

LOTHIAN NHS BOARD

Board Meeting
25 March 2009

Director of Public Health & Health Policy

HEALTHCARE ASSOCIATED INFECTION

1 Purpose of the Report

- 1.1 The purpose of this report is to update the Board on progress and actions to reduce Healthcare Associated Infection (HAI) across NHS Lothian. This report follows the SGHD format received in December 2008.

2 Recommendations

- 2.1 The Board is recommended to support the following activities in delivering the agenda to reduce and manage HAI:
- Management of bed occupancy and capacity management to minimise the risk of HAI.
 - Ongoing surveillance of MRSA and MSSA Bacteraemia to target resources for a sustained reduction.
 - Scottish Patient Safety Programme work within Lothian on the development and testing of processes and practice to prevent HAI related to central venous and peripheral cannulae.
 - Completion and submission of surveillance forms by clinicians to infection control.
 - Antimicrobial stewardship to reduce antibiotic associated Clostridium difficile.
 - The ongoing progression of Clostridium difficile reduction programme into other care areas using the Scottish Patient Safety Approach to ensure controlled, monitored and sustainable.
 - NHS Lothian set a stretched target of 40% reduction against the Scottish Government target of 30% reduction in Clostridium difficile rates by 2011.
 - Those achieving a hand hygiene compliance of less than 95% will be required to register this result via DATIX incident reporting system, as this will be considered a 'red' alert, requiring remedial action to be taken. This will include education and an increase in monitoring to weekly until sustained above 95% for 4 consecutive weeks.
 - Incident Management Team for increased MRSA levels in Cardiothoracic Unit RIE.

3 Summary of the Issues

- MRSA Bacteraemia rates decreased to 9 episodes in February 2009 (14 episodes in December 2008 and 14 in January 2009). MSSA Bacteraemia rates increased to 21 episodes in February (29 episodes in December 2009 and 19 in January 2009).
- Early indications for February results are MRSA rates will decrease slightly and MSSA will remain stable at current level.
- Although December and January saw an increase in bacteraemia rates Health Protection Scotland report published January 2009 indicated NHS Lothian had an average reduction in Staphylococcus aureus Bacteraemia of 11.3% per annum since 2005. The increased rate in December and January can possibly be attributed to seasonal changes and higher bed occupancy (99%), as there were an extra 150 beds opened during this period.
- Clostridium difficile rates decreased from 83 in January 2009 to 59 in February 2009.
- Although Clostridium difficile rates rose in December 2008 and January 2009 comparison for the same reporting periods in 2006 and 2007 show rates have reduced. The annual incidence rate in Scotland is 1.29 cases of CDI per 1000 total Occupied Bed Days (OCBDs) – NHS Lothian annual incidence is reported by HPS as below the national average at 1.20 compared to 1.31 in 2007. NHS Lothian is still online, on target and making progress towards achieving the 30% target by 2011.
- NHS Lothian achieved 93% Hand Hygiene Compliance in line with the national average.
- NHS Lothian Cleaning Services is consistently achieving Green Status when reporting the National Monitoring results, averaging 94.7% over the year to date (April 08 to January 09). This is an increase on the 94.5% achieved in the previous reporting period.
- Discharge screening of patients in the cardiothoracic unit has identified an increase in the level of MRSA acquisition above baseline rates. Between the 2nd February and 4th March 2009 nine patients have tested positive for MRSA with 3 requiring antimicrobial therapy.
- Norovirus levels within Scotland began to increase from October. To date, a total of 27 incidents of gastro-enteritis have been investigated in NHS Lothian, with Norovirus confirmed in 17 instances (63%). 10 are unknown but presumed Norovirus on epidemiological grounds.
- Blood stream infections within critical care RIE remain below average. This has been the case in 17 out of the last 19 months. This is both clinically and statistically significant.
- Ventilator Associated Pneumonia rates within critical care RIE are in control and remain below average in January.
- Mandatory surgical site surveillance of indicates rates remain high post discharge for abdominal hysterectomy. Review indicates patients with contributory factors such as high Body Mass Index, Malignancy and Diabetes.

4 HAI Report

4.1 Staph aureus bacteraemias (SAB)

4.1.1 Short, medium and long term trends in SAB, plus MRSA, MSSA bacteraemias

MRSA Bacteraemia rates decreased to 9 episodes in February 2009 (14 episodes in December 2008 and 14 in January 2009). MSSA Bacteraemia rates increased to 21 episodes in February (29 episodes in December 2008 and 19 in January 2009) (Figs 2-5). A review of the increase in Bacteraemia rates indicates this was associated with increased activity rates across NHS Lothian. There were approximately an additional 150 beds opened in December to accommodate the increased demand on the service. Although December and January saw an increase in bacteraemia rates Health Protection Scotland report published January 2009 indicated NHS Lothian had achieved an average reduction of 11.3% per annum since 2005.

