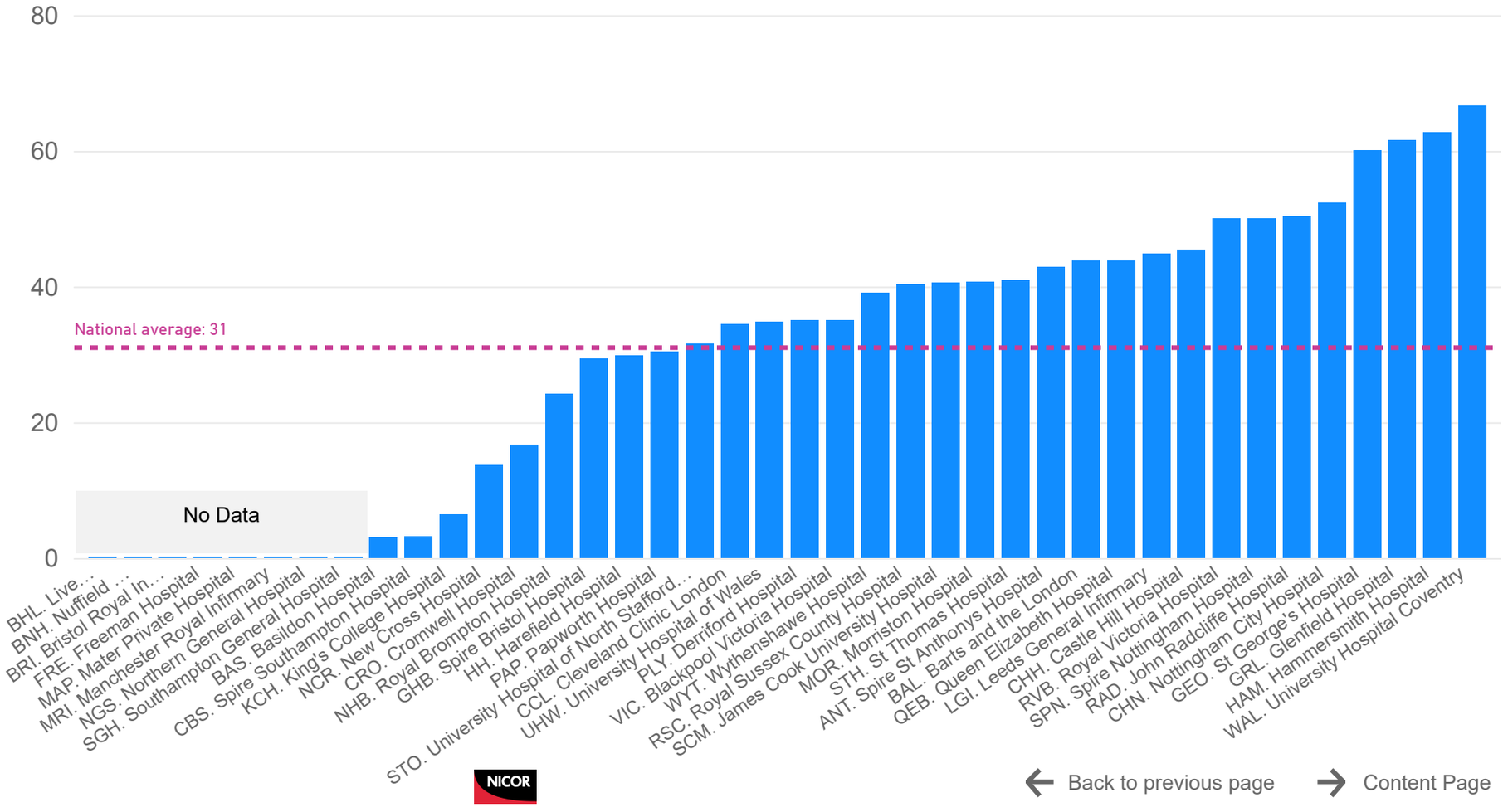
The 2018 GIRFT report recommended all hospitals collect data on blood transfusion rates during or following cardiac surgery.

In 2024/25, the average blood transfusion rate for patients undergoing isolated aortic valve replacement (AVR) was 31%.

2 NHS hospitals reported a transfusion rate of under 10% while 11 (9 NHS) hospitals had transfusion rates of more than 50%.

