NATIONAL AUDIT OF PERCUTANEOUS CORONARY INTERVENTION (NAPCI)

2020 SUMMARY REPORT
(2018/19 DATA)

NICOR

BCIS

CONTENTS

EXECUTIVE SUMMARY

Overall PCI activity

There has been a slight (2.5%) fall in the number of PCIs performed in the UK in 2018/19 to 100,294. The demographic features of those treated have remained similar, as has the presenting clinical syndrome (67% presenting with acute coronary syndromes).

PCI centre volume

The treatment of patients needing PCI is complex as it requires the interaction of a number of different team members to optimise care. It is therefore important that these teams are performing enough procedures for them to remain familiar with all the processes involved. There has been a progressive trend to reducing the number of lower volume centres and the percentage of PCI centres performing less than 400 cases in a year has fallen again from 31% to 30% (all centres), and 17% to 16% of NHS centres. Thus there remains a number of relatively low volume centres, though this has reduced slightly.

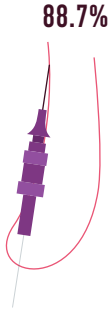
Delays to treatment of STEMI by emergency PCI

For primary PCI, centres continue to perform well with short Door-To-Balloon times (75.5% of patients were treated within 60 of arrival at the PCI centre), though there is variation and room for improvement in some centres. However Call-To-Door times are lengthening suggesting a problem with the speedy delivery of patients by ambulance services to PCI centres.

Time delays from admission to first hospital with symptoms of NSTEMI to time of PCI (if this is required for treatment of NSTEMI)

Patients presenting with NSTEMI continue to experience longer delays to treatment than recommended, with only 54.8% treated within 72 hours. A systematic review across regions is necessary if improvements are to occur. This can include capacity issues, efficiencies and prioritisations.

Use of radial access for PCI



In 2018/19, 88.7% of procedures were performed using radial access (compared with 51.1% in 2010). This represents a substantial shift in practice of which the UK can be proud. The few operators who have yet to change their practice should be encouraged to make use of the educational resources available in the UK and, given the high percentages of the large majority, are very likely to have colleagues who can help support their shift in practice.

DES as proportion of stented cases in PPCI

Use of drug eluting stent for primary PCI by centre is very high in keeping with recommendations, with almost all centres at > 90% usage.

Proportion of patients treated by PCI for stable symptoms who are treated as a day case

About 63% of such PCI cases were performed at day cases. There is wide variation from nearly 100% to almost 0%. The explanation for this variation will include differences in the management of wards and day units, pressure on beds from emergency admissions and differences in patient pathways. Hospitals should seek to modify their pathways and ward structures to reduce unnecessary overnight stays for patients.

Future directions:

The ambition is to have more contemporaneous data, and for these to be available to hospitals in as close to real time as possible.

To this end we have been creating a suite of analytic tools that interrogate and analyse the live NICOR dataset. To date we have developed three aspects:

1. Data completeness tool that shows each PCI centre any fields in the dataset that are incomplete.

2. Key metrics (such as those for quality improvement described above) have been programmed to run on the live data. After selecting the time frame of interest a centre is presented not only with their own performance, but a comparison both with the national average, and the average of the 'best' 10 centres.

3. Finally, users can program their own reports to interrogate any combination of fields, and again end up with an analysis of their own performance, compared with national average.

We will continue to develop this tool to provide enhanced ways for centres to see their performance and compare it with others.

1. INTRODUCTION

There are several reports generated after analyses of the audit data provided by interventional centres across the UK.

1.1 THE FULL BCIS AUDIT SLIDE DECK (FINANCIAL YEAR 2018/19)

For the full audit report of all adult interventional procedures performed in the UK in the year 1st April 2018 to 31st March 2019, please see the BCIS website
https://www.bcis.org.uk/resources/audit-results/

That full report includes not only a large number of analyses of the PCI procedural data, but also other interventional activity such as transcatheter aortic valve implantation (TAVI), other valve interventions, closure of left atrial appendages and closure of 'holes' such as atrial septal defects. The data contained within the NCAP report below is a small subset of those analyses, with a focus on a few quality improvement metrics.

1.2 PUBLIC REPORTS OF OPERATOR AND CENTRE DATA - CLINICAL OUTCOMES PUBLICATION (3 YEAR ROLLING DATA TO 2018/19)

The Clinical Outcomes Publication, which includes individual PCI operator reports, including assessment of risk-adjusted 30 day survival (for England and Wales), runs on a slightly different timetable. The data extract for these analyses is taken after validation cycles and so occurs later than the data extract used for the analyses in the audit slide deck and NCAP reports (1.1 and 1.3). Thus some data missing from these reports (as described below) will be present in the COP report (not yet published).
For the COP analysis please see the public section of the BCIS website
https://www.bcis.org.uk/patient-area/

1.3 THE CURRENT REPORT OF THE NATIONAL AUDIT OF PERCUTANEOUS CORONARY INTERVENTION AS PART OF THE NATIONAL CARDIAC AUDIT PROGRAMME (NCAP)

The report presented below is a focused view of a few specific metrics that try to address quality improvement. It is based on the annual survey and an extract of PCI specific data dated 25-10-2019. The annual survey is sent to all centres that perform percutaneous coronary intervention (PCI) in the United Kingdom (UK). There was a 100% response to this survey across the UK.

Analysis of the PCI procedures themselves is undertaken using procedure specific data that are uploaded to the NICOR servers by each centre. The intention has always been that every PCI procedure from every centre in the UK should be uploaded for analysis. However during the collection of the 2018/19 data there were changes to information governance legislation. These created unexpected hurdles that are taking time to resolve. As a result, at the time of the main data extract for analysis of this report (25-10-2019), data were not available from the following centres:

- 6 private hospitals (BMI Park Hospital, London Bridge Hospital, Leeds Nuffield Hospital, Spire Hospital Hull and East Riding, Wellington Hospital, Harley Street Clinic.
- 2 Scottish centres (Royal Infirmary of Edinburgh and Ninewells Hospital)
- 2 centres from Northern Ireland (Altnagelvin Hospital and Royal Victoria Hospital).
- In addition there were technical problems relating to data upload that resulted in no data being received from 5 English NHS centres (Royal United Hospital Bath, Royal Blackburn Hospital, Kings College Hospital, Queen Alexandra Hospital and West Middlesex Hospital). While these technical issues have since been resolved, data from these 5 English hospitals are not included in the current analysis.

1.4 OVERVIEW OF THE STRUCTURE OF PROVISION OF PCI ACTIVITY: THERE HAS BEEN A FALL IN THE NUMBER OF PCIs PERFORMED

In 2018/19 there were 118 PCI centres in the UK, which is exactly the same as in the previous year. For the first time since records began in 1991, there has been a slight reduction in the number of PCI procedures performed. Thus, total PCI procedures performed has fallen by 2.5% to 100,294. This equates to a reduced rate of 1,510 procedures per million population (pmp) for the UK. This change in activity, however, has been heterogeneous across the UK countries. While rates have fallen in England (-3%), Northern Ireland (-6.6%) and Scotland (-0.4%), they have increased in Wales by 7.5% pmp.

