

## Board of Directors (Public)

### Item 2.5

**Subject:** Annual Mortality Review 2016  
**Date of meeting:** 31<sup>st</sup> January 2017  
**Prepared by:** Dr Raphael Perry/Medical Director  
**Presented by:** Dr Raphael Perry/Medical Director

BAF Ref	Impact on BAF
1, 2	None

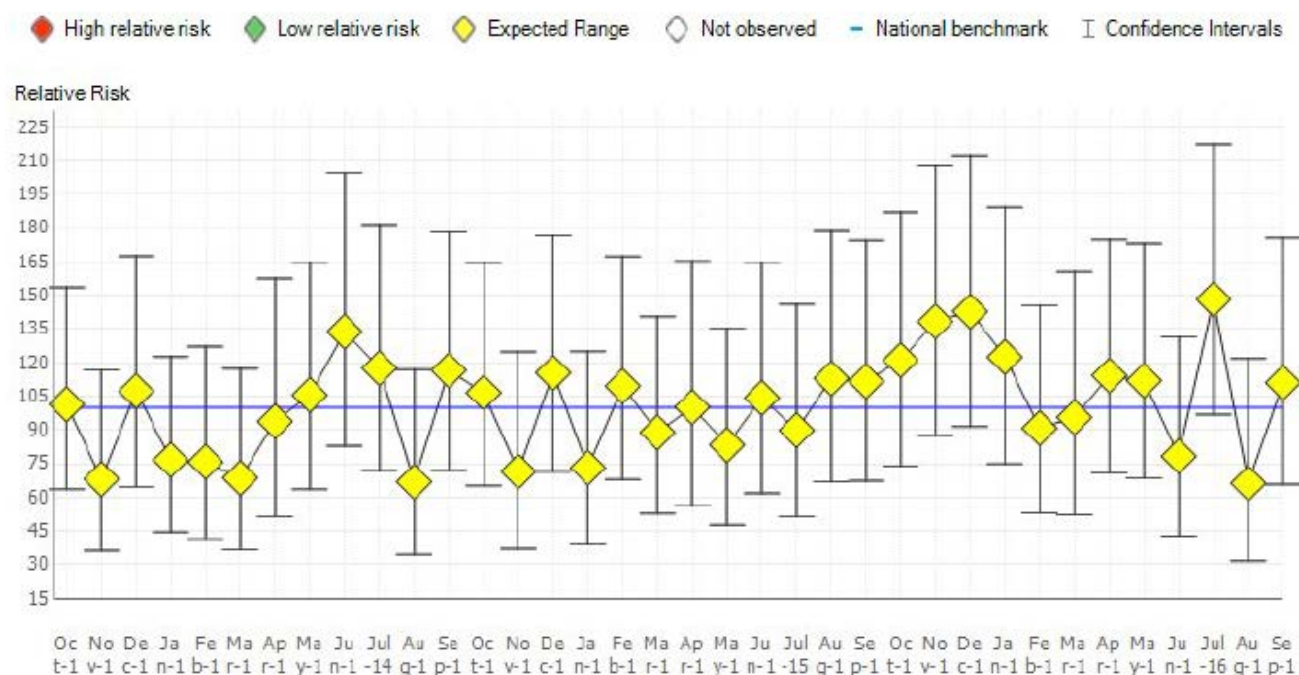
#### 1. Executive Summary

- This paper summarises the performance for the year up to December 2016 and reviews the measures in place to ensure mortality is kept as low as possible.
- Mortality has maintained improvements seen since 2013 over the last three years despite the acuity and case mix
- There is a new mortality reduction strategy
- Clinical systems and processes are in place to minimise the risk of death. Work will continue to refine these.
- Consultant outliers continue to be performance managed according to policy
- There are robust plans to improve organisational learning
- The MRG process is being improved in line with national guidance

