# NICOR REPORT ON LEEDS GENERAL INFIRMARY DATA ANALYSIS IN THE NATIONAL CONGENITAL HEART DISEASE AUDIT SEPTEMBER 2014

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**REPORT ON LEEDS GENERAL INFIRMARY DATA ANALYSIS IN THE**

**NATIONAL CONGENITAL HEART DISEASE AUDIT**

## 1. Introduction

NICOR's mission is to provide accurate data on cardiovascular outcomes for the public, healthcare providers and the medical profession. NICOR continues to be committed in all its registries to provide appropriately analysed, accurate outcome data in a timely manner which is understandable by the public, health care providers and the medical profession.

NICOR hosts the National Congenital Heart Disease Audit which has been reporting adjusted outcomes for procedures for over a decade.

As part of routine annual analysis and reporting procedures, Leeds General Infirmary (LGI) was identified as having a survival rate significantly lower than predicted (96.5% actual vs 97.8% predicted) for 2010-2013. However, further analysis of more contemporaneous data (data submitted by LGI for 2013-2014) and subsequent analysis requested by Professor Sir Bruce Keogh, NHS Medical Director (centre aggregated analysis for 2011-2014, 2012-2014 and 2009-2014 (5 year trend)) show that LGI has survival rates within the expected limits in all these other instances. In addition, LGI data quality has improved since 2009.

## 2. Methods

The results were based on all 30-day survival and were verified by LGI and by Office for National Statistics (ONS)/Data Linkage Extraction Service (DLES) tracking.

All centre aggregated analysis was conducted using the Partial Risk Adjustment in Surgery (PRAiS) software (version 2.2) for risk adjustment[1].

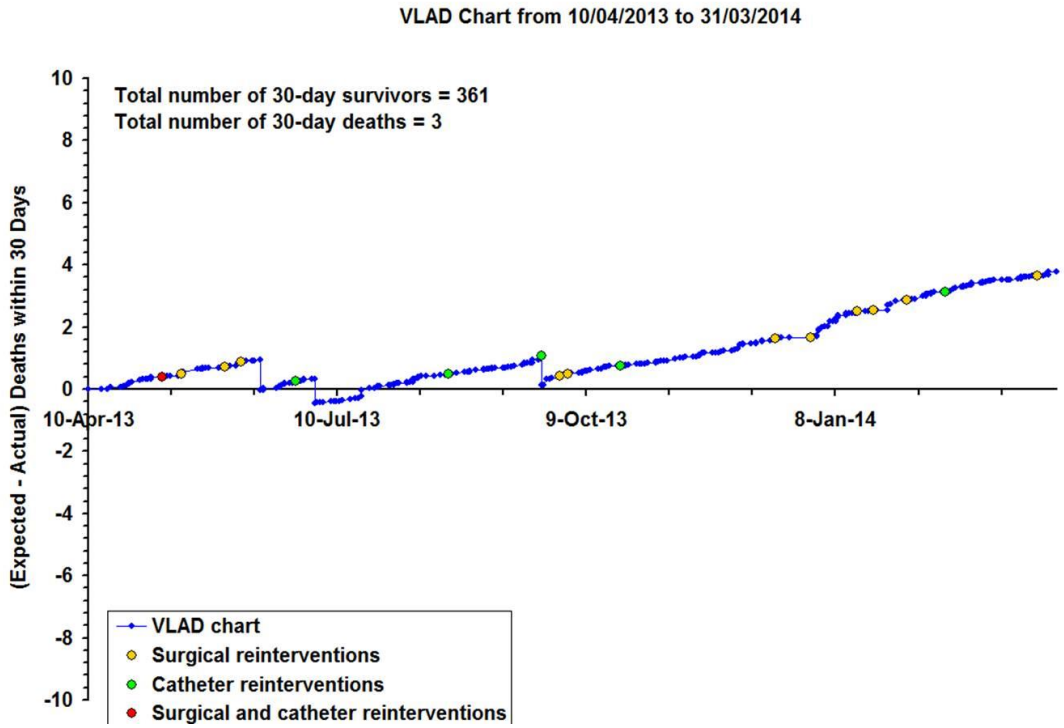
All analyses are conducted by financial year (April 1st to March 31st). All analyses reported including 2013-2014 financial year data was conducted on data submitted to NICOR by LGI. A data validation visit (Section 4) was performed on 3rd September 2014. Publication of all congenital 2013-2014 data is planned for early 2015.

## 3. Results

### a. LGI centre analysis: 2013-2014

Figure I shows the Variable Life Adjustment Display (VLAD)[2] 30-day survival plot for 2013-2014. Survival was as predicted (actual survival 99.2% v predicted survival 98.1%).