The provision of emergency PCI for ST-elevation myocardial infarction (STEMI) – called 'primary' PCI (or PPCI) - has also not altered since the previous year, with 68 centres being the destination for paramedic crews to bring patients from the community directly for emergency 'primary' PCI. Of these, 58 offer this service all hours every day of the year (i.e. 24/7/365). Four centres link to form hybrid services, so that one or other centre is available 24/7/365, and six of them link so that one centre provides daytime emergency activity, but another takes over at night.

1.5 PCI PROCEDURE SPECIFIC DATA

Taking note of the small amount of data missing as described above, the following general observations can be made. Overall the mean age of patients being treated by PCI has remained similar over recent years, and was 65.6 years in 2018/19; 74.4% were men and 24.2% diabetic. The proportion of patients that had previously been treated by PCI has gradually risen to 27.9%, and the proportion of current smokers has fallen to 22.4%. The percentage of Asian and Black patients has risen to 10% and 1.2% respectively. The proportion of cases performed for any acute coronary syndrome is stable at about 67%, of which 26.4% are for the emergency treatment of STEMI by primary PCI. There has been a slight fall (from 1.9% to 1.8%) in the proportion undergoing emergency PCI in the context of out-of-hospital cardiac arrest with the requirement for pre-procedural mechanical ventilator support.

2. QUALITY IMPROVEMENT METRICS

2.1 | PCI CENTRE CASE VOLUME; THERE ARE FEWER LOWER VOLUME CENTRES

QI Metric Description/Name	PCI centre annual PCI procedure volume
Why is this important?	The treatment of patients needing PCI is complex as it requires the interaction of a number of different team members to optimise care. It is therefore important that these teams are performing enough procedures for them to remain familiar with all the processes involved.
QI theme	Safety
What is the standard to be met?	400 total While there is no clear cut off below which a hospital will be too inexperienced to provide optimal care, current recommendations from the British Cardiovascular Intervention Society (BCIS) are that centres should perform more than 400 cases a year.[1,2] Nevertheless observational research into the relationship between patient survival outcomes and centre volume using the BCIS dataset of UK activity has not found that lower volume centres were putting patients at risk.[3,4]
Key references to support the metric	References as above are in reference list at end of report.
Numerator	All PCI cases.
Denominator	n/a
Trend	There has been a progressive trend to reducing the number of lower volume centres and the percentage of PCI centres performing less than 400 cases in a year has fallen again from 31% to 30% (all centres), and 17% to 16% of NHS centres [Figures 1 and 2]. 20 centres have performed less than 200 cases on 3 successive years, of which Ealing was the only NHS centre [Figure 3]. Thus there remain a number of relatively low volume centres, though this has reduced slightly.
Variance	See Figure 4. This is largely explained by the catchment population, geographical considerations and local commissioning decisions.

Figure 1: *Number of PCIs per centre: trend in % of centres doing <400 procedures per year 2010 – 2018/19*

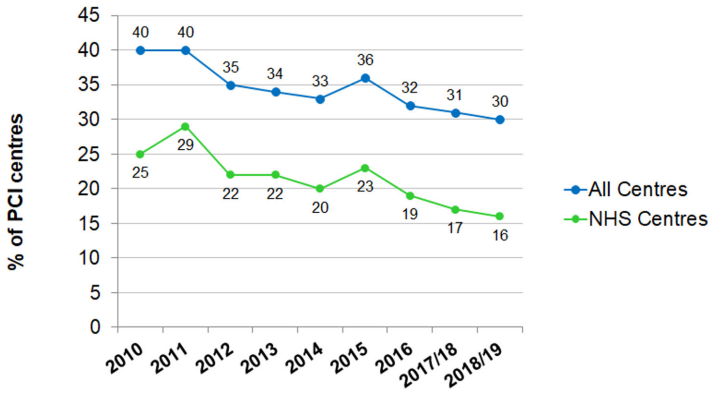


Figure 2a: *NHS centres performing <400 procedures during 2018/19*

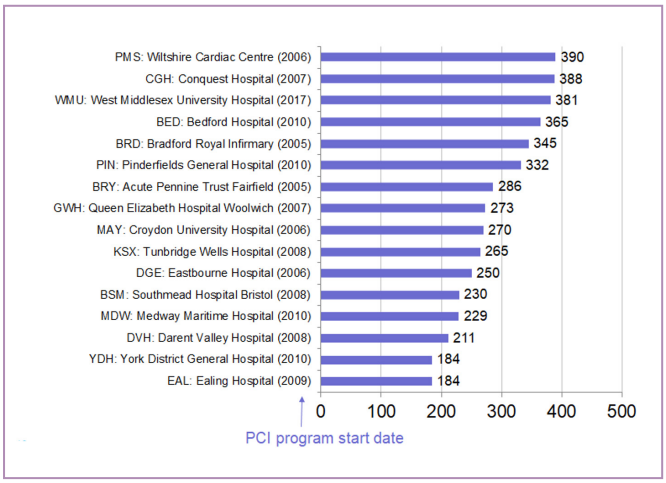


Figure 2b: *Private centres performing <400 procedures during 2018/19*

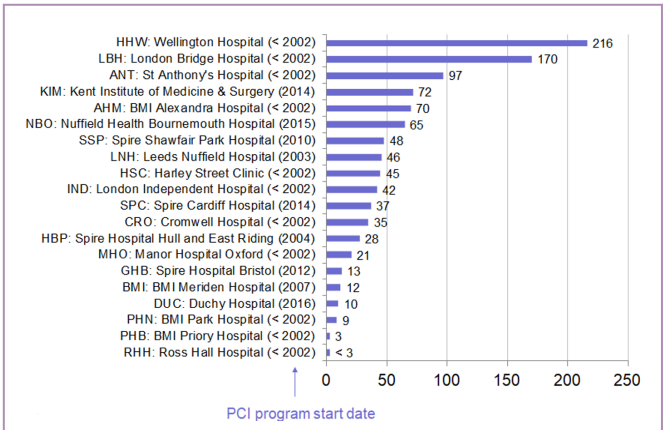


Figure 3: *NHS and private centres performing <200 cases for each of the last 3 years (to 2018/19)*

