Oxford Radcliffe Hospitals NHS
NHS Trust

Board of Directors Meeting: Thursday 29 January 2009

BD2009.16

Subject	Cardiothoracic Surgical Services: Report on adult outcomes 2007/2008

Purpose of paper	The Trust Board needs assurance that cardiac outcomes are closely monitored and that action is taken wherever necessary. Regular monitoring of clinical performance and outcomes generated by accurate, timely and validated data is an essential part of managing risks to high quality care and patient safety. This presentation is part of regular briefing to the Board and other stakeholders of the continued quality of the services provided within cardiothoracic surgery.
Board Lead(s)	Mrs Elaine Strachan-Hall, Director of Nursing and Clinical Leadership
Background papers (if any)	HCC Investigation Report into adult cardiothoracic surgical services March 2007 HCC Follow up report October 2008

Action/decision required	The Trust Board is asked to note the outcomes report and to recommend its presentation to the SHA Board at its meeting in March 2009 in support of its consideration of the final sign off for the HCC Action Plan on cardiothoracic surgical services.			
Key purpose	Strategy	<u>Assurance</u>	Policy	Performance
Strategic Goal(s)	All			
Strategic Objective(s)	SO1 - To consolidate and advance the international status of the Trust's defining services. SO6 - To provide demonstrably excellent clinical outcomes and indicators of patient safety			
Links to Board Assurance Framework/ Trust Key Risks/Annual Health Check element(s)	S4BH: C7ac – good corporate and clinical governance in place			
Also considered by	Governance Committee			

Resource and financial impact	Not applicable
Consideration of legal/equality/diversity/engagement issues	Not applicable
Acronyms and abbreviations used	
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Cardiothoracic surgical services: report on outcomes

Introduction

1. This report presents the data for outcomes for primary (first time) CABG, primary AVR and for all cardiac surgery for the years 2007/2008 and follows the pattern of Report TB2007 47 considered by the Trust Board in July 2007.

2. The service continues to monitor data via its own computerised database. The data are presented at the monthly M & M meetings, where additional monthly outcome analysis based on the database is presented by Dr. Brian Shine.

3. In responding to the HCC's investigation, the Trust has paid particular attention to the scrutiny of performance and to the accuracy of the data. The surgical staff are actively involved in the validation of the data and in the scrutiny of performance through both audit and M&M meetings. Data completion in terms of activity, mortality and the Euroscore data fields was consistently 100% by April 2008. A selective sample of these data is validated regularly. The service set a new target of 100% completion of the postoperative morbidity data by April 2009. This has already been achieved by the surgical service by August 2008.

4. The John Radcliffe data for 2007/2008 was exported to CCAD ahead of the deadline, and the unit awaits the CCAD analysis for this period.

5. The data are collated and combined on monthly, quarterly and annual bases. This report presents activity and outcomes data for 2007/2008 and provides data for 2005/2006 and 2006/2007 for comparative purposes. Annual reports from CCAD are produced much later on in the year as datasets need to be complete from all other cardiac centres and other sources of data. As soon as the relevant national data are available, the performance of the ORH will be reviewed against these benchmarks.

The outcome data

6. The outcomes for primary CABG, primary AVR and all cardiac surgery are presented by unit and by surgeon for 2007/2008.

   6.1. Mr. R. Sayeed took up his consultant post on 1st April 2007.

   6.2. The data refer to activity and in-hospital mortality (the measure used by the Society for Cardiothoracic Surgery in Great Britain and Ireland) for the various groups.

   6.3. In addition to the mortality, the survival and mean Logistic Euroscore of the relevant population is included. The Logistic Euroscore can be assumed to represent the predicted or expected mortality for the relevant group.

   6.4. The high risk patients are divided into two groups: (1) high risk with a Logistic

Euroscore between 10 and 20 and (2) very high risk with a Logistic Euroscore >20.

