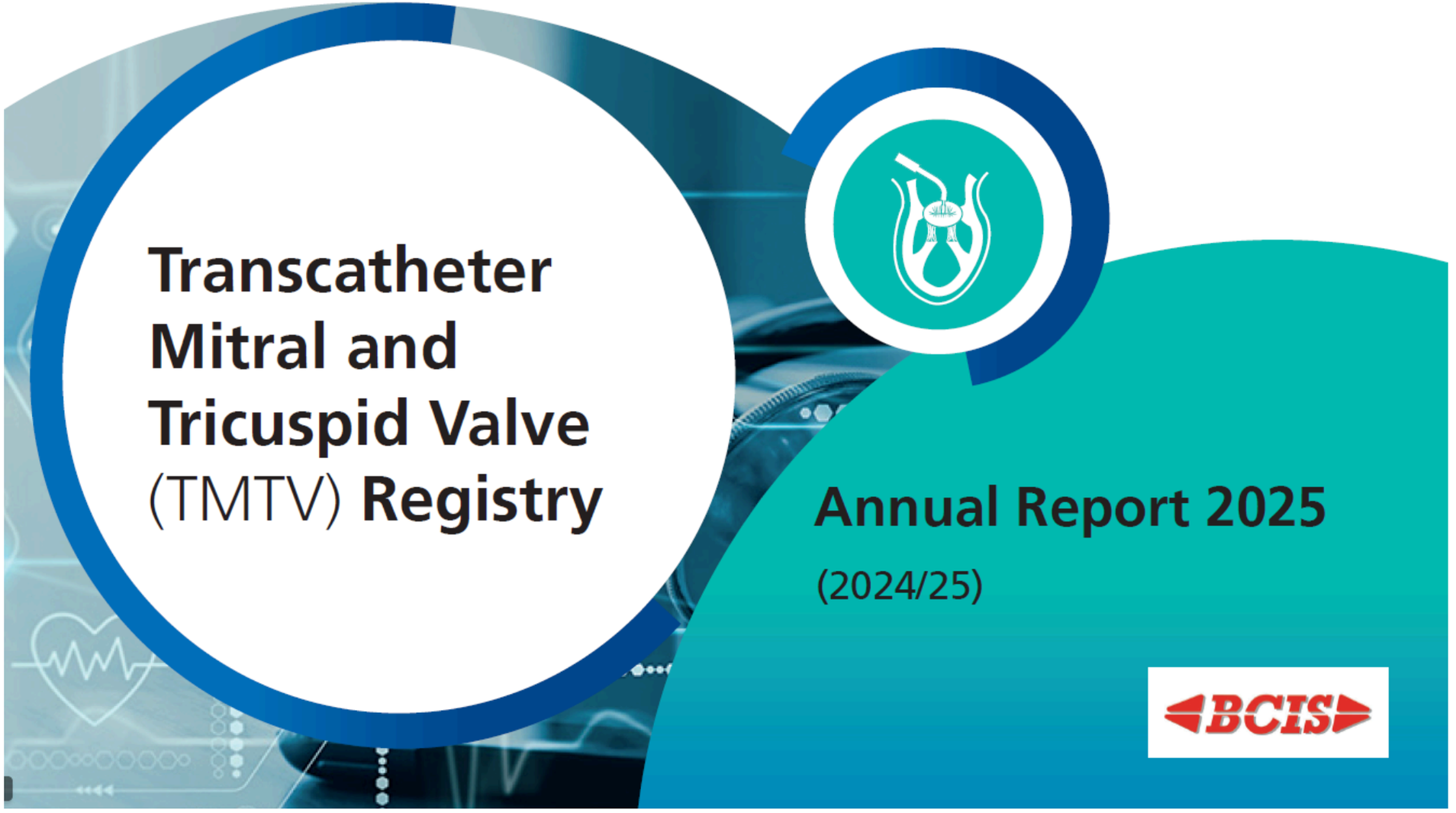
NCAP

NATIONAL CARDIAC AUDIT PROGRAMME

NICOR



Transcatheter Mitral and Tricuspid Valve (TMTV) Registry

Annual Report 2025

(2024/25)

BCIS

Report at a glance All data are for 2024/25 unless otherwise stated

The TMTV registry comprises all procedures relating to the mitral and tricuspid valve, including mitral transcatheter edge-to-edge repair.

Service providers

- 24 NHS (England, Wales, N Ireland) hospitals and 5 private providers are performing TMTV procedures
- 96% of NHS (England, Wales, N Ireland) hospitals undertaking mitral TEER, including the 2 non-commissioned hospitals, have submitted data
- 4 private providers performing mitral TEER procedures have not registered with NICOR to submit data
- 92% average hospital data completeness
- 3.1 pmp to 18.4 pmp wide variation in mitral TEER cases per million population across Cardiac Networks

Procedures

- 916 TMTV procedures were carried out representing a 60% increase compared to 2023/24
- 614 (67%) mitral TEER procedures
- 118 (12.8%) tricuspid TEER procedures
- 61 (6.7%) procedures involving dedicated mitral and tricuspid valve implants (at 6 hospitals)
- 64% of centres undertaking mitral TEER are also undertaking tricuspid TEER
- 84.1% of TMTV cases are planned elective procedures

Clinical features

- 79 years is the median age of patients undergoing TMTV procedures
- 63% of patients undergoing TMTV procedures have a Rockwood clinical frailty score of 3-4 and only 1% have a clinical frailty score ≥7

Outcomes

- 72% cases have no or mild residual mitral regurgitation following a mitral TEER procedure
- 0.8% of cases result in stroke (the most common complication)
- 1.1% in-hospital mortality

Recommendations

1.Hospitals should ensure all TMTV cases are submitted to the registry

2.Hospitals should ensure timely, complete and accurate data are submitted to the registry with particular attention to:

- Demographic profile of the patient
- Procedure type
- Aetiology of the valve pathology
- The serial number of any implanted device
- Discharge status.

Introduction to the report

The Transcatheter Mitral & Tricuspid Valve (TMTV) registry is part of the National Cardiac Audit Programme (NCAP) and was launched by the National Institute of Cardiovascular Outcomes Research (NICOR) in June 2023.

The primary responsibility of the TMTV audit is to report on the use of Mitral Transcatheter Edge-to-Edge Repair (TEER) procedures, first commissioned by NHS England in 2019. The registry also describes activity for TMTV procedure for NHS hospitals in England to monitor the outcomes of those lower volume procedures that may also be in the early stage of clinical adoption.

The main focus of the audit is quality assurance and improvement. This report summarises the number of patients being treated with TMTV procedures, where these treatments are being delivered, the quality of care and outcomes for patients. The slides in the report are interactive and enable you to explore the data of interest to you.

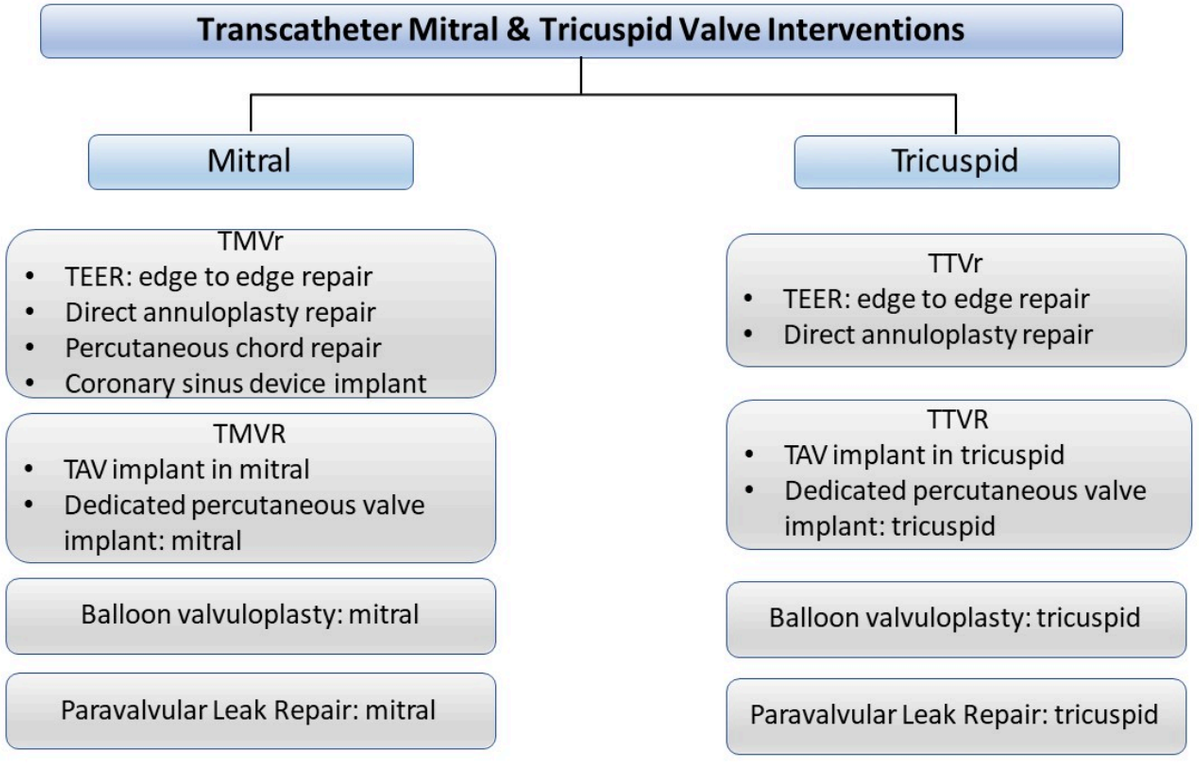
This is our third report since the registry was launched. The TMTV registry is now in phase 3 of its development (April 2025-March 2026) during which its analytic plan will be fully implemented and regular reporting will be established. The TMTV registry has recently enabled data entry using the NICOR online web based platform and third party local hospital electronic record systems to support contemporaneous data entry. Hospitals can use online NICOR tools to analyse their activity and outcomes, including benchmarking themselves against other hospitals delivering TMTV procedures. You can find details of the audit methodology here.

In this report, 96% of NHS (England, Wales & NI) hospitals performing procedures have submitted data but informal surveying suggests 100% cases are not being submitted. NICOR TMTV group has requested hospitals to submit their data within four weeks of a procedure. Timely data submission improves the utility of the collected data. At present, caution remains when drawing conclusions about the exact number of TMTV procedures and their quality and outcomes.

The audit relies on the efforts of clinical and data management teams at the participating hospitals. We are grateful to the hospitals that have engaged with the TMTV registry and the staff who have patiently entered data and supported delivery of this audit. We hope for their continued and increasing role in the development of the registry.

NICOR TMTV Registry Team

Types of transcatheter mitral and tricuspid valve (TMTV) procedures



Key:

TMVr Transcatheter Mitral Valve repair
TMVR Transcatheter Mitral Valve Replacement
TAV Transcatheter Aortic Valve
TTVr Transcatheter Tricuspid Valve repair
TTVR Transcatheter Tricuspid Valve Replacement

TMTV cases were submitted to the registry by 26 centres in 2024/25

Registered hospitals that submitted 2024/25 TMTV data

26

These comprise 22 hospitals commissioned to perform mitral TEER, 1 private centre and 3 hospitals not commissioned to perform mitral TEER

Registered hospitals that did not submit 2024/25 TMTV data

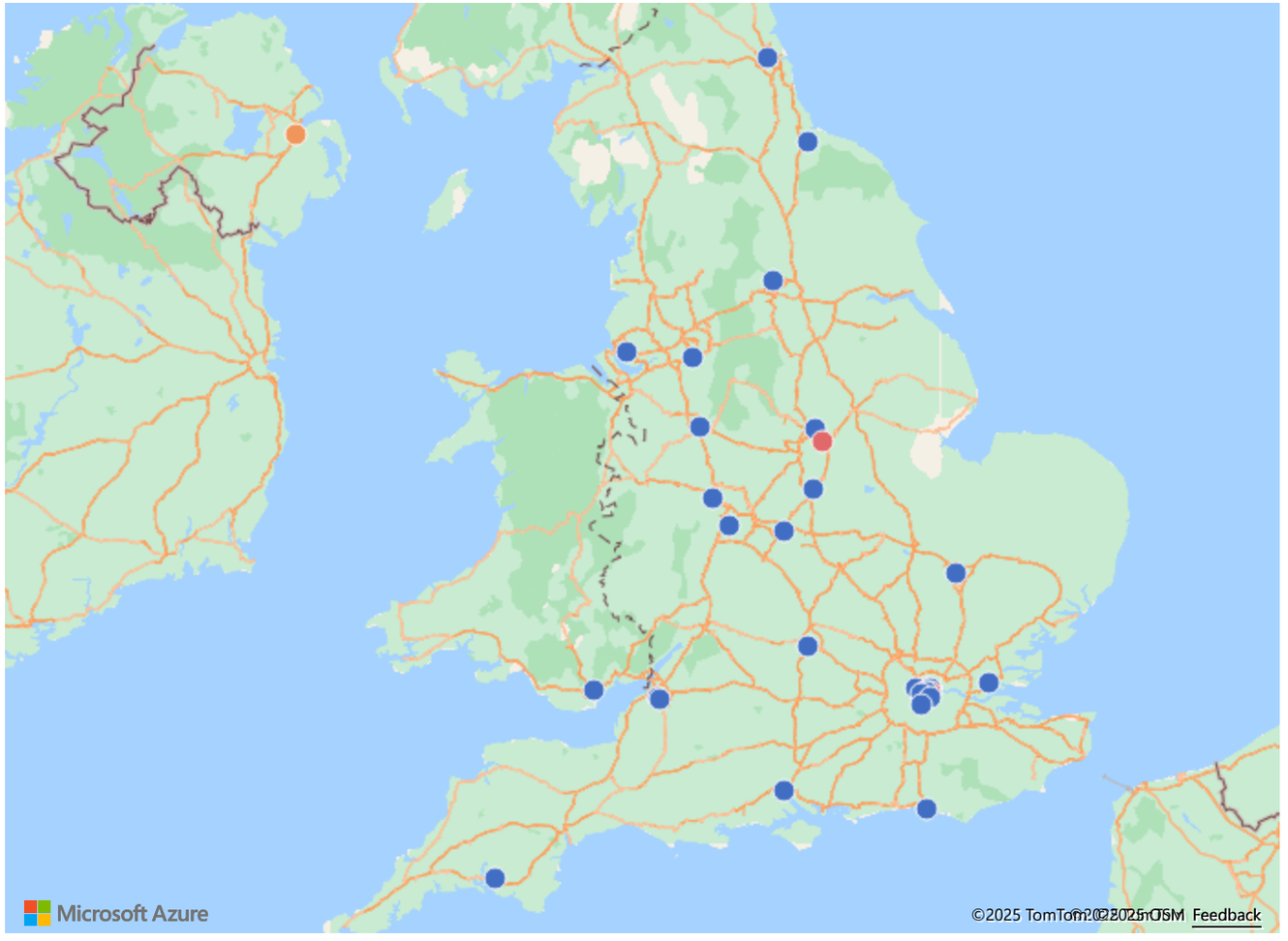
1

This hospital is commissioned to perform mitral TEER

Non-registered hospitals that did not submit 2024/25 TMTV data

4

Location of hospitals submitting 2024/25 data to the TMTV registry



24 hospitals were commissioned to perform mitral transcatheter edge-to-edge repair (TEER) procedures in 2024/25