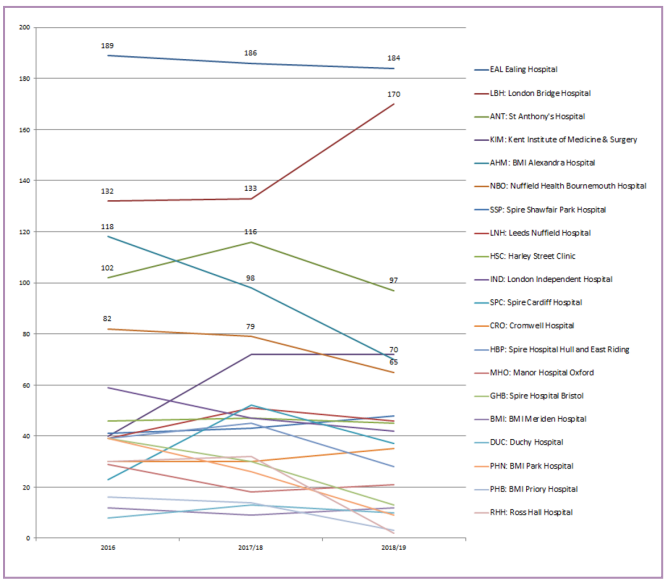
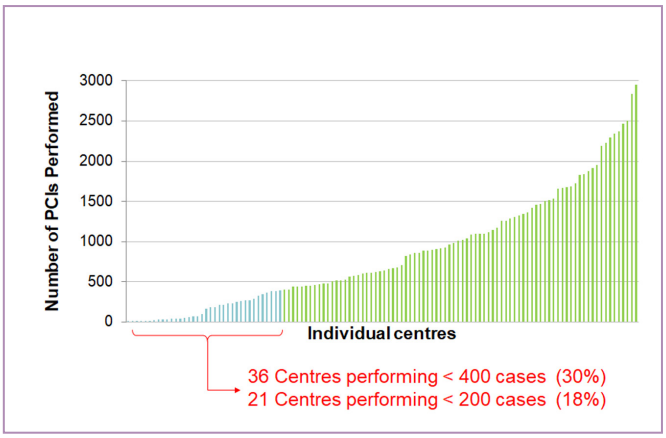


Figure 4: *Number of procedures performed in 2018/19 by individual PCI centres in the UK*



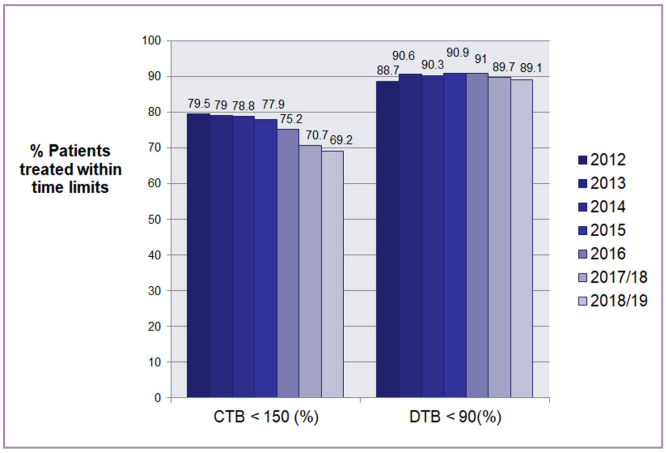
Recommendations for those centres not achieving the standard

A letter is sent from BCIS clinical standards group to any centre whose total PCI numbers fall below 200 for 3 successive years. Regional commissioners may need to discuss with local providers.

2.2 | DELAYS TO PRIMARY PCI FOR STEMI: CALL-TO-DOOR TIMES ARE LENGTHENING

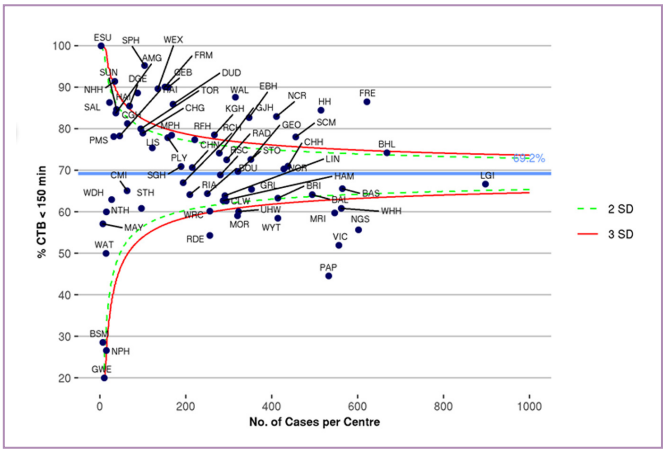
QI Metric Description/Name	Delays to treatment of STEMI by emergency PCI
Why is this important?	Mortality reduction Patients suffering a heart attack are diagnosed using electrocardiograms (or ECGs) to determine whether they have ST-elevation myocardial infarction (STEMI) or non-ST elevation myocardial infarction (NSTEMI). Those with STEMI are most likely to have complete coronary occlusion and are considered to be at high risk of substantial heart muscle damage or early death. These patients require emergency primary percutaneous coronary intervention (Primary PCI) which is a technique to re-open the blocked coronary artery causing the heart attack. Once STEMI has been recognised, the sooner that primary PCI is performed the more likely it is that significant heart muscle damage can be prevented and the greater are the chances of the patient surviving.[5] The timeliness of Primary PCI is therefore an important measure of the quality of care. Treatment delays are the most easily audited index of quality of care in STEMI.
QI theme	Effectiveness
What is the standard to be met?	All cases excluding shock and pre-PCI ventilation: Call-To-Balloon time (CTB): <150 min in ≥75% patients PPCI centre Door-To-Balloon time (DTB): <60 min in ≥75% of patients Call-To-PPCI centre door (CTD2 time): No current target set NICE Acute coronary syndrome in adults, Quality Standard 68 (QS68), recommends measuring the proportion of patients with acute STEMI who receive primary PCI within 150 minutes of the call for professional help (this is the CTB time).[6] The European Society of Cardiology (ESC) makes several recommendations:[7] They consider the 'STEMI diagnosis' time to be the most reliably measured and relevant point in the pathway. They recommend that for patients presenting to primary PCI capable centres, the time from 'STEMI diagnosis' at a PCI centre to balloon time (Door-To-Balloon time, or DTB) should be <60 mins. BCIS position statement: At least 75% of all patients should have a DTB time of less than 60 minutes.[2]
Key references to support the metric	References as above are in reference list at end of report.
Numerator	For all Primary PCI (direct admissions and inter-hospital transfers (IHT) but excluding patients presenting in cardiogenic shock and those requiring pre-PCI ventilation 1. % treated within target time 2. Median time delay (min)
Denominator	All Primary PCI, excluding patients presenting in cardiogenic shock and those requiring pre-PCI ventilation
Trends	While CTB times have progressively lengthened, DTB have remained similar [Figures 5-8]. The percentage treated within 150 minutes of a call has fallen from 79.5% in 2012, to 69.2% in 2018/19. This suggests that CTD times have been lengthening (see MINAP report)
Variance	There is a variation in performance that is not just explained by the presence or absence of a local Accident & Emergency department (where delays can occur); many centres should be able to improve on performance.

Figure 5: *Call- and Door-To-Balloon times as % treated within 150 min and 90 min respectively, from 2012 to 2018/19*



These data show the overall trend, but there is considerable variation between centres. The spread of CTB times between different centres can be seen in Figure 6.