Cardiac Surgery: adult case mix

7. The adult case mix has been divided according to acquired and congenital adult cardiac surgery.

CASE MIX	Adult Acquired			Adult Congenital			Acquired	Congenital
	2007/2008	2007/2006	2006/2005	2007/2008	2007/2006	2006/2005	TOTAL	TOTAL
C RATNATUNGA	212	250	233		1	3	**695**	**4**
D TAGGART	173	222	240				**635**	
I KADIR			74				**74**	
R PILLAI	167	196	191	5	5	11	**554**	**21**
R SAYEED	171						**171**	**0**
S WESTABY	89	159	129	18	13	19	**377**	**50**
TOTAL	812	827	867	23	19	33	**2506**	**75**

Logistic euroSCORE (European System for Cardiac Operative Risk Evaluation) is now the formal scoring system to assess the risk of dying after a heart operation in the UK as used by the Healthcare Commission and the Society of Cardiothoracic Surgery

Primary CABG

8. This shows the survival and mortality following primary CABG for three years 2007/2008, 2006/2007 and 2005/2006. For 2007/2008 the unit mortality was 2.2% which is less than half the unit's mean Logistic Euroscore 4.6. All individual surgeons had mortalities less than their Logistic Euroscores.

2007/08	Primary CABG	Mortality in JR	Mortality %	Survival %	Predicted Mortality %
C RATNATUNGA	95	5	5.26	94.74	5.97
D TAGGART	139	0	0.00	100.00	4.08
R PILLAI	69	3	4.35	95.65	5.76
R SAYEED	114	2	1.75	98.25	3.18
S WESTABY	29	0	0.00	100.00	6.02
TOTAL	446	10	2.24	97.76	4.64
2006/07	**Primary CABG**	**Mortality in JR**	**Mortality %**	**Survival %**	**Predicted Mortality %**
C RATNATUNGA	147	3	2.04	97.96	5.48
D TAGGART	160	5	3.13	96.88	4.45
R PILLAI	100	2	2.00	98.00	5.46
S WESTABY	53	1	1.89	98.11	3.15
TOTAL	**460**	**11**	**2.39**	**97.61**	**4.84**
2005/06	**Primary CABG**	**Mortality in JR**	**Mortality %**	**Survival %**	**Predicted Mortality %**
C RATNATUNGA	159	3	1.89	98.11	4.72
D TAGGART	181	1	0.55	99.45	4.00
I KADIR	58	0	0.00	100.00	6.71
R PILLAI	123	3	2.44	97.56	3.52
S WESTABY	57	1	1.75	98.25	5.38
TOTAL	**578**	**8**	**1.38**	**98.62**	**4.50**

Primary AVR

9. This table gives the survival and mortality results for primary AVR for 2007/2008, 2006/2007 and 2005/2006. The numbers are smaller than for primary CABG. The unit mortality was 3.3% for 2007/2008 which is less than half the unit's mean Logistic Euroscore, 7.4. All individual surgeons have mortalities for 2007/2208, which are less than the Logistic Euroscore for their own populations.

2007/08	Primary AVR	Mortality in JR	Mortality %	Survival %	Predicted Mortality %
C RATNATUNGA	33	0	0.00	100.00	6.41
D TAGGART	21	1	4.76	95.24	7.05
R PILLAI	24	1	4.17	95.83	8.94
R SAYEED	20	1	5.00	95.00	6.04
S WESTABY	25	1	4.00	96.00	8.43
TOTAL	123	4	3.25	96.75	7.36
2006/07	**Primary AVR**	**Mortality in JR**	**Mortality %**	**Survival %**	**Predicted Mortality %**
C RATNATUNGA	27	0	0.00	100.00	10.24
D TAGGART	27	1	3.70	96.30	10.78
R PILLAI	29	2	6.90	93.10	7.73
S WESTABY	32	1	3.13	96.88	7.60
TOTAL	**115**	**4**	**3.48**	**96.52**	**9.00**
2005/06	**Primary AVR**	**Mortality in JR**	**Mortality %**	**Survival %**	**Predicted Mortality %**
C RATNATUNGA	35	0	0.00	100.00	5.79
D TAGGART	24	0	0.00	100.00	5.38
I KADIR	3	0	0.00	100.00	8.09
R PILLAI	29	1	3.45	96.55	6.91
S WESTABY	32	1	3.13	96.88	6.84
TOTAL	**122**	**2**	**1.64**	**98.36**	**6.36**