Note: This is a new metric and only 3 years of data are available (8 hospitals did not provide data).

Percentage of patients undergoing isolated AVR requiring a blood transfusion by hospital (2024/25)



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Of the patients undergoing isolated mitral valve replacement, 20% received a blood transfusion in 2024/25

The 2018 GIRFT report recommended all hospitals collect data on blood transfusion rates during or following cardiac surgery.

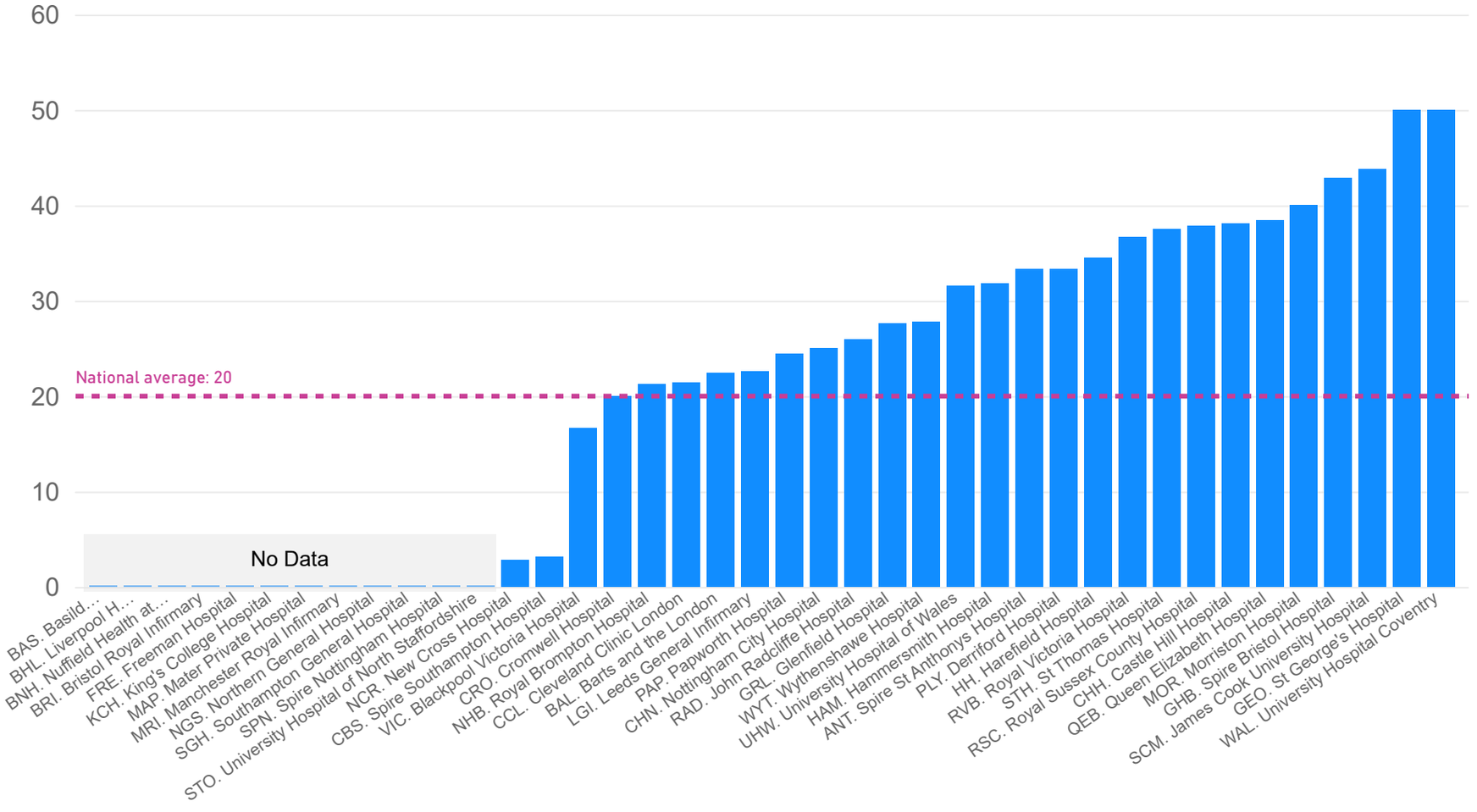
In 2024/25, the average UK blood transfusion rate was 20% for isolated mitral valve replacement (MVR).