Figure 1: NHS Lothian SAB Trajectory

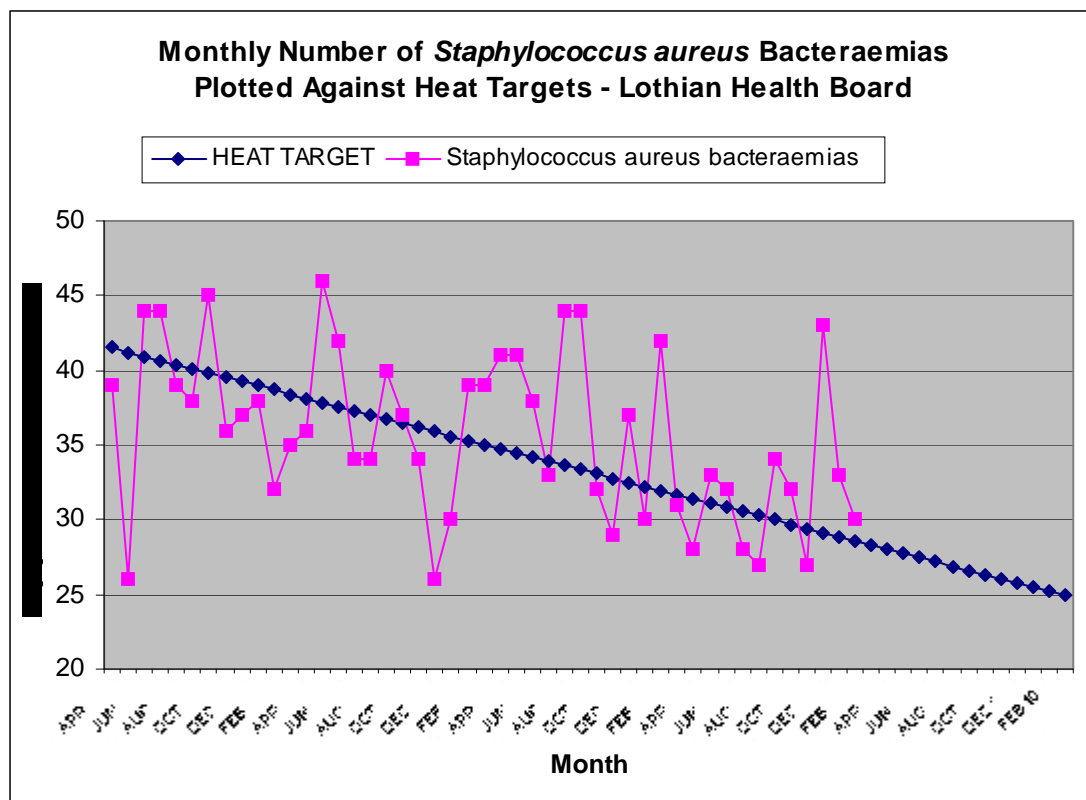


Figure 2: MRSA bacteraemias, Royal Infirmary Edinburgh

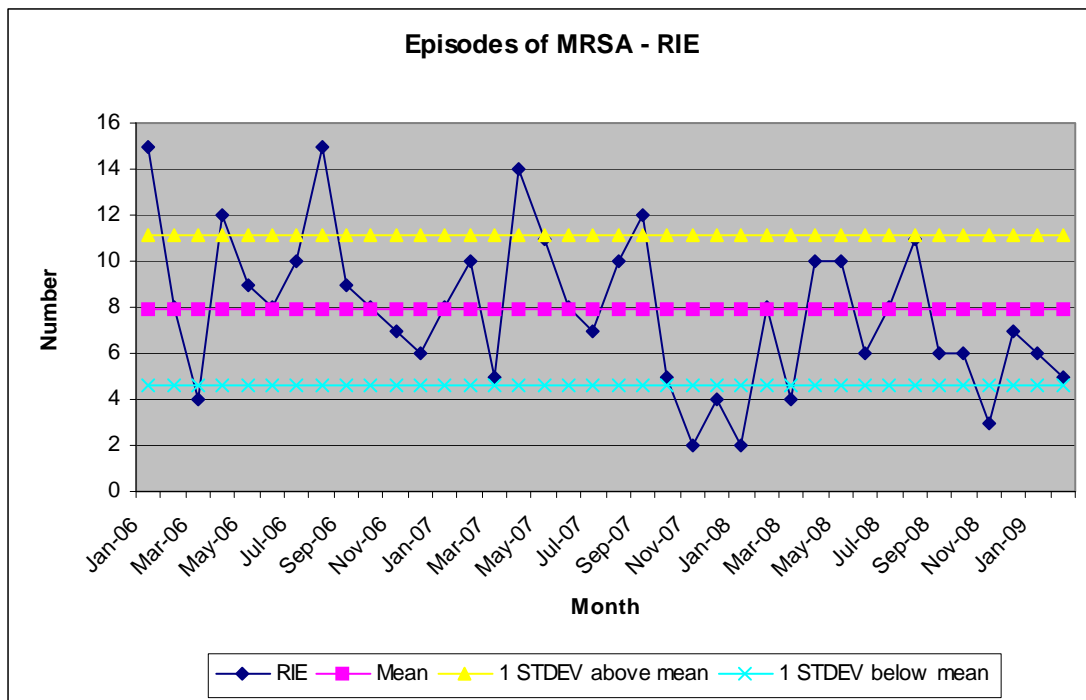


Figure 3: MRSA bacteraemias, Western General Hospital Edinburgh