All cardiac surgery

10. The in-patient mortality for the unit was 4.6% which was less than the predicted Logistic Euroscore of 7.8. All surgeons' mortalities for all cardiac surgery are less than the Logistic Euroscore of their own populations for 2007/2008.

2007/2008	All Adult Primary Surgery	Mortality in JR	Mortality %	Survival %	Predicted Mortality Log Euro
C RATNATUNGA	204	11	5.4	94.6	9.3
D TAGGART	198	6	3.0	97.0	5.8
R PILLAI	193	9	4.7	95.3	8.3
R SAYEED	179	7	3.9	96.1	5.7
S WESTABY	113	8	7.1	92.9	11.3
TOTAL	**887**	**41**	**4.6**	**95.47**	**7.8**

High Risk

11. This table gives the mortality for patients with a Logistic Euroscore of 10-20 and >20 for 2007/2008, 2006/2007 and 2005/2006. The numbers of high risk and very high risk remain stable despite a lower denominator. The unit had a mortality of 9.1% for high risk and 27.1% for very high risk, both of which were less than the predicted Logistic Euroscore.

High risk (10-20%)

2007/08	Log Euro 10 to 20	Mortality in JR	Mortality %	Survival %	Predicted Mortality %
C RATNATUNGA	24	2	8.33	91.67	13.81
D TAGGART	19	2	10.53	89.47	13.24
R PILLAI	26	2	7.69	92.31	14.08
R SAYEED	12	1	8.33	91.67	13.72
S WESTABY	18	2	11.11	88.89	14.24
TOTAL	**99**	**9**	**9.09**	**90.91**	**13.84**
2006/07	**Log Euro 10 to 20**	**Mortality in JR**	**Mortality %**	**Survival %**	**Predicted Mortality %**
C RATNATUNGA	24	2	8.33	91.67	14.42
D TAGGART	16	2	12.50	87.50	13.67
R PILLAI	23	1	4.35	95.65	13.75
S WESTABY	17	2	11.76	88.24	12.95
TOTAL	**80**	**7**	**8.75**	**91.25**	**13.77**
2005/06	**Log Euro 10 to 20**	**Mortality in JR**	**Mortality %**	**Survival %**	**Predicted Mortality %**
C RATNATUNGA	24	5	20.83	79.17	13.28
D TAGGART	18	2	11.11	88.89	13.04
I KADIR	14	2	14.29	85.71	13.10
R PILLAI	26	3	11.54	88.46	14.72
S WESTABY	22	1	4.55	95.45	13.43
TOTAL	**104**	**13**	**12.50**	**87.50**	**13.56**

Very High Risk

2007/08	Log Euro > 20	Mortality in JR	Mortality %	Survival %	Predicted Mortality %
C RATNATUNGA	22	2	9.09	90.91	41.56
D TAGGART	7	2	28.57	71.43	45.01
R PILLAI	16	6	37.50	62.50	33.03
R SAYEED	8	4	50.00	50.00	41.01
S WESTABY	17	5	29.41	70.59	39.20
TOTAL	**70**	**19**	**27.14**	**72.86**	**39.32**
2006/07	**Log Euro > 20**	**Mortality in JR**	**Mortality %**	**Survival %**	**Predicted Mortality %**
C RATNATUNGA	26	5	19.23	80.77	49.31
D TAGGART	19	2	10.53	89.47	35.89
R PILLAI	16	5	31.25	68.75	37.65
S WESTABY	11	1	9.09	90.91	31.11
TOTAL	**72**	**13**	**18.06**	**81.94**	**39.77**
2005/06	**Log Euro > 20**	**Mortality in JR**	**Mortality %**	**Survival %**	**Predicted Mortality %**
C RATNATUNGA	20	7	35.00	65.00	36.16
D TAGGART	9	1	11.11	88.89	40.50
I KADIR	6	0	0.00	100.00	35.37
R PILLAI	13	2	15.38	84.62	40.32
S WESTABY	24	8	33.33	66.67	47.48
TOTAL	**72**	**18**	**25.00**	**75.00**	**41.16**