Figure 6: *Proportion of procedures performed within a CTB time of <150 minutes by hospital, according to volume of activity at each hospital, 2018/19 (see end of report for site codes)*

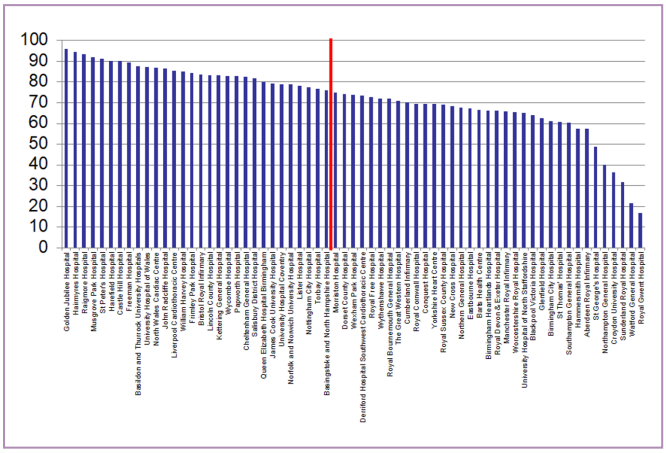


While CTB is made up of both the ambulance response and transportation times and the rapidity of treatment at the PCI centres, the DTB focuses just on the centre's performance.

These data therefore suggest that there has been a progressive reduction in the ability of emergency services to respond quickly to a patient's call for help.

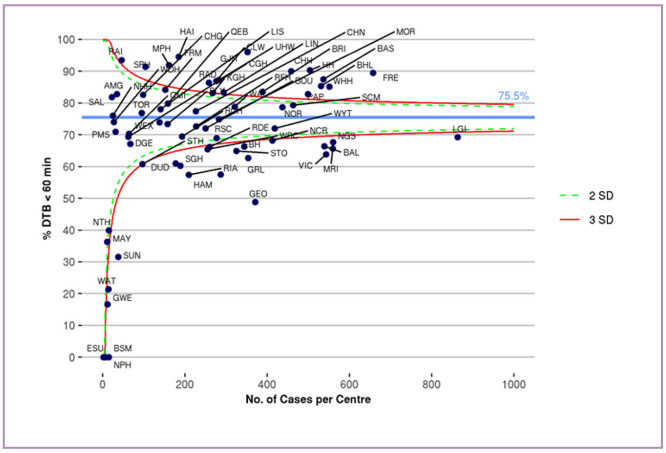
Though door-to-balloon times have remained more stable, with 89.1% of patients treated within 90 minutes of arrival at PCI centre [Figure 7], there has been a slight reduction in the timeliness of treatment over recent years. Importantly there does remain considerable variation between hospitals, with 75.5% achieving a DTB <60 min [Figure 8]. This suggests there is scope for improvement if the poorer performing centres could match the better performing centres.

Figure 7: *Door-To-Balloon (DTB) times: proportion of procedures with a DTB time of <60 minutes by hospital (patients with cardiogenic shock or on a ventilator excluded), 2018/19*



[Note: Hospitals to the right side of the red line do not perform ≥75% of PPCI procedures within 60 minutes.]

Figure 8: *Funnel plots of proportion treated with 60 minutes of arrival at hospital, 2018/19*
(see end of report for site codes)



Recommendations for those not achieving the standard

A focus is needed to reverse the deterioration in ambulance response times. In addition, although the overall DTB times are good, there is still considerable variation between hospitals. Improvement in the slower centres is therefore also needed to improve patient care. These centres should contact centres that perform well to see what lessons can be learned.

2.3 DELAYS TO PCI FOR PATIENTS PRESENTING TO HOSPITAL WITH NON-ST-ELEVATION MYOCARDIAL INFARCTION (NSTEMI): SLIGHT IMPROVEMENT BUT TOO MANY PATIENTS ARE STILL WAITING TOO LONG

QI Metric Description/Name	Time delays from admission to first hospital with symptoms of NSTEMI to time of PCI (if this is required for treatment of NSTEMI)
Why is this important?	In people with an intermediate or higher risk of future adverse cardiovascular events, coronary angiography with coronary revascularisation as appropriate offers advantages over an initial conservative strategy. Studies have shown no advantage to delaying such investigation and treatment while optimising medical therapy. Conversely waiting for longer times before performing angiography +/- revascularisation does not appear to be associated with increased mortality.[5] However there are several disadvantages for patients if they have to wait for in-patient investigations. They are at risk of non-fatal myocardial infarction, and the increase in length of stay puts them at risk of the dangers of being in a hospital environment such as hospital acquired infections. It also negatively impacts on their quality of life and is a waste of scarce NHS resource.
QI theme	Effectiveness
What is the standard to be met	NICE Quality Standard (QS68): <72 Hours in >75% of patients NICE suggest that patients at intermediate or higher risk of future cardiovascular events should be seen by cardiac specialists and offered coronary angiography (with follow-on PCI if indicated) within 72 hours of first admission to hospital. This is captured in the NICE Acute coronary syndromes in adults Quality Standard [QS68].[6]
Key references to support the metric	References as above are in reference list at end of report.
Numerator	PCI indication 'NSTEMI', treated within 72 hours of arrival at first hospital (whether PCI centre or referring centre – i.e. director inter-hospital transfer [IHT])
Denominator	PCI indication 'NSTEMI'
Trend	Median delay for patients transferred from another hospital (inter hospital transfers or IHT) was 82.4 hours, and for patients admitted directly to the PCI centre, 58.7 hrs in 2018/19 [Figure 9]. Overall the delays appear not to have changed substantially since at least 2014. As has been observed before, this equates to an additional 24 hrs delay for patients whose admission starts in a non-PCI centre and require transfer before PCI.
Variance	In addition to the lack of improvement, there is considerable variation between centres, as previous years.

Figure 9: *Delays to PCI, when indicated, in patients with NSTEMI, 2014 – 2018/19, for direct admissions and those requiring an inter-hospital transfer (IHT)*

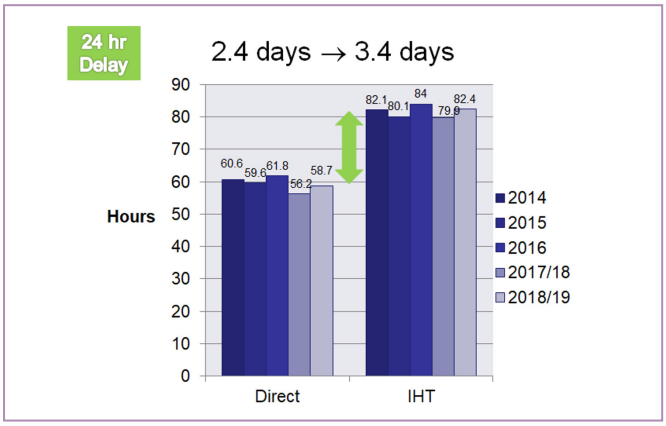
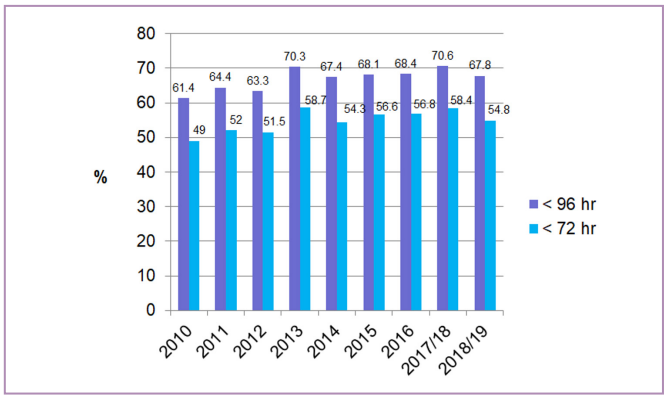