This represented 240 patients who had a blood transfusion out of approximately 1,200 cases for which data were reported.

2 (NHS) hospitals reported a transfusion rate of under 10% while 2 (NHS) hospitals had a transfusion rate of 50%.

Note: This is a new metric and only three years of data are available (12 hospitals did not provide data).

Percentage of patients undergoing isolated MVR who received a blood transfusion by hospital (2024/25)



Multi-disciplinary team (MDT) meeting discussions took place for 45% of patients undergoing isolated coronary artery bypass grafting (CABG)

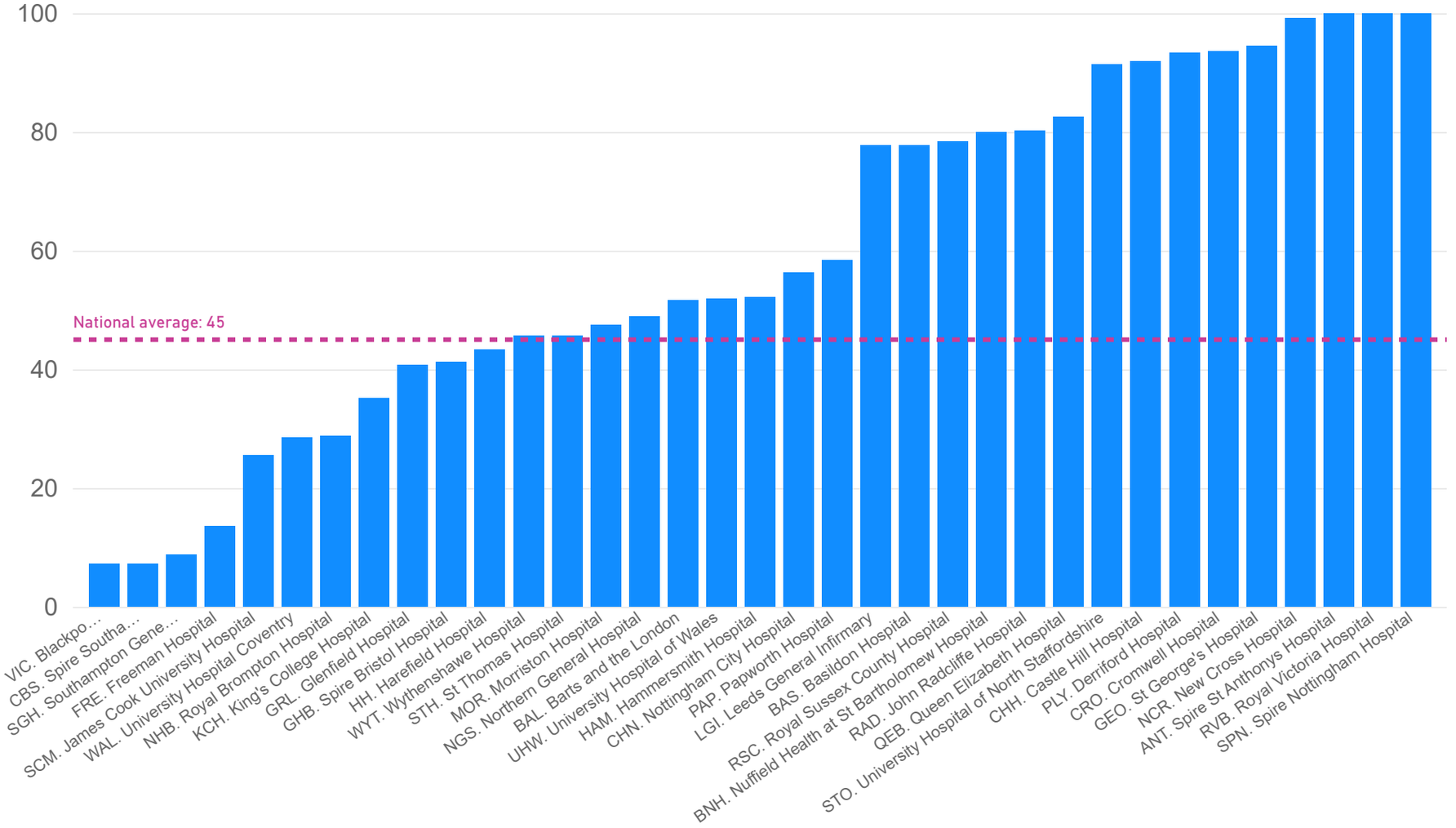
The 2021 GIRFT report recommended that all non-emergency cardiac surgery should be discussed by a disease-specific multi-disciplinary team (MDT).