Dr. Foster

12. There were no alarm bells for in-patient mortality of primary CABG for the period 2007/2008.

Plots

The VLAD Plot

13. This represents a VLAD and runs from 2001/2002. The last completed annual data set is 2007/2008. Figure 1 illustrates that since 2001/2002 the unit has consistently lost fewer (or gained more) lives (68 lives) than predicted for primary CABG and that all individual surgeons have similarly lost fewer (or gained more) lives than predicted.

14. Figure 2 represents the same data for primary AVR. The unit and all surgeons have lost fewer (or gained more) lives than predicted.

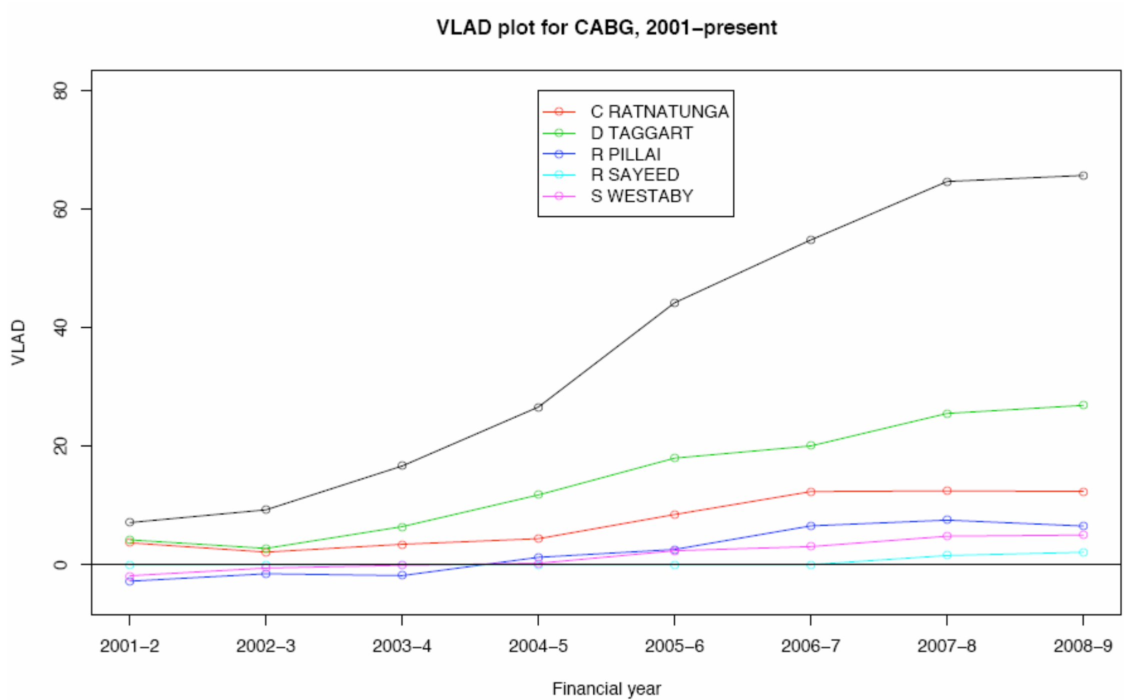

Figure 1 – VLAD plot for primary CABG

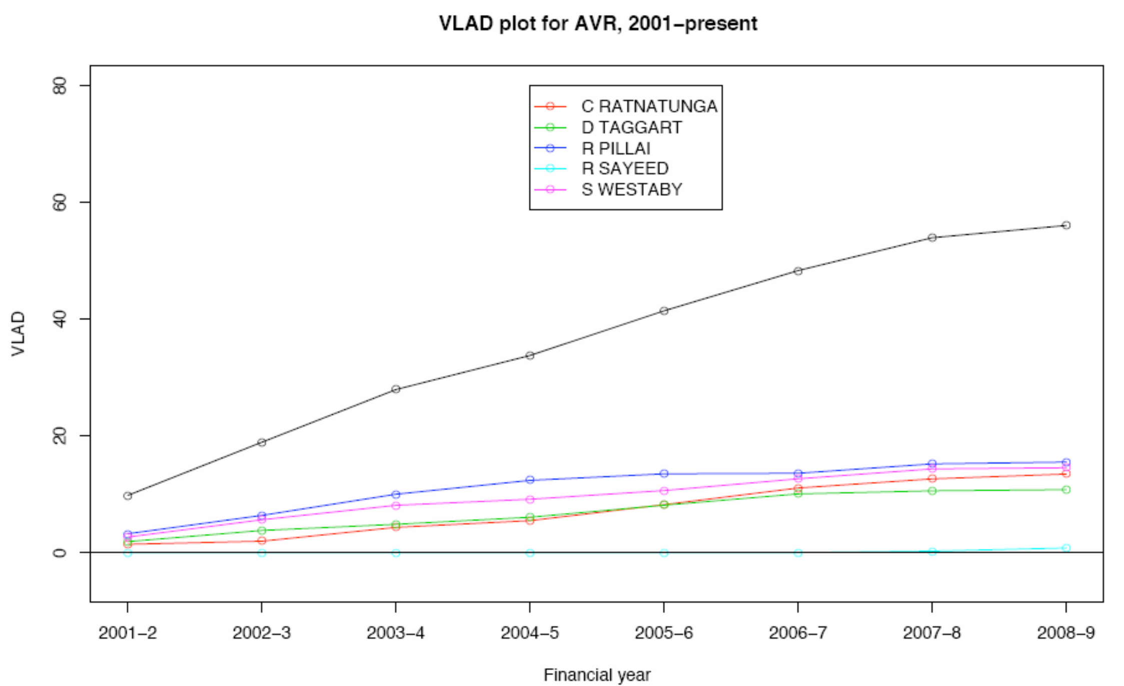

Figure 2 – VLAD plot for primary AVR

Funnel plots

15. In a funnel plot the ratio of observed to expected deaths is plotted against expected deaths. If outcomes are as expected, the individual points should cluster around 1. The plot also includes the upper and lower 95% and 99% confidence intervals. The data as for the above VLAD plots are from the year 2001/02 onwards and the most

leftward point is for the incomplete year 2007/08.

16. The unit mortality has always been below predicted and on four occasions better than the 95% lower confidence intervals (Figure 3). Four surgeons (Pillai, Ratnatunga, Taggart and Westaby) have had observed: expected death ratios of >1 for one or more years, but no individual surgeon's outcomes have given cause for concern and all have observed: expected death ratios of less than 1 for all or the majority of years.

