



BCIS National Audit Adult Interventional Procedures

1st April 2018 to 31st March 2019

Peter F Ludman

BCIS Audit Lead

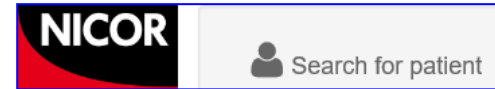
On behalf of

British Cardiovascular Intervention Society

Data Sources



- Annual survey
 - Structure
 - Procedure totals
 - Slides labelled 'Survey'

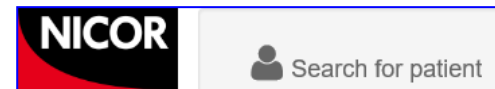


- PCI Procedural data
 - csv file upload
 - Direct entry
- Extract
- ONS track  Office for National Statistics
- Cleaning
- Analysis 
- Outputs
 - Benchmarking / COP / QI

Data Sources



- Annual survey
 - Structure
 - Procedure totals
 - Slides labelled 'Survey Monkey'



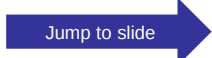
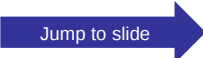
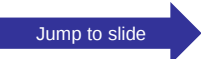
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← or →



Contents

- **Structure (PCI)** 
 - Angio and PCI centres and maps
 - Total angio and PCI numbers
 - No of PCIs per centre and per angio
 - PCI pmp and by country and v CABG
 - Centre PCI volumes
 - PCI operators, by centre, by PCI
 - On call rotas for PPCI
 - On site v off site surgical cover
 - Day case activity
 - Primary PCI units
 - **NICOR data collection** 
 - Centre participation
 - Databases used
 - Case ascertainment
 - Data completeness
 - **Appropriateness (PCI)** 
 - Demographics
 - Indication for PCI / Clinical syndrome
 - PPCI activity (by unit, pmp, by vessel)
 - PCI for out of hospital arrest
 - PCI territories / vessels / lesions/LMS/CTO
 - Stents (BMS and DES)
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 - LV support and shock
 - Primary PCI for > 80 yrs
 - Extraction / Rota / [IVUS](#) / [OCT](#) / [FFR](#) / Laser etc.
 - Arterial access
 - **Process of care (PCI)** 
 - Delays to treatment
 - NSTEMI (direct v IHT)
 - Primary PCI DTB / CTB
 - IHT versus Direct admission
 - Length of stay
 - **Outcome (PCI)** 
 - MACCE
 - Peri-procedural complications and by access
 - Tracked 30 day mortality
 - Outcome by syndrome
 - Outcome by lesion subset
 - **Adult non coronary intervention** 
 - Valves
 - **TAVI** and other Aortic 
 - Mitral
 - PV / AV / TV
 - Septal ablation for HOCM
 - LAA occlusion
 - ASD / PFO / Para-prosthetic leak closure
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- **Structure (PCI)** [Jump to slide](#)
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Process of care (PCI)

[Jump to slide](#)

Delayed

Outcome (PCI)

[Jump to slide](#)

- Delays to treatment
- NSTEMI (direct v IHT)
- Primary PCI DTB / CTB
- IHT versus Direct admission
- Length of stay
- MACCE
- Peri-procedural complications and by access
- Tracked 30 day mortality
 - Outcome by syndrome
 - Outcome by lesion subset

Adult non coronary intervention

[Jump to slide](#)

- Valves
 - **TAVI** and other Aortic [Jump to TAVI](#)
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NICOR Update

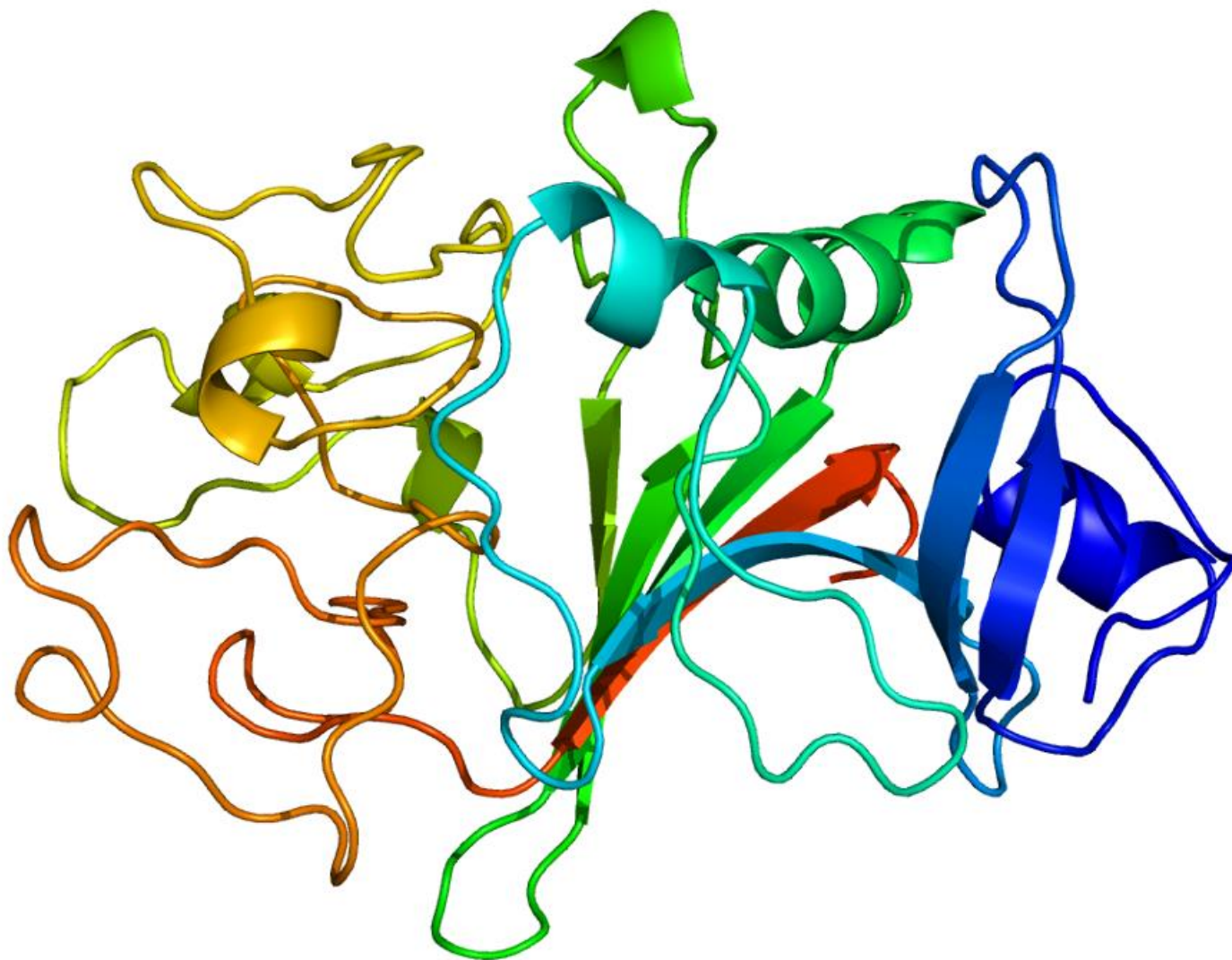
Conclusions and summary

Appendix:

[Jump to slide](#)

PCI Centre NICOR / CCAD Centre codes

Structure



PCI Centres

1 of 2

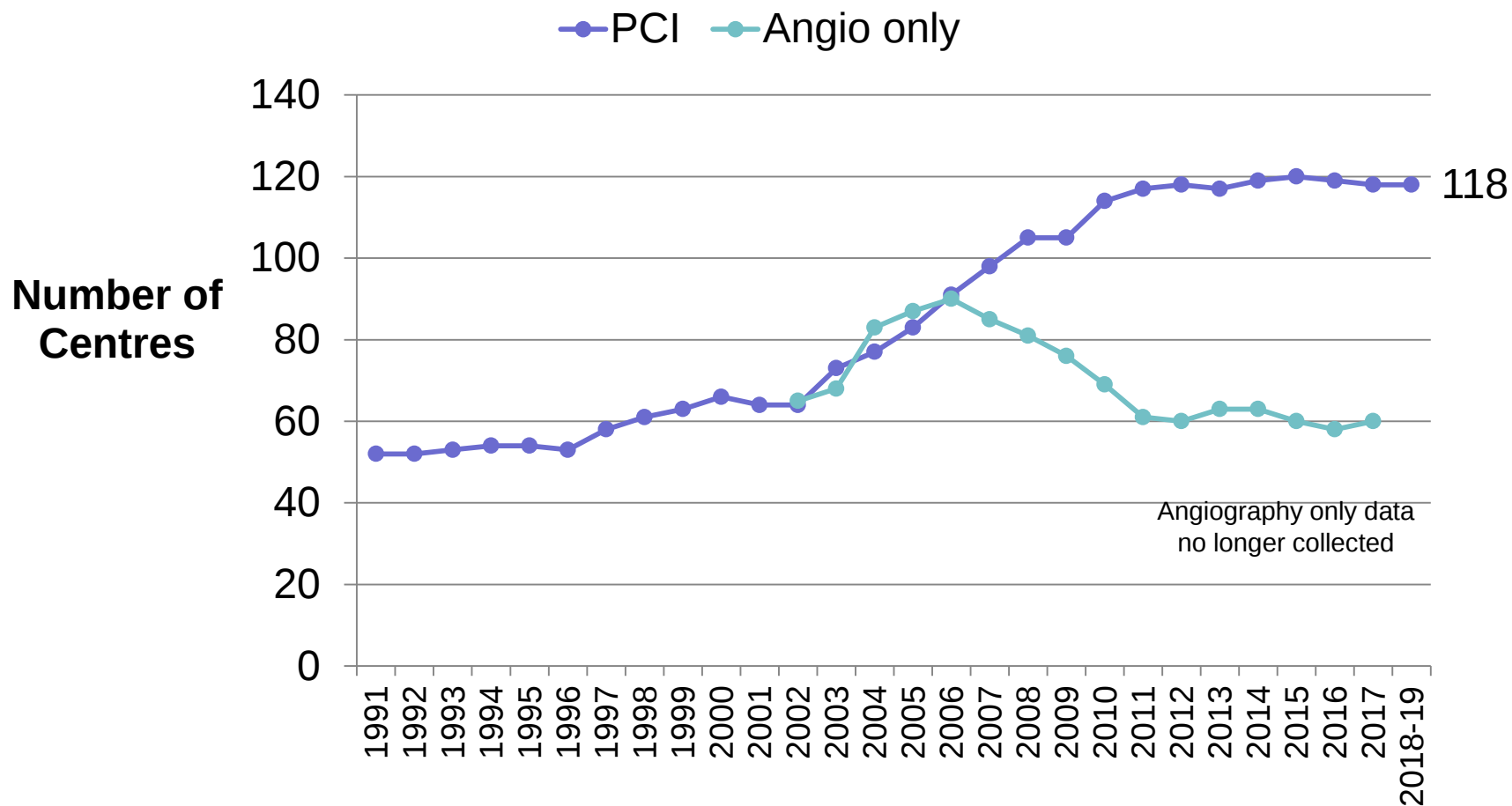
Year		PCI Centres
Stopped		Started
2010		• Spire Shawsfair Park, Edinburgh • Altnagelvin (previous angio) • Bedford (previous angio) • Medway (previous angio) • Pindefields (previous angio) • Raigmore, Inverness (previous angio) • Royal Blackburn (previous angio) • Salisbury (previous angio) • Scunthorpe (previous angio) • York District general (previous angio)
2011	• St Mary's, London	• Royal Gwent, Newport (previous angio) • Spire Hospital, Southampton (previous angio) • Calderdale Royal, Halifax (previous angio) • Cumberland Infirmary, Carlisle (previous angio)
2012	• None	• Spire Bristol Hospital
2013	• Whipps Cross	• None

PCI Centres

2 of 2

Year			PCI Centres	
	Stopped		Started	
2014	• None		• Luton and Dunstable • Kent Institute of Medicine and Surgery • Spire Cardiff Hospital • Ipswich Hospital (previous angio) • Frenchay moves to Southmead	
2015	• None		• Nuffield Health, Bournemouth	
2016	• Sandwell (activity to Birmingham City site)		• UCL closes and combines with BAL in move to Barts Heart Centre (SBH) • Duchy Hospital, Cornwall (previous angio)	
2017	• Belfast City Hospital • Spire Leeds		• West Middlesex University Hospital	
2018-19	• No change		• No change	

UK Centres



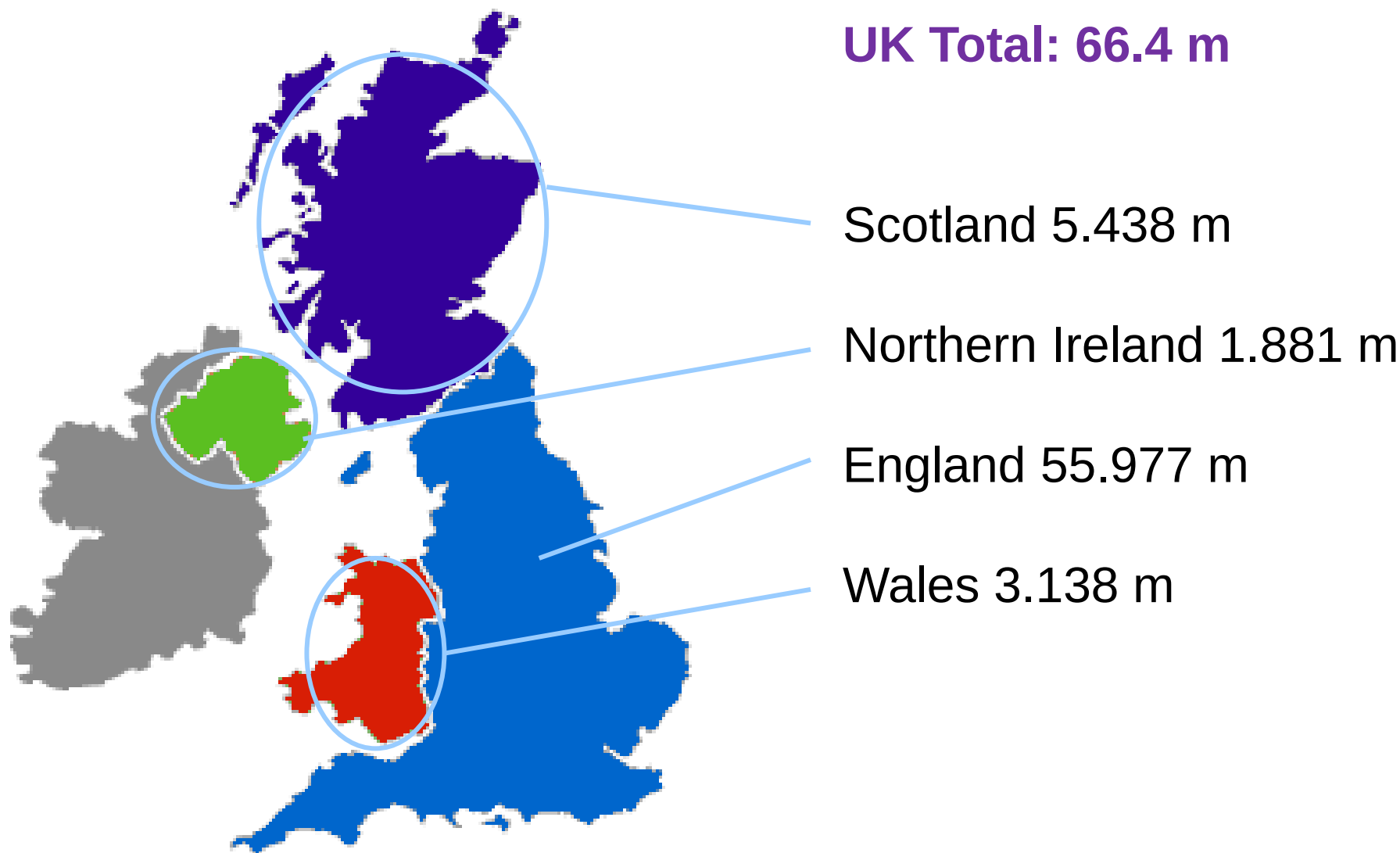
PCI Centres in 2018-19



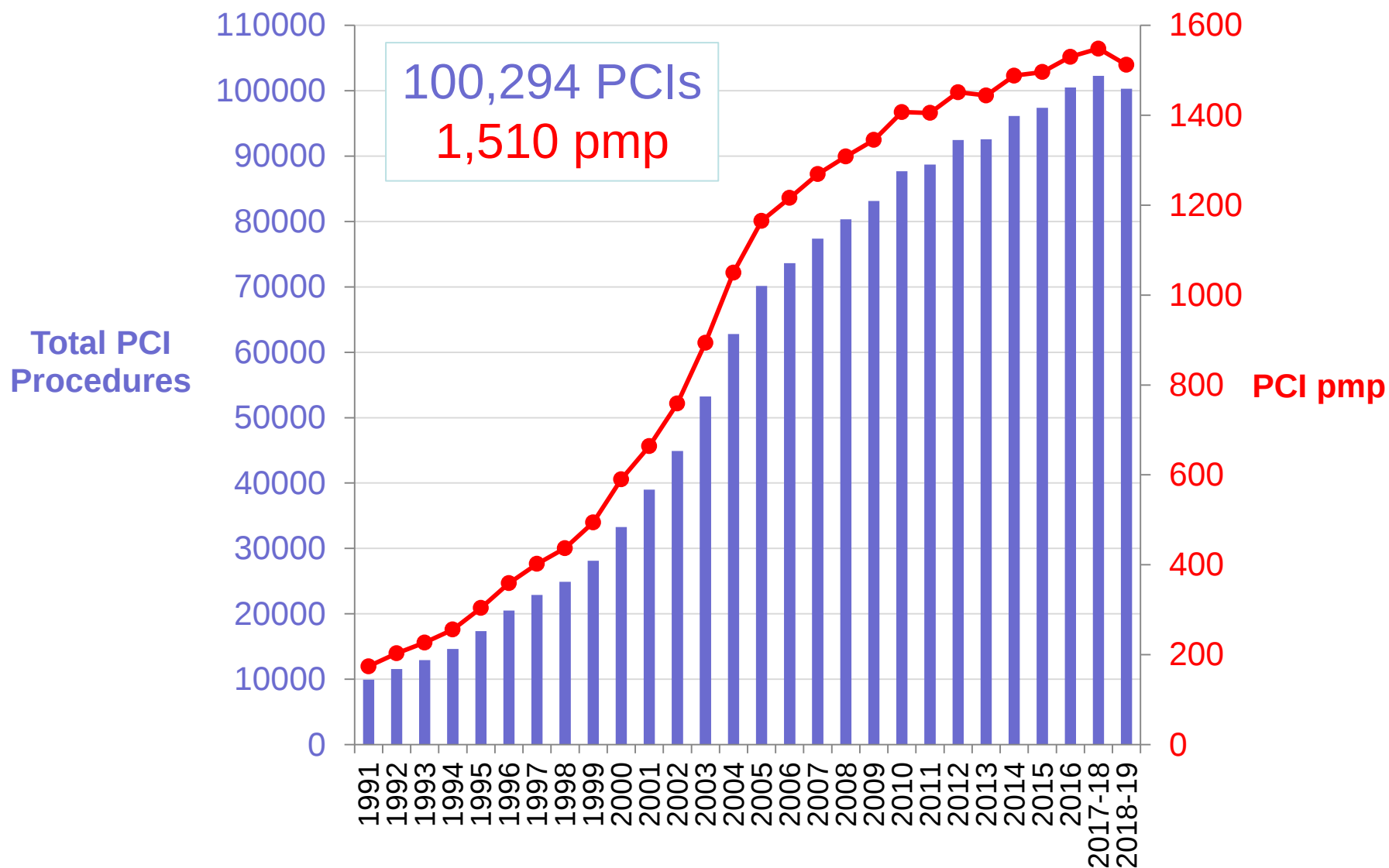
	NHS	Private
Scotland	6	2
England	85	17
N Ireland	3	0
Wales	4	1
Total	98	20
Total	118	

Population estimates

Mid 2018

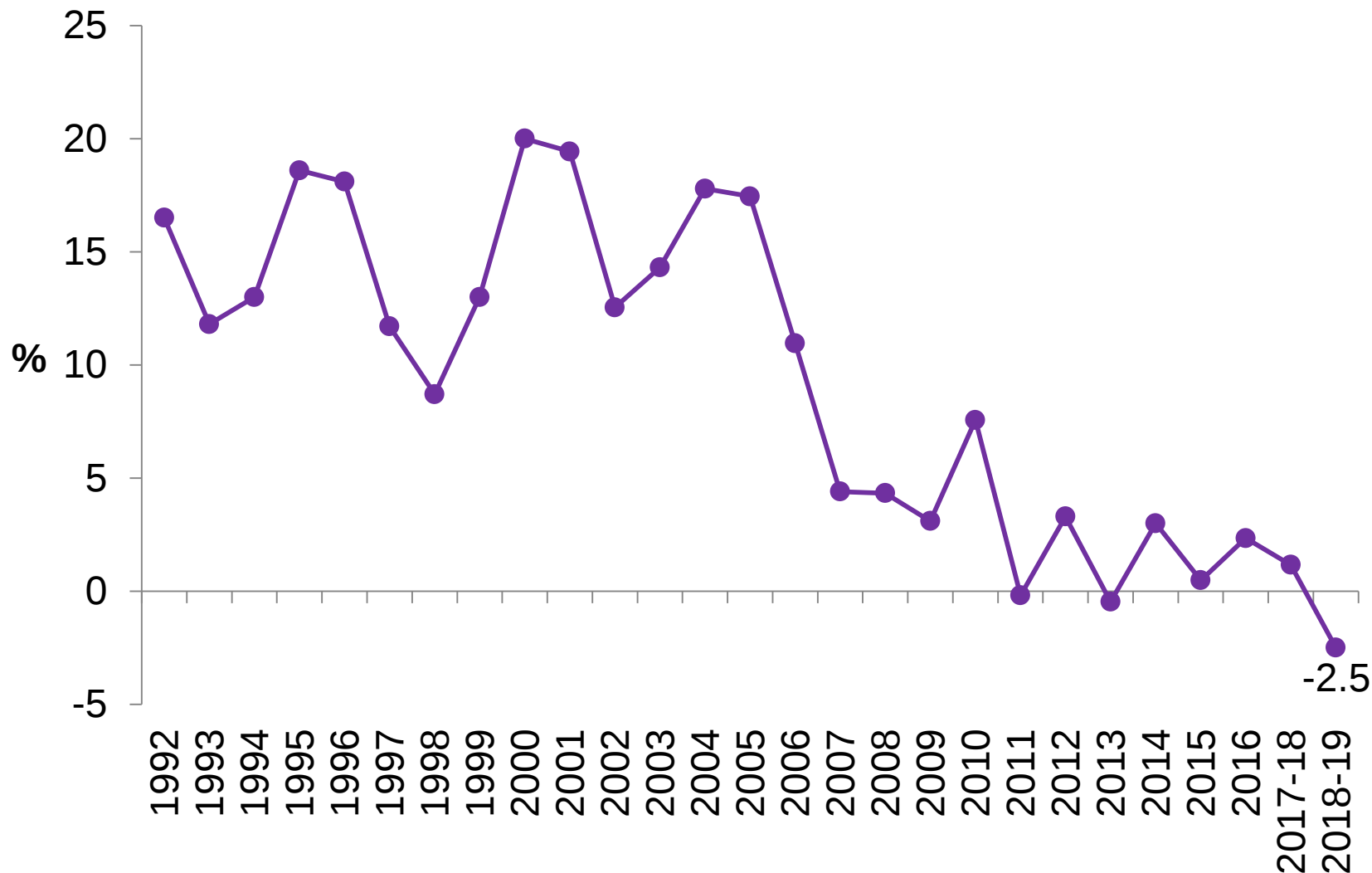


Total PCI activity all UK



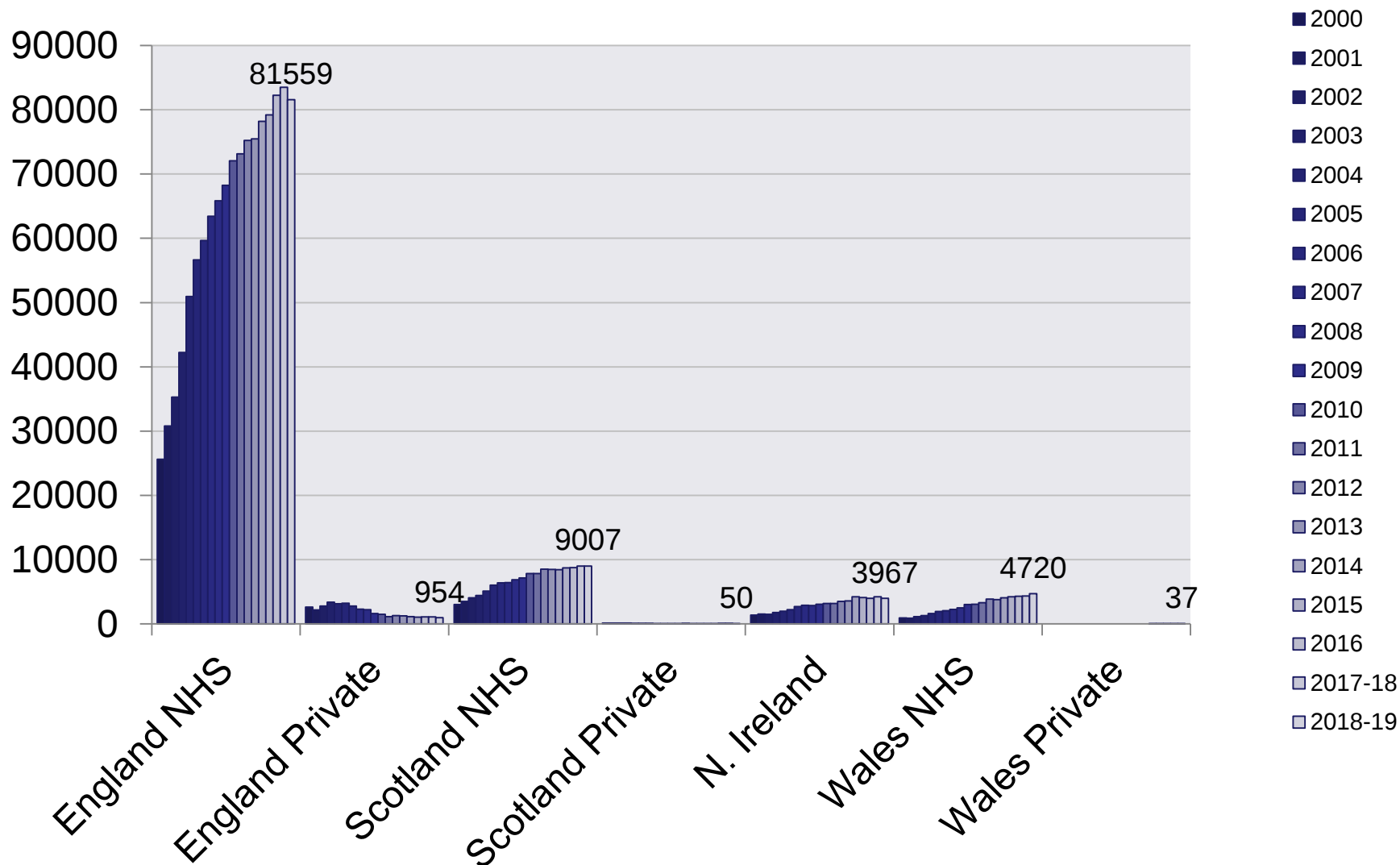
PCI pmp all UK

Rate of Increase



Total PCIs in the UK

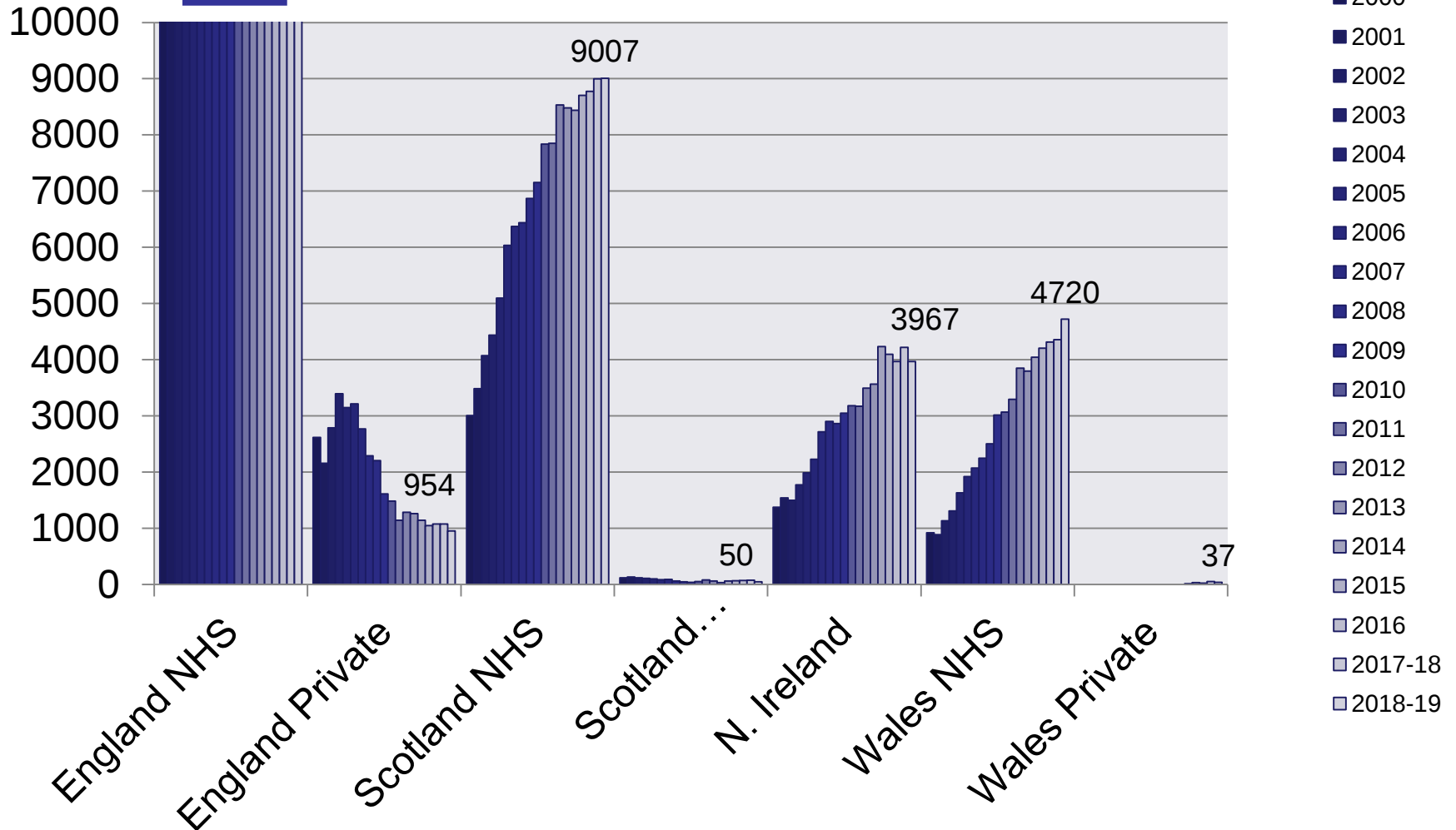
by Country and Type of Institution



Total PCIs in the UK

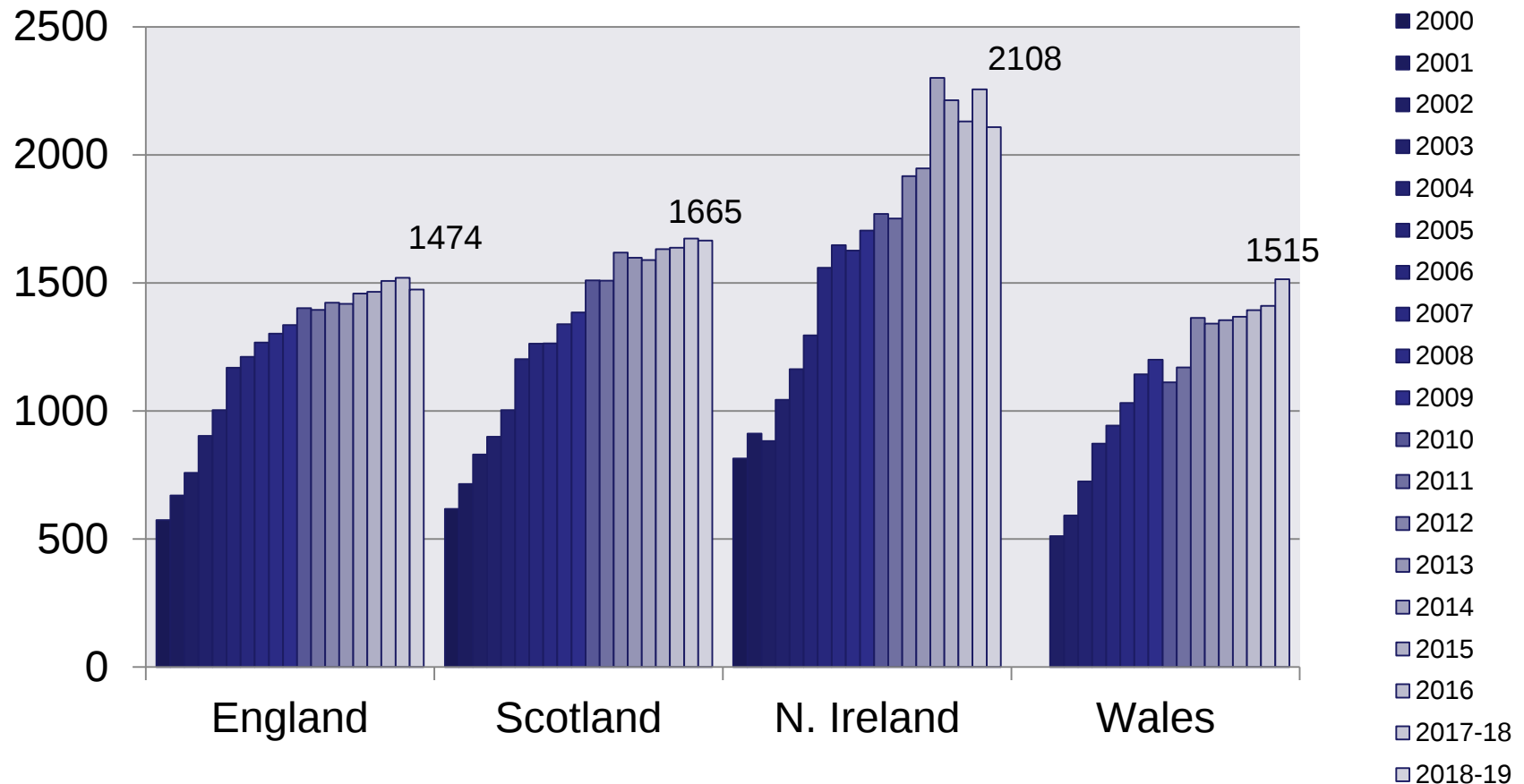
by Country and Type of Institution

Zoom



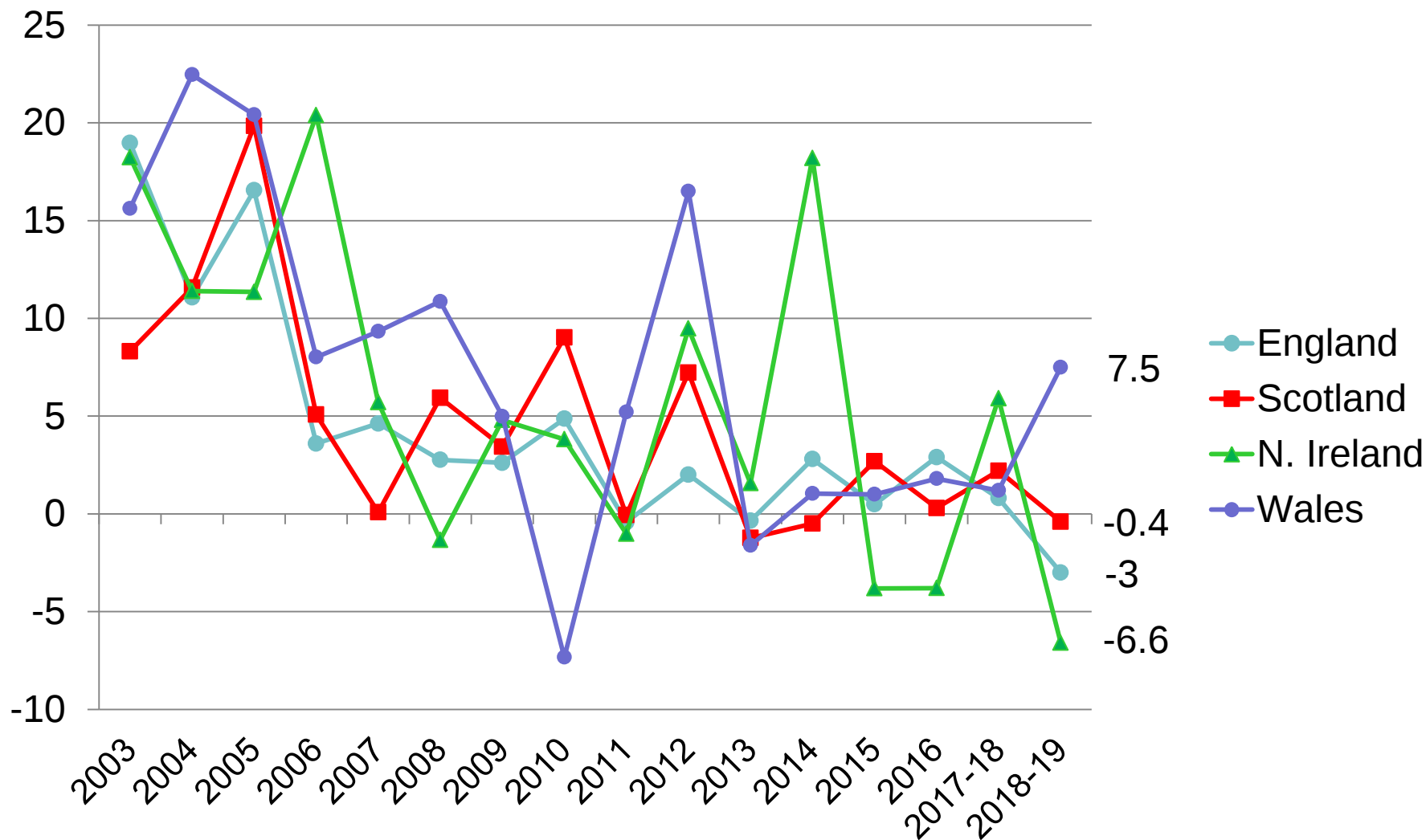
PCI pmp

By UK Country

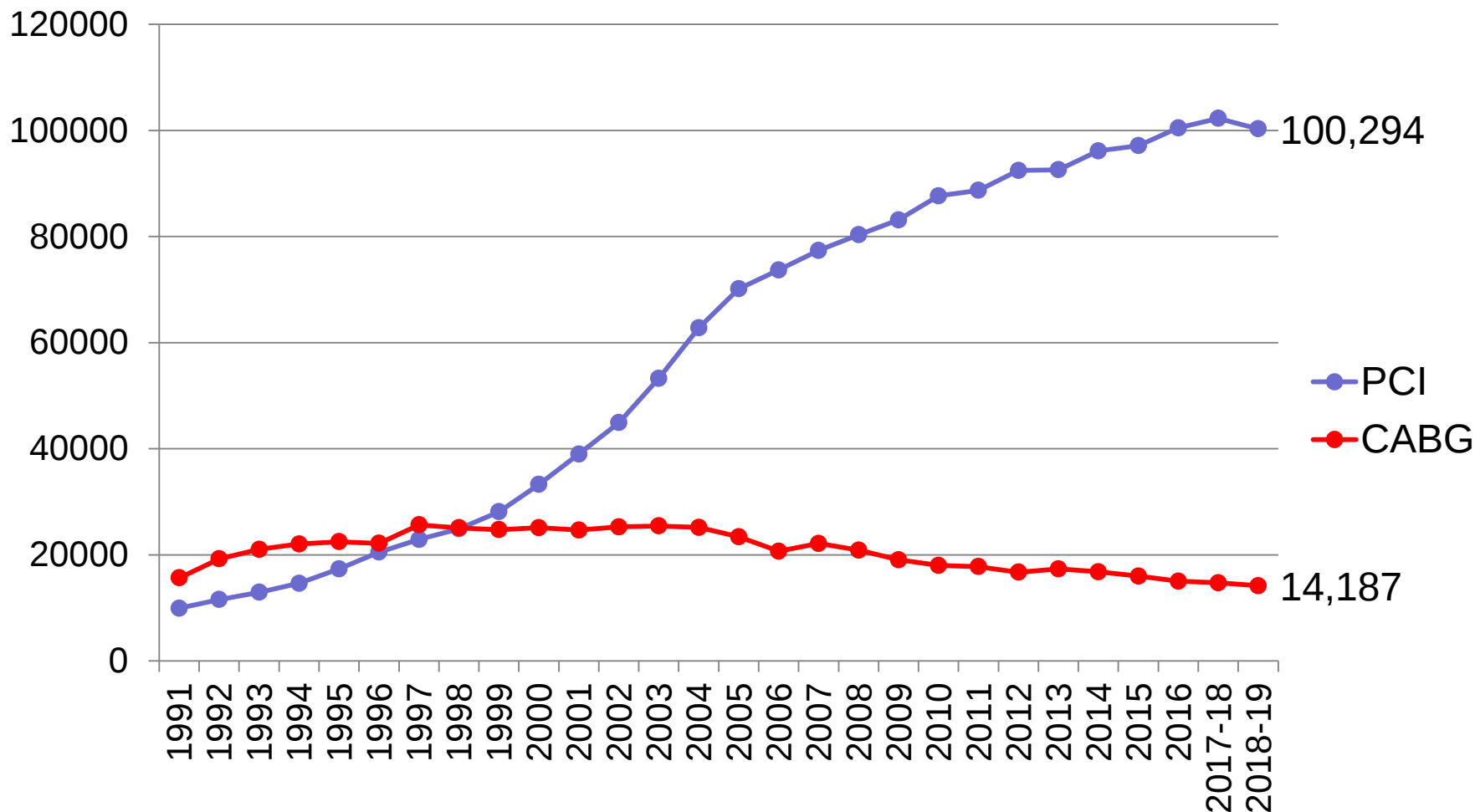


PCI pmp

Rate of Increase by UK Country

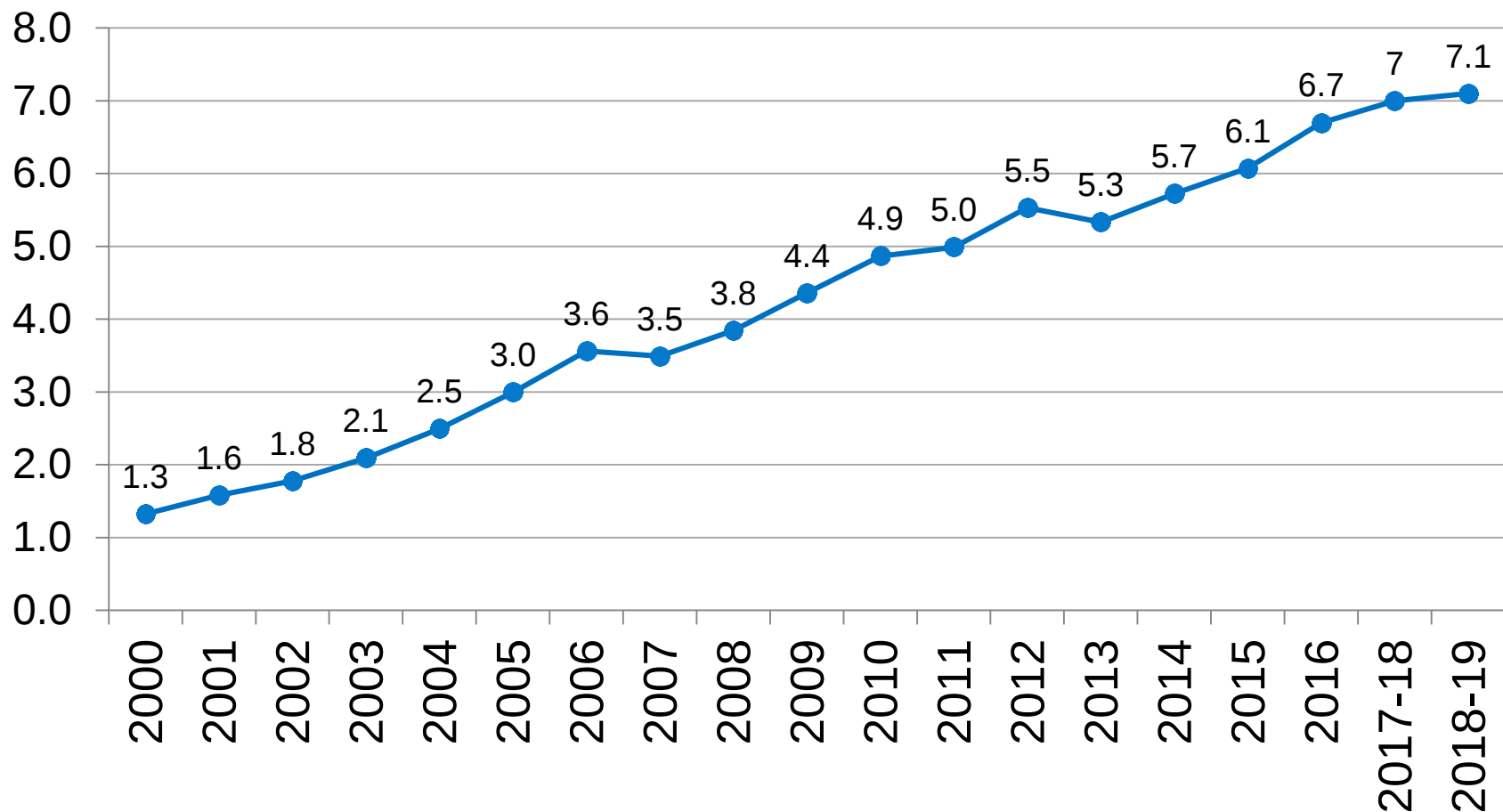


Total PCI vs Isolated CABG



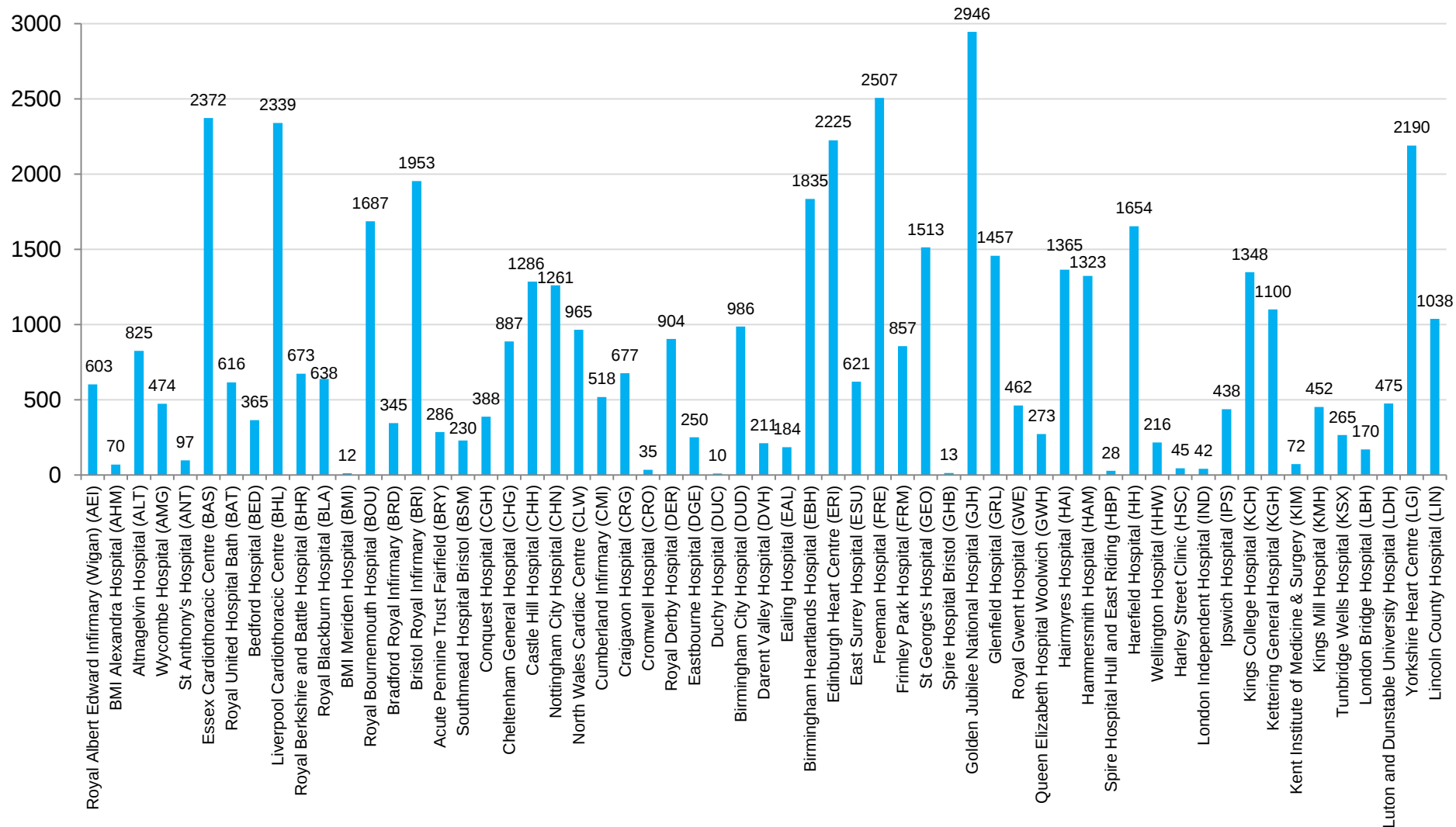
Note: 2018-19 CABG is estimated. Includes Ireland, excludes Glasgow

PCI vs Isolated CABG Ratio

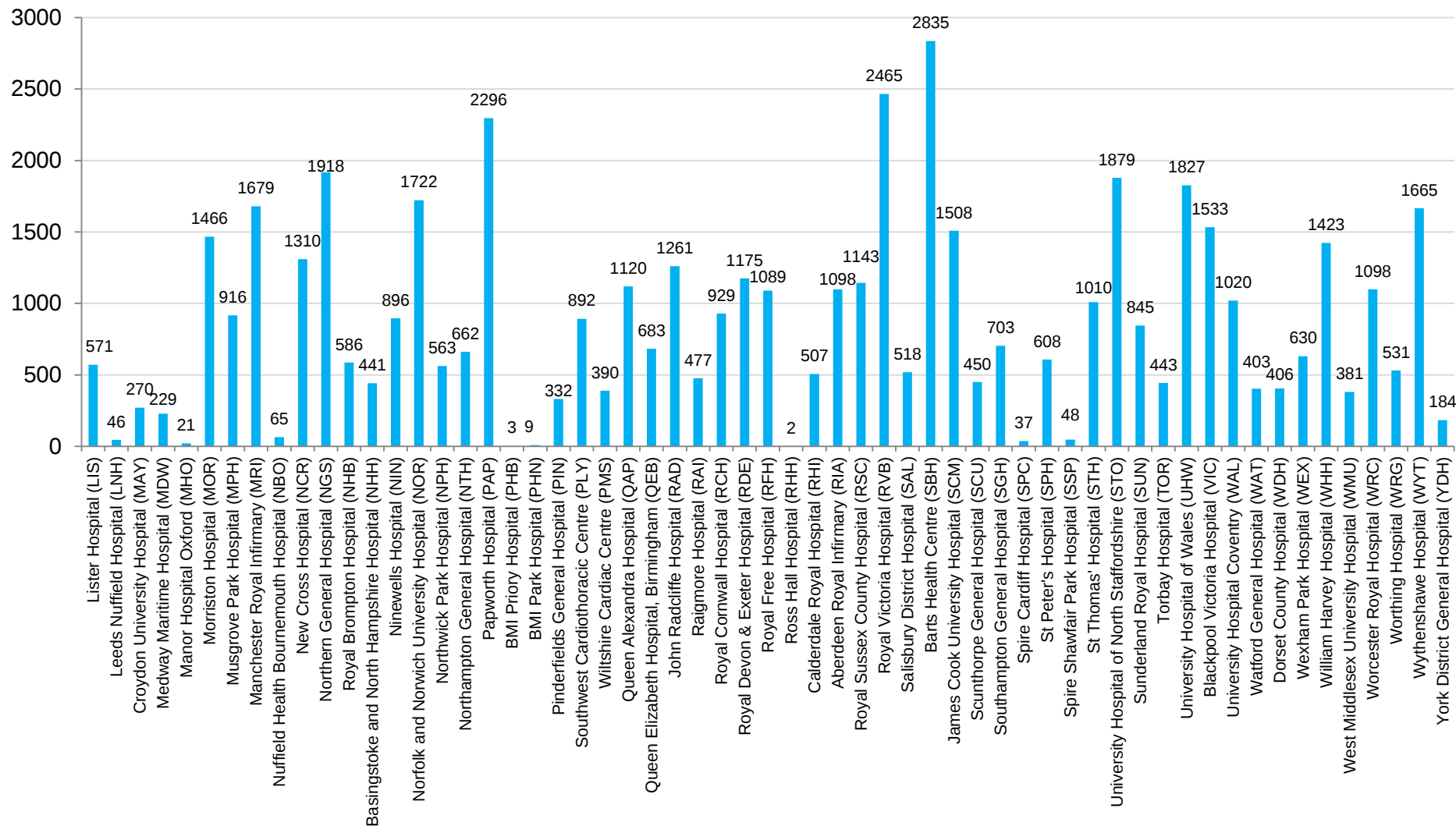


Note: 2018-19 CABG is estimated. Includes Ireland, excludes Glasgow

Number of PCIs per Centre (A to L)

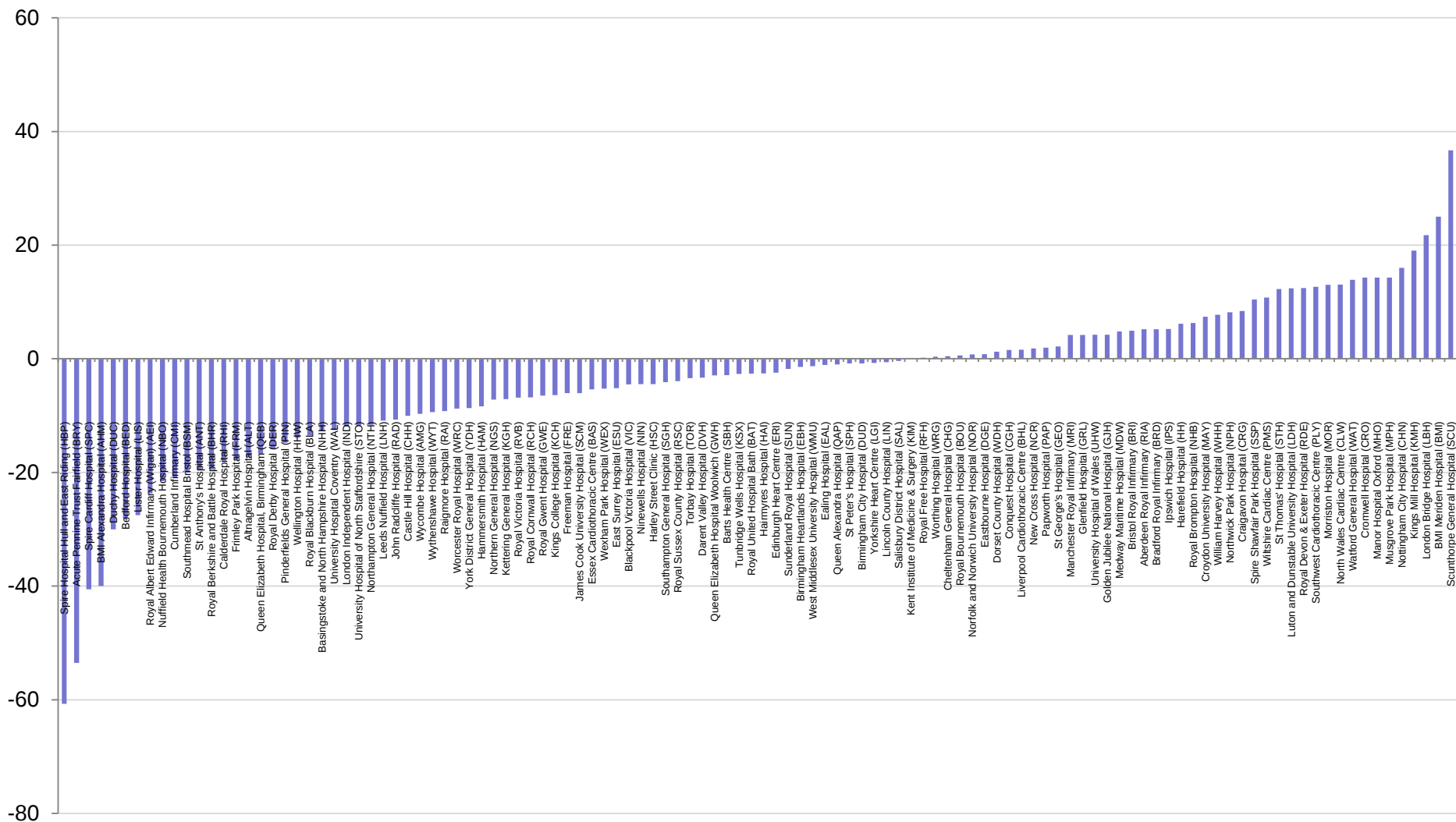


Number of PCIs per Centre (L to Z)



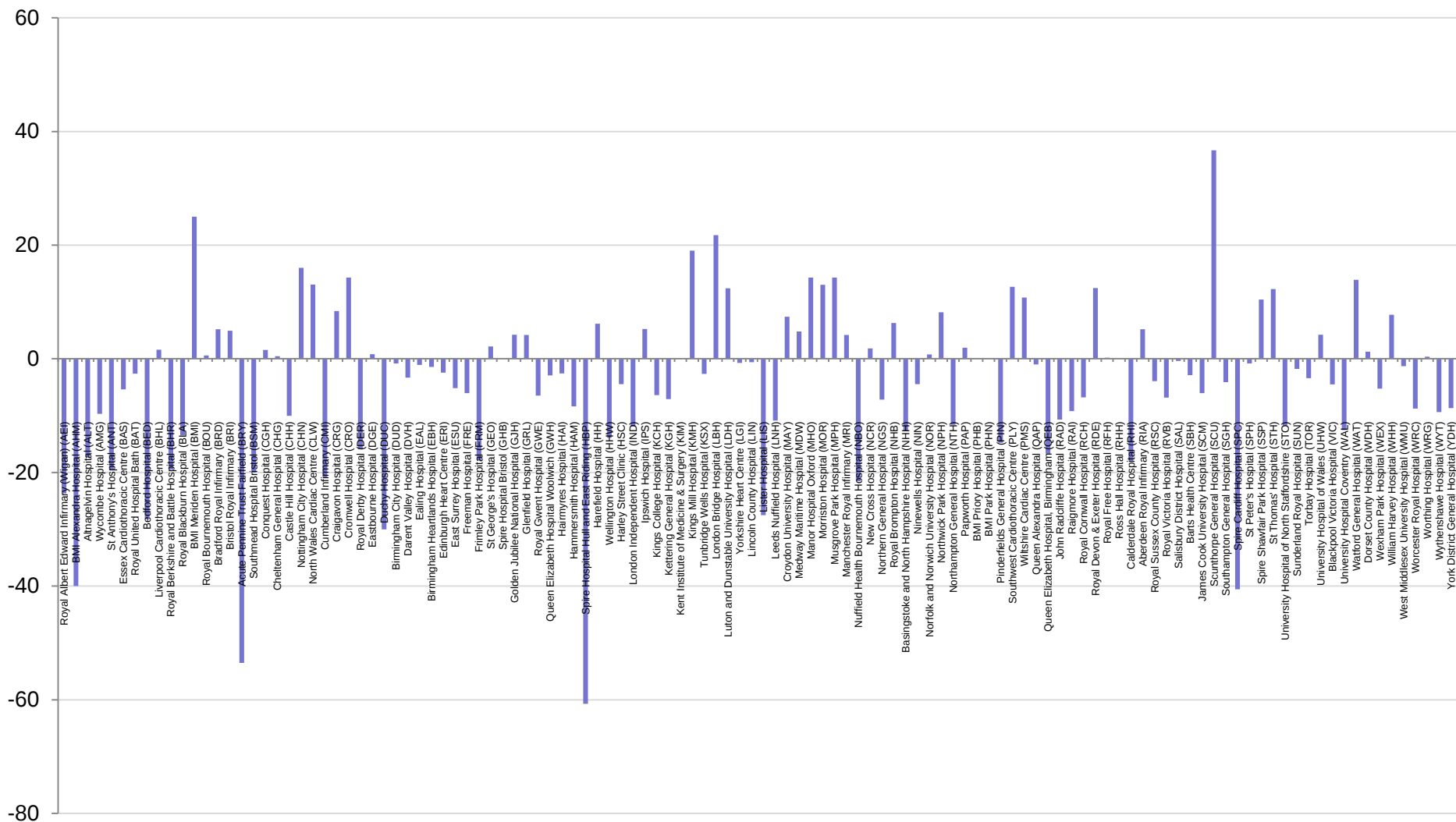
Number of PCIs per Centre

% Increase from 2017/1 to 2018/19 – Ordered by % change



Note: RHH -1500%, PHB -366%, PHN -188%, GHB -130%

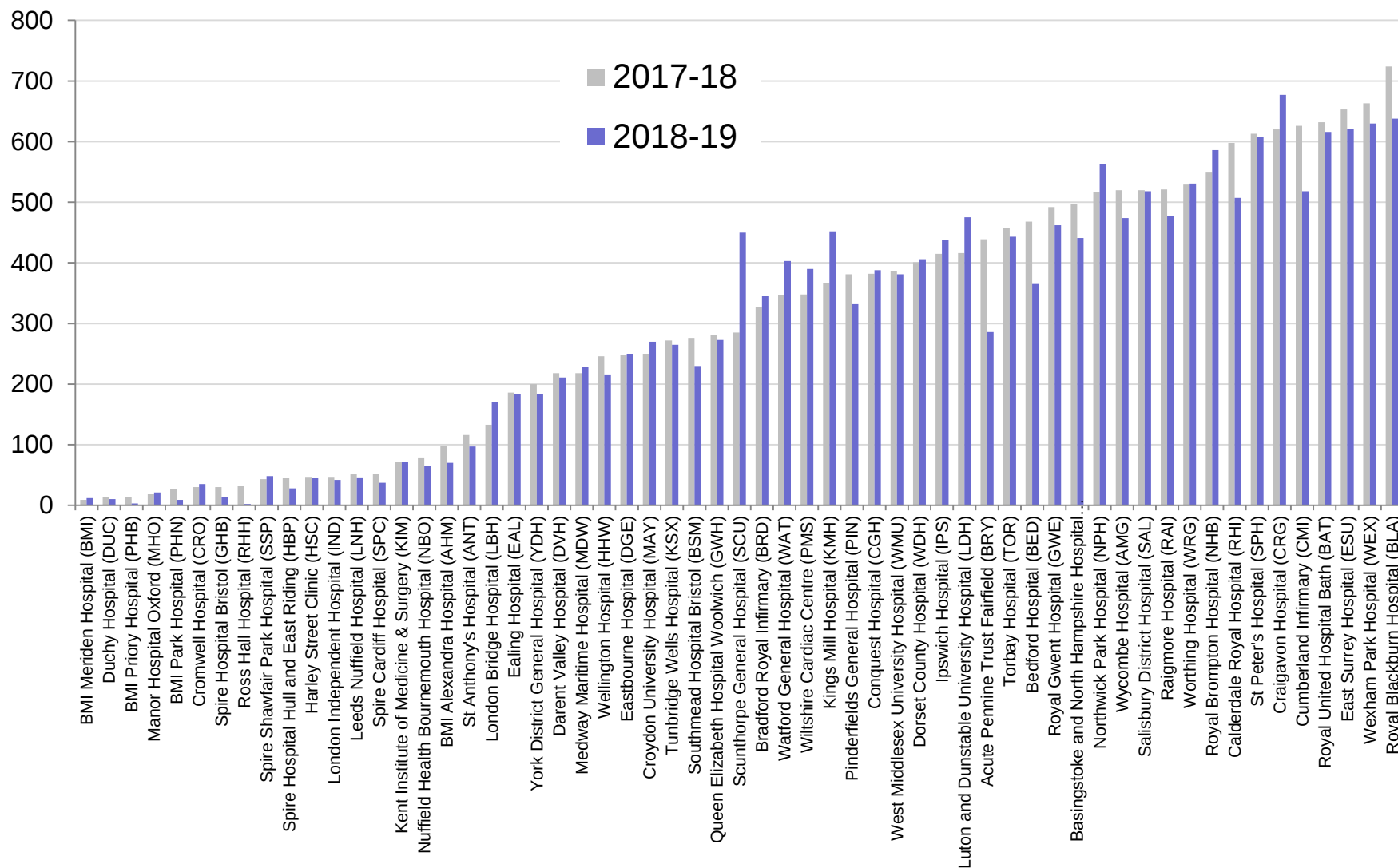
% Increase from 2017/1 to 2018/19 – ordered by centre name