Hospitals commissioned to perform mitral TEER procedures

23

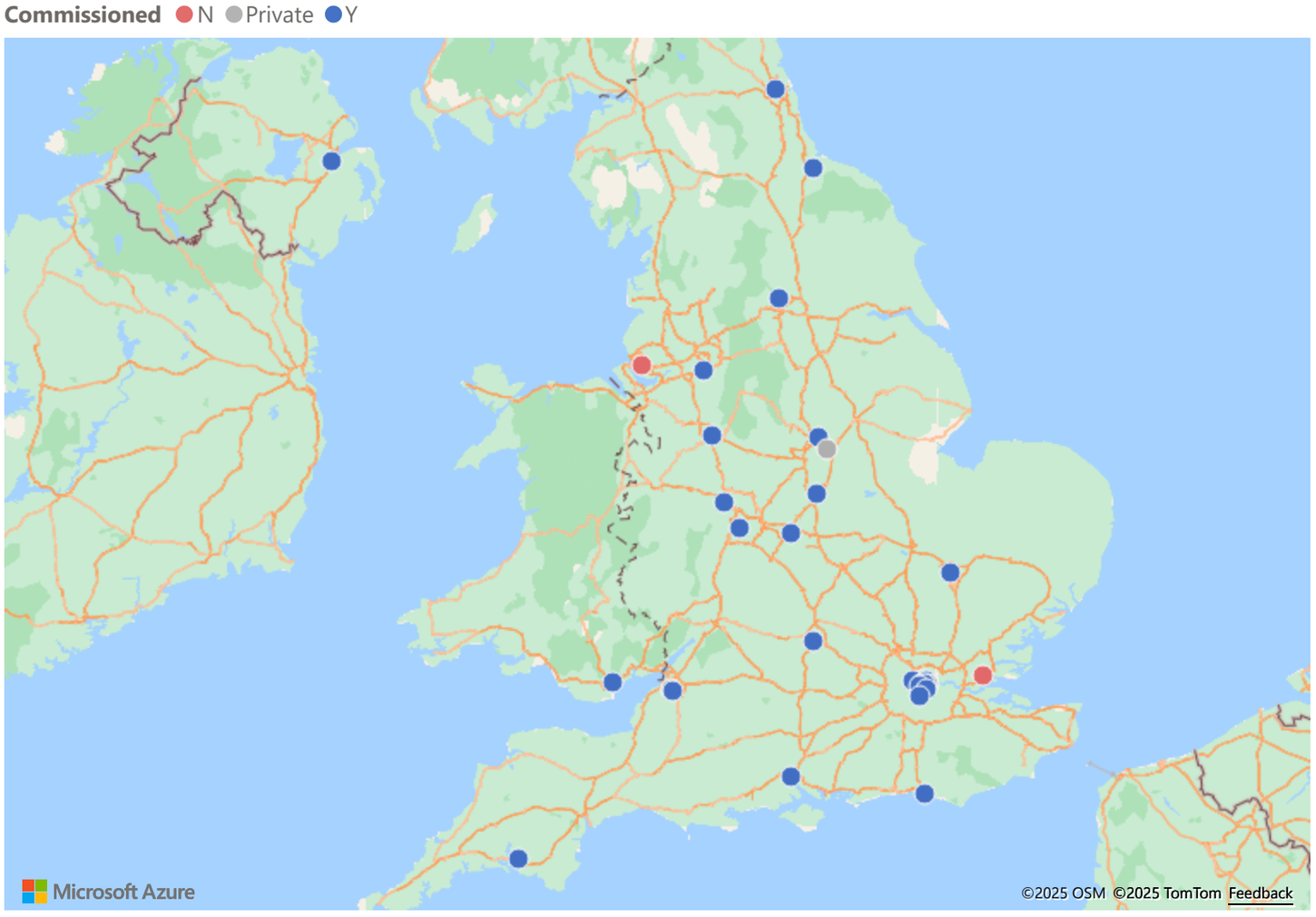
Hospitals performing mitral TEER procedures but not commissioned by NHS England

3

Private hospitals performing mitral TEER procedures

5

Location of hospitals commissioned or submitting mitral TEER data to the TMTV registry in 2024/25



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Data completeness is generally good but needs to be improved for several key fields to assist with benchmarking

Average data completeness across all the data fields in the TMTV registry is 92%.

Important data fields such as post-procedure regurgitation in cases of mitral TEER, status at discharge and discharge destination are completed less well. This limits the ability to draw conclusions about the quality of treatments with confidence.

There is the need for data quality improvement especially at the following hospitals that are also delivering amongst the highest volumes: St Bart's Hospital, Royal Brompton Hospital, John Radcliffe Hospital Oxford. Particular attention to data quality needs to be paid by University Hospital Coventry.

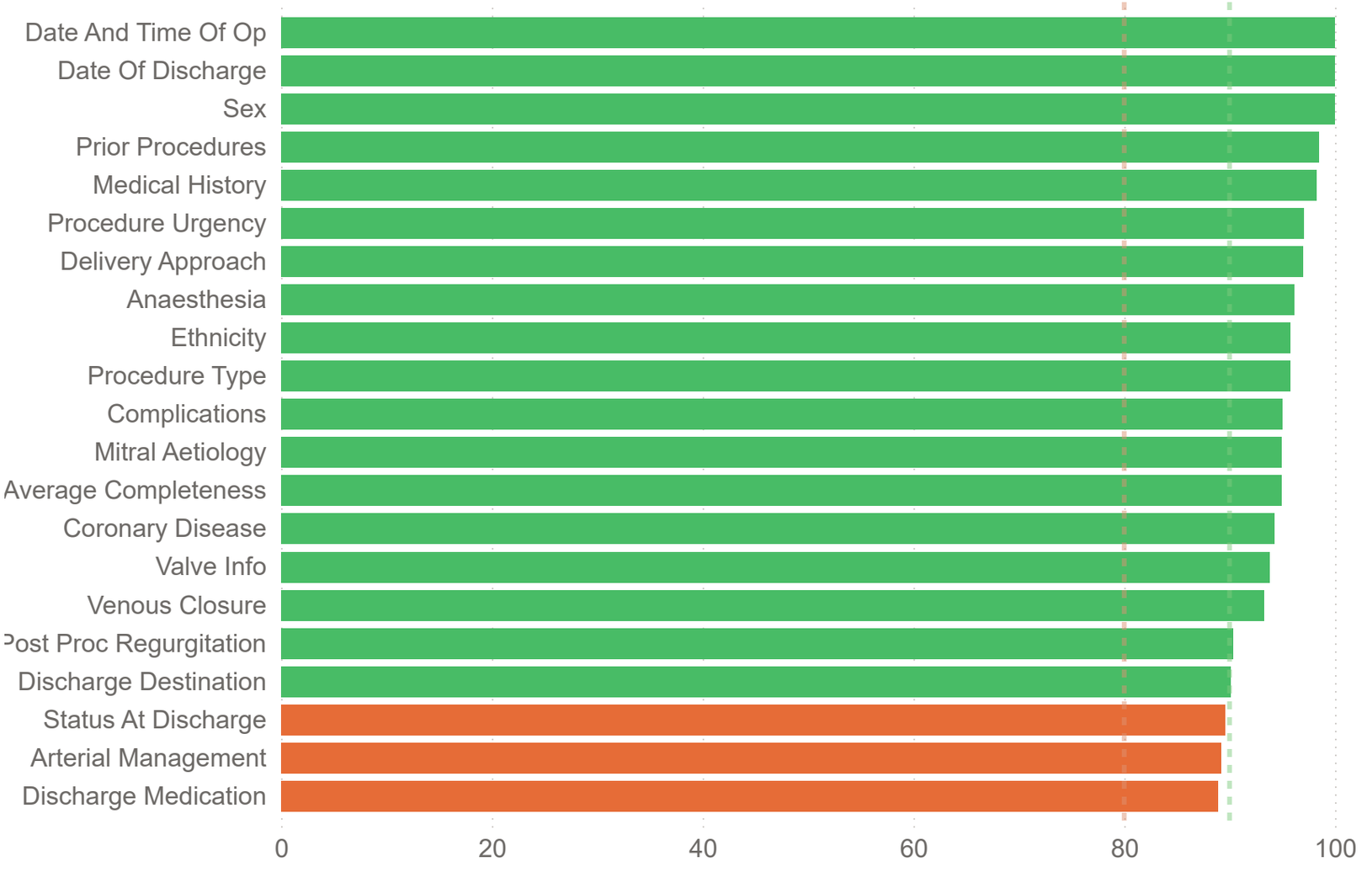
Select a hospital below to see its data.

Key
Data completeness by field or group of fields
Green > 90%
Orange 80-90%
Red <80%

Select hospital

All

Average percent completeness of data variables in theTMTV registry (2024/25)



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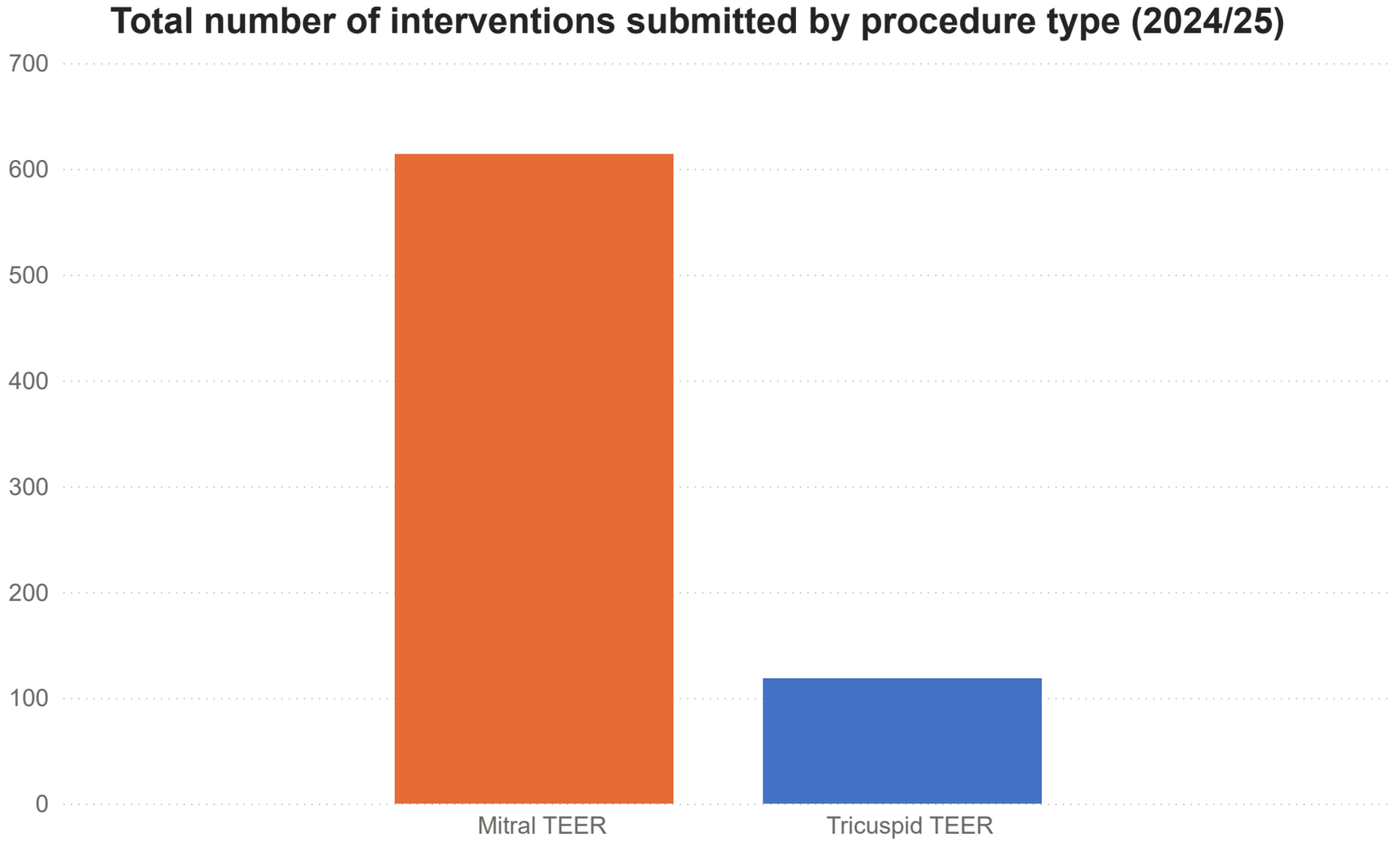
The majority of TMTV procedures were mitral transcatheter edge-to-edge repairs (TEERs)

Mitral valve transcatheter edge-to-edge repair (TEER) procedures made up 67% of all TMTV procedures in 2024/25.

Non-commissioned tricuspid TEER procedures were the second largest group, representing 13% of TMTV interventions.

5.7% of submissions did not specify procedure type. All hospitals should accurately complete the data set to confirm the procedure performed.



The TMTV registry captures several non-TEER TMTV procedures

Balloon mitral valvuloplasty procedures make up the majority of non-TEER cases. Dedicated percutaneous valve implant procedures for the tricuspid valve are emerging.

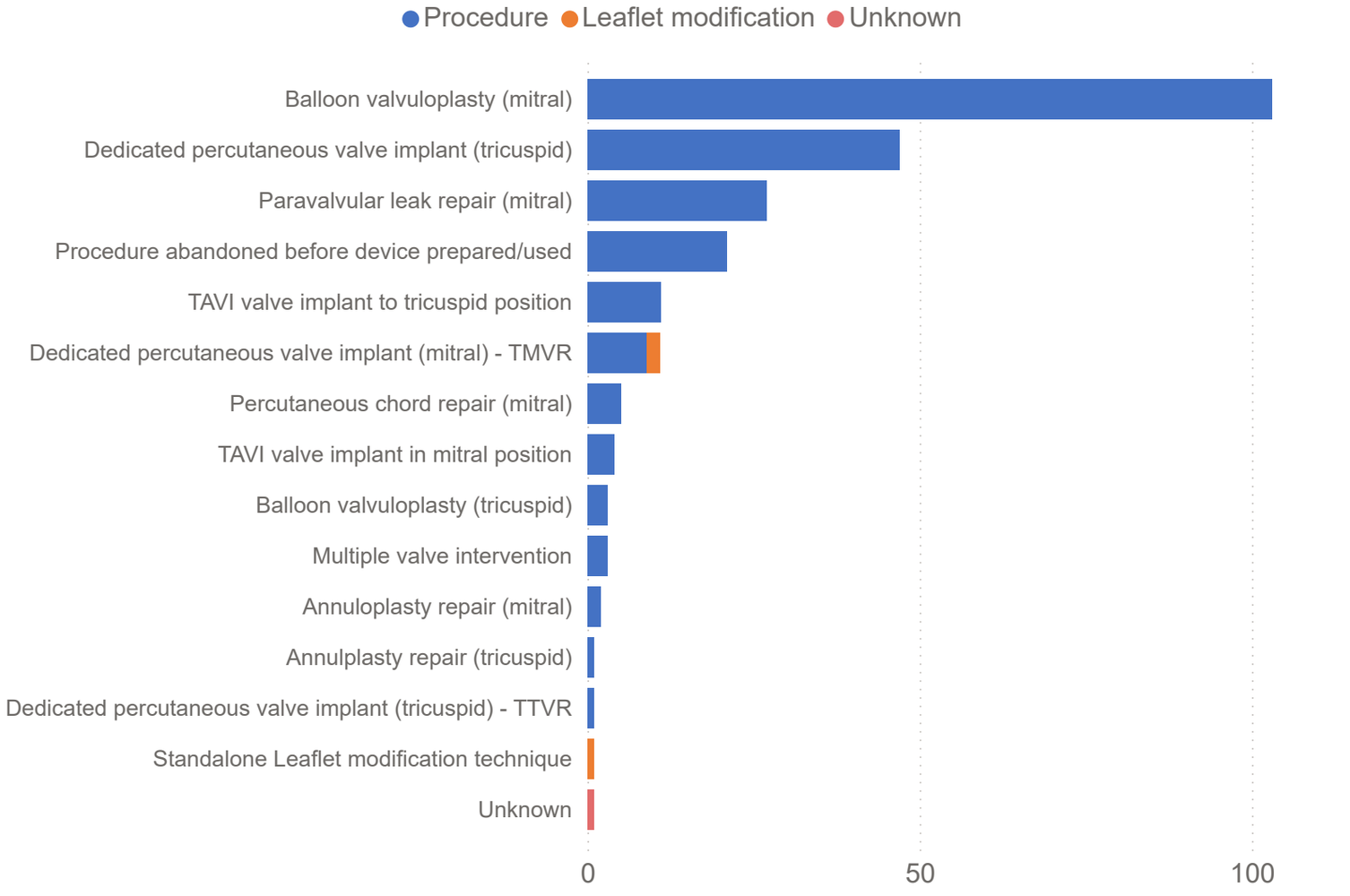
Combined TMTV procedures are labelled as 'Multiple valve intervention'

Combined TMTV procedures are labelled as ‘Multiple valve intervention’ and include:

- TAVI implant to tricuspid position and pulmonary valve-in-valve procedure.
- TAVI implant to tricuspid position and percutaneous pulmonary valve implantation.
- TAVI implant to tricuspid and paravalvular leak repair of tricuspid valve.