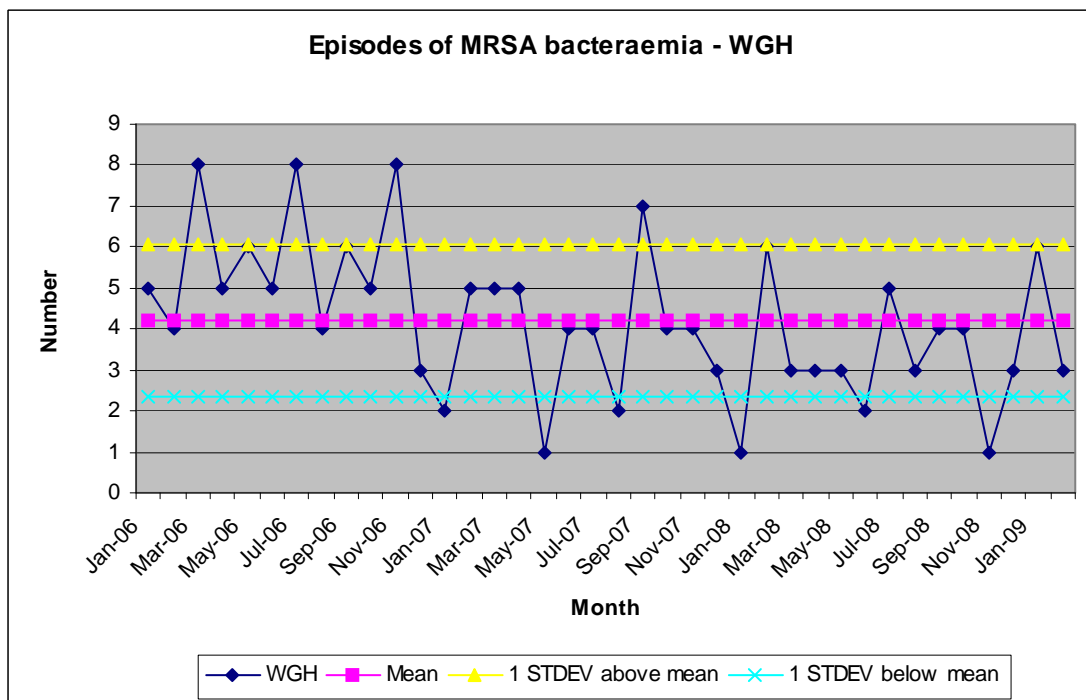


Figure 4: MRSA bacteraemias, St John's Hospital Livingston

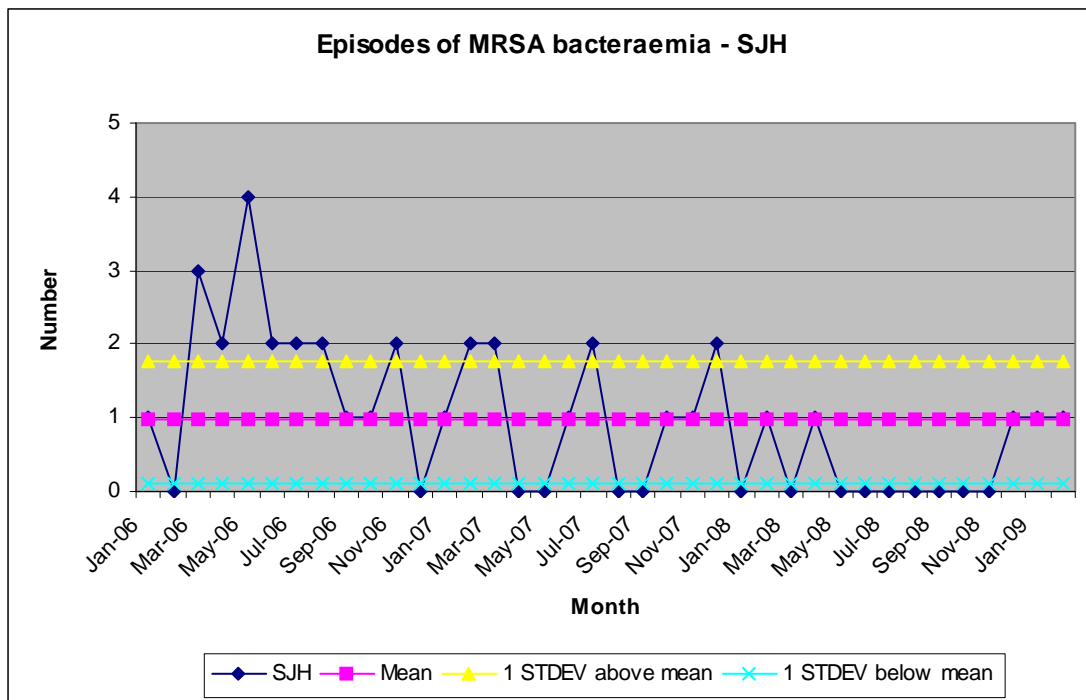
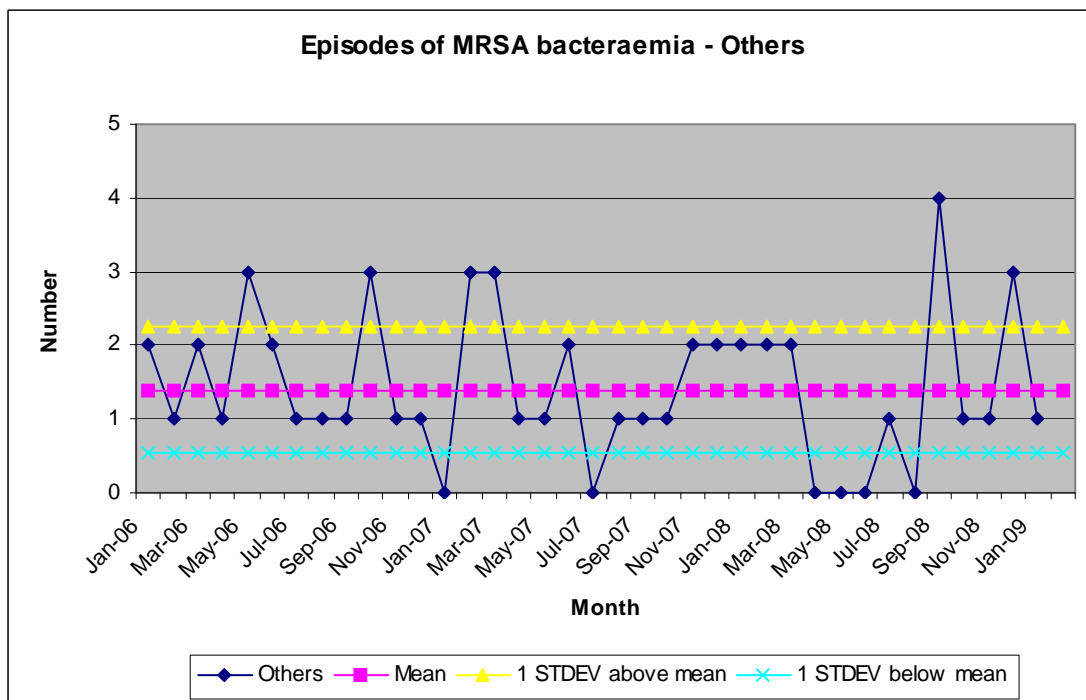


Figure 5: MRSA bacteraemias, others (primary care and non-acute hospitals)



4.1.2 Current HEAT Status

NHS Lothian's HEAT target for SAB reduction is 40% (Fig 1) continue to show some variation. The target for March 2009 (Apr 2008 – Mar 2009) is 349. Between April 2008 and 31st February there have been 340 incidences (Table 1).