Note: RHH -1500%, PHB -366%, PHN -188%, GHB -130%

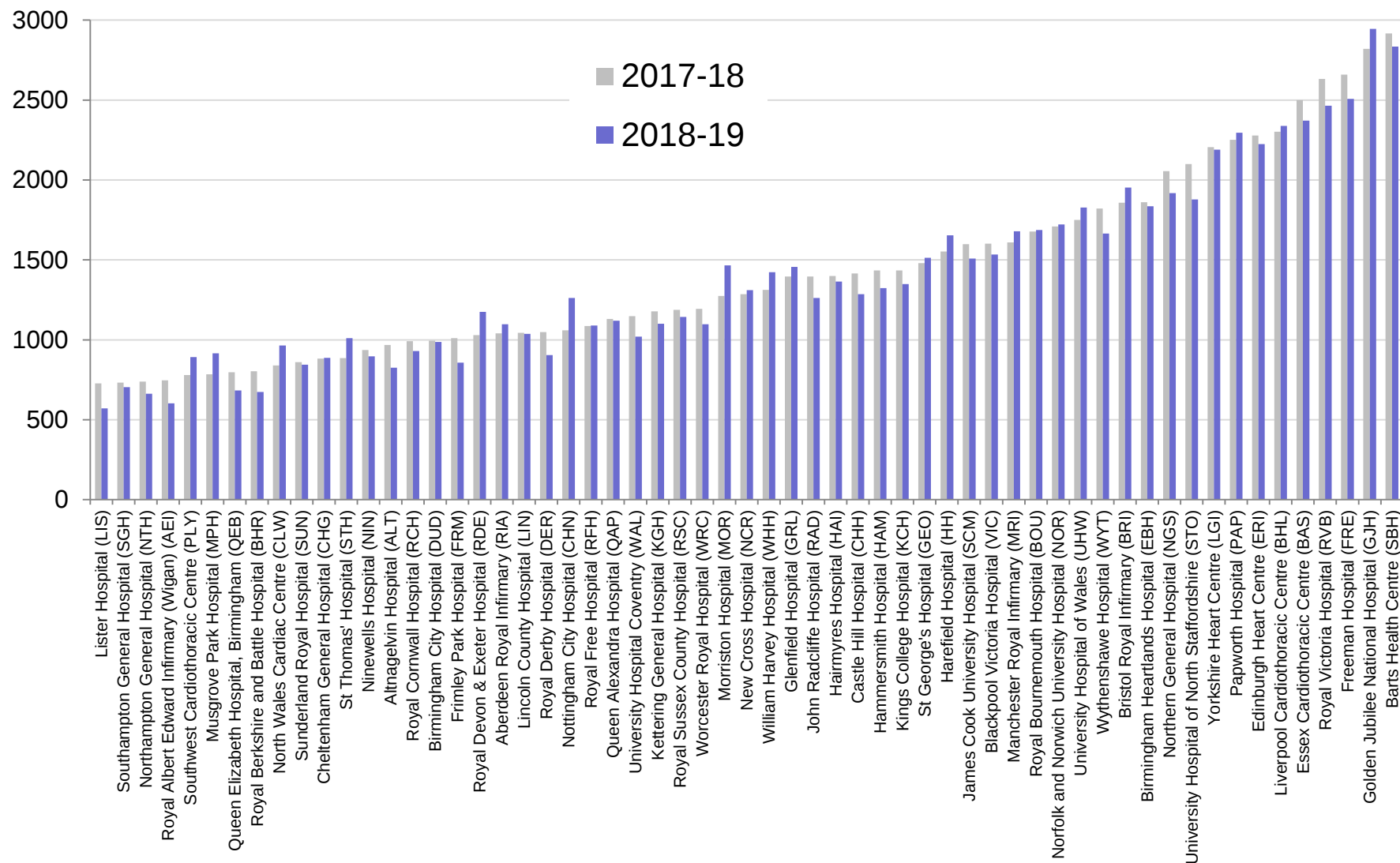
Number of PCIs per Centre

Ordered by 2017-18 activity (part 1)



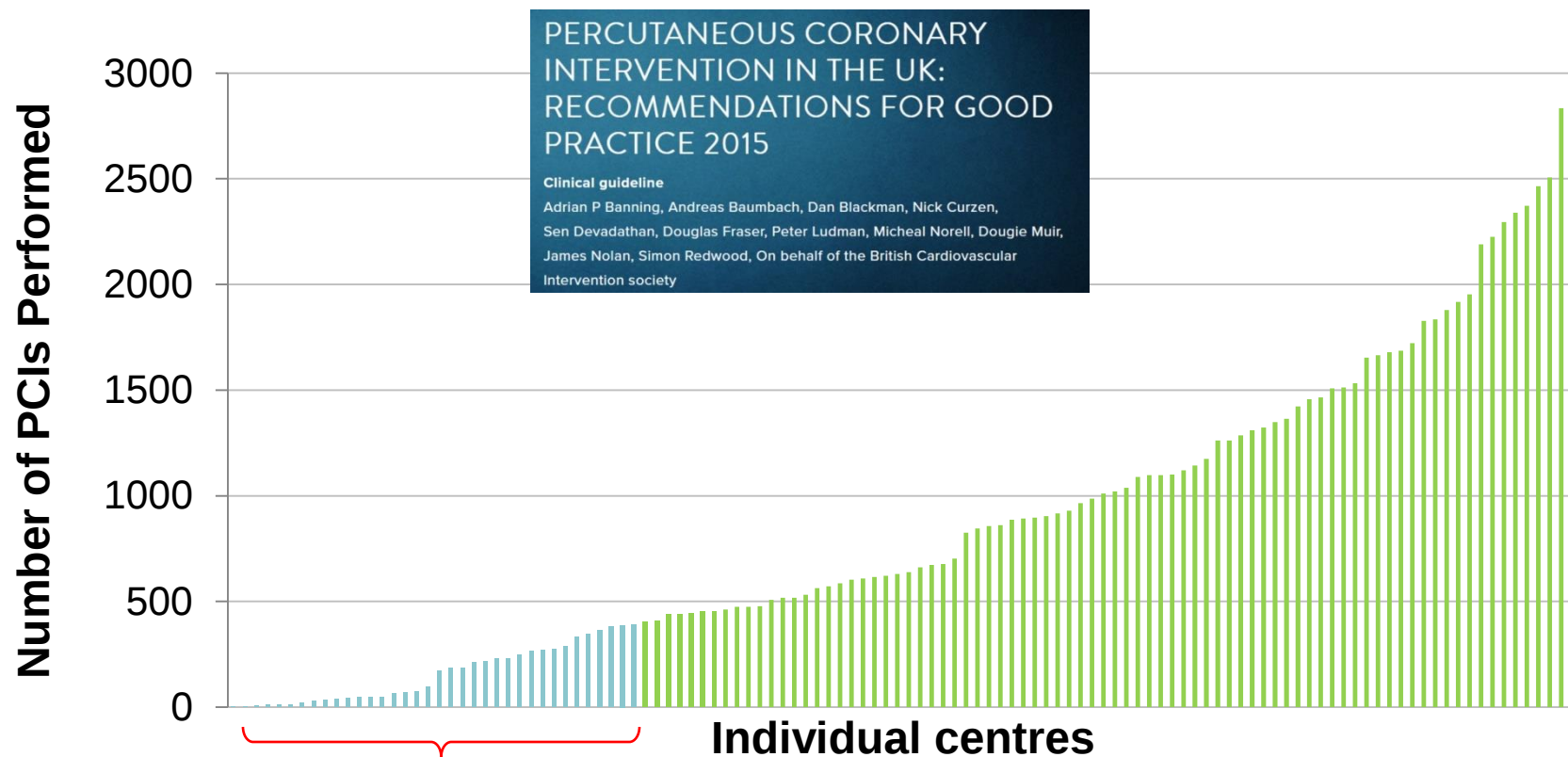
Number of PCIs per Centre

Ordered by 2017-18 activity (part 2)



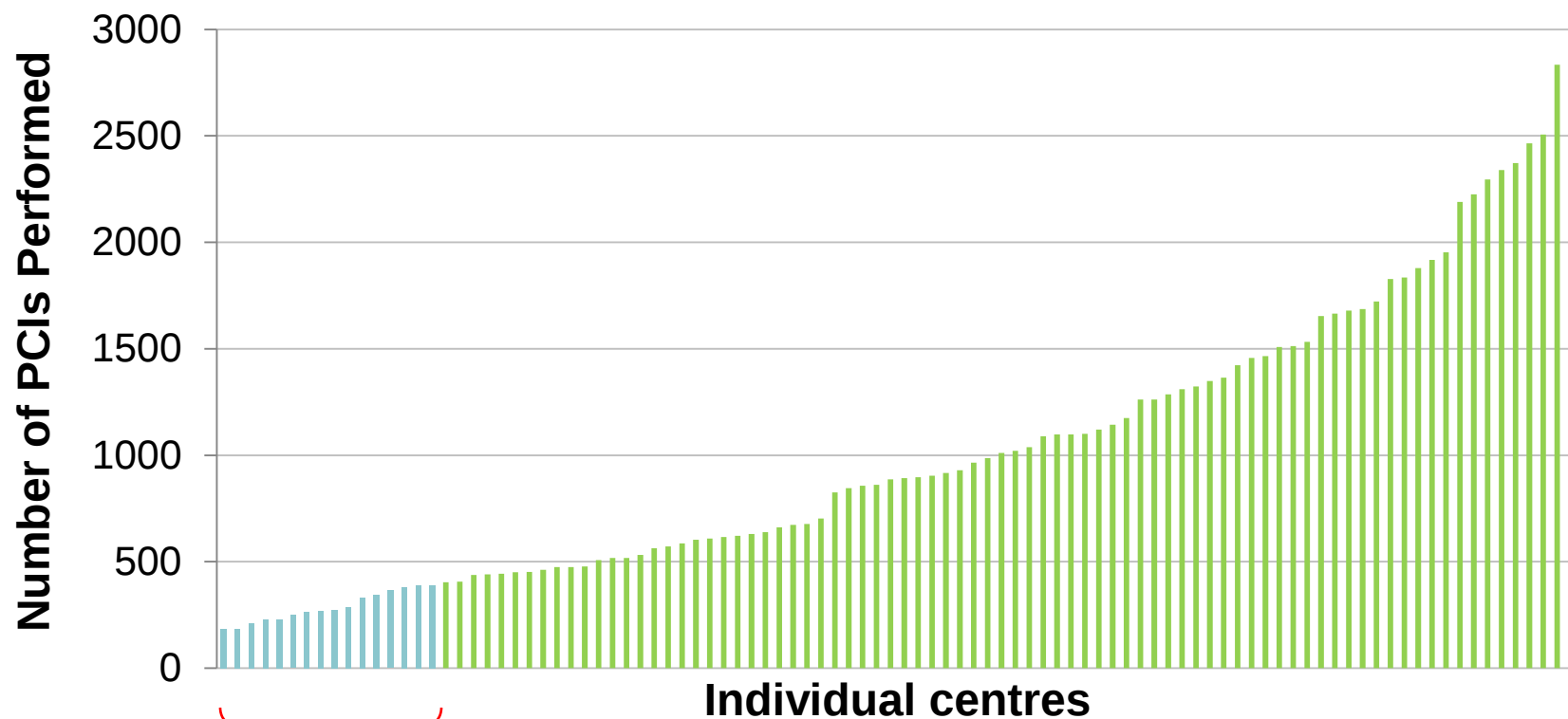
Number of PCIs per Centre

NHS and Private



Number of PCIs per Centre

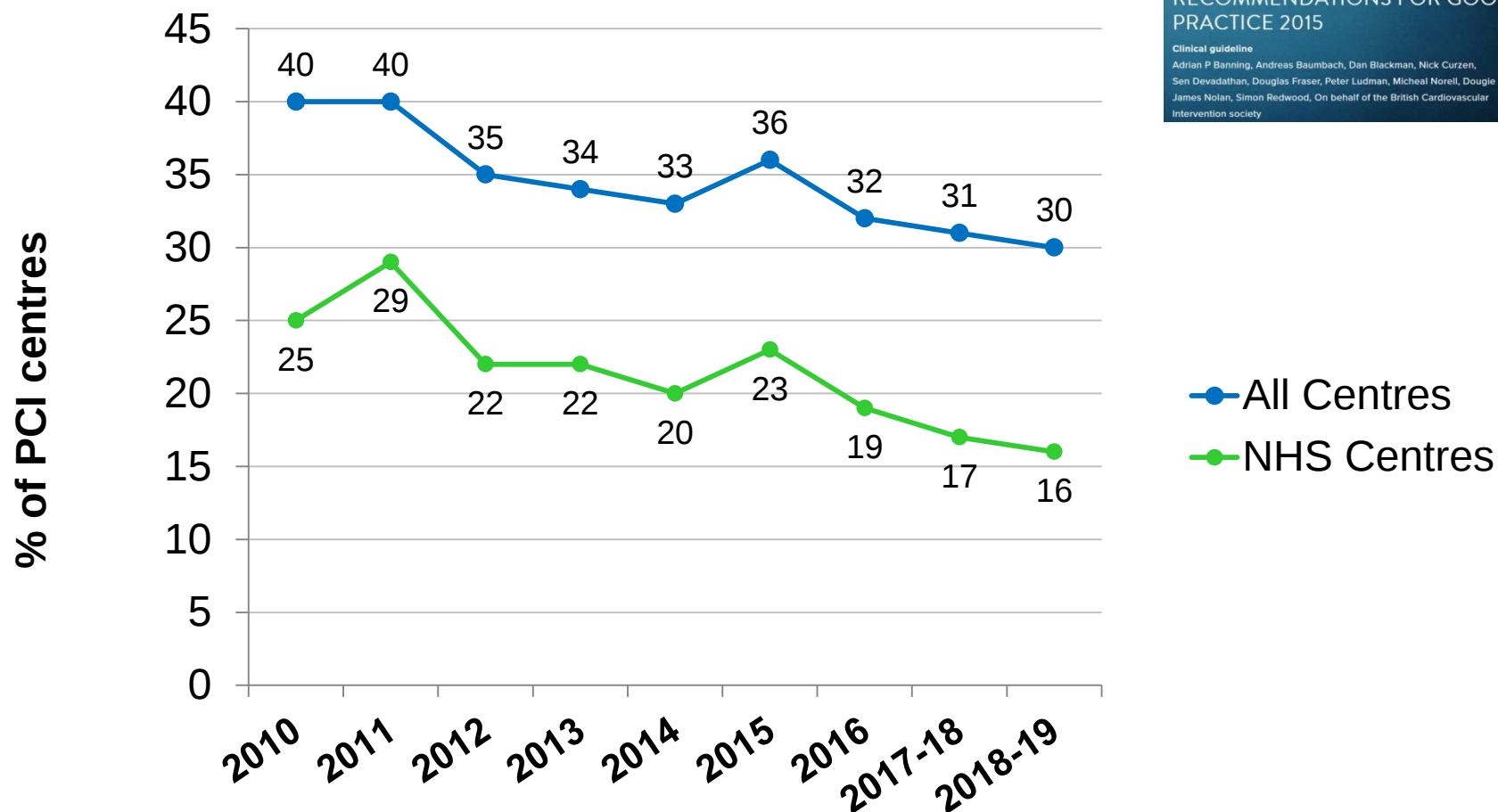
NHS Centres



16 Centres performing < 400 cases (16%)
2 Centres performing < 200 cases (2%)

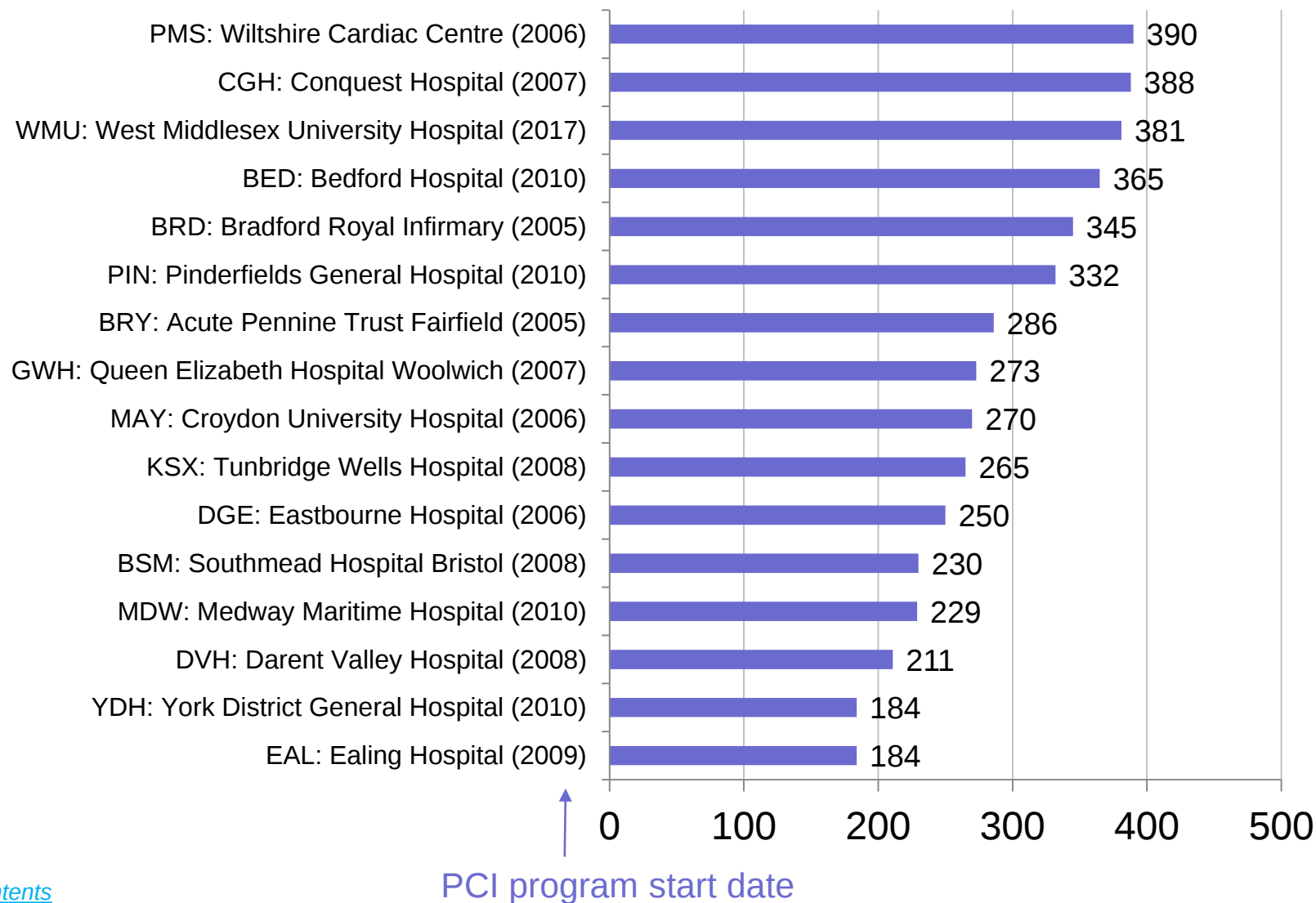
Number of PCIs per Centre

% Centres < 400 cases pa



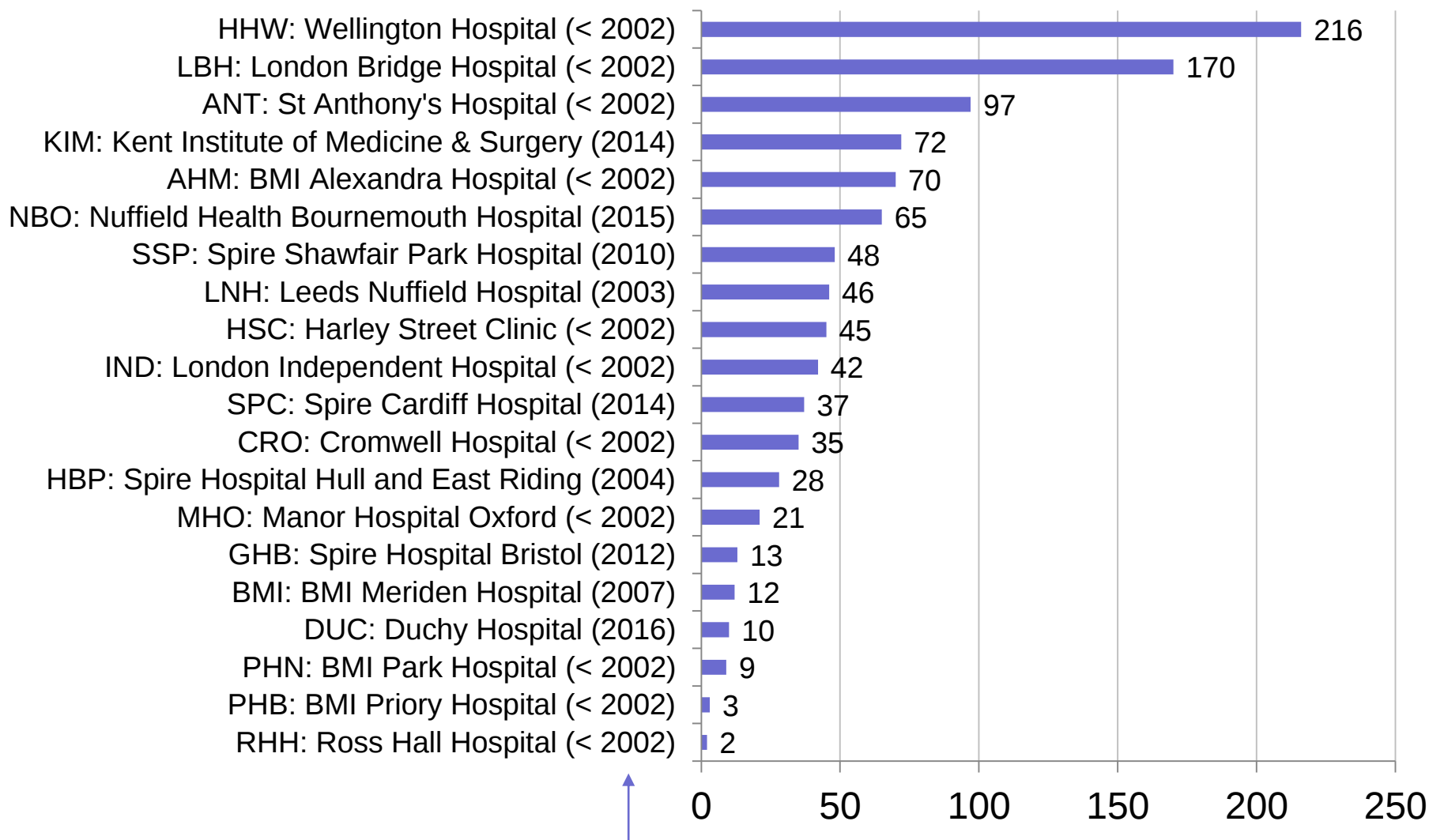
Centres < 400 PCIs

NHS



Centres < 400 PCIs

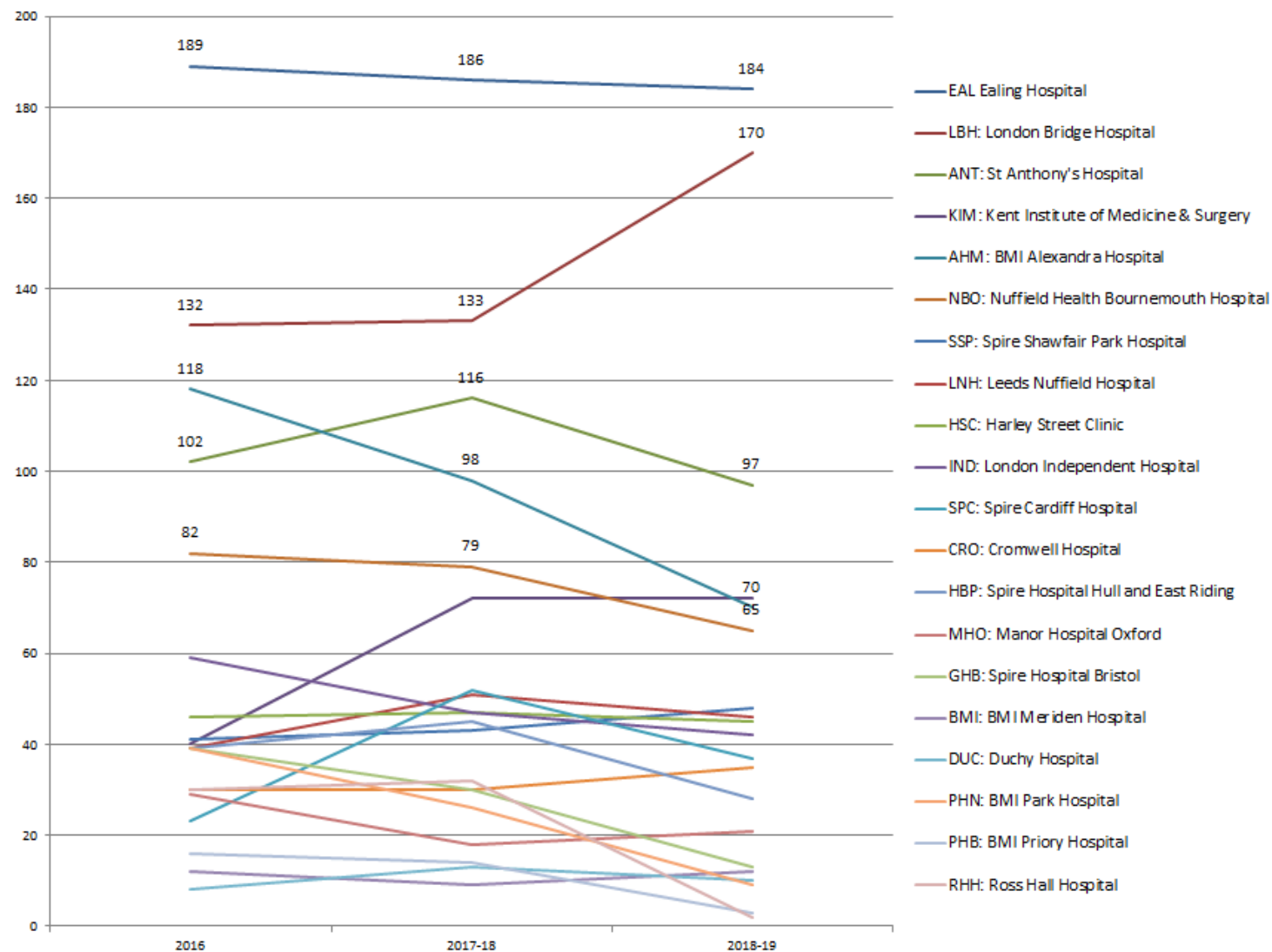
Private



PCI program start date

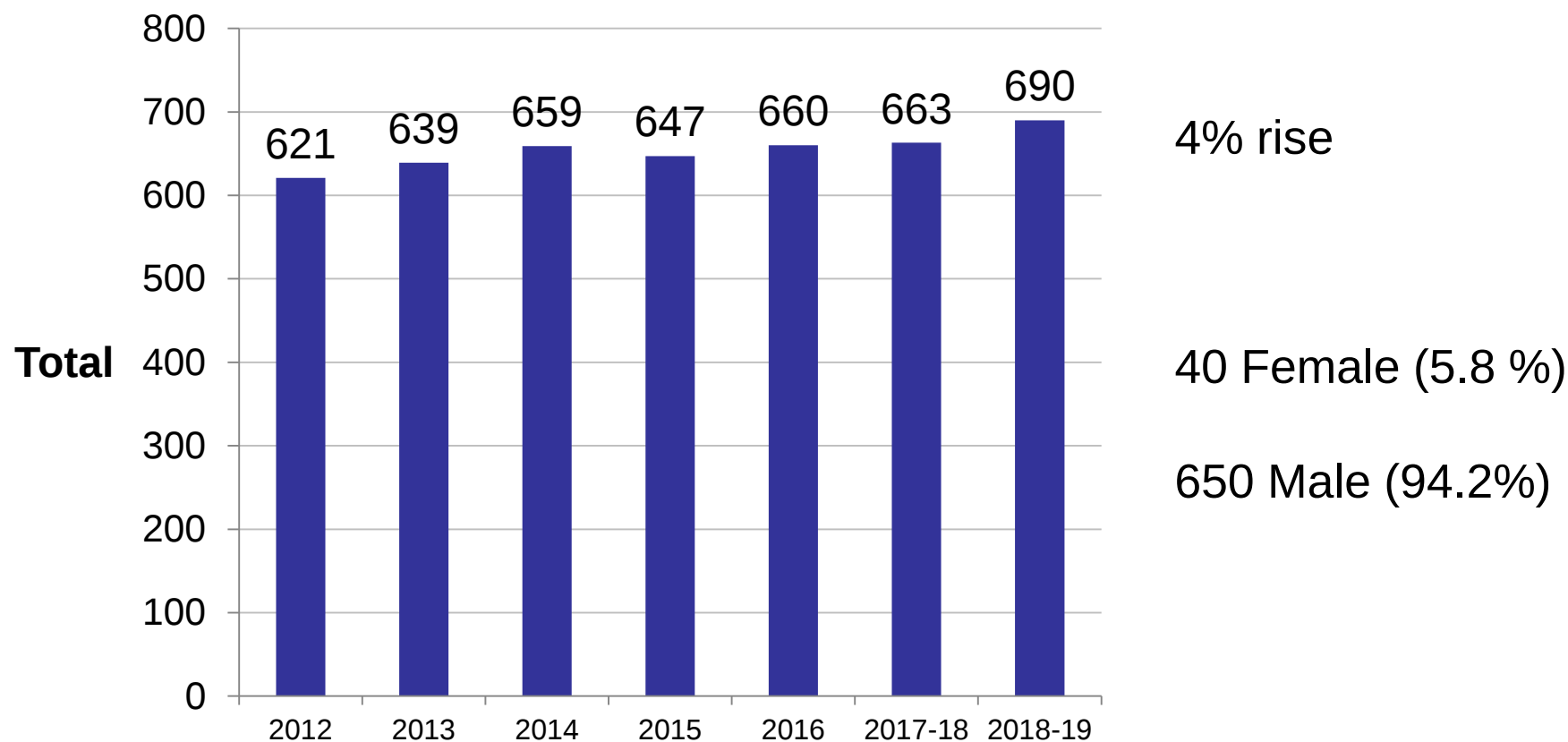
Centres < 200 PCIs

In 2016, 2017-18 and 2018-19

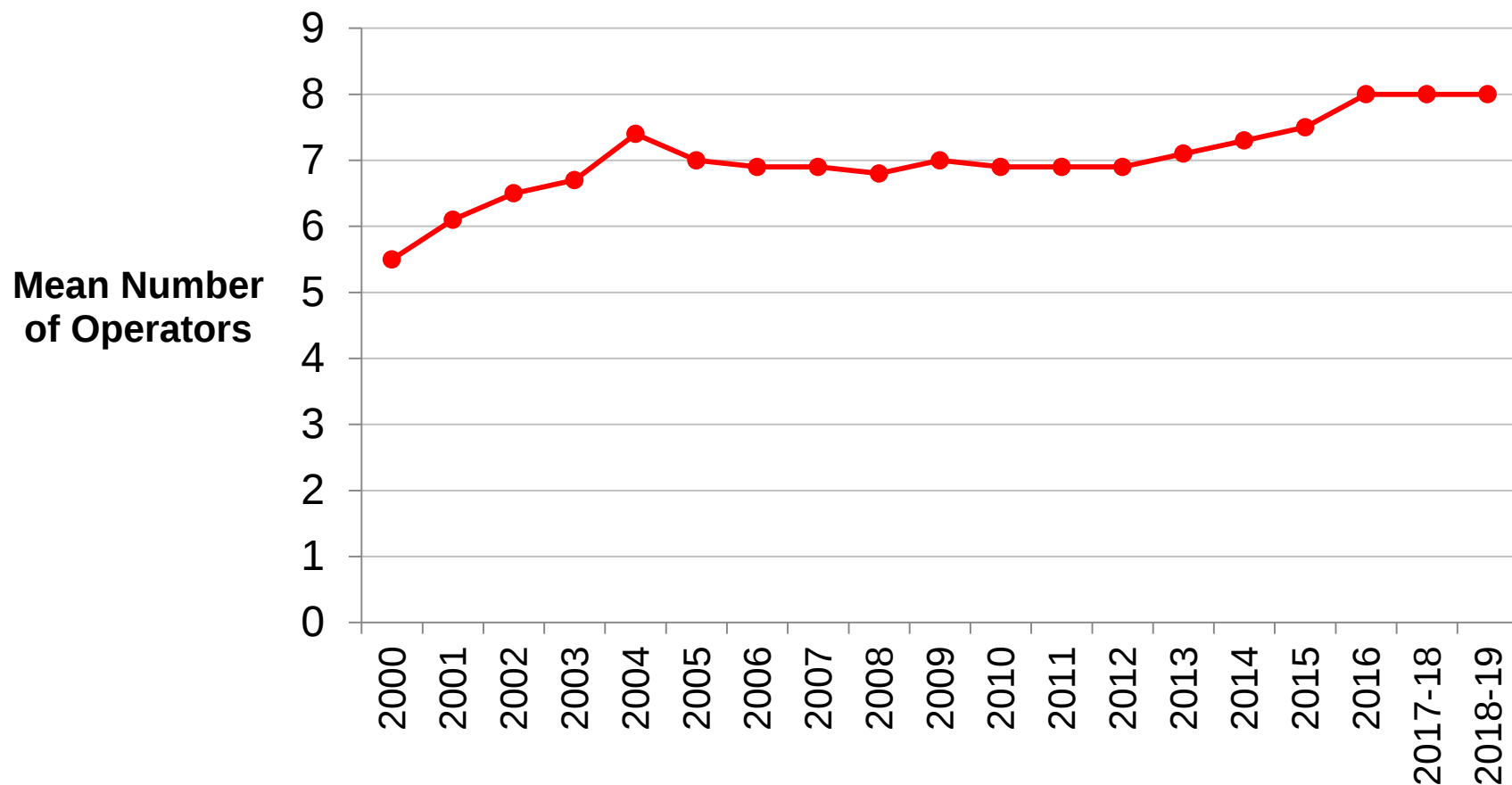


Interventional Consultants

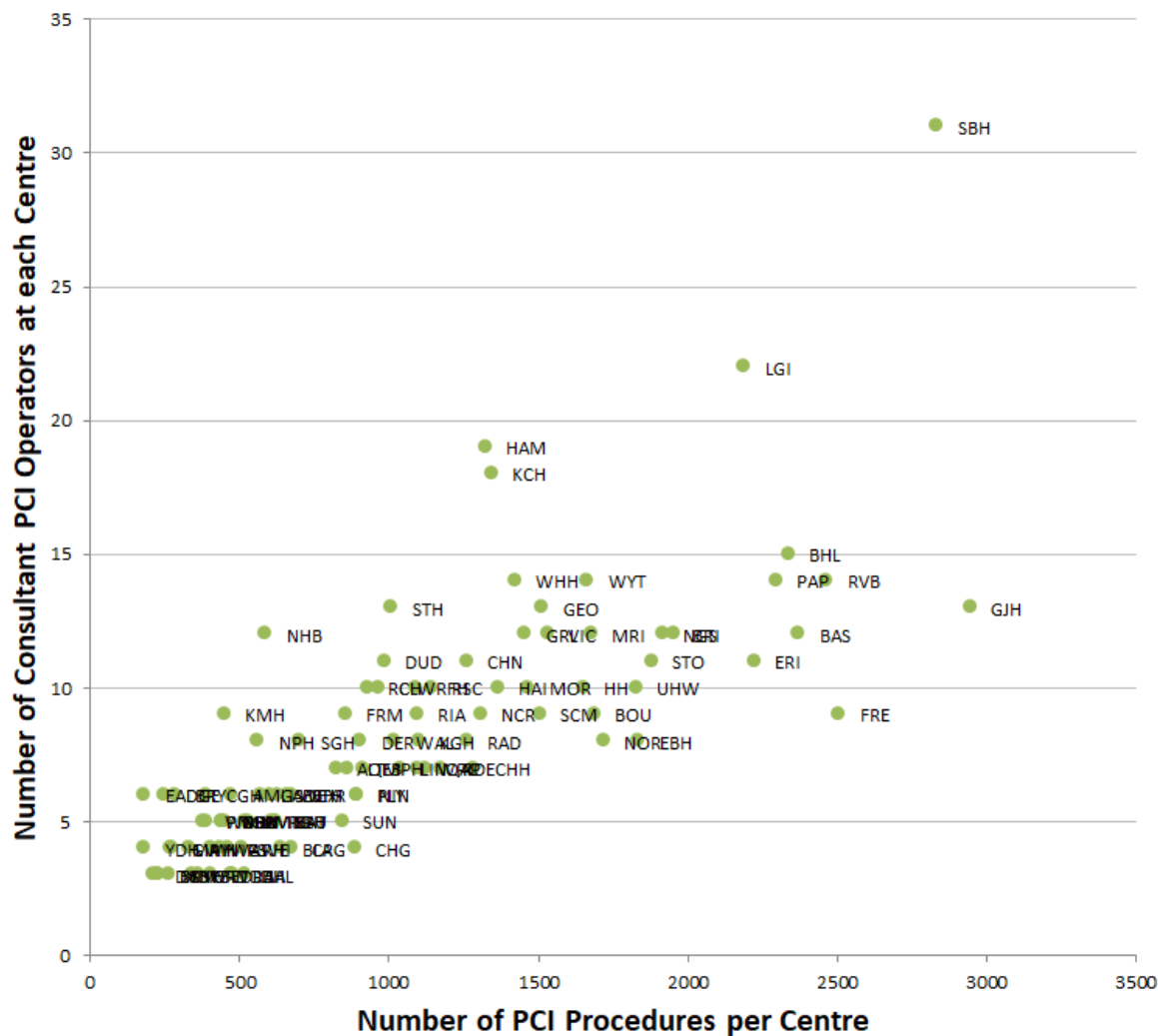
- Number of PCI operators by GMC number



No. of Consultants (Per NHS Centre)

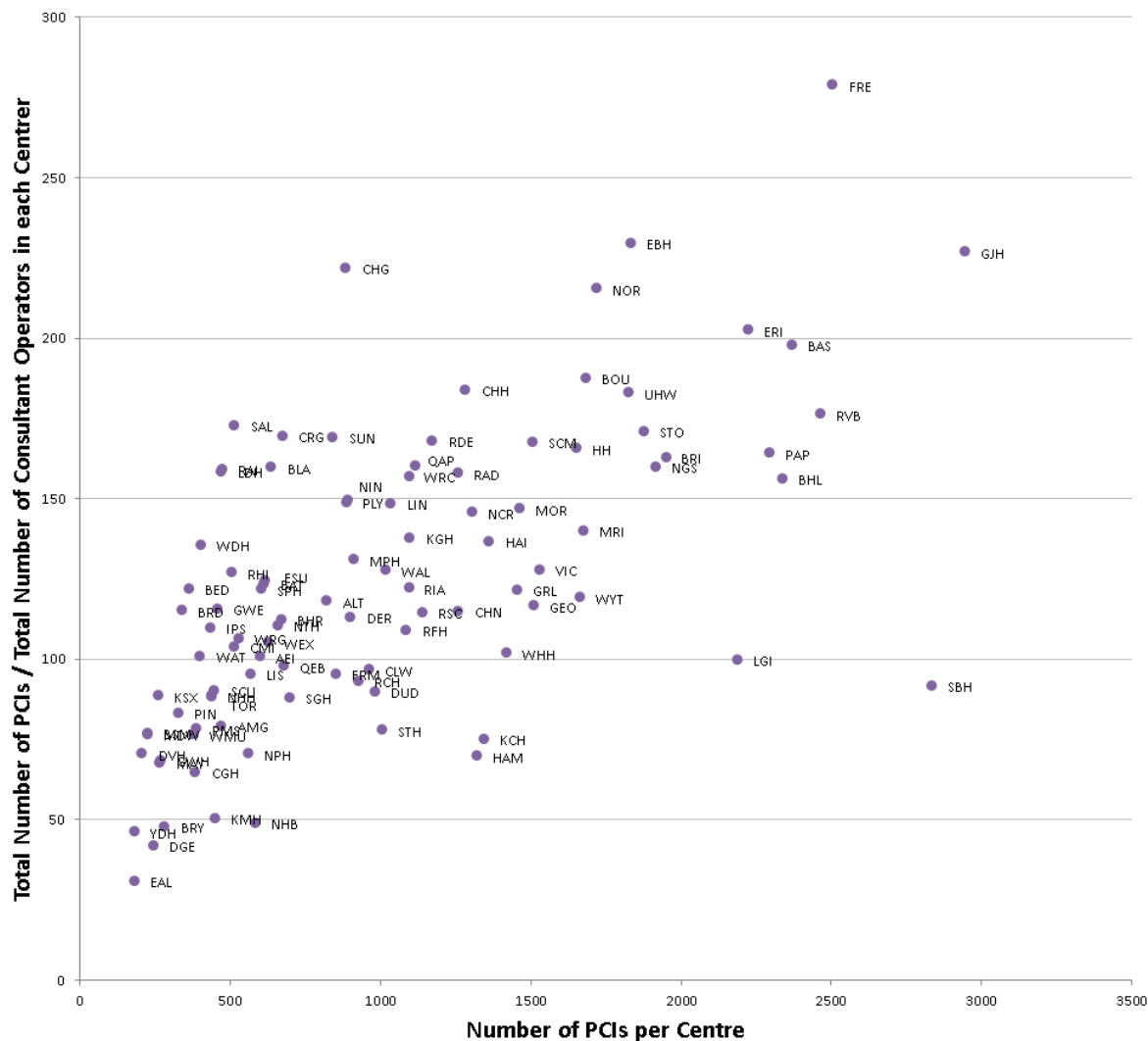


No. of Consultants In NHS centres (2018-19)



PCIs per Consultant

(NHS Centres 2018-19)



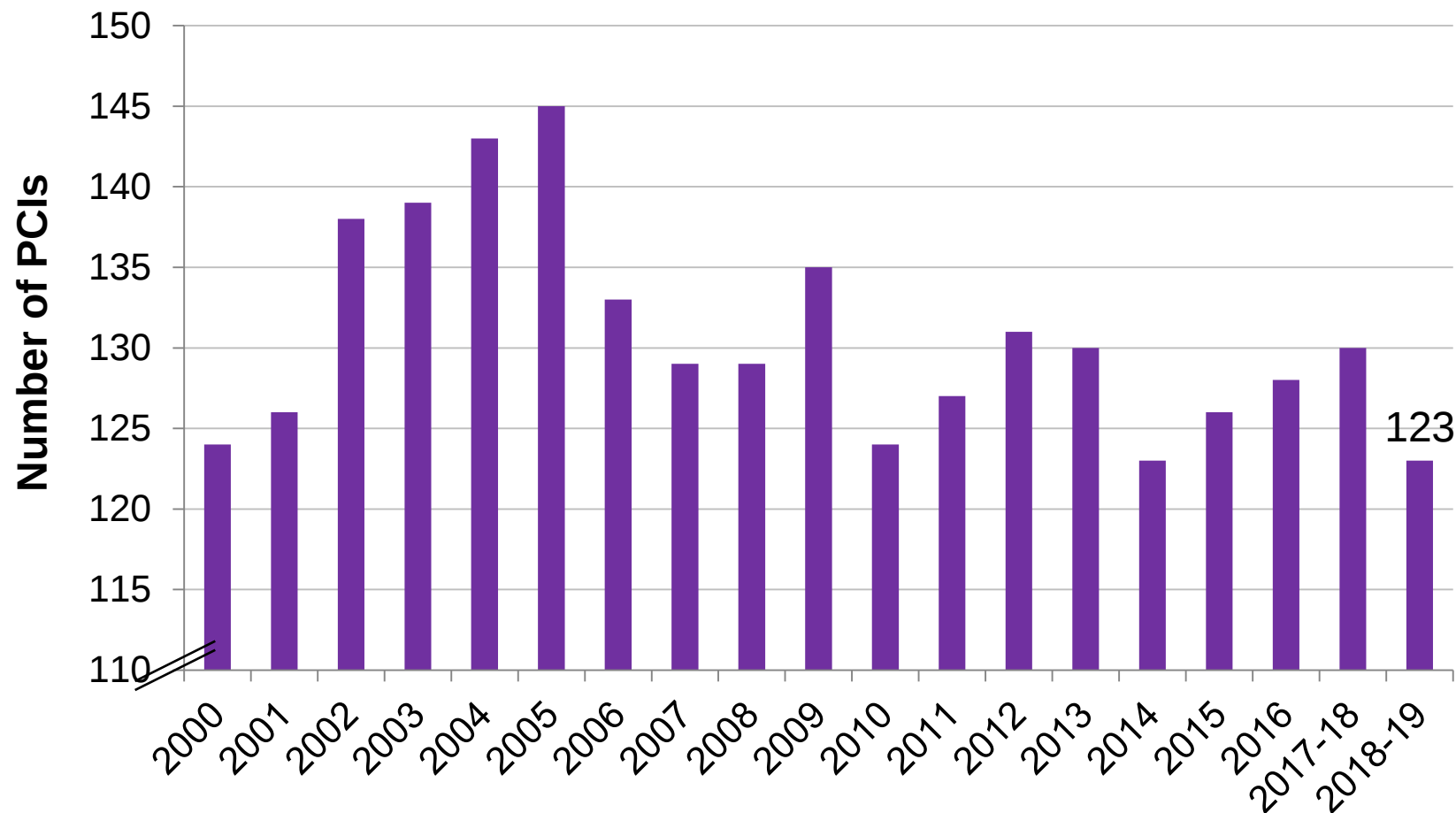
Note:

Data from institutional volume divided by No operators per institution

Some consultants work in multiple institutions

PCI per Consultant

PCI Centre case volume / Number of operators



NHS Centres

Primary PCI Rotas



Primary Percutaneous Coronary Intervention for ST Elevation Myocardial Infarction
Position statement for Facilities and Emergency Medical Staffing July 2016

MacCarthy PA, Blackman DJ, Hildick-Smith D, Banning AP

2 Staffing Standards

2.1 Primary PCI rotas:

Key Recommendations

- The maximum frequency of on-call rota for any individual should not be more frequent than 1:6

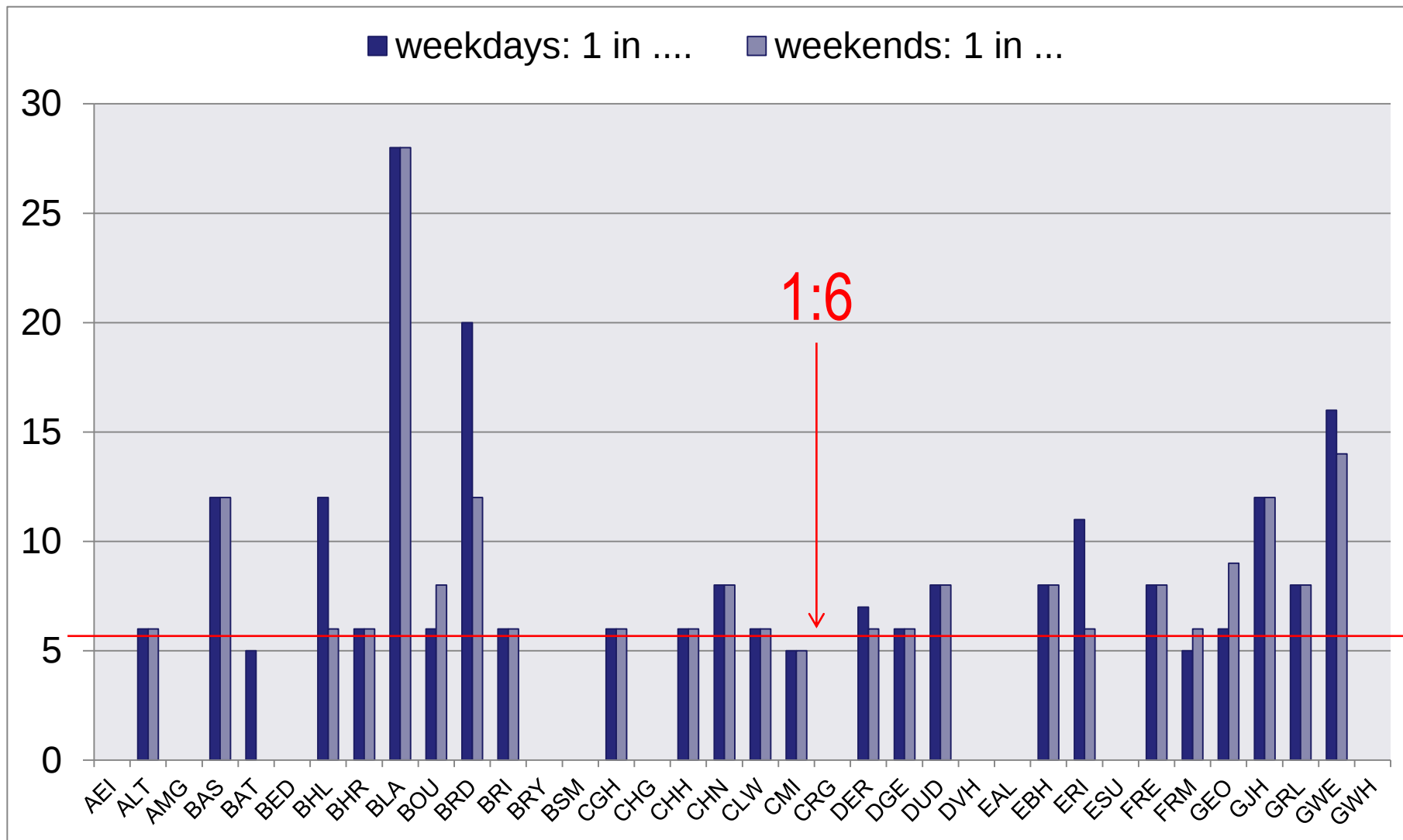
- A Consultant Interventional Cardiologists rota will include:-

One half-day of compensatory rest for each full day of consecutive on-call in lower volume centres (<400 PPCI procedures per year)

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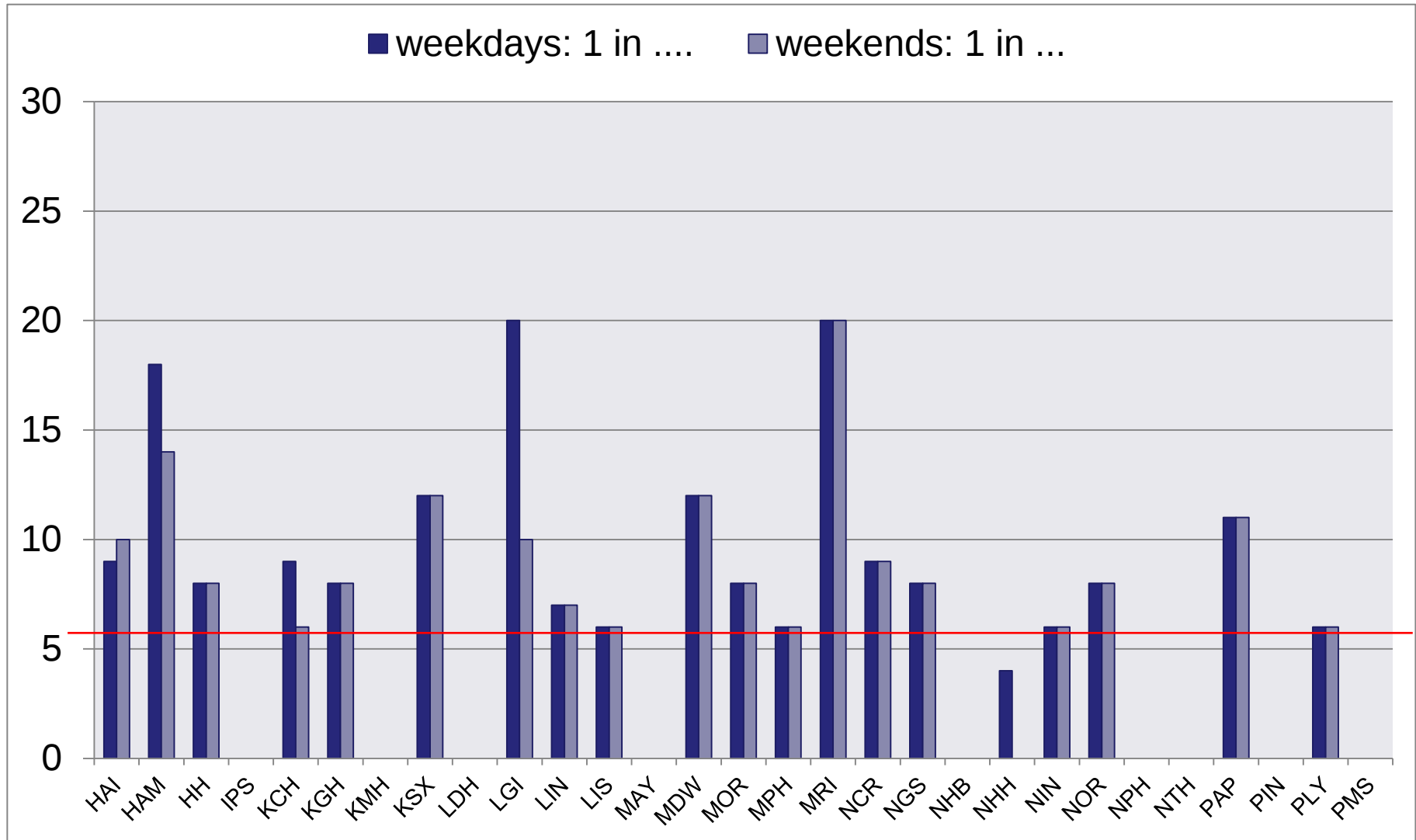
PPCI

On call Rotas (A-G)



PPCI

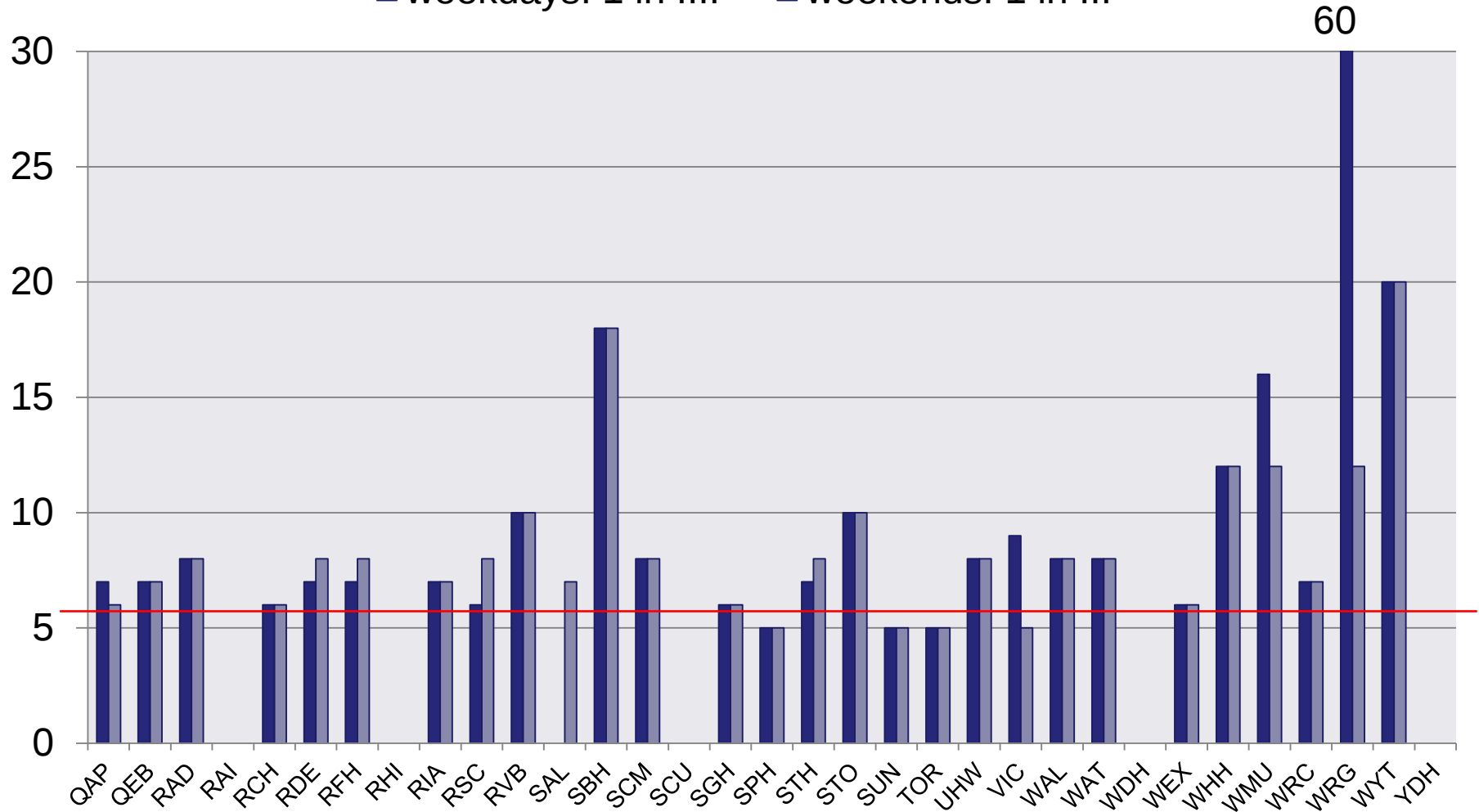
On call Rotas(H-P)



PPCI

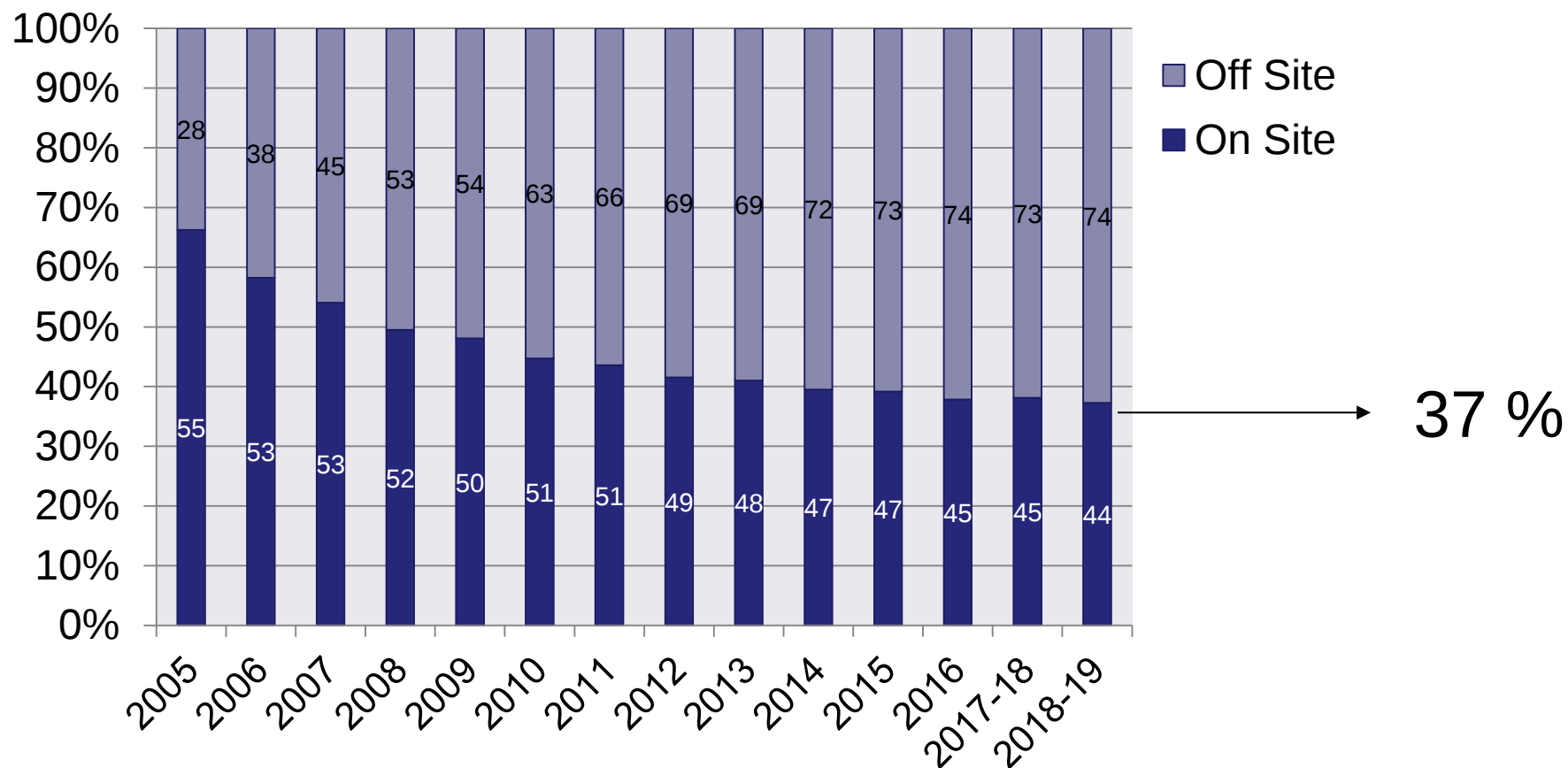
On call Rotas (Q-Y)

■ weekdays: 1 in ■ weekends: 1 in ...