Leaflet modification techniques such as transcatheter electrosurgery are advanced techniques to facilitate device implantation and are identified separately here. They may be undertaken as a preparatory standalone procedure or during the device implantation procedure.

Number of non-TEER procedures submitted to the registry (2024/25)



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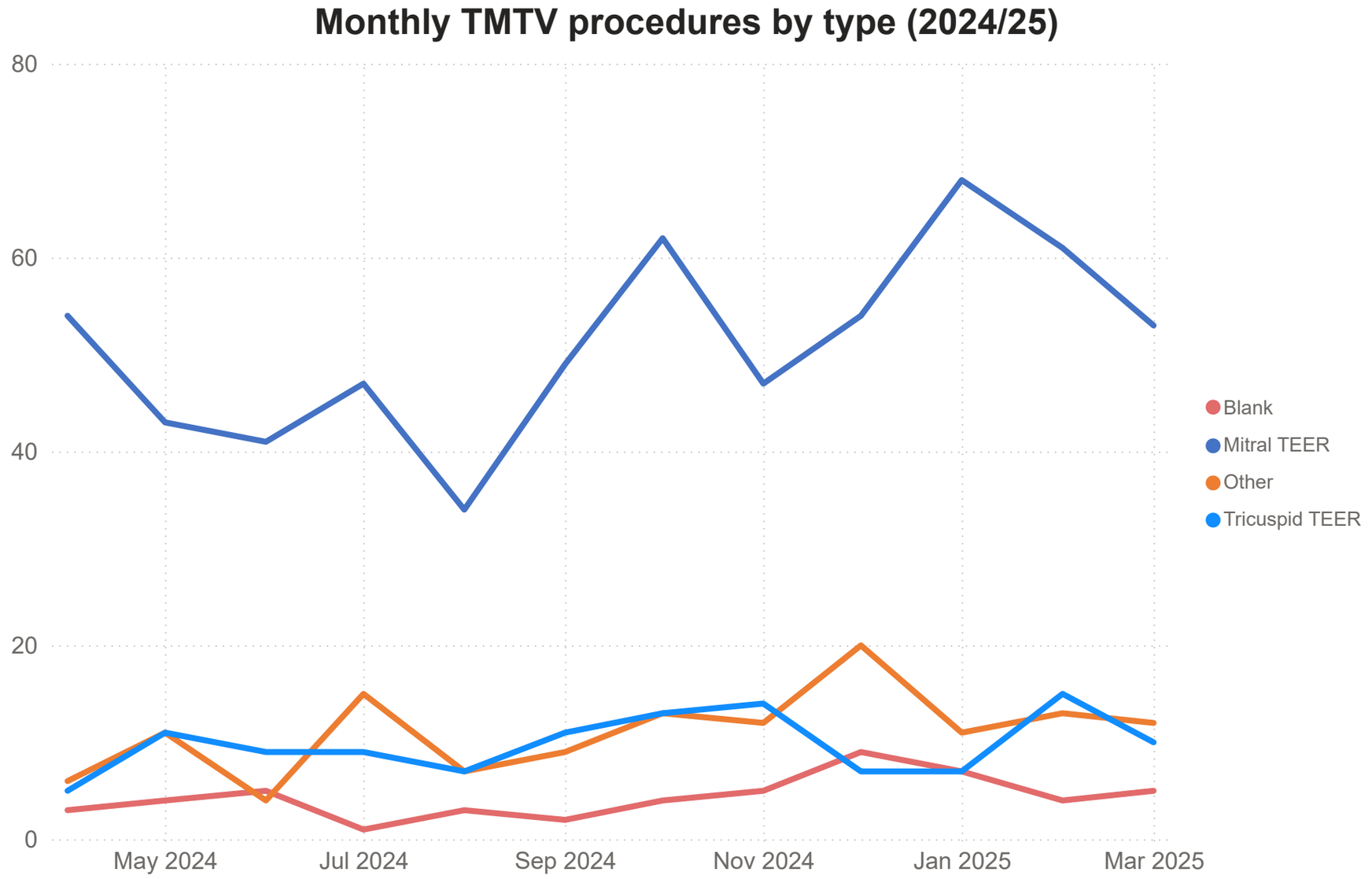
The number of monthly TMTV procedures is increasing, driven mainly by the rise in mitral TEER procedures in 2024/25

The number of monthly mitral TEER procedures increased in Q3-Q4 of 2024/25.

The numbers of the remaining procedures are too small to comment on clear trends.



The rate of mitral TEER cases per million population in some areas was 11 fold higher than in other areas

The maps show the rate of mitral TEER procedures per million population (pmp) across the 42 Integrated Care Boards (ICBs) in England, 7 Welsh Health Boards (HBs) and 16 Cardiac Networks (CNs). Darker shading = higher rates.

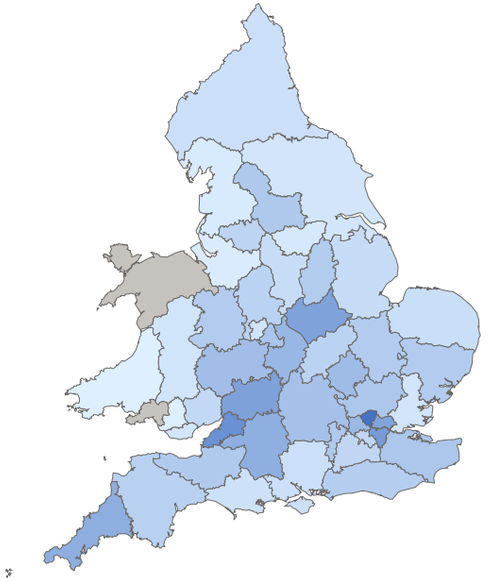
There is wide variation in the age-standardised rate from:

- 0.2pmp in Hywel Dda University Health Board tp 3.5pmp in NHS North Central London ICB
- 0.3pmp in Cheshire and Merseyside Cardiac Network to 8.5 pmp in West of England Cardiac Network

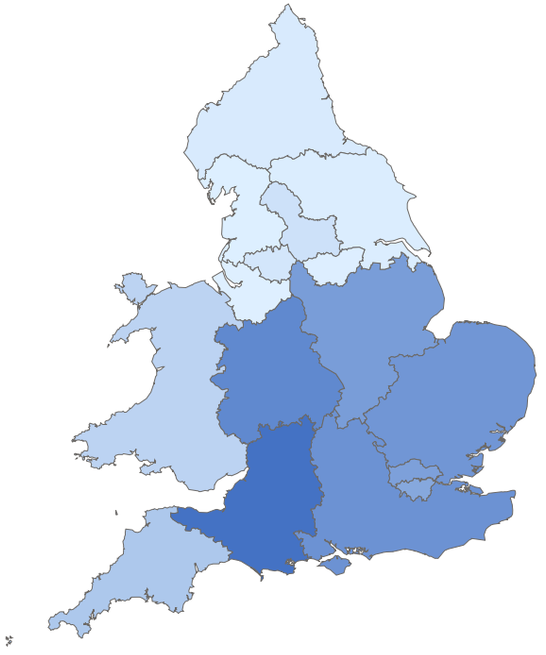
The variation might be partially explained by the length of time the hospitals have been delivering their mitral TEER services. Several other factors may influence this variation.

Select the procedure type and rate (actual or age-adjusted) or hover over the maps to see specific data.

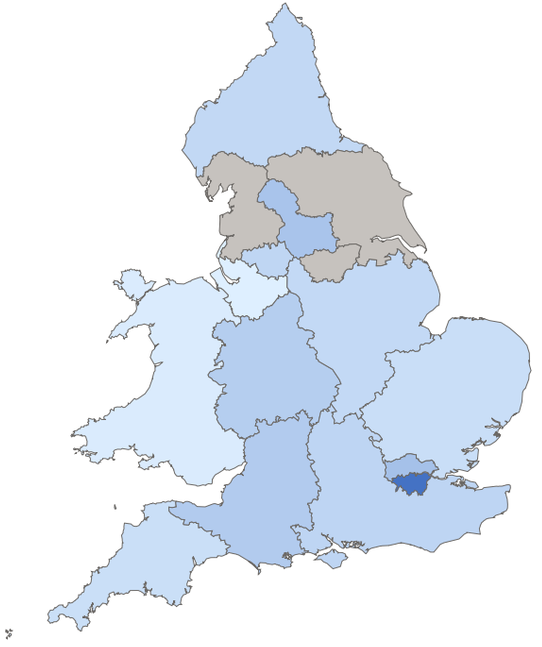
Mitral TEER procedures based on patient home by ICB/HB (2024/25)



Mitral TEER procedures based on patient home location by Cardiac Network (2024/25)



Mitral TEER procedures based on hospital location by Cardiac Network (2024/25)



Select procedure type

Mitral TEER

Select rate

Age-standardised rate

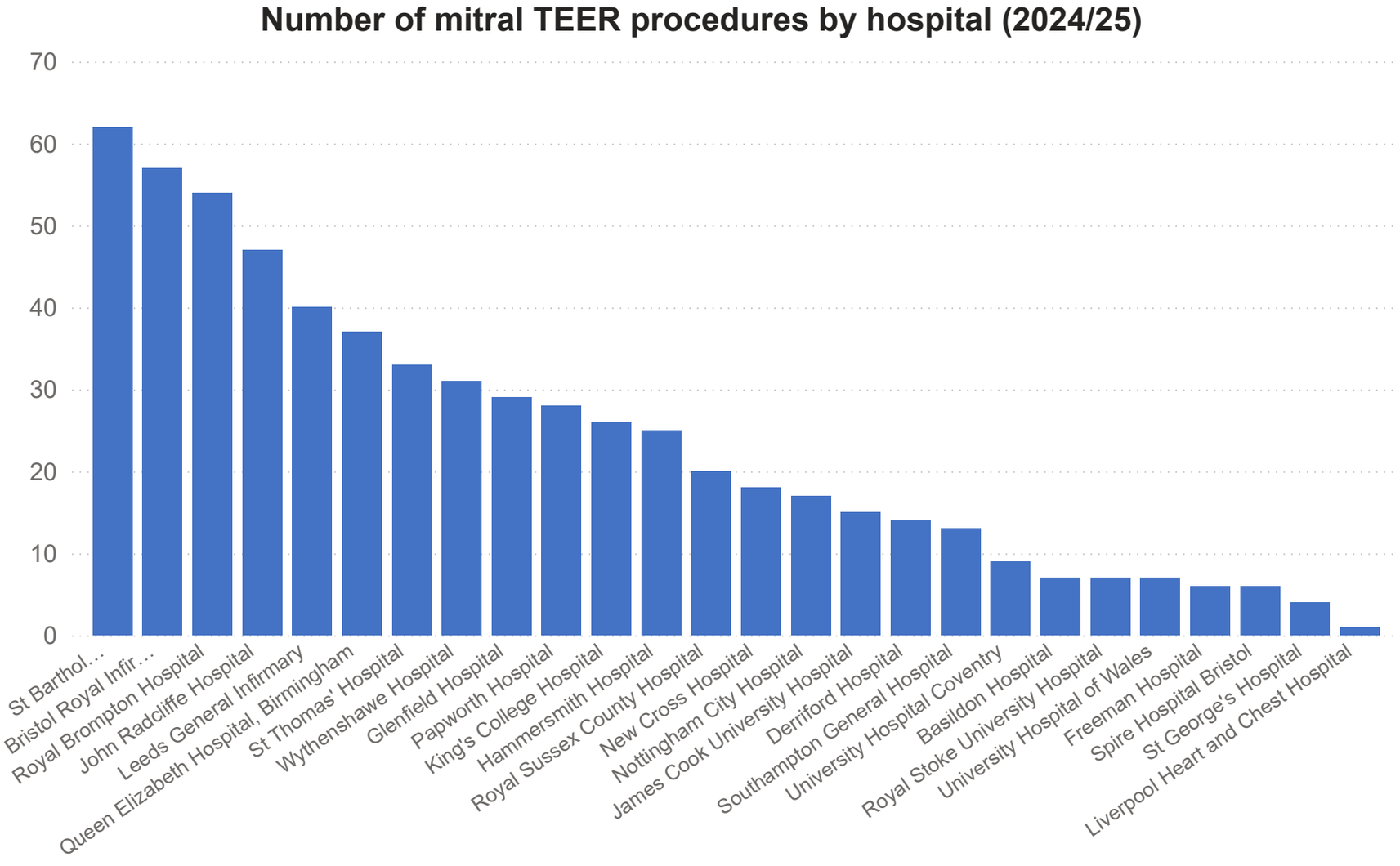
There was significant variation in mitral TEER case numbers between hospitals

The number of mitral TEER procedures at each hospital varied significantly in 2024/25 from:

- **62 at St Bartholomew's Hospital to**
- **1 at Liverpool Heart & Chest Hospital**

Improved clinical pathways and maturity of programmes would be expected to smooth out this variation.

Caution needs to be applied when interpreting these data as hospitals may not yet be submitting 100% of cases to the registry.