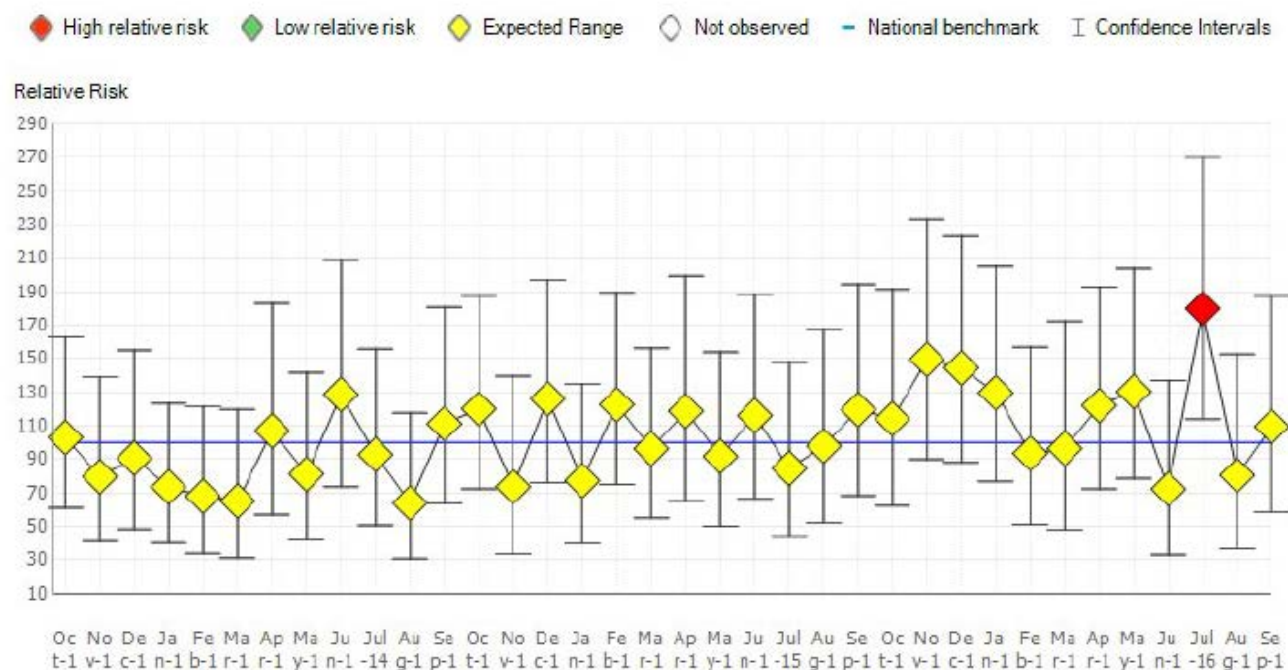
#### 2. Mortality indicators – organisational

Hospital Standardised Mortality Ratio (HSMR) indicators (both for all diagnoses and for 56 diagnoses associated with mortality) are slightly above expected in September 2016 and for the financial year 2016-17. However, confidence limits include unity (where the observed number of deaths equals those expected from application of the risk model), and therefore this finding is not statistically significant. The Board will recall that these measures run a number of months behind real time as they are provided by Dr Foster using validated methodology. The average HSMR for the period to September 2016 is 115.8. A detailed review of outlying figures is provided in section five below.

### HSMR for all diagnosis groups



### HSMR for 56 diagnosis groups associated with mortality



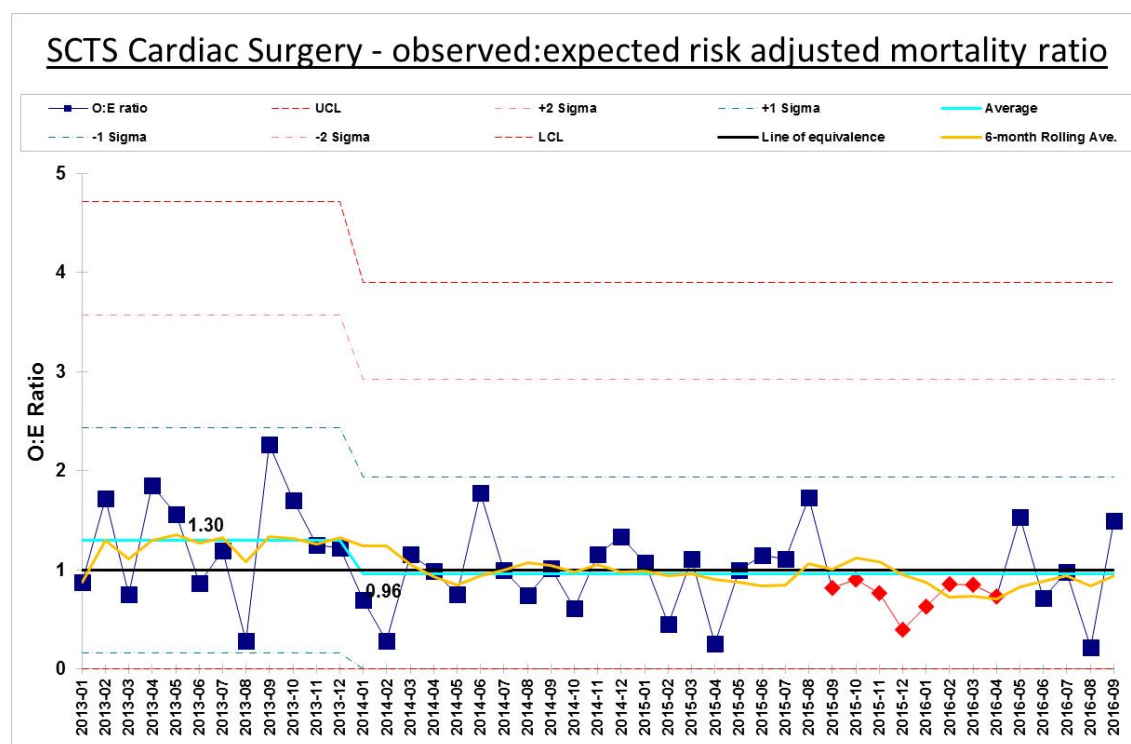
The below table shows the actual number of deaths that have occurred at the Trust over the last four-years from 2013 to 2016. The number of deaths have reduced by 21% during this period.