In 2024/25, on average 45% patients receiving a coronary artery bypass graft (CABG) operation were recorded as having been discussed at an MDT.

Performance varied widely across hospitals, with six NHS hospitals achieving MDT discussions in over 90% of cases, while the lowest-performing hospital did so for only 1% of patients.

Note: This is a new metric and only three years of data are available (7 hospitals did not provide data).

Percentage of isolated CABG cases discussed at an MDT by hospital (2024/25)



Multi-disciplinary team (MDT) meeting discussions took place for 43% of patients undergoing isolated aortic valve replacement (AVR)

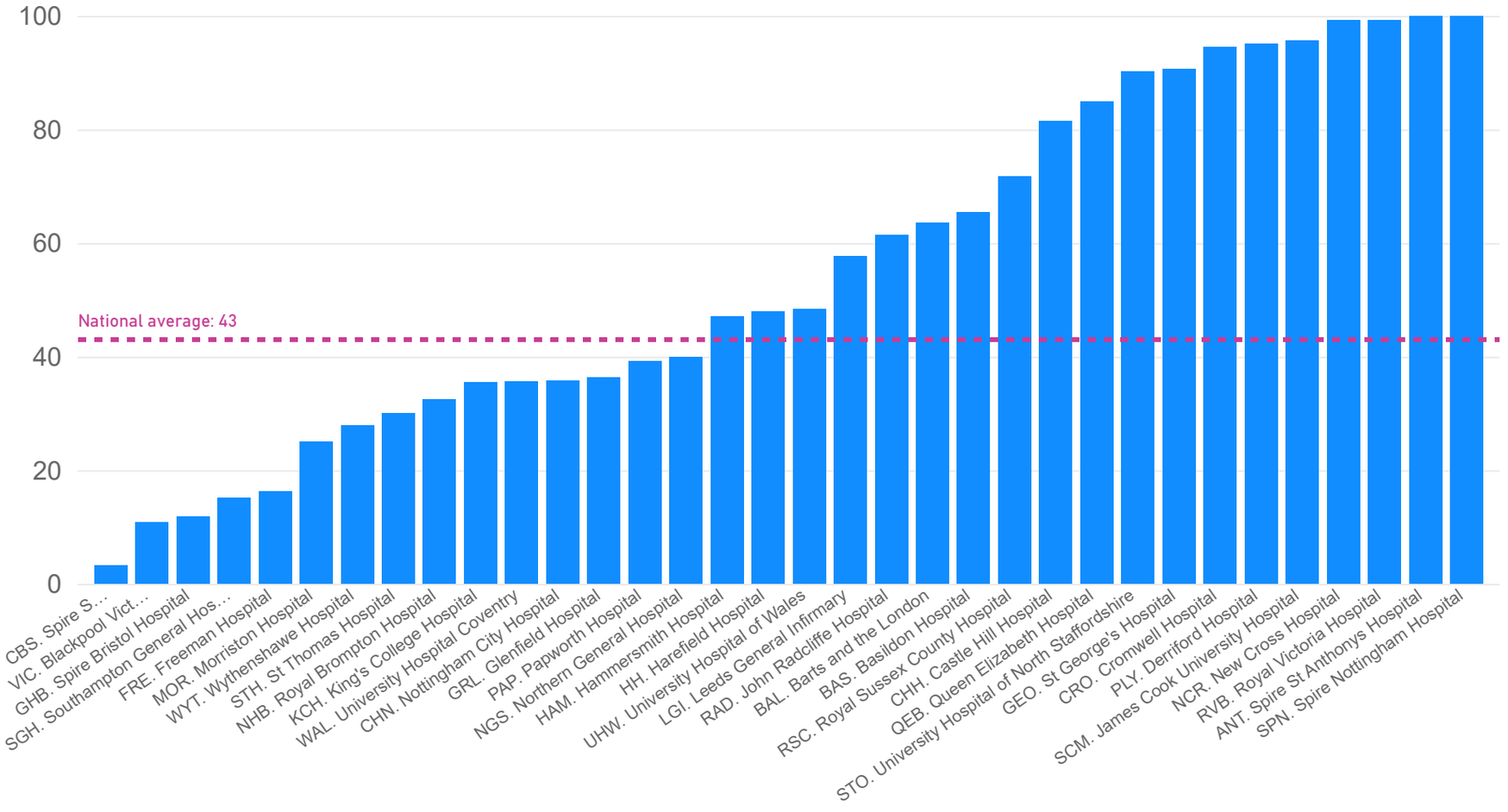
The 2021 GIRFT report recommended that all non-emergency cardiac surgery should be discussed by a disease-specific multi-disciplinary team (MDT).