Table 1: NHS Lothian HEAT Target

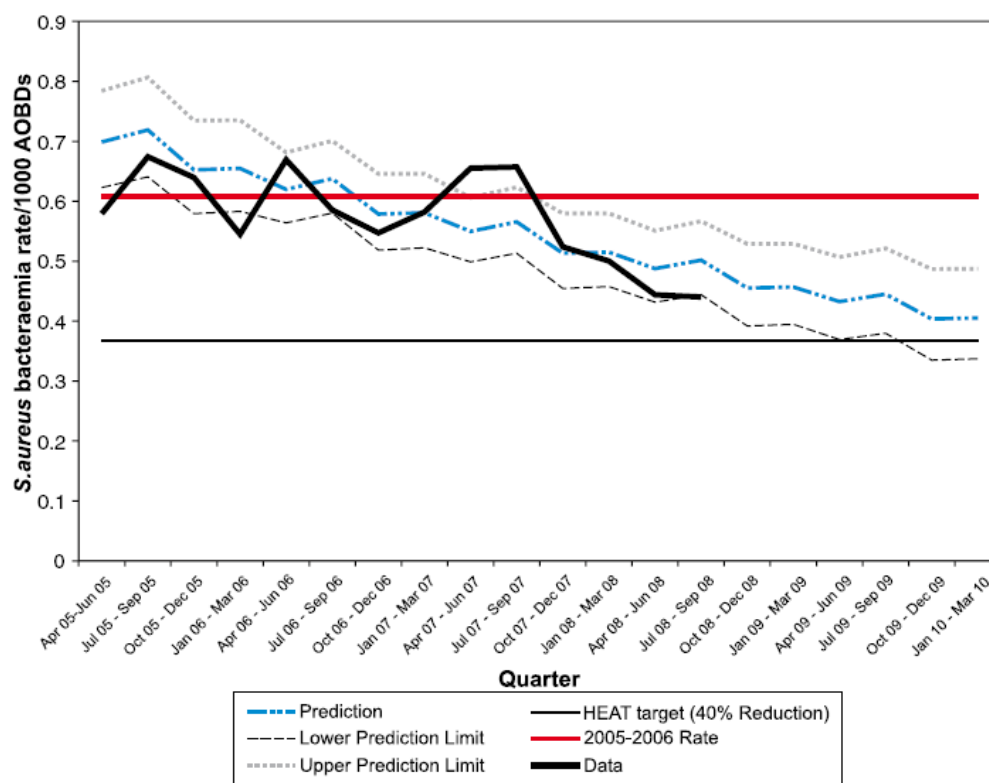
NHS Board	LOTHIAN	Actual SAB
2005-06 MRSA number	227	
2005-06 MSSA number	271	
2005-06 total SA number	498	498
Reduction (%) to be achieved by 31/3/2010	40	
Expected SA number at 31/3/2007	448	437
Expected SA number at 31/3/2008	398	442
Expected SA number at 31/3/2009	349	340 (Apr-Feb 09)
Expected number of SA at 31/3/2010	299	

4.1.3 National Context - HPS quarterly national report January 2009

The HPS Quarterly report published Jan 2009 showed the number of *S. aureus* bacteraemia reported in NHS Lothian had fallen by 11.3% per year (Figure 6). NHS Lothian's MRSA rate (0.21 per 1000 AOBs) was reported above the national average (0.123 per 1000 AOBs). Our SAB rate overall (0.44 per 1000 AOBs) was above the last published national average (0.43 per 1000 AOBs)

Figure 6: HPS Quarterly Report Jan 2009 *S. aureus* bacteraemia predictions

Figure 34: *S. aureus* bacteraemia per 1000 AOBs in NHS Lothian showing the HEAT target, predicted rates and prediction limits.



4.1.4 Current/new initiatives to reduce cases

These include:

- Root Cause Analysis.
- Weekly and monthly reporting.
- Local targets for the reduction of *Staphylococcus aureus* bacteraemia.
- Under Scottish Patient Safety Programme progression of central venous catheterisation packs into theatre and radiology.
- The testing of peripheral intravenous cannulae procedure packs.
- Work to develop central venous catheter maintenance protocols and procedures.

4.1.5 Lothian specific problems identified

Infection control issue surveillance forms to the Consultant managing the patients' care. Of the forms returned a review of 89 incidences approx 72% (64) of forms had no source identified. 20.5% (25) of forms identified central venous catheter as the source. Actions required included:

- Enhanced surveillance, including ensuring clinicians complete *Staphylococcus aureus* bacteraemia forms, which will identify likely routes of infection and therefore potential corrective actions.
- Ongoing Scottish Patient Safety Programme work to extend the use of the central venous catheterisation pack across NHS Lothian
- Ongoing Scottish Patient Safety Programme work to develop the central venous catheterisation maintenance protocols and procedures

- Scottish Patient Safety Programme work to develop process and procedures for peripheral venous cannulae
- Reinforcing staff infection control training, with the focus on hand hygiene (currently 93%).

4.2 *Clostridium difficile* infection (CDI)

4.2.1 Short, medium and long term trends in CDI.

The annual incidence rate in Scotland is 1.29 cases of CDAD per 1000 total Occupied Bed Days (OCBDs) – NHS Lothian annual incidence is reported by HPS as below the national average at 1.20. In February 2009, there were 59 instances of *Clostridium Difficile*, including 7 reported from primary care and children's services, areas where local surveillance is more stringent than that required nationally.