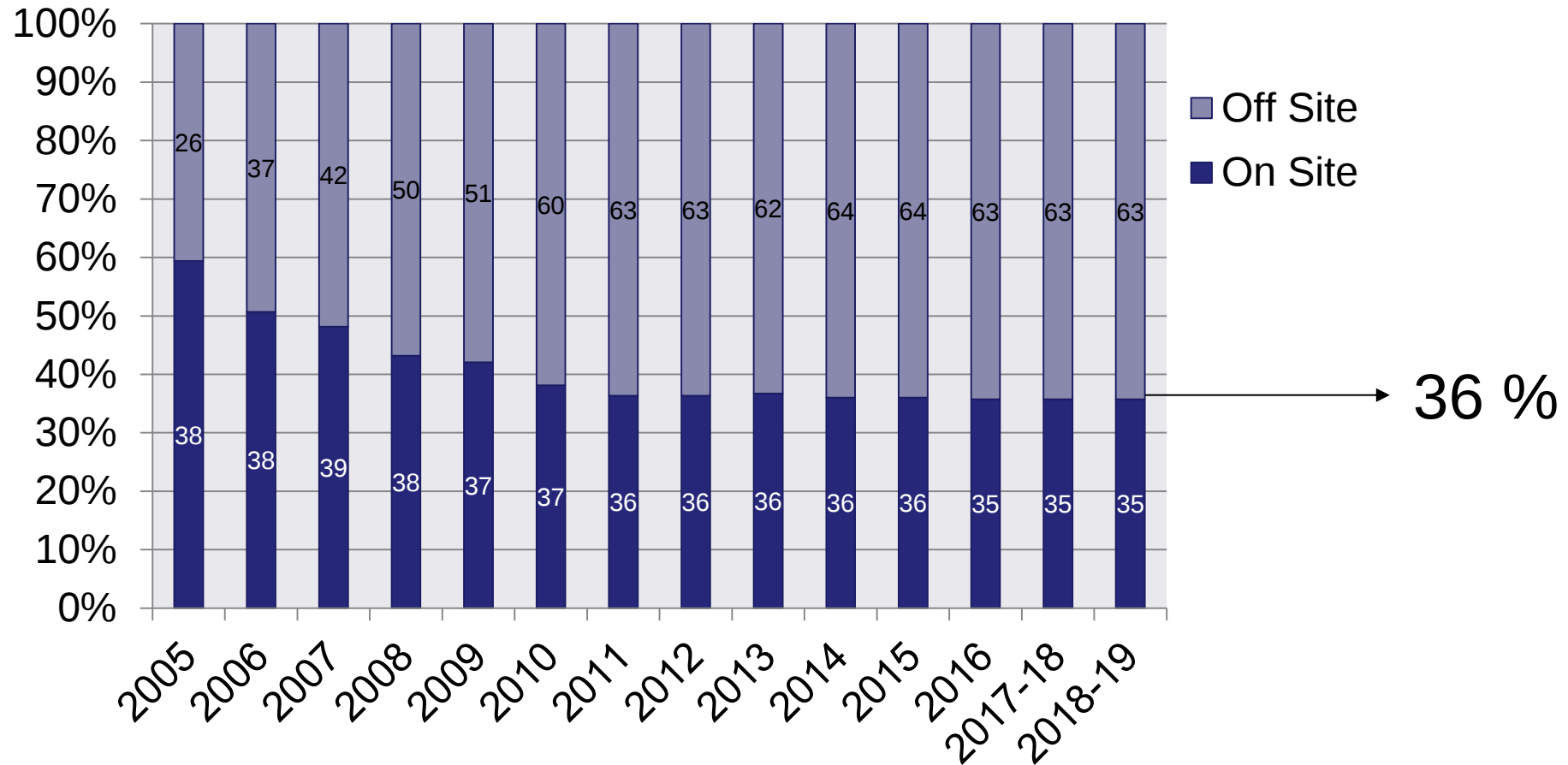
On v Off Site Surgery

All Centres (NHS and private)



On v Off Site Surgery

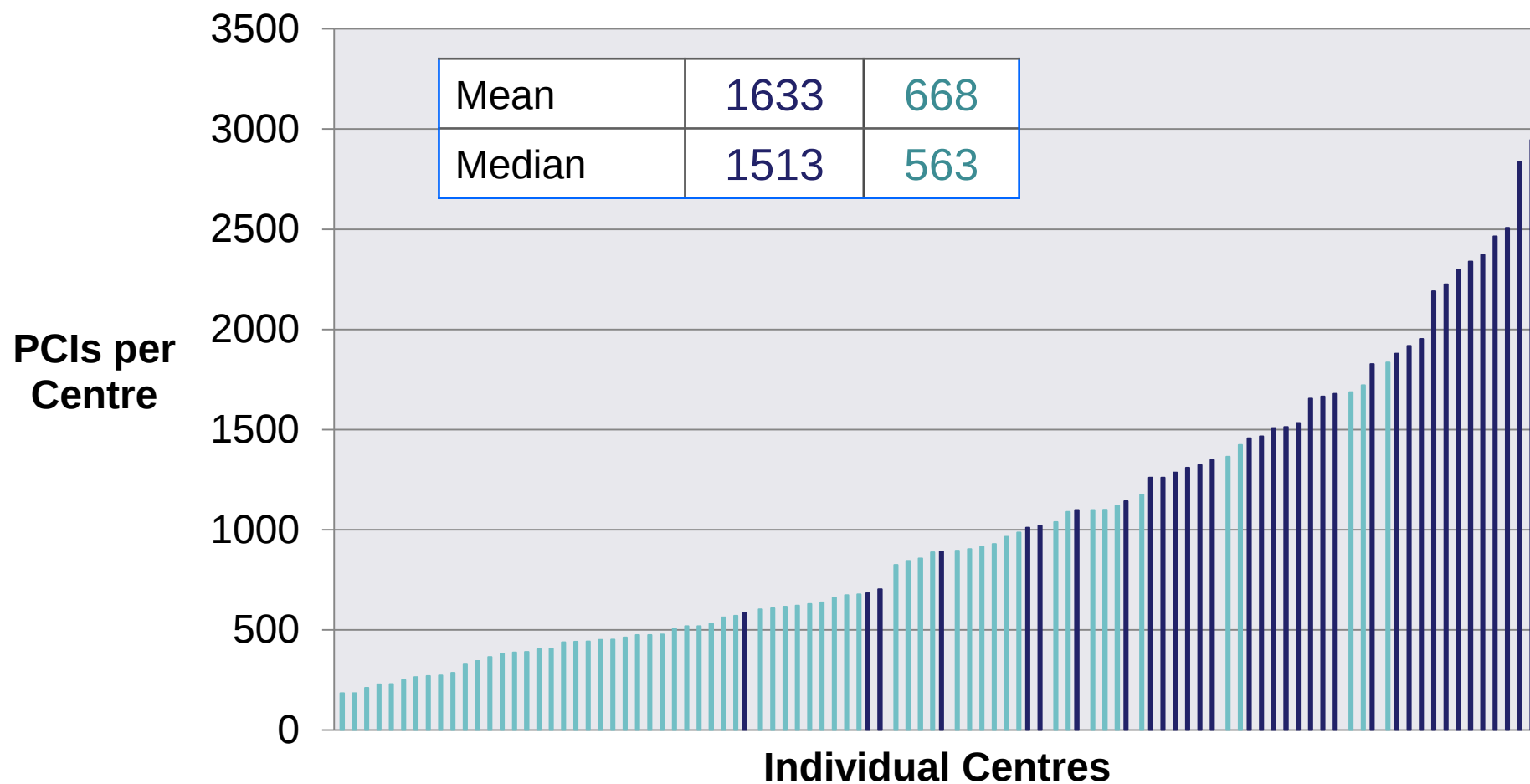
NHS Centres Only



Surgical Cover

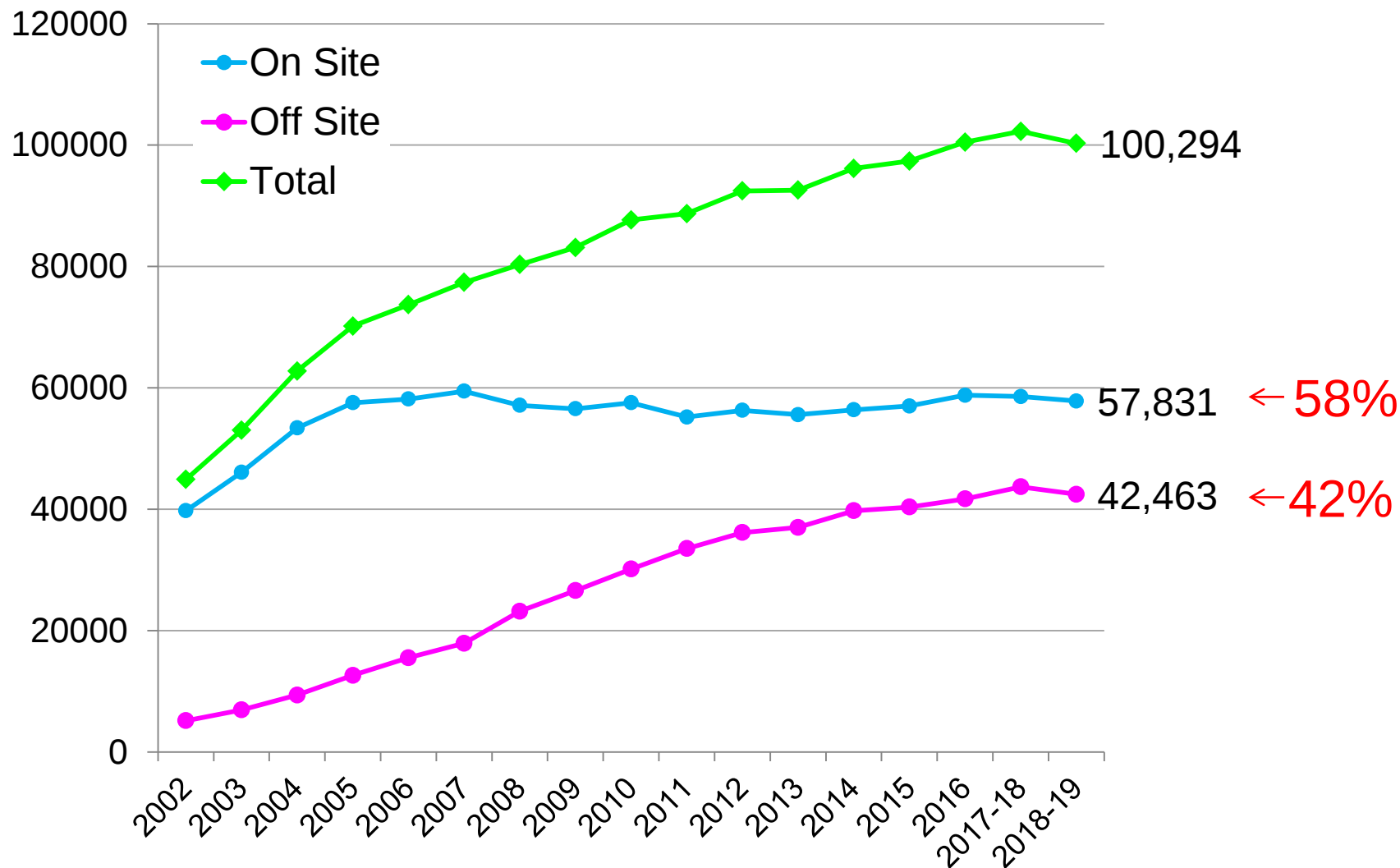
(NHS centres only)

■ On site ■ Off site



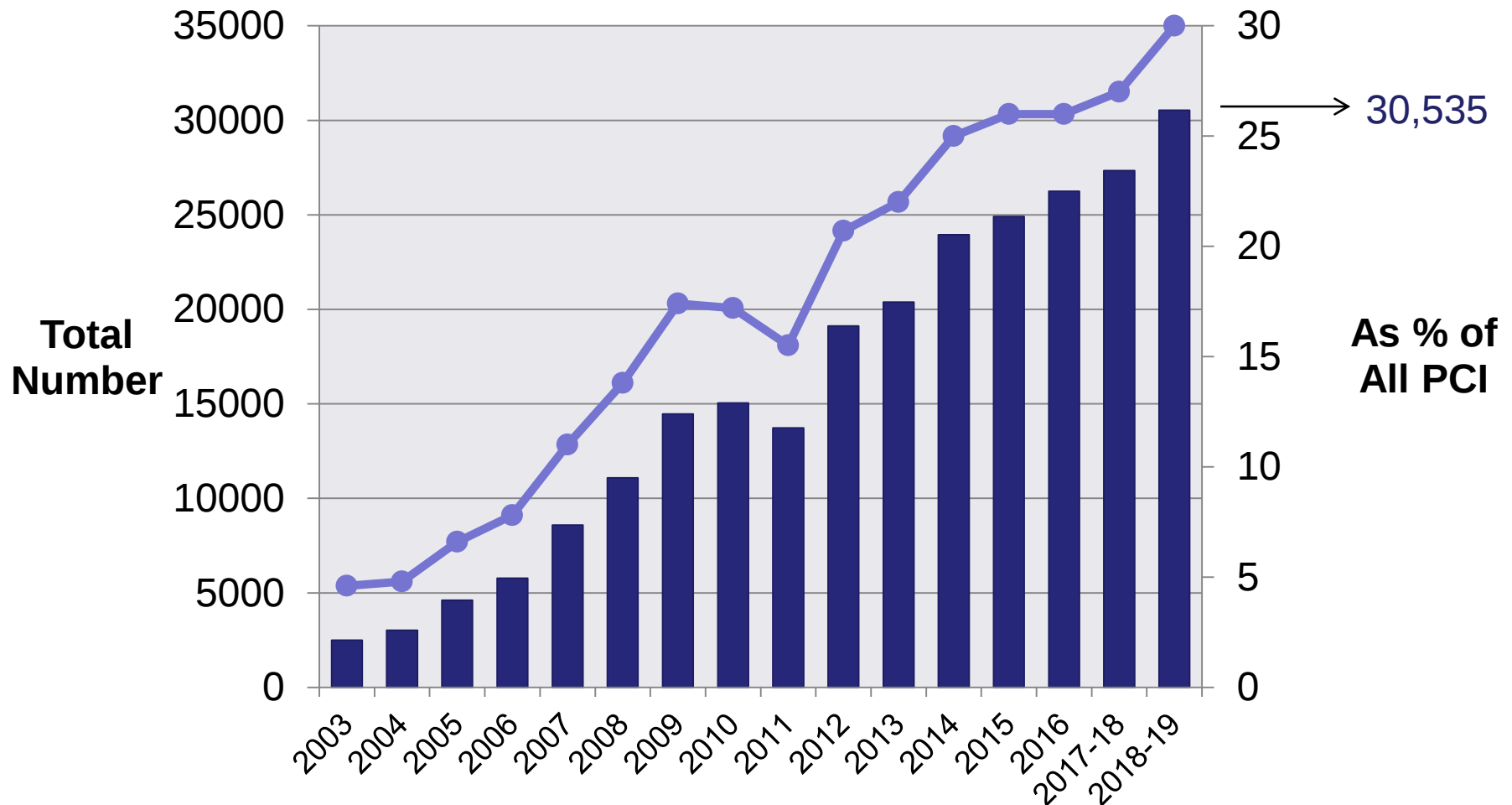
Total Number of PCIs

By Surgical cover NHS & Private



Day Case PCI

- 114 answered query of whom 113 perform planned elective day case PCI



Primary PCI 2018-19

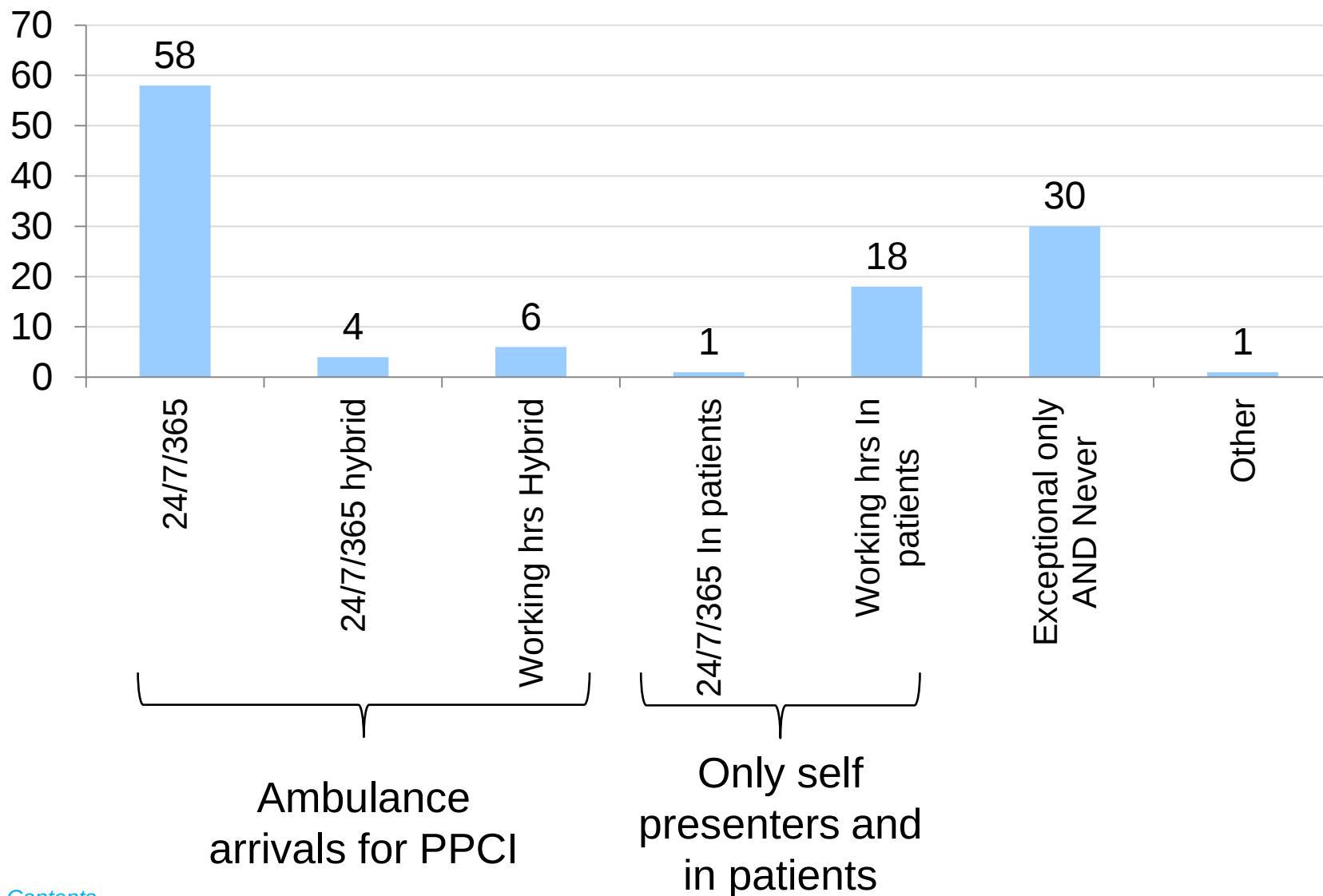


PPCI as part of
ambulance network

- PPCI 24/7
- PPCI 24/7 Hybrid
- PPCI working hrs
- No PPCI as part
of ambulance network

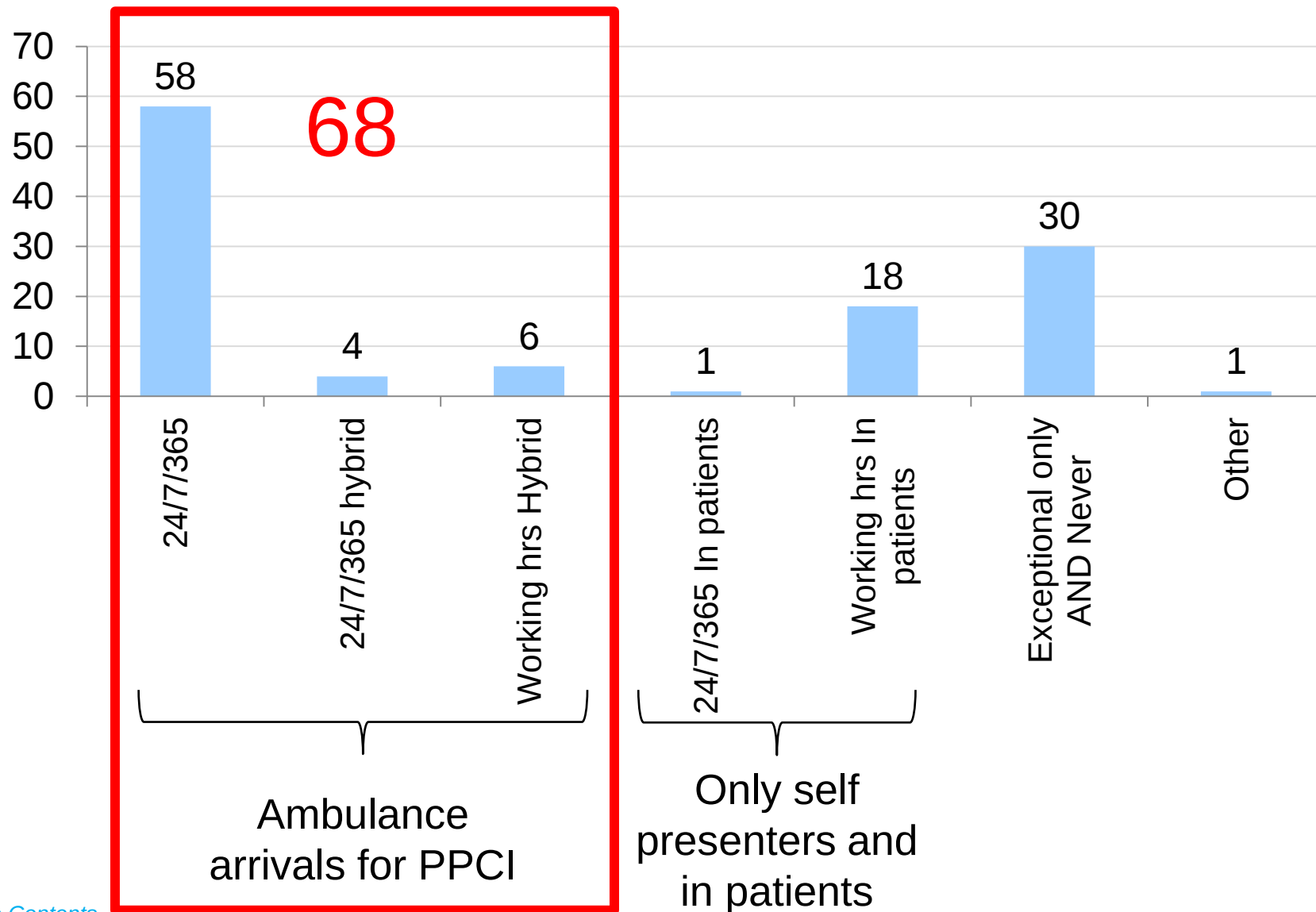
Primary PCI

Pattern of activity offered (NHS 2018-19)



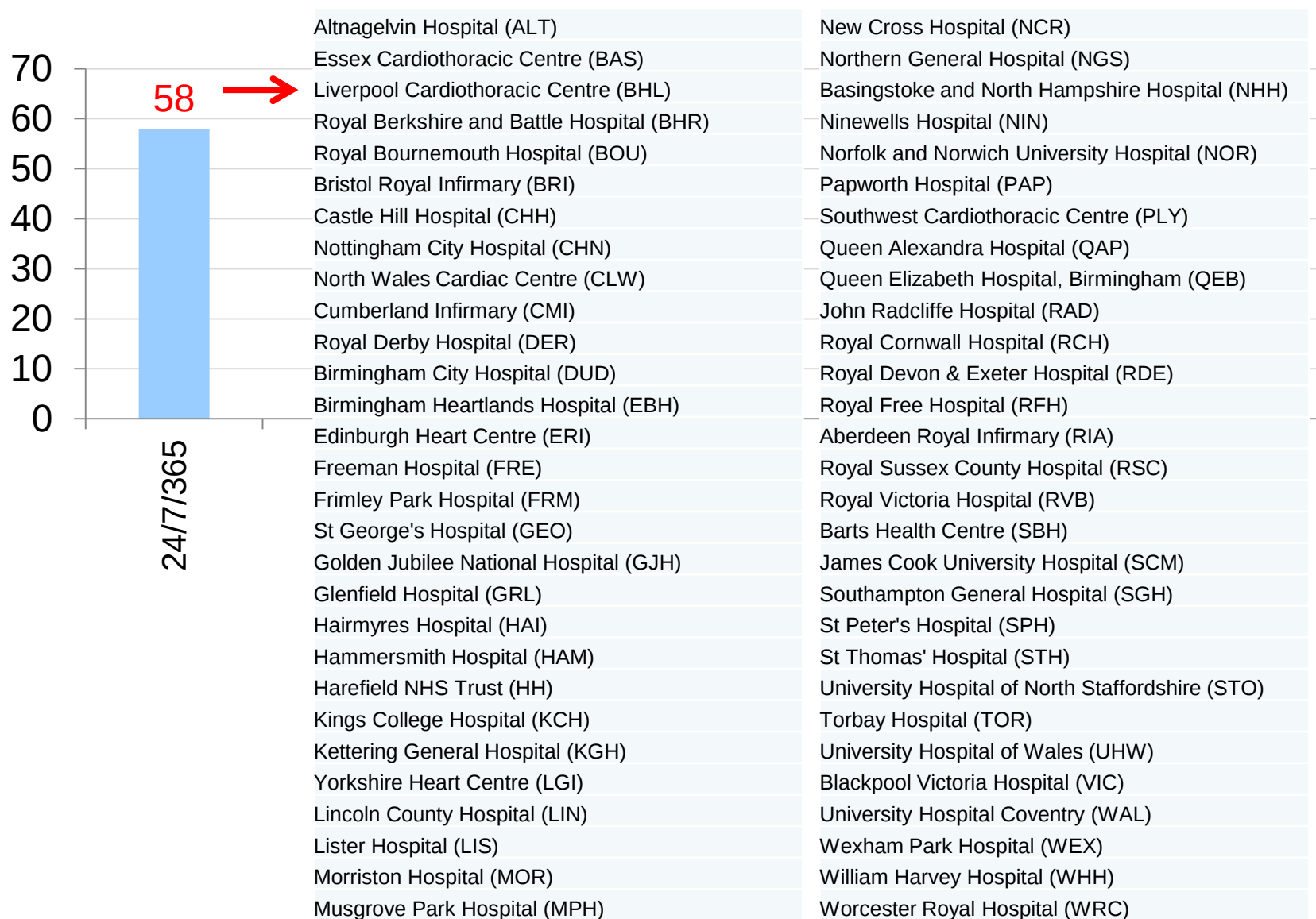
Primary PCI

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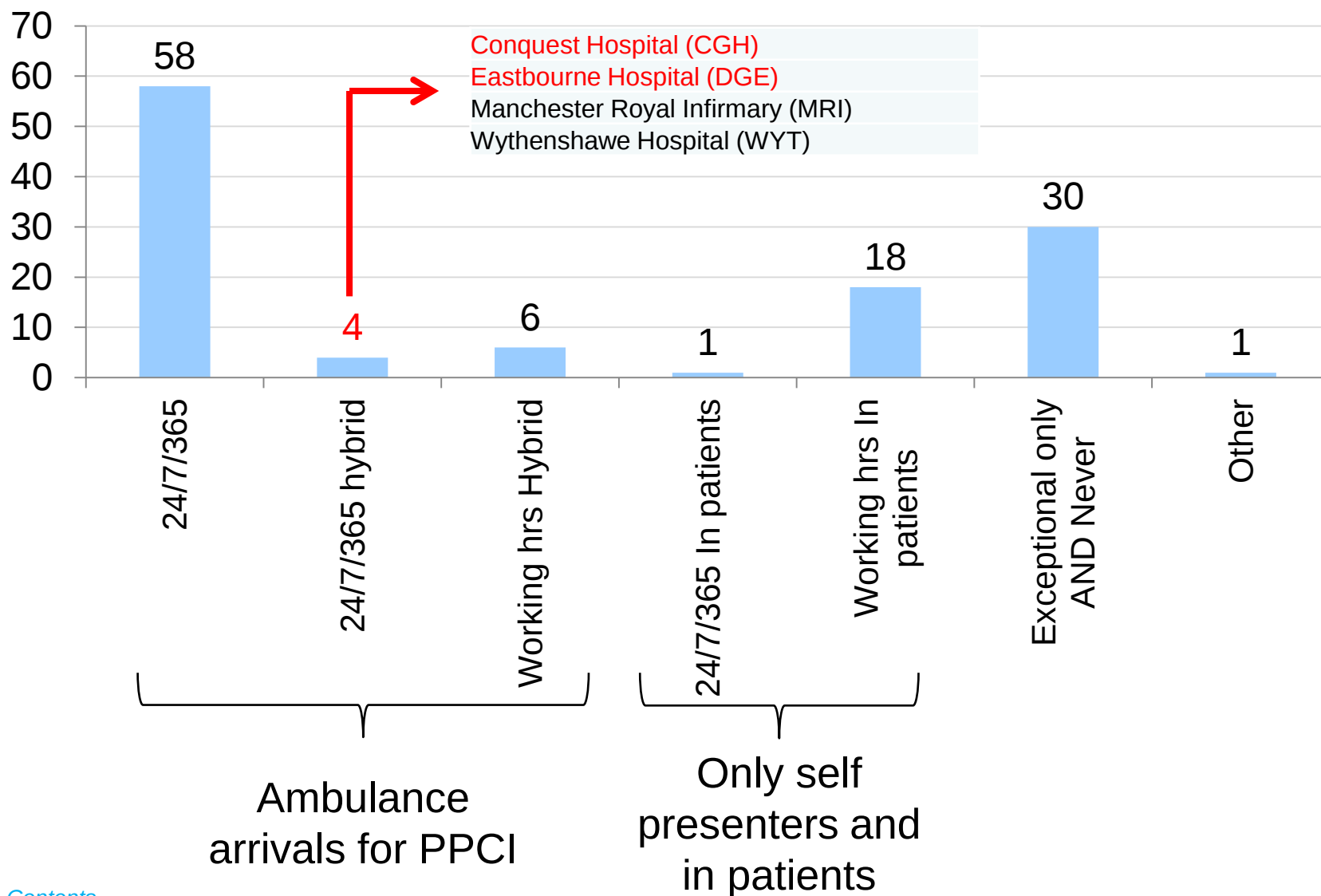
Primary PCI

Pattern of activity offered (NHS 2018-19)



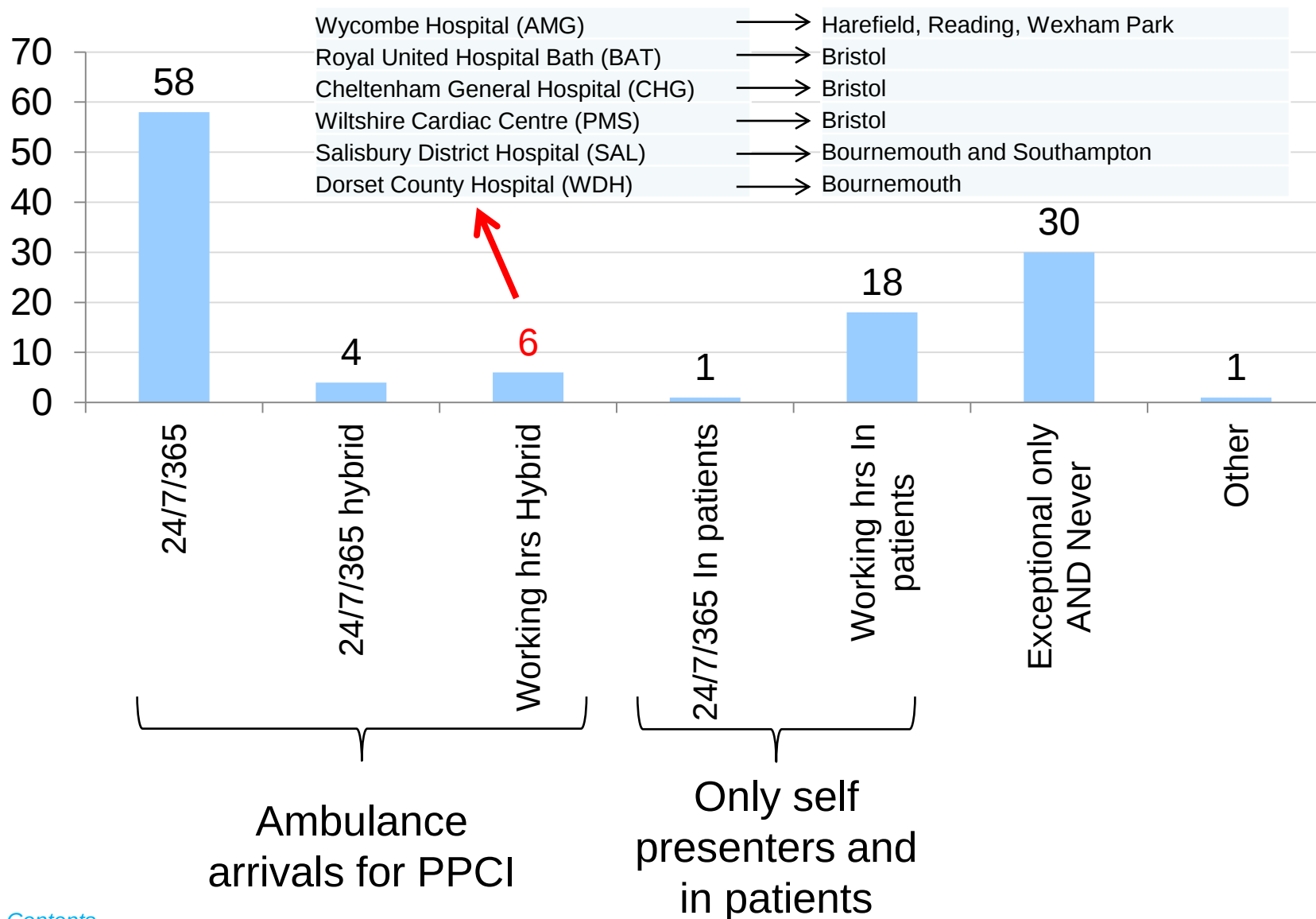
Primary PCI

Pattern of activity offered (NHS 2018-19)



Primary PCI

Pattern of activity offered (NHS 2018-19)

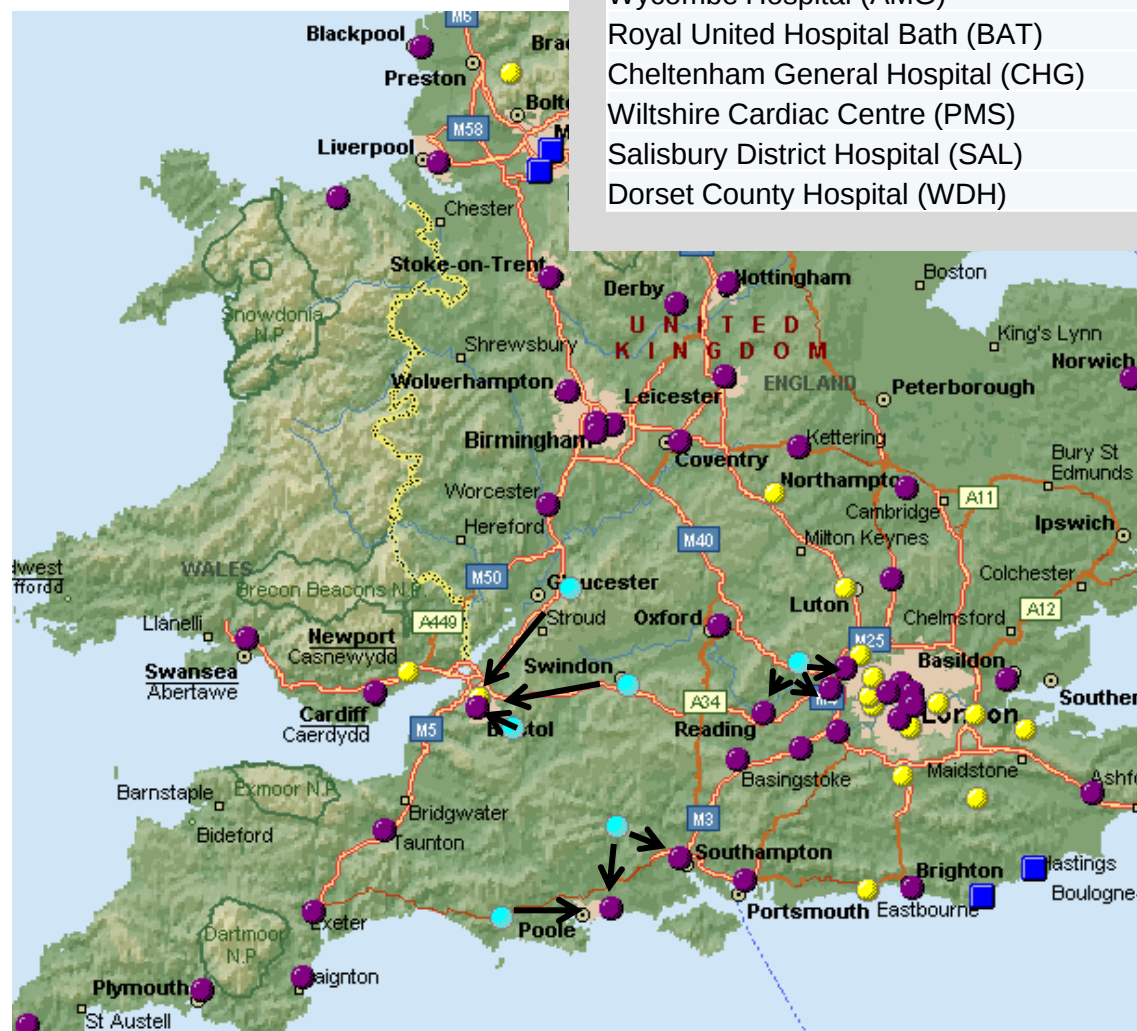




PPCI 2018-19

Hybrid links

Wycombe Hospital (AMG)	→	Harefield, Reading, Wexham Park
Royal United Hospital Bath (BAT)	→	Bristol
Cheltenham General Hospital (CHG)	→	Bristol
Wiltshire Cardiac Centre (PMS)	→	Bristol
Salisbury District Hospital (SAL)	→	Bournemouth and Southampton
Dorset County Hospital (WDH)	→	Bournemouth

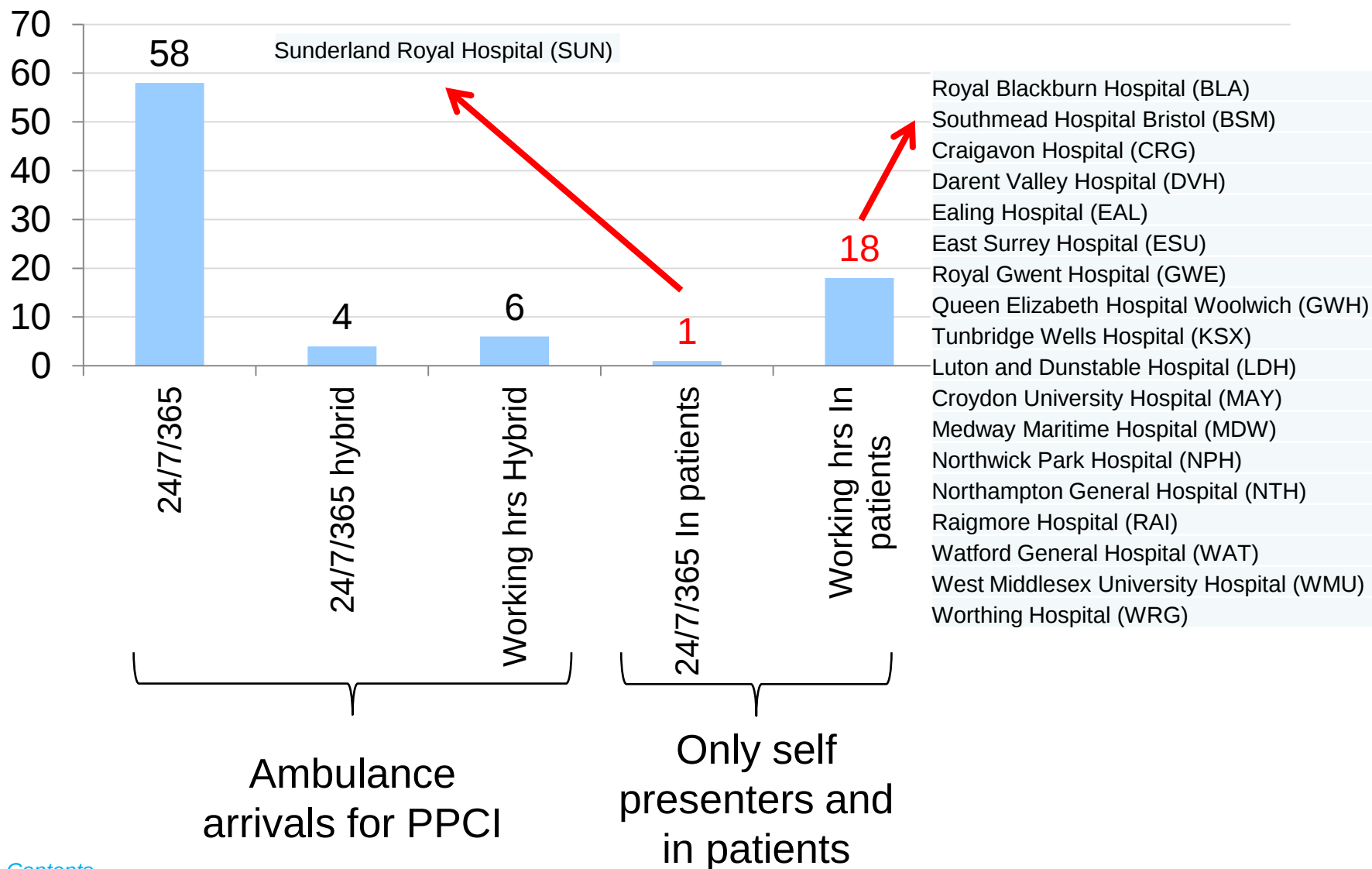


PPCI as part of ambulance network

- PPCI 24/7
- PPCI 24/7 Hybrid
- PPCI working hrs
- No PPCI as part of ambulance network

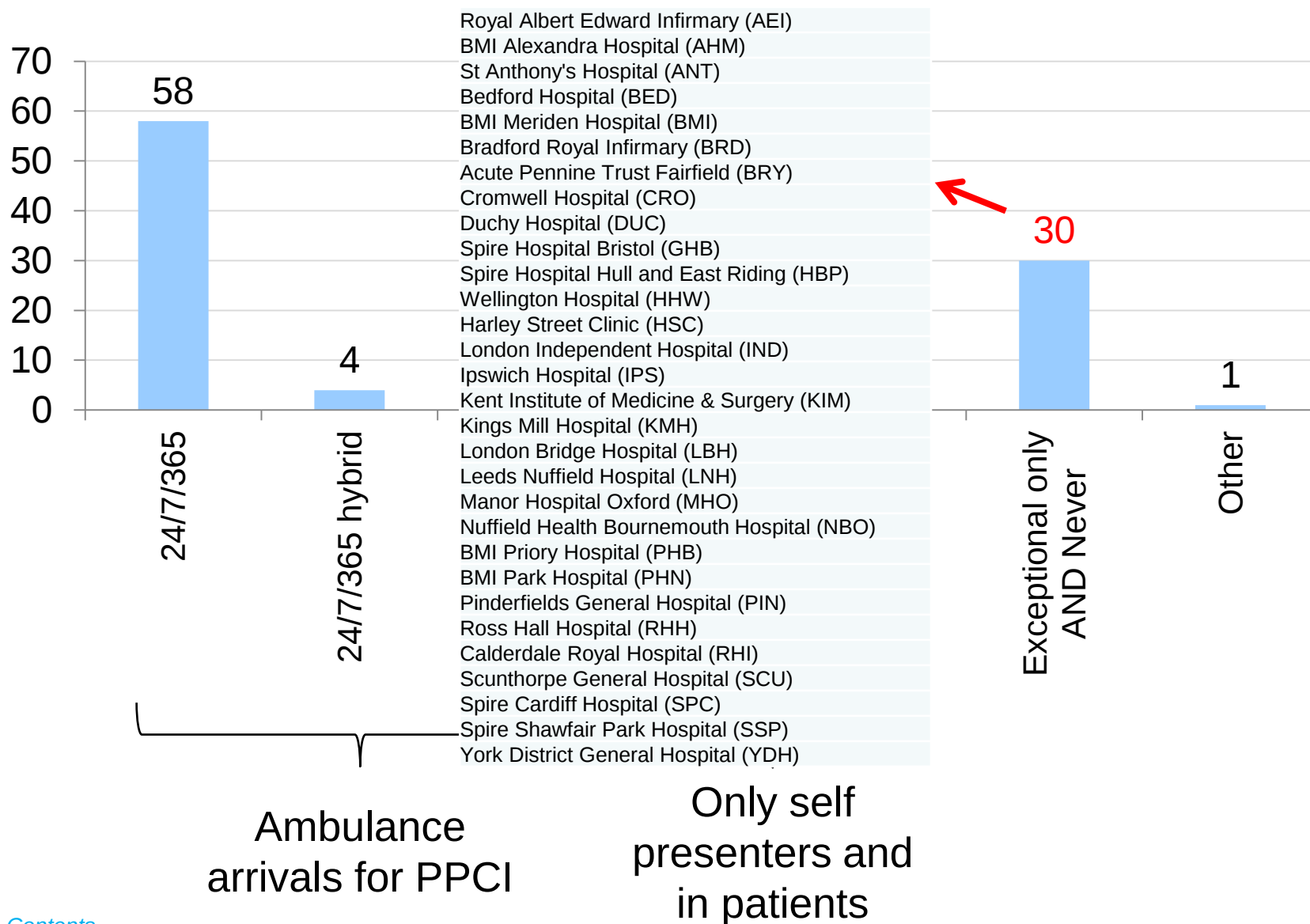
Primary PCI

Pattern of activity offered (NHS 2018-19)



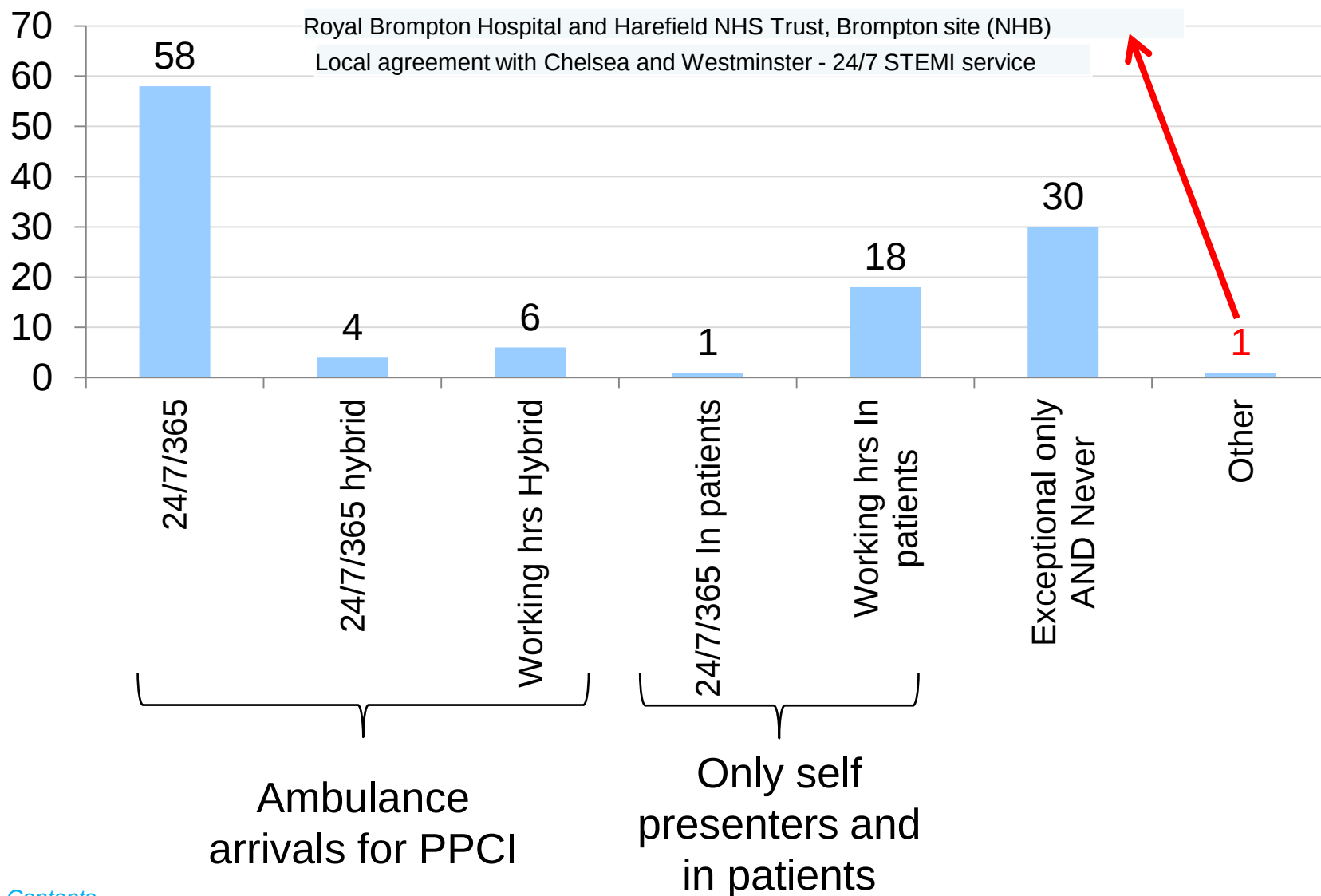
Primary PCI

Pattern of activity offered (NHS 2018-19)



Primary PCI

Pattern of activity offered (NHS 2018-19)



Compensatory Rest



Primary Percutaneous Coronary Intervention for ST Elevation Myocardial Infarction
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2 Staffing Standards

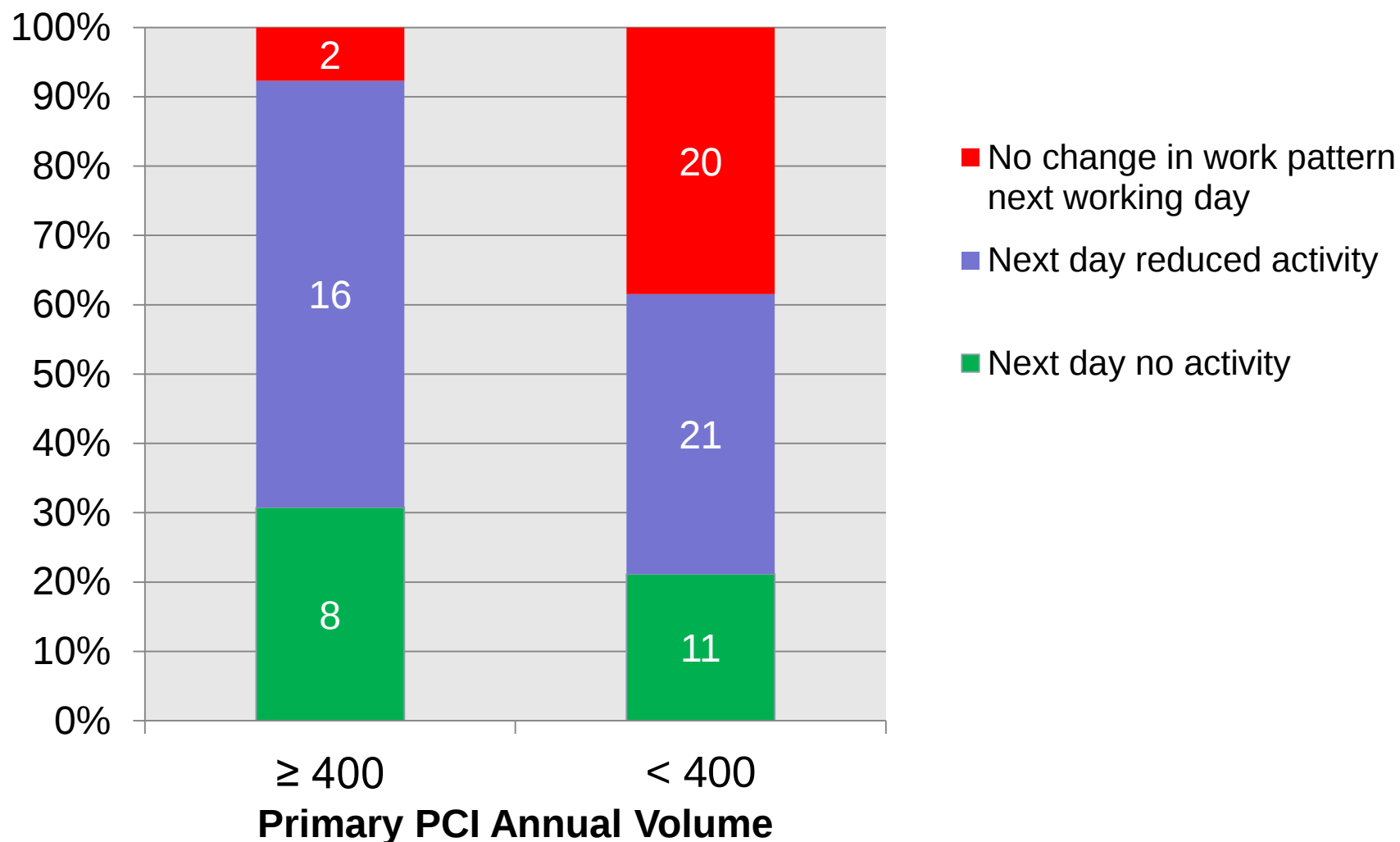
2.1 Primary PCI rotas:

Key Recommendations

- The maximum frequency of on-call rota for any individual should not be more frequent than 1:6
- A Consultant Interventional Cardiologists rota will include:-
 - One half-day of compensatory rest for each full day of consecutive on-call in lower volume centres (<400 PPCI procedures per year)
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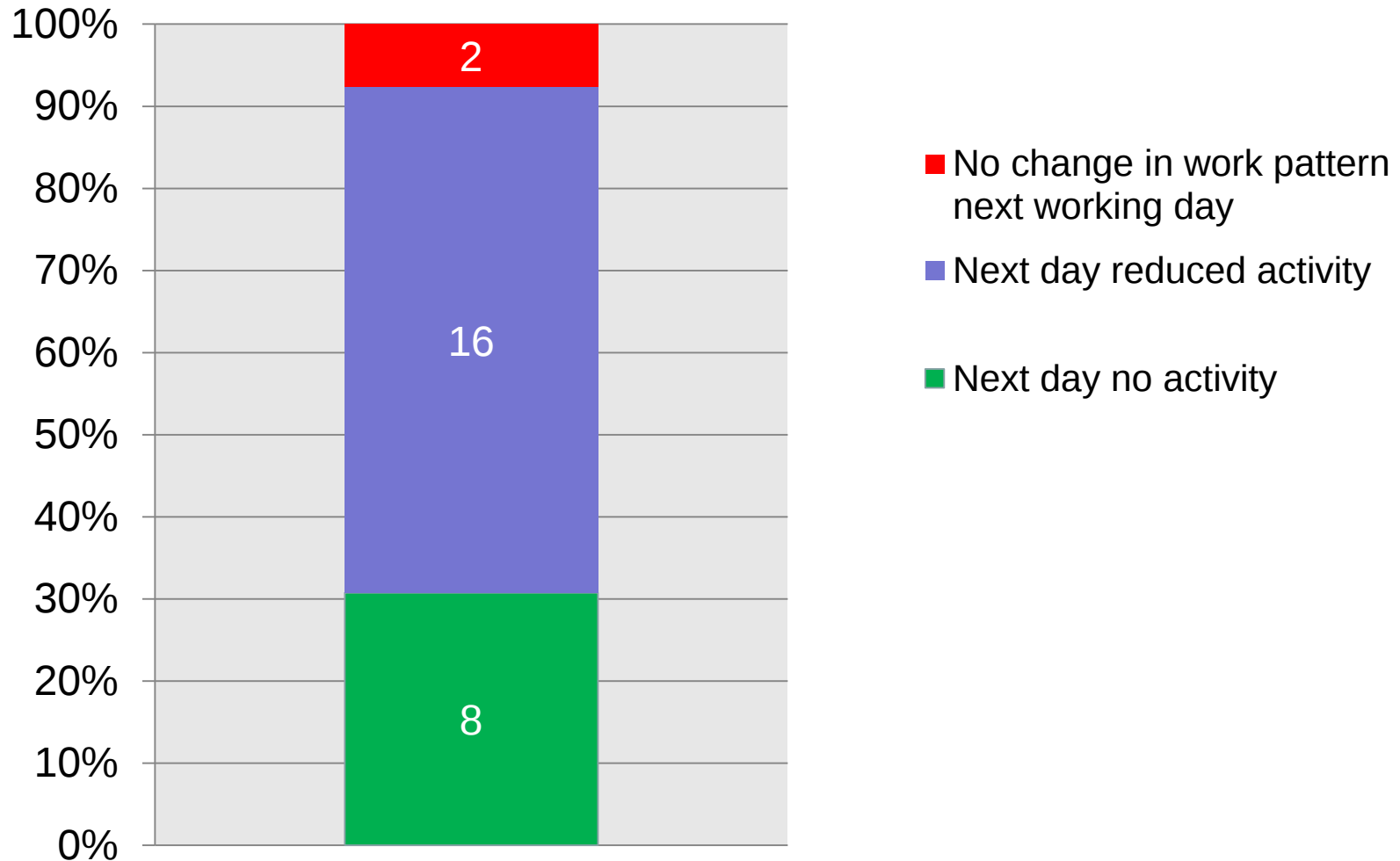
Compensatory Rest

After PPCI on call night by Centre Volume



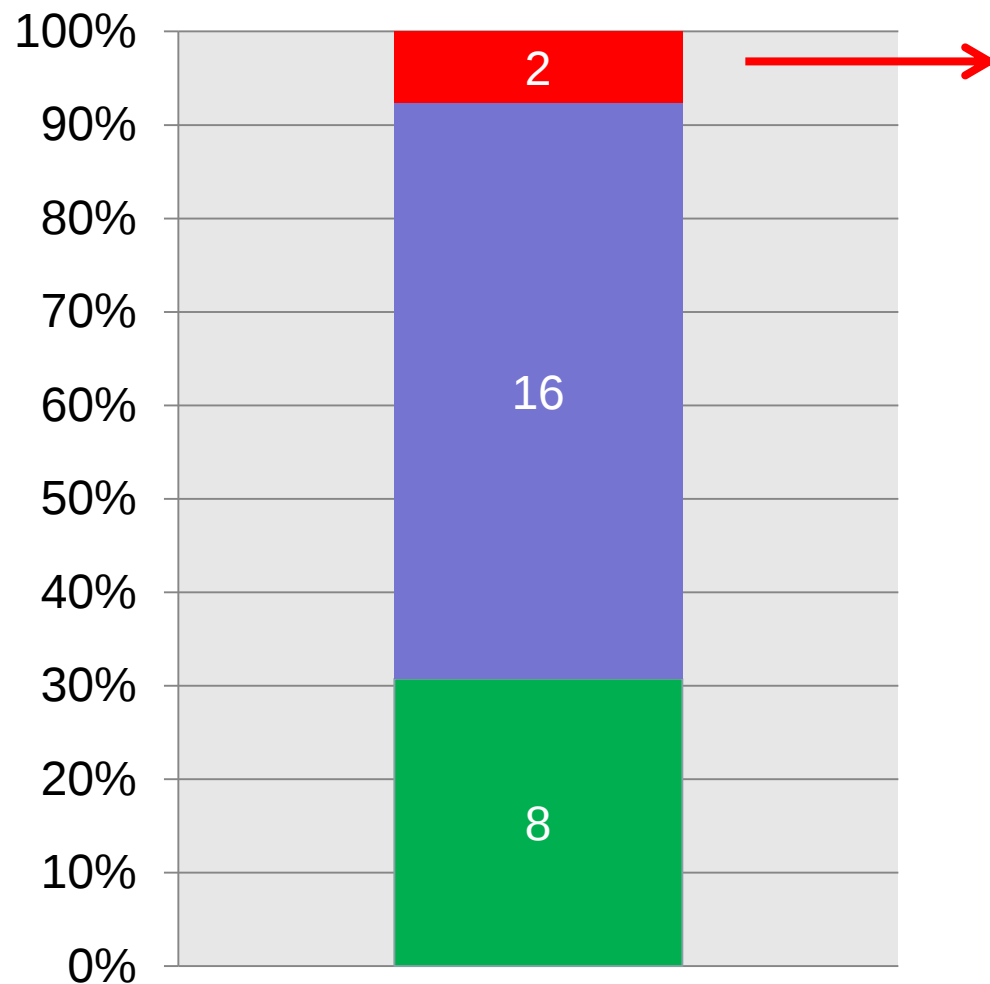
Compensatory Rest

After PPCI on call night: Centre vol ≥ 400 pPCI



Compensatory Rest

After PPCI on call night: Centre vol ≥ 400 pPCI

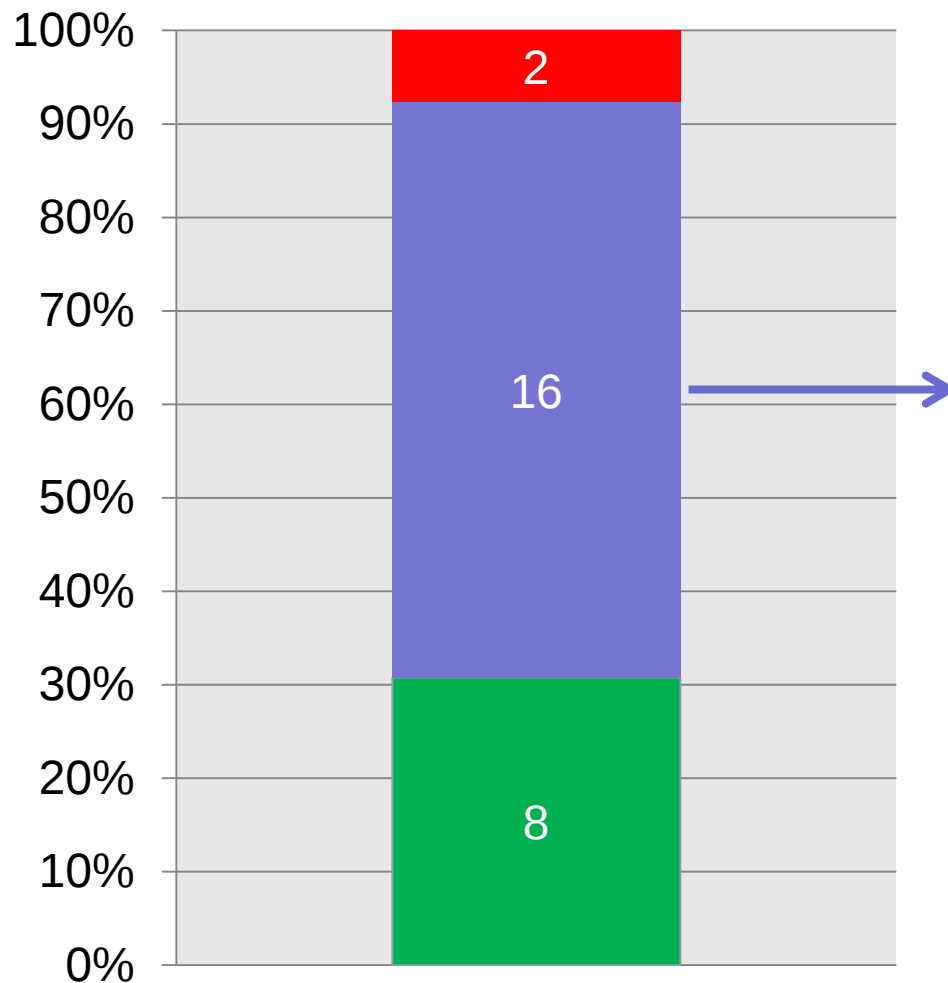


No change

ERI	Edinburgh Heart Centre
EBH	Birmingham Heartlands Hospital

Compensatory Rest

After PPCI on call night: Centre vol ≥ 400 pPCI

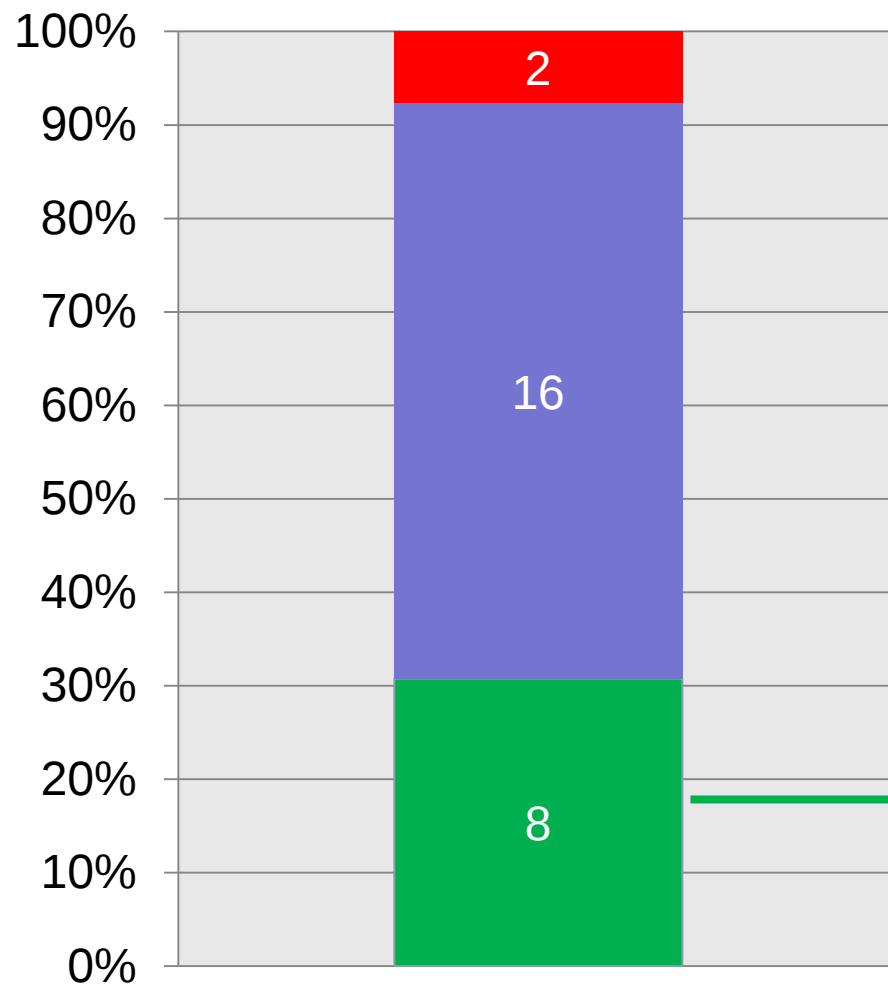


Reduced Activity

FRE	Freeman Hospital
NGS	Northern General Hospital
VIC	Blackpool Victoria Hospital
GJH	Golden Jubilee National Hospital
SCM	James Cook University Hospital
WHH	William Harvey Hospital
SBH	Barts Health Centre
PAP	Papworth Hospital
NCR	New Cross Hospital
BRI	Bristol Royal Infirmary
UHW	University Hospital of Wales
STO	University Hospital of North Staffordshire
NOR	Norfolk and Norwich University Hospital
GEO	St George's Hospital
WAL	University Hospital Coventry
GRL	Glenfield Hospital