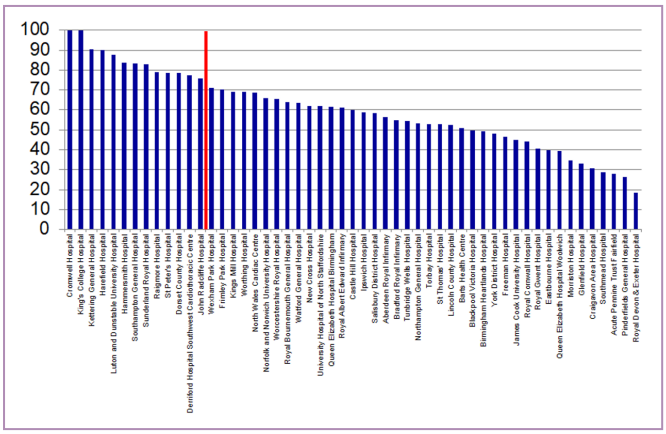
Figure 10: *Delays to PCI, when indicated, in patients with NSTEMI, 2010 – 2018/19, showing data for all patients whether initial admission was to a PCI centre or not (and thus needed an inter-hospital transfer)*



As would be expected from these findings the proportion of patients who are treated within either 96 hours (previous NICE standard) or 72 hours of admission to the first hospital remains poor and has also not changed substantially over recent years [Figure 10].

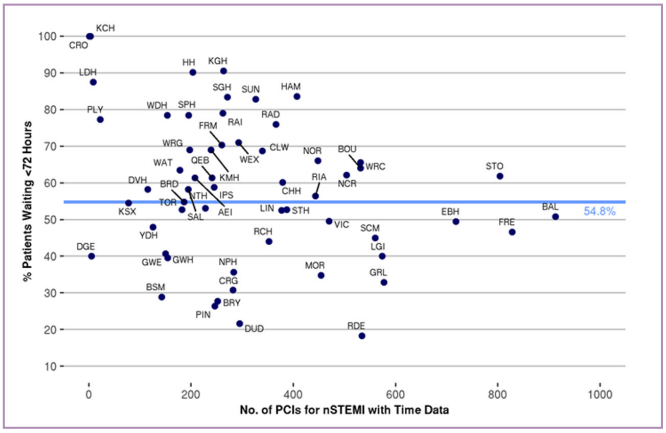
There is also marked variation with substantial delays in some hospitals, suggesting considerable scope for improvement if centres could achieve the performance of the better performing hospitals [Figures 11 and 12].

Figure 11: *Proportion of patients with NSTEMI undergoing PCI within 72 hrs, 2018/19*



[Note: Hospitals to the right of the red line are not performing ≥75% of PCI procedures for patients with NSTEMI within 72 hours.]

Figure 12: *Delays to PCI in patients presenting with NSTEMI, as % treated within 72 hrs by centre, 2018/19*
(see end of report for site codes)



Recommendations for those not achieving the standard

It is important that many centres improve the rapidity of patient access to invasive cardiology investigation and treatment.

This would improve the patient's experience and save wasted bed days. Given the wide variation, lessons from the poorer performing centres could be learnt from the top performing centres. The 'best practice tariff' introduced in 2017-19 may begin to address these issues but does not yet appear to have had any impact. A systematic review across regions is necessary if improvements are to occur with this aspect of clinical care. This can include capacity issues, efficiencies and prioritisations.

2.4 | RADIAL ACCESS FOR PCI PROCEDURES: REACHING A CEILING?

QI Metric Description/Name	Use of radial access for PCI
Why is this important?	Radial access is associated with fewer complications than femoral access, and in high risk patients this has been shown to translate to improved survival – see additional detail below.
QI theme	Safety and outcomes
What is the standard to be met?	>75% of all cases to be performed via radial route 2018 ESC/EACTS Guidelines on myocardial revascularization:[9] Radial access is recommended as the standard approach, unless there are overriding procedural considerations. Recommendation Class 1, level of evidence A 2017 European Society of Cardiology Guidelines for management of acute myocardial infarction in patients presenting with STEMI:[2] Radial access is recommended (for primary PCI) over femoral access if performed by an experienced radial operator. Recommendation Class 1, level of evidence A The BCIS Domain Expert Working Group advised an audit standard cut off of 75% radial rate to allow for variations in an operator's case mix (for example, those treating chronic total occlusions are more likely to need to use transfemoral access).
Key references to support the metric	References as above and in text below are in reference list at end of report.
Numerator	Arterial access route includes right or left radial artery
Denominator	All PCI procedures (defined as procedures in the dataset where number of lesions/vessels attempted >0)
Trends	There has been a further improvement, measured as an increase in the percentage of patients whose PCI is performed via the radial route (rather than femoral) from 87.2% in 2017/18 to 88.7% in the current analysis [Figure 13].
Variance	See Figures 14 and 15. There are still some centres with a relatively low rate of radial procedures but fewer centres fail to meet the standard.

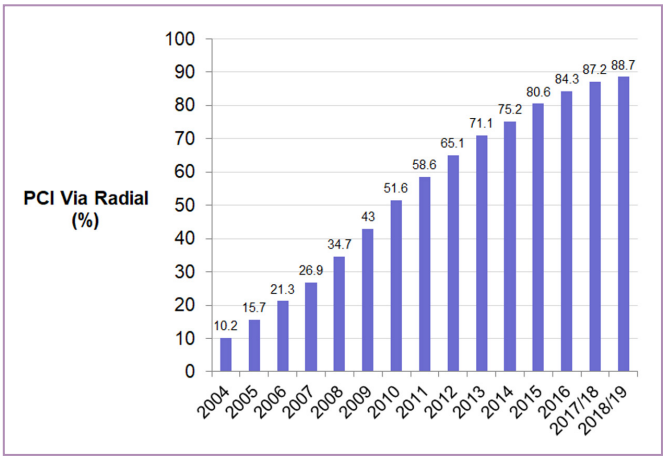
To perform PCI, a tube (catheter) needs to be inserted into the patient's arterial system. This can be inserted into the artery at the top of the leg (called the femoral artery), or in the wrist (called the radial artery). During the early development of PCI, before full miniaturisation of equipment, large bore tubes had to be used, and so could only be inserted into a large artery (such as the femoral). In recent years the equipment needed for PCI procedures has become smaller, and is now thin enough to be inserted into the smaller radial artery.

There are several advantages to using the radial artery for access. For example, unlike the femoral artery it does not have other critical structures close by that could be damaged (the femoral artery on the other hand is surrounded by the femoral vein and nerve). It is easier to compress the radial artery to stop bleeding after the tubes are removed, and if any bleeding does occur it is more obvious and so can be corrected more quickly. Furthermore the use of the radial route enables quicker mobilisation after the procedure.