	2013	2014	2015	2016
CABG	21	20	7	21
Valve	11	10	10	13

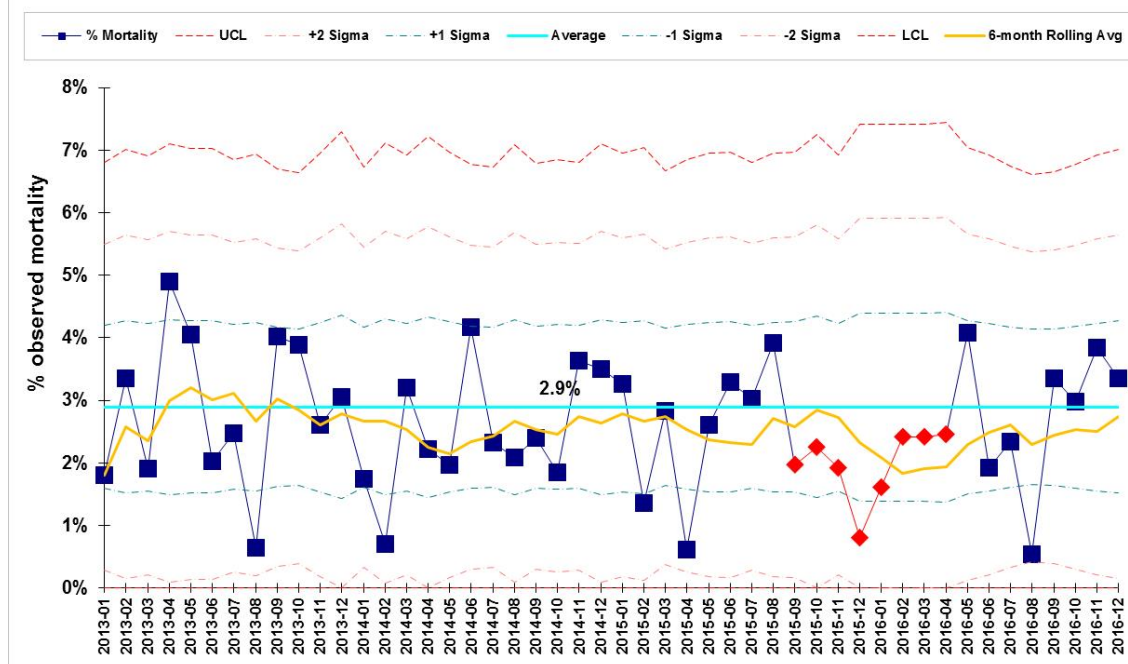
CABG & Valve	15	13	10	7
Other Cardiac Surgery	33	30	35	26
Thoracic Surgery	28	16	22	19
UGI Surgery	5	3	6	1
Primary PCI	28	18	22	24
Non-primary PCI	5	7	4	3
Other Cardiology	49	40	42	50
Respiratory	15	10	13	4
<b>Total Number of Deaths</b>	<b>210</b>	<b>167</b>	<b>171</b>	<b>168</b>
<b>Total Number of Admissions</b>	<b>12977</b>	<b>12762</b>	<b>13257</b>	<b>13145</b>
<b>% Deaths</b>	<b>1.62%</b>	<b>1.31%</b>	<b>1.29%</b>	<b>1.28%</b>

## Cardiac Surgical Mortality

Risk adjusted surgical mortality, measured with a six-month rolling average, is below expected for the year up to September 2016. Board members will recall the timeliness of these data was explained with data validation prior to national submission resulting in a quarterly time lag.