Compensatory Rest

After PPCI on call night: Centre vol ≥ 400 pPCI

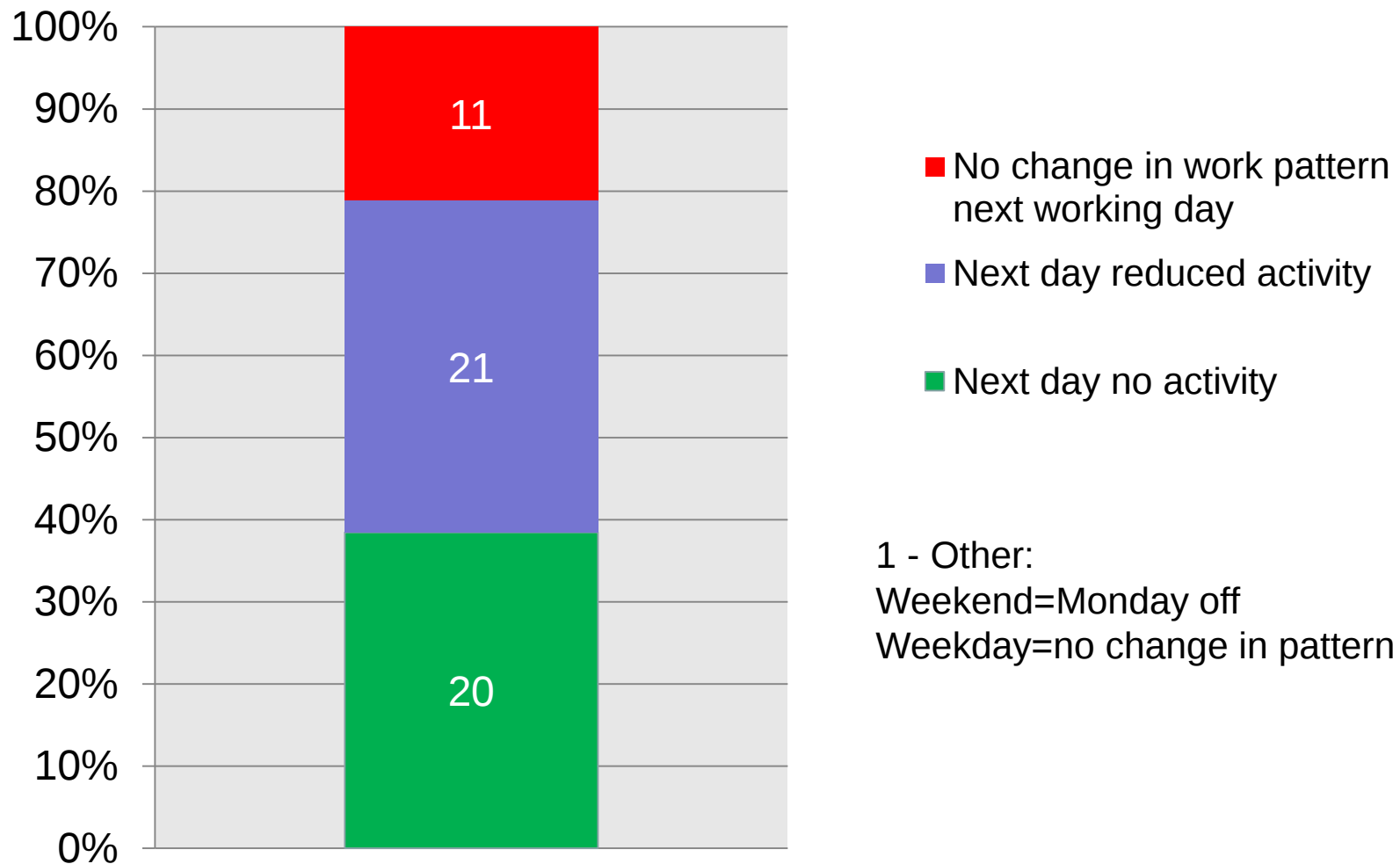


No Activity

LGI	Yorkshire Heart Centre
BHL	Liverpool Cardiothoracic Centre
BAS	Basildon and Thurrock University Hospitals
MRI	Manchester Royal Infirmary
WYT	Wythenshawe Hospital
CHH	Castle Hill Hospital
MOR	Morrison Hospital
HAI	Hairmyres Hospital

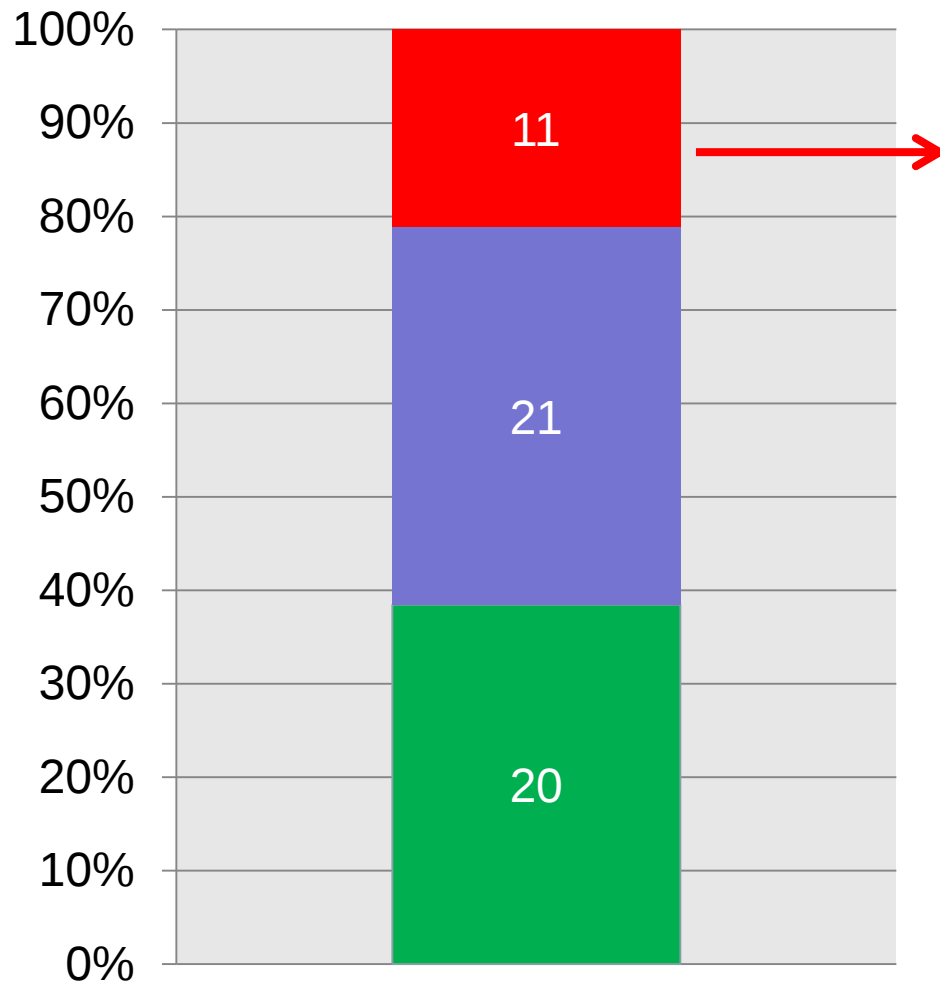
Compensatory Rest

After PPCI on call night Centre vol < 400 pPCI



Compensatory Rest

After PPCI on call night Centre vol < 400 pPCI

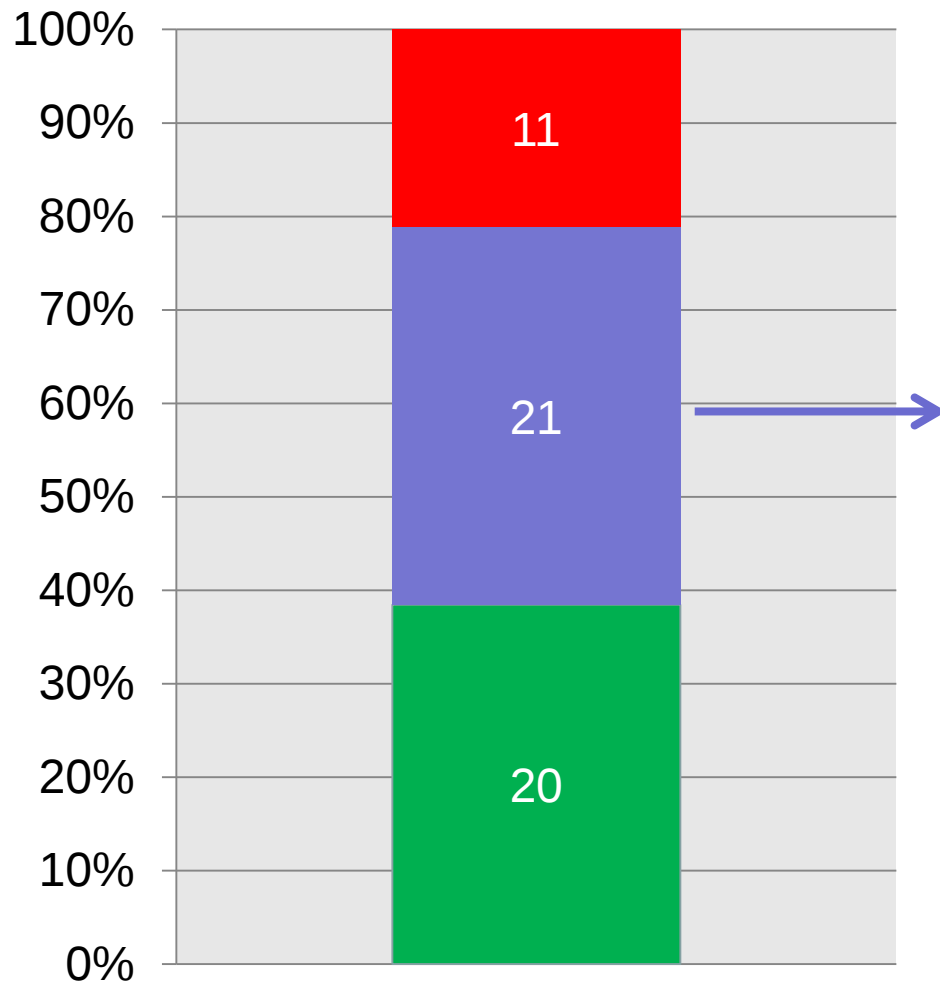


No change

KCH	Kings College Hospital
RSC	Royal Sussex County Hospital
WRC	Worcester Royal Hospital
RAD	John Radcliffe Hospital
BOU	Royal Bournemouth Hospital
SGH	Southampton General Hospital
RIA	Aberdeen Royal Infirmary
PLY	Southwest Cardiothoracic Centre
ALT	Altnagelvin Hospital
STH	St Thomas' Hospital
TOR	Torbay Hospital
SPH	St Peter's Hospital
NHH	Basingstoke and North Hampshire Hospital
DGE	Eastbourne Hospital
CGH	Conquest Hospital
BAT	Royal United Hospital Bath
SUN	Sunderland Royal Hospital
WAT	Watford General Hospital
WMU	West Middlesex University Hospital
GWE	Royal Gwent Hospital

Compensatory Rest

After PPCI on call night Centre vol < 400 pPCI

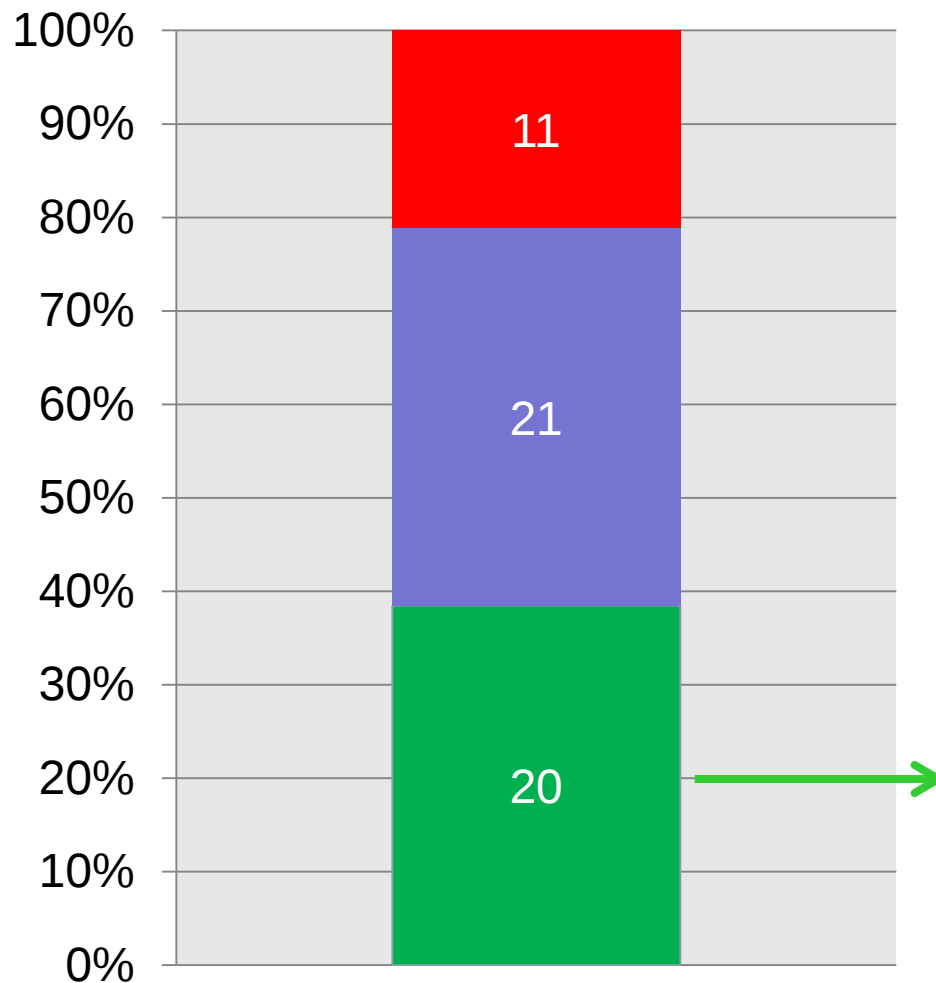


Reduced Activity

HAM	Hammersmith Hospital
CHN	Nottingham City Hospital
QAP	Queen Alexandra Hospital
DER	Royal Derby Hospital
RFH	Royal Free Hospital
KGH	Kettering General Hospital
CLW	North Wales Cardiac Centre
RDE	Royal Devon & Exeter Hospital
LIS	Lister Hospital
QEB	Queen Elizabeth Hospital, Birmingham
RCH	Royal Cornwall Hospital
DUD	Birmingham City Hospital
MPH	Musgrove Park Hospital
WEX	Wexham Park Hospital
BHR	Royal Berkshire and Battle Hospital
SAL	Salisbury District Hospital
BLA	Royal Blackburn Hospital
BSM	Southmead Hospital Bristol
DVH	Darent Valley Hospital
RHI	Calderdale Royal Hospital
YDH	York District General Hospital

Compensatory Rest

After PPCI on call night Centre vol < 400 pPCI



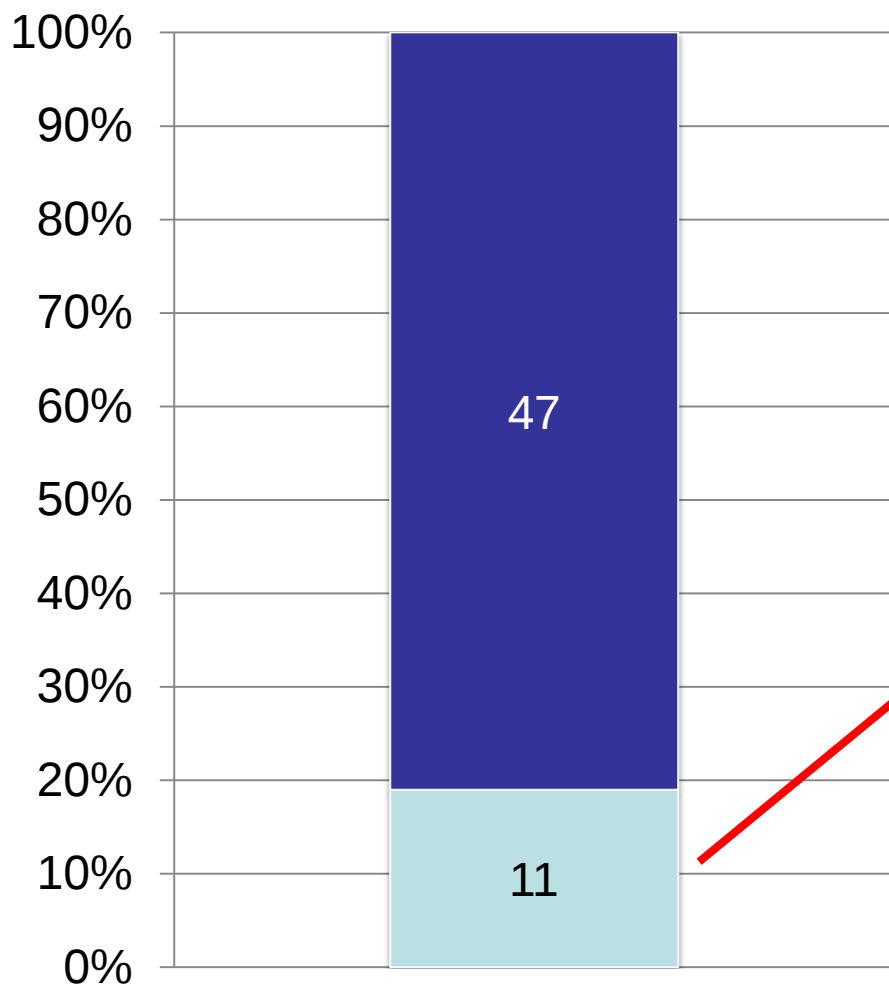
No Activity

LIN	Lincoln County Hospital
CMI	Cumberland Infirmary
PMS	Wiltshire Cardiac Centre
MDW	Medway Maritime Hospital
AEI	Royal Albert Edward Infirmary (Wigan)
WRG	Worthing Hospital
BRD	Bradford Royal Infirmary
BRY	Acute Pennine Trust Fairfield
KMH	Kings Mill Hospital
PIN	Pinderfields General Hospital
RVB	Royal Victoria Hospital

If activity is reduced following primary PCI on call, then this is covered by:

- No change in PAs, work just shifted elsewhere
- or
- Reduced PAs

If activity is reduced following primary PCI on call, then this is covered by:



- No change in PAs, just work shifted elsewhere
- Reduced PAs

BAS	Basildon and Thurrock University Hospitals
CHN	Nottingham City Hospital
CLW	North Wales Cardiac Centre
KMH	Kings Mill Hospital
KSX	Tunbridge Wells Hospital
LIN	Lincoln County Hospital
MDW	Medway Maritime Hospital
NGS	Northern General Hospital
PAP	Papworth Hospital
RHI	Calderdale Royal Hospital
WHH	William Harvey Hospital



Primary Percutaneous Coronary Intervention for ST Elevation Myocardial Infarction
Position statement for Facilities and Emergency Medical Staffing July 2016

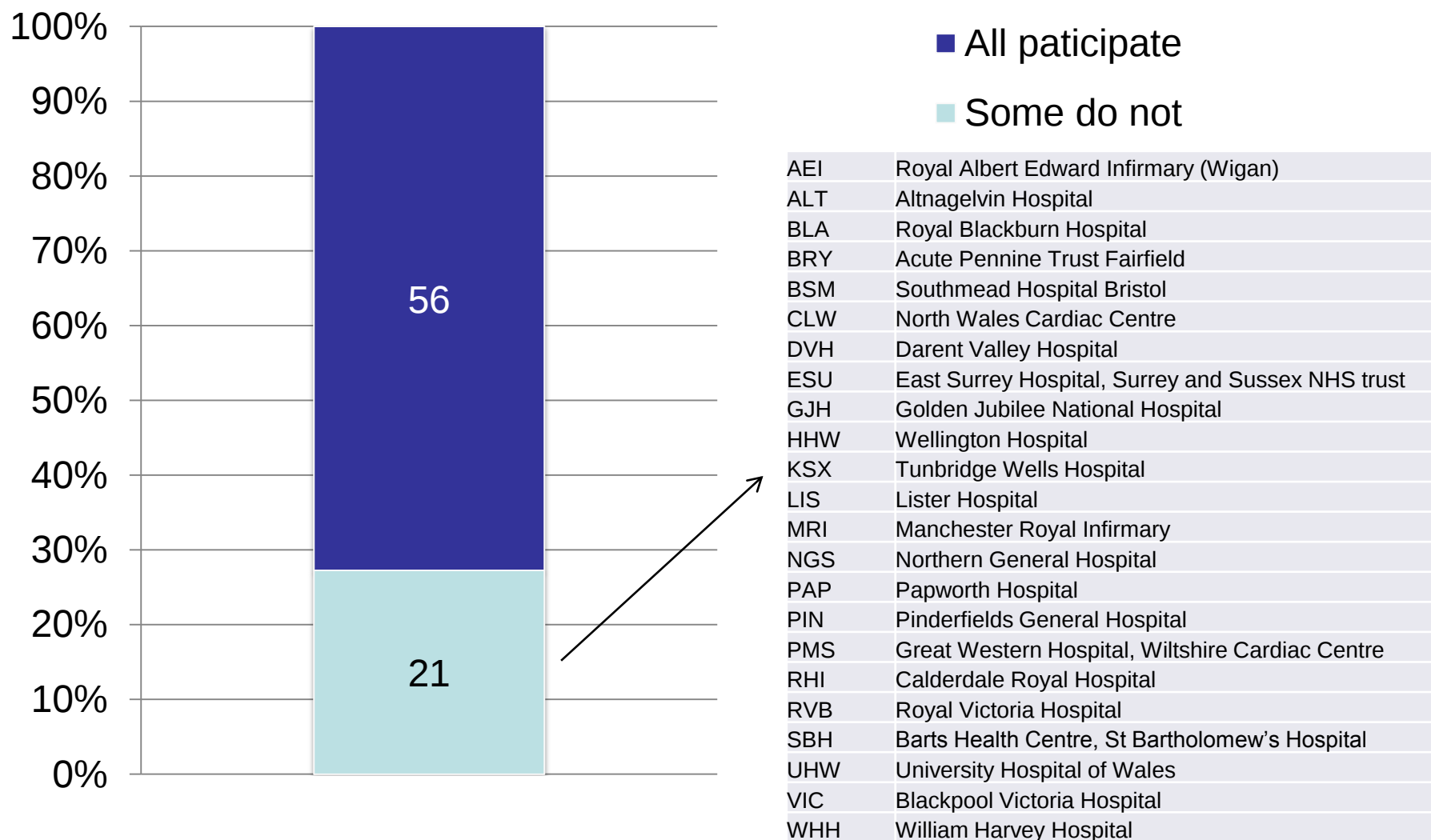
MacCarthy PA, Blackman DJ, Hildick-Smith D, Banning AP

2.2 Primary PCI operators

Key Recommendations

- All Interventional Cardiologists should participate in an agreed 24/7 PPCI rota
- All Interventional Cardiologists should undertake a minimum of 20 PPCI procedures per year

Are there any interventional cardiologists at your centre who DO NOT participate in that on call rota?



Routine Repatriation

NSTEMI and STEMI

26 Centres

AEI	Royal Albert Edward Infirmary (Wigan)
ALT	Altnagelvin Hospital
BED	Bedford Hospital
BRY	Acute Pennine Trust Fairfield
CLW	North Wales Cardiac Centre
CRG	Craigavon Hospital
EBH	Birmingham Heartlands Hospital
ERI	Edinburgh Heart Centre
GJH	Golden Jubilee National Hospital (formerly HCI)
GWH	Queen Elizabeth Hospital Woolwich
HAI	Hairmyres Hospital
HAM	Hammersmith Hospital
IPS	Ipswich Hospital
LGI	Yorkshire Heart Centre
MOR	Morrison Hospital
MPH	Musgrove Park Hospital
MRI	Manchester Royal Infirmary
NGS	Northern General Hospital
PMS	Great Western Hospital, Wiltshire Cardiac Centre
RFH	Royal Free Hospital
RVB	Royal Victoria Hospital
UHW	University Hospital of Wales
VIC	Blackpool Victoria Hospital
WDH	Dorset County Hospital
WMU	West Middlesex University Hospital
WRC	Worcester Royal Hospital

Morbidity and Mortality Meetings

For IHD (NHS Centres)

Frequency	
Once each week	5
Once every 2 weeks	1
Once a month	64
Every 2 months	6
Once a quarter	17
Sporadically	4
Never	1
Grand Total	98

Multidisciplinary Meetings

For IHD (NHS Centres)

Frequency	
Daily	2
3 times each week	2
2 times each week	11
Once a week	72
Once every 2 weeks	5
Once a month	3
Sporadically	1
Never	1
Other	1
Grand Total	98

Procedure Specific Data



NICOR

Developers

- Infrastructure
- Qreg5
- Mongo db

Live data analysis

Extracts
ONS data
(Anonymisation)

Analytic team

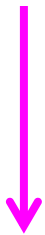
Linked and cleaned

Slide deck
benchmarking (QA / QI)

Outlier analysis
COP

Data Entry

PCI



Local
database



csv file
export



Direct

Patient

Pre-PCI Status

Medical History

Shock/O

Patient

Hospital Identifier ? *

Local Patient Identifier ? *

Patient Name (Surname) ?

Patient Name (Forename) ?

CSV

NICOR

CSV Import Process

Upload File

Uploading for: PETER LUDMANGEBINICOR

Hospital importing: QEB

Date: 20/12/2018 09:44

Assets: Please Select

Select CSV file: Browse...

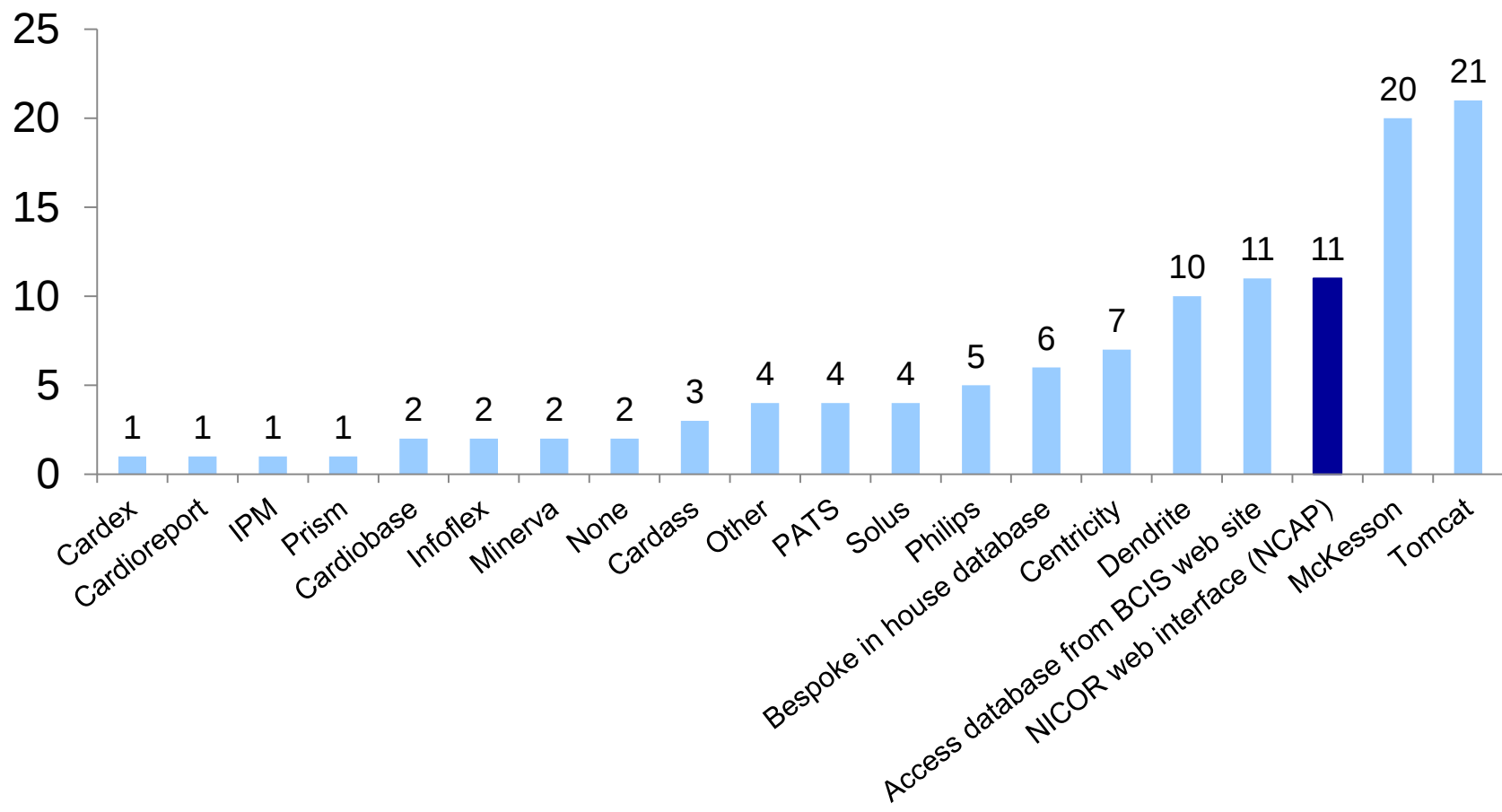
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NICOR User Guide

NICOR Technical Support call: 0203 765 0000 or email: nicor.helpdesk@nhs.uk

Data Gathering Software

2018-19



Procedure Specific Data Collection

The screenshot shows the NICOR Web Portal interface. The browser address bar displays <https://ncap.nicor.org.uk/web/restrictor>. The portal header includes navigation links: Home, Search Patient, Import (selected), Export, Completeness, and Logout. The user is logged in as PETER LUDMAN/QEB/NICOR. The main content area is titled 'CSV Import Process' and features an 'Upload File' button. Below this, a form contains the following fields: 'Uploading by' (PETER LUDMAN/QEB/NICOR), 'Hospital importing' (QEB), 'Date' (20/12/2018 09:44), 'Audit' (Please Select), and 'Select CSV file' (Browse...). A red asterisk and the text 'needed to save record' are visible above the form fields.

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NICOR User Guide

For Technical Support call: 0203 765 8550 or email nicor-helpdesk@bartshealth.nhs.uk

Procedure Specific Data Collection

The screenshot shows the NICOR Web Portal interface. The browser address bar displays <https://ncap.nicor.org.uk/web/restrictor>. The portal header includes navigation links: Home, Search Patient, Import (selected), Export, Completeness, and Logout. Below the header, the domain is set to PCI | Hospital: QEB, Queen Elizabeth Hospital, Edgbaston | PETER LUDMAN/QEB/NICOR. The main content area is titled 'CSV Import Process' and features an 'Upload File' button. A red asterisk indicates a required field: 'needed to save record'. The form contains the following fields: 'Uploading by' (text input with value 'PETER LUDMAN/QEB/NICOR'), 'Hospital importing' (text input with value 'QEB'), 'Date' (text input with value '20/12/2018 09:44'), 'Audit' (dropdown menu with value 'Please Select'), and 'Select CSV file' (text input with a 'Browse...' button).

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[NCAP User Guide](#)

For Technical Support call: 0203 760 6666 or email nicor-helpdesk@bartshealth.nhs.uk

Procedure Specific Data Collection

https://ncap.nicor.org.uk/web/restricted/ NICOR Web Portal NICOR NCAP

Home Search Patient Import Export Completeness Logout

Domain: PCI | Hospital : QEB. Queen Elizabeth Hospital, Edgbaston | PETER LUDMAN/QEB/NICOR

CSV Import Process

Upload File

* needed to save record

Uploading by: PETER LUDMAN/QEB/NICOR

Hospital importing *: QEB

Date: 20/12/2018 09:44

Audit *: Please Select

Select CSV file *: Browse...

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NCAP User Guide

For Technical Support call: 0203 765 8550 or email nicor-

https://ncap.nicor.org.uk/web/restricted/im/ NICOR Web Portal NICOR NCAP

Home Search Patient Import Export Completeness Logout

Domain: PCI | Hospital : QEB. Queen Elizabeth Hospital, Edgbaston | PETER LUDMAN/QEB/NICOR

Previous imports for QEB

Refresh

The information regarding the status of your upload does not automatically refresh. To check if the upload has completed, please click "Refresh"

Uploaded Date	Dataset Version	Records Count							Messages Count			Status	Log	CSV
		Total	New Signed	New Draft	Modified Signed	Modified Draft	Rejected	Not Modified	Warning	Serious	Fatal			
03/12/2018 10:24	Pci_5.6.5	780	21	0	47	0	1	711	16	5	1	Completed		
23/11/2018 16:51	Pci_5.6.5	758	19	2	20	1	0	716	13	5	0	Completed		
14/11/2018 17:17	Pci_5.6.5	1676	6	0	10	1	0	1659	33	3	0	Completed		

Procedure Specific Data Collection

https://ncap.nicor.org.uk/web/restricted/ NICOR Web Portal NICOR NCAP

Home Search Patient Import Export Completeness Logout

Domain: PCI | Hospital : QEB. Queen Elizabeth Hospital, Edgbaston | PETER LUDMAN/QEB/NICOR

CSV Import Process

Upload File

* needed to save record

Uploading by: PETER LUDMAN/QEB/NICOR

Hospital importing *: QEB

Date: 20/12/2018 09:44

Audit *: Please Select

Select CSV file *: Browse...

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NCAP User Guide

For Technical Support call: 0203 765 8550 or email nicor-

https://ncap.nicor.org.uk/web/restricted/im/ NICOR Web Portal NICOR NCAP

Home Search Patient Import Export Completeness Logout Domain: PCI | Hospital : QEB. Queen Elizabeth Hospital, Edgbaston | PETER LUDMAN/QEB/NICOR

NICOR

Previous imports for QEB Refresh

The information regarding the status of your upload does not automatically refresh. To check if the upload has completed, please click "Refresh"

Uploaded Date	Dataset Version	Records Count							Messages Count			Status	Log	CSV
		Total	New Signed	New Draft	Modified Signed	Modified Draft	Rejected	Not Modified	Warning	Serious	Failed			
03/12/2018 10:24	Pci_5.6.5	780	21	0	47	0	1	711	16	5	1	Completed		
23/11/2018 16:51	Pci_5.6.5	758	19	2	20	1	0	716	13	5	0	Completed		
14/11/2018 17:17	Pci_5.6.5	1676	6	0	10	1	0	1659	33	3	0	Completed		

Procedure Specific Data Collection

RECORD SEQUENCE	LOG ENTRY	SURNAME	FORENAME	HOSPITAL NUMBER	DATE_AND_TIME_O	PROCEDURE	CONSULTANT RESPONSIBLE FOR	LOG											
1	NUMBER DATE"				F OPERATION	GMC NUMBER	TYPE												
2	292 02/12/2019 17:41				12/04/2019 13:30	6111053	WARNING	Out of Hospital Arrest is 1. Yes and Arterial blood gas on arrival: ph is blank											
3	292 02/12/2019 17:41				12/04/2019 13:30	6111053	WARNING	Out of Hospital Arrest is 1. Yes and Arterial blood gas on arrival: Base is blank											
4	292 02/12/2019 17:41				12/04/2019 13:30	6111053	WARNING	Out of Hospital Arrest is 1. Yes and Arterial blood gas on arrival: Lactate is blank											
5	326 02/12/2019 17:41				28/04/2019 21:06	3334722	WARNING	Out of Hospital Arrest is 1. Yes and Arterial blood gas on arrival: Base is blank											
6	388 02/12/2019 17:41				21/05/2019 18:58	4613174	WARNING	Postcode Of Usual Address is in invalid format. Please check and enter valid Postcode											
7	418 02/12/2019 17:41				02/06/2019 20:00	6048882	WARNING	Postcode Of Usual Address is in invalid format. Please check and enter valid Postcode											
8	426 02/12/2019 17:41				03/06/2019 17:27	4077196	WARNING	Postcode Of Usual Address is in invalid format. Please check and enter valid Postcode											
9	428 02/12/2019 17:41				04/06/2019 18:13	4613174	WARNING	Postcode Of Usual Address is in invalid format. Please check and enter valid Postcode											
10	444 02/12/2019 17:41				10/06/2019 15:56	6048882	WARNING	Postcode Of Usual Address is in invalid format. Please check and enter valid Postcode											
11	493 02/12/2019 17:41				27/06/2019 17:41	2820567	WARNING	Out of Hospital Arrest is 1. Yes and Arterial blood gas on arrival: Base is blank											
12	515 02/12/2019 17:41				07/07/2019 15:57	6111053	WARNING	Postcode Of Usual Address is in invalid format. Please check and enter valid Postcode											
13	717 02/12/2019 17:41				20/09/2019 12:07	6048882	WARNING	Out of Hospital Arrest is 1. Yes and Arterial blood gas on arrival: Lactate is blank											
14	717 02/12/2019 17:41				20/09/2019 12:07	6048882	WARNING	Out of Hospital Arrest is 1. Yes and Arterial blood gas on arrival: Base is blank											
15	717 02/12/2019 17:41				20/09/2019 12:07	6048882	WARNING	Out of Hospital Arrest is 1. Yes and Arterial blood gas on arrival: ph is blank											
16	773 02/12/2019 17:41				08/10/2019 13:10	4077196	WARNING	Cx Stenosis (PCI) is blank											
17	802 02/12/2019 17:41				17/10/2019 17:23	2820567	SERIOUS	Number lesions successful must be <= Number lesions attempted.											
18	815 02/12/2019 17:42				21/10/2019 17:52	4077196	FATAL	Number of lesions attempted =0 and number of vessels attempted =0 but none of the 1-6 options are selected as true											
19	827 02/12/2019 17:42				27/10/2019 16:50	4077196	SERIOUS	If Indication for Intervention is 4,5,6,7,8 or 12 then Procedure Urgency must be 3. Emergency or 4. Salvage											
20	828 02/12/2019 17:42				29/10/2019 10:20	4077196	WARNING	Postcode Of Usual Address is in invalid format. Please check and enter valid Postcode											

https://ncap.nicor.org.uk/web/restricted/im NICOR Web Portal NICOR NCAP

Home Search Patient Import Export Completeness Logout Domain: PCI | Hospital : QEB. Queen Elizabeth Hospital, Edgbaston | PETER LUDMAN/QEB/NICOR

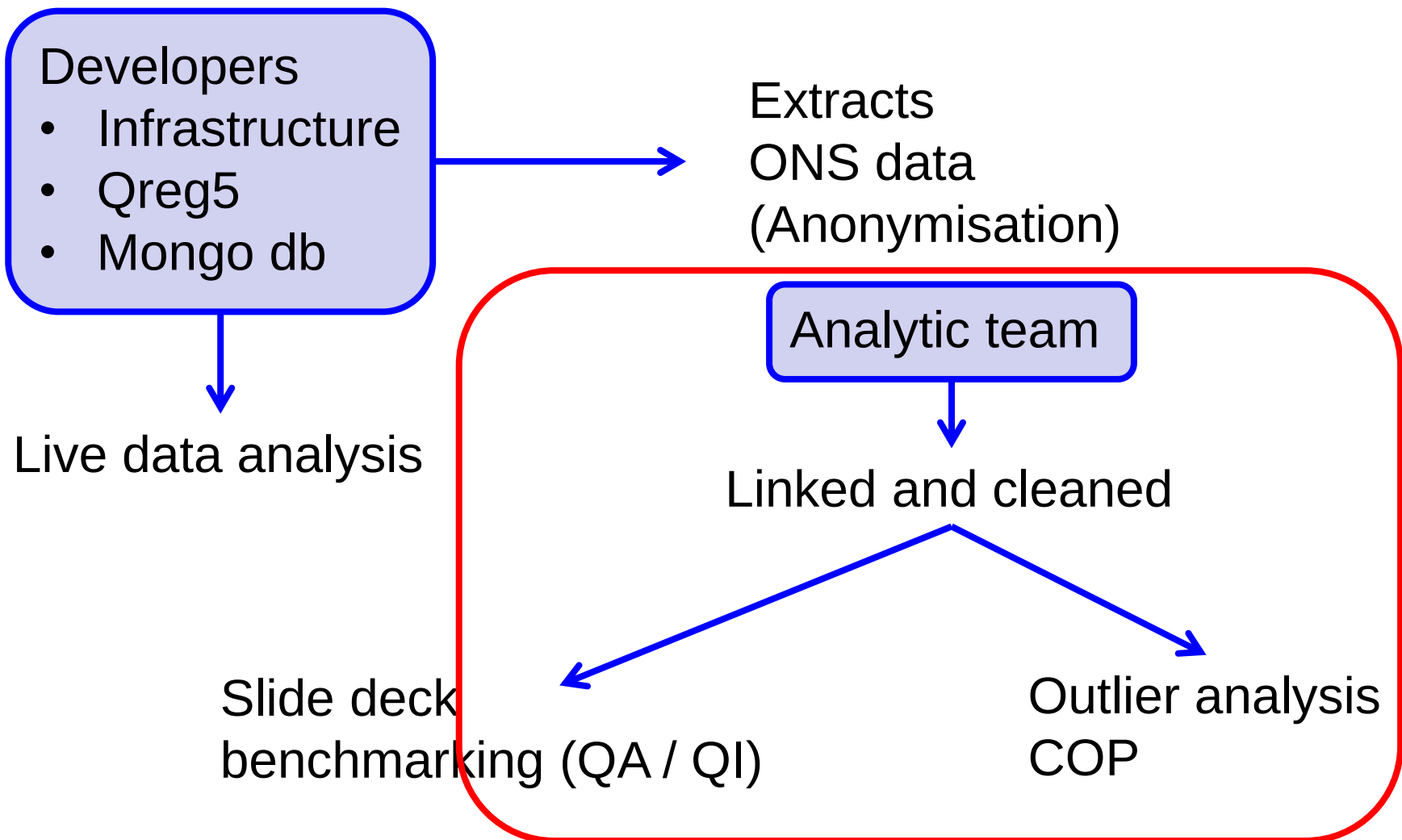
NICOR

Previous imports for QEB [Refresh](#)

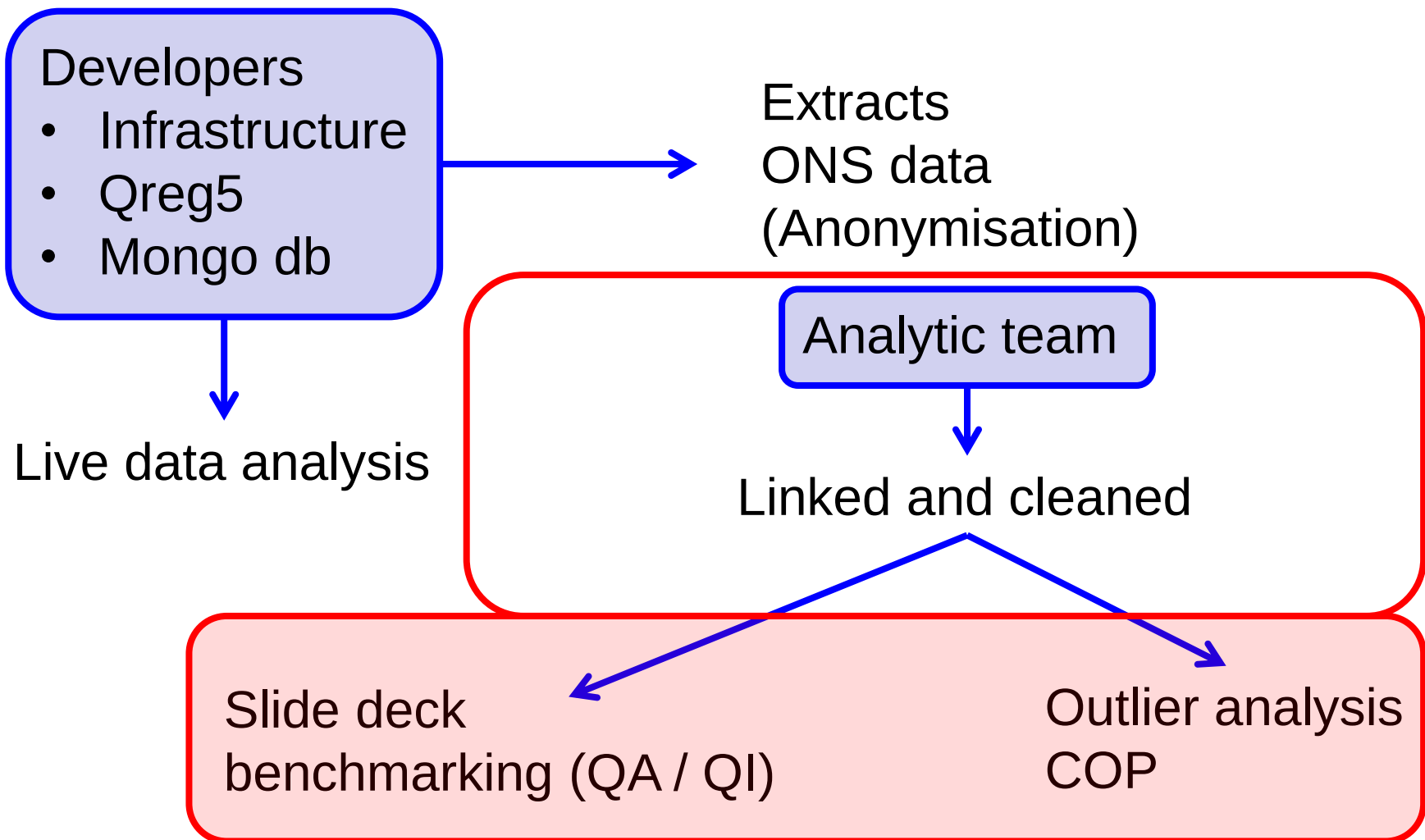
The information regarding the status of your upload does not automatically refresh. To check if the upload has completed, please click "Refresh"

Uploaded Date	Dataset Version	Records Count							Messages Count			Status	Log	CSV
		Total	New Signed	New Draft	Modified Signed	Modified Draft	Rejected	Not Modified	Warning	Serious	Fatal			
03/12/201810:24	Pci_5.6.5	780	21	0	47	0	1	711	16	5	0	Completed		
23/11/201816:51	Pci_5.6.5	758	19	2	20	1	0	716	13	5	0	Completed		
14/11/201817:17	Pci_5.6.5	1676	6	0	10	1	0	1659	33	3	0	Completed		

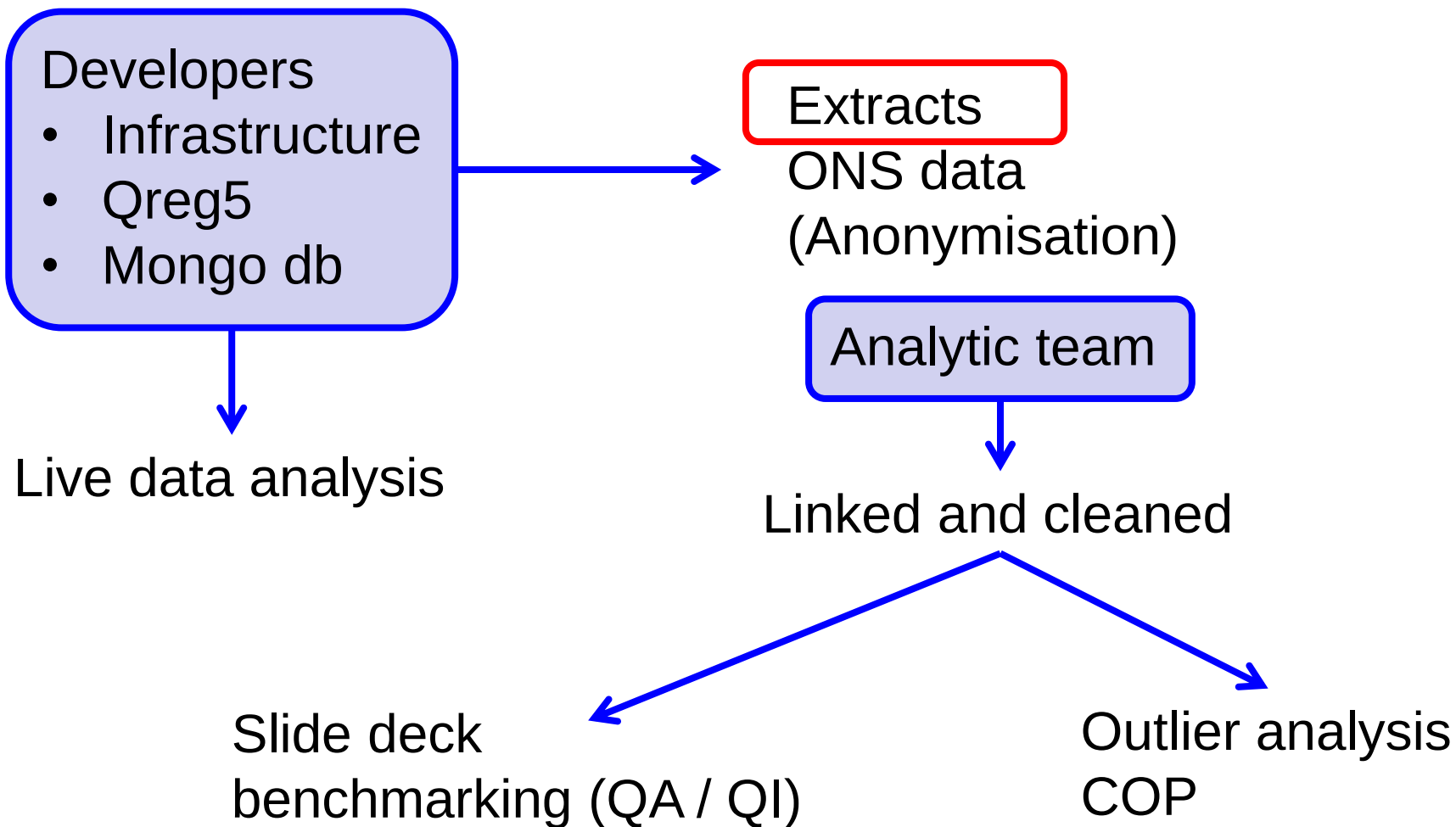
NICOR



NICOR



NICOR



Procedure Specific Data Analysis

- Data Quality
 - Centre participation
 - Case ascertainment
 - Data completeness

Procedure Specific Data Analysis

- Data Quality
 - Centre participation
 - Case ascertainment
 - Data completeness

Procedure Specific Analysis

Participation in NICOR 2018-19

		Total No. of Centres	Data to NICOR*	Missing
England	NHS	85	85 → 80	5
	Private	17	10 → 11	6
Wales	NHS	4	4	0
	Private	1	1	0
N Ireland		3	2 → 1	2
Scotland	NHS	6	5 → 4	2
	Private	2	2	0

*Arrows show comparison with 2017-18

Procedure Specific Analysis

Participation in NICOR 2018-19

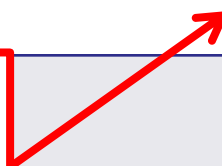
		Total No. of Centres	Data to NICOR*	Missing
England	NHS	85	85 → 80	5 → 0
BAT, WMU, QAP, KCH, BLA All aware and correcting technical issues				6
				0
	Private	1	1	0
N Ireland		3	2 → 1	2
Scotland	NHS	6	5 → 4	2
	Private	2	2	0

*Arrows show comparison with 2017-18

Procedure Specific Analysis

Participation in NICOR 2018-19

		Total No. of Centres	Data to NICOR*	Missing
England	NHS	85	85 → 80	5
	Private	17	10 → 11	6
BMI Park Hospital (PHN)				0
London Bridge Hospital (LBH)				0
Leeds Nuffield Hospital (LNH)				2
Spire Hospital Hull and East Riding (HBP)				2
Wellington Hospital (HHW)				2
Harley Street Clinic (HSC)				0
Private		2	2	0



Procedure Specific Analysis

Participation in NICOR 2018-19

		Total No. of Centres	Data to NICOR*	Missing
England	NHS	85	85 → 80	5
	Private	17	10 → 11	6
Wales	NHS	4	4	0
	Private	0	0	0
N Ireland		3	2 → 1	2
Scotland	NHS	6	5 → 4	2
	Private	2	2	0

Altnagelvin Hospital (ALT)
Royal Victoria Hospital (RVB)

*Arrows show comparison with 2017-18

Procedure Specific Analysis

Participation in NICOR 2018-19

		Total No. of Centres	Data to NICOR*	Missing
England	NHS	85	85 → 80	5
	Private	17	10 → 11	6
Wales	NHS	4	4	0
	Private	1	1	0
Royal Infirmary of Edinburgh (ERI) Ninewells Hospital (NIN)				2
Scotland	NHS	6	5 → 4	2
	Private	2	2	0

*Arrows show comparison with 2017-18

Procedure Specific Data Analysis

- Data Quality
 - Centre participation
 - Case ascertainment
 - Data completeness

Case Ascertainment

BCIS Aggregate Audit for Adult Percutaneous Interventional Procedures (1st January 2012 to 31st December 2012)	BCIS Aggregate Audit for Adult Percutaneous Interventional Interventional procedures
	*51. Overall Total Number of PCI procedures Note - This does not include procedures where ONLY a pressure wire / IVUS or OCT study has taken place. - This number will be compared with the number of cases uploaded to NICOR in order to assess case ascertainment.



NICOR
Data warehouse

Case Ascertainment

New methodology

Wales: Patient Episode Database for Wales (PEDW)

England: Hospital Episode statistics (England)



NICOR
Data warehouse

Case Ascertainment

New methodology

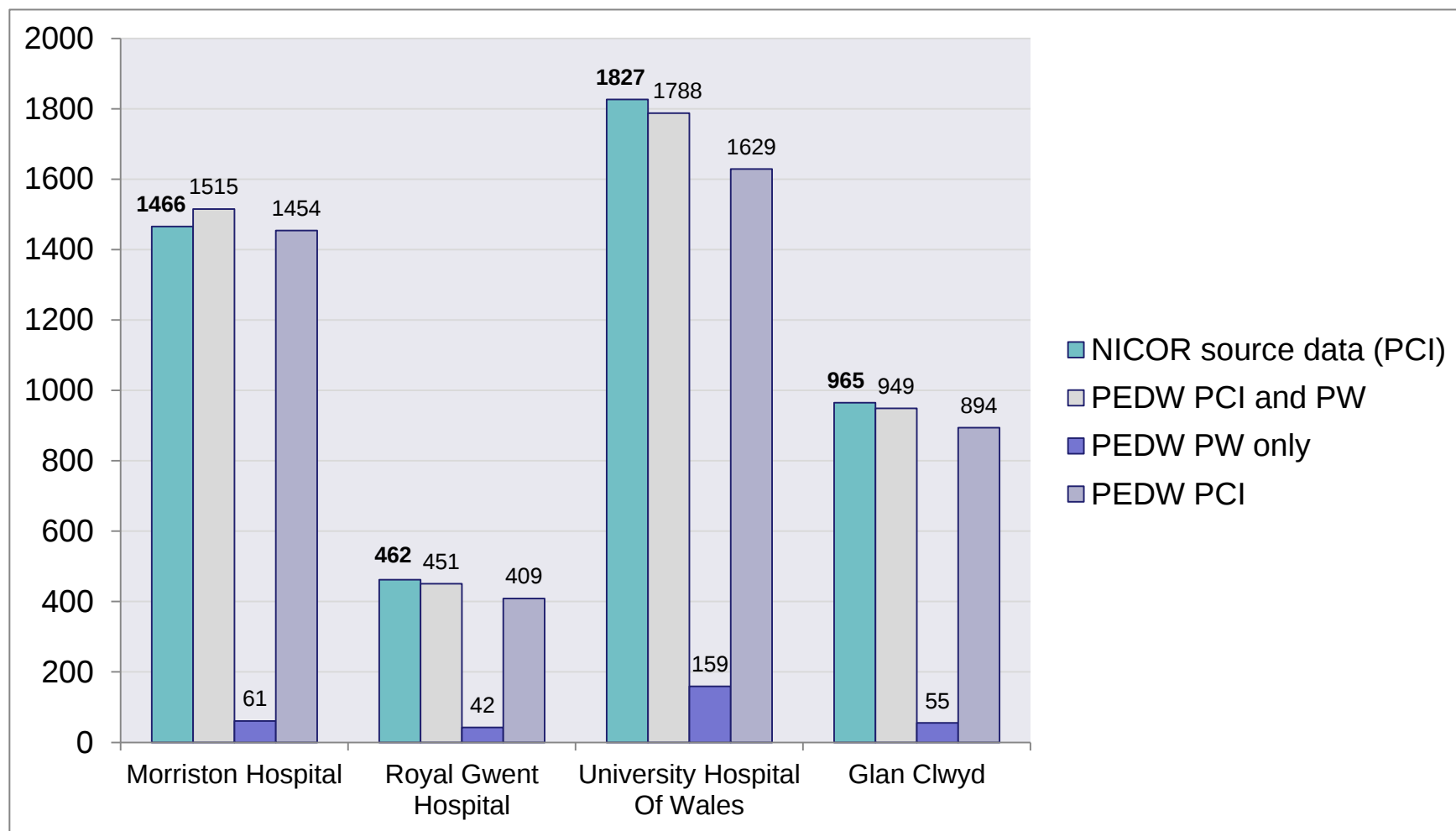
Wales: Patient Episode Database for Wales (PEDW)

England: Hospital Episode statistics (England)

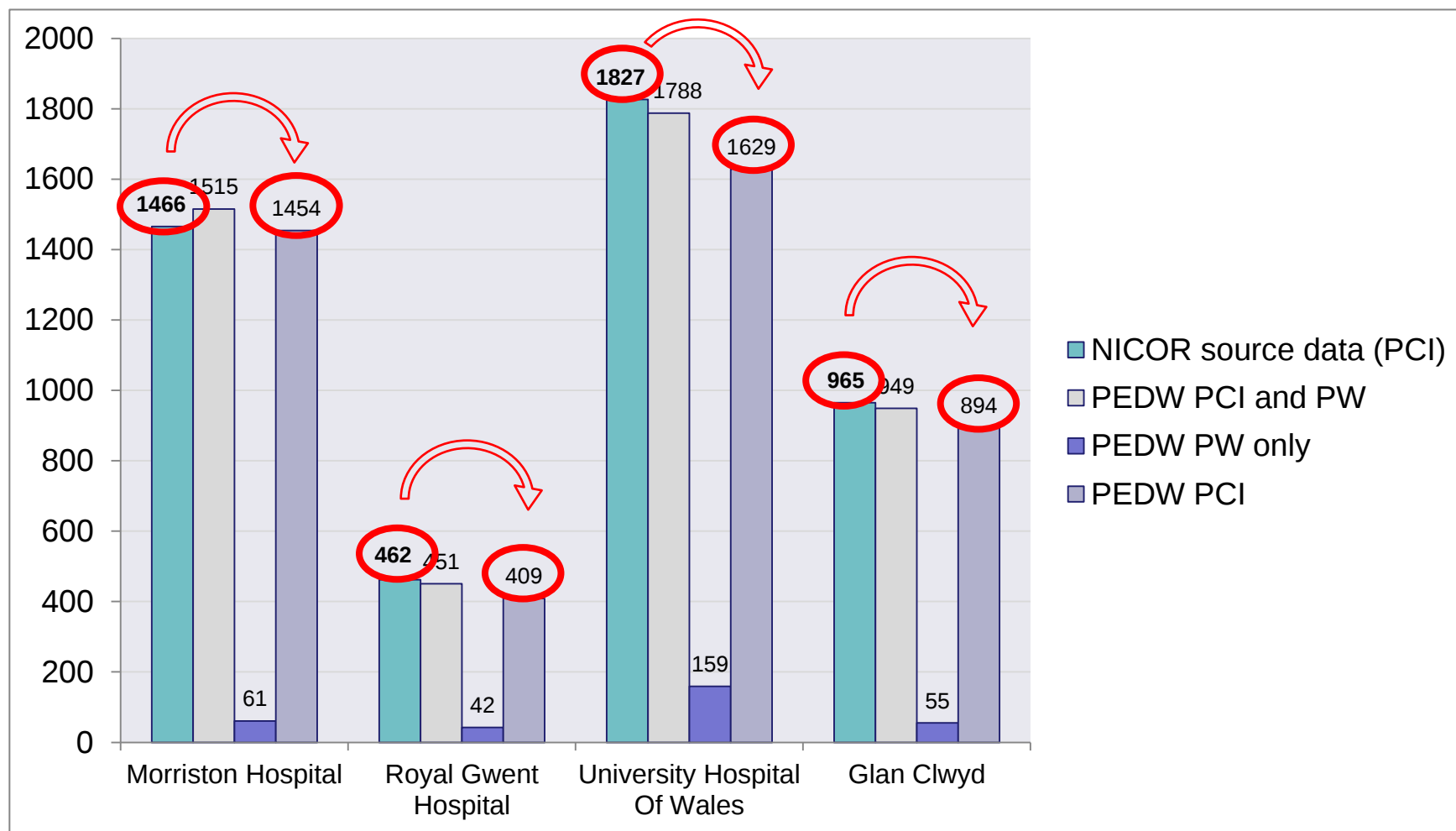


NICOR
Data warehouse

Case Ascertainment



Case Ascertainment



Case Ascertainment

New methodology

Wales: Patient Episode Database for Wales (PEDW)

England: Hospital Episode statistics (England)



HES Data
awaited

NICOR
Data warehouse

Procedure Specific Data Analysis

- Data Quality
 - Centre participation
 - Case ascertainment
 - Data completeness

Procedure Specific Data Analysis

- Data Quality
 - Centre participation
 - Case ascertainment
 - Data completeness
- 
- Assessed for 3 scenarios:
 - 1. Risk adjusted outcomes
 - 2. Delays to treatment for Primary PCI
 - 3. Delays to treatment for UA / NSTEMI

NICOR Minimum Data Standard

- > 95% completeness

All PCI

1.03	NHS number (E&W)
1.06	Birth date
1.07	Sex
5.05	Medical History
2.13	Previous MI
5.06	History of renal disease
2.16	Diabetes
5.35	Creatinine
2.18	Weight
2.04	Cardiogenic shock (Pre- PCI)
2.03	Procedure urgency
3.09	Vessels attempted
4.04	Discharge date
4.03	Status at discharge
4.01	PCI Hospital outcome
5.31	Consultant responsible GMC Number
3.02	Consultant responsible Name

Primary PCI

(in community at symptom onset)

5.30	Location of Patient at STEMI onset
3.26	Date/time of first balloon inflation

PCI for all types of ACS

2.07	Date/time of symptom onset
5.27	Date/time of call for help
2.08	Date/time of arrival at first hospital
5.26	Date/time of arrival at PCI hospital
2.09	Admission Route

Data Completeness Tool

NICOR **BCIS Reports** Refresh Hospital QEB. Queen Elizabeth Logout

**New data completeness tool
Available from March 2020**

Standard

Reports	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
View Reports	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
• Aggregate (by Hospital)	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
• Aggregate (by GMC No.)	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
• Delays	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
• VLAD	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
• Funnel (by Hospital)	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
• Funnel (by GMC No.)	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
Completeness	88.8	89.3	84.8	87.1	90.3	92	82.9	90.9	87	N/A	N/A	N/A
Support	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
020 3108 1978	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A
Technical Support	100	100	100	100	100	100	100	100	100	N/A	N/A	N/A



Data Completeness

Calculate Completeness

Audit Please Select ▼

Date Interval DD/MM/YYYY

And DD/MM/YYYY

Report Level COMPLETE ▼

Data completeness

User Reports ▼

QI Reports

Data Completeness

[Calculate Completeness](#)

Audit

Pci_5_6_5 ▾

Date Interval

01/01/2019



And

31/12/2019



Report Level

COMPLETE ▾

Results

[Export to CSV](#)

Variable Desc	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019
Administrative Category	97.0	100.0	98.0	98.0	100.0	100.0	96.0	98.0	95.0	97.0	96.0	100.0
Admission route (ACS only)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.0
Arterial Complications	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arterial access	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arterial blood gas on arrival in cath lab: Base excess	100.0	100.0	100.0	97.0	100.0	98.0	100.0	100.0	98.0	100.0	98.0	100.0
Arterial blood gas on arrival in cath lab: Lactate	100.0	100.0	100.0	98.0	100.0	100.0	100.0	100.0	98.0	100.0	98.0	100.0
Arterial blood gas on arrival in cath lab: pH	100.0	100.0	100.0	98.0	100.0	100.0	100.0	100.0	98.0	100.0	98.0	100.0
Arterial management	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Athero-thrombus removal device(s) used	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Birth Date	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Audit

Date Interval

And

Report Level

Results

Export to CSV

Variable Desc	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019
Patient Ethnic Group	98.0	100.0	100.0	100.0	100.0	100.0	98.0	100.0	100.0	100.0	96.0	100.0
CCS Angina Status (Pre-procedure; Stable only)	98.0	100.0	100.0	100.0	100.0	100.0	98.0	100.0	98.0	100.0	98.0	100.0
Previous MI	97.0	97.0	100.0	100.0	98.0	100.0	100.0	98.0	100.0	100.0	100.0	100.0
Family history of CAD	97.0	97.0	97.0	97.0	98.0	97.0	100.0	100.0	91.0	97.0	94.0	98.0
Administrative Category	97.0	100.0	98.0	98.0	100.0	100.0	96.0	98.0	95.0	97.0	96.0	100.0
Research title	97.0	100.0	100.0	98.0	100.0	98.0	97.0	98.0	100.0	100.0	97.0	100.0
NYHA Dyspnoea Status (Pre-procedure; Stable only)	97.0	93.0	87.0	97.0	95.0	97.0	92.0	98.0	98.0	100.0	98.0	100.0
Smoking status	96.0	91.0	97.0	94.0	93.0	96.0	96.0	98.0	90.0	95.0	93.0	88.0
Largest balloon/stent DIAMETER used	96.0	96.0	95.0	98.0	94.0	91.0	97.0	98.0	100.0	89.0	94.0	98.0

Audit

Date Interval

And

Report Level

Results

Export to CSV

Variable Desc	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019
Patient Ethnic Group	98.0	100.0	100.0	100.0	100.0	100.0	98.0	100.0	100.0	100.0	96.0	100.0
CCS Angina Status (Pre-procedure; Stable only)	98.0	100.0	100.0	100.0	100.0	100.0	98.0	100.0	98.0	100.0	98.0	100.0
Previous MI	97.0	97.0	100.0	100.0	98.0	100.0	100.0	98.0	100.0	100.0	100.0	100.0
Family history of CAD	97.0	97.0	97.0	97.0	98.0	97.0	100.0	100.0	91.0	97.0	94.0	98.0
Administrative Category	97.0	100.0	98.0	98.0	100.0	100.0	96.0	98.0	95.0	97.0	96.0	100.0
Research title	97.0	100.0	100.0	98.0	100.0	98.0	97.0	98.0	100.0	100.0	97.0	100.0
NYHA Dyspnoea Status (Pre-procedure; Stable only)	97.0	93.0	87.0	97.0	95.0	97.0	92.0	98.0	98.0	100.0	98.0	100.0
Smoking status	96.0	91.0	97.0	94.0	93.0	96.0	96.0	98.0	90.0	95.0	93.0	88.0
Largest balloon/stent DIAMETER used	96.0	96.0	95.0	98.0	94.0	91.0	97.0	98.0	100.0	89.0	94.0	98.0



Data Completeness

Calculate Completeness

Audit

Pci_5_6_5

Date Interval

01/01/2019

And

31/12/2019

Report Level

COMPLETE

Results

Export to CSV

Variable Desc	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019
Patient Ethnic Group	98.0	100.0	100.0	100.0	100.0	100.0	98.0	100.0	100.0	100.0	96.0	100.0
CCS Angina Status (Pre-procedure; Stable only)	98.0	100.0	100.0	100.0	100.0	100.0	98.0	100.0	98.0	100.0	98.0	100.0
Previous MI	97.0	97.0	100.0	100.0	98.0	100.0	100.0	98.0	100.0	100.0	100.0	100.0
Family history of CAD	97.0	97.0	97.0	97.0	98.0	97.0	100.0	100.0	91.0	97.0	94.0	98.0
Administrative Category												
Research title												
NYHA Dyspnoea Status (Pre-procedure)												
Smoking status												
Largest balloon/stent DIAMETER used												



Empty Records

Month

01/2019

Variable

Previous MI

Variable Tab(Group)

MedicalHistoryContainer

Completeness

97.0

Procedures

Export to CSV

Procedure Date	Dataset	Firstname	Surname	Hospital Number
08/01/2019 13:11	Pci 5 6 5			
11/01/2019 16:15	Pci 5 6 5			

[To Contents](#)



Data Completeness

Calculate Completeness

Audit

Pci_5_6_5

Date Interval

01/01/2019

And

31/12/2019

Report Level

COMPLETE

Results

Export to CSV

Variable Desc
Patient Ethnic Group
CCS Angina Status (Pre-procedure; Stable on
Previous MI
Family history of CAD
Administrative Category
Research title
NYHA Dyspnoea Status (Pre-procedure
Smoking status
Largest balloon/stent DIAMETER used

Patient

Pre-PCI Status

Medical History

Shock/OOHA

Operators

Cardiac Anatomy

PCI Procedure

Adjunctive Rx

Outcome

Medical History

Previous MI ?