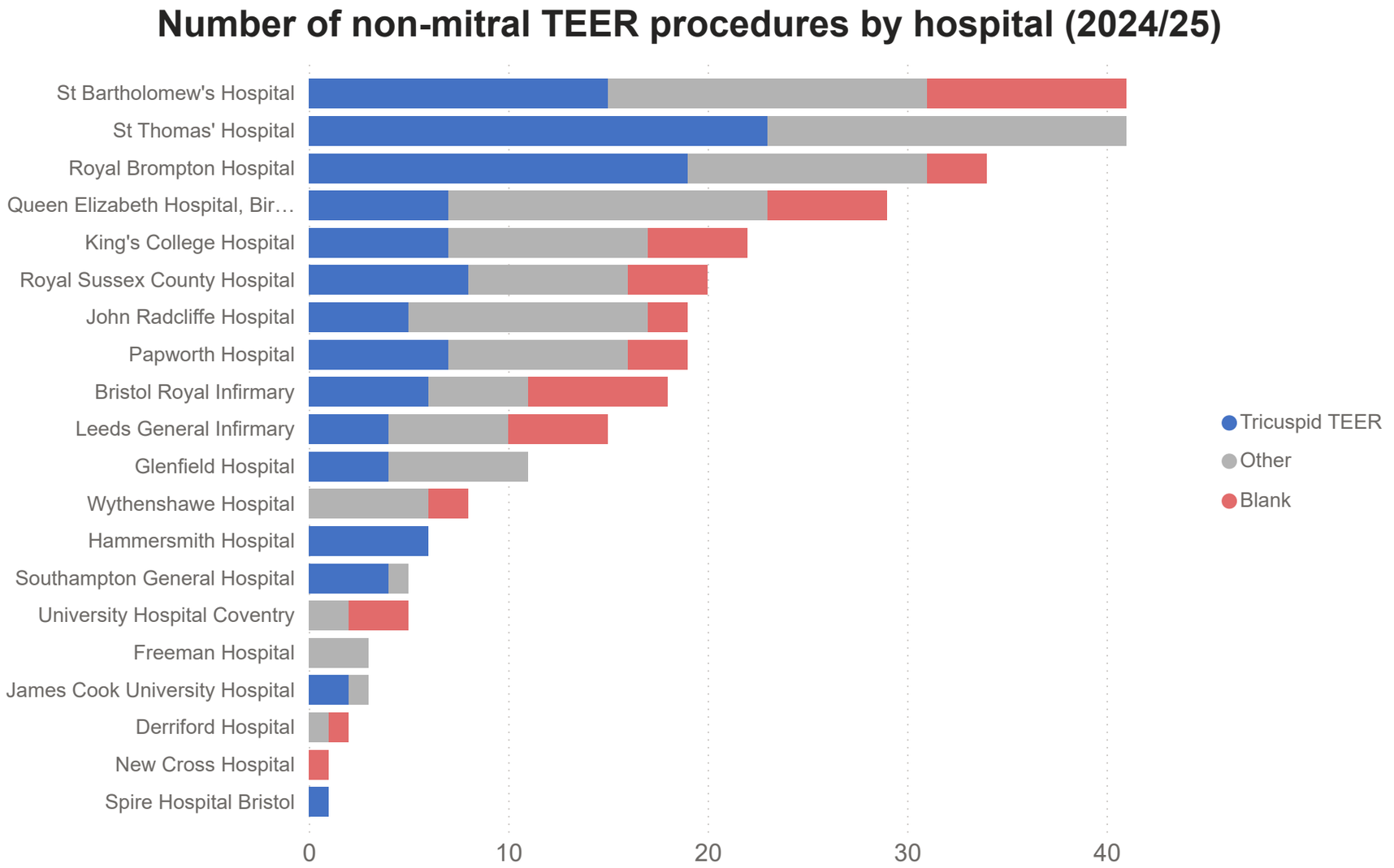


20 hospitals (including 1 private provider) undertook non-mitral TEER procedures in 2024/25

The number of non-mitral TEER procedures at each hospital in 2024/25 ranged from:

- 41 at St Bartholomew's Hospital and St Thomas' Hospital to
- 1 at New Cross Hospital and Spire (private) hospital Bristol

All hospitals need to provide complete and accurate data to the registry.



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The majority of hospitals have at least two TMTV operators

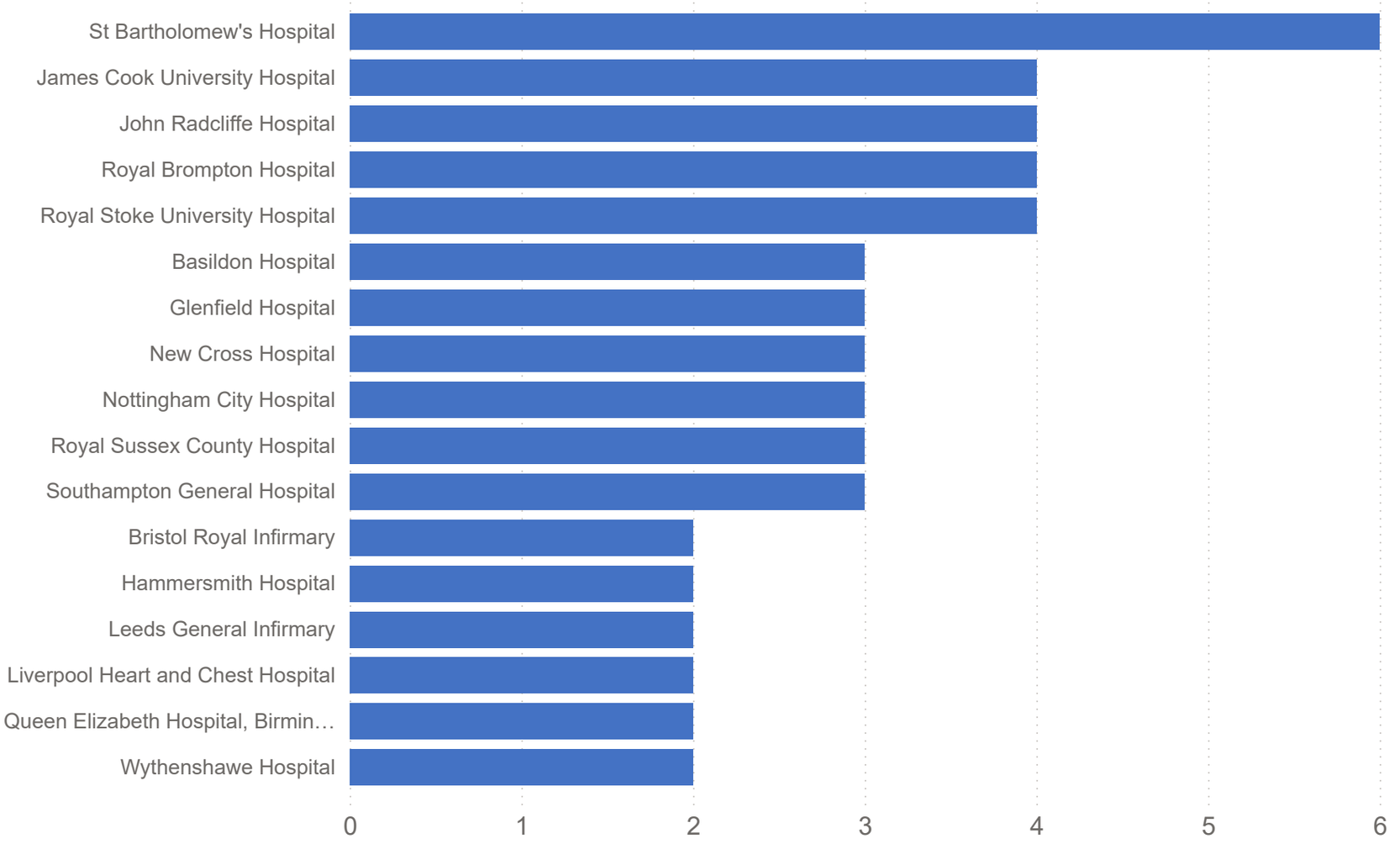
The number of TMTV operators in each hospital ranges from 2 as the lowest number up to 6 in St Bartholomew's Hospital which is the highest volume centre.

9 hospitals did not provide data about operators:

- Derriford Hospital
- Freeman Hospital
- King's College Hospital
- Royal Papworth Hospital
- Spire Hospital, Bristol
- St George's Hospital
- St Thomas' Hospital
- University Hospital Coventry
- University Hospital of Wales, Cardiff

All hospitals should provide complete and accurate data to the registry.

Number of TMTV operators by hospital (2024/25)



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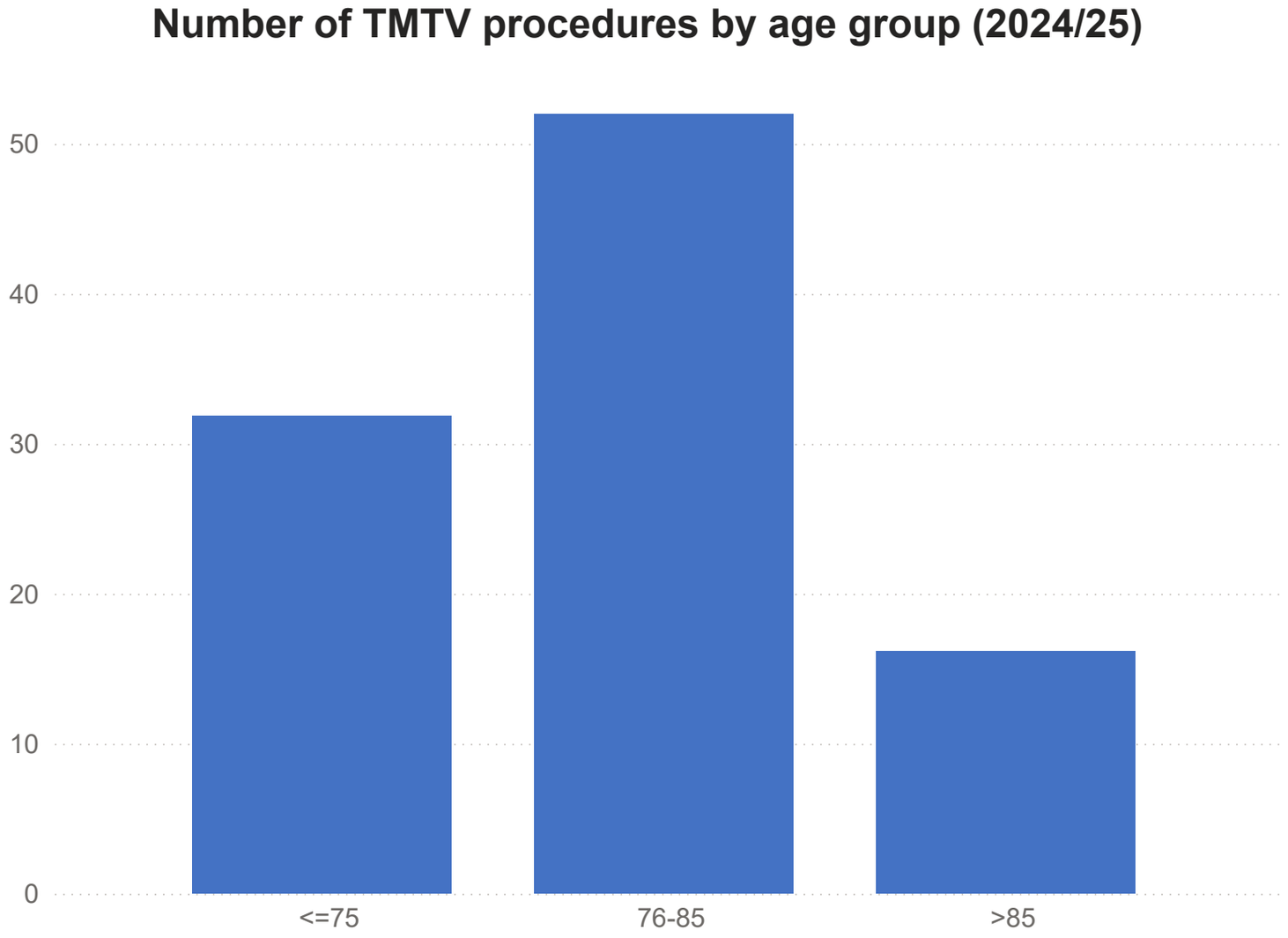
Most TMTV patients were aged between 76 and 85

Just over half of patients undergoing TMTV procedures were aged 76-85 years of age in 2024/25.

The proportion of patients who underwent TMTV procedures aged 75 years or under was 32%.

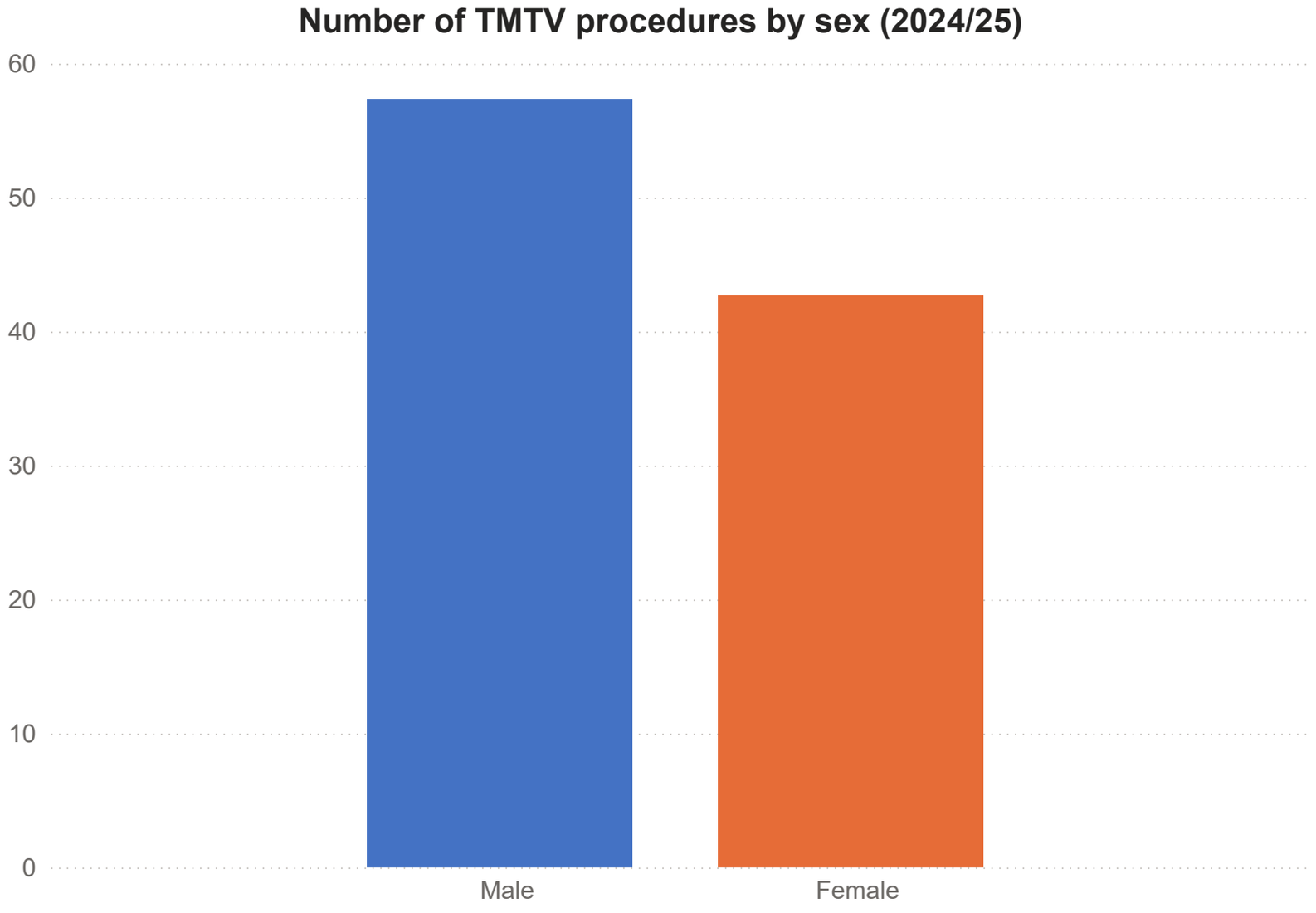
The median age of patients undergoing TMTV procedures is 80 years.