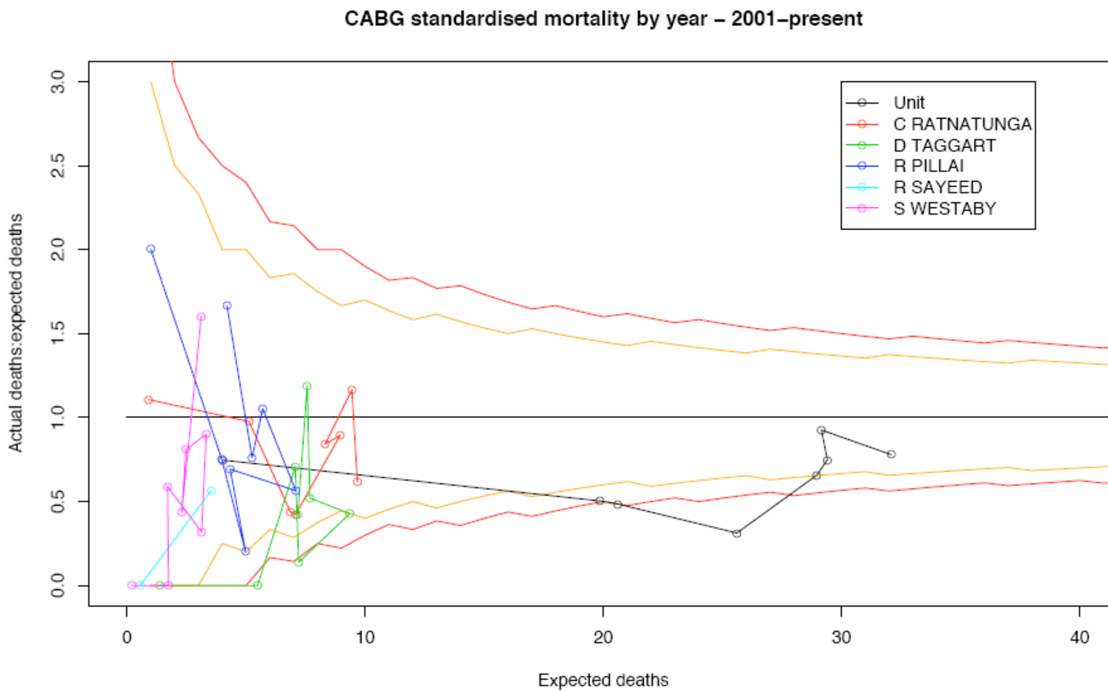

Figure 3 – Funnel Plot for Primary CABG

17. The HCC and Society for Cardiothoracic Surgery are proposing to recalibrate the Logistic Euroscore by halving it. This has had the effect of producing a mortality rate outside the upper 99% confidence level for the unit for 2002/03 one year and outside the upper 95% confidence level for the unit for 2001/02 (Figure 4). The plot demonstrates that similarly three cardiac surgeons (Pillai, Ratnatunga and Taggart) had outcomes outside the upper 95% confidence level for at least one year, but that at all other times their outcomes were within the 95% confidence limits.