0. No1. Yes9. Unknown

Previous CABG ?

0. No1. Yes9. Unknown

Previous PCI ?

0. No1. Yes9. Unknown

Diabetes ?

0. Not Diabetic

Height ?

163

Weight ?

63.0

Cholesterol ?

0.0

Procedures

Export to CSV

Procedure Date	Dataset	Firstname	Surname	Hospital Number
08/01/2019 13:11	Pci 5 6 5			
11/01/2019 16:15	Pci 5 6 5			

Contents

- **Structure (PCI)** [Jump to slide](#)
 - Angio and PCI centres and maps
 - Total angio and PCI numbers
 - No of PCIs per centre and per angio
 - PCI pmp and by country and v CABG
 - Centre PCI volumes
 - PCI operators, by centre, by PCI
 - On call rotas for PPCI
 - On site v off site surgical cover
 - Day case activity
 - Primary PCI units
- **NICOR data collection** [Jump to slide](#)
 - Centre participation
 - Databases used
 - Case ascertainment
 - Data completeness
- **Appropriateness (PCI)** [Jump to slide](#)
 - Demographics
 - Indication for PCI / Clinical syndrome
 - PPCI activity (by unit, pmp, by vessel)
 - [PCI for out of hospital arrest](#)
 - PCI territories / vessels / lesions/LMS/CTO
 - Stents (BMS and DES)
 - [Adjunctive pharmacotherapy](#)
 - LV support and shock
 - Primary PCI for > 80 yrs
 - Extraction / Rota / IVUS / OCT / FFR / Laser etc.
 - [Arterial access](#)

- **Process of care (PCI)** [Jump to slide](#)
 - Delays to treatment
 - NSTEMI (direct v IHT)
 - Primary PCI DTB / CTB
 - IHT versus Direct admission
 - Length of stay
- **Outcome (PCI)** [Jump to slide](#)
 - MACCE
 - Peri-procedural complications and by access
 - Tracked 30 day mortality
 - Outcome by syndrome
 - Outcome by lesion subset

- **Adult non coronary intervention** [Jump to slide](#)
 - Valves
 - **TAVI** and other Aortic [Jump to TAVI](#)
 - Mitral
 - PV / AV / TV
 - Septal ablation for HOCM
 - LAA occlusion
 - ASD / PFO / Para-prosthetic leak closure
 - Coro sinus / great vessel
 - Renal Denervation
- NICOR Update
- Conclusions and summary

Appendix: [Jump to slide](#)
PCI Centre NICOR / CCAD Centre codes

Appropriateness



Adjunctive Therapy

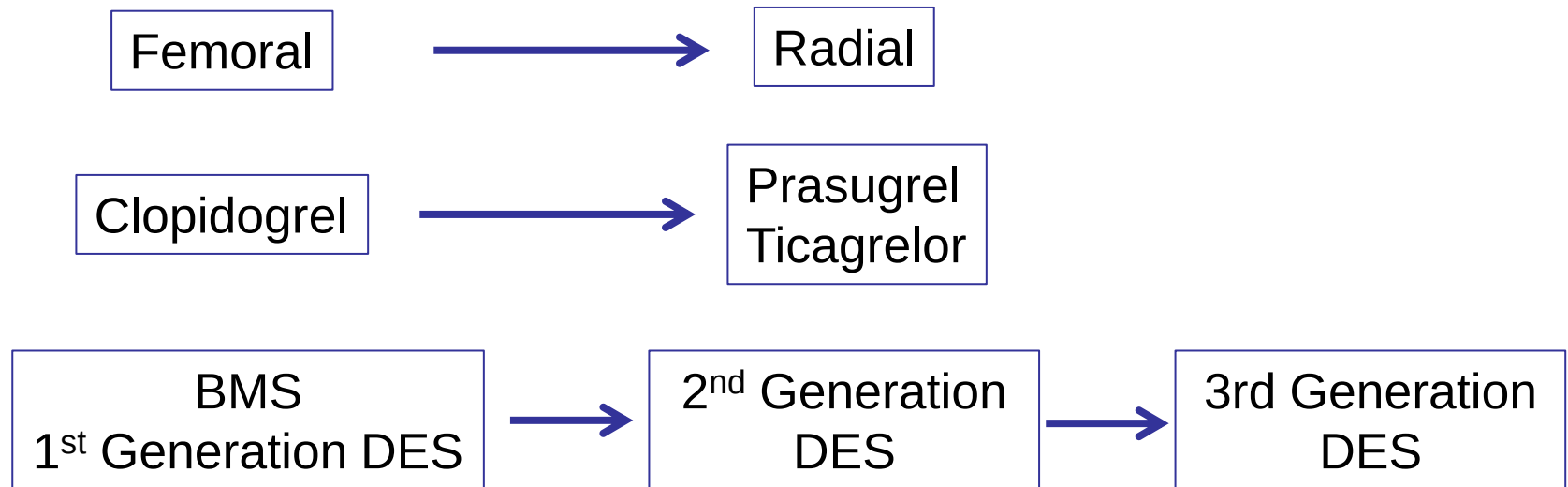


Audit Presentation

- UK PCI activity and delivery
- PCI procedure specific data
 - NICOR
 - Case ascertainment
 - Antiplatelet therapy
- Structural Intervention
- New analytic tools for NICOR data
- Clinical Outcomes Publication

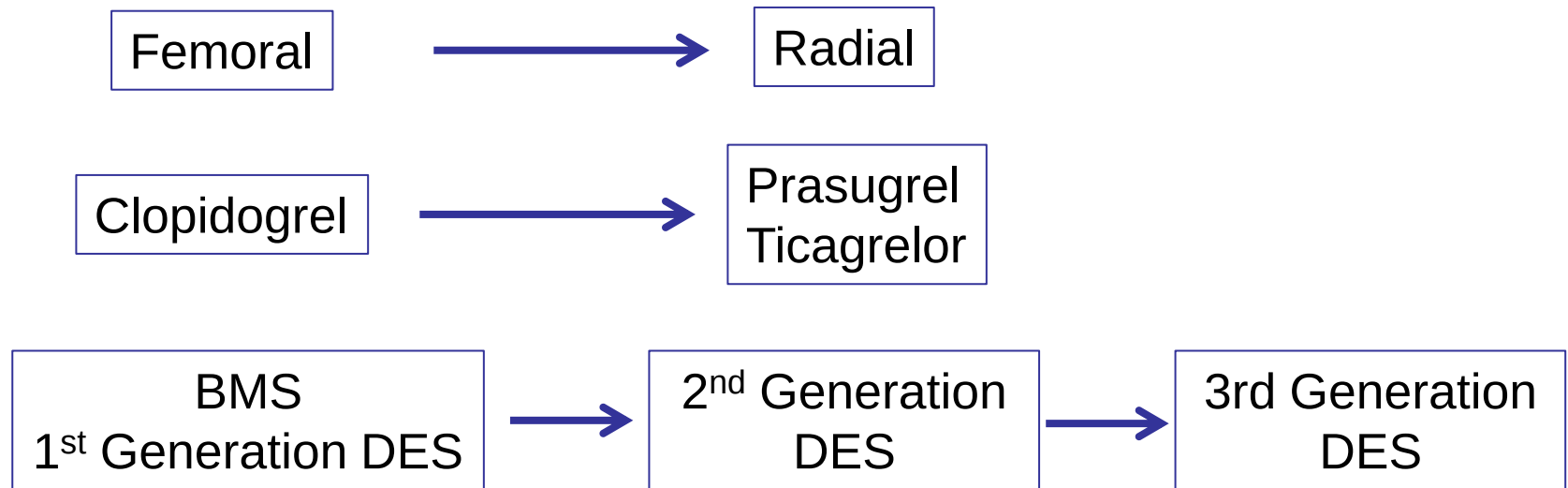
GP IIb/IIIa Antagonists

- Evolution of PCI



GP IIb/IIIa Antagonists

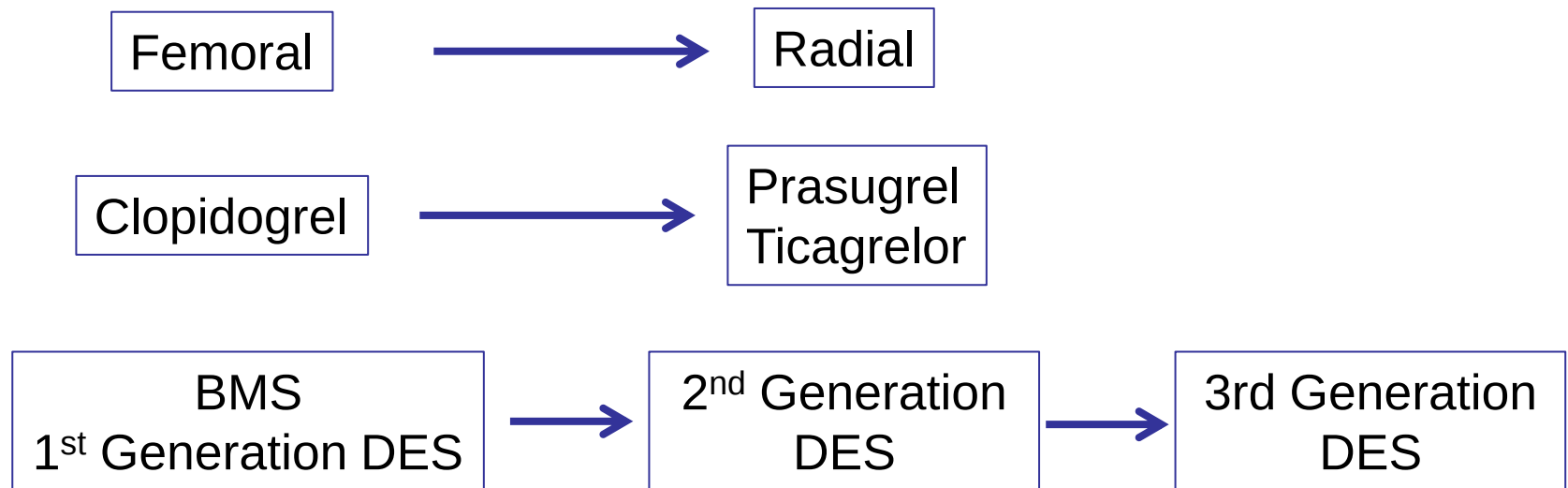
- Evolution of PCI



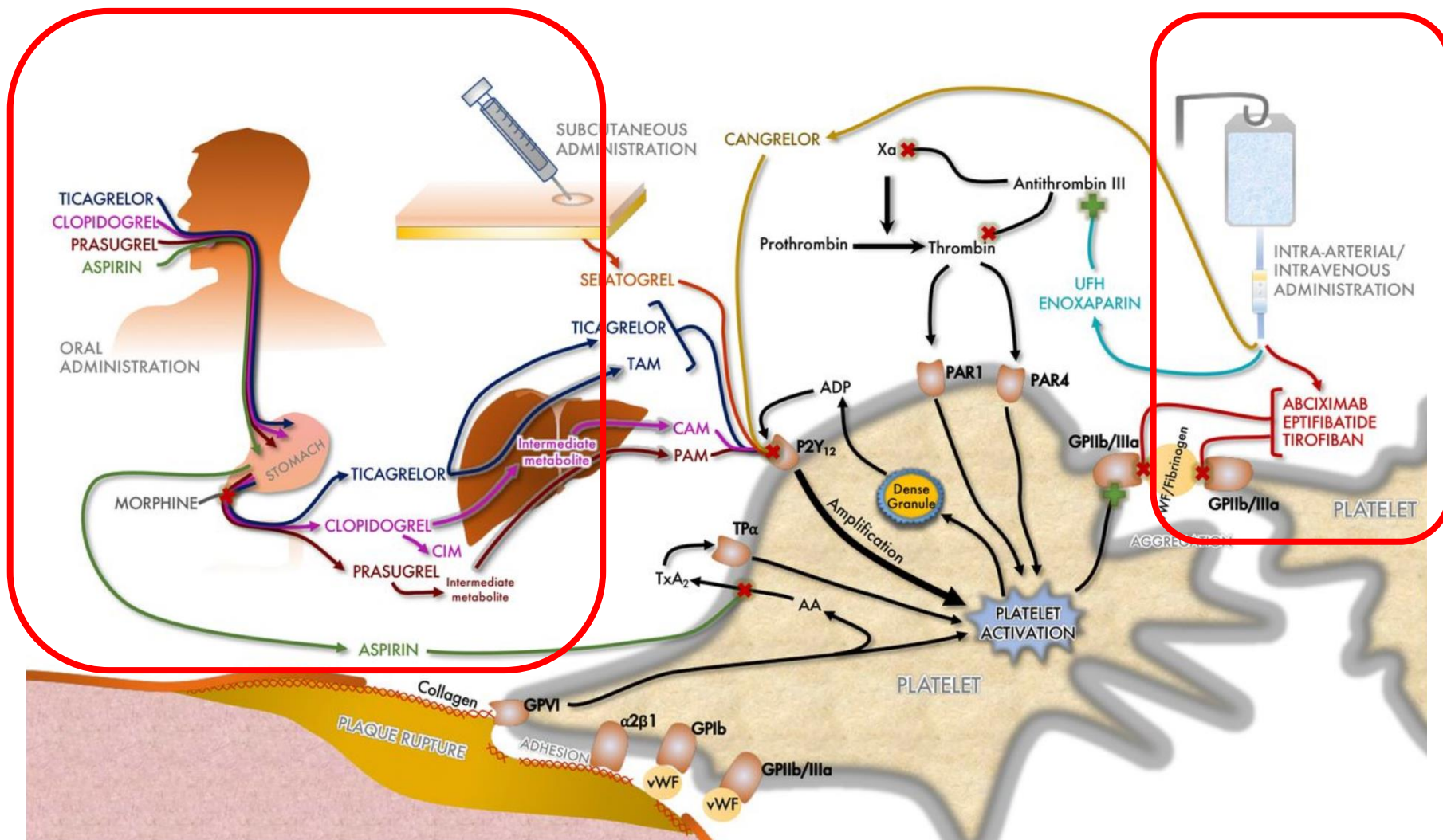
GP IIb/IIIa trials
Routine v none

GP IIb/IIIa Antagonists

- Evolution of PCI



 GP IIb/IIIa trials  Data still applicable?
Routine v none



Storey R JACC 2020;75:

GP IIb/IIIa Antagonist

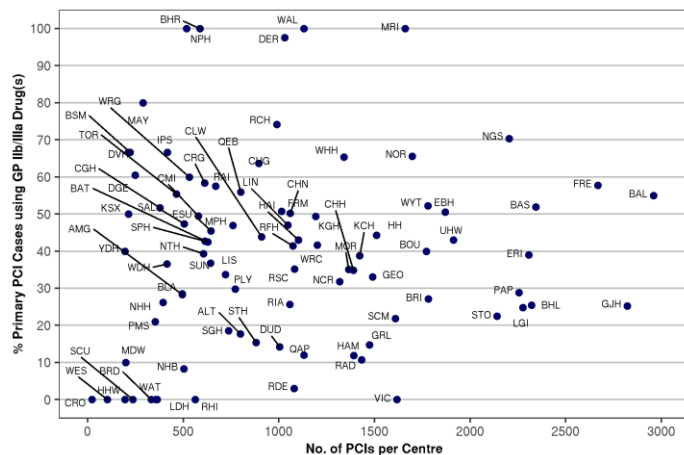
Use in Primary PCI

- 2018 ESC/EACTS Guidelines on myocardial revascularization
 - Primary PCI:

GP IIb/IIIa inhibitors should be considered for bail-out if there is evidence of no-reflow or a thrombotic complication.	IIa	C
GP IIb/IIIa antagonists may be considered in P2Y ₁₂ -inhibitor naïve patients undergoing PCI.	IIb	C

- Removed IIb B recommendation for routine use of GPI in PPCI due to the “lack of evidence”

Routine v Bail-out 2b3a inhibitor use



Routine v Bail-out 2b3a inhibitor use

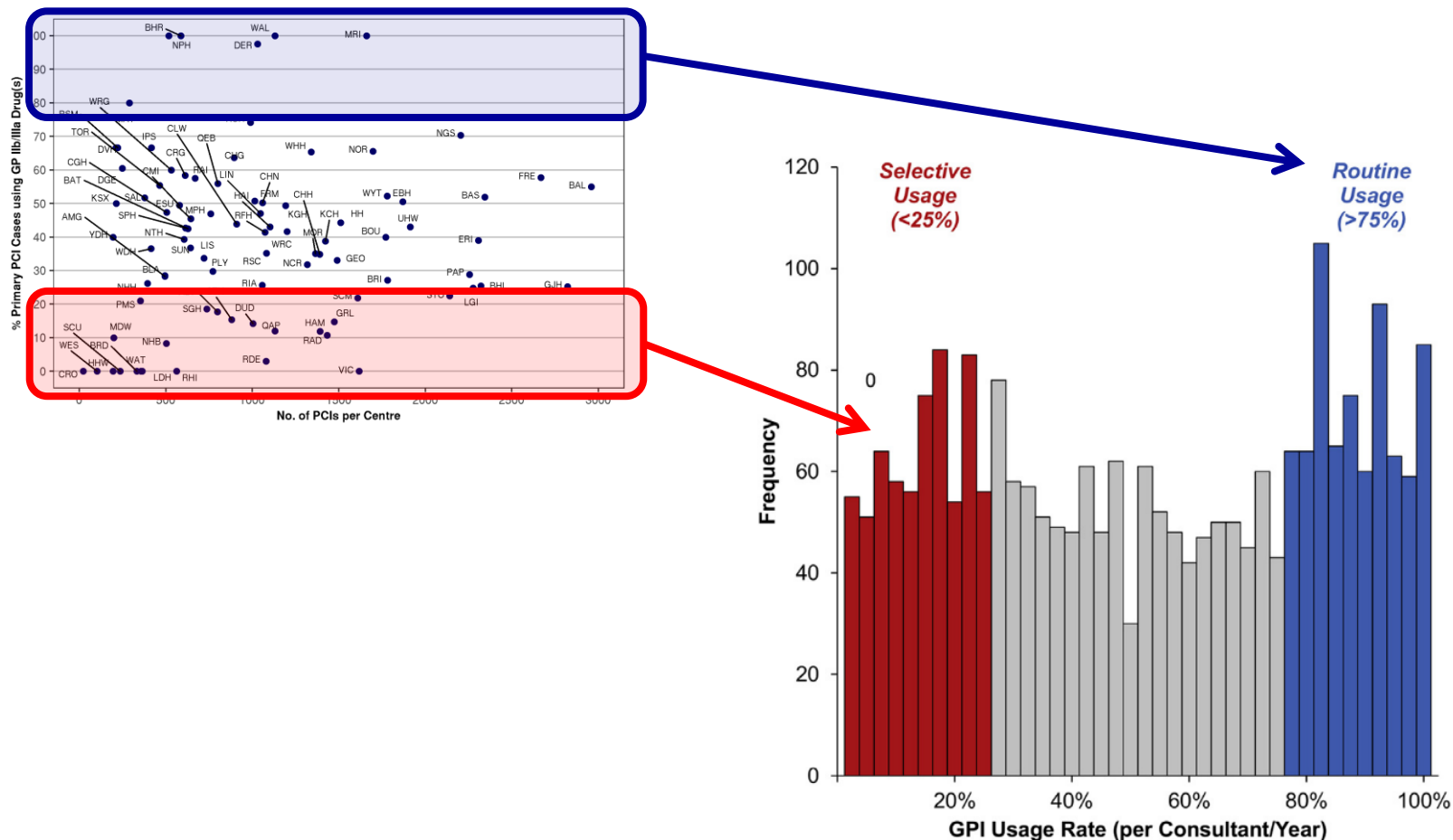


Figure 3. Distribution histogram of glycoprotein IIb/IIIa inhibitors (GPI) usage rates per consultant-year.

Routine v Bail-out 2b3a inhibitor use

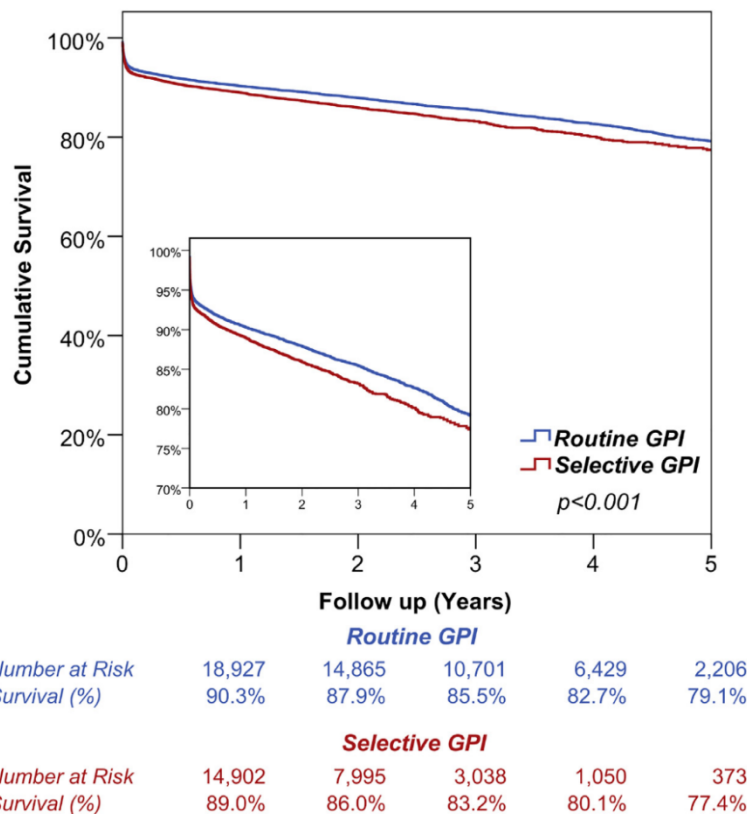
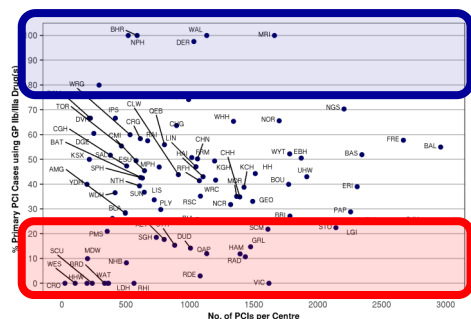


Figure 7. Kaplan-Meier curves of patient survival by glycoprotein IIb/IIIa inhibitor (GPI) usage strategy.

Table 2

Univariable and multivariable Cox regression analysis of routine versus selective GPI usage

Outcome	Unadjusted		Fully adjusted*	
	HR (95% CI)	p Value	HR (95% CI)	p Value
All-cause mortality	0.88 (0.83-0.93)	<0.001	0.82 (0.77-0.88)	<0.001

The P2Y₁₂ Antiplatelet Agents

TRITON-TIMI 38

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

NOVEMBER 15, 2007

VOL. 357 NO. 20

Prasugrel versus Clopidogrel in Patients with Acute Coronary Syndromes

Stephen D. Wiviott, M.D., Eugene Braunwald, M.D., Carolyn H. McCabe, B.S., Gilles Montalescot, M.D., Ph.D., Witold Ruzyllo, M.D., Shmuel Gottlieb, M.D., Franz-Joseph Neumann, M.D., Diego Ardissino, M.D., Stefano De Servi, M.D., Sabina A. Murphy, M.P.H., Jeffrey Riesmeyer, M.D., Govinda Veerakkody, Ph.D., C. Michael Gibson, M.D., and Elliott M. Antman, M.D., for the TRITON-TIMI 38 Investigators*

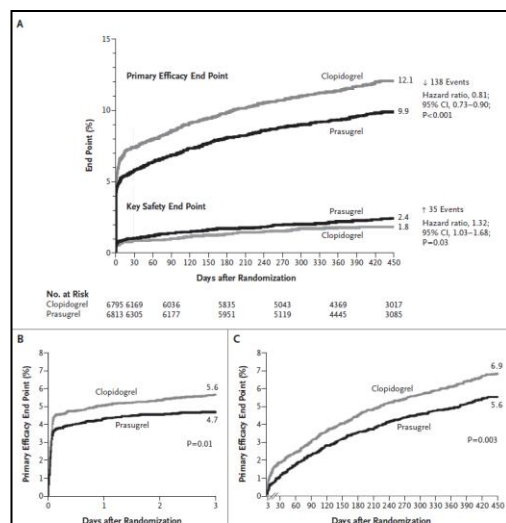


Figure 1. Cumulative Kaplan-Meier Estimates of the Rates of Key Study End Points during the Follow-up Period. Panel A shows data for the primary efficacy end point (death from cardiovascular causes, nonfatal myocardial infarction [MI], or nonfatal stroke) (top) and for the key safety end point (Thrombolysis in Myocardial Infarction [TIMI] major bleeding not related to coronary-artery bypass grafting) (bottom) during the full follow-up period. The hazard ratio for prasugrel, as compared with clopidogrel, for the primary efficacy end point at 30 days was 0.77 (95% confidence interval [CI], 0.67 to 0.88; $P<0.001$) and at 90 days was 0.80 (95% CI, 0.71 to 0.90; $P<0.001$). Data for the primary efficacy end point are also shown from the time of randomization to day 3 (Panel B) and from 3 days to 15 months, with all end points occurring before day 3 censored (Panel C). In Panel C, the number at risk includes all patients who were alive (regardless of whether a nonfatal event had occurred during the first 3 days after randomization) and had not withdrawn consent for follow-up. The P values in Panel A for the primary efficacy end point were calculated with the use of the Gehan-Wilcoxon test; all other P values were calculated with the use of the log-rank test.

PLATO

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

SEPTEMBER 10, 2009

VOL. 361 NO. 11

Ticagrelor versus Clopidogrel in Patients with Acute Coronary Syndromes

Lars Wallentin, M.D., Ph.D., Richard C. Becker, M.D., Andrzej Budaj, M.D., Ph.D., Christopher P. Cannon, M.D., Håkan Emanuelsson, M.D., Ph.D., Claes Held, M.D., Ph.D., Jay Horowitz, M.D., Steen Husted, M.D., D.Sc., Stefan James, M.D., Ph.D., Hugo Katus, M.D., Kenneth W. Mahaffey, M.D., Benjamin M. Scirica, M.D., M.P.H., Allan Skene, Ph.D., Philippe Gabriel Steg, M.D., Robert F. Storey, M.D., D.M., and Robert A. Harrington, M.D., for the PLATO Investigators*

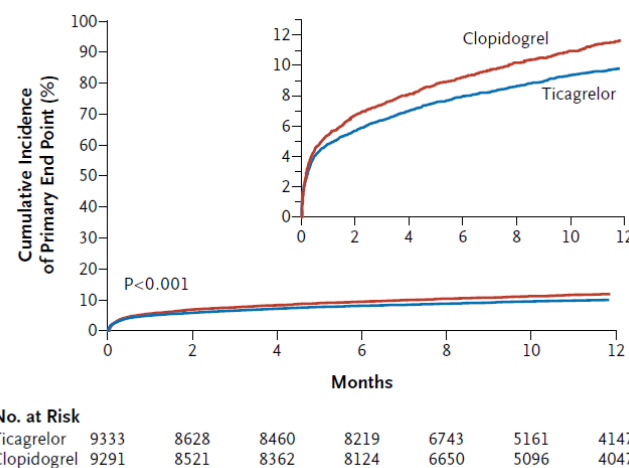


Figure 1. Cumulative Kaplan-Meier Estimates of the Time to the First Adjudicated Occurrence of the Primary Efficacy End Point.

The primary end point — a composite of death from vascular causes, myocardial infarction, or stroke — occurred significantly less often in the ticagrelor group than in the clopidogrel group (9.8% vs. 11.7% at 12 months; hazard ratio, 0.84; 95% confidence interval, 0.77 to 0.92; $P<0.001$).

Prasugrel v Ticagrelor

For Primary PCI

- PLATO and TRITON PPCI subgroups
 - No benefit v Clopidogrel
- England and Wales 2007 to 2014
- Compare use of P2Y₁₂ antiplatelet drugs
- 89,067 Primary PCI procedures
- Propensity matching

Prasugrel v Ticagrelor

For Primary PCI

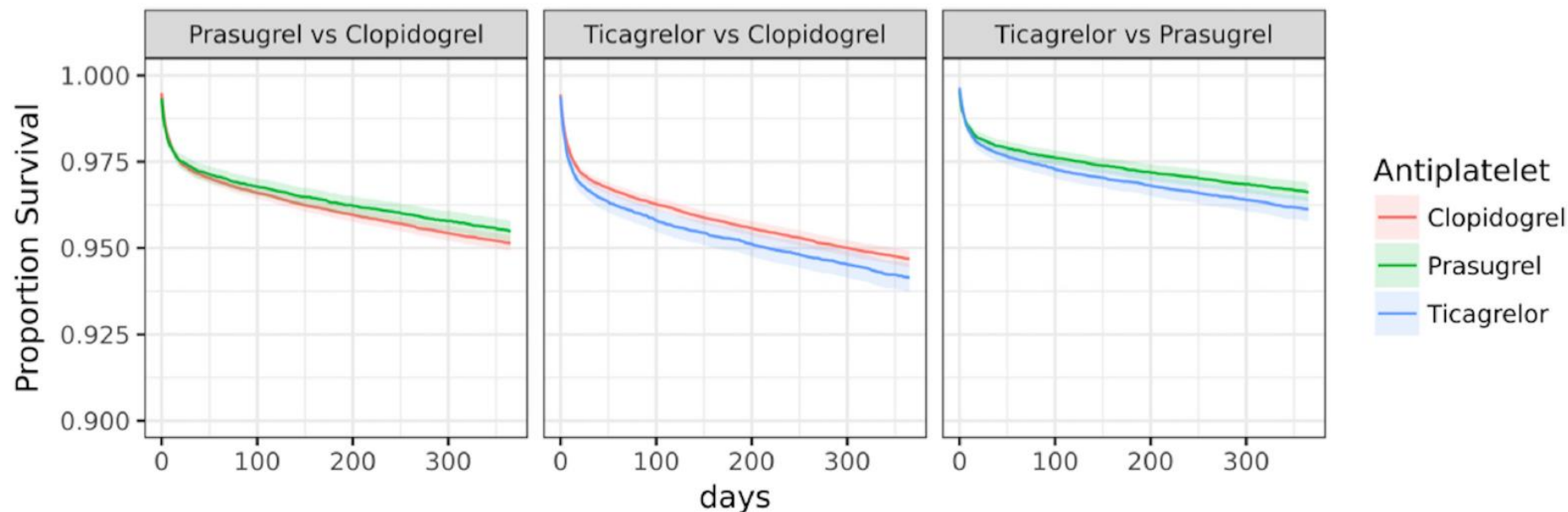


Figure 3 Kaplan-Meier curves for the propensity-score-matched datasets. CIs are represented by coloured shades.

$p=0.084$

$p=0.019$

$p=0.03$

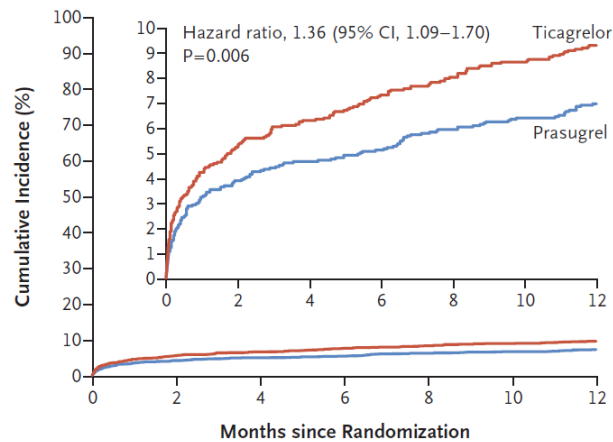
Multivariate Cox regression model survival censored at 1 year

ISAR-REACT 5

ORIGINAL ARTICLE

Ticagrelor or Prasugrel in Patients with Acute Coronary Syndromes

S. Schüpke, F.-J. Neumann, M. Menichelli, K. Mayer, I. Bernlochner, J. Wöhrle, G. Richardt, C. Liebetrau, B. Witzenbichler, D. Antoniucci, I. Akin, L. Bott-Flügel, M. Fischer, U. Landmesser, H.A. Katus, D. Sibbing, M. Seyfarth, M. Janisch, D. Boncompagni, R. Hilz, W. Rottbauer, R. Okrojek, H. Möllmann, W. Hochholzer, A. Migliorini, S. Cassese, P. Mollo, E. Xhepa, S. Kufner, A. Strehle, S. Leggewie, A. Allali, G. Ndrepepa, H. Schühlen, D.J. Angiolillo, C.W. Hamm, A. Hapfelmeier, R. Tölg, D. Trenk, H. Schunkert, K.-L. Laugwitz, and A. Kastrati, for the ISAR-REACT 5 Trial Investigators*



No. at Risk

Ticagrelor	2012	1877	1857	1835	1815	1801	1722
Prasugrel	2006	1892	1877	1862	1839	1829	1803

Figure 2. Cumulative Incidence of the Primary End Point at 1 Year.

The Kaplan–Meier curves show the cumulative incidence of the primary end point, which was a composite of death, myocardial infarction, or stroke at 1 year. The inset shows the same data on an enlarged y axis.

Table 2. Clinical End Points.*

End Point	Ticagrelor Group (N = 2012)	Prasugrel Group (N = 2006)	Hazard Ratio (95% CI)	P Value
Primary end point: death, myocardial infarction, or stroke — no. (%)	184 (9.3)	137 (6.9)	1.36 (1.09–1.70)	0.006
Death — no. (%)				
From any cause	90 (4.5)	73 (3.7)	1.23 (0.91–1.68)	
From cardiovascular cause	63 (3.2)	59 (3.0)		
From noncardiovascular cause	27 (1.4)	14 (0.7)		

JAMA Internal Medicine | [Original Investigation](#)

Association of Ticagrelor vs Clopidogrel With Major Adverse Coronary Events in Patients With Acute Coronary Syndrome Undergoing Percutaneous Coronary Intervention

Ricky D. Turgeon, BSc(Pharm), PharmD; Sheri L. Koshman, BSc(Pharm), PharmD; Erik Youngson, MMath; Bryan Har, MD; Stephen B. Wilton, MD, MSc; Matthew T. James, MD, PhD; Michelle M. Graham, MD

JAMA Intern Med. doi:[10.1001/jamainternmed.2019.6447](https://doi.org/10.1001/jamainternmed.2019.6447)

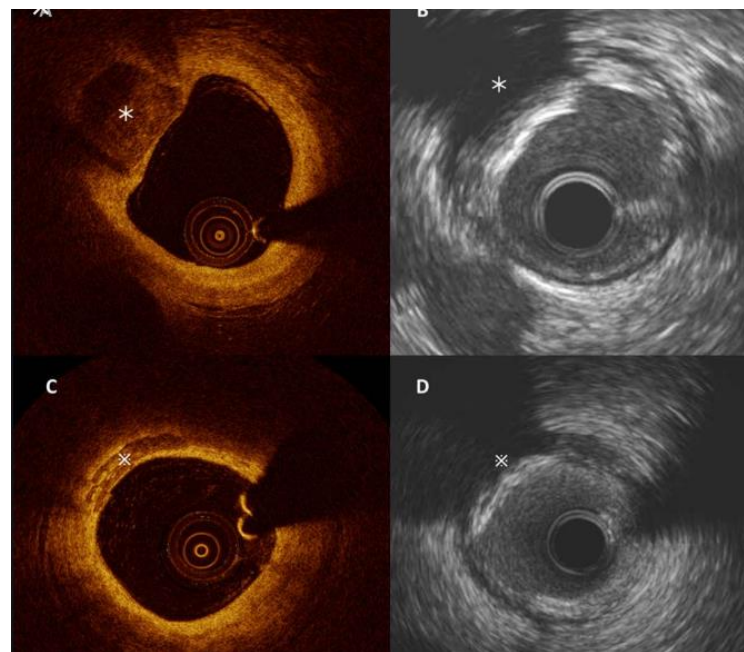
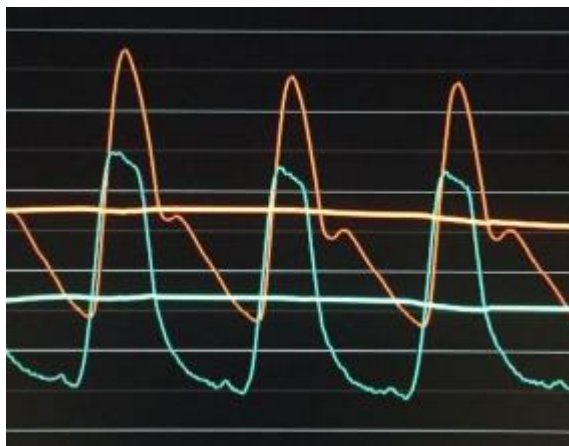
Published online January 13, 2020.

- PCI cohort (2012 to 2016 n=11,185)
 - The Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease registry
- P2Y12 inhibitor treatment
 - Pharmaceutical Information Network
 - exposure to P2Y12 inhibitors
 - data on P2Y12 inhibitor adherence, persistence, and switching.

Table 2. Association of Clopidogrel vs Ticagrelor With Outcomes Within 1 Year After Percutaneous Coronary Intervention for Acute Coronary Syndrome

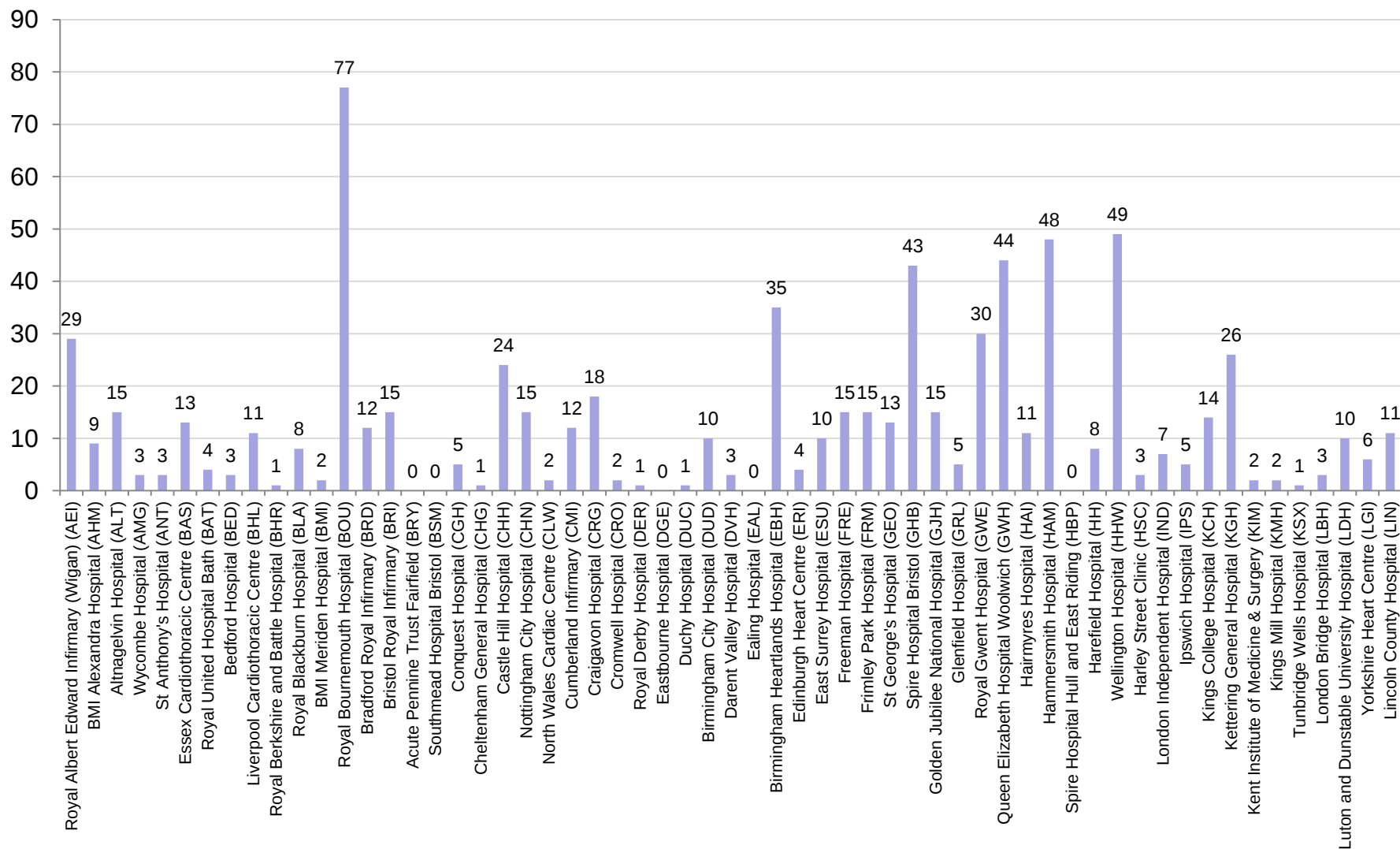
Outcome	No. (%)		P Value	HR (95% CI)		
	Clopidogrel Group (n = 7109)	Ticagrelor Group (n = 4076)		Unadjusted	Adjusted for Age and Sex	Fully Adjusted ^a
MACE	828 (11.6)	419 (10.3)	.03	0.84 (0.74-0.95) ^b	0.88 (0.78-0.995) ^b	0.97 (0.85-1.10)
All-cause death	159 (2.2)	63 (1.5)	.01	0.73 (0.54-0.98) ^b	0.91 (0.67-1.23)	1.19 (0.87-1.62)
ACS	505 (7.1)	259 (6.4)	.13	0.85 (0.73-1.00)	0.88 (0.75-1.03)	0.93 (0.79-1.09)
Coronary revascularization	338 (4.8)	178 (4.4)	.35	0.83 (0.69-1.01)	0.85 (0.70-1.04)	0.90 (0.73-1.10)
PCI	249 (3.5)	133 (3.3)	.50	0.87 (0.70-1.09)	0.88 (0.71-1.11)	0.87 (0.69-1.09)
Coronary artery bypass grafting	94 (1.3)	46 (1.1)	.38	0.72 (0.49-1.06)	0.75 (0.51-1.11)	1.01 (0.68-1.52)
Stent thrombosis	25 (0.4)	19 (0.5)	.35	1.30 (0.71-2.38)	1.29 (0.70-2.36)	1.66 (0.88-3.12)
Composite of death, ACS, or ischemic stroke	676 (9.5)	328 (8.0)	.009	0.82 (0.72-0.94) ^b	0.87 (0.76-1.00)	0.93 (0.80-1.09)
Ischemic stroke	40 (0.6)	20 (0.5)	.62	0.91 (0.52-1.57)	1.02 (0.59-1.78)	1.35 (0.75-2.40)
Major bleeding	449 (6.3)	277 (6.8)	.32	1.09 (0.93-1.27)	1.23 (1.05-1.43) ^b	1.51 (1.29-1.78) ^b
Intracranial	11 (0.2)	5 (0.1)	.67	0.68 (0.22-2.15)	0.71 (0.22-2.24)	0.88 (0.26-2.90)
Gastrointestinal	135 (1.9)	99 (2.4)	.06	1.33 (1.02-1.74) ^b	1.55 (1.19-2.04) ^b	2.02 (1.52-2.68) ^b
Pulmonary	175 (2.5)	111 (2.7)	.40	1.12 (0.88-1.43)	1.24 (0.97-1.58)	1.49 (1.15-1.93) ^b
Urologic	74 (1.0)	38 (0.9)	.58	0.86 (0.58-1.30)	1.01 (0.67-1.52)	1.16 (0.76-1.78)
Other	85 (1.2)	42 (1.0)	.43	0.89 (0.61-1.30)	0.99 (0.68-1.44)	1.18 (0.79-1.75)
Dyspnea	116 (1.6)	119 (2.9)	<.001	1.80 (1.39-2.34) ^b	2.01 (1.54-2.61) ^b	1.98 (1.47-2.65) ^b

Intravascular Physiology and Imaging



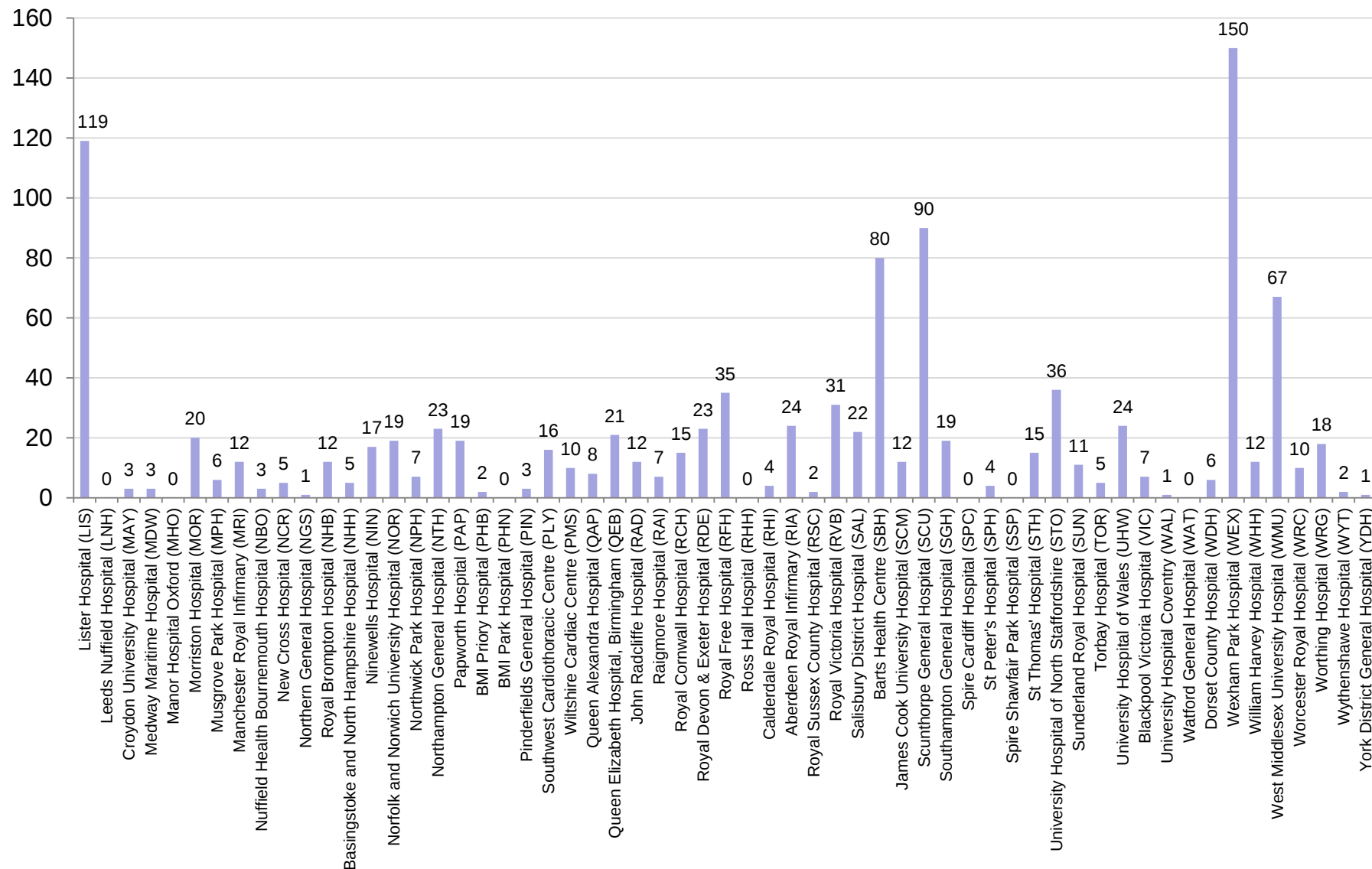
Intravascular Ultrasound

Diagnostic only studies (Centres A to L)



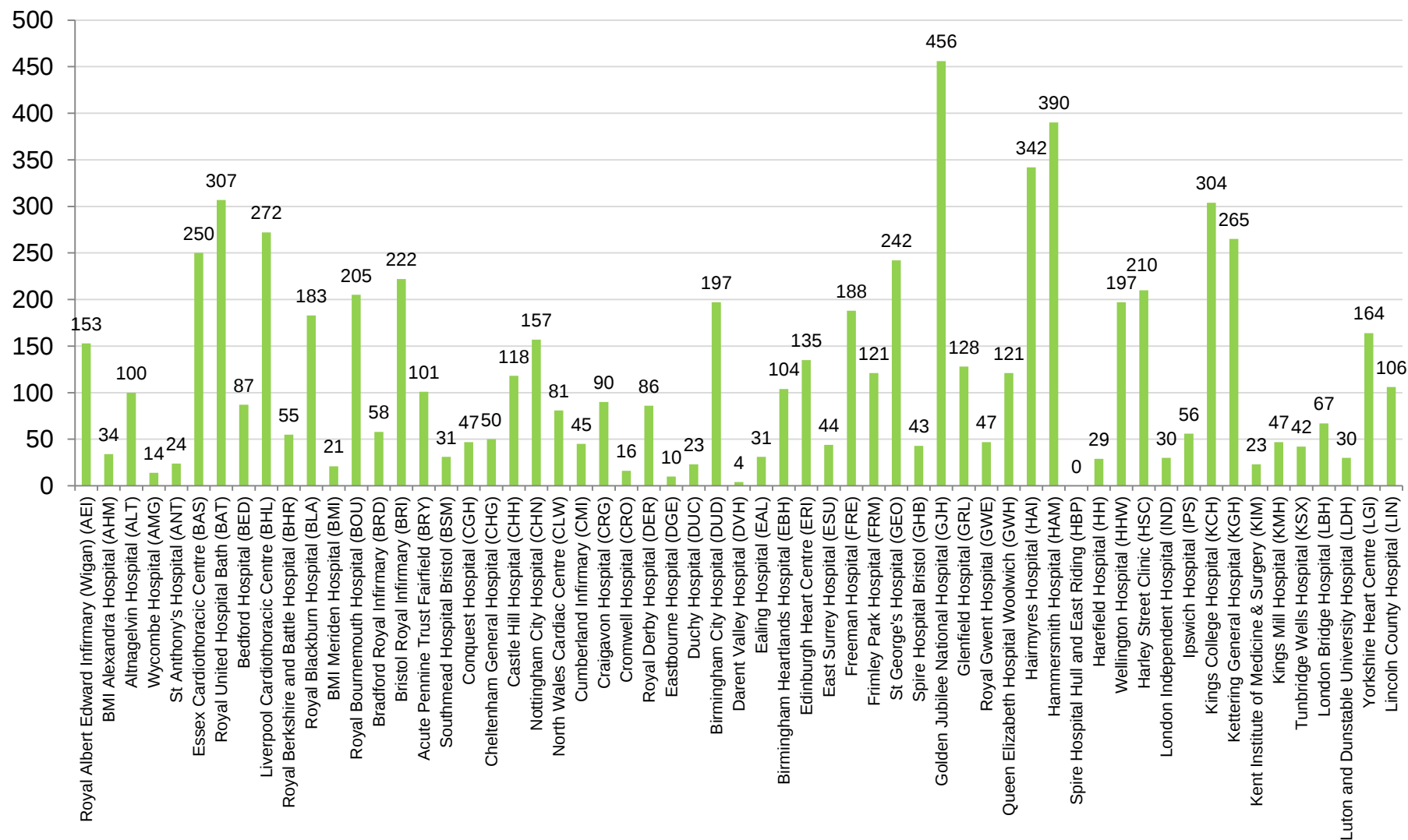
Intravascular Ultrasound

Diagnostic only studies (Centres L to Z)



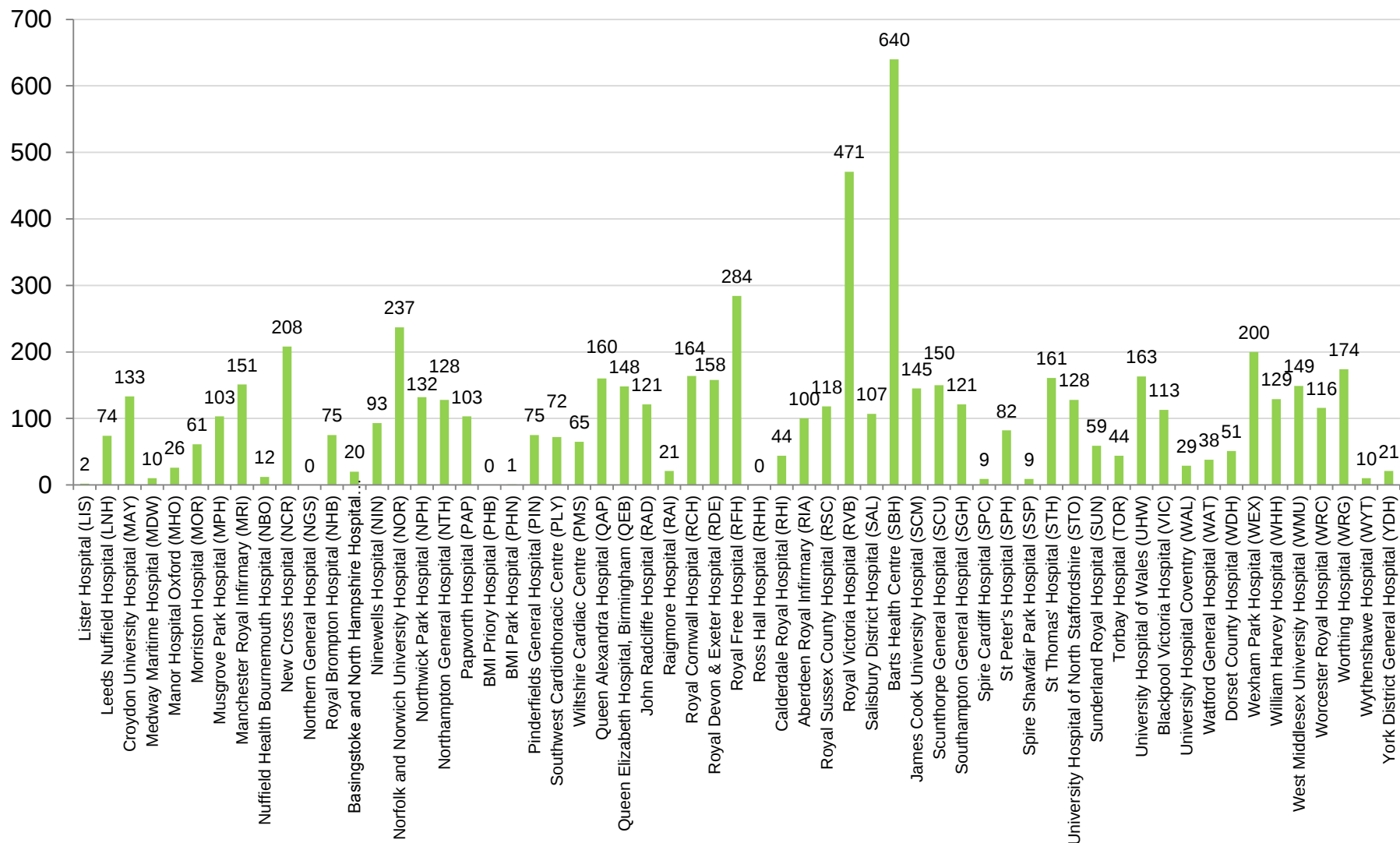
FFR, iFR, CFR, dPR, RFR etc

Diagnostic only studies (Centres A to L)



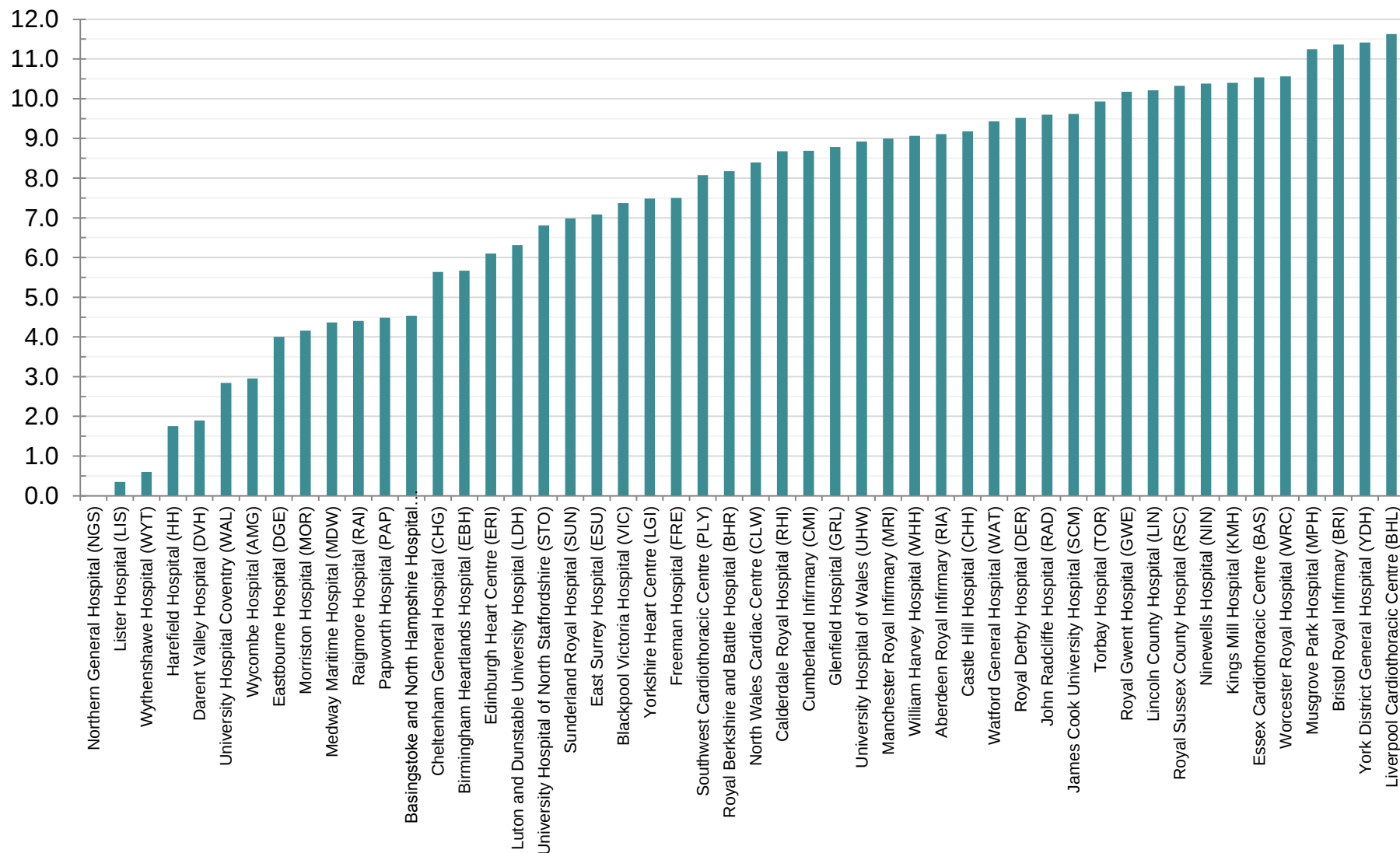
FFR, iFR, CFR, dPR, RFR etc

Diagnostic only studies (Centres L to Z)