More male than female patients were treated with a TMTV procedure

A higher proportion of patients receiving TMTV procedures were male in 2024/25.

57% of cases that reported the sex of the patient involved males.



The ethnicity of patients undergoing TMTV procedures was not recorded in 8% of cases

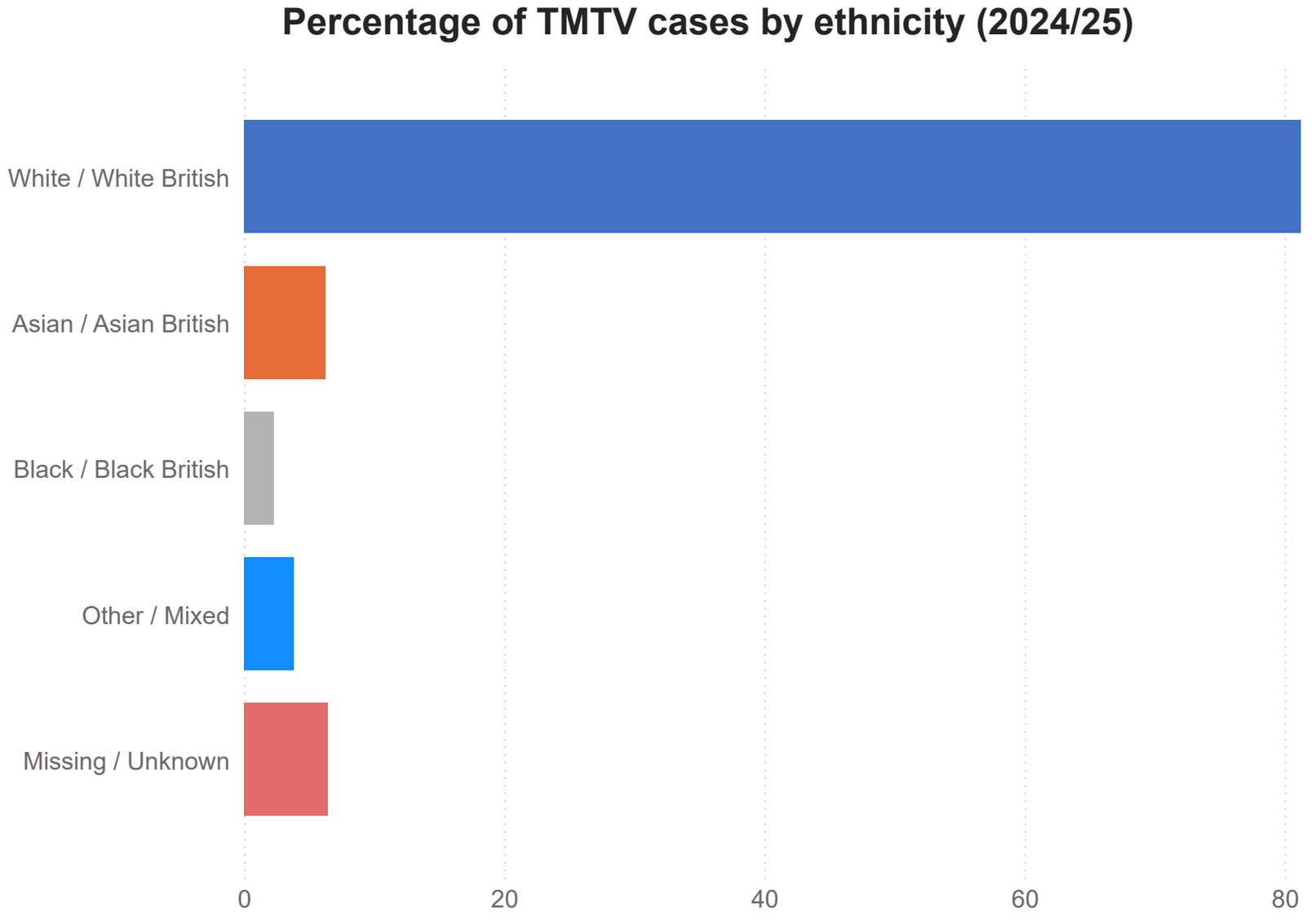
For TMTV cases where the ethnicity data were captured, the breakdown in 2024/25 was:

- 81.2% White
- 6.2% Asian / Asian British
- 2.3% Black / Black British
- 3.8% Other or Mixed

The 2021 Census data for those aged 70 and over age were:

- 95% White
- 3% Asian / Asian British
- 1% Black / Black British
- 1% Other / Mixed

Future analysis will integrate demographic data to help draw conclusions about unequal opportunities for treatment.



The majority of patients undergoing transcatheter mitral valve procedures were fit or had mild or moderate degrees of frailty

The Canadian Study of Health and Aging (CSHA) Clinical Frailty Scale (CFS) is used to assess the level of frailty in older adults. It evaluates a person's overall fitness and functional status. It is based on clinical judgement and used to better-inform decisions about care and treatment.

The percentage of mitral valve cases with frailty broken down according to the CSHA CFS in 2024/25 was as follows:

1-2: Very fit or Fit = 7.6%
3-4: Managing well or Very mildly frail = 55%
5-6: Mildly or moderately frail = 24.6%
7-8: Very or Very severely frail = 1.2%
9: Terminally ill: = 0%

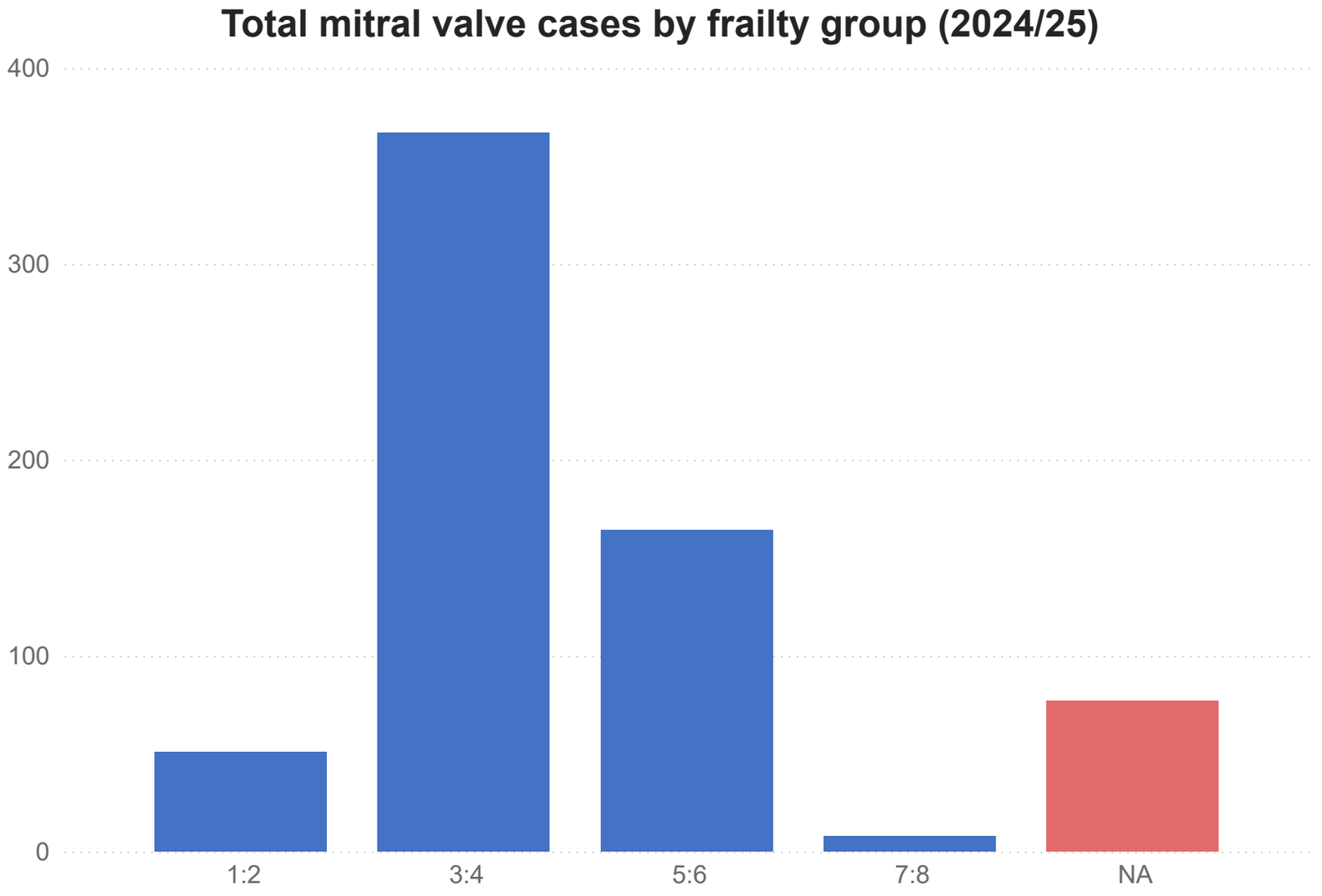
CSHA CFS was incomplete in 11.5% of cases ('NA').

All hospitals should provide complete and accurate data to the registry.

Select a procedure below to see specific data.

Select procedure

All



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The majority of patients undergoing transcatheter tricuspid valve procedures were fit or had mild or moderate degrees of frailty

The Canadian Study of Health and Aging (CSHA) Clinical Frailty Scale (CFS) is used to assess the level of frailty in older adults. It evaluates a person's overall fitness and functional status. It is based on clinical judgement and used to better inform decisions about care and treatment.

The percentage of tricuspid valve cases with frailty broken down according to the CSHA CFS in 2024/25 was as follows:

1-2: Very fit or Fit = 4.5%
3-4: Managing well or Very mildly frail = 53.6%
5-6: Mildly or Moderately frail = 21.8%
7-8: Very or Very severely frail = 1.1%
9: Terminally ill = 0%

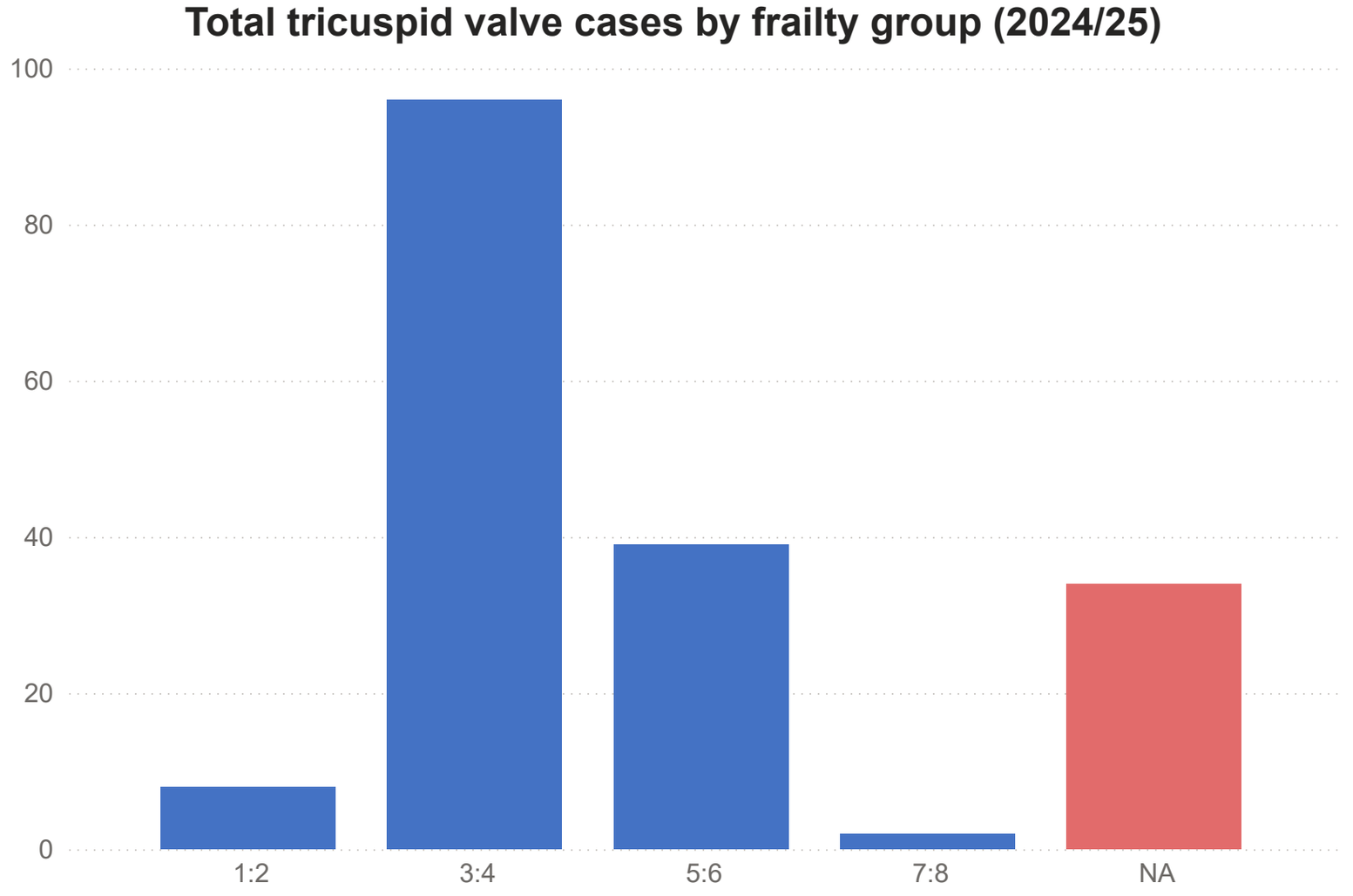
CSHA CFS was incomplete in 19% of cases ('NA').

All hospitals should provide complete and accurate data to the registry.

Select a procedure below to see specific data.