Figure I: LGI VLAD plot for 2013-2014




NB: There were no procedures between 01.04.13 and 10.04.13

### b. LGI centre analysis: 2009-2014

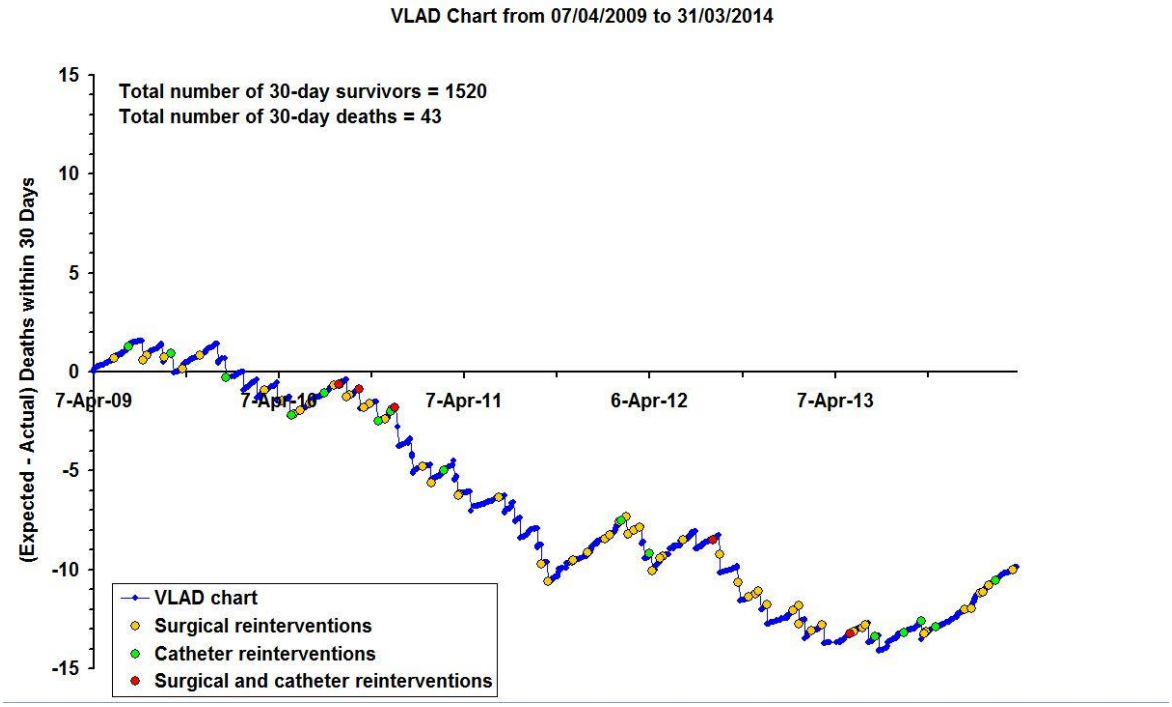
Additional aggregate analysis including 2013-2014 data showed that survival was as predicted in all instances (Table I). Figure II shows the VLAD plots for the data period 2009-2014, Figure III shows the VLAD plot for the data period 2011-2014 and Figure IV shows the VLAD plot for the data period 2012-2014.

Table I: LGI Actual and Predicted Survival

Summary compared to binomial predicted two-sided control limits at 95% and 99.8%

| Period | Surgical Episodes | Actual Survival | Predicted Survival | Summary |
|---|---|---|---|---|
| 2009-2014 (5 years) | 1563 | 97.3% | 97.9% | survival as predicted |
| 2011-2014 (3 years) | 980 | 97.6% | 97.9% | survival as predicted |
| 2012-2014 (2 years) | 685 | 98.0% | 98.0% | survival as predicted |
| 2013-2014 (1 year) | 364 | 99.2% | 98.1% | survival as predicted |