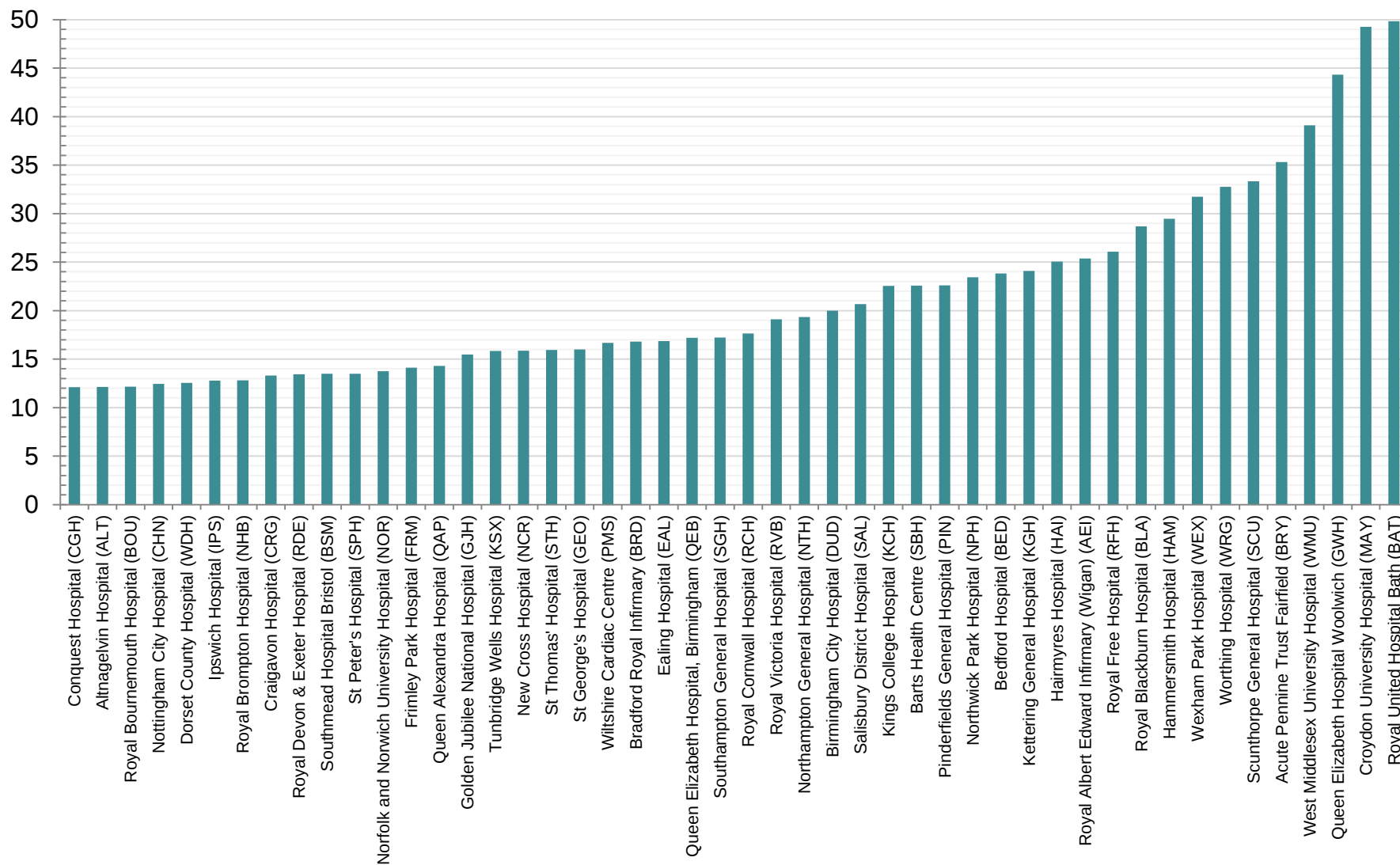
Diagnostic only FFR as % all PCI

NHS Centres (0 to 11% activity)



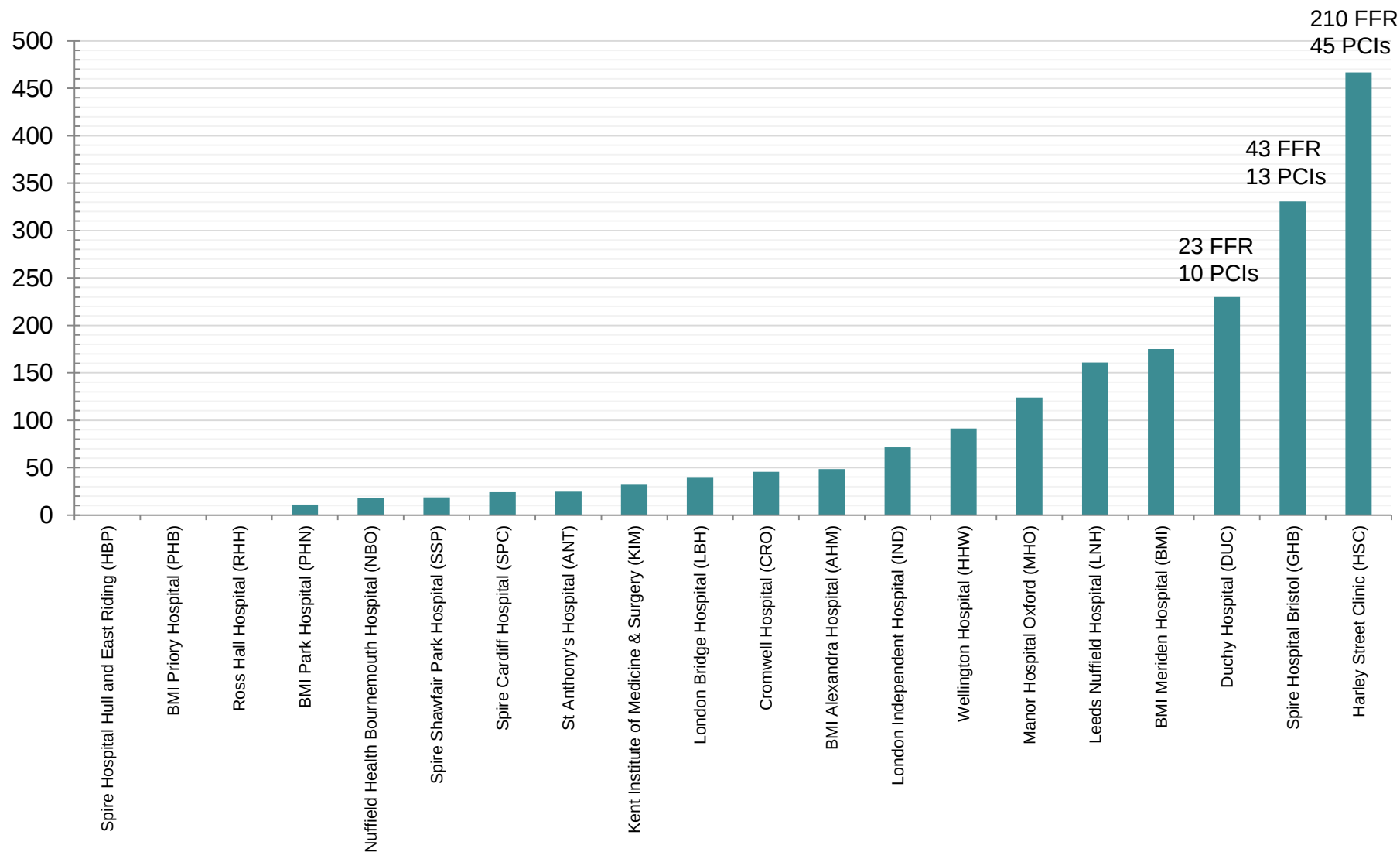
Diagnostic only FFR as % all PCI

NHS Centres (12% or more activity)



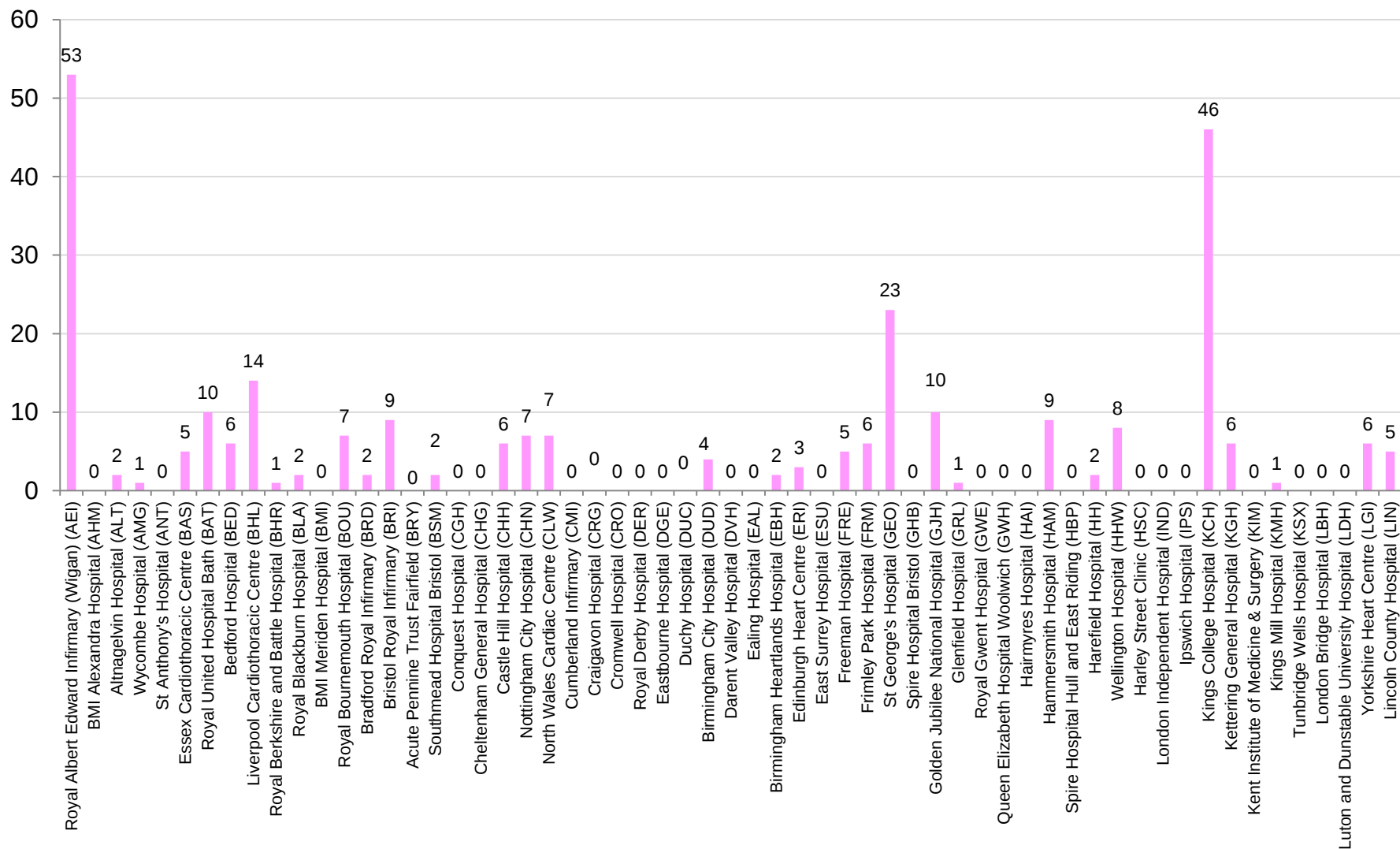
Diagnostic only FFR as % all PCI

Private Centres



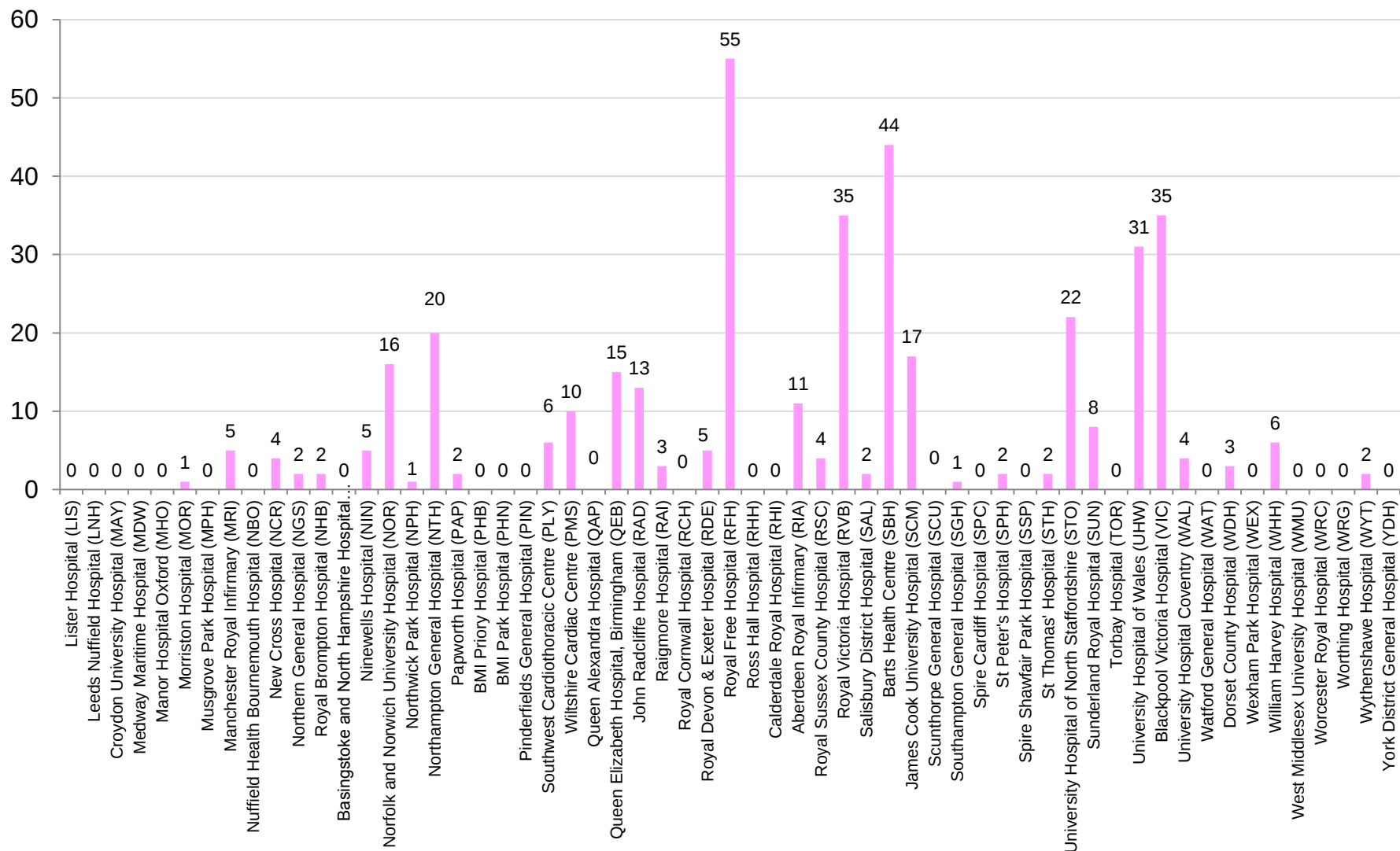
Swept Laser Imaging (OCT, OFDI)

Diagnostic only studies (Centres A to L)



Swept Laser Imaging (OCT, OFDI)

Diagnostic only studies (Centres L to Z)



Time Delays to Treatment

AWAITED

Contents

- **Structure (PCI)** [Jump to slide](#)
 - Angio and PCI centres and maps
 - Total angio and PCI numbers
 - No of PCIs per centre and per angio
 - PCI pmp and by country and v CABG
 - Centre PCI volumes
 - PCI operators, by centre, by PCI
 - On call rotas for PPCI
 - On site v off site surgical cover
 - Day case activity
 - Primary PCI units
- **NICOR data collection** [Jump to slide](#)
 - Centre participation
 - Databases used
 - Case ascertainment
 - Data completeness
- **Appropriateness (PCI)** [Jump to slide](#)
 - Demographics
 - Indication for PCI / Clinical syndrome
 - PPCI activity (by unit, pmp, by vessel)
 - [PCI for out of hospital arrest](#)
 - PCI territories / vessels / lesions/LMS/CTO
 - Stents (BMS and DES)
 - [Adjunctive pharmacotherapy](#)
 - LV support and shock
 - Primary PCI for > 80 yrs
 - Extraction / Rota / IVUS / OCT / FFR / Laser etc.
 - [Arterial access](#)

- **Process of care (PCI)** [Jump to slide](#)
 - Delays to treatment
 - NSTEMI (direct v IHT)
 - Primary PCI DTB / CTB
 - IHT versus Direct admission
 - Length of stay
- **Outcome (PCI)** [Jump to slide](#)
 - MACCE
 - Peri-procedural complications and by access
 - Tracked 30 day mortality
 - Outcome by syndrome
 - Outcome by lesion subset

- **Adult non coronary intervention** [Jump to slide](#)
 - Valves
 - **TAVI** and other Aortic [Jump to TAVI](#)
 - Mitral
 - PV / AV / TV
 - Septal ablation for HOCM
 - LAA occlusion
 - ASD / PFO / Para-prosthetic leak closure
 - Coro sinus / great vessel
 - Renal Denervation
- NICOR Update
- Conclusions and summary

Appendix: [Jump to slide](#)
PCI Centre NICOR / CCAD Centre codes

Outcome

AWAITED

Contents

- **Structure (PCI)** [Jump to slide](#)
 - Angio and PCI centres and maps
 - Total angio and PCI numbers
 - No of PCIs per centre and per angio
 - PCI pmp and by country and v CABG
 - Centre PCI volumes
 - PCI operators, by centre, by PCI
 - On call rotas for PPCI
 - On site v off site surgical cover
 - Day case activity
 - Primary PCI units
- **NICOR data collection** [Jump to slide](#)
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 - PPCI activity (by unit, pmp, by vessel)
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 - PCI territories / vessels / lesions/LMS/CTO
 - Stents (BMS and DES)
 - [Adjunctive pharmacotherapy](#)
 - LV support and shock
 - Primary PCI for > 80 yrs
 - Extraction / Rota / IVUS / OCT / FFR / Laser etc.
 - [Arterial access](#)

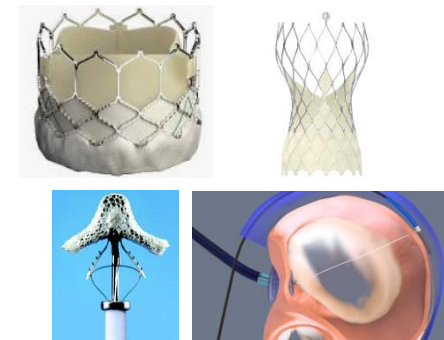
- **Process of care (PCI)** [Jump to slide](#)
 - Delays to treatment
 - NSTEMI (direct v IHT)
 - Primary PCI DTB / CTB
 - IHT versus Direct admission
 - Length of stay
- **Outcome (PCI)** [Jump to slide](#)
 - MACCE
 - Peri-procedural complications and by access
 - Tracked 30 day mortality
 - Outcome by syndrome
 - Outcome by lesion subset

- **Adult non coronary intervention** [Jump to slide](#)
 - Valves
 - **TAVI** and other Aortic [Jump to TAVI](#)
 - Mitral
 - PV / AV / TV
 - Septal ablation for HOCM
 - LAA occlusion
 - ASD / PFO / Para-prosthetic leak closure
 - Coro sinus / great vessel
 - Renal Denervation
- NICOR Update
- Conclusions and summary

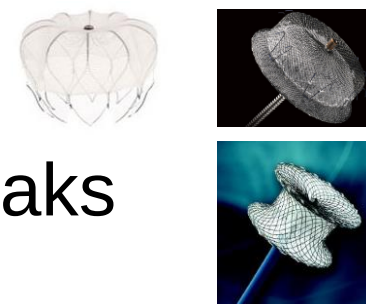
Appendix: [Jump to slide](#)
PCI Centre NICOR / CCAD Centre codes

Adult Non Coronary and Structural Intervention

- Valves
 - Aortic
 - Mitral



- Septal ablation (HCM)
- LAA Occlusion
- Holes (ASD / PFO / VSD / Paravalve leaks)
- Coro sinus / Great vessels
- Renal denervation



Aortic



Transcatheter Aortic Valve Implantation

- 3 new centres in 2018-19
 - CHH: Castle Hill Hospital (Hull and East Yorkshire NHS Trust)
 - GJH: Golden Jubilee National Hospital
 - RIA: Aberdeen Royal Infirmary
- Total 41 UK TAVI Centres

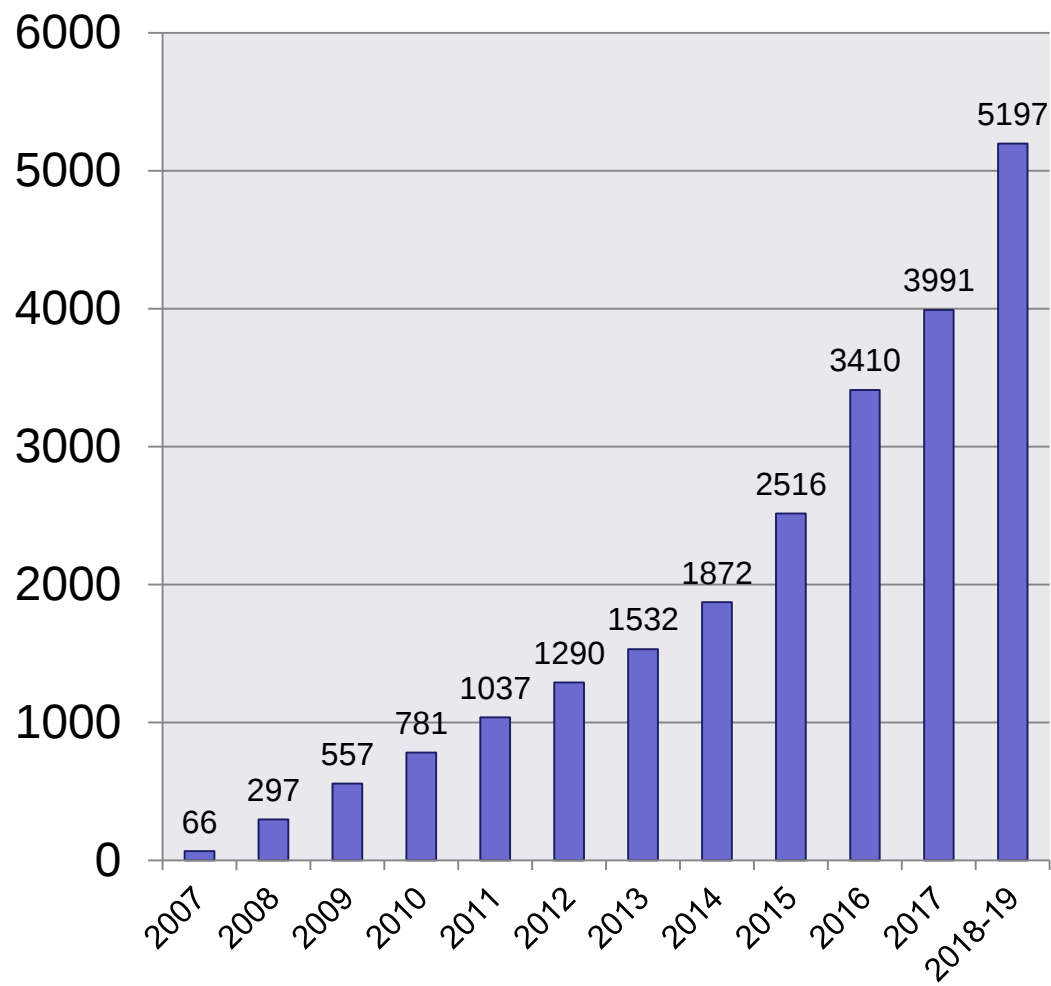
TAVI 2018-19

41 centres



TAVI

Number per
Year



≈78 pmp

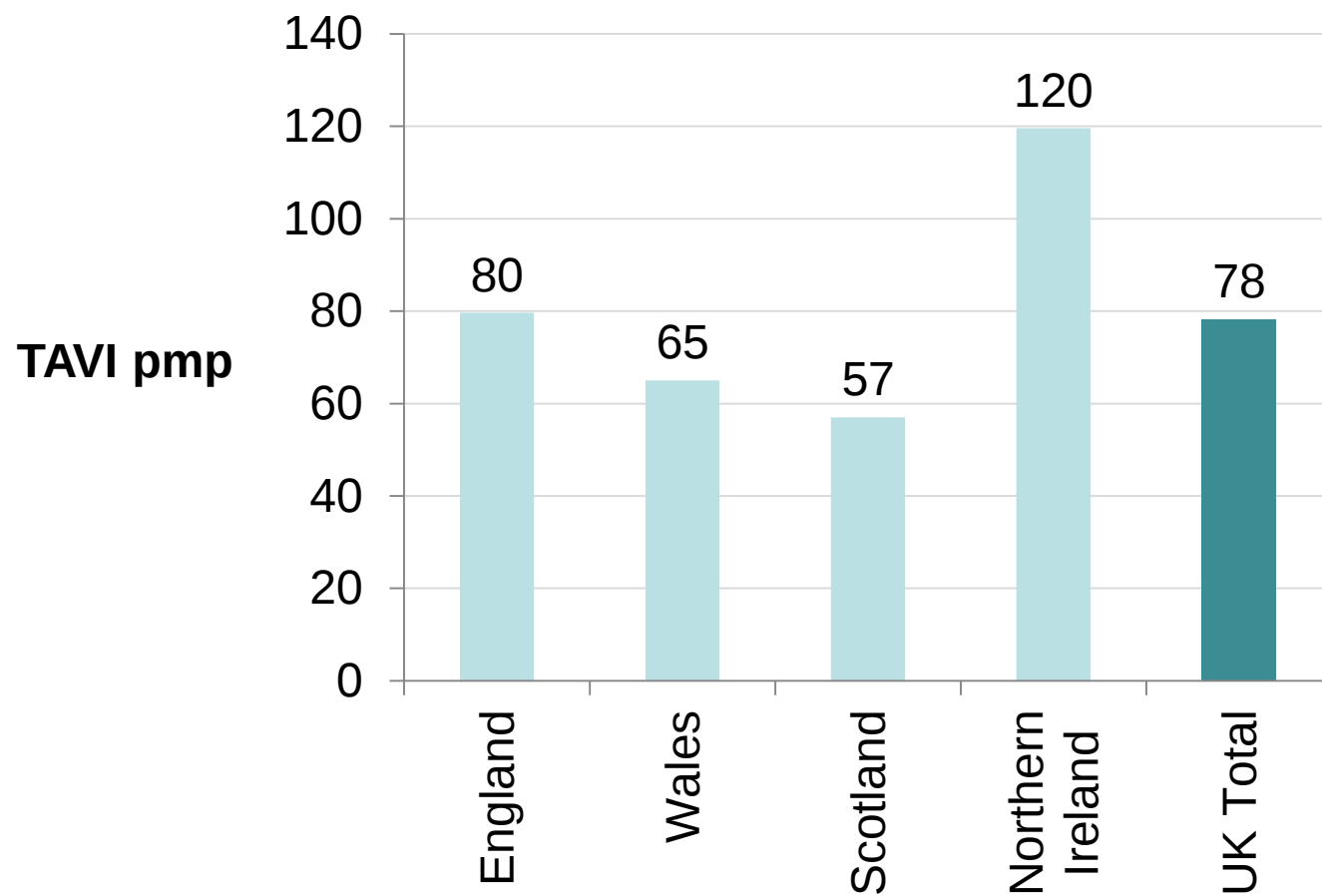
TAVI

2018-19

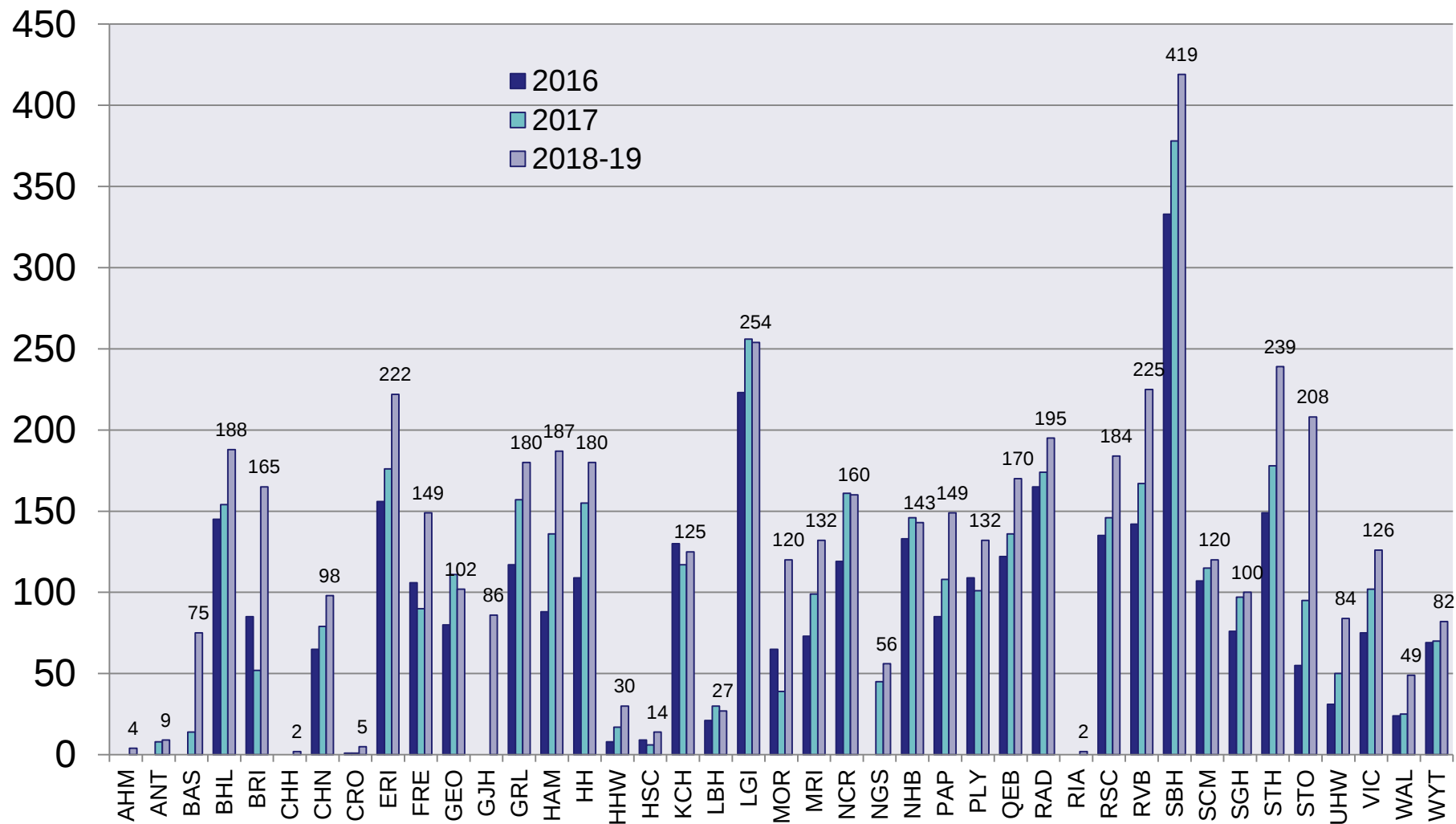
Country	Number of Centres	Total TAVI	Population mid 2018	TAVI pmp
England	35	4458	5.5977	80
Wales	2	204	3.1386	65
Scotland	3	310	5.4381	57
Northern Ireland	1	225	1.8816	120
ALL	41	5197	6.64	78

TAVI

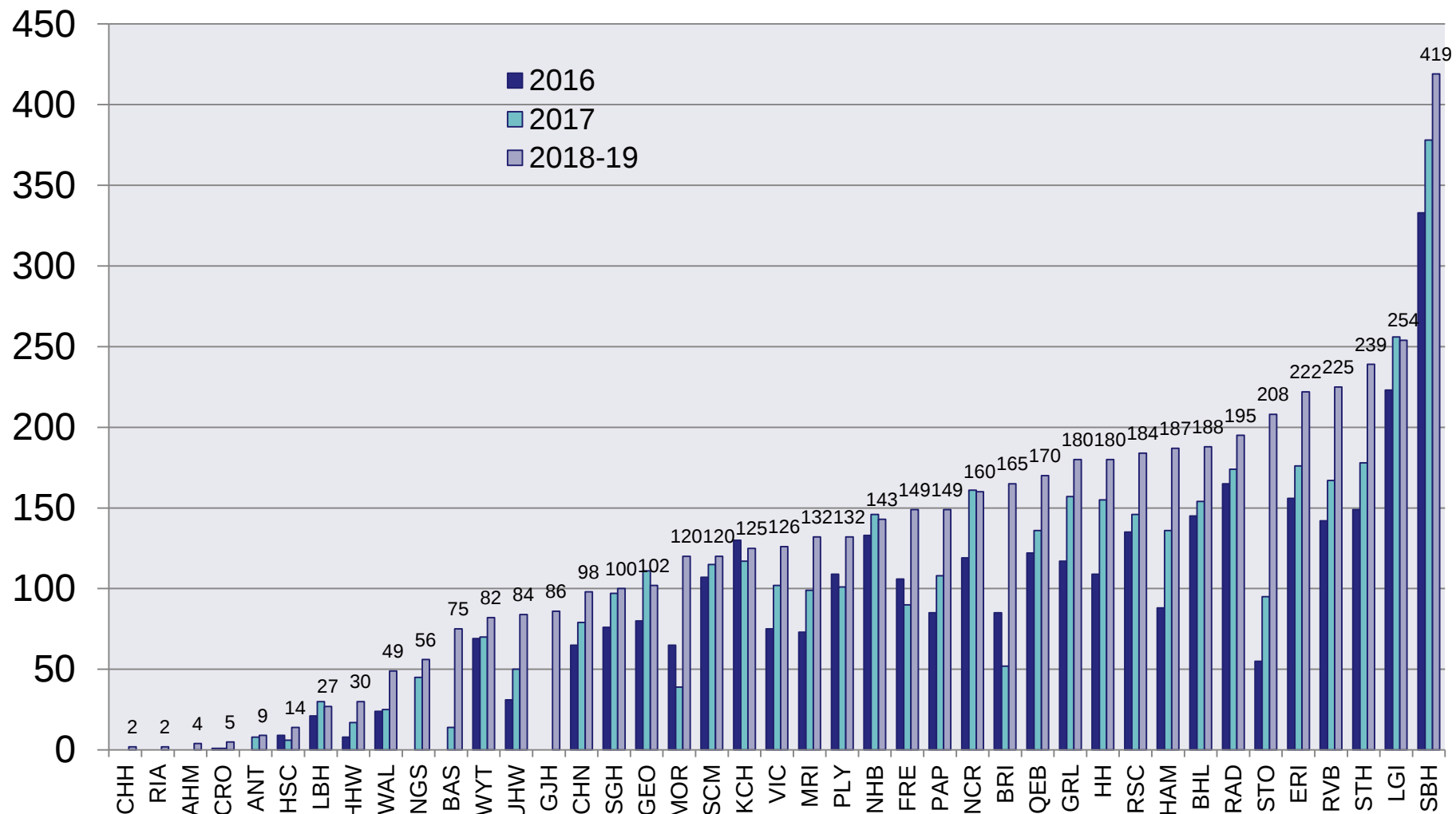
2018-19



TAVI

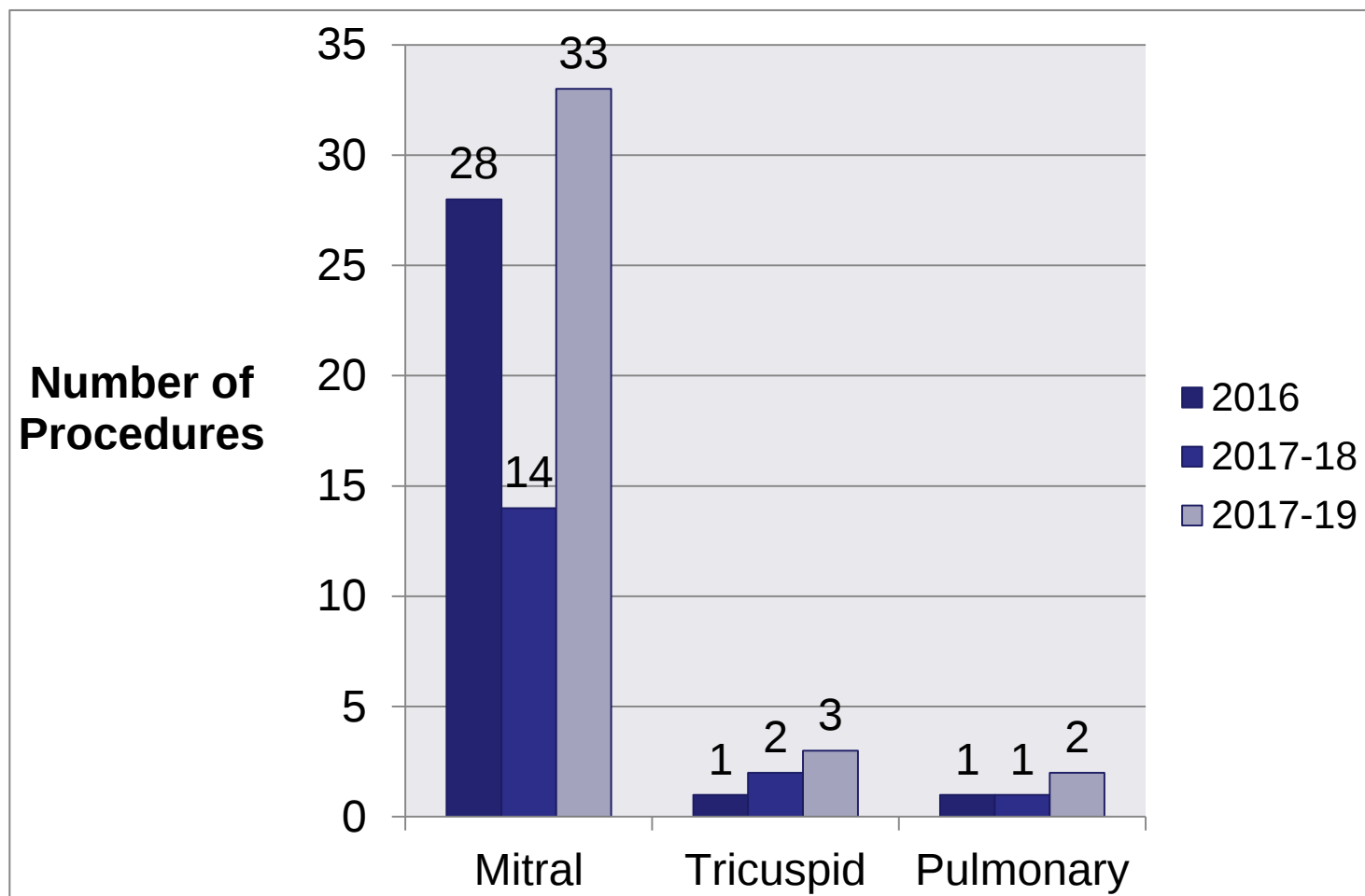


TAVI



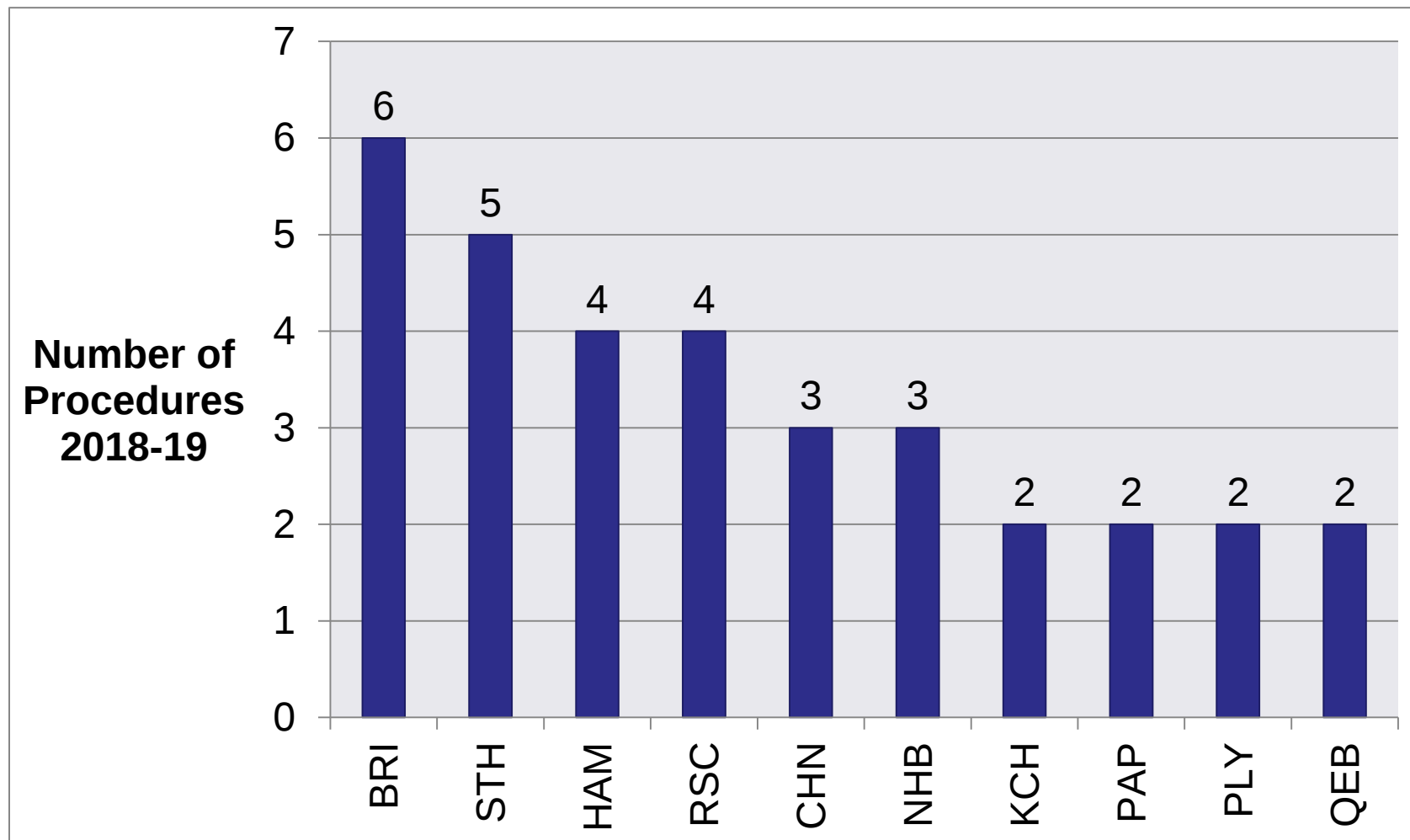
Percutaneous Valves

TAVI Valve to treat failing bioprostheses



Percutaneous Valves

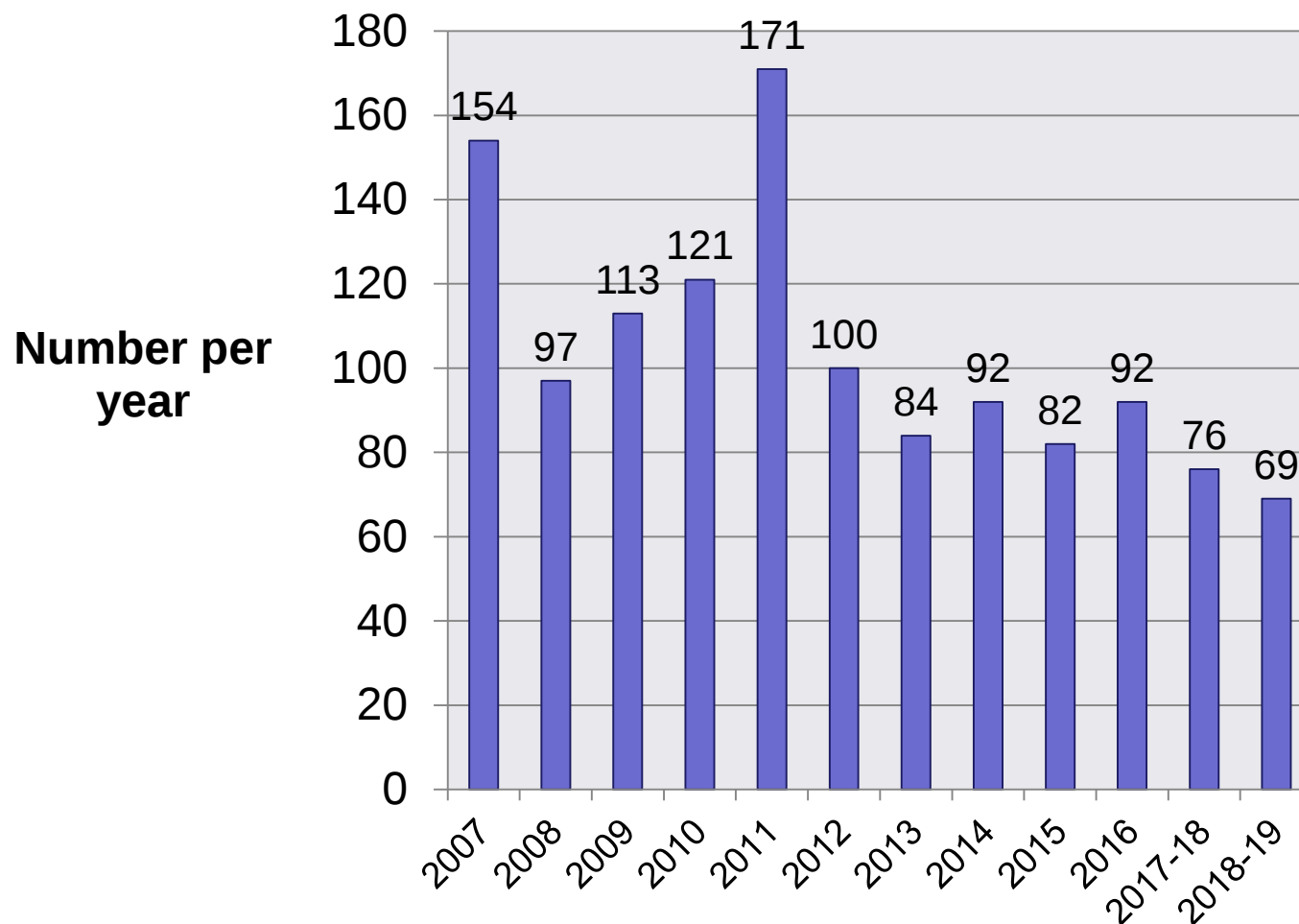
TAVI Valve to treat failing mitral bioprosthesis



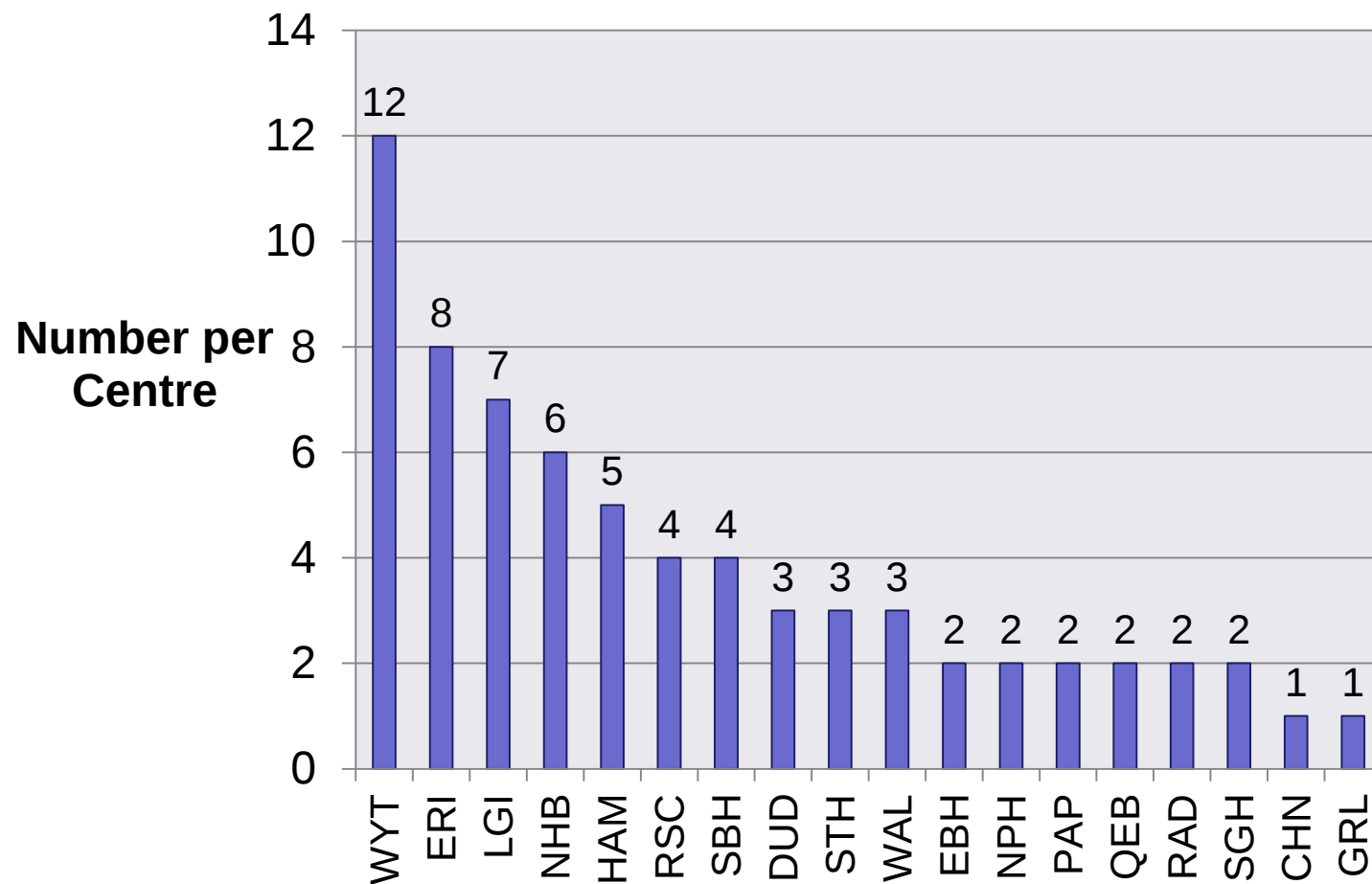
Mitral



Mitral Balloon Valuloplasty



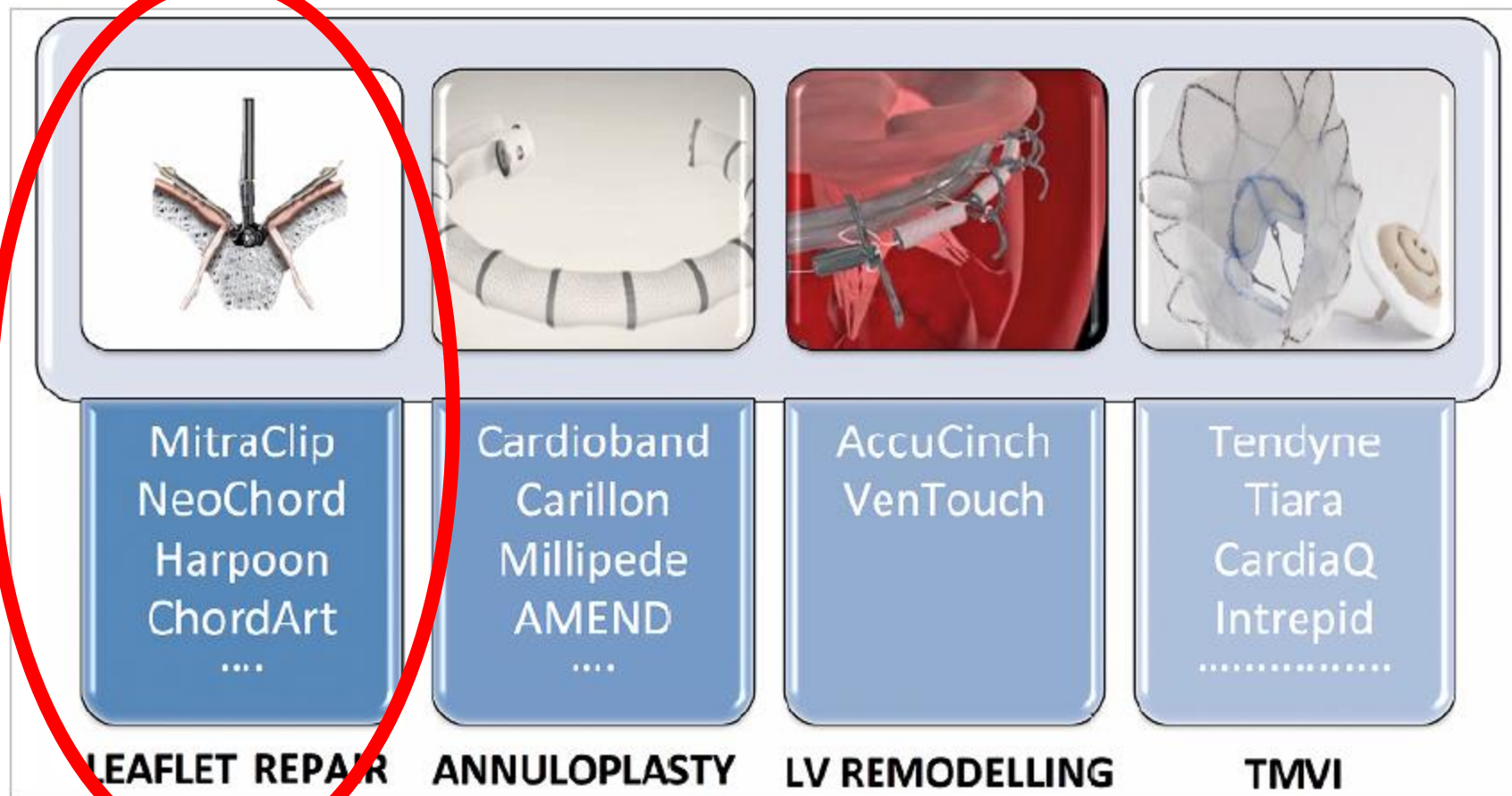
Mitral Balloon Valvuloplasty 2018-19



Number of centres: 18

Mitral Valve Repair

Taramasso M, EuroIntervention 2018;14:AB91-AB100



Percutaneous Valves

Mitra-Clip



Clinical Commissioning Policy: Percutaneous mitral valve leaflet repair for primary degenerative mitral regurgitation in adults

NHS England Reference: 170128P



First published: July 2019

Policy Statement

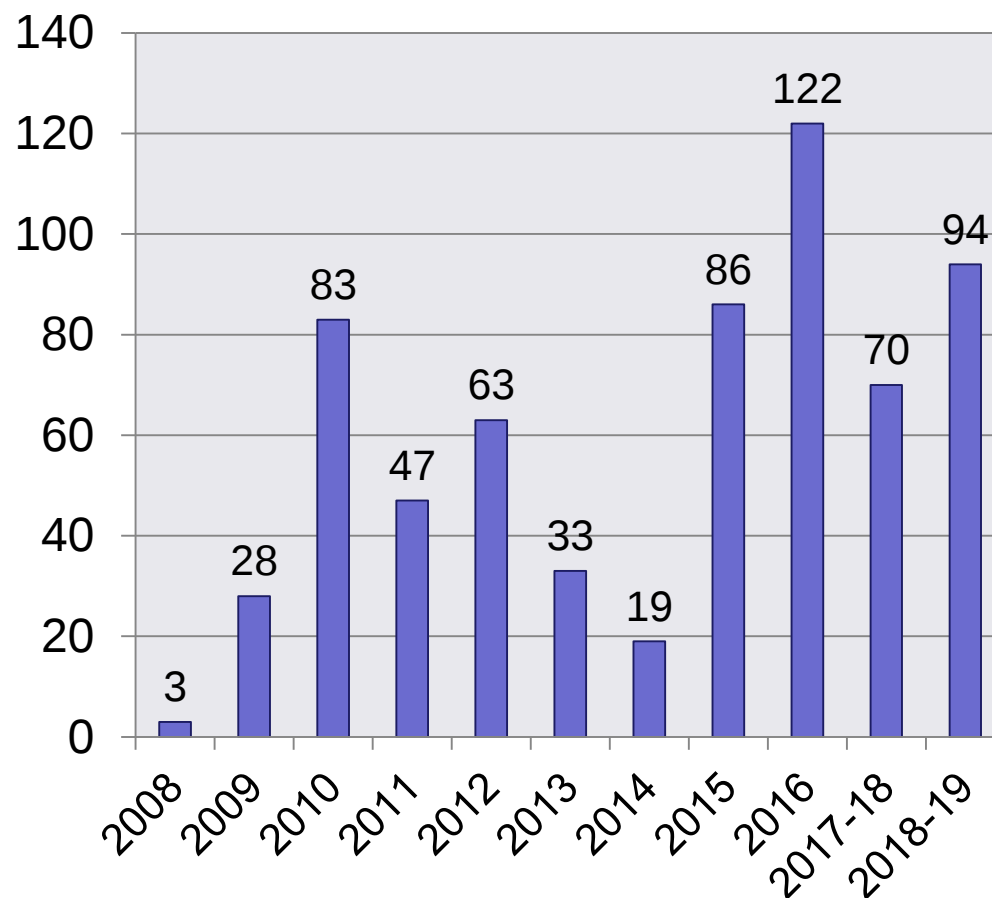
NHS England will commission Percutaneous mitral valve leaflet repair for primary degenerative mitral regurgitation in adults in accordance with the criteria outlined in this document.