Select procedure

All



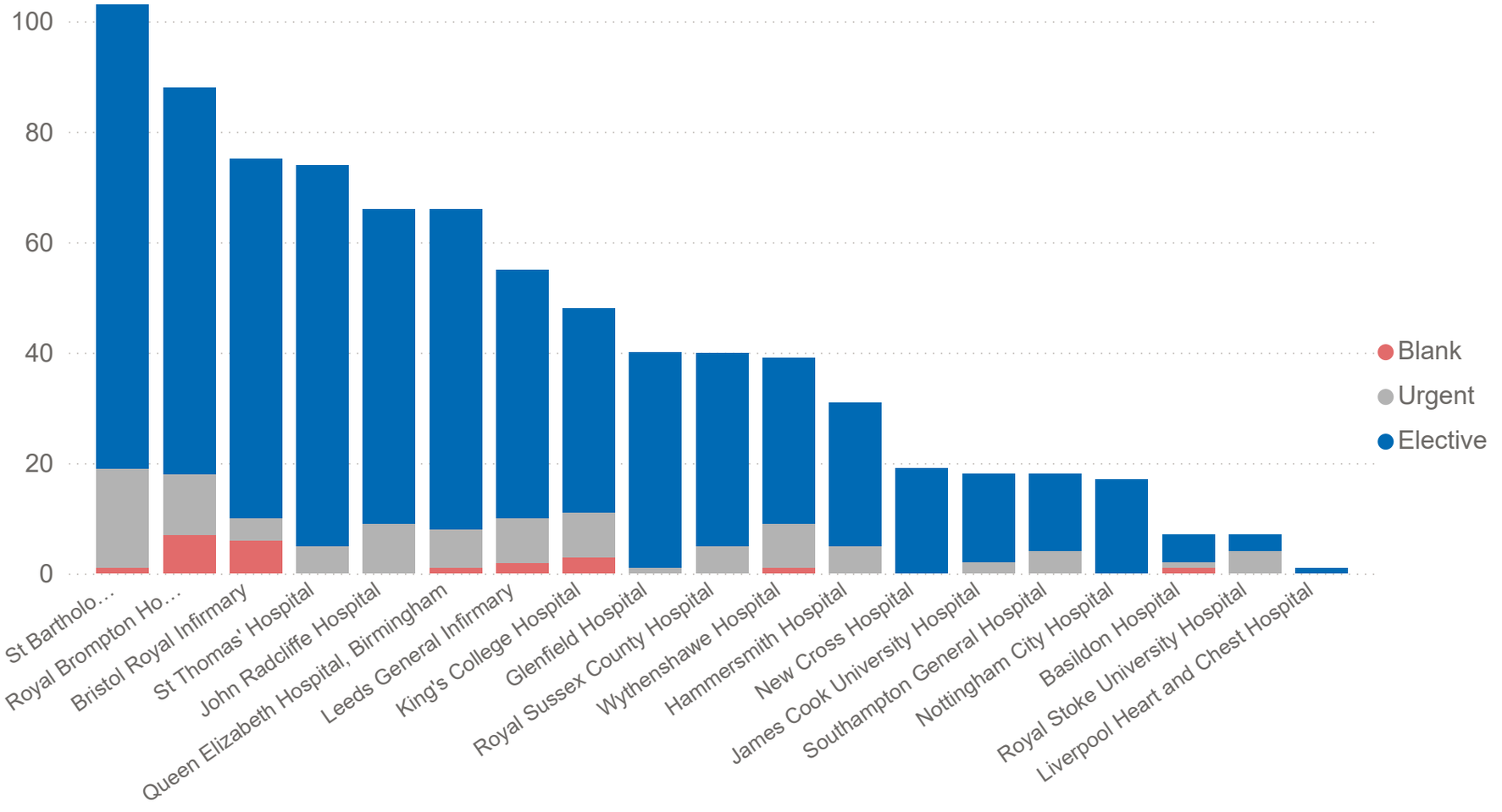
The vast bulk of TMTV cases were elective procedures but most hospitals undertook a small number of urgent cases

The vast majority of TMTV cases were elective planned cases in 2024/25.

A small number of cases were performed urgently when the clinical team considered this necessary before discharging the patient.

All hospitals should provide complete and accurate data to the registry.

Number of TMTV cases by procedure urgency, by hospital (2024/25)



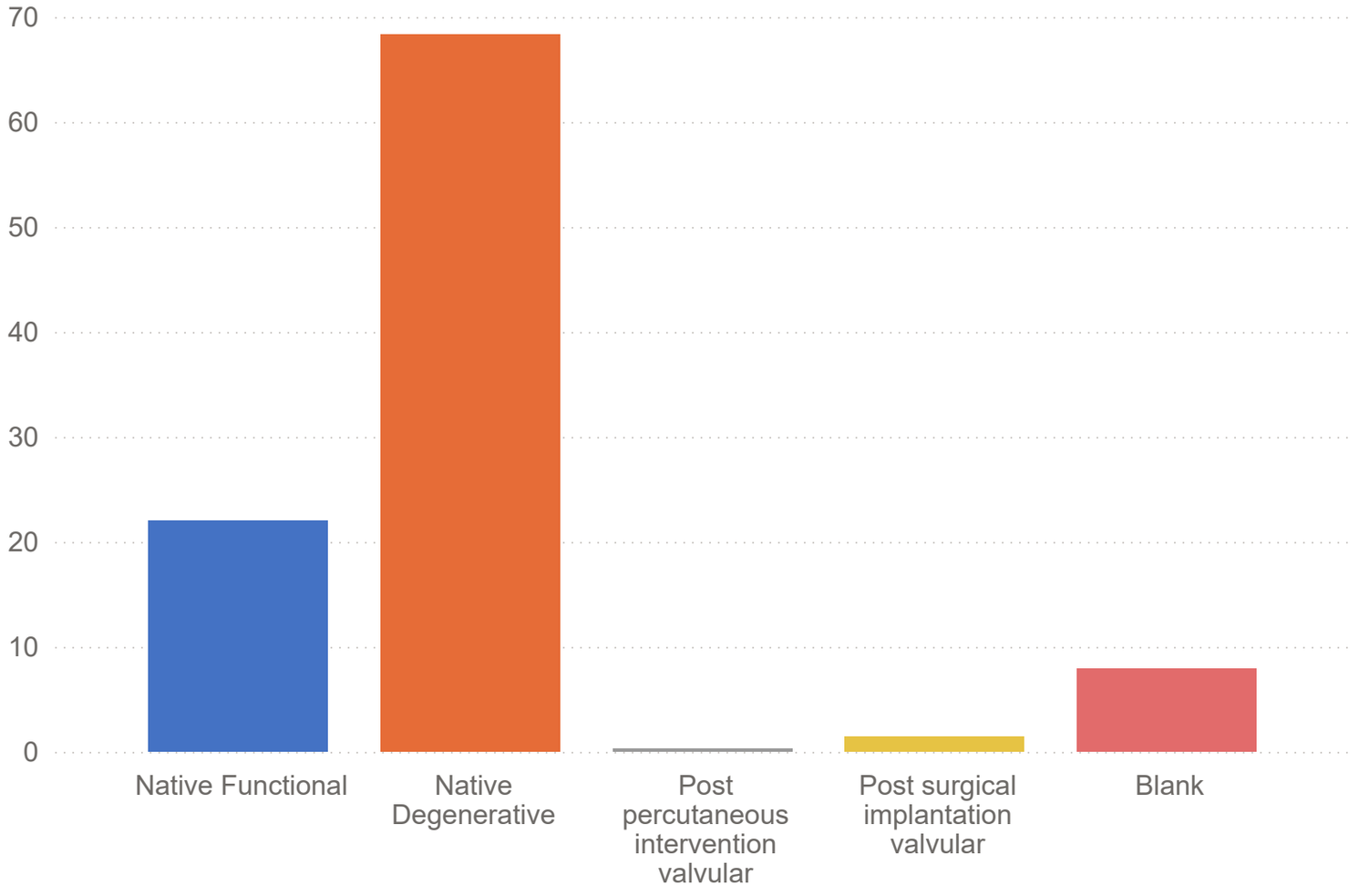
Most mitral TEER procedures were undertaken for primary degenerative disease but a fifth of cases were for secondary causes of mitral regurgitation

68% of mitral TEER cases in 2024/25 were for primary degenerative disease of the mitral valve.

22% of cases were for secondary mitral regurgitation which is not presently commissioned by NHS England. This has reduced from 2023/24 by 16%.

The analysis cannot be performed for 8% of cases. All hospitals should provide accurate and complete data to the registry.

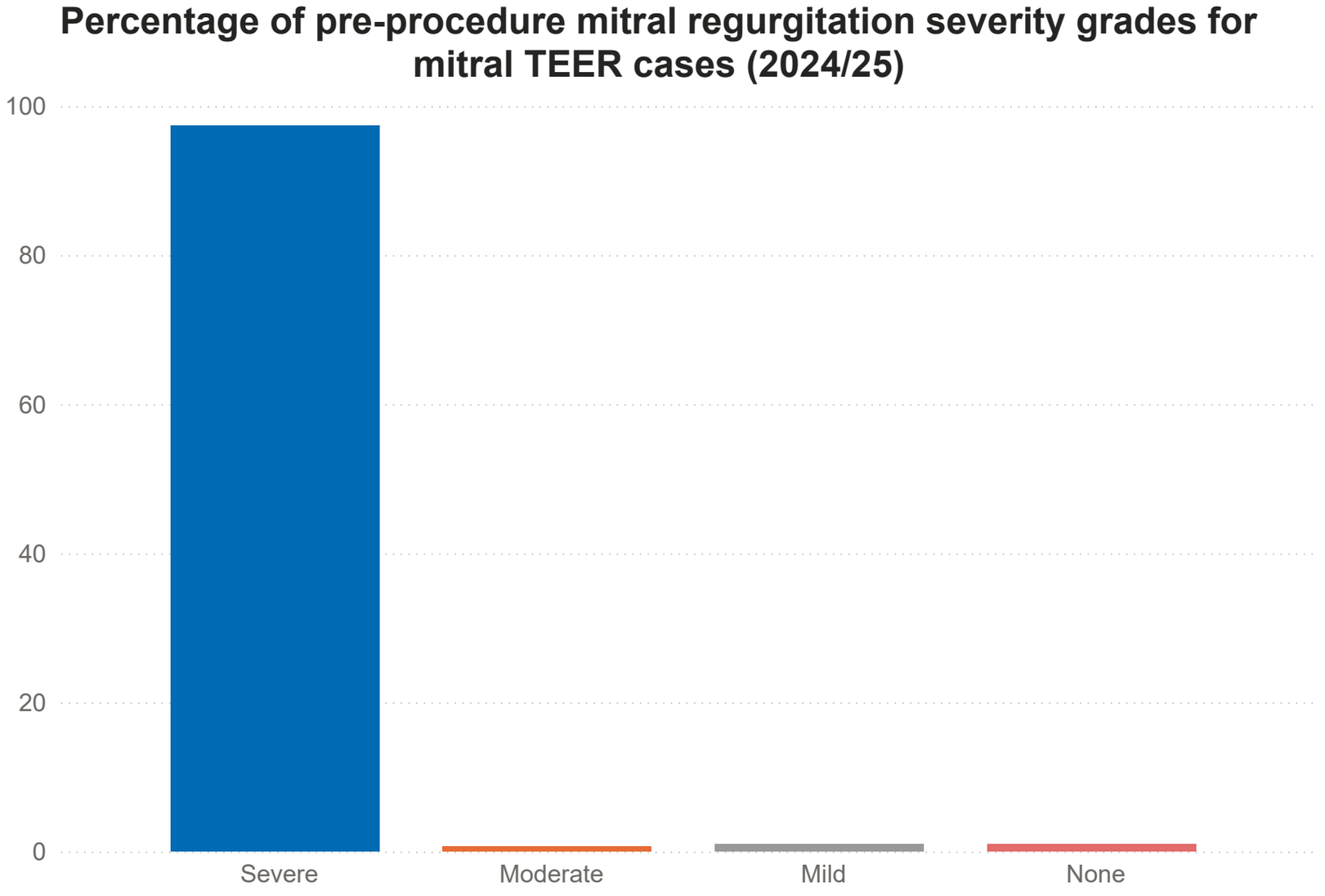
Percentage of mitral TEER cases by aetiology of mitral regurgitation (2024/25)



Almost all mitral TEER cases in 2024/25 were for treatment of severe mitral regurgitation

In 2024/25, 97% of mitral TEER cases were for severe mitral regurgitation.

Cases for mild or no mitral regurgitation may be due to data entry errors.



The majority of patients undergoing mitral TEER have marked symptoms prior to the procedure

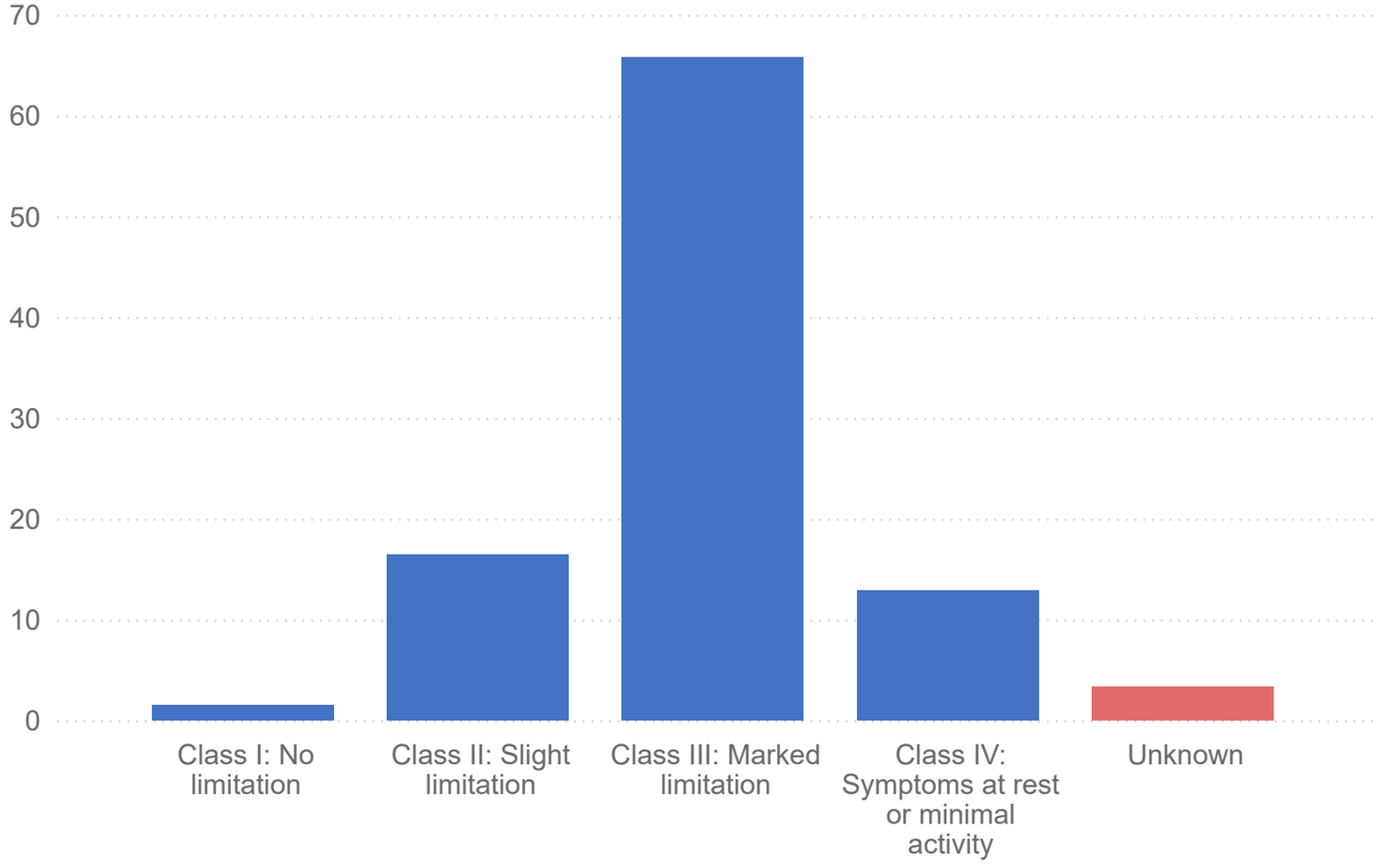
The majority of cases were symptomatic.