In 2024/25, 43% of patients undergoing isolated aortic valve replacement (AVR) were recorded as being discussed at an MDT.

There is a huge variation between units, with 7 NHS hospitals achieving the target for more than 90% of procedures, compared to only 1% in the worst-performing.

Note: This is a new metric and only three years of data are available (4 hospitals did not provide data).

Percentage of patients undergoing isolated AVR discussed at an MDT by hospital (2024/25)



Multi-disciplinary team (MDT) meeting discussions took place for 53% of patients undergoing isolated mitral valve replacement (MVR)

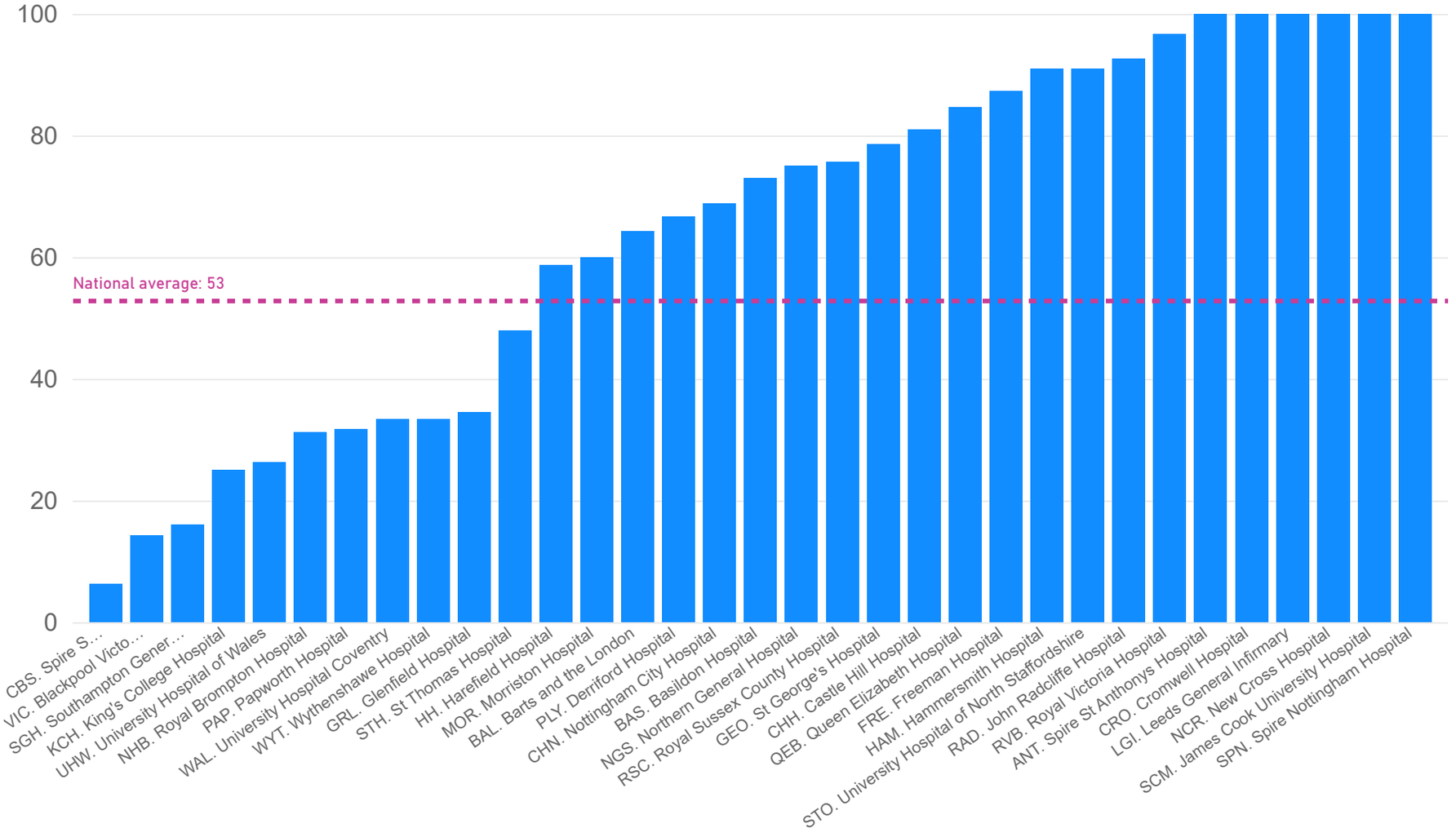
The 2021 GIRFT report recommended that all non-emergency cardiac surgery should be discussed by a disease-specific multi-disciplinary team (MDT).