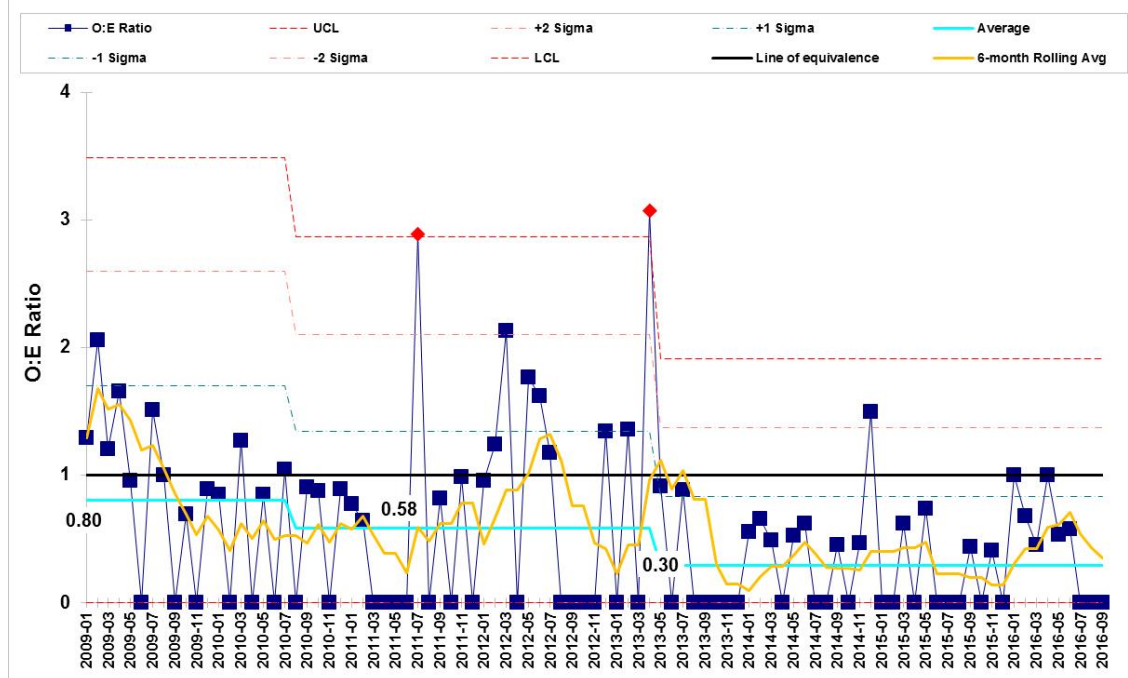
### SCTS Cardiac Surgery - observed mortality rates



### PCI

The risk adjusted non-primary PCI major adverse cardiac events (MACE), measured by a six-month rolling average, is also below the expected level throughout 2016 up to September.

### Non-Primary PCI - observed:expected risk adjusted MACE ratio



## Mortality Reduction Strategy

Mortality results from a complex interaction of both individual and systems factors. A competent practitioner may have poor outcomes as a result of poor support from existing systems. An example would be inadequate infection prevention policies. Even if the support systems are adequate, poor results may occur due to lack of compliance by the practitioner. It has also been suggested that average practitioners may produce excellent results when supported by excellent systems and policies. The trust has had a low risk adjusted mortality rate due to the continued efforts at mortality reduction.

The previous strategy focused on four main areas:

1. Practitioner performance
2. Having Trust-wide policies and procedures that reflect best practice and ensuring compliance with these.
3. Surgery specific quality issues.
4. Organisational learning from errors and harm

The Medical Director and Director of Research & Informatics have developed a new mortality reduction strategy in 2016 in conjunction with clinical colleagues from the three divisions. The Advancing Quality Alliance has developed processes to assist trusts in mortality reduction. A full day workshop has taken place with AQuA and the mortality improvement group has met regularly to develop the new strategy. The aim of the strategy is to reduce in patient mortality by 10% by 2020; this would come down from 1.3% to 1.17%.

**Reduction in variation of practice – assessed by SLR and EPR:** introducing explicit standards; same day admission process; introduce a ‘failure modes effect analysis’ focusing on high risk procedures; introducing a program of enhanced recovery.

**Mortality Review and Organisation Learning:** complete planned changes to mortality review process; introduce the Responsible Accountable Consultant Informed (RACI) matrix to manage actions emerging from the mortality reviews; ensure that divisional systems are in place for effective communication of improvements from mortality reviews.

**Patient Safety measured by patient safety cultural assessment:** walk arounds to ensure improvements are reaching the general workforce; introduce comprehensive quality improvement training at all levels aligned to the aims of the strategy.