The percentage of mitral TEER cases with pre-procedural severity of symptoms broken down by New York Heart Association (NYHA) class was:

- 1.6% Class I: No limitation
- 16.5% Class II: Slight limitation
- 65.8% Class III: Marked symptoms
- 12.9% Class IV: Symptoms at rest or minimal activity

Hospitals should provide accurate and complete data for all patients undergoing treatment.

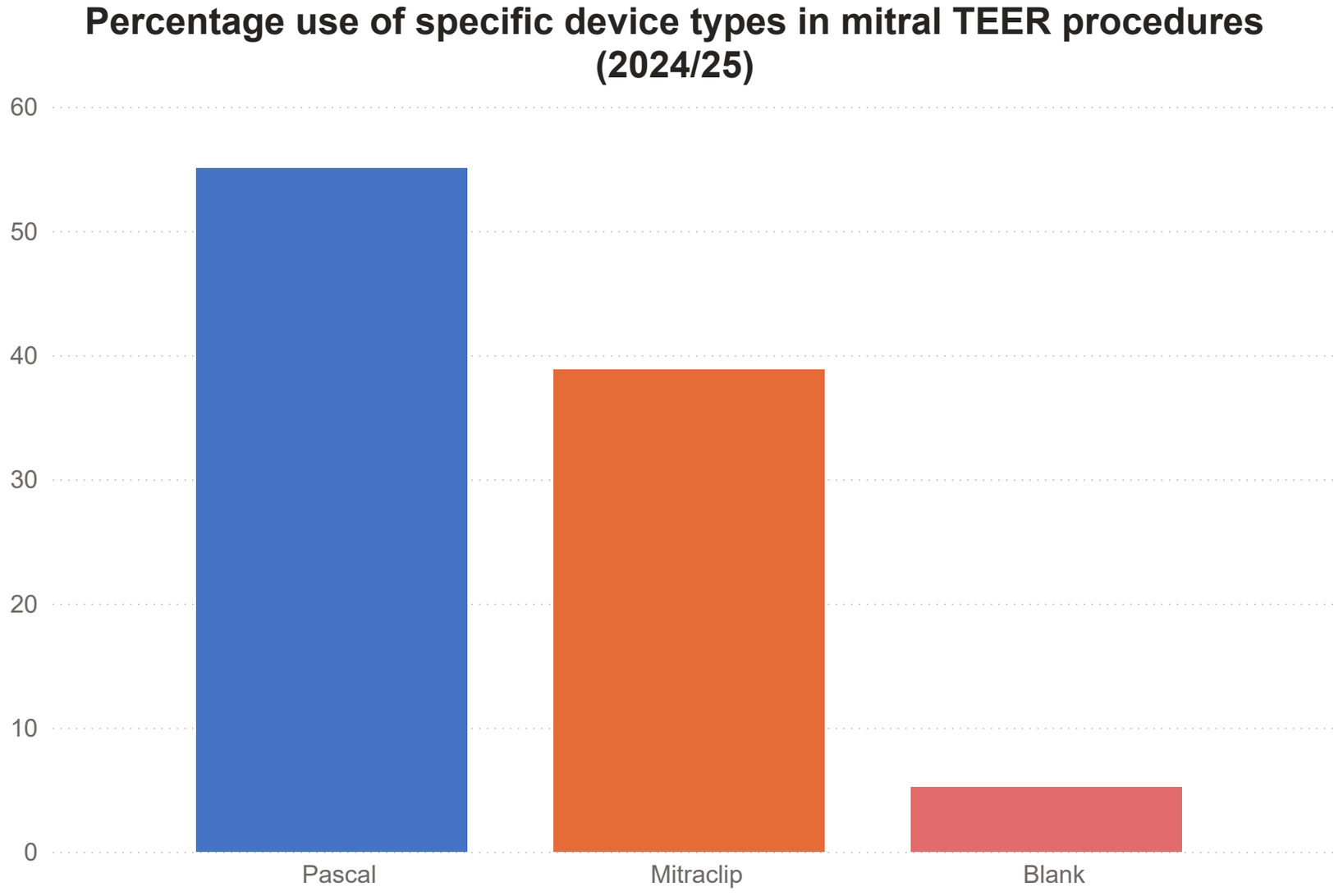
Percentage of mitral TEER cases with different pre-procedural NYHA symptom class (2024/25)



2 types of commercial device were used in mitral TEER procedures

Both types of commercially available device (MitraClip and PASCAL) were used for mitral TEER procedures.

The majority of cases (55%) used the Pascal repair system.



The median length of stay for mitral TEER cases was 2 days

The median length of stay (LOS) for all mitral TEER cases was 2 days (based on data from 26 hospitals).

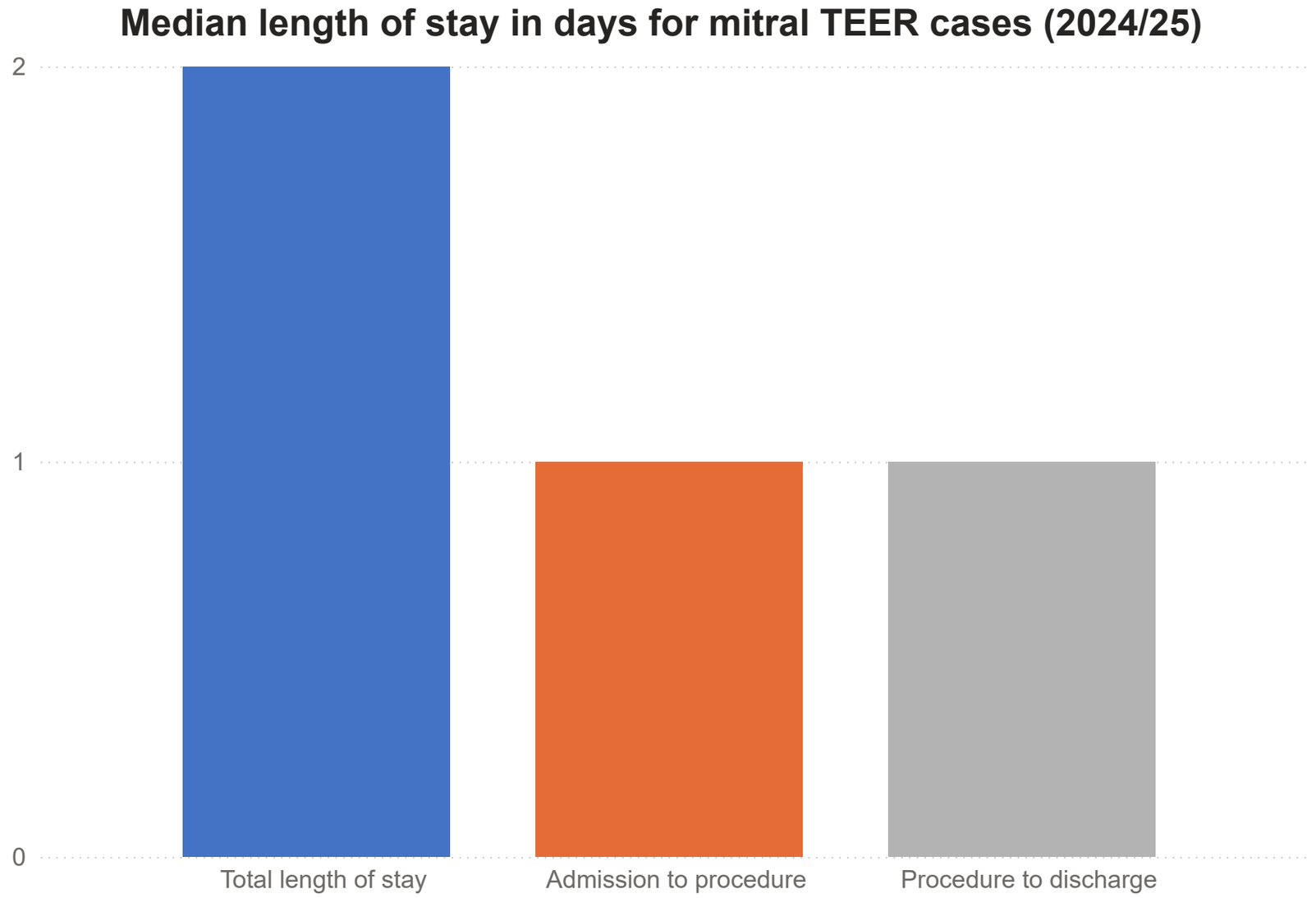
This comprised:

- 1 day time from admission to mitral TEER procedure
- 1 day from mitral TEER procedure to discharge.

The individual LOS for a patient reflects a number of factors including urgency, clinical profile and the presence of any complications.

All hospitals must provide complete data to the registry to enable this analysis.

Note: Cases represent combined urgent and elective admissions.



The median length of stay for mitral TEER varied between 1 and 6 days

There is variability in the median length of stay (LOS) for mitral TEER cases by hospital.

Several factors may influence this variation, but services should review their processes for elective procedures to reduce hospital stay.

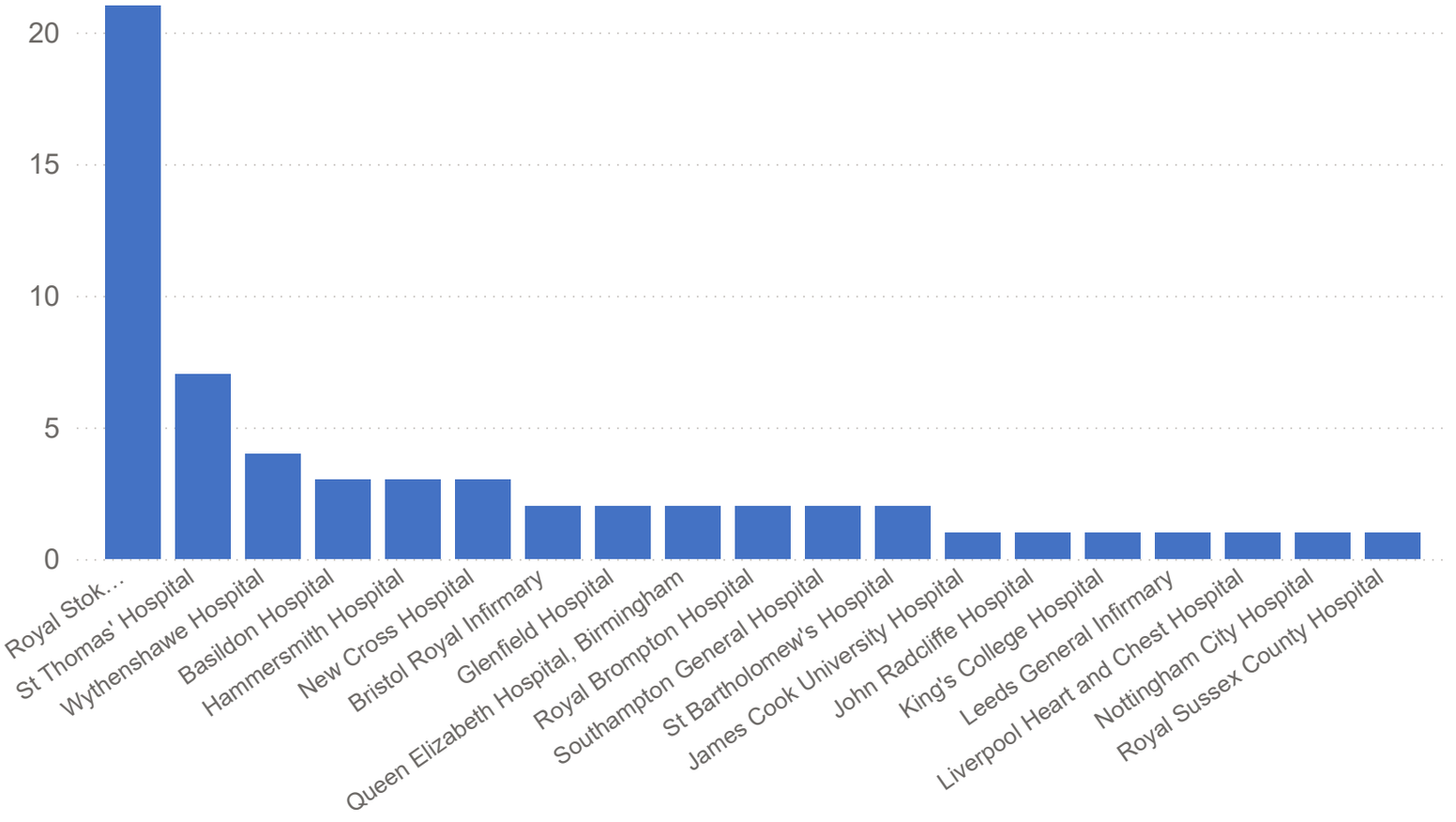
Royal Stoke submitted length of stay for 7 cases only, which may contribute to its higher median length of stay.

Lack of data means that we are not able to provide this analysis for:

- Derriford Hospital
- Freeman Hospital
- Derriford Hospital
- Royal Papworth Hospital
- Spire Hospital Bristol
- St George's Hospital
- University Hospital CoventryUniversity Hospital of Wales, Cardiff
- Spire Hospital Bristol

Note: Cases represent combined urgent and elective admissions.

Median length of stay (days) for mitral TEER cases by hospital (2024/25)



TMTV procedure times varied between hospitals

TMTV procedure times vary within and between hospitals. The median times range from 60 to 200 minutes across a variety of procedures.

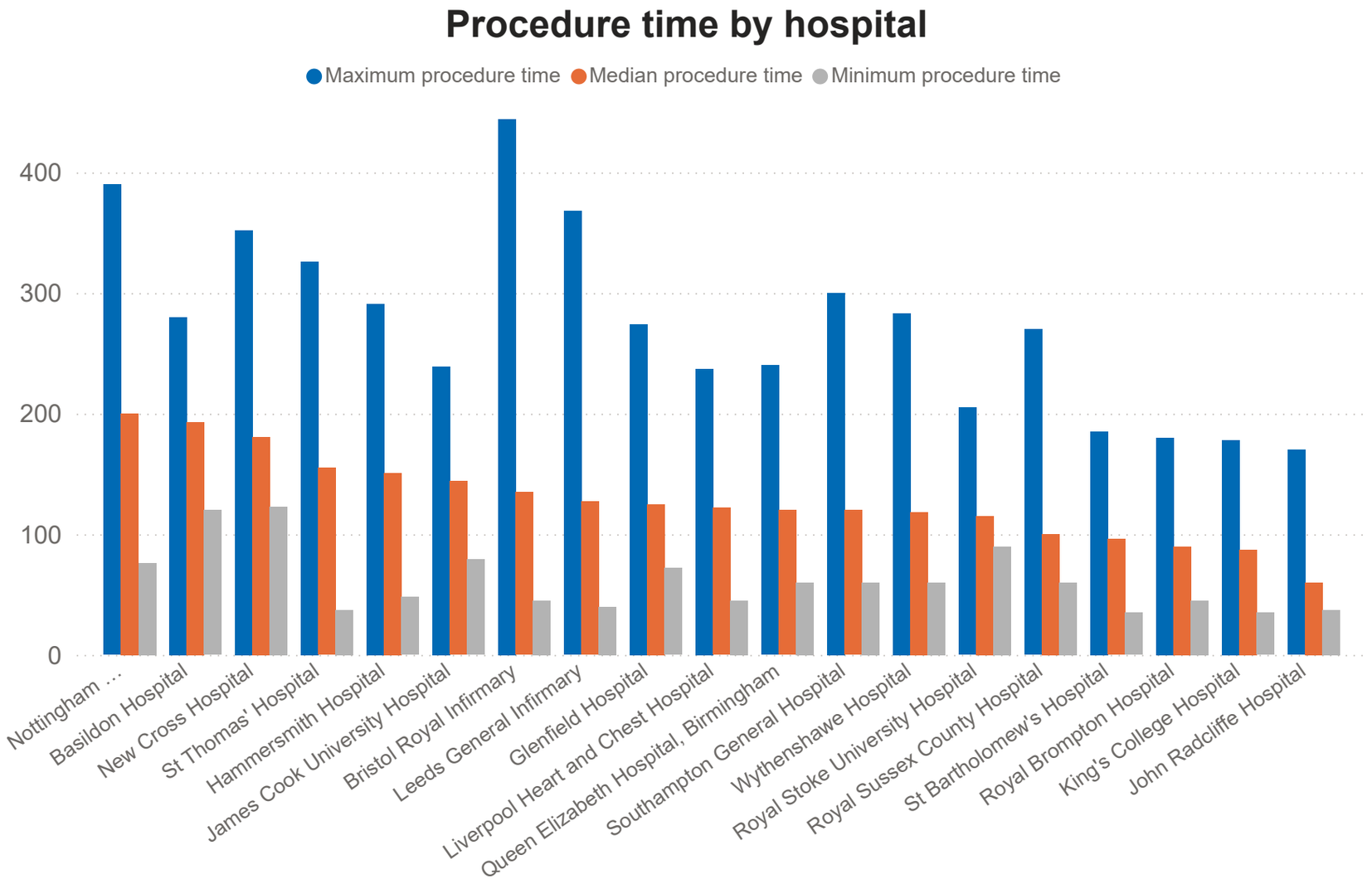
Procedure times cannot be calculated for the following hospitals because of lack of data:

- Derriford Hospital
- Freeman Hospital
- Royal Papworth Hospital
- Spire Hospital, Bristol
- St George's Hospital
- University Hospital Coventry
- University Hospital of Wales, Cardiff

Select a procedure below to see specific data.