Figure II: LGI VLAD plot for 2009-2014




NB: There were no procedures conducted between 01.04.09 and 07.04.09

Figure III: LGI VLAD plot for 2011-2014

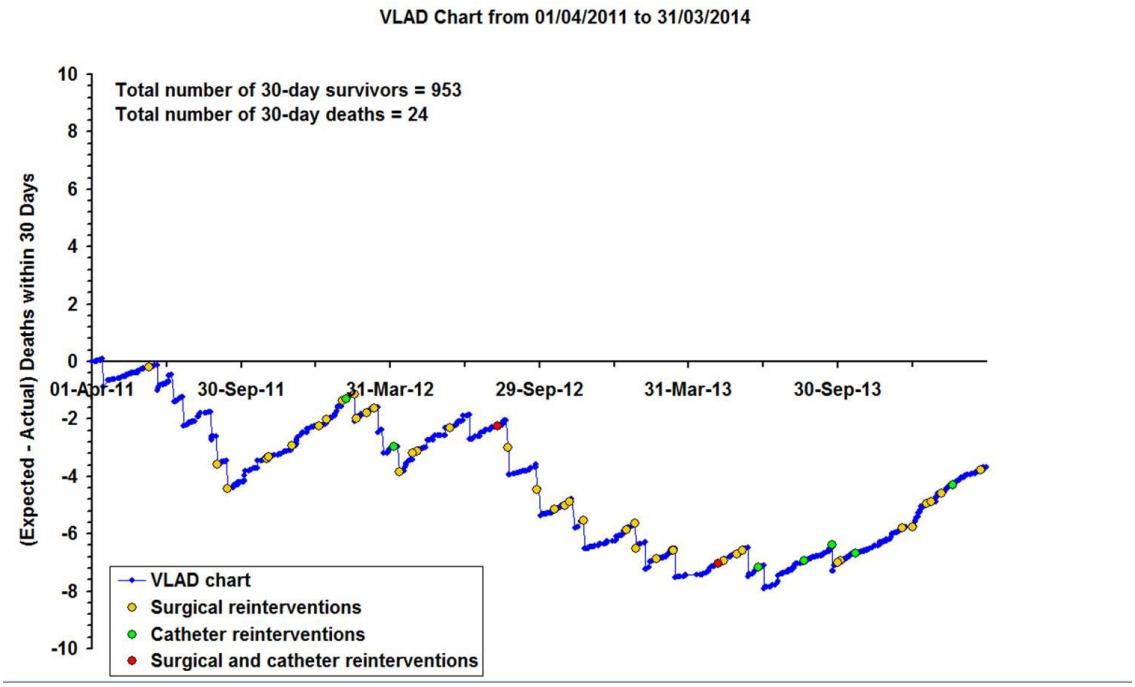
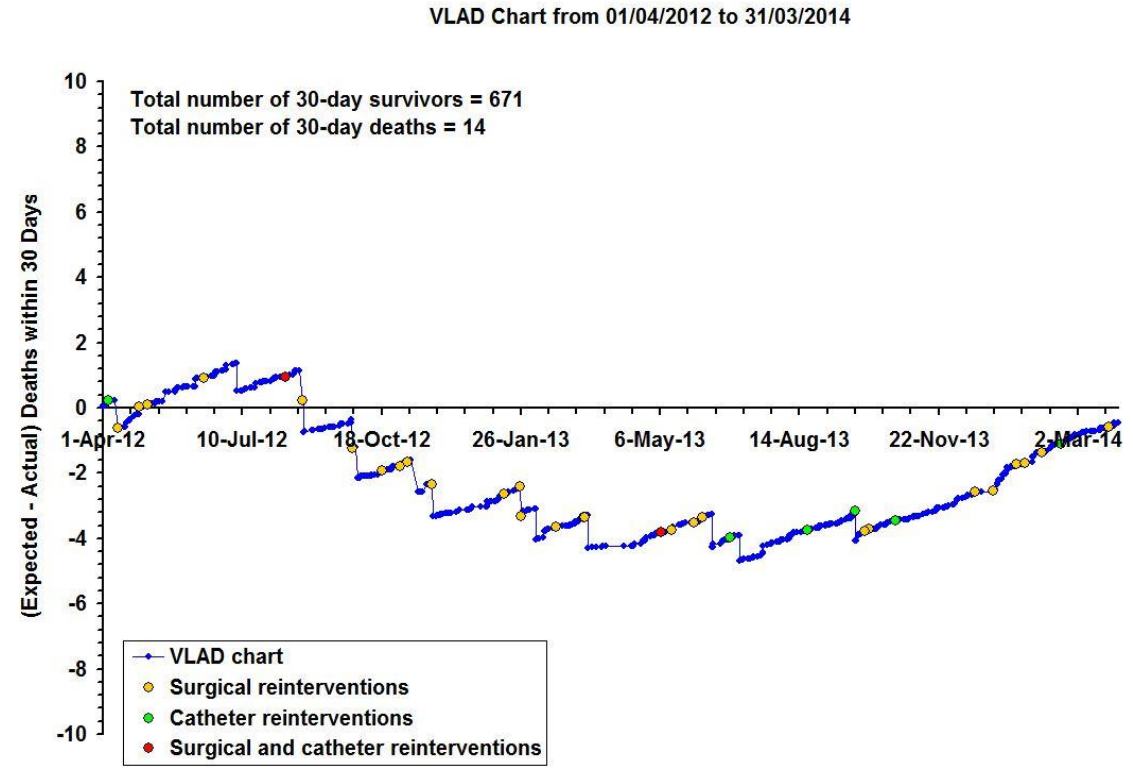



Figure IV: LGI VLAD plot for 2012-2014.