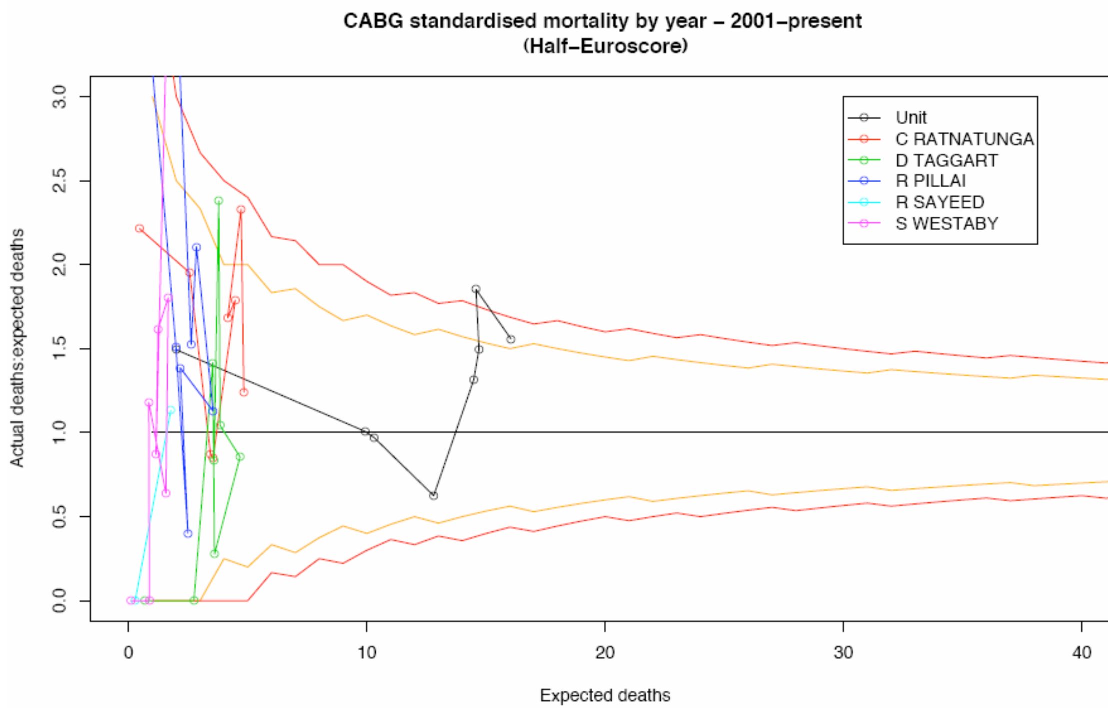

Figure 4 – Funnel Plot for Primary CABG Using Half Logistic Euroscore

18. Finally, the mortality for primary AVR is displayed by the funnel plot in Figure 5. The unit's outcomes were better than the 99% lower confidence interval for 4 out of 7 years. Similarly all individual surgeons have outcomes below the observed: expected death ratio of 1.

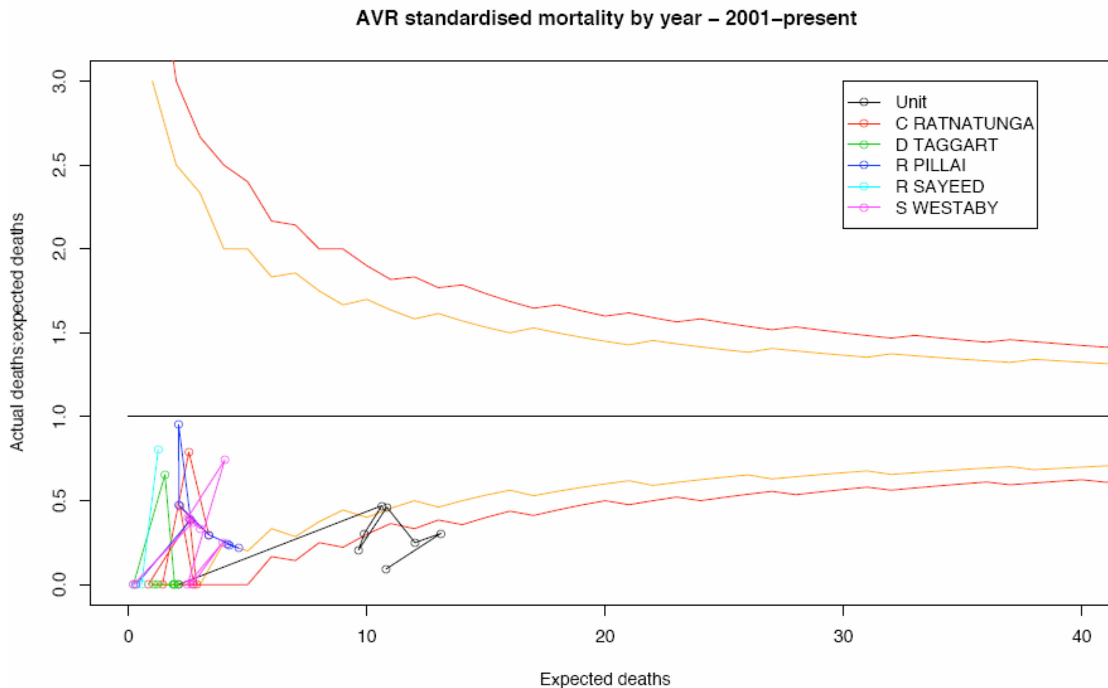

Figure 5 – Funnel Plot for Primary AVR

Conclusions

19. On the basis of the above data for 2007/2008, the unit and all the ORH cardiac surgeons have mortality figures that are better than expected compared to the Logistic Euroscore predicted mortality for primary CABG, primary AVR and all cardiac surgery.