Percutaneous Valves

Mitra-Clip

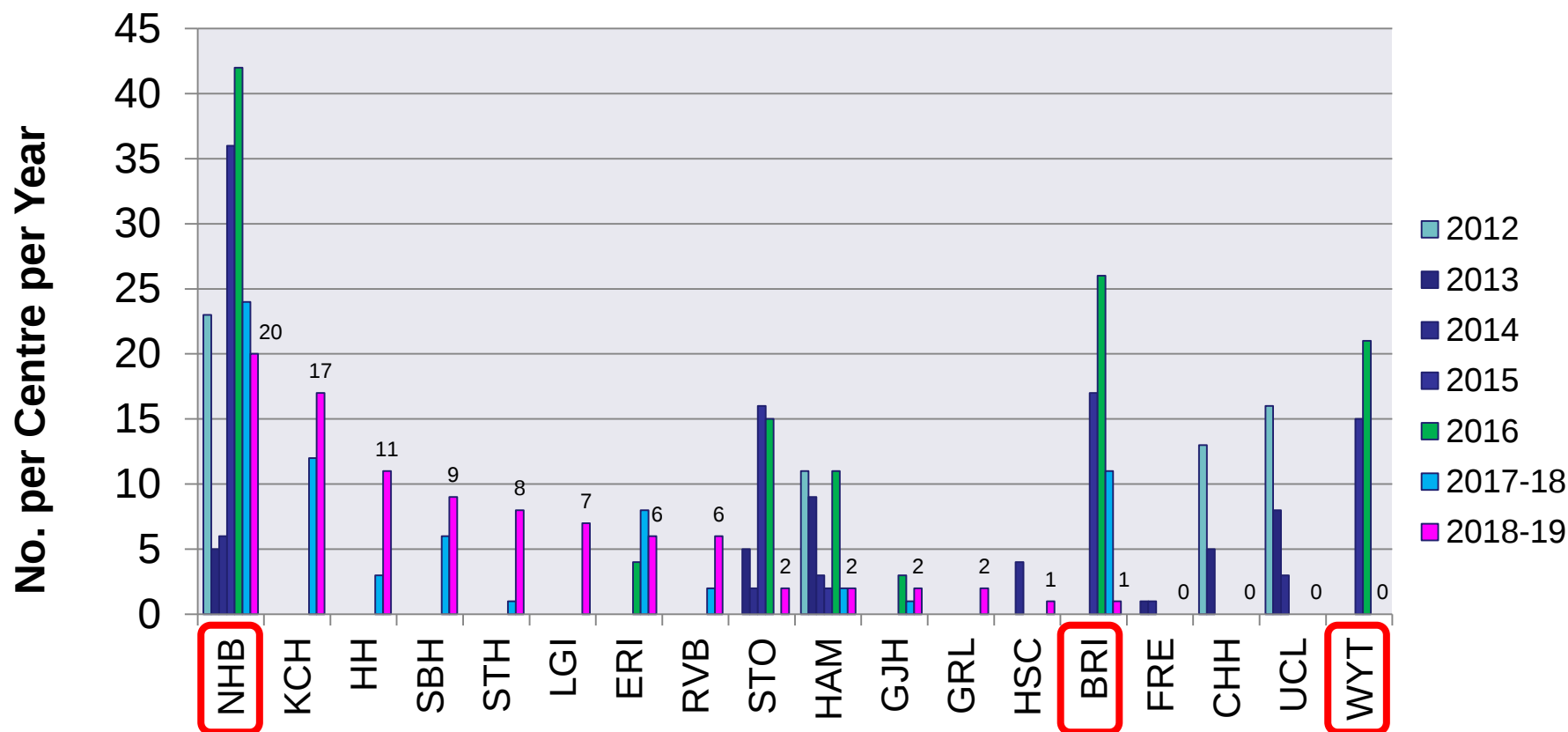


Number per
Year



Percutaneous Valves

Mitra-Clip

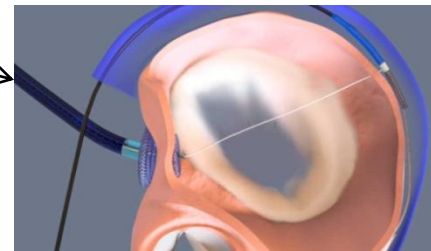
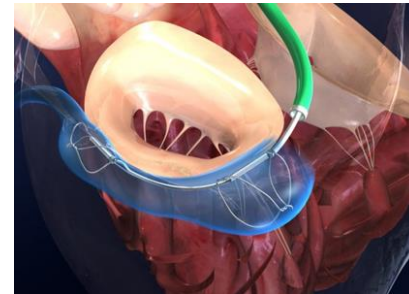


Values shown: procedures in 2018-19
Number of Centres: 18

Percutaneous Valves

Mitral Valve Repair - Other 2018-19

- LGI (Leeds)
 - 2 Carillon →
- NHB (Brompton)
 - 7 Tendyne →
- RSC (Brighton)
 - 1 Arto →

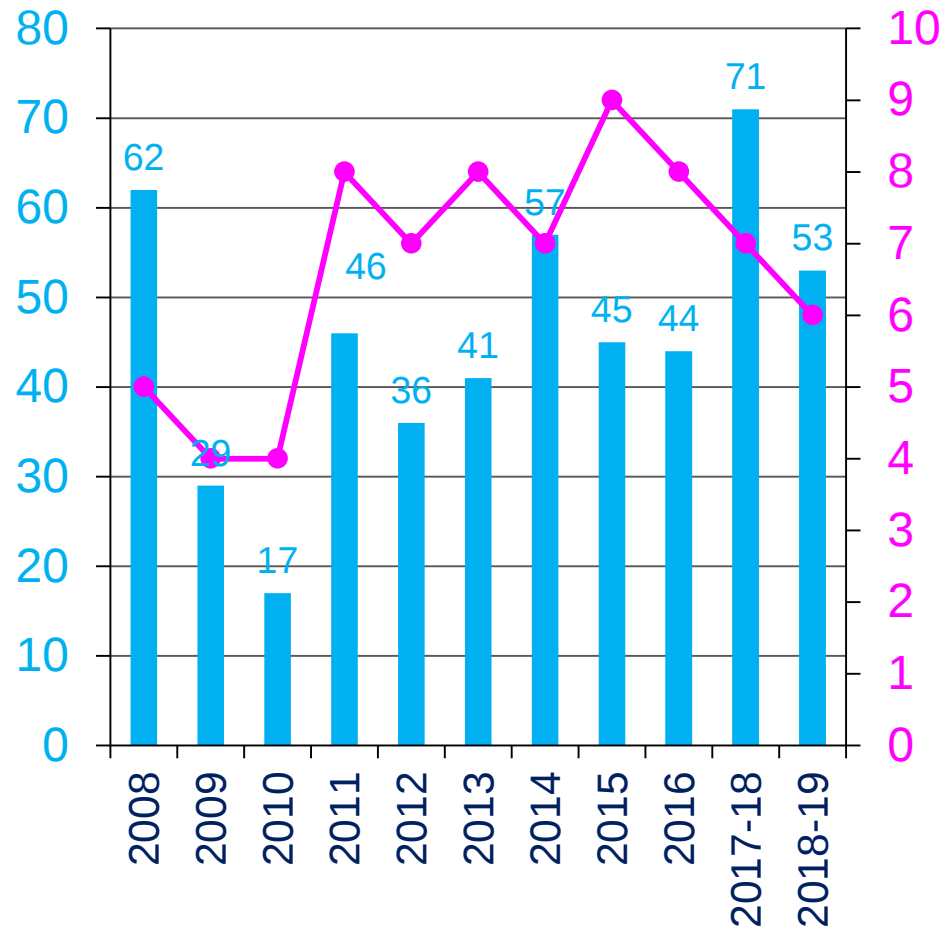


Percutaneous Valves

Pulmonary Valves



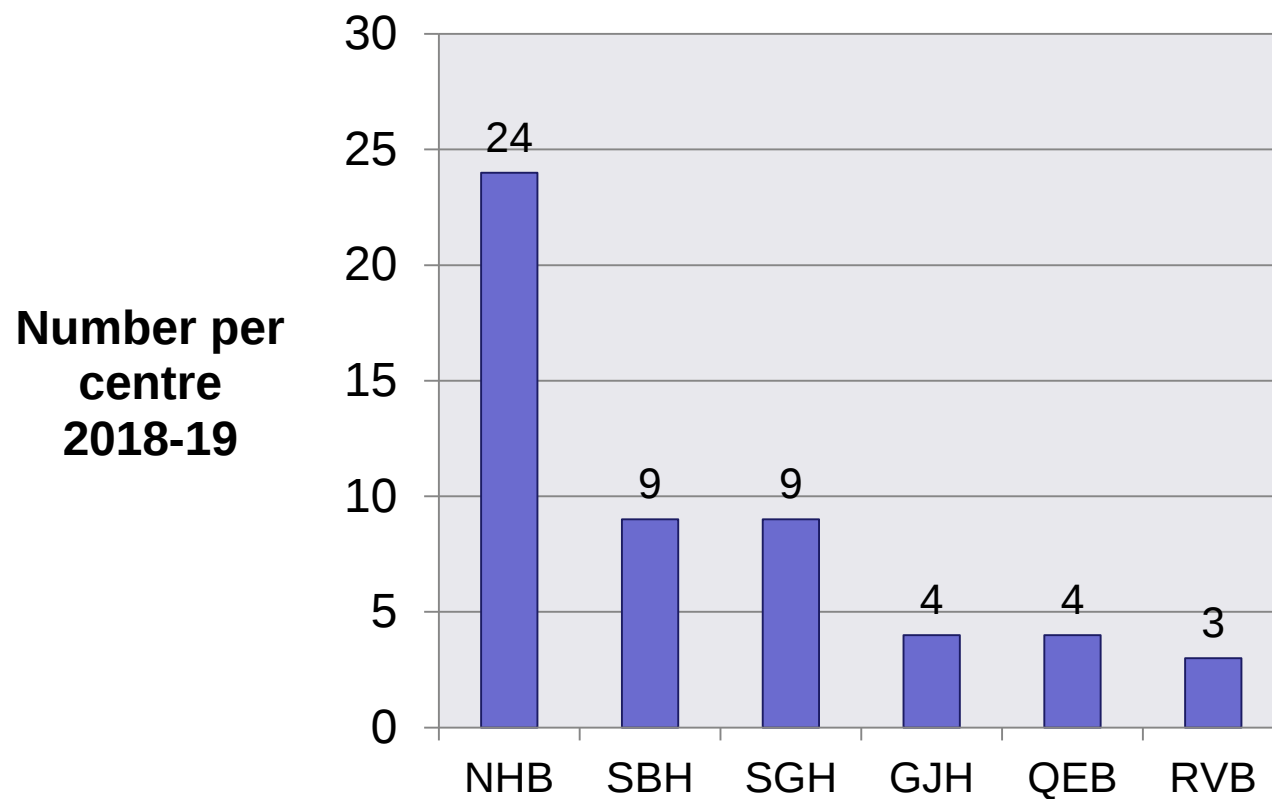
Number of
Procedures



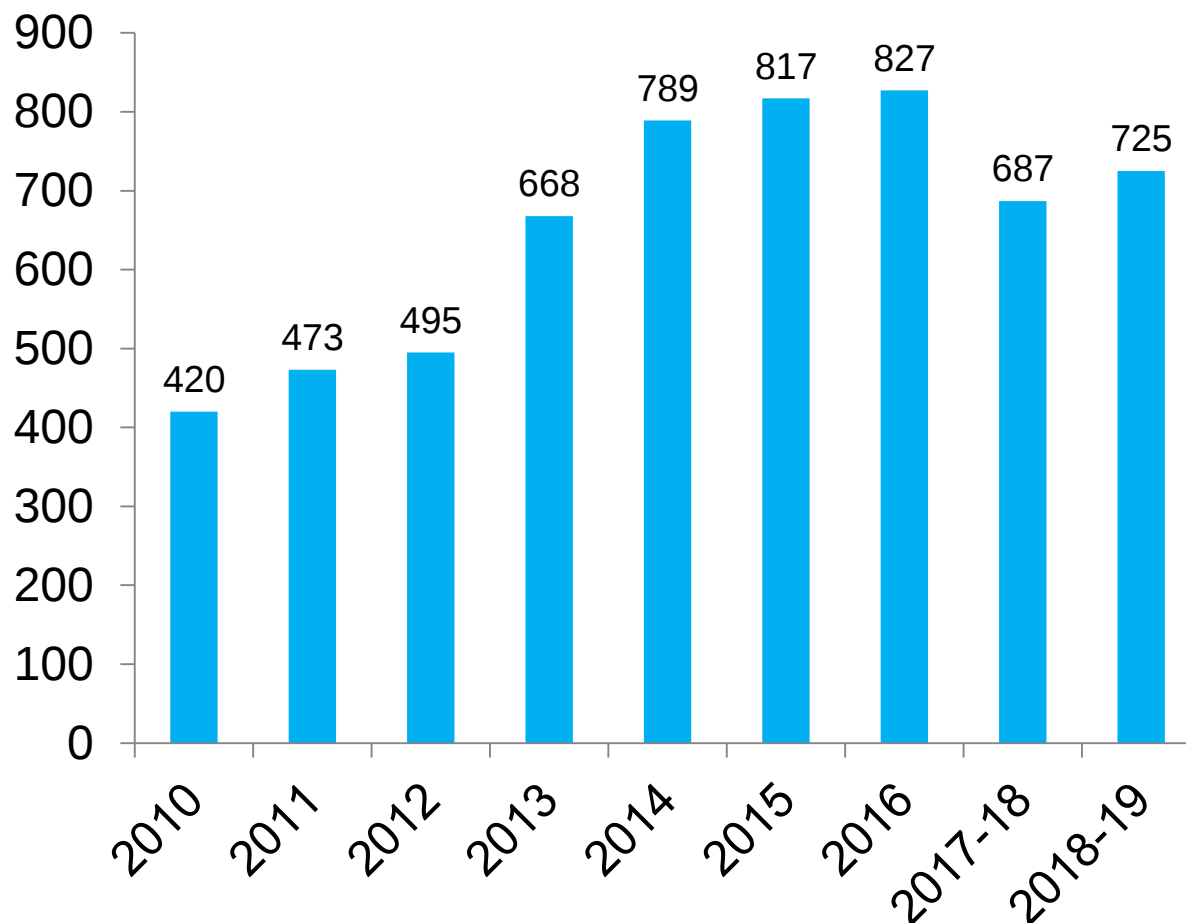
Number of
Centres

Percutaneous Valves

Pulmonary Valves

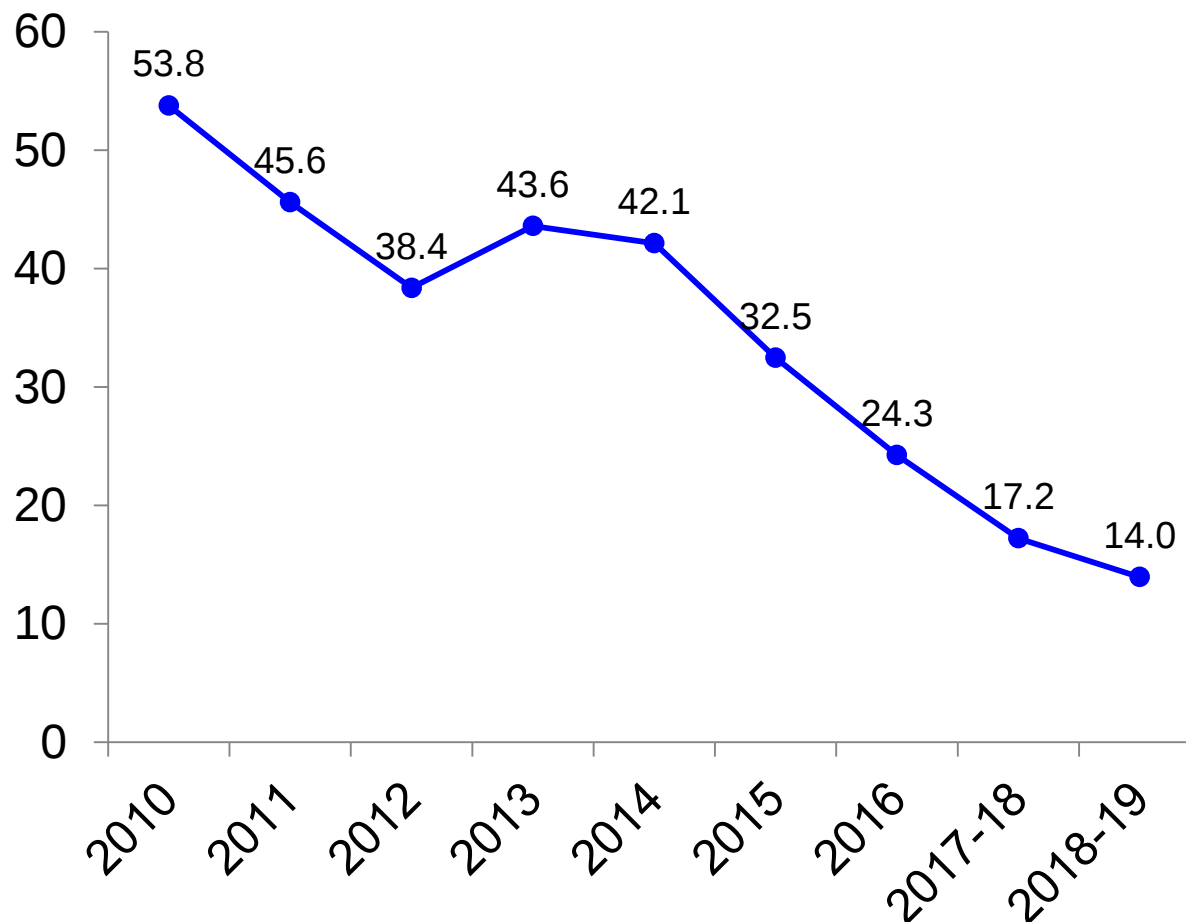


Aortic Balloon Valuloplasty (not as part of TAVI)



Aortic Balloon Valvuloplasty

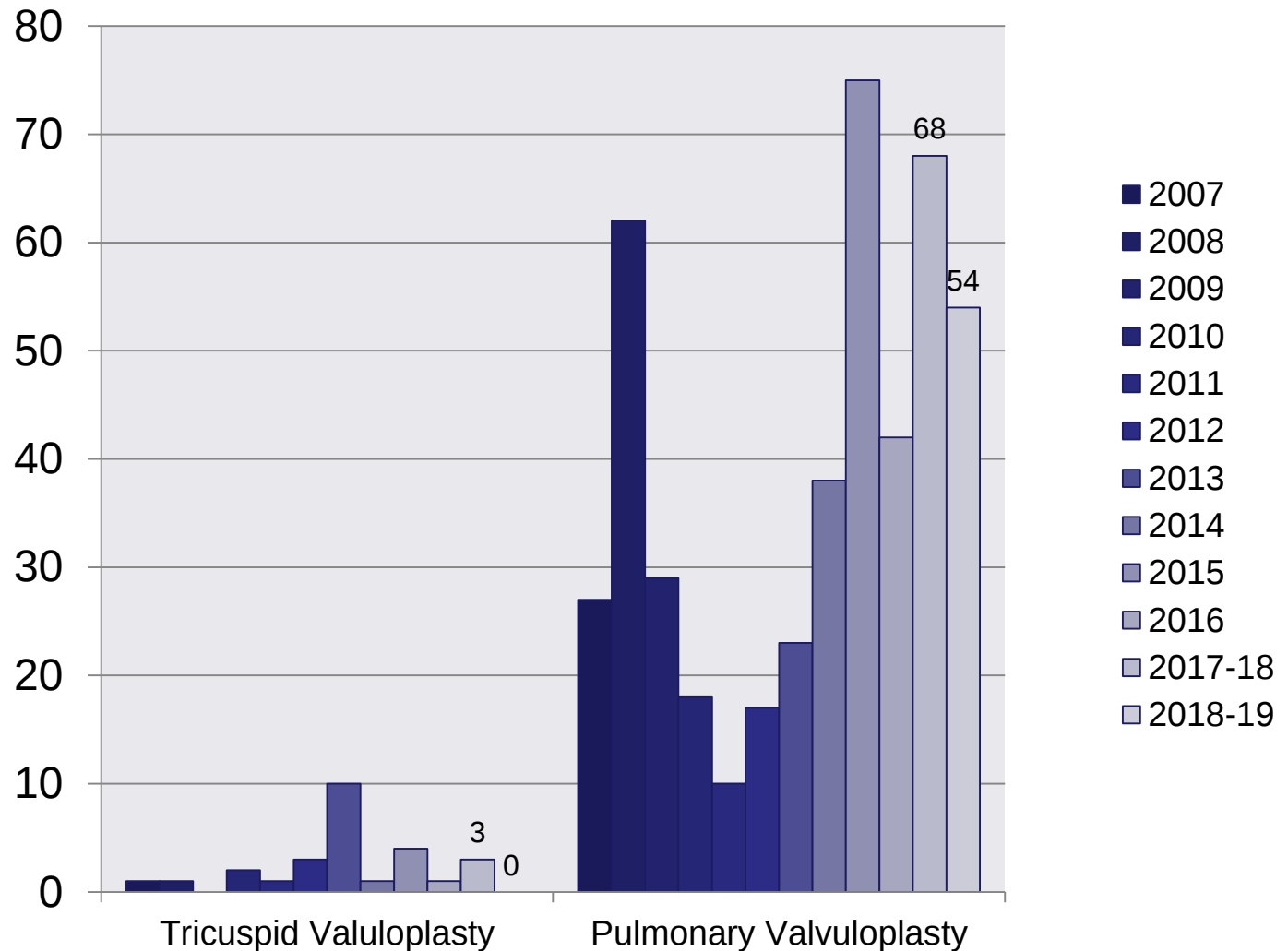
(not as part of TAVI - as a % of TAVI)



Balloon Valvuloplasty

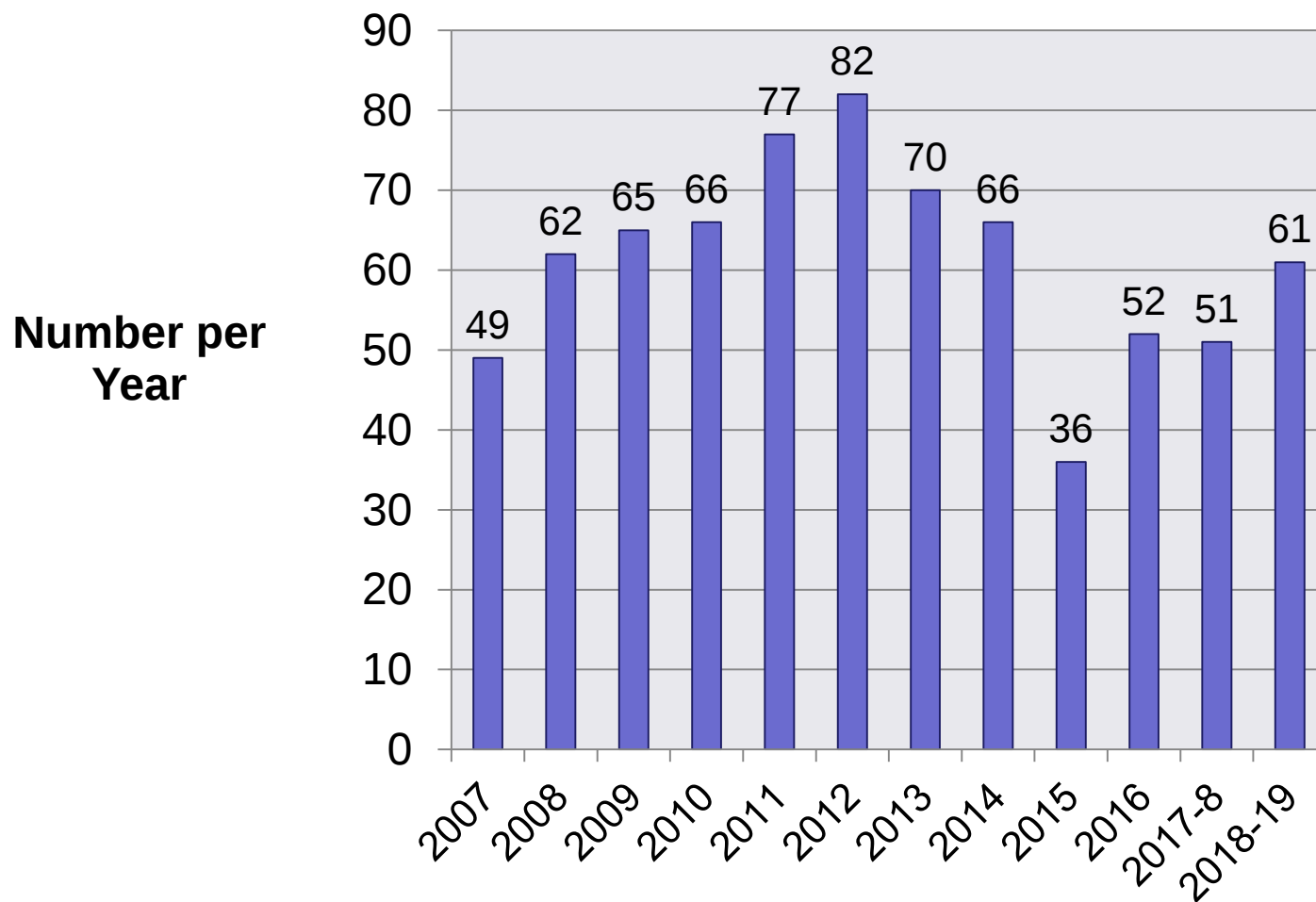
Not as part of valve implantation

Number of
Procedures



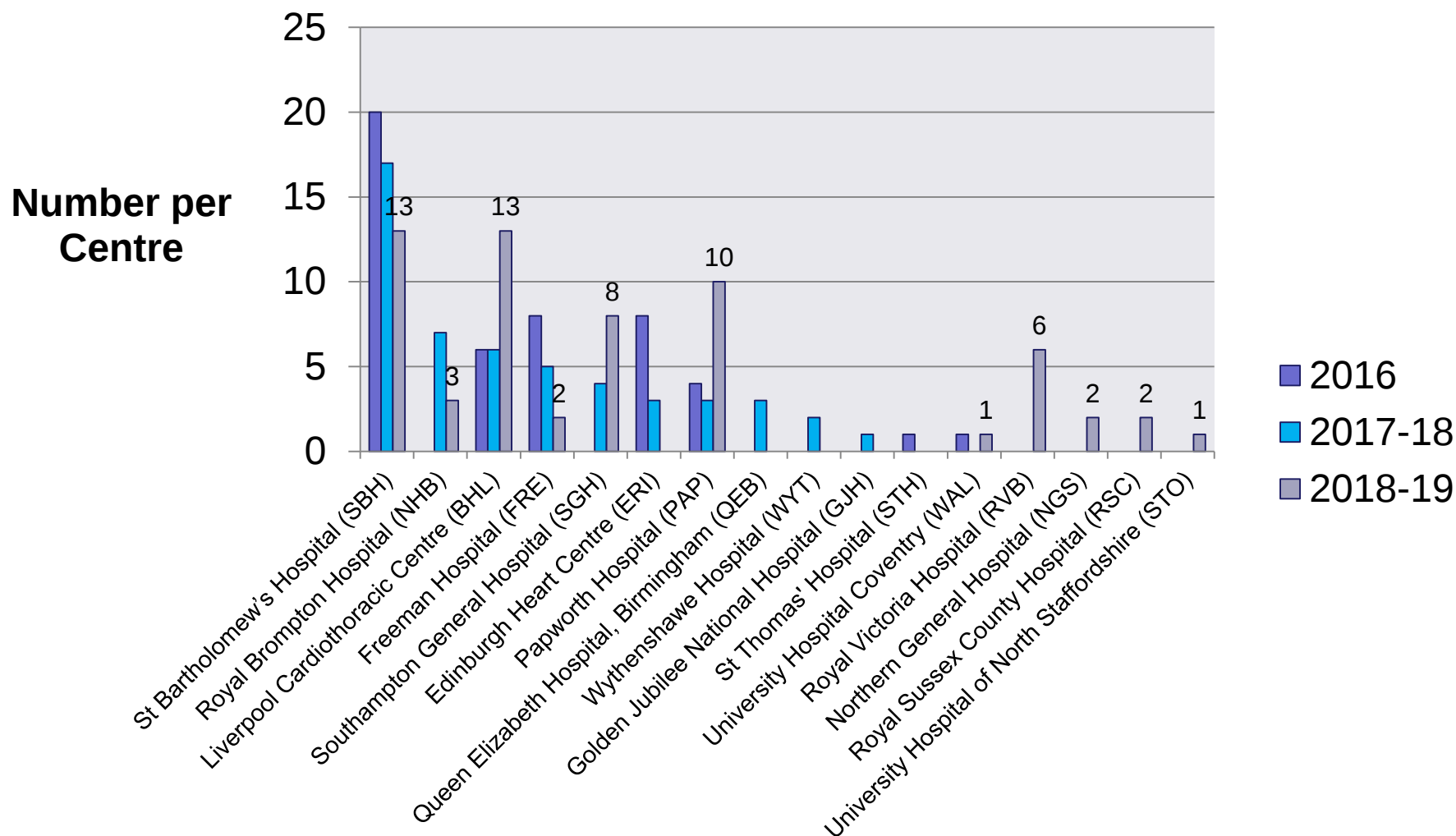
HCM

Alcohol Mediated Septal Ablation

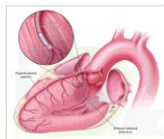


HCM

Alcohol Mediated Septal Ablation



Number of centres 2018-19: 11



HCM

Alcohol Mediated Septal Ablation

2018-19

	Number of alcohol septal ablations	Of which – second attempt	LVOT MDT	Number of operators performing at least one	Other methods for septal reduction	Type of Service
Liverpool Cardiothoracic Centre (BHL)	13	0	0	1	0	Regional service
Barts Health Centre (SBH)	13	2	13	1	0	Sub-regional service
Papworth Hospital (PAP)	10	0	10	1	0	Supra-regional service
Southampton General Hospital (SGH)	8	0	8	2	0	Regional service
Royal Victoria Hospital (RVB)	6	0	0	4	0	Regional service
Royal Brompton Hospital (NHB)	3	?	?	2	?	?
Freeman Hospital (FRE)	2	0	0	1	0	Supra-regional service
Northern General Hospital (NGS)	2	0	2	1	0	Own catchment area
Royal Sussex County Hospital (RSC)	2	0	2	2	0	Own catchment area
University Hospital of North Staffs (STO)	1	0	1	2	0	Supra-regional service
University Hospital Coventry (WAL)	1	0	1	1		Own catchment area

LAA Occlusion



Clinical Commissioning Policy: Left Atrial Appendage Occlusion for patients with atrial fibrillation and relative or absolute contraindications to anticoagulation (adults)

NHS England Reference: 170060P



1

NHS England INFORMATION READER BOX

Directorate

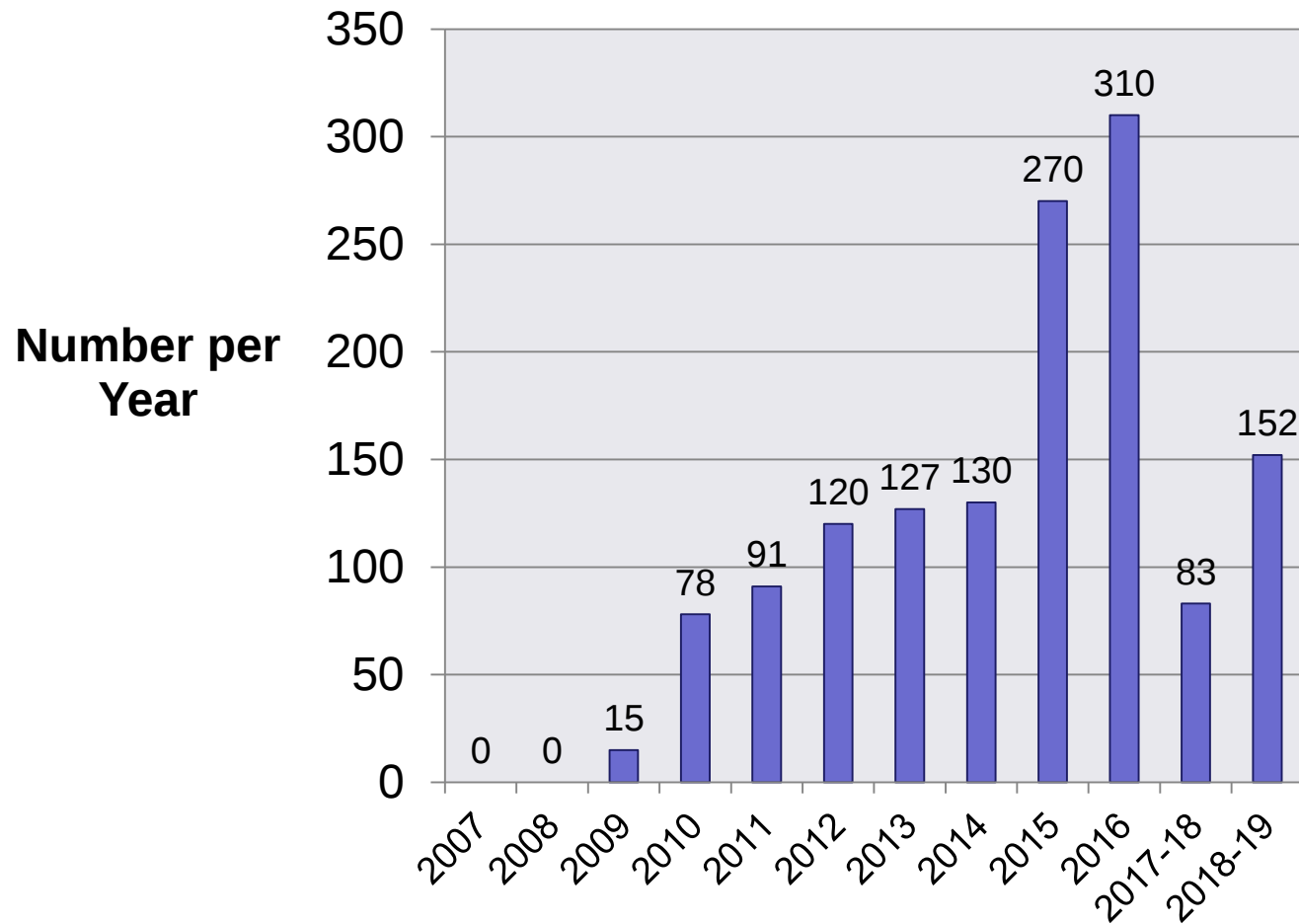
Medical	Operations and Information	Specialised Commissioning
Nursing	Trans. & Corp. Ops.	Commissioning Strategy
Finance		

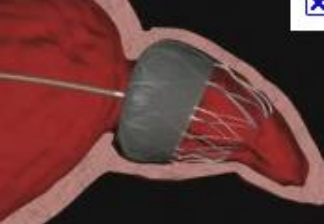
Publications Gateway Reference:

07603

Document Purpose	Policy
Document Name	Clinical commissioning policy: Left Atrial Appendage Occlusion for patients with atrial fibrillation and relative or absolute contraindications to anticoagulation (adults)
Author	Specialised Commissioning Team
Publication Date	29 June 2018
Target Audience	CCG Clinical Leaders, Care Trust CEs, Foundation Trust CEs, Medical Directors, Directors of PH, Directors of Nursing, NHS England Regional Directors, NHS England Directors of Commissioning Operations, Directors of Finance, NHS Trust CEs
Additional Circulation List	
Description	Routinely Commissioned - NHS England will routinely commission this specialised treatment in accordance with the criteria described in this policy.

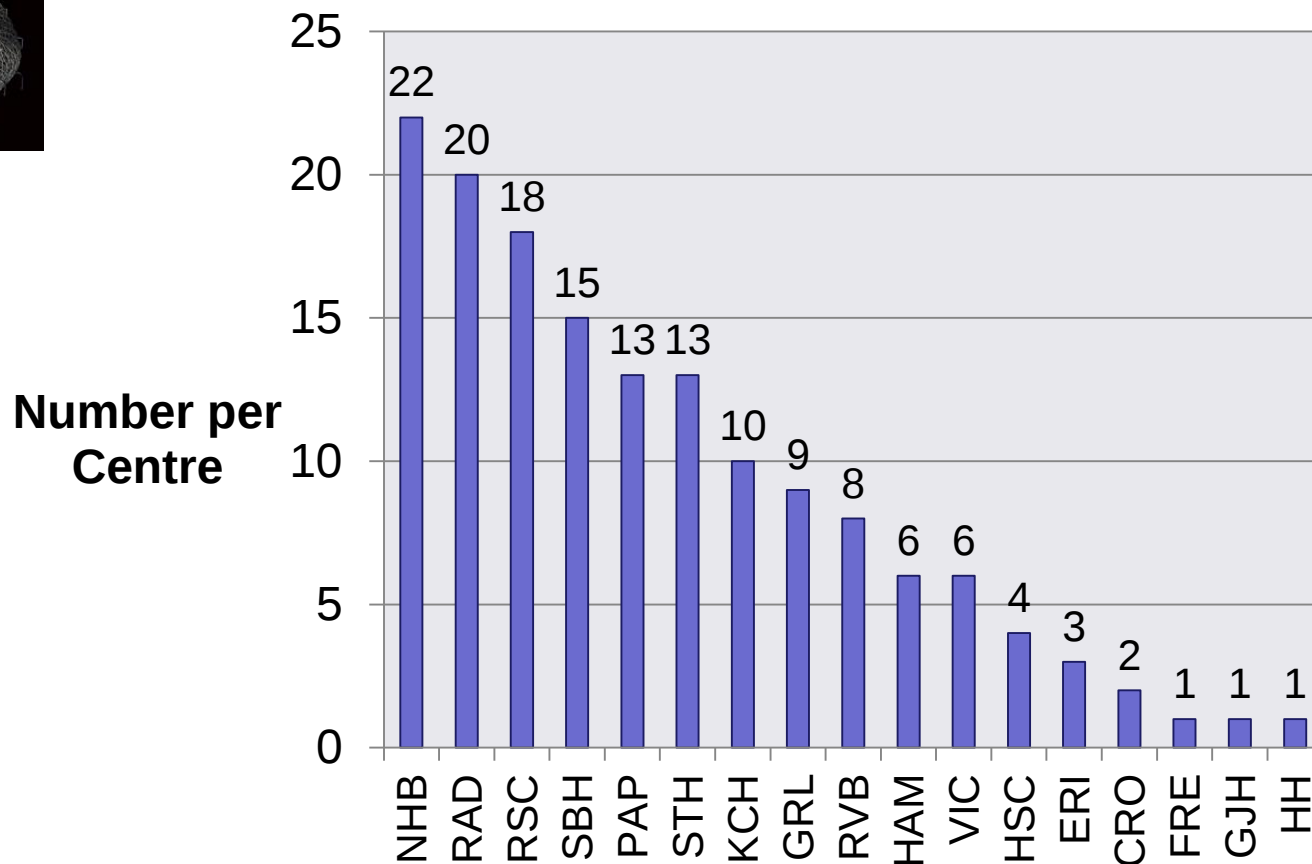
LAA Occlusion





LAA Occlusion

2018-19



Number of centres: 17

ASD and PFO Closure



**Clinical Commissioning
Policy: Percutaneous
patent foramen ovale
closure for the prevention
of recurrent cerebral
embolic stroke in adults
(around the age 60 years
and under)**

NHS England Reference: 170130P



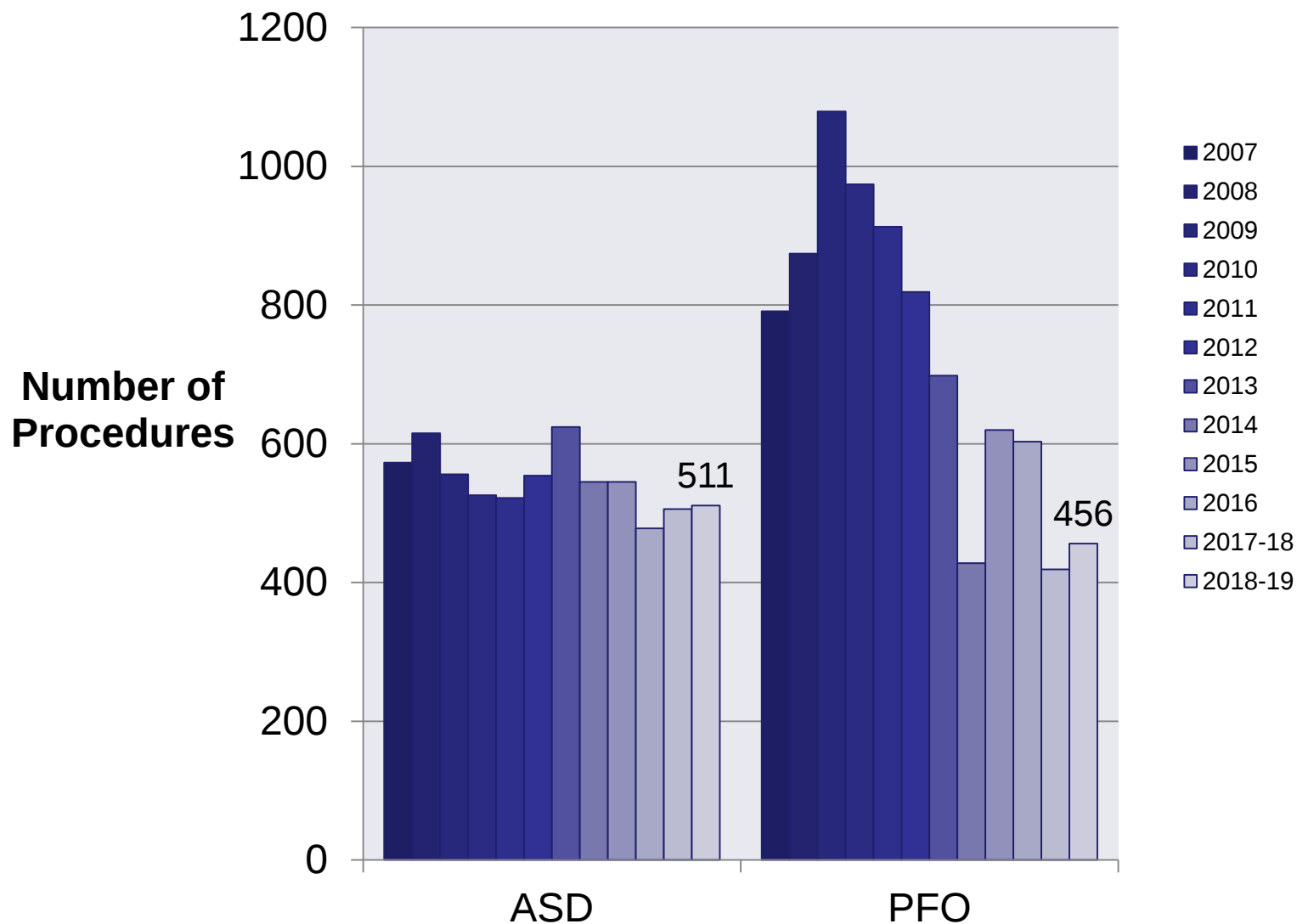
First published: July 2019

Policy Statement

NHS England will commission percutaneous patent foramen ovale closure for the prevention of recurrent cerebral embolic stroke in accordance with the criteria outlined in this document.

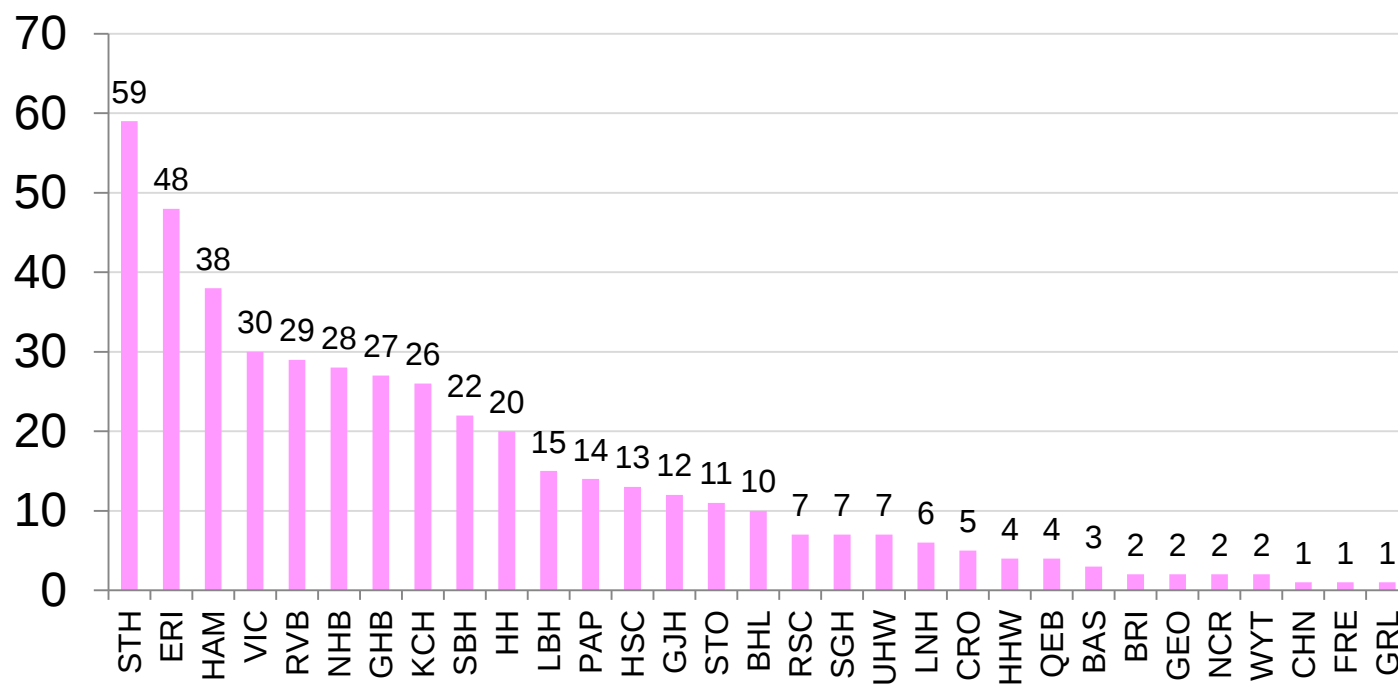


ASD and PFO Closure



PFO Closure

Procedures in
2018-19

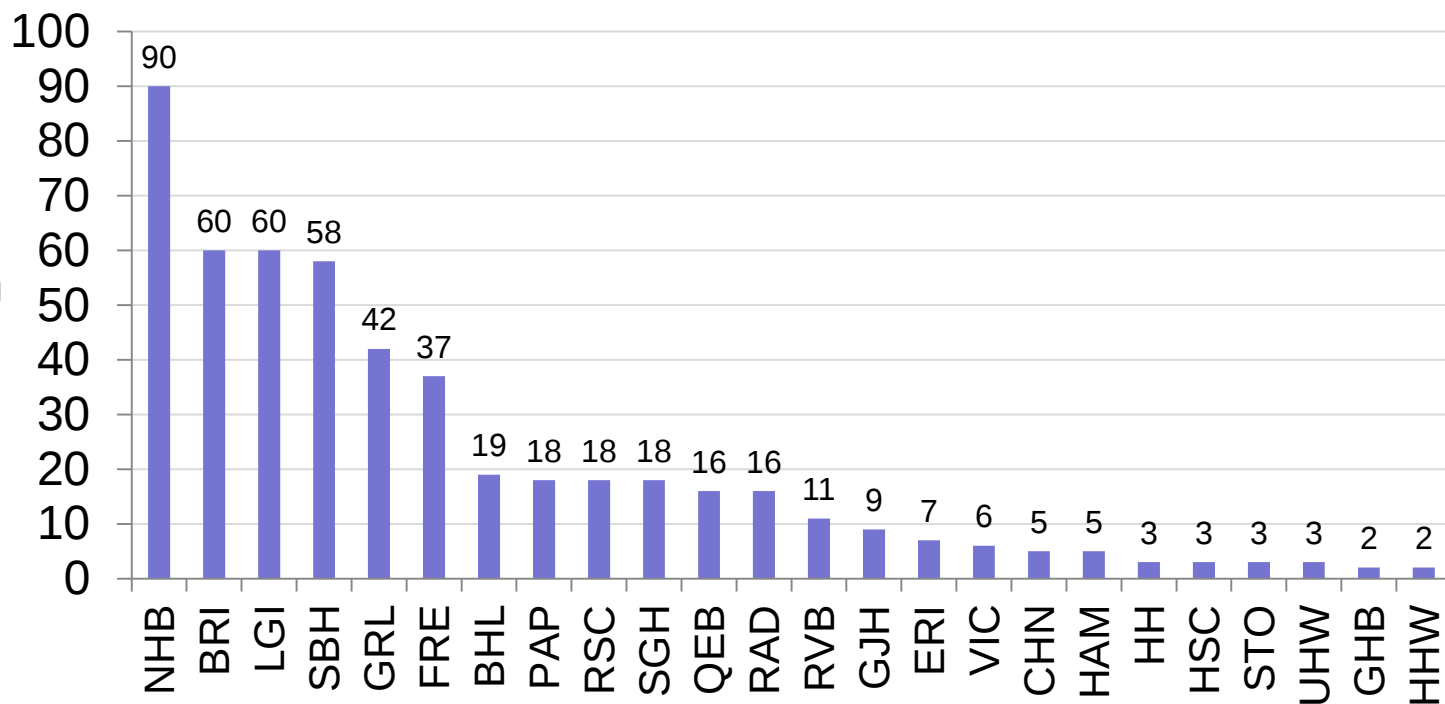


Number of centres: 31



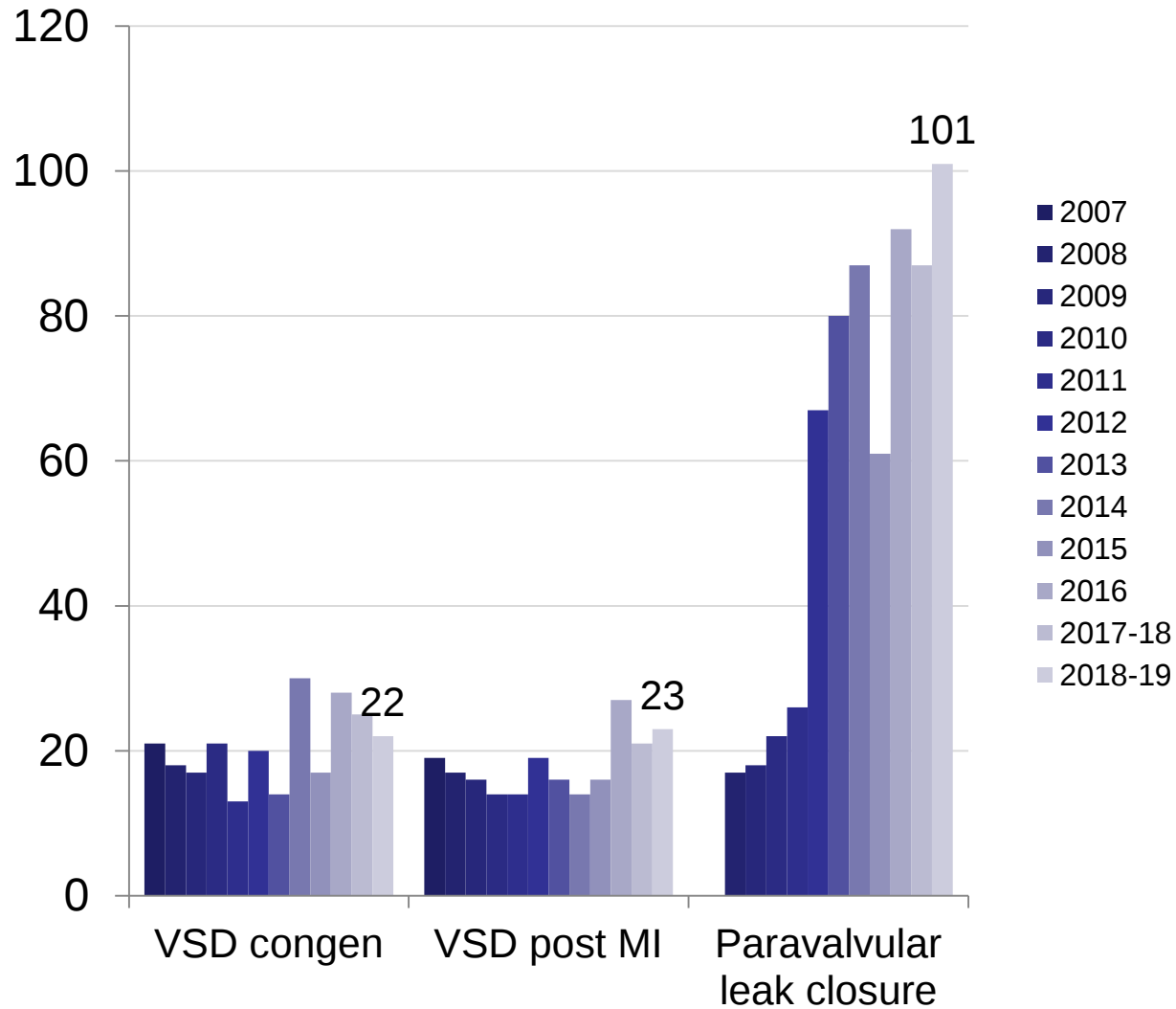
ASD Closure

Procedures in
2018-19

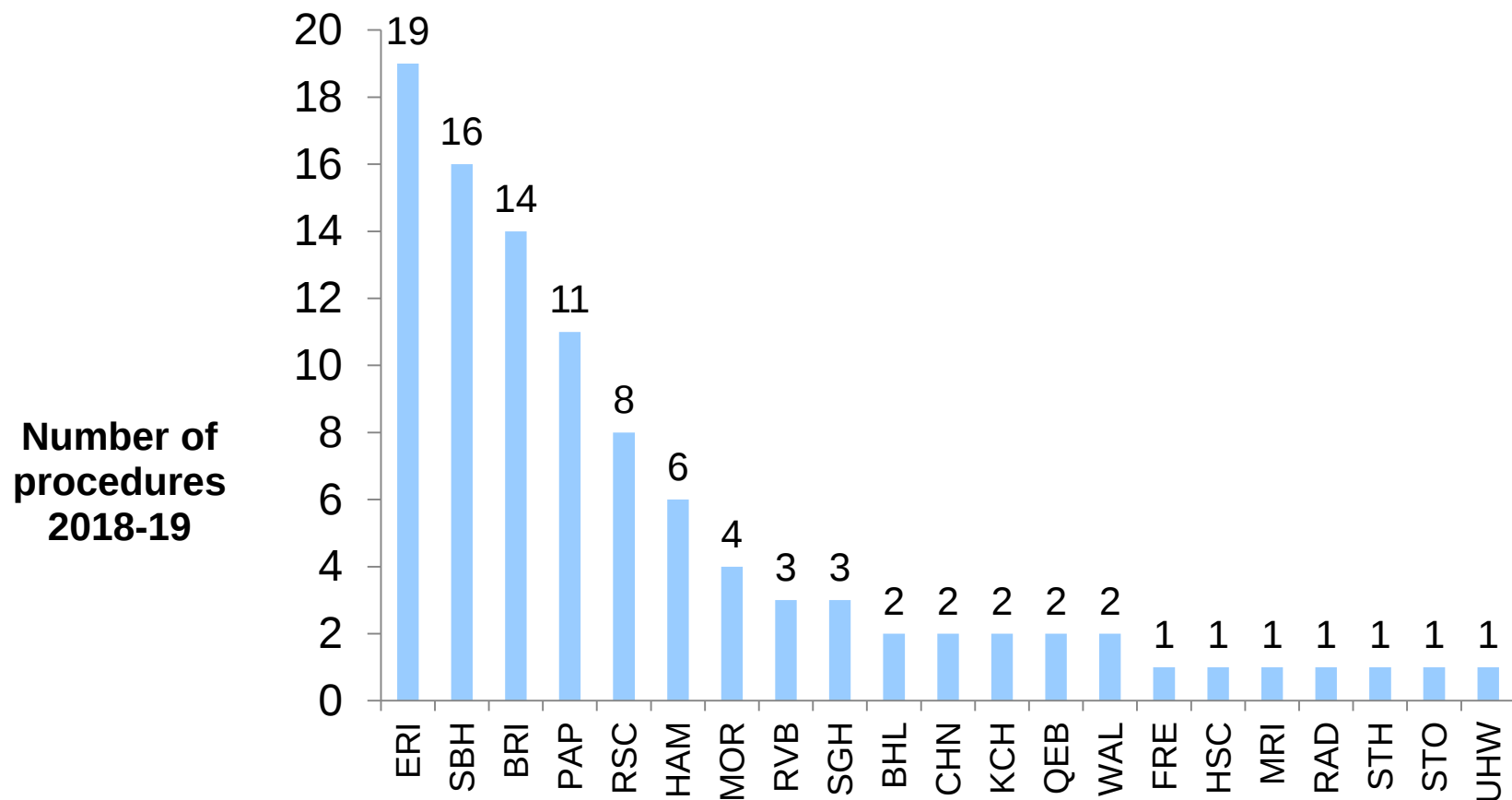


Number of centres: 24

VSDs and Paravalve Leaks

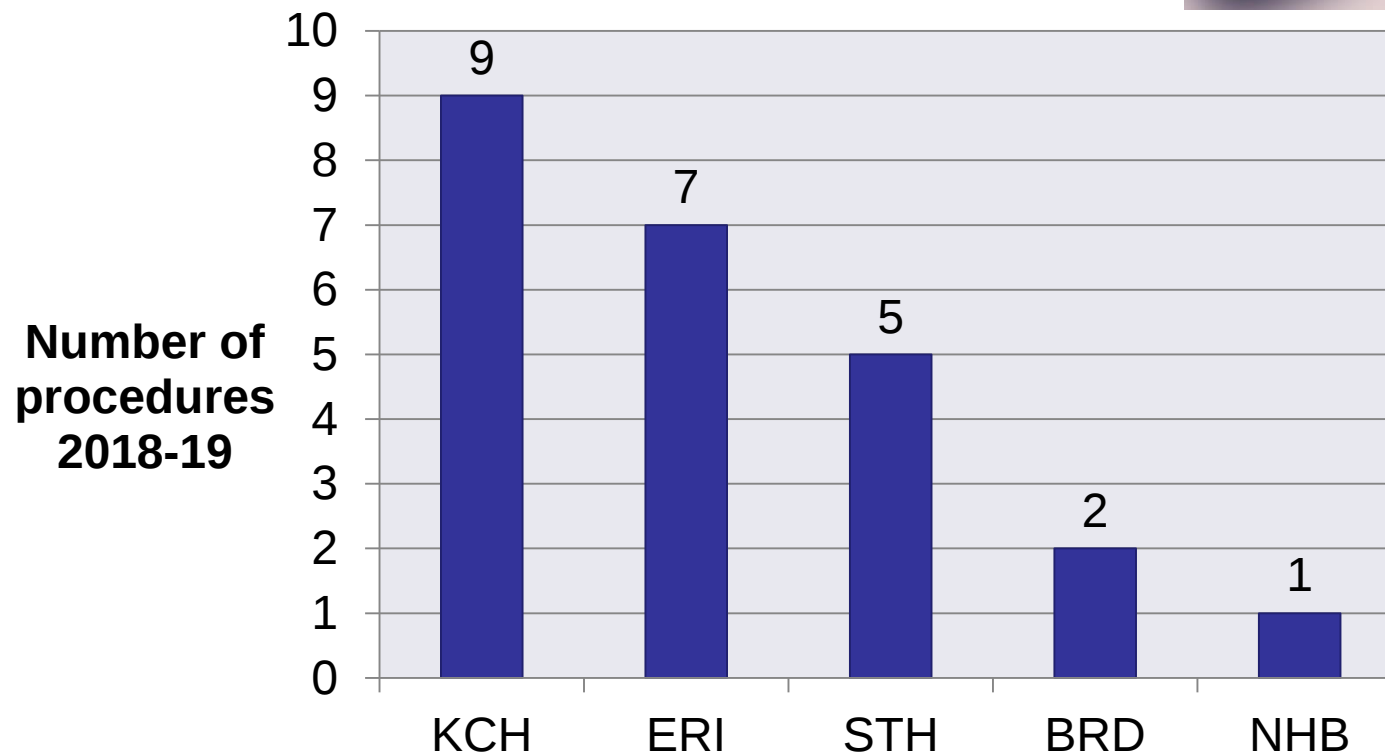
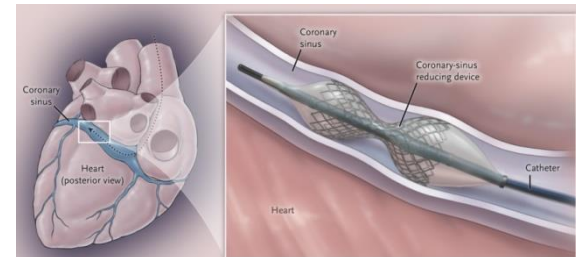


Prosthetic paravalular leak closure



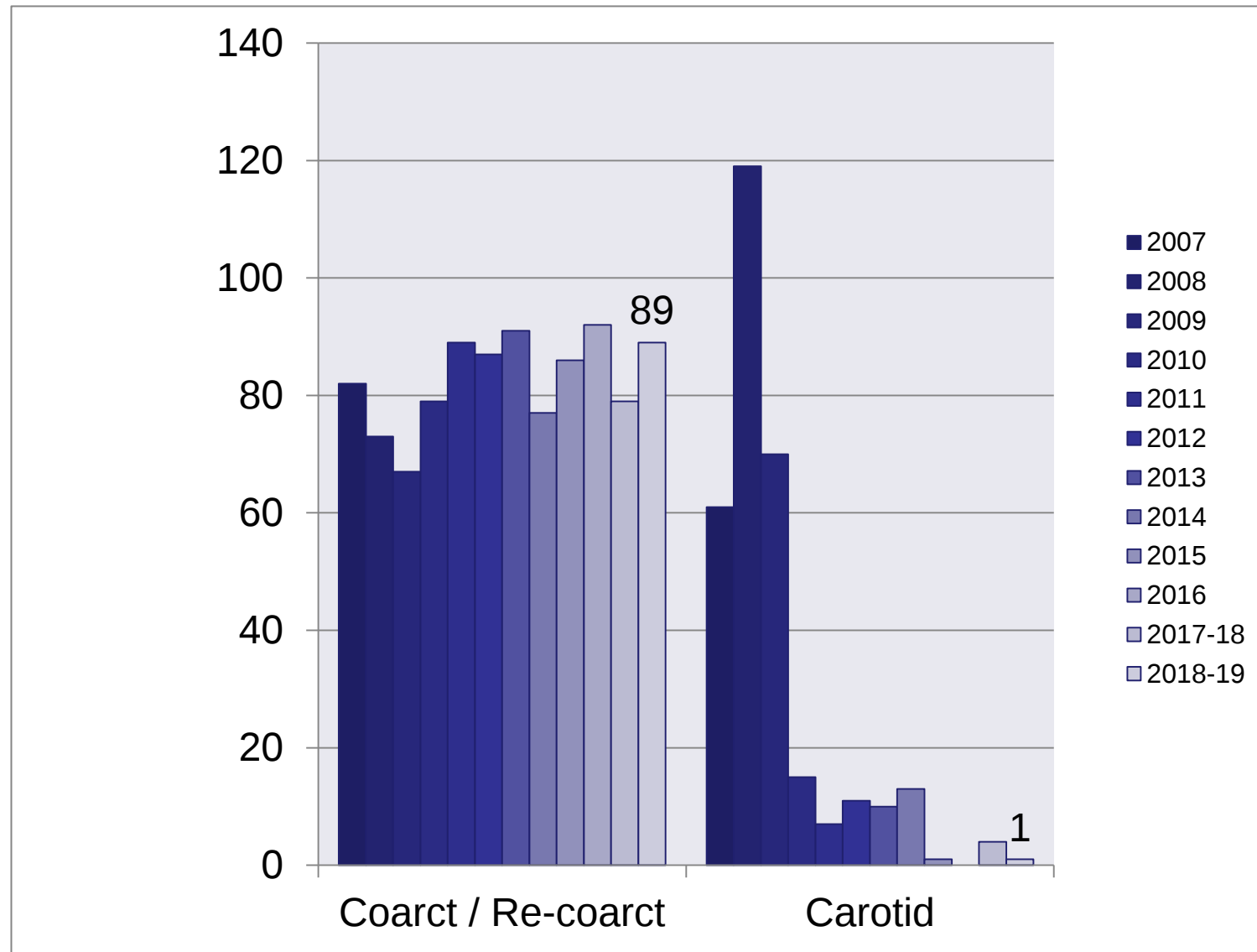
Number of centres: 21

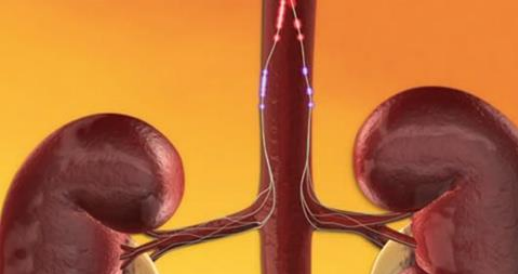
Coronary Sinus Reducer (for refractory angina)



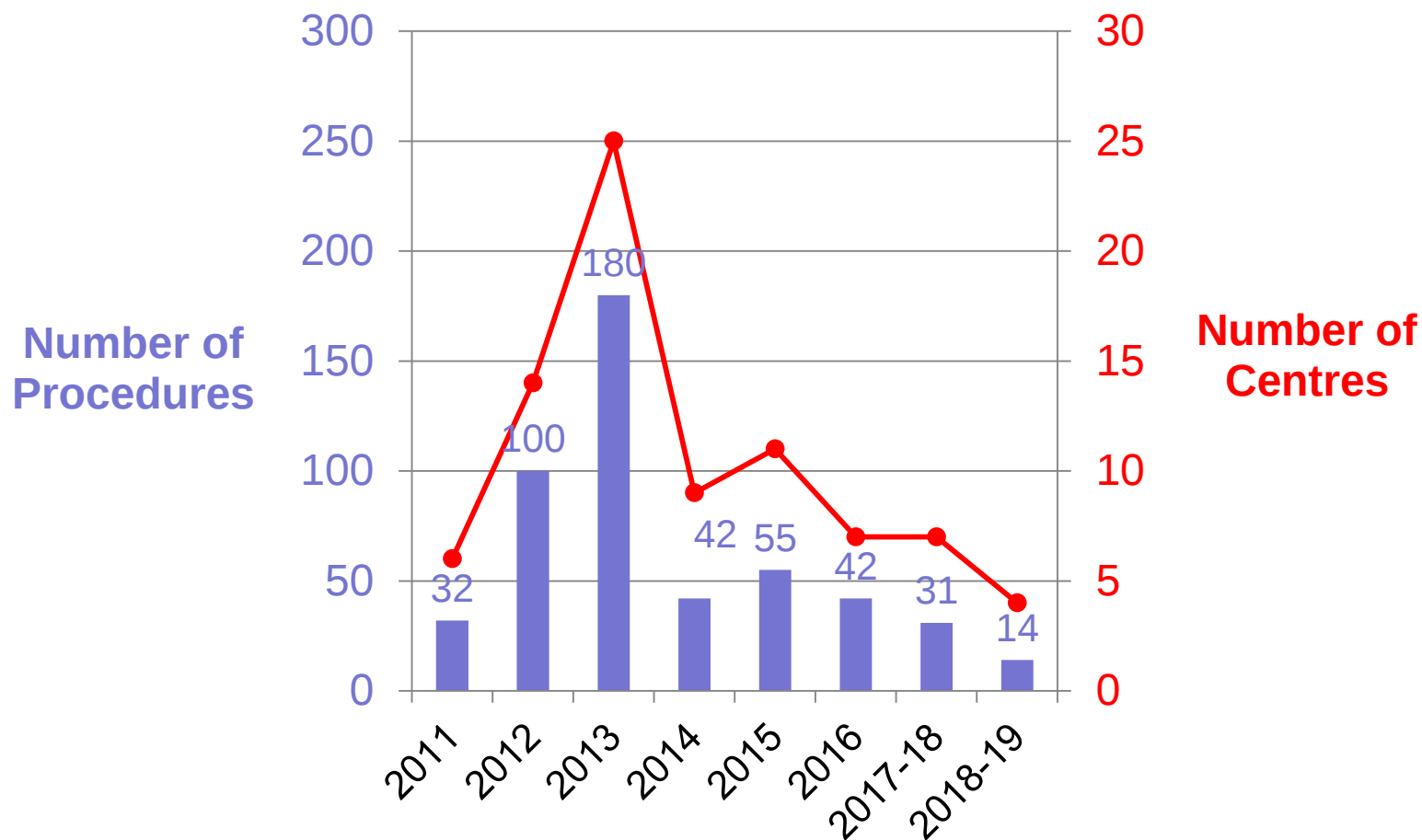
24 procedures in 5 Centres

Adult Great Vessel Intervention

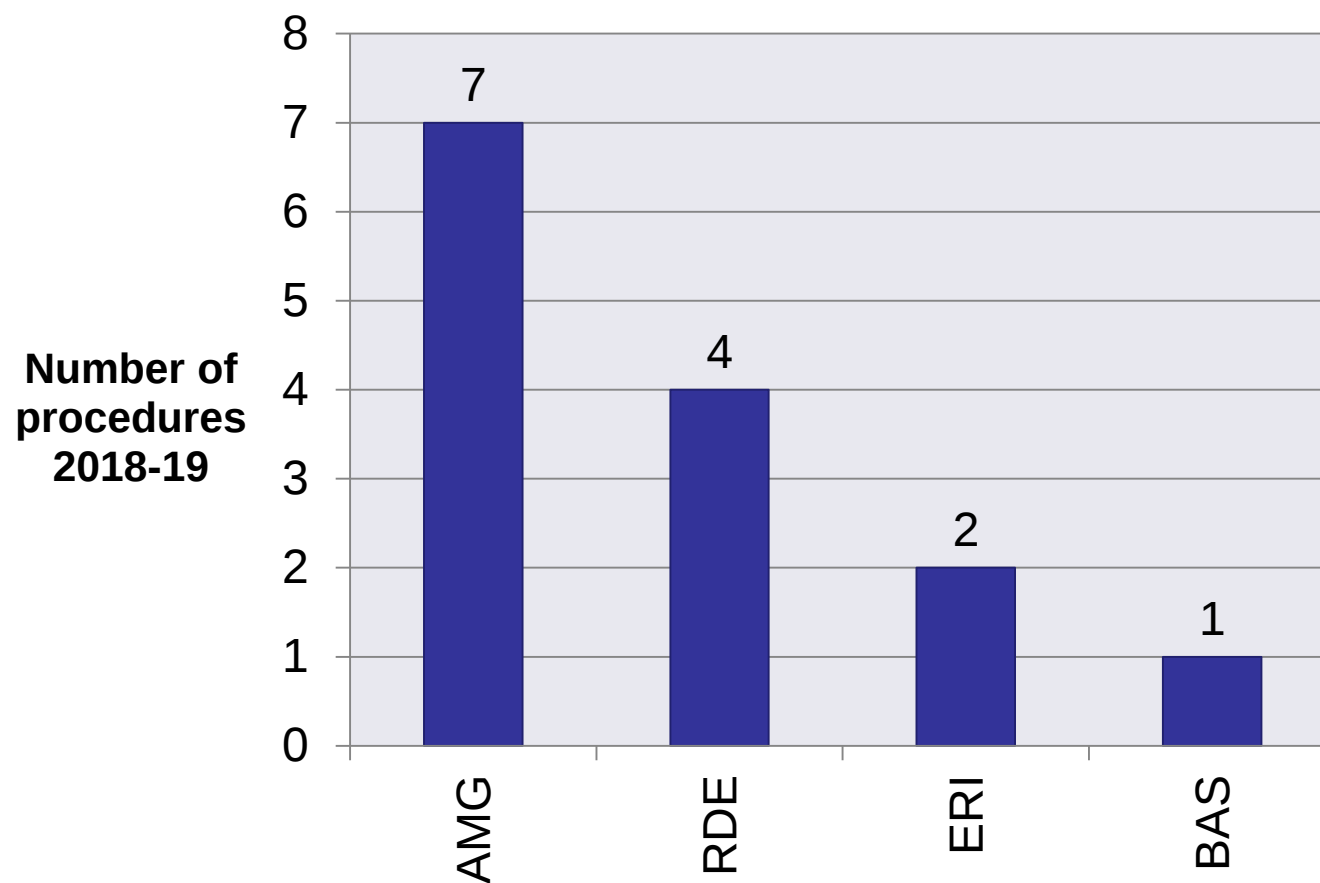




Renal Denervation



Renal Denervation



Number of centres: 4

NICOR - Update



Please provide username and password to sign in

	Username
	

Login

Audit Presentation

- UK PCI activity and delivery
- PCI procedure specific data
 - NICOR
 - Case ascertainment
 - Antiplatelet therapy
- Structural Intervention
- New analytic tools for NICOR data
- Clinical Outcomes Publication

NICOR

Developers

- Infrastructure
- Qreg5
- Mongo db

Live data analysis

Extracts
ONS data
(Anonymisation)