Select procedure type

Mitral TEER



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Mitral TEER is associated with a low number of complications

The most common complication of a mitral TEER procedure in 2024/25 was stroke which occurred in only 0.8% of cases.

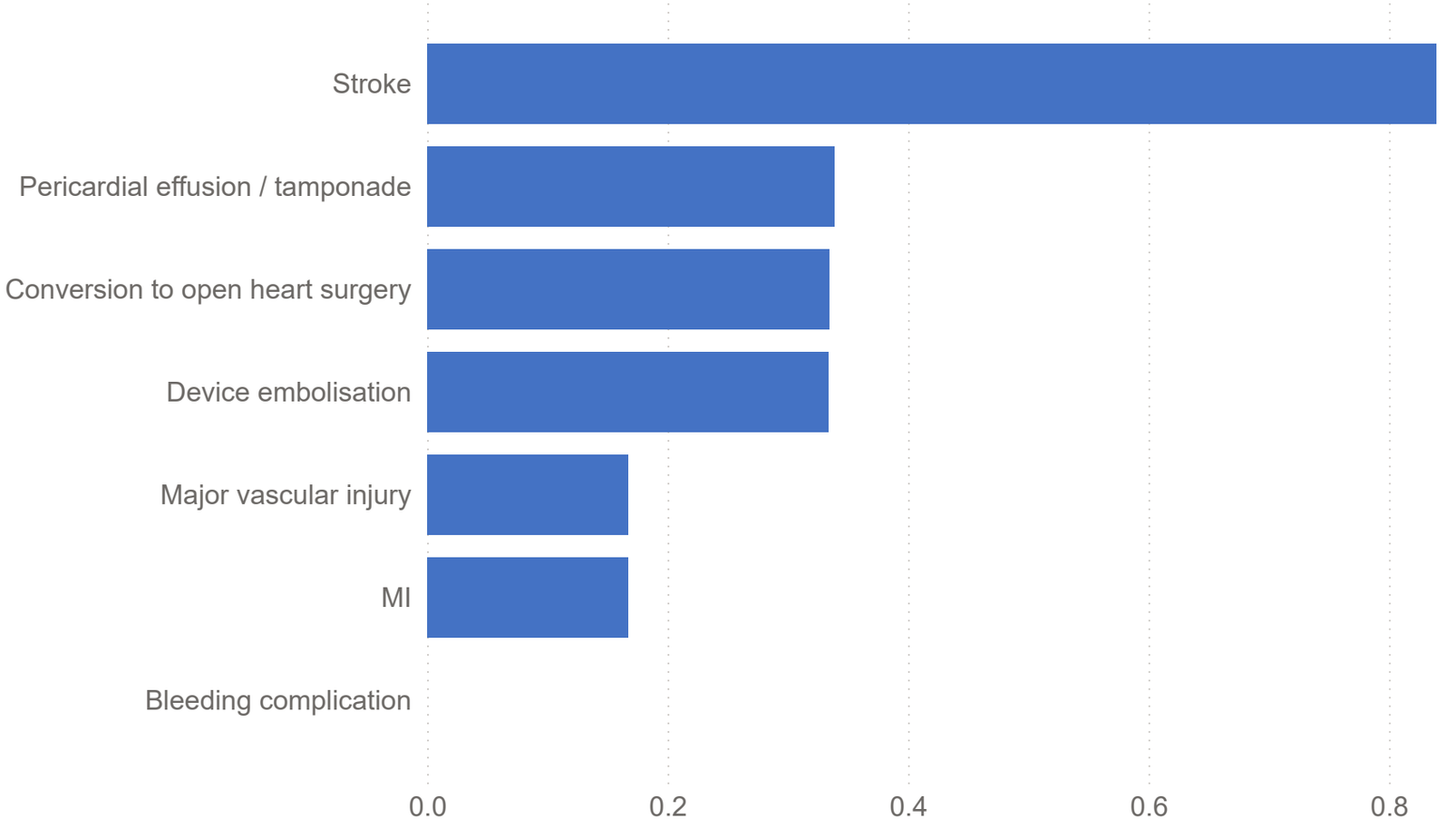
Conversion to open heart surgery occurred in two cases:

- 1 for unsuccessful mTEER requiring emergency bypass and sternotomy
- 1 for an mTEER complication (posterior mitral leaflet tear)

There were no cases of significant bleeding.

Centres should ensure complications are clearly described if unlisted in the dataset entry.

Percentage of cases with recorded complications following a mitral TEER procedure (2024/25)

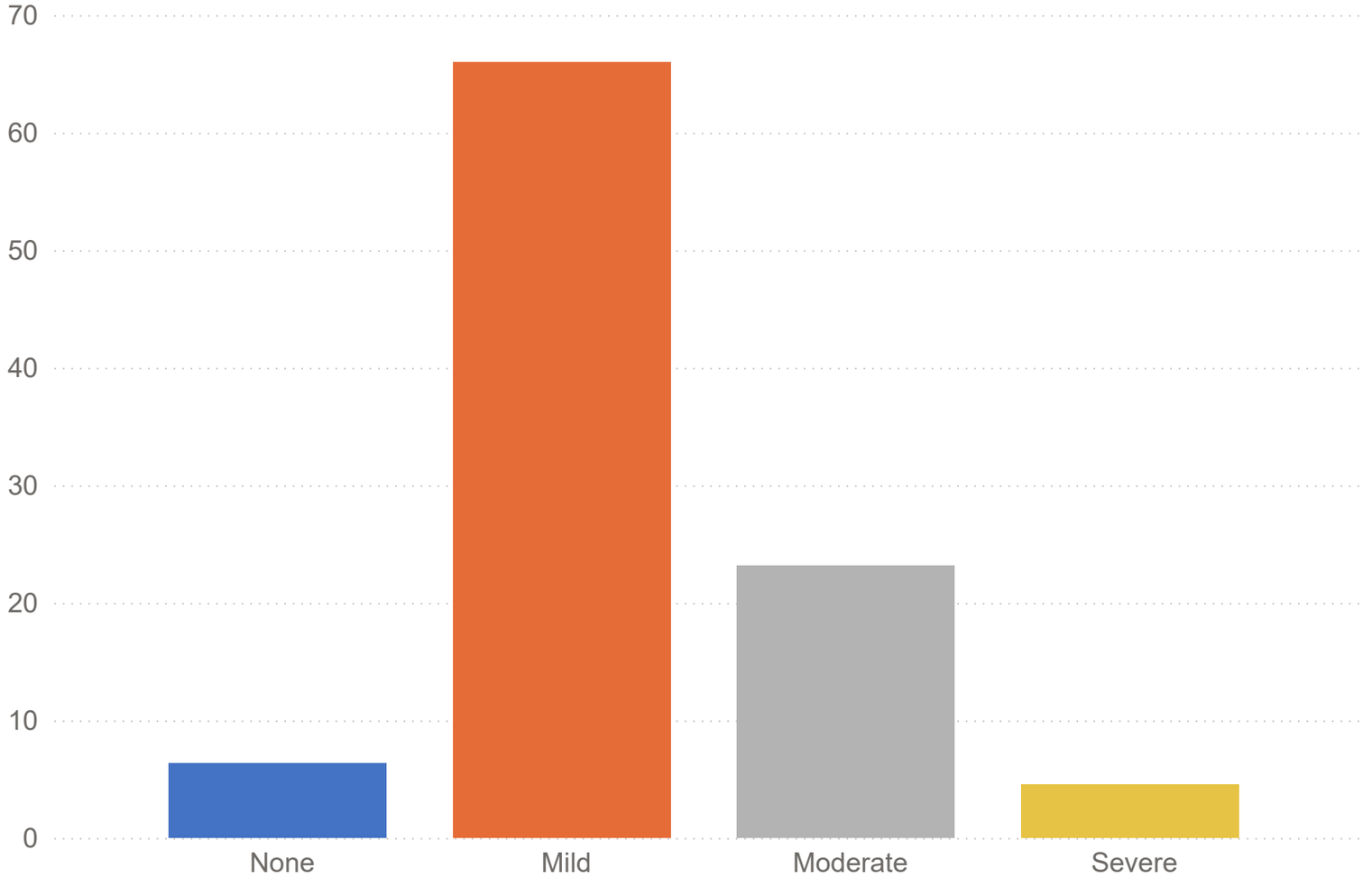


The majority of mitral TEER procedures resulted in no or mild mitral regurgitation

Following a mitral TEER 6.3% of cases had no mitral regurgitation and 66% had mild mitral regurgitation.

The residual mitral regurgitation following mitral TEER indicates effectiveness of the treatment. Data completion for this variable has improved compared to 2023/24 when 10% submissions were incomplete.

Percentage mitral regurgitation severity class following mitral TEER procedures (2024/25)



Most mitral TEER procedures result in only a small post-procedure MV gradient

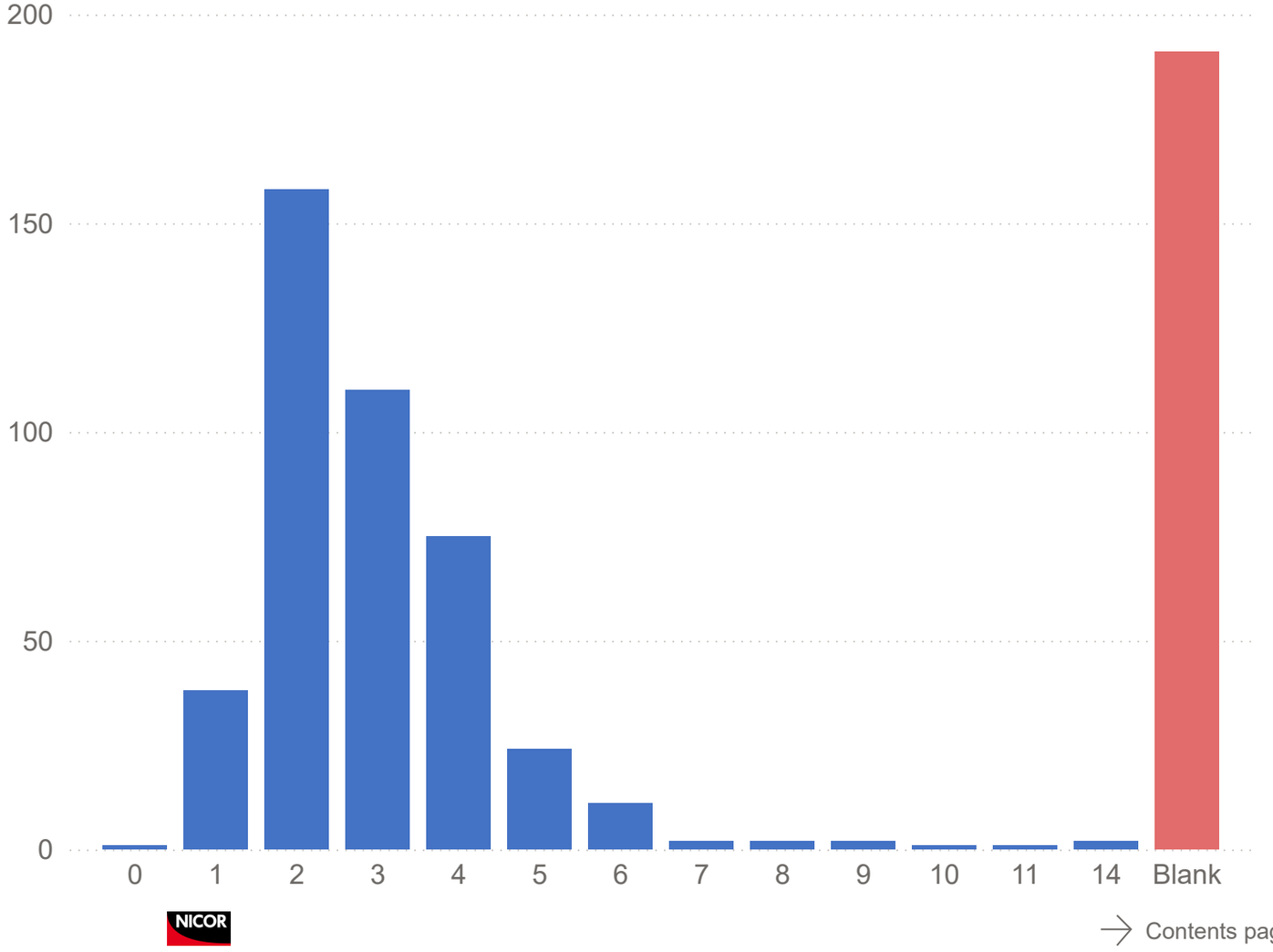
The majority of mitral TEER procedures resulted in a final mitral valve gradient of less than or equal to 5mmHg.

It is unlikely that procedures would be left with gradients above 5-7mmHg and almost implausible that procedures ended with gradients over 10mmHg suggesting data entry error in some cases.

The gradient is a marker of the opening of the mitral valve. Mitral TEER device(s) reduce the opening of the valve and the procedure requires a balance between optimal reduction in mitral regurgitation and ensuring the valve opening is not significantly affected.

31% of submissions were incomplete for this variable which limits interpretation. All hospitals should ensure these data are complete.

Total cases by mean mitral valve gradient (mm Hg) following a mitral TEER procedure (2024/25)



The risk of mortality following a TMTV procedure is low

The overall in-hospital mortality rate following TMTV procedures is 1.1% and 30-day mortality rate is 1.9%.

Longer follow up data will be available over time and enable 1-year mortality rates to be assessed.

Hospitals should ensure discharge status is complete for every patient.