NHS Lothian has carried out a review against the recommendations following the Vale of Leven. Systems are in place for surveillance and management of identified cases to prevent cross infection. The antimicrobial and infection control team are testing a system of reporting antimicrobial usage in conjunction with *Clostridium difficile* rates to clinical teams. The successful reduction programme developed at RVH and WGH is being progressed into other areas and resulting in successful reduction in these areas. This programme will continue to progress using Scottish Patient Safety Programme systematic approach to ensure implementation robust and sustainable. Information leaflets are available and these were developed in consultation with our patient/public representatives. Infection control is part of the corporate induction and mandatory update programme.

Figure 7: CDI HEAT Target Trajectory NHS Lothian

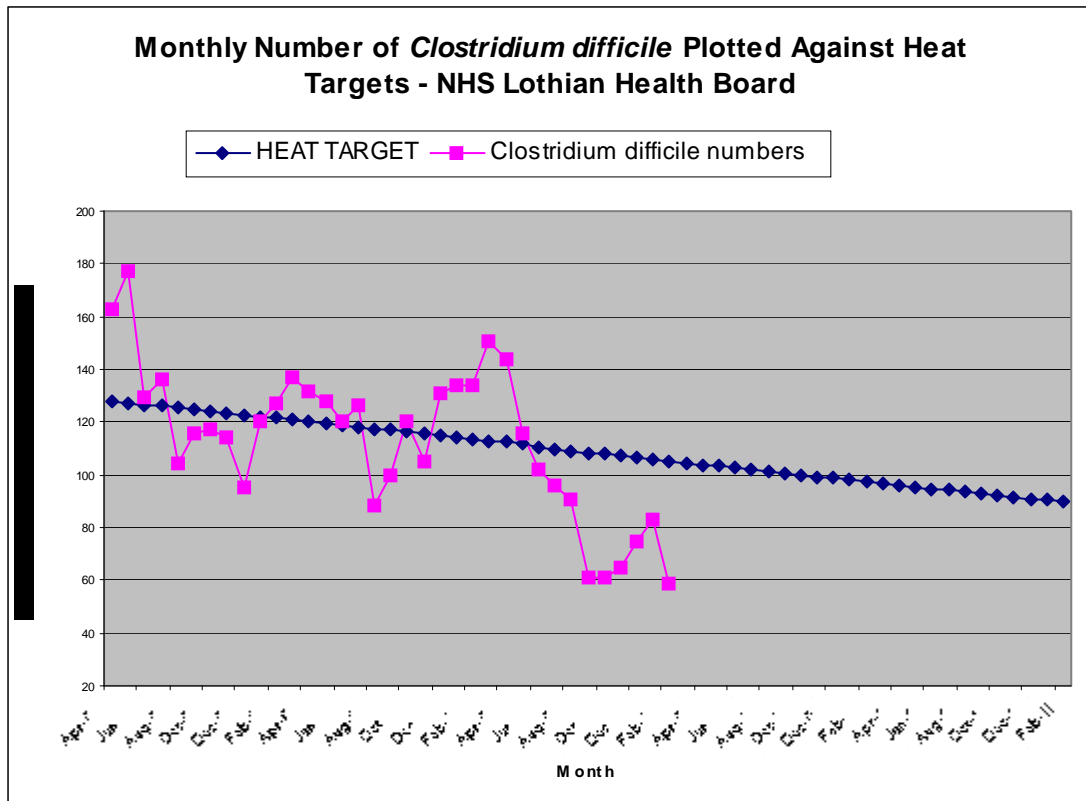
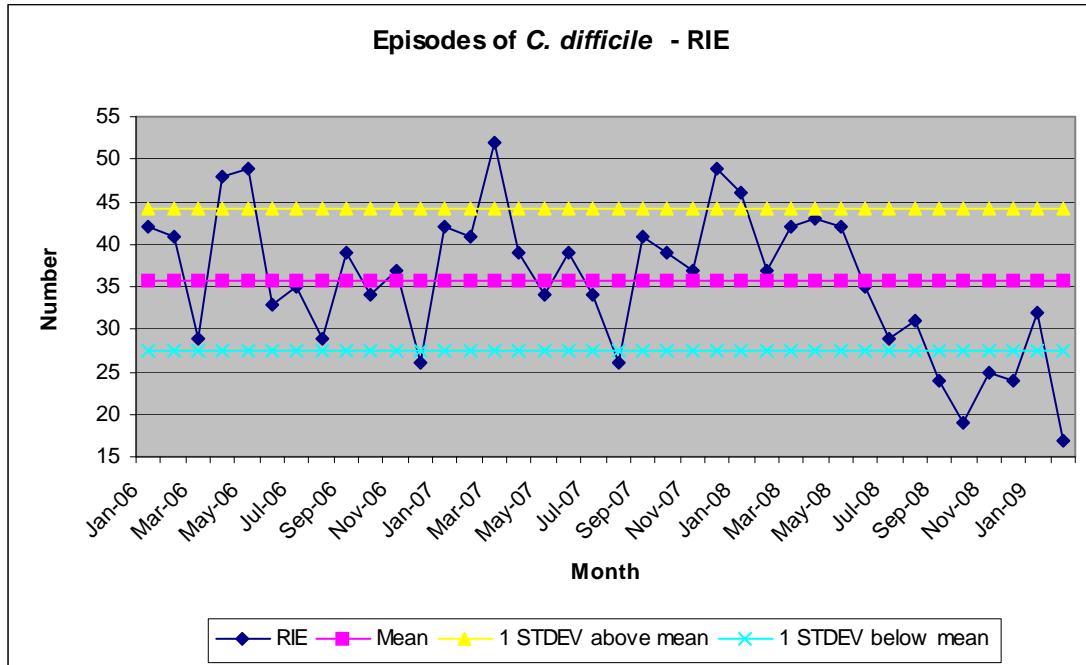
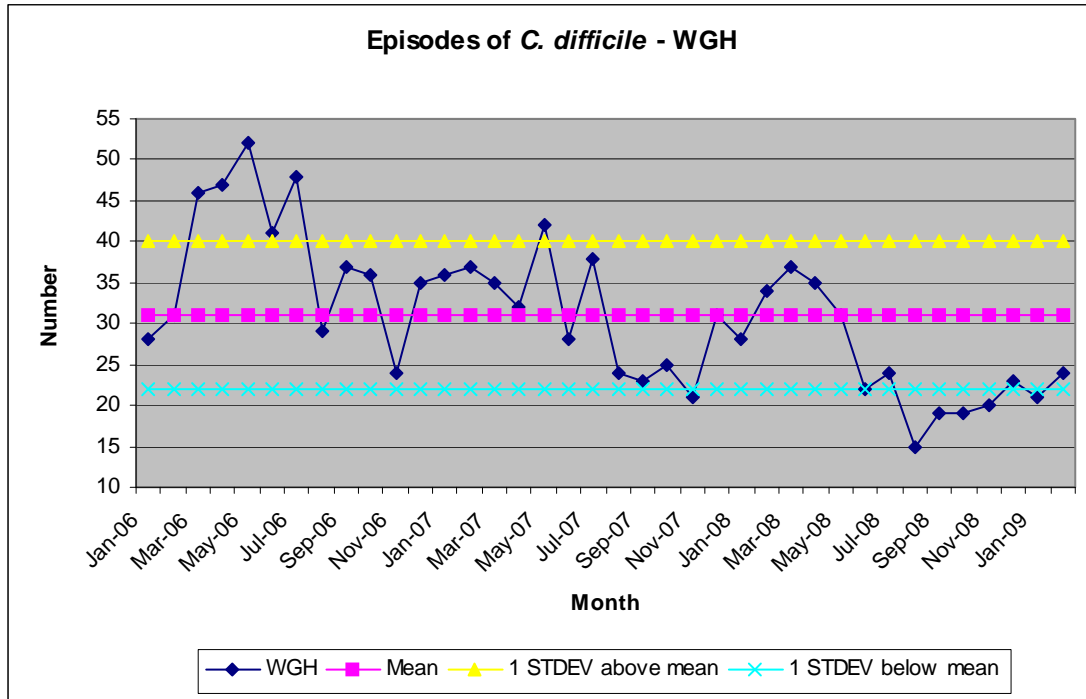