20. The national mortality for CABG is believed to be falling and The Society for Cardiothoracic Surgery of Great Britain and Ireland is looking to introduce a recalibrated Euroscore: work continues to develop methodologies of ensuring risk scoring systems are kept up to date. The current expectation for CABG is that it will be Logistic Euroscore for the HCC Website and half (50%) Logistic Euroscore for Society monitoring. For 2007/2008 Ratnatunga and Pillai had observed mortalities that were 89% and 76% of Logistic Euroscore respectively. Sayeed's observed mortality was 56% of Logistic Euroscore. Taggart and Westaby had observed moralities less than half Logistic Euroscore.

21. ORH mortality rate for primary AVR, the other most common operation for acquired adult heart disease for 2007/08, is lower than the predicted mortality and has been so for a number of years, as information provided through CCAD and by the ORH to the Healthcare Commission showed. This finding is important as there is unlikely to be a clinical systematic explanation for high mortality for one procedure and not for the other.

22. The data presented include mortality as in-patients in the John Radcliffe; the data are accurate, having been validated rigorously by clinical and information management staff. Thirty-day mortality (another measure) is not presented here. The difference is likely to be small.

23. Direct comparison of unit's results within the UK should be viewed with the understanding that this assumes that the distribution of pre-operative risk predictors is uniform across the UK and that the risk scoring system is a perfect predictor of the risk of mortality. Predicted models, however, are only models and can never be completely accurate.

24. There has been no recommendation as yet to recalibrate the Logistic Euroscore for AVR mortality, although it is likely that this will be introduced in due course (probably at 30% of Logistic Euroscore prediction).

25. Of the Unit's cardiac surgical workload 21% of patients were high or very high risk with a predicted mortality of at least 10%. The unit's mortality for high risk and very high risk patients is comfortably within the Logistic Euroscore predictions for 2007/2008. The numbers of patients and deaths for individual surgeons are small and so the confidence limits are extremely wide.

26. The VLAD and funnel plots enable real time monitoring of unit and surgeons outcomes. The unit has recently introduced the concept of using VLAD and funnel

plots over a rolling period of twelve months to enable early detection of trends in outcomes. The Service now also monitors Dr. Foster alarm bells for cardiac surgery monthly using it as an additional source of information.

27. The scrutiny of the Governance Committee of the data for cardiac surgical outcomes for the two key benchmark procedures, CABG and AVR, has been very helpful and regular reports are made throughout the year. In addition, the data will continue to be analysed within the cardiothoracic surgical service and discussed regularly using meetings such as the monthly Morbidity and Mortality (M&M) meetings; updates will be provided through the Division and Directorate governance structures, ensuring rigorous local monitoring of activity and outcomes.

28. The Governance Committee noted that the M&M meetings review all deaths taking place in the previous month to ensure that any necessary actions are taken, and review all high risk patients (as indicated by the logistic Euroscore), and their care, paying particular attention to ensure that practice continues to be improved.

29. In addition, the quarterly reports on the NSF for coronary heart disease contain significant statistical detail on performance for adult cardiac surgery. The data for both adult and paediatric surgical activity is submitted to CCAD. These reports will be made available to the Governance Committee.

Recommendation

30. The Trust Board is asked to:

    30.1 note the above outcomes and the ongoing scrutiny of outcomes and activity

    30.1 to recommend presentation of the report to the SHA Board meeting in March 2009.

Chandi Ratnatunga
Clinical Director