Complications are lower if it is possible to use the radial rather than the femoral route, and radial access results in better long term outcomes and lower mortality.[10] Nevertheless, the radial route is technically challenging, especially if the operator's previous training and experience has been limited to transfemoral access.

Because of the advantages of transradial access we have reported the radial versus femoral access rates for all operators and PCI hospitals. However it is not possible to treat all patients using a radial approach. Some patient's radial arteries are still too small, and some PCI techniques still require large bore equipment that cannot fit into an average radial artery. As a result operators who attempt to use a radial route in all appropriate patients will not have 100% radial rates, but rather rates that are likely to be between about 80% and 95%.

Figure 13: *Growth in the use of radial access for PCI, 2004 – 2018/19*



The number of NHS hospitals in England with radial rates less than 75% has fallen from 10 to 7 [Figure 15).

Figure 14: *Use of radial access in PCI by hospital, 2018/19 (see end of report for site codes)*

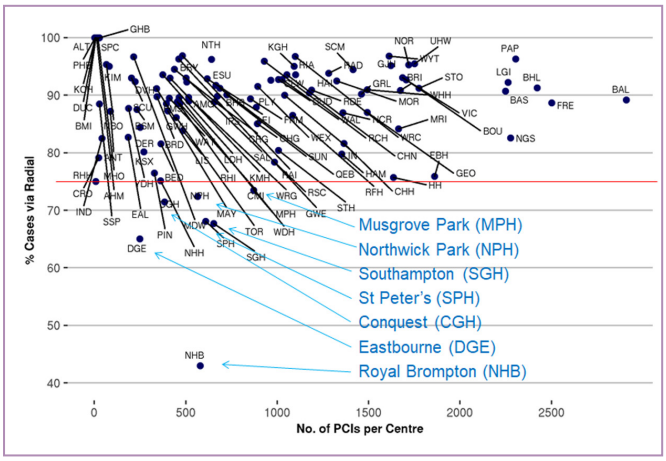
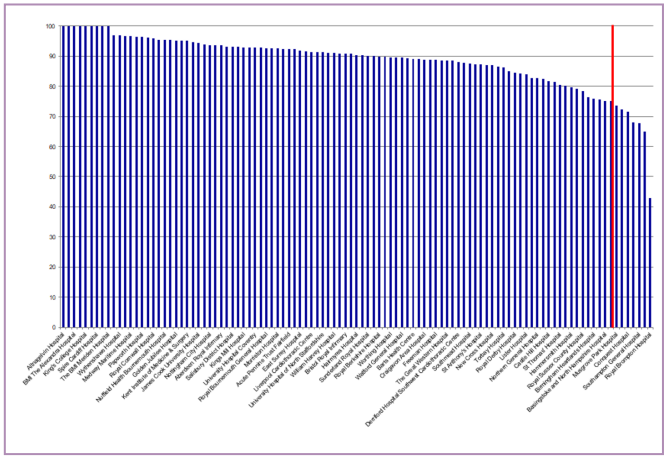


Figure 15: *Radial access rates by hospital, 2018/19*



[Note: Hospitals to the right of the red line are not achieving ≥75% of PCI procedures using radial artery access.]

Recommendations for those not achieving the standard

There has been a substantial shift in practice of which the UK can be proud. The few operators who have yet to change their practice should be encouraged to make use of the educational resources available in the UK and, given the high percentages of the large majority, are very likely to have colleagues who can help support their shift in practice.

2.5 | DAY CASE PCI: MUCH MORE COULD BE DONE TO OFFER THIS OPPORTUNITY

QI Metric Description/Name	Proportion of patients treated by PCI for stable symptoms who are treated as a day case
Why is this important?	Patient experience – see additional detail below
QI theme	Effectiveness
What is the standard to be met?	>75% as day cases The BCIS Domain Expert Working Group recommended that >75% of PCI procedures performed electively for stable symptoms should be discharged the same day as the procedure.
Key references to support the metric	References in text below are in reference list at end of report.
Numerator	Day case procedure for PCI for stable elective patients defined as: 2.03 Procedure Urgency = 1. Elective & 3.11 Number of lesions attempted >0 AND 3.01 Date and time of operation = same DATE as 4.04 Discharge Date
Denominator	PCI for stable elective patients defined as: 2.03 Procedure Urgency = 1. Elective & 3.11 Number of lesions attempted >0
Trends	No obvious trend over last 3 years
Variance	This audit has demonstrated that there is extremely wide variation in day case rates, with some centres performing day case PCI in almost all elective cases, and some where almost all patients are kept in overnight following their procedure [Figures 16 and 17].

When PCI was first introduced, in the first few hours after the procedure serious complications would occur in about 5% of cases requiring emergency intervention including surgery. As a result all patients were kept in hospital overnight and monitored carefully. However the PCI has evolved and has become a much safer treatment. This is due to a number of developments including the use of stents, special anti-platelet (blood-thinning) drugs, and the use of radial artery access (see above).

While patients who need PCI for a heart attack usually still need to stay in hospital overnight, patients who are being treated electively for symptoms of stable angina usually do not.

The safety of same day discharge following uncomplicated PCI for stable symptoms has been demonstrated in several trials,[11] and analyses of the BCIS dataset.[12] Greater adoption of same day discharge has the potential to improve patient satisfaction, increase bed availability, and reduce hospital costs without increasing adverse patient outcomes.

Figure 16: *Proportion of Elective PCI performed as a day case by hospital, according to overall hospital PCI activity, 2018/19*

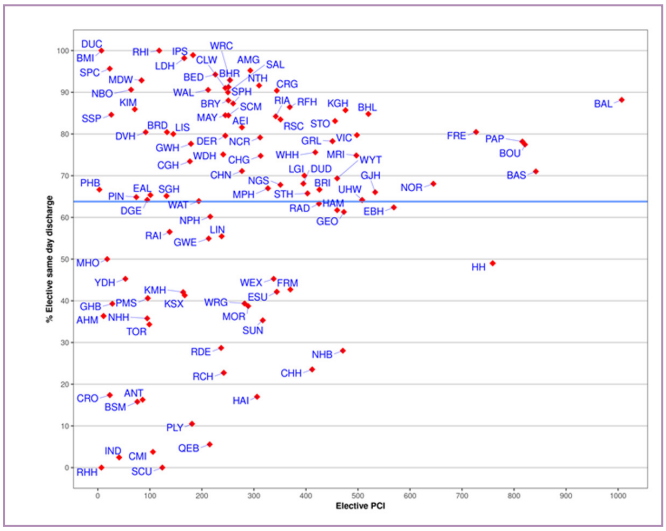
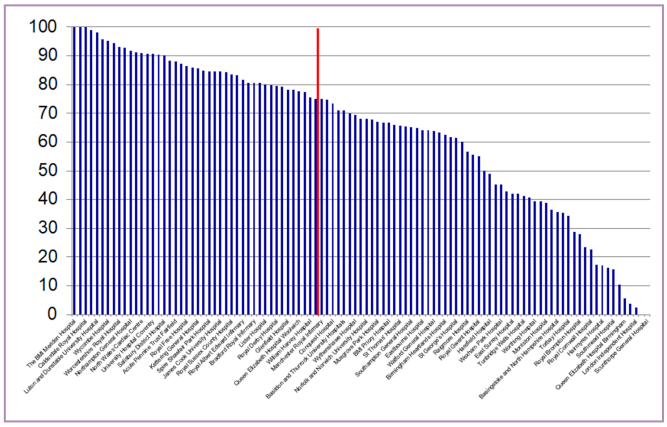


Figure 17: *Elective PCI performed as a day case by hospital, 2018/19*



[Hospitals to the right of the red line are not achieving ≥75% of elective PCI patients treated as a day case.]