**Digital healthcare:** review and improve interoperability between trusts, primary care and community; use EPR as a quality improvement tool (e.g. care bundle compliance); integrate NICOR datasets into EPR for audit of clinical performance.

**Decision Making – adherence to MDT processes:** change focus of revascularisation MDT to high risk MDT; change expectation of patients for intervention by educating colleagues in referring trusts; introduce shared decision making; include within standard operating procedures guidance regarding patient selection.

**Education and Training** – adherence to training plan: review job plans to ensure protected time for learning; educate referral base so we act as a single team; introduce simulation training.

**Communication – stakeholder engagement:** video consultation; embed electronic referral system with standardised referral information; refine EPR to enhance communication within LHCH

This builds on the previous strategy and focuses on the following in addition to the following established processes.

### **Practitioner Performance**

Individual performance is monitored to ensure early intervention if deterioration occurs.

Cardiac Surgery and Cardiology risk adjusted CUSUM curves are reviewed every 6 months, reported to the Divisions and reviewed at Divisional Governance Meetings. Cardiology MACCE (Major Adverse Cardiac & cerebrovascular Events) is reviewed bimonthly with discussion between operators and learning points circulated.

CUSUM data is also reviewed at the quarterly cross divisional Quality & PFEC meeting.

There are no individual operator performance issues in Cardiology procedures.

In cardiac surgery there has been a recalibration of risk adjustment by NICOR (National Institute for Cardiac Outcomes Research). In 2016 two cardiac surgeons have breached the trust 90% Confidence interval for expected performance. None of these have breached the national 95% CI though this data is last years as there is a lag in the production of national data. The surgeons are being managed by the Trust's policy "Measuring and Monitoring Cardiac Surgical performance in Cardiac surgery".

This is led by the surgical division and audit lead reporting to the medical director. The application of the policy ensures continued performance scrutiny and offers remediation in a step wise process starting with mentoring and extending to retraining until the results fall within expected. One of the surgeons has returned to within the confidence limits and the other is on the planned improvement trajectory.

## **3. Trust-wide Policies and compliance**

### **Care Bundles**

These are groups of interventions that have been demonstrated to improve patient safety.

1. Ventilator Acquired Pneumonia (VAP) bundle.
2. Urinary Catheter bundle.
3. Peripheral line bundle
4. Central line bundle
5. Surgical site infection bundle
6. Sepsis bundle
7. Venous thromboembolism bundle

There is generally good uptake of these bundles across the organisation although audit data has been variable. The Infection Control committee receives audits from the Directorates of

the peripheral line bundle and catheter bundle. If the audits are not of the required standard this is addressed by the Heads of Nursing. Outcomes and re-audit are fed back to the Infection Prevention Committee. There have been no bacteraemias as a result of an infected peripheral cannula.

Compliance with surgical antibiotic prophylaxis is excellent and the Theatre Infection Control Policy is being reviewed and updated in June 2015.

### **Venous Thrombo-embolism.**

The introduction of EPR has allowed close scrutiny of the risk assessment and prescription of medication to reduce thromboembolism. There has been a significant improvement in these areas, including the assessment of day case cardiology patients. Both screening assessment and treatment have fallen within target though reassessment has not. Further work has been carried out within the divisions to ensure compliance. This includes a recent change to the EPR January 2017 change Wednesday) to ensure reminders over VTE reassessment.

### **Application of the Sepsis Bundle**

Compliance with the sepsis care bundle has been the subject of a considerable amount of work by the sepsis lead. Much work has gone into refining the bundle in an effort to simplify the EPR order set. Audits have demonstrated improvement in the key areas of obtaining blood cultures and administering at least one appropriate antibiotic within the first hour though there is still a need for further improvement. Since the last annual report the definitions and treatment of sepsis has changed under national guidance and the trust has moved to the new screening tool incorporated into EPR.

The Trust launched a new sepsis campaign in December 2016, incorporating an updated sepsis bundle on EPR, video presentations and educational workshops for all groups. Focus on education and accountability with the middle grade medical staff should improve compliance in all areas.

The new screening tool will allow focus on patients with severe sepsis and continue to measure the KPIs reported through the dashboard. The infection prevention committee

### **Rise in Methicillin sensitive Staphylococcus aureus (MSSA) Bacteraemias**

There has been an increase in the number of Trust acquired MSSA bacteraemias. All were reported to the HCAI surveillance scheme in line with mandatory requirements. Reviews indicate that the increase has been due to chest infections and wound infections post-surgery.