## 4. Data quality

Data is validated through data validation visits and death validation procedures. In brief, all centres who submit ten or more cases (therapeutic surgery and/or catheter procedures) to the National Congenital Heart Disease Audit qualify for a validation visit. The hospital records of 20 patients whose data have been submitted are randomly selected to be reviewed. The data that the centre submitted to NICOR for these 20 patients is then checked against their hospital notes. As part of the feedback to the site, the site receives a quality score (called the Data Quality Indicator) on the case note validation.

The data quality indicator (DQI) is a measure of the accuracy and completeness of data entry (across four domains: demographics, pre-procedure, procedure and outcome) into the NICOR outcomes software when comparing to actual patient records during a site validation visit. Typically, NICOR would expect the DQI to be greater than 90%. As shown in Table II, data quality has increased considerably since 2009 for surgery and overall at LGI, and remaining consistently high for catheter procedures.

Table II: DQI at LGI between 2009 and 2013.

| | Data Year Validated | Overall DQI | Surgery DQI | Catheter DQI |
|---|---|---|---|---|
| **2009** | 07/08 | 91.75% | 88.25% | 96.25% |
| **2010(i)** | 08/09 | 91.25% | 84.0% | 96.0% |
| **2010(ii)** | 09/10 | 92.5% | 88% | 98.75% |
| **2012** | 10/11 | 95.25% | 95% | 96.25% |
| **2013** | 11/12 | 93.5% | 92% | 95.75% |
| **2013(ii)** | 12/13 | 94.75% | 94.25% | 96% |
| **2014** | 13/14 | 96.75% | 95.25% | 99% |

## 5. LGI response

LGI were notified of their centre-aggregated analysis outlier status for 2010-2013 data and provided a written response which can be found at
https://nicor5.nicor.org.uk/CHD/an_paeds.nsf/vwContent/home?Opendocument

LGI were asked on 20.07.14 to verify the death data. Two congenital heart doctors stated independently that they agreed NICOR's centre aggregated analysis for their hospital.

## 6. Reducing timelines for NICOR reporting

NICOR are committed to decreasing the time from data close to data reporting and by 2015 aim to be reporting data within 6 months of data close (data close is 3 months from the end of the financial year):

| Data year | Publication date | Data validation visits | Number of months from data close to publication |
|---|---|---|---|
| 2012-2013 | September 2014 | Completed 9 months earlier than in previous years | 16 |
| 2013-2014 | March 2015 | Data validation visits only occurred in paediatric centres and high volume adult centres (no visits to other low volume adult congenital centres) and will completed by November 2014 (4 months from data close). The draft report will be submitted to HQIP in January 2015. | 9 |
| 2014-2015 | December 2015 | Data validation processes are currently being reviewed so reporting can occur within 6 months of data close. | 6 |

There are factors outside of NICOR control that will influence NICOR's ability to deliver this.

1. ***Healthcare Quality Improvement Partnership***: The National Congenital Heart Disease Audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). NICOR are therefore contractually required to follow HQIP processes. Currently, the time required for the outlier process to be followed and completed is unknown, as the new policy is being drafted. Additionally, HQIP require draft reports two months prior to publication for review.

2. ***Health and Social Care Information Centre (HSCIC):*** NICOR is dependent on timely and receipt of mortality data from the HSCIC. This has been highly problematic in 2014. For the congenital audit, no mortality data was received between November 2013 and July 2014.

## 7. Conclusions

Centre aggregated data analysis and analysis for arterial switch operation for isolated transposition of the great arteries showed LGI had a survival rate significantly lower than predicted for 2010-2013, at

the warning level. LGI have had a number of external reviews of the service including a review of all deaths in the 2010-2013 period. This report was published on 13th March 2014 (www.nhsengland.org/congenitlaheartdisease). Further analysis of 2013-2014 data shows that LGI survival is now within expected limits. NHS England are aware of these results.

NICOR is committed to producing more timely reports. Although dependent on HSCIC and HQIP timelines and delivery, NICOR aims to provide 2013-2014 in March 2015 (6 months sooner than the 2012-2013 data and within 9 months of data close) and 2014-2015 data in December 2015 (within 6 months of data close).

## 8. References


1. Crowe S, Brown KL, Pagel C, Muthialu N, Cunningham D, Gibbs J, Franklin RC, Utley M, Tsang VT. Development of a diagnosis- and procedure-based risk model for 30 day outcome after pediatric surgery. J Thorac Cardiovasc Surg 2013. 145 (5): 1270-1278.
2. Pagel C, Utley M, Crowe S, Witter T, Anderson D, Samson R, McLean A, Banks V, Tsang V, Brown K. Real time monitoring of risk-adjusted paediatric cardiac surgery outcomes using variable life-adjusted display: Implementation in three UK centres. Heart 2013. 99: 1445-1450.