Recommendations for those not achieving the standard

Hospitals should seek to modify their pathways and ward structures to reduce unnecessary overnight stays for patients.

The explanation for this wide variation will include differences in the management of wards and day units, pressure on beds from emergency admissions and differences in patient pathways.

2.6 DRUG ELUTING STENTS (DES) USE DURING PRIMARY PCI (PPCI): HIGH ADHERENCE TO THE EXPECTED STANDARD

QI Metric Description/Name	DES as proportion of stented cases in PPCI
Why is this important?	Evidence of benefit over bare metal stents. When drug eluting stents were first developed to reduce the rate of restenosis observed with bare metal stents, there were concerns about the potential for these new stents to be at increased risk of later thrombotic occlusion (stent thrombosis). These concerns have now been assuaged by recent trials of the latest (third generation) drug eluting stents.[13,14] These trials show that new generation drug eluting stents maintain the benefits of reduced restenosis, without increasing the risk of stent thrombosis. In fact the most recent trials show DES are associated with less stent thrombosis than bare metal stents.
QI theme	Effectiveness, outcomes
What is the standard to be met?	>90% use of DES where a stent is deployed to treat STEMI 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation :[7] Stenting with new-generation DES is recommended over BMS for primary PCI. Class 1, Level of evidence A
Key references to support the metric	References as above are in reference list at end of report.
Numerator	Primary PCI where the stent used is a DES, defined as: 3.11 Number of lesions attempted >0 AND 2.02 Indication for Intervention = 4. ACS - Primary PCI for STEMI (no lysis) AND 3.15 Number Stents used >0 AND DES = 3.16 Number of Drug-eluting stents used >0
Denominator	Primary PCI where a stent is used, defined as: 3.11 Number of lesions attempted >0 AND 2.02 Indication for Intervention = 4. ACS - Primary PCI for STEMI (no lysis) AND 3.15 Number Stents used >0
Trends	There has been a small drop overall in the proportion of patients receiving a stent during PCI over the last few years, possibly because of an emerging evidence around the use of drug-eluting balloons. However, where a stent is used, there remains a very high use of DES [Figures 18 and 19].
Variance	This audit has assessed the use of DES during PPCI for all centres, and shown very high levels of compliance with these recommendations in almost all centres. A plot of any stent and drug eluting stent use over the years shows that almost all stents now used are drug eluting [Figures 20 and 21].

Figure 18: *Trends in stent use during all PCI procedures 1992 – 2018/19, with DES use since 2003*

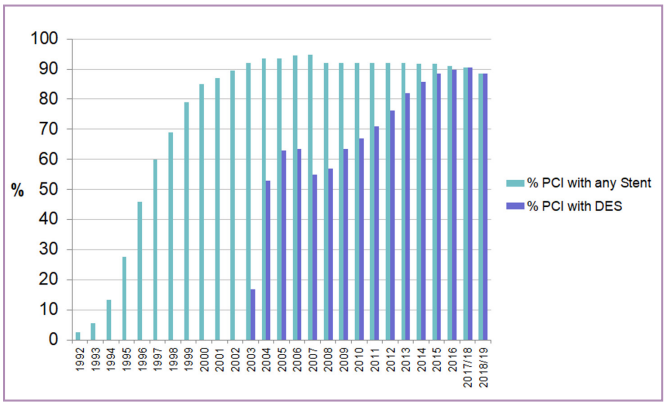
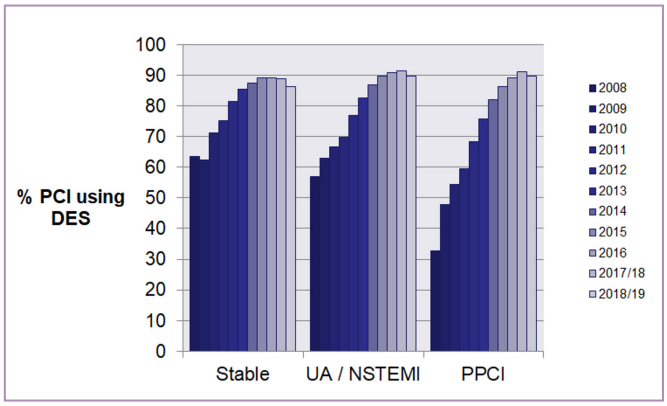


Figure 19: *Use of DES during PCI procedures in specific syndromes, 2008 – 2018/19*



Assessing stent type use by presenting syndrome shows consistently high use in all [Figure 19].

Use of drug eluting stent for primary PCI by centre shows almost all centres with >90% usage [Figures 20 and 21].

Figure 20: *Use of DES in PPCI by hospital, 2018/19*
(see end of report for site codes)

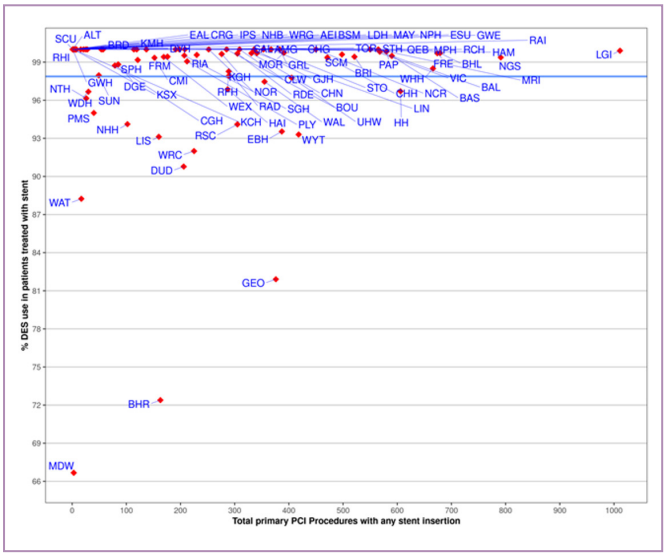
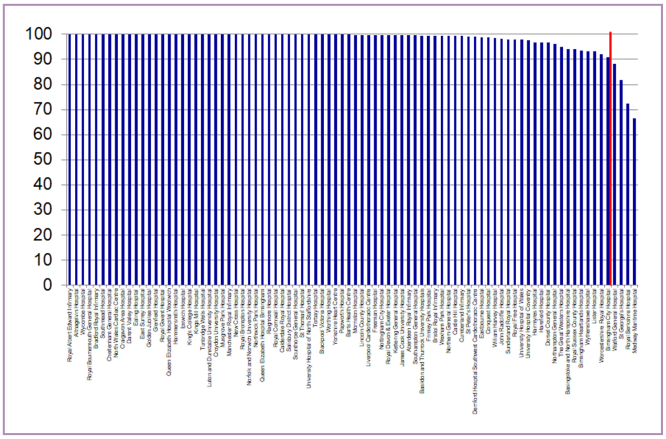


Figure 21: *Use of DES in PPCI in individual hospitals, 2018/19*



[Note: Hospitals to the right of the red line do not use DES in ≥90% of PPCI procedures requiring a stent.]