	2012	2013	2014	2015	2016
Number of LHCH acquired MSSA cases per year	4	3	6	11	8



Staph aureus is frequently carried in the nasal passages of patients. Audit has shown only 60% of patients were being screened in outpatients, principally as the EPR screening bundle was difficult to access. This has meant that some patients were not being decolonised preoperatively and at increased risk of a bloodstream infection. This has been rectified and the screening rate will be audited in 3 months

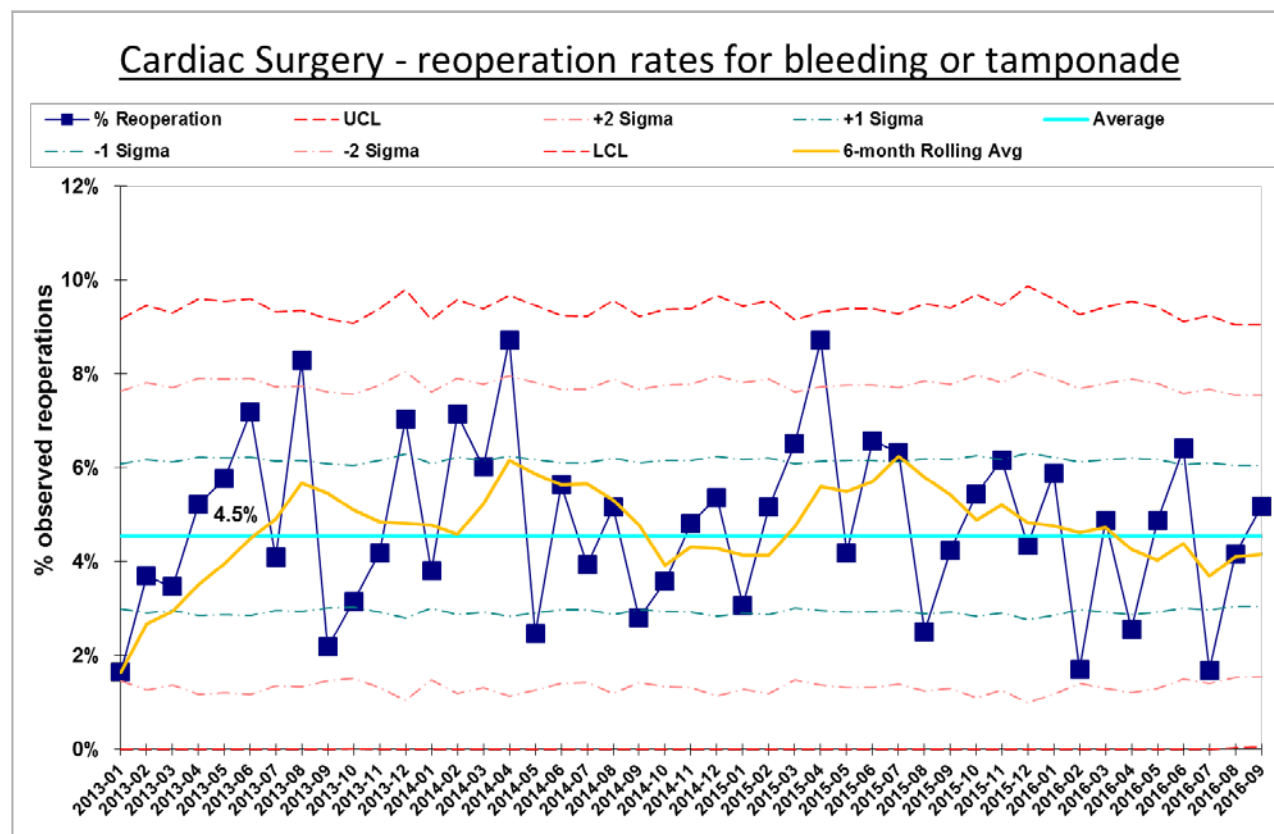
Enhanced screening, combined with good antibiotic prophylaxis and a comprehensive central line bundle should see the incidence of bacteraemias reduce.

A working group of the infection prevention committee has been set up to review the risks for surgical site infection and its management.

### **Surgery specific Quality indicators.**

Resternotomy for bleeding following cardiac surgery.

Previous audits of resternotomy for bleeding have shown this complication to be associated with a six fold increase in mortality. Tight control of this complication is key to reducing mortality and is a key performance indicator in cardiac surgery.



The chart above shows a rate of less than 5% as measured with a six-month rolling average in 2016 to date. The rate is in keeping with the national average for this complication, and is reviewed regularly at surgical audit meetings.

Other quality indicators are reviewed at monthly surgical audit meetings. They include length of stay, internal mammary artery use and readmission to ITU.