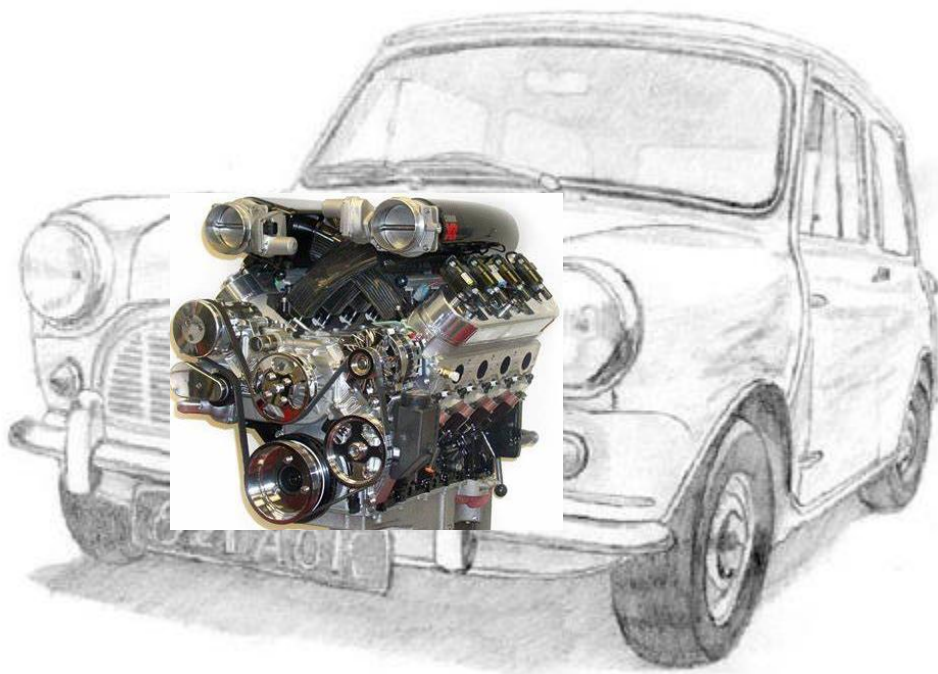
Analytic team

Linked and cleaned

Slide deck
benchmarking (QA / QI)

Outlier analysis
COP

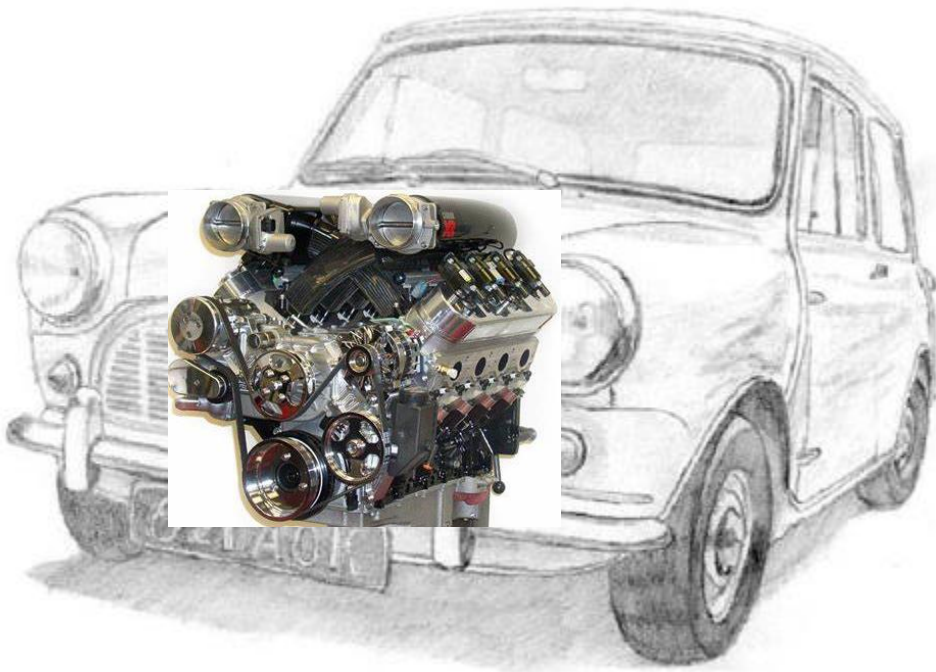
Lotus Notes → QReg5



Monthly data reports
Monthly PCI delays reports
Quarterly Funnels
Quarterly VLADs
Appraisal reports

Lotus Notes → QReg5

New Dashboard



Home Search Patient Import Export Data completeness QI Metrics Reporting Domain: PCI | Hospital : QEB: Queen Elizabeth Hospital, Edg

NICOR

Data Completeness

[Calculate Completeness](#)

Audit

Date Interval And

Report Level

[Results](#)



Fixed Reports

Generate Report

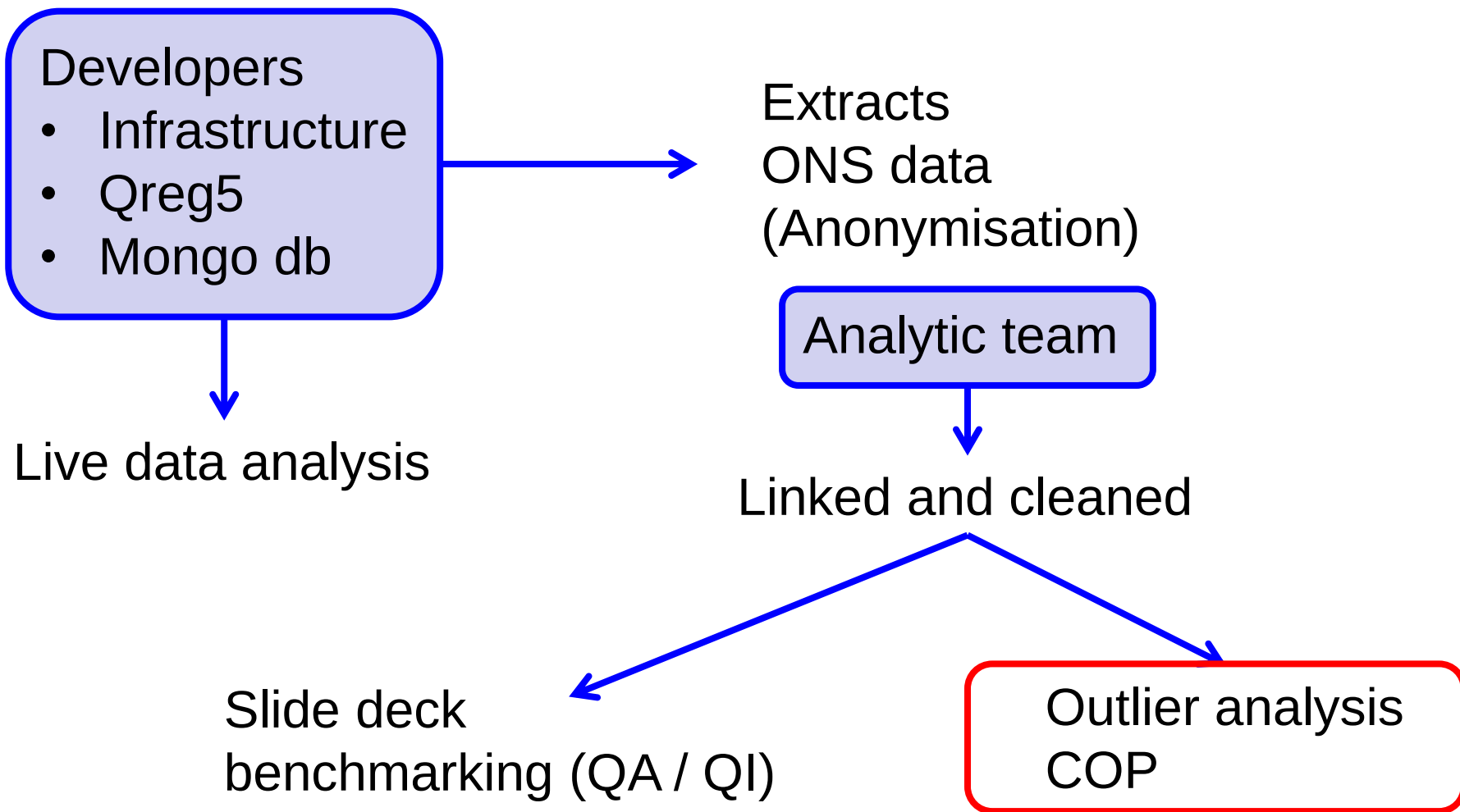
Data completeness **User Reports ▼** QI Reports

- Select from list
- User designed
- Favourite queries

Audit Presentation

- UK PCI activity and delivery
- PCI procedure specific data
 - NICOR
 - Case ascertainment
 - Antiplatelet therapy
- Structural Intervention
- New analytic tools for NICOR data
- Clinical Outcomes Publication

NICOR



Clinical Outcomes Publication

- Current 3 year analysis
 - 2015/16 + 2016/17 + 2017/18
 - Consultant Operator and Centre Specific reports
- Excluded
 - Patient requiring pre-PCI ventilation
 - PCI performed within 30 day of previous
 - Patient not resident in England or Wales
- Included
 - Cardiogenic shock

Data completeness analysis for ONS 30 day 30 day survival track:

Patients treated in E&W but not resident there identified by ZZ postcode

Clinical Outcomes Publication

- Assessing patient outcome following PCI
 - Raw outcome data - no adjustment for case mix
 - Risk models
 - Need good calibration and discrimination
 - Helpful for overall populations and individual assessments
 - Assessing outcomes of PCI centres and PCI operators
 - Funnel plots
 - Statistical complexity
 - Overdispersion
 - Multiple comparisons
 - Model drift
 - Clustering by Centre

Clinical Outcomes Publication

- Advisors:
 - Professor Sir David Spiegelhalter (University of Cambridge)
 - Professor Rumana Omar (Department of Statistical Science at UCL)
 - Dr Gareth Ambler (Senior lecturer UCL)
 - Dr Menelaos Pavlou (Lecturer UCL)
- Random effects models
 - Allows for adjustment for case mix
 - Allows for variability between hospitals – deals with overdispersion
 - Automatically re-calibrates models
 - Does not incorporate false discovery rates
 - Cannot be displayed as a funnel plot

Clinical Outcomes Publication

- Outlier analysis not performed if:
 - Survival track $< 90\%$
 - < 200 PCIs performed over 3 years
- Public report of 3 SD only
- Operator report of 2 and 3 SD
- Contact with PCI centre or Operator made if
 - Survival track $< 90\%$
 - Poor survival at 2 SD or 3 SD (potential outlier)
 - Better survival at 2 SD or 3 SD (potential outlier)

Clinical Outcomes Publication

- Current status:
 - Validation reports sent 2018
 - No outlier status included (ONS track unavailable)
 - ONS track → New statistical methodology
 - Potential outliers contacted Sept 2019
 - Publication 2020 (? March/April)
 - Available for viewing on web first
 - Publically available

Clinical Outcomes Publication

PCI Centre 6 page report



National Audit of Percutaneous Coronary Interventions PCI Hospital Report

Data from 1st April 2015 to 31st March 2018 inclusive

The data completeness provided for this report's risk adjusted outcomes are considered to be: **ADEQUATE**

(BCIS require data completeness levels of greater than 95 percent in each category to allow appropriate analysis of PCI outcome data)

Total Number of PCI Procedures: 2465

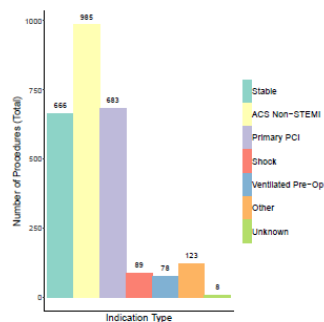
Consultants Performing PCI:

GMC	2015/16	2016/17	2017/18	Total
2820567	91	69	90	250
2931574	94	98	102	294
3071591	68	1	-	69
3334722	104	67	65	236
4077196	143	103	137	383
4114912	1	-	-	1
4613174	206	202	179	587
4732149	164	-	-	164
5204403	-	147	55	202
6048882	-	-	73	73
6067087	-	111	95	206
Total	871	798	796	2465

This report was generated by the NICOR Analysis Team on 09 October 2019 based on data as of 15th Feb 2019.

1 of 6

Number of Procedures Split by Clinical Syndrome:



GMC	2015/16	2016/17	2017/18	Total
Stable	244	223	199	666
ACS Non-STEMI	347	325	313	985
Primary PCI	229	199	255	683
Shock	22	31	36	89
Ventilated Pre-Op	20	20	38	78
Other	47	48	28	123
Unknown	4	3	1	8

Radial Access Rates (2017/18 data only):

	Hospital Rate	National Average
Percent of Cases Where a Radial Access Route Was Used	80.07%	87.29%

This report was generated by the NICOR Analysis Team on 09 October 2019 based on data as of 15th Feb 2019.

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Door to Balloon Times and Delays (2017/18 data only):

(Note: delays calculations are for patients with symptom onset in the community and for Primary PCI also excludes those ventilated or in shock)

Extent of Data Completeness in Variables Relevant to Primary PCI Door to Balloon Time Delays

	Complete Records	Percentage
Date/time of symptom onset	197	100%
Date/time of call for help	197	100%
Date/time of arrival at first hospital	197	100%
Date/time of arrival at PCI hospital	197	100%
Date/time of first balloon inflation	197	100%
Discharge date	197	100%

Door to Balloon Times: Primary PCI

	Hospital Rate	National Average
Primary PCI: Percent of Cases Treated Within 90 minutes	91.88%	89.58%

Breakdown of Admission Route for NSTEMI Cases (Where Admission Route Has Been Recorded):

	Hospital Rate	National Average
% of cases recorded as 'Direct Admission'	96.75%	72.55%

Extent of Complete Data in Variables Relevant to NSTEMI Door to Balloon Time Delays

	Complete Records	Percentage
Route of admission *	313	100%
Completeness of data to assess delays: Direct Admission **	268	100%
Completeness of data to assess delays: IHT ***	11	100%

* Out of all NSTEMI cases

** Out of all direct admission cases (requires admission route and arrival at PCI centre)

*** Out of all IHTs (requires admission route, symptom onset time, arrival at first hospital, and arrival at PCI centre)

Door to Balloon Times (where admission route and timings are recorded): NSTEMI

	Hospital Rate	National Average
NSTEMI: % of ALL Cases Treated Within 72 Hours	61.37%	57.81%
NSTEMI: % of Direct Admission Treated Within 72 Hours	62.60%	64.51%
NSTEMI: % of IHT Cases Treated Within 72 Hours	22.22%	46.93%

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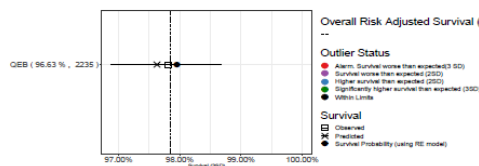
Clinical Outcomes Publication

PCI Centre 6 page report

Extent of Data Completeness in Variables Relevant to Risk Estimation (3 years of data):

	Age	Sex	Medical History	Shock	Urgency	Vessels Attempted	Diabetes	Prior MI	Renal Disease	Indication
Count	2465	2465	2465	2465	2465	2465	2460	2458	2464	2457
Percent	100	100	100	100	100	100	99.8	99.72	99.96	99.68

Display of Risk Adjusted Analysis:



Vertical axis: Hospital identifier and in parentheses: number of patients treated and completeness rate of life status tracking percentage (i.e. the percentage of patients for whom survival data are available).

Horizontal axis: Percentage Survival at 30 days

The following are presented:

1. Overall Survival to 30 days [dashed vertical line]: the overall proportion of patients who survive across all hospitals
2. Observed Survival per hospital [square]: The proportion of patients who survive 30 days after PCI in each hospital
3. Predicted Survival per hospital [cross]: The Predicted Survival, using the BCIS 30-day mortality model to account for case-mix. For example, a high predicted survival (relative to the national survival) suggests that the hospital performs PCI on relatively low-risk patients.

4. Survival probability (RE model) for outlier detection [full circle]: Survival for each hospital, derived from a random effects model after accounting for case-mix. This estimate and the corresponding horizontal bar provide an indication of whether the hospital is an outlier after taking into account observed and predicted survival

Quantities 1) and 2) do not require any statistical modelling. Calculation of the quantities 3) and 4) require the application of the BCIS 30-day mortality model to predict the outcome and of a random effects model for the detection of outliers.

Horizontal bars around the Survival probability (Random Effects model RE Model) indicate whether a hospital is a potential outlier at a 3 standard deviation significance level:

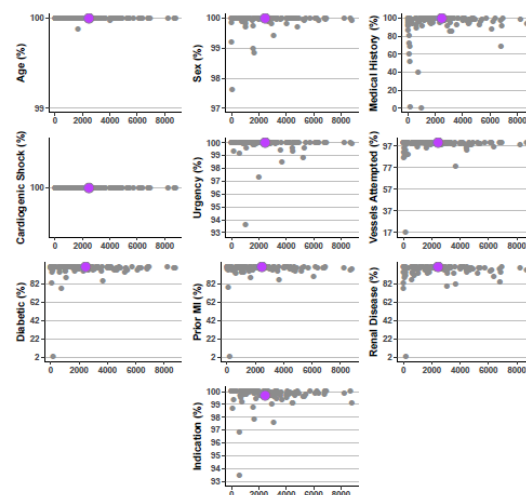
- If the bar for a hospital crosses the vertical Overall Survival dashed line, then the performance of that hospital does not deviate from normal performance.
- If the bar fails to cross the vertical Overall Survival dashed line, then the hospital is either performing significantly better (Green), or significantly worse (Red) than normal. Such hospitals are potential outliers at the 3 SD level

This report was generated by the NICOR Analysis Team on 09 October 2019 based on data as of 15th Feb 2019.

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Risk Factor Completeness Plots:

The plots below present the percentage of completeness in each risk factor against the total volume for the period covered by this report. The plots are based on the overall set of PCI records for this hospital. The percentages for this hospital are plotted as purple dots. All other hospitals are represented as smaller grey dots.

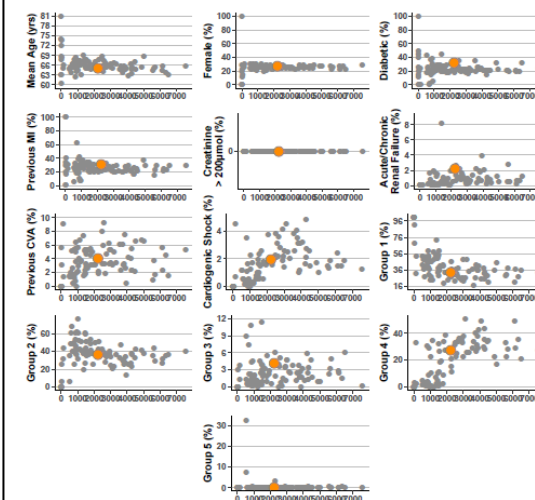


This report was generated by the NICOR Analysis Team on 09 October 2019 based on data as of 15th Feb 2019.

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Risk Factor Prevalence Plots (30 Day Post-Procedural Mortality Only):

The plots below present the prevalence of each risk factor used in the 30 day post-procedural survival model. The values are plotted against the total volume for the period covered by this report. The plots are based on the subset of PCI records for this hospital that is used in the 30 day post-procedural survival analysis. The percentages for this hospital are plotted as orange dots. All other hospitals are represented as smaller grey dots.



Definitions of Groups 1-5

- Group 1: "stable angina" OR "stable coronary/LV anatomy" OR "staged procedure" OR "hybrid procedure"
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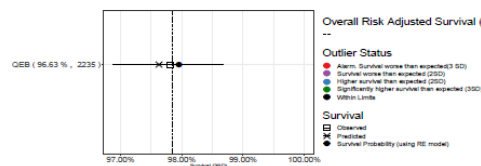
Clinical Outcomes Publication

PCI Centre 6 page report

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Display of Risk Adjusted Analysis:



Vertical axis: Hospital identifier and in parentheses: number of patients treated and completeness rate of life status tracking percentage (i.e. the percentage of patients for whom survival data are available).
Horizontal axis: Percentage Survival at 30 days

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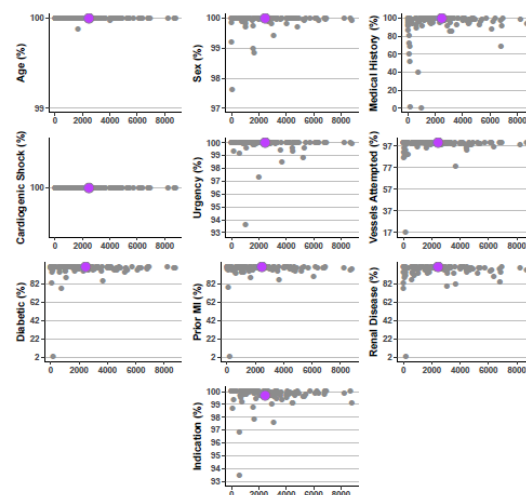
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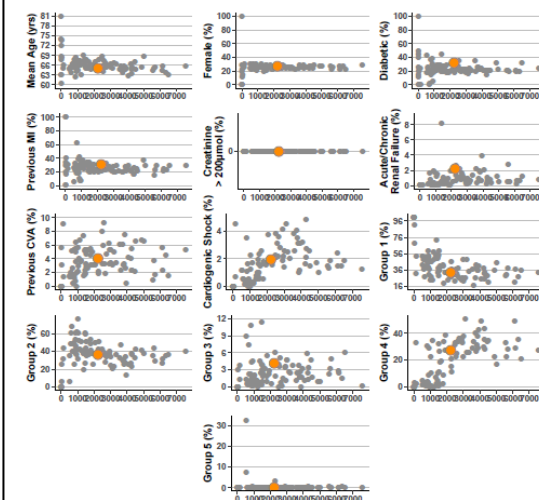


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Risk Factor Prevalence Plots (30 Day Post-Procedural Mortality Only):

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Definitions of Groups 1-5

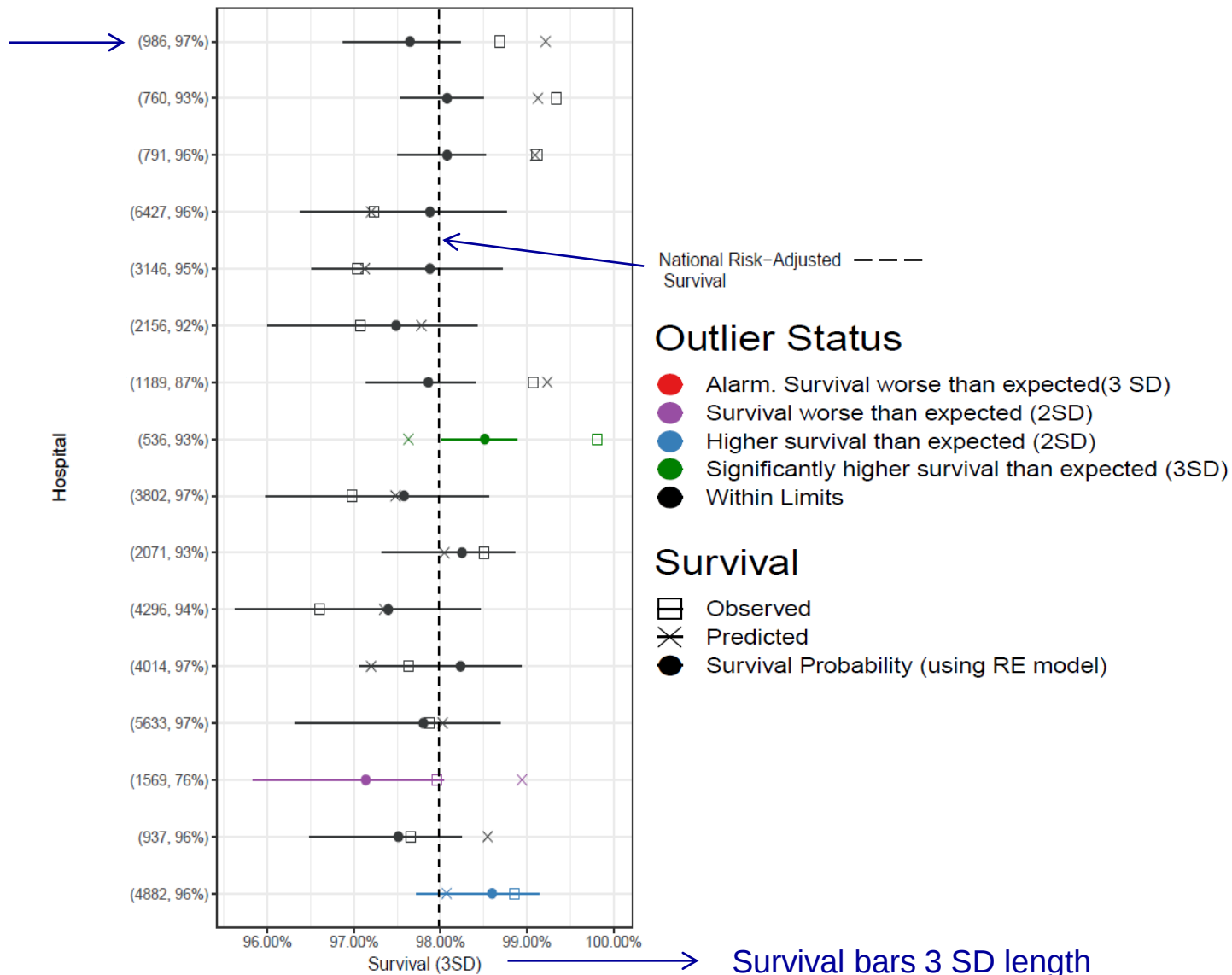
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Hospital Potential Outliers

Number of PCIs
% with ONS track

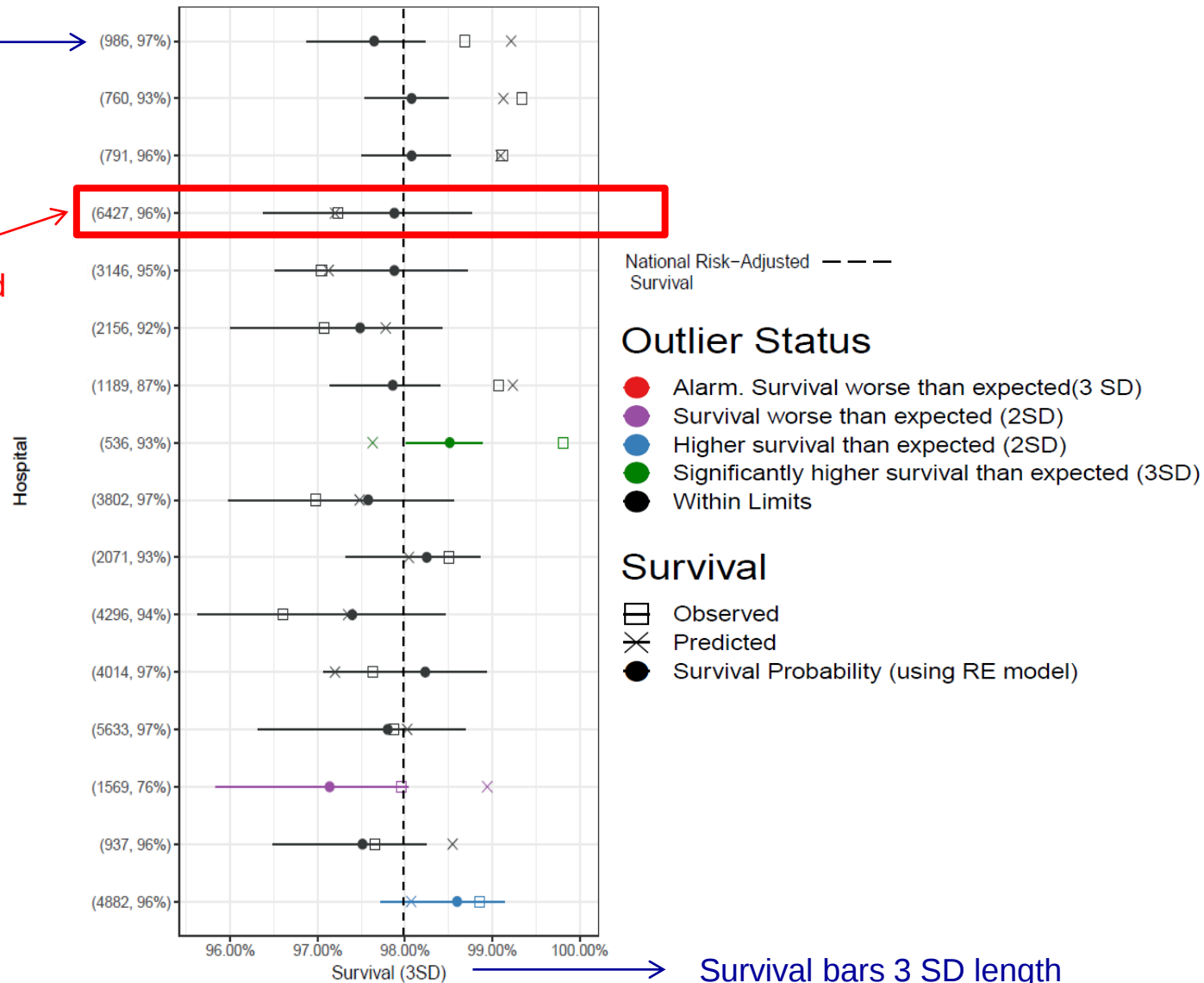


Hospital Potential Outliers

Number of PCIs
% with ONS track



Good ONS track
Observed same as Predicted
Both less than National
RA: Not outlier



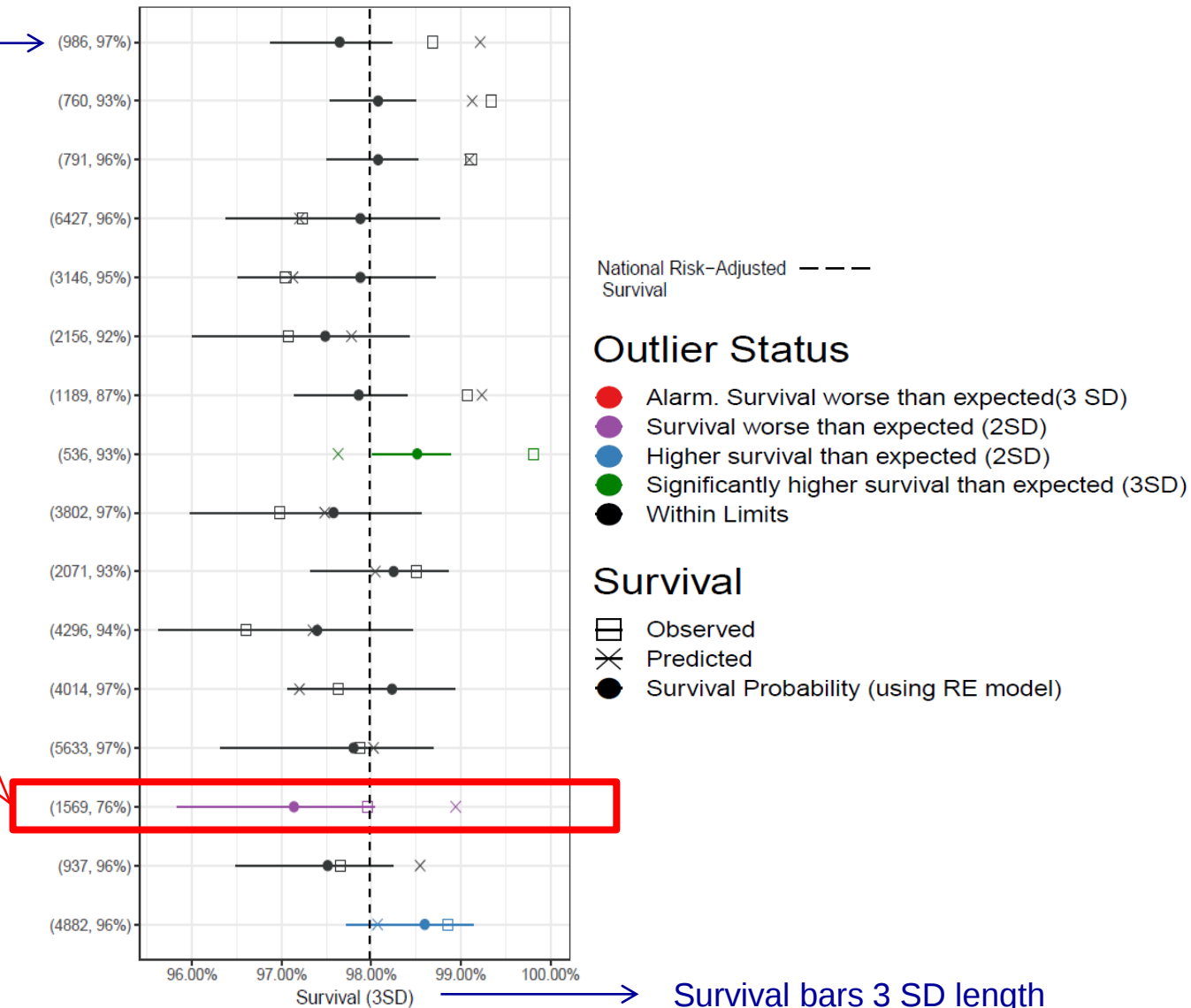
Hospital Potential Outliers

Number of PCIs
% with ONS track



Poor ONS track
Observed same as National
Predicted higher
RA: 2 SD poor survival
Error line still shows NS

Hospital

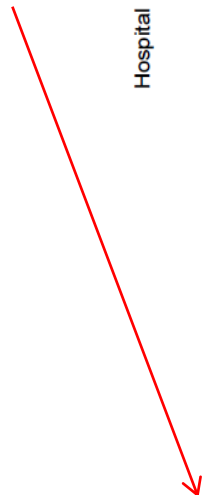


Hospital Potential Outliers

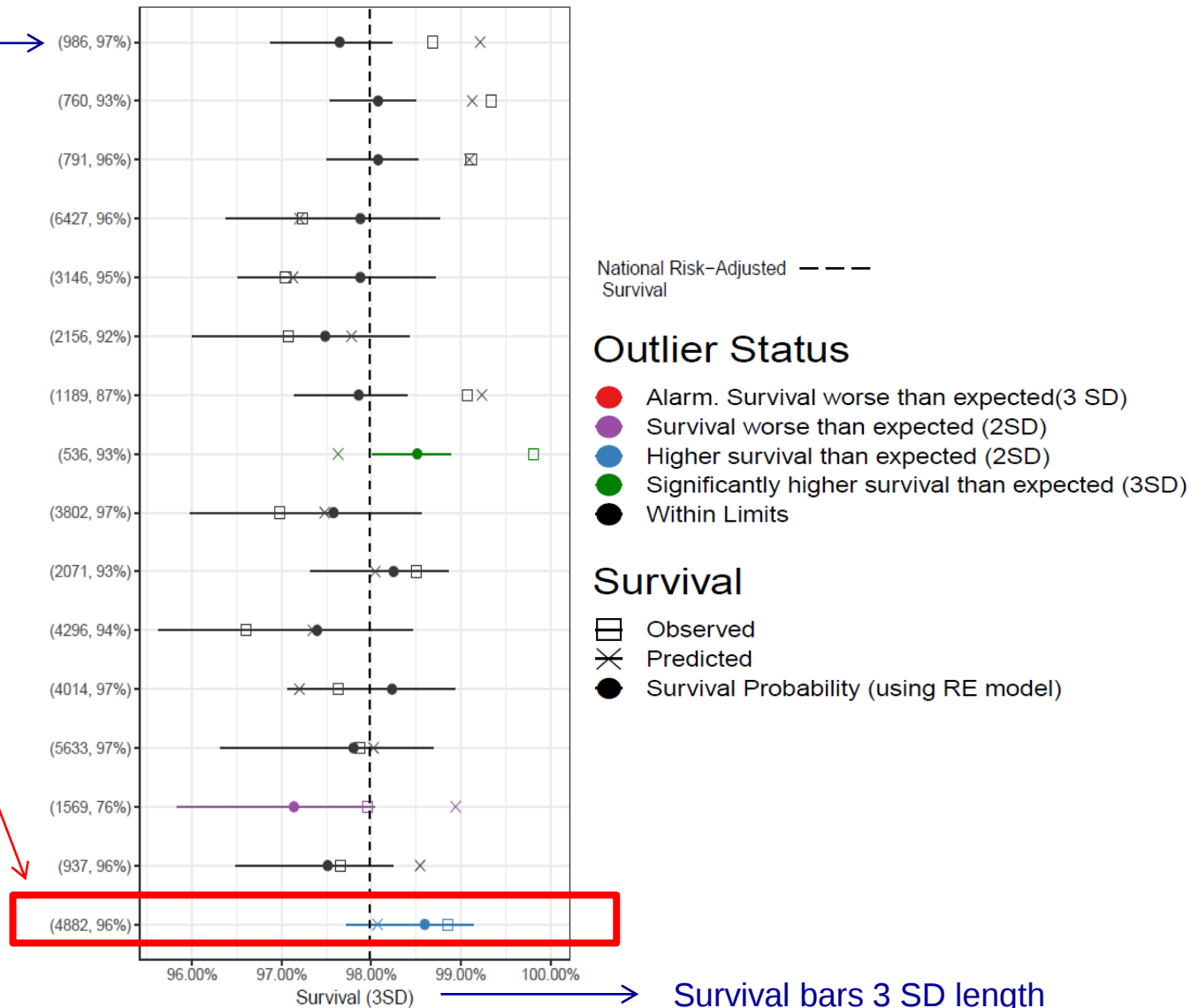
Number of PCIs
% with ONS track



Good ONS track
Observed better the Predicted
Observed better than National
RA: 2 SD better survival
Error line still shows NS



Hospital



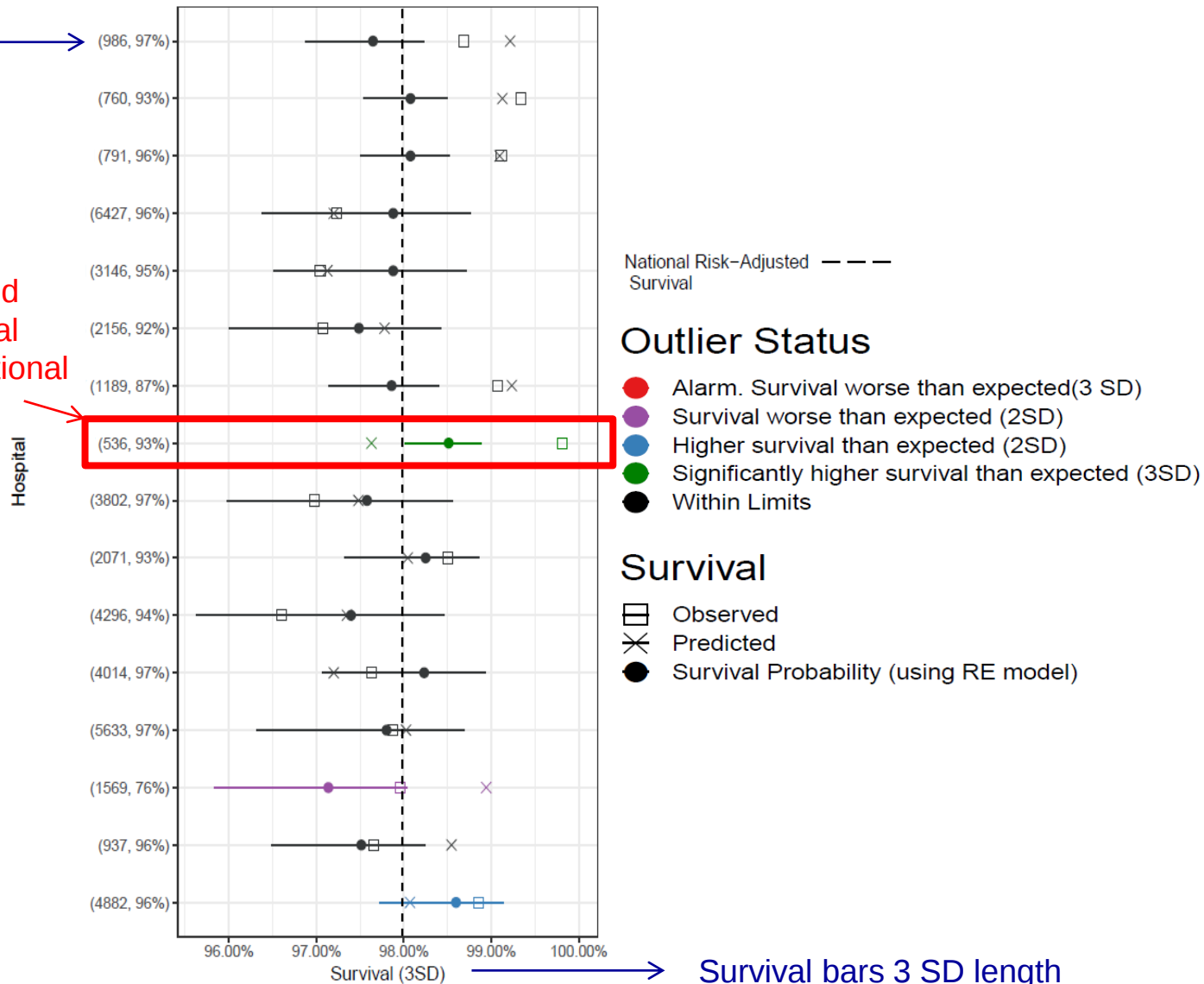
Hospital Potential Outliers

Number of PCIs
% with ONS track



Moderate ONS track
Observed better the Predicted
Observed better than National
Predicted **lower ++** than National
RA: +3SD outlier

Hospital

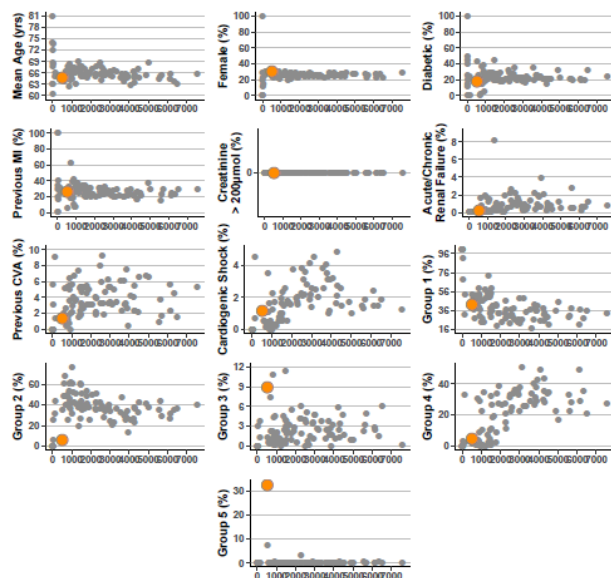


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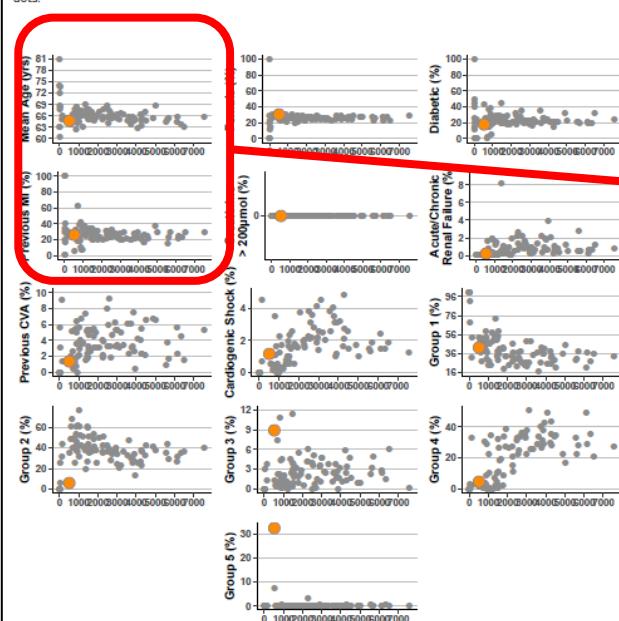
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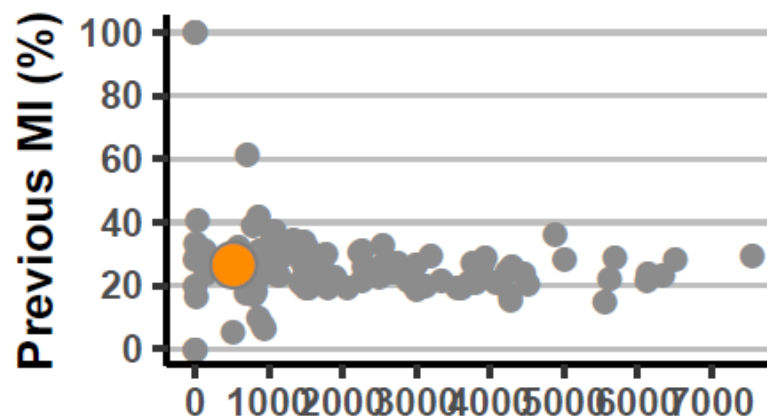
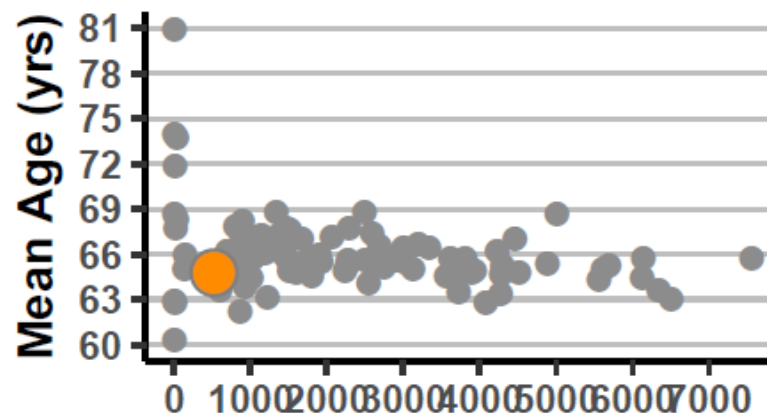


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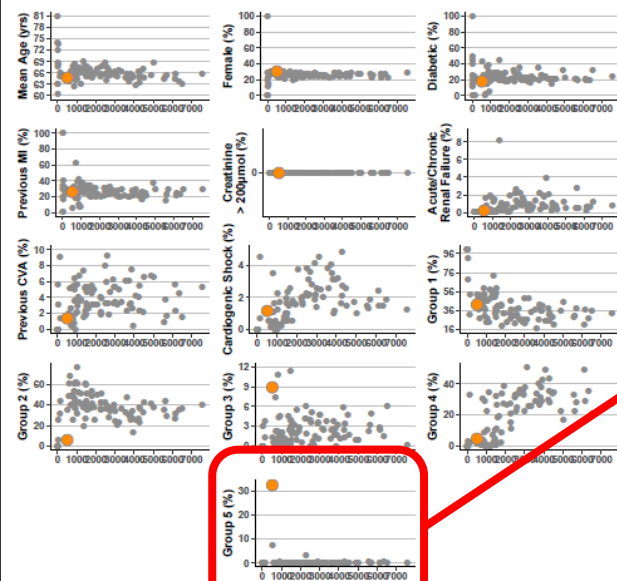


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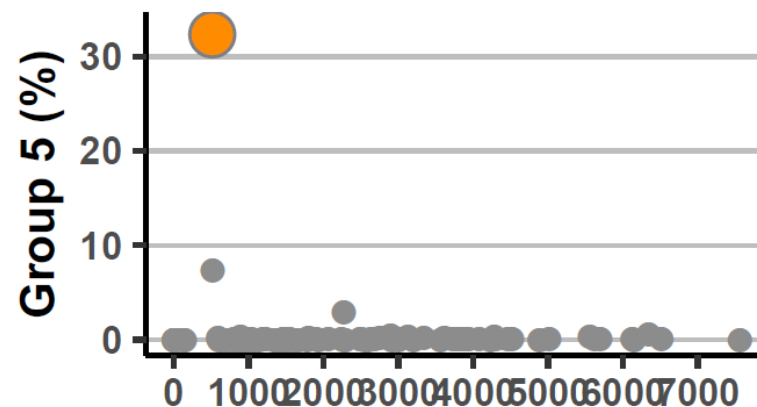


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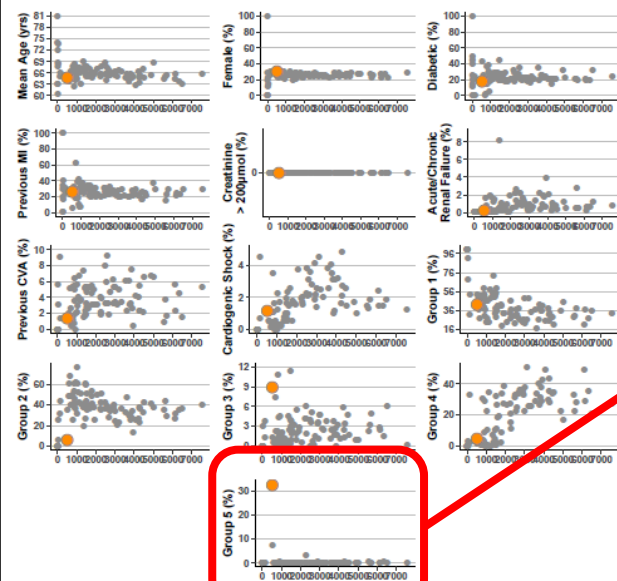


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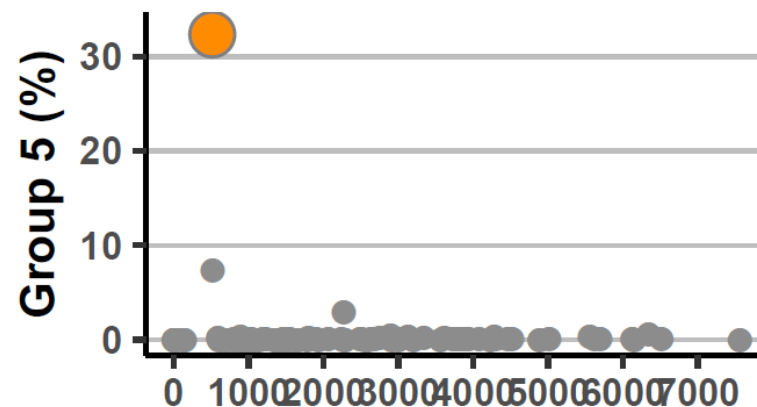
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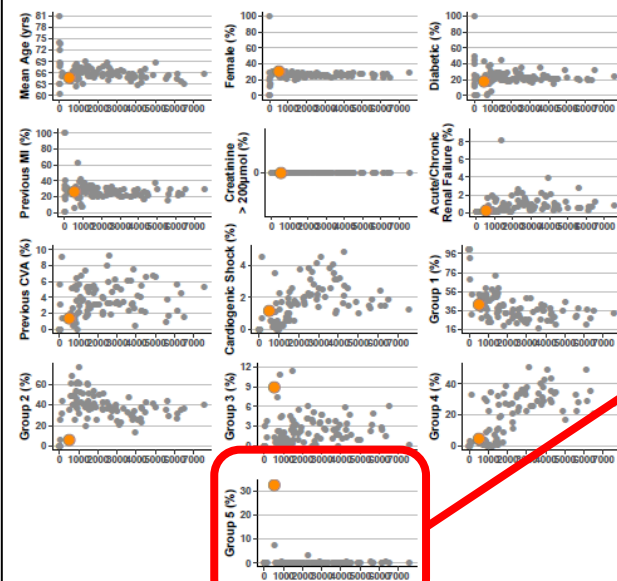
Group 5:
ACS
Rescue PCI for STEMI (failed lysis)

Clinical Outcomes Publication

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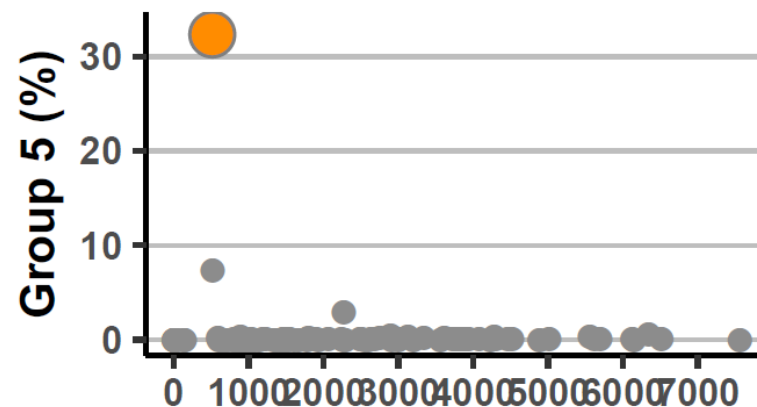
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Group 5:
ACS
Rescue PCI for STEMI (failed lysis)

Database mapping error:
UA / NSTEMI / Conv STEMI
incorrectly coded as above

Clinical Outcomes Publication

Operator Reports



National Audit of Percutaneous Coronary Interventions

PCI Operator Report

Data from 1 April 2015 to 31st March 2018 inclusive

Consultant Name:
 GMC Number:

The data completeness provided for this report's risk adjusted outcomes are considered to be: **ADEQUATE**

(BCIS require data completeness levels of greater than 95 percent in each category to allow appropriate analysis of PCI outcome data)

Total Number of PCI Procedures: 294

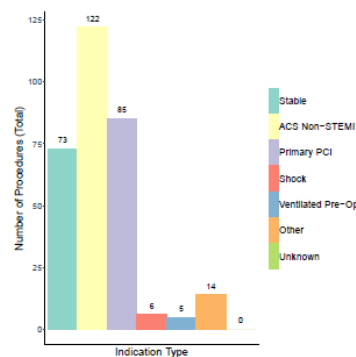
Hospitals at which PCI was Performed:

Hospital	2015/16	2016/17	2017/18	Total
Queen Elizabeth Hospital, Edgbaston	94	98	102	294
Total	94	98	102	294

This report was generated by the NICOR Analysis Team on 08 October 2019 based on data as of 15th Feb 2019.

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Number of Procedures Split by Clinical Syndrome:



Indication	2015/16	2016/17	2017/18	Total
Stable	25	27	21	73
ACS Non-STEMI	42	39	41	122
Primary PCI	24	26	35	85
Shock	2	1	3	6
Ventilated Pre-Op	1	1	3	5
Other	3	6	5	14
Unknown	0	0	0	0

Radial Access Rates (2017/18 data only):

	Consultant Rate	National Average
Percent of Cases Where a Radial Access Route Was Used	84.31%	87.29%

This report was generated by the NICOR Analysis Team on 08 October 2019 based on data as of 15th Feb 2019.

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PPCI and NSTEMI
No process measures

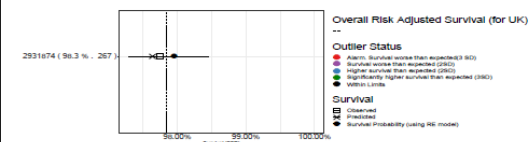
Clinical Outcomes Publication

Operator Reports

Extent of Completeness in Variables Relevant to Risk Estimation:

	Age	Sex	Medical History	Shock	Urgency	Vessels Attempted	Diabetes	Prior MI	Renal Disease	Indication
Count	0	0	0	0	0	0	0	0	0	0
Percent	100	100	100	100	100	100	100	100	100	100

Display of Risk Adjusted Analysis:



Vertical axis: Consultant identifier and in parentheses: number of patients treated and completeness rate of life status tracking percentage (i.e. the percentage of patients for whom survival data are available).
Horizontal axis: Percentage Survival at 30 days
The following are presented:

- Overall Survival to 30 days [dashed vertical line]: the overall proportion of patients who survive across all hospitals
- Observed Survival per consultant [square]: The proportion of patients who survive 30 days after PCI for each consultant
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- Survival probability (RE model) for outlier detection [full circle]: Survival for each consultant, derived from a random effects model after accounting for case-mix. This estimate and the corresponding horizontal bar provide an indication of whether the consultant is an outlier after taking into account observed and predicted survival

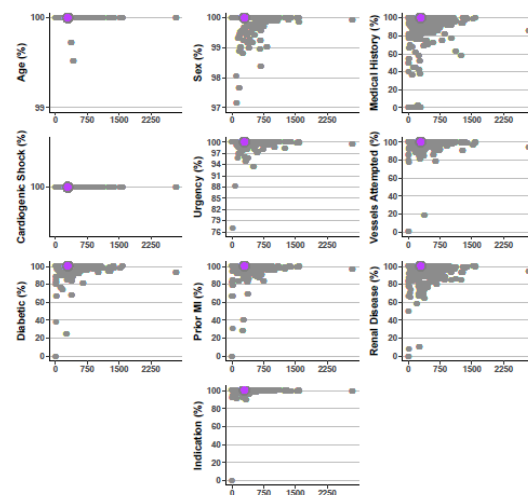
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- If the bar for a consultant crosses the vertical Overall Survival dashed line, then the performance of that consultant does not deviate from normal performance.
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This report was generated by the NICOR Analysis Team on 08 October 2019 based on data as of 15th Feb 2019.
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Risk Factor Completeness Plots:

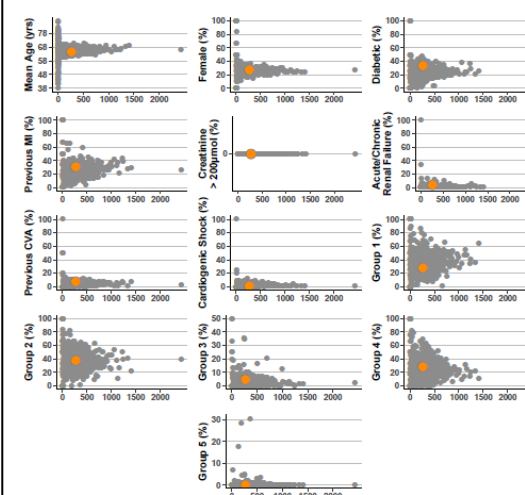
The plots below present the percentage of completeness in each risk factor against the total volume for the period covered by this report. The percentages for this consultant are plotted as purple dots. All other consultants are represented as smaller grey dots.



This report was generated by the NICOR Analysis Team on 08 October 2019 based on data as of 15th Feb 2019.
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Risk Factor Prevalence Plots (30 Day Post-PCI Survival Only):

The plots below present the prevalence of each risk factor used in the 30 day post-PCI survival model. The plots are based on the subset of PCI records for this consultant that is used in the 30 day post-PCI survival analysis. The percentages for this consultant are plotted as orange dots. All other consultants are represented as smaller grey dots.



Definitions of Groups 1-5

- Group 1: "stable angina" OR "stable coronary/LV anatomy" OR "staged procedure" OR "hybrid procedure"
- Group 2: "ACS - UA, NSTEMI or convalescent STEMI" AND (NEITHER "emergency" NOR "salvage")
- Group 3: "ACS - UA, NSTEMI or convalescent STEMI" AND (EITHER "emergency" OR "salvage")
- Group 4: "ACS - Primary PCI for STEMI (no lysis)" OR "ACS - Facilitated PCI for STEMI (lysis + PCI)" OR "Acute or sub-acute PCI thrombolysis" OR "Bail out following acute complication of diagnostic cardiac catheterisation"
- Group 5: "ACS - Rescue PCI for STEMI (failed lysis)" OR "ACS - PCI for re-infarction (no lysis)" OR "ACS - Rescue PCI for re-infarction (failed lysis)"

This report was generated by the NICOR Analysis Team on 08 October 2019 based on data as of 15th Feb 2019.
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Summary

• PCI

- Many ‘firsts’
 - No change in 118 PCI centres
 - Fall in total PCI procedures performed – 2.5%
 - Procedure specific data delayed
- Interesting observational research (to be re-kindled)
- Clinical Outcomes Publication statistics updated

• Structural intervention

- TAVI 78 pmp from 41 centres
- Uptake of Mitraclip, LAAO and PFO slow after break in funding

• Future

- NICOR Challenges
- New dashboard of analytic tools in development



Thank You

UK PCI Centre Codes 2018-19



UK PCI Centre Codes 2018-19

AEI	Royal Albert Edward Infirmary (Wigan)	DVH	Darent Valley Hospital
AHM	BMI Alexandra Hospital	EAL	Ealing Hospital
ALT	Altnagelvin Hospital	EBH	Birmingham Heartlands Hospital
AMG	Wycombe Hospital	ERI	Edinburgh Heart Centre
ANT	St Anthony's Hospital	ESU	East Surrey Hospital, Surrey and Sussex NHS trust
BAS	Basildon and Thurrock University Hospitals	FRE	Freeman Hospital
BAT	Royal United Hospital Bath	FRM	Frimley Park Hospital
BED	Bedford Hospital	GEO	St George's Hospital
BHL	Liverpool Cardiothoracic Centre	GHB	Spire Hospital Bristol
BHR	Royal Berkshire and Battle Hospital	GJH	Golden Jubilee National Hospital (formerly HCI)
BLA	Royal Blackburn Hospital	GRL	Glenfield Hospital
BMI	BMI Meriden Hospital	GWE	Royal Gwent Hospital
BOU	Royal Bournemouth Hospital	GWH	Queen Elizabeth Hospital Woolwich
BRD	Bradford Royal Infirmary	HAI	Hairmyres Hospital
BRI	Bristol Royal Infirmary	HAM	Hammersmith Hospital
BRY	Acute Pennine Trust Fairfield	HBP	Spire Hospital Hull and East Riding
BSM	Southmead Hospital Bristol	HH	Royal Brompton Hospital and Harefield NHS Trust, Harefield site
CGH	Conquest Hospital	HHW	Wellington Hospital
CHG	Cheltenham General Hospital	HSC	Harley Street Clinic
CHH	Castle Hill Hospital (Hull and East Yorkshire NHS Trust)	IND	London Independent Hospital
CHN	Nottingham City Hospital	IPS	Ipswich Hospital
CLW	North Wales Cardiac Centre	KCH	Kings College Hospital
CMI	Cumberland Infirmary	KGH	Kettering General Hospital
CRG	Craigavon Hospital	KIM	Kent Institute of Medicine & Surgery
CRO	Cromwell Hospital	KMH	Kings Mill Hospital
DER	Royal Derby Hospital	KSX	Tunbridge Wells Hospital
DGE	Eastbourne Hospital	LBH	London Bridge Hospital
DUC	Duchy Hospital	LDH	Luton and Dunstable University Hospital
DUD	Birmingham City Hospital	LGI	Yorkshire Heart Centre

UK PCI Centre Codes 2018-19

LIN	Lincoln County Hospital	RFH	Royal Free Hospital
LIS	Lister Hospital	RHH	Ross Hall Hospital
LNH	Leeds Nuffield Hospital	RHI	Calderdale Royal Hospital
MAY	Croydon University Hospital	RIA	Aberdeen Royal Infirmary
MDW	Medway Maritime Hospital	RSC	Royal Sussex County Hospital
MHO	Manor Hospital Oxford	RVB	Royal Victoria Hospital
MOR	Morriston Hospital	SAL	Salisbury District Hospital
MPH	Musgrove Park Hospital	SBH	Barts Health Centre, St Bartholomew's Hospital
MRI	Manchester Royal Infirmary	SCM	James Cook University Hospital
NBO	Nuffield Health Bournemouth Hospital	SCU	Scunthorpe General Hospital
NCR	New Cross Hospital	SGH	Southampton General Hospital
NGS	Northern General Hospital	SPC	Spire Cardiff Hospital
NHB	Royal Brompton Hospital and Harefield NHS Trust, Brompton site	SPH	St Peter's Hospital
NHH	Basingstoke and North Hampshire Hospital	SSP	Spire Shawfair Park Hospital
NIN	Ninewells Hospital	STH	St Thomas' Hospital
NOR	Norfolk and Norwich University Hospital	STO	City General Hospital (University Hospital of North Staffordshire)
NPH	Northwick Park Hospital	SUN	Sunderland Royal Hospital
NTH	Northampton General Hospital	TOR	Torbay Hospital
PAP	Papworth Hospital	UHW	University Hospital of Wales
PHB	BMI Priory Hospital	VIC	Blackpool Victoria Hospital
PHN	BMI Park Hospital	WAL	Walsgrave Hospital (University Hospital Coventry)
PIN	Pinderfields General Hospital	WAT	Watford General Hospital
PLY	Derriord Hospital, Southwest Cardiothoracic Centre	WDH	Dorset County Hospital
PMS	Great Western Hospital, Wiltshire Cardiac Centre	WEX	Wexham Park Hospital
QAP	Queen Alexandra Hospital	WHH	William Harvey Hospital, East Kent Hospitals NHS Trust
QEB	Queen Elizabeth Hospital, Birmingham	WMU	West Middlesex University Hospital
RAD	John Radcliffe Hospital	WRC	Worcester Royal Hospital
RAI	Raigmore Hospital	WRG	Worthing Hospital
RCH	Royal Cornwall Hospital	WYT	Wythenshawe Hospital
RDE	Royal Devon & Exeter Hospital	YDH	York District General Hospital

Versions

History of Changes to Slide Set

- 24-01-2020 First version
- 04-03-2020 Correction of date label for PPCI centre type slides