Figure 8: CDI rates Royal Infirmary Edinburgh



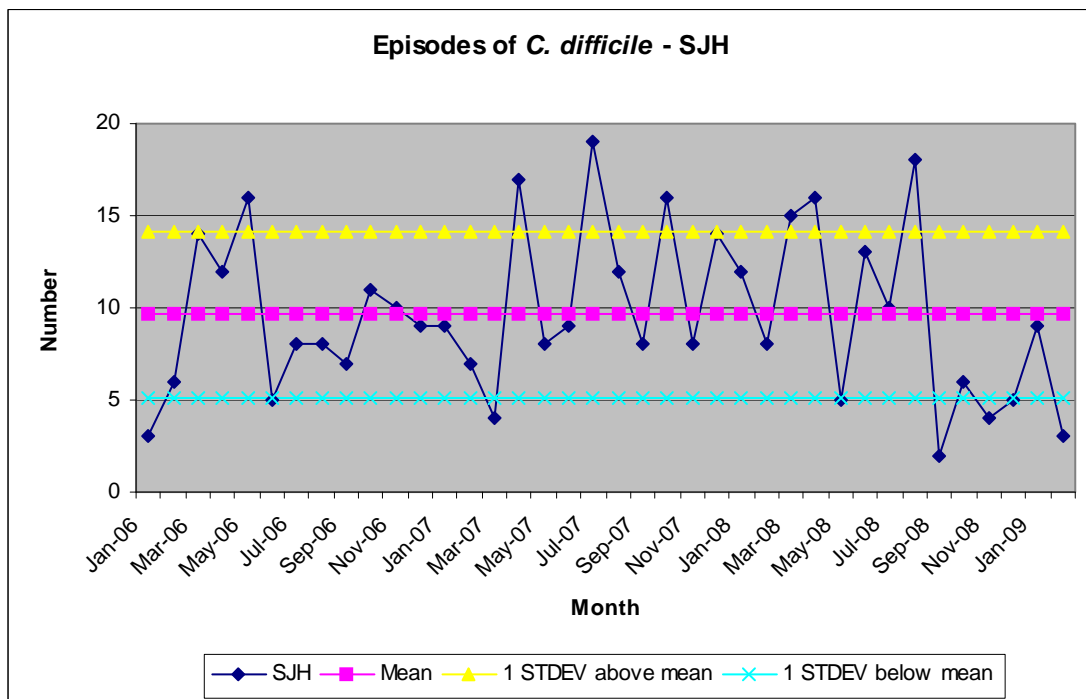
RIE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year_2006	42	41	29	48	49	33	35	29	39	34	37	26
Year_2007	42	41	52	39	34	39	34	26	41	39	37	49
Year_2008	46	37	42	43	42	35	29	31	24	19	25	24
Year_2009	32	17										

Figure 9: CDI rates Western General Hospital Edinburgh



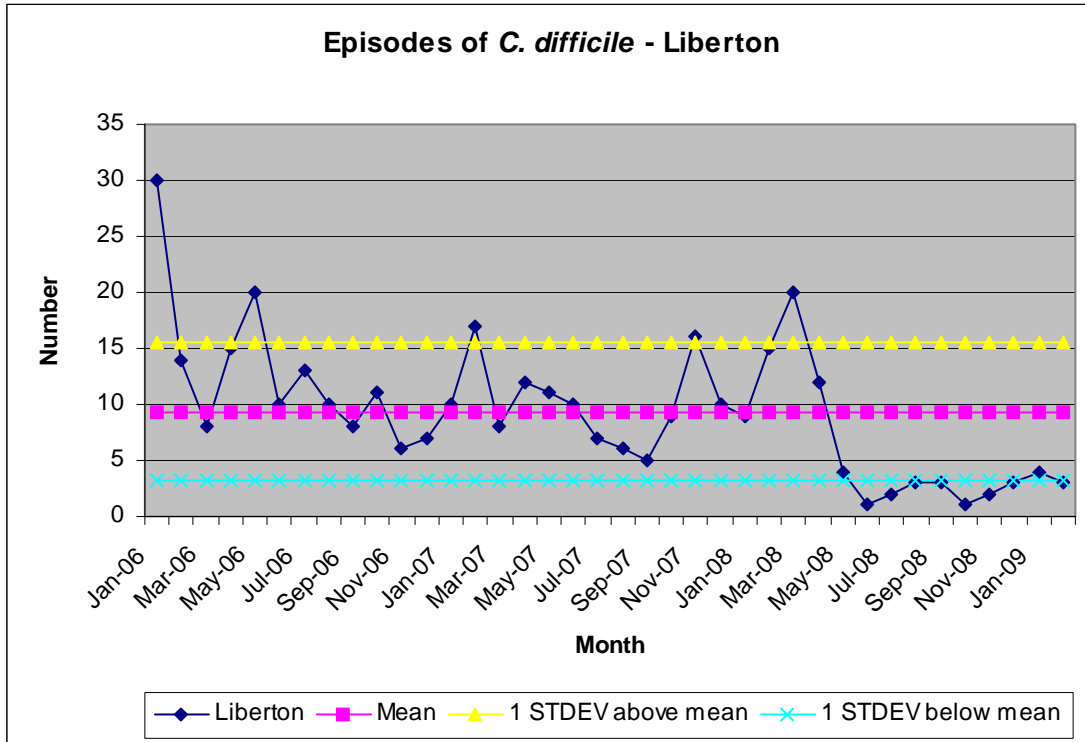
WGH	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year_2006	28	31	46	47	52	41	48	29	37	36	24	35
Year_2007	36	37	35	32	42	28	38	24	23	25	21	31
Year_2008	28	34	37	35	31	22	24	15	19	19	20	23
Year_2009	21	24										

Figure 10: CDI rates St John's Hospital Livingston