## **4. Organisational Learning**

### **Mortality Review Group (MRG) process.**

The Trust has had a well-established review process for all deaths since 2011. The mortality review process has been improved and brought up to date with national guidance issued in January 2016.

The new recommendations suggested updated TORs for the group to incorporate junior staff and a wider MD group – this has been completed. There is a significant emphasis on actions and review of all potentially avoidable deaths.

In addition to discussions at audit days MRG results with recommendations will be sent to the relevant division to manage through divisional governance. From the end of 2015 additional time has been set aside quarterly at the Operations Board for cross divisional learning from the MRG and from other governance issues. Also quarterly there is a cross divisional Quality and PFEC governance meeting chaired by the Medical Director. As well as addressing common themes from the divisional monthly governance meetings (which this replaces once per quarter) there will be opportunity to share outcomes from the MRG

The 28 day target for completing mortality reviews was met in 85% cases in 2014 but this worsened in 2015. This is in part due to pressures on consultant staff time. Further work to increase the timeliness of return in 2015 has been carried out. This includes proactive measures by the medical director and the lead administrator of the MRG group. In October 2016 a system of screening of forms was introduced with a core group of six consultants doing a brief overview to establish whether an in depth review was necessary. To date 63% (26) of cases needed an initial screening only with 37% (15) going on to full screening by other members of the consultant body. Initial screening of cases was complete in seven days in 88% of cases. The reduction in the need for full reviews will lead to a reduction in the number of cases exceeding the twenty eight day target.

Nursing review of cases is carried out in parallel now to encompass the multidisciplinary group. The reviews cover all aspects of care during the patient's journey, including system wide and individual errors.

A multidisciplinary MRG meets at least monthly and selects those reviews which suggest areas for improvement that should be shared with the rest of the organisation. These are then sent for presentation at audit days in surgery and cardiology, with the principle and reviewing consultant discussing the case.

.The MRG process has also contributed to a culture of individual accountability within the clinical body, with the awareness that all clinical care is subject to independent scrutiny. The Chair of the MRG summarises the key learning points every 3 months for the Directorates and presents an annual review to the Trust's Quality and patient experience committee. In the past one area of poor performance in the process is in actioning recommendations. There has been a significant improvement allied to the organisational learning strategy.

## Multi-disciplinary Team Meetings

There are established MDTs in the following areas; revascularisation, aortic surgery, mitral valve surgery and TAVI. There is also a weekly imaging meeting to discuss the cardiac imaging which directs treatment pathways in various patient groups.

The revascularisation MDT occurs twice weekly and discusses high risk patients. Review of the process has shown an increasing proportion of patients being recommended for medical treatment rather than surgery or PCI. The other MDTs convene weekly or fortnightly and review the appropriate strategy for elderly patients with aortic valve disease, aortic aneurysm and patients with mitral valve disease.

## Reflective practice and incident reporting.

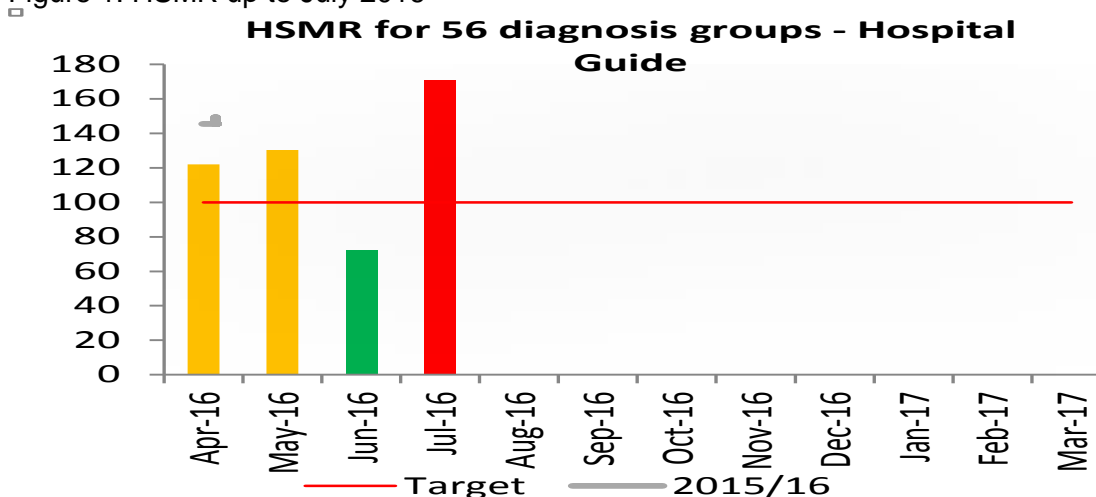
Whilst the MRG process focuses on deaths, errors resulting in less significant harm can also provide a learning opportunity. Twice a year each consultant is required to present their reflection of a case that they learned from at the audit meetings

These presentations have been very open, honest and informative and allowed an open, challenging culture in the clinical body that can only serve to benefit organisational learning. All Serious Untoward Events are presented and discussed at audit days, along with critical incident reviews from the operating theatre environment.