Of patients undergoing isolated mitral valve replacement (MVR), 53% were recorded as being discussed at an MDT.

There is very considerable variation in performance between hospitals with 11 NHS hospitals achieving the target in >90% of operations, compared with the worst, where only 14% of cases were discussed by an MDT.

Note: This is a new metric and only three years of data are available (10 hospitals did not provide data).

Percentage of patients undergoing isolated MVR discussed at an MDT by hospital (2024/25)



ANT	St Anthony's Hospital, London
BAL	Barts Heart Centre, London
BAS	Basildon Hospital, Essex
BHL	Liverpool Heart and Chest Hospital
BNH	Nuffield Health at St Bartholomew's Hospital
BRI	Bristol Royal Infirmary
CBS	Spire Hospital, Southampton
CHH	Castle Hill Hospital, Hull
CHN	Nottingham City Hospital
CCL	Cleveland Clinic, London
CRO	Cromwell Hospital, London
FRE	Freeman Hospital, Newcastle
GEO	St George's Hospital, London
GHB	Spire Bristol Hospital
GRL	Glenfield Hospital, Leicester
HAM	Hammersmith Hospital, London
HH	Harefield Hospital, London
HHW	Wellington Hospital, London
HSC	Harley Street Clinic, London
KCH	Kings College Hospital, London
LBH	London Bridge Hospital, London
LGI	Yorkshire Heart Centre, Leeds
MAP	Mater Private Hospital
MAT	Mater Misericordiae Hospital, Dublin
MOR	Morriston Hospital, Swansea
MRI	Manchester Royal Infirmary
NCR	New Cross Hospital, Wolverhampton
NGS	Northern General Hospital, Sheffield
NHB	Royal Brompton Hospital, London
PAP	Royal Papworth Hospital, Cambridge
PLY	Derriford Hospital, Plymouth
QEB	Queen Elizabeth Hospital, Birmingham
RAD	John Radcliffe Hospital, Oxford
RSC	Royal Sussex County Hospital, Brighton
RVB	Royal Victoria Hospital, Belfast
SCM	James Cook University Hospital, Middlesbrough
SGH	Southampton General Hospital
SPN	Spire Hospital Nottingham
STH	St Thomas' Hospital, London
STO	University Hospital of North Staffordshire, Stoke
UHW	University Hospital of Wales, Cardiff
UCH	University College Hospital, London
VIC	Blackpool Victoria Hospital
WAL	University Hospital, Coventry
WYT	Wythenshawe Hospital, Manchester

The NACSA audit uses risk-adjusted methods to compare outcomes at different hospitals performing cardiac surgical procedures

The NACSA audit has worked with University College London Department of Statistical Science to develop a risk adjustment model to allow the outcomes of different hospitals to be compared.

A random effects model is used to infer outlier status for each hospital (details of the methodology can be found here).

The results of the latest analysis are displayed on the relevant slide using a forest plot (note these shows survival rates, the inverse of the mortality rates):

- Performance that is within expected limits (black dot) is based on the survival probability using a random effects model.
- The observed survival (square) is the actual survival rate for each hospital. Certain high-risk procedures are excluded (details are available here).
- Predicted survival rate (X) is calculated using an annually recalibrated version of EuroSCORE logistic.

The y-axis has the abbreviated code for each hospital. Clicking on the button 'List of hospital names' shows the code for each hospital.

The numbers of operations performed in the last three years and the percentage data completeness are also shown.