Recommendations for those not achieving the standard

Hospitals not meeting the standards for the use of drug-eluting stents during primary PCI should review their cases to see where improvements can be made.

2.7 | DATA COMPLETENESS

An assessment of data completeness forms part of the Clinical Outcomes Publication that will be available later in the year. For completeness the rationale and description is provided below.

QI Metric Description/Name	**1. Data completeness of key fields required for risk adjusted outcome analysis** **2. Data completeness for time delays to STEMI treatment** **3. Data completeness for time delays to NSTEMI treatment**
Why is this important?	1. To allow accurate assessment of outcomes 2. To allow accurate assessment of delays to PCI in ACS
QI theme	Safety and effectiveness and surrogate for outcomes
What is the standard to be met? (Ideally evidence-based standards; avoid national average where possible - use top quartile/quintile etc instead)	>95% completeness of each of the key fields
Key references to support the metric	BCIS data monitoring group recommendation

3. FUTURE DIRECTION

The ambition is to have more contemporaneous data, and for these to be available to hospitals in as close to real-time as possible.

To this end we have been creating a suite of analytic tools that interrogate and analyse the live NICOR dataset. To date we have developed three aspects:

- A data completeness tool that shows each PCI centre any fields in the dataset that are incomplete. The tool is interactive, allowing them to drill down to the individual procedures for which missing data need to be found. This enhanced visibility of data completeness will help centres to enhance the quality of data entry.
- Key metrics (such as those for quality improvement described above) have been programmed to run on the live data. After selecting the time frame of interest a centre is presented not only with their own performance, but a comparison both with the national average, and the average of the 'best' 10 centres.
- Users can program their own reports to interrogate any combination of fields, and again end up with an analysis of their own performance, compared with national average.

We will continue to develop this tool to provide enhanced ways for centres to see their performance and compare it with others.

PCI CENTRE CODES

Hospital code	Hospital Name
AEI	Royal Albert Edward Infirmary (Wigan)
AHM	BMI Alexandra Hospital
ALT	Altnagelvin Hospital
AMG	Wycombe Hospital
ANT	St Anthony's Hospital
BAS	Basildon and Thurrock University Hospitals
BAT	Royal United Hospital Bath
BED	Bedford Hospital
BHL	Liverpool Cardiothoracic Centre
BHR	Royal Berkshire and Battle Hospital
BLA	Royal Blackburn Hospital
BMI	BMI Meriden Hospital
BOU	Royal Bournemouth Hospital
BRD	Bradford Royal Infirmary
BRI	Bristol Royal Infirmary
BRY	Acute Pennine Trust Fairfield
BSM	Southmead Hospital Bristol
CGH	Conquest Hospital
CHG	Cheltenham General Hospital
CHH	Castle Hill Hospital
CHN	Nottingham City Hospital
CLW	North Wales Cardiac Centre
CMI	Cumberland Infirmary
CRG	Craigavon Hospital
CRO	Cromwell Hospital
DER	Royal Derby Hospital
DGE	Eastbourne Hospital
DUC	Duchy Hospital
DUD	Birmingham City Hospital
DVH	Darent Valley Hospital
EAL	Ealing Hospital
EBH	Birmingham Heartlands Hospital
ERI	Edinburgh Heart Centre
ESU	East Surrey Hospital
FRE	Freeman Hospital
FRM	Frimley Park Hospital
GEO	St George's Hospital
GHB	Spire Hospital Bristol

Hospital code	Hospital Name
GJH	Golden Jubilee National Hospital
GRL	Glenfield Hospital
GWE	Royal Gwent Hospital
GWH	Queen Elizabeth Hospital Woolwich
HAI	Hairmyres Hospital
HAM	Hammersmith Hospital
HBP	Spire Hospital Hull and East Riding
HH	Harefield Hospital
HHW	Wellington Hospital
HSC	Harley Street Clinic
IND	London Independent Hospital
IPS	Ipswich Hospital
KCH	Kings College Hospital
KGH	Kettering General Hospital
KIM	Kent Institute of Medicine & Surgery
KMH	Kings Mill Hospital
KSX	Tunbridge Wells Hospital
LBH	London Bridge Hospital
LDH	Luton and Dunstable University Hospital
LGI	Yorkshire Heart Centre
LIN	Lincoln County Hospital
LIS	Lister Hospital
LNH	Leeds Nuffield Hospital
MAY	Croydon University Hospital
MDW	Medway Maritime Hospital
MHO	Manor Hospital Oxford
MOR	Morriston Hospital
MPH	Musgrove Park Hospital
MRI	Manchester Royal Infirmary
NBO	Nuffield Health Bournemouth Hospital
NCR	New Cross Hospital
NGS	Northern General Hospital
NHB	Royal Brompton Hospital
NHH	Basingstoke and North Hampshire Hospital
NIN	Ninewells Hospital
NOR	Norfolk and Norwich University Hospital
NPH	Northwick Park Hospital
NTH	Northampton General Hospital
PAP	Papworth Hospital
PHB	BMI Priory Hospital
PHN	BMI Park Hospital
PIN	Pinderfields General Hospital
PLY	Derriford Hospital, Southwest Cardiothoracic Centre

Hospital code	Hospital Name
PMS	Great Western Hospital, Wiltshire Cardiac Centre
QAP	Queen Alexandra Hospital
QEB	Queen Elizabeth Hospital, Birmingham
RAD	John Radcliffe Hospital
RAI	Raigmore Hospital
RCH	Royal Cornwall Hospital
RDE	Royal Devon & Exeter Hospital
RFH	Royal Free Hospital
RHH	Ross Hall Hospital
RHI	Calderdale Royal Hospital
RIA	Aberdeen Royal Infirmary
RSC	Royal Sussex County Hospital
RVB	Royal Victoria Hospital
SAL	Salisbury District Hospital
SBH	Barts Health Centre, St Bartholomew's Hospital
SCM	James Cook University Hospital
SCU	Scunthorpe General Hospital
SGH	Southampton General Hospital
SPC	Spire Cardiff Hospital
SPH	St Peter's Hospital
SSP	Spire Shawfair Park Hospital
STH	St Thomas' Hospital
STO	University Hospital of North Staffordshire
SUN	Sunderland Royal Hospital
TOR	Torbay Hospital
UHW	University Hospital of Wales
VIC	Blackpool Victoria Hospital
WAL	University Hospital Coventry
WAT	Watford General Hospital
WDH	Dorset County Hospital
WEX	Wexham Park Hospital
WHH	William Harvey Hospital
WMU	West Middlesex University Hospital
WRC	Worcester Royal Hospital
WRG	Worthing Hospital
WYT	Wythenshawe Hospital
YDH	York District General Hospital

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