## 5. Review of HSMR variation

HSMR for 56 diagnosis groups (supplied from Dr Foster - Hospital Guide) highlighted as above 150 at 171.08 with statistical significance for July 2016 and rated red [see Figure 1]; although still rated as amber for the year to date position at 123.93.

Figure 1: HSMR up to July 2016

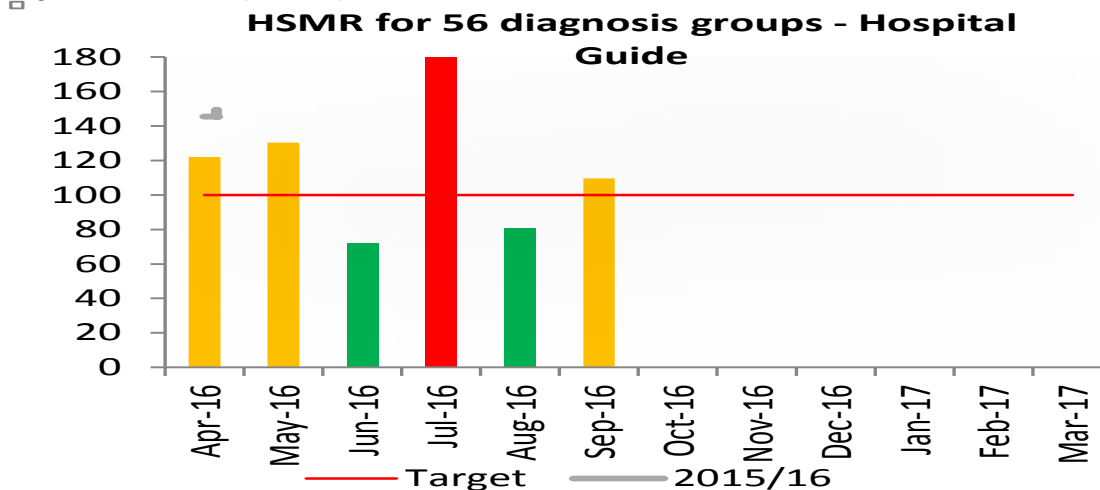


## Findings

In July 2016, there were 21 in-hospital deaths. Of these 20 have been through the mortality review group. None were reported to the coroner. There were no recurring themes drawn out of the reviews.

The latest intelligence from Dr Foster (received 4<sup>th</sup> January 2017) indicates that the red rating in July 2016 has returned back to normal levels with August 2016 below 100 and September just over 100 but not statistically significant [see Figure 2].

Figure 2: HSMR up to September 2016



In the absence of a recurring theme that the statistically significant finding was for one isolated month in July 2016, the intelligence would suggest that this occurrence is isolated and not systemic.

The range of mortality indicators available within the Trust should be continued to be monitored on a monthly basis with accompanying mortality reviews to ensure no recurring themes or systemic issues arise.

## 6. Conclusion

The Trust has a comprehensive multi-faceted strategy in place to manage the factors that contribute to mortality. Progress has been made in many areas and the clinical teams are focusing on those areas with less acceptable performance. The Trust is treating older, sicker patients with multiple co-morbidities and maintaining the lowest possible mortality rate will continue to be a significant challenge and hence focus for attention.

All areas of performance have been enhanced over the last year and there are plans for wider organisational learning and implementation of a new MRG process. Continued work will be undertaken in sepsis, VTE management and prevention of MSSA bacteraemias which are almost exclusively in post-operative patients.

## 7. Recommendation

The Board is asked to note the current position with regards mortality and take assurance from the ongoing work:-

- Mortality remains below national figures despite the changes in population demographics and acuity
- There is a new mortality reduction strategy to make further improvements
- Robust performance management of outliers

- There is no effect of differential waiting times on waiting list mortality
- A robust approach to organisational learning
- Revision of the MRG process as per national guidelines with clear actions on possibly preventable deaths
- Regular MDT meetings across the whole range of patients according the most appropriate management
- Contributory factors such as sepsis control, VTE prophylaxis and reduction in wound infections are under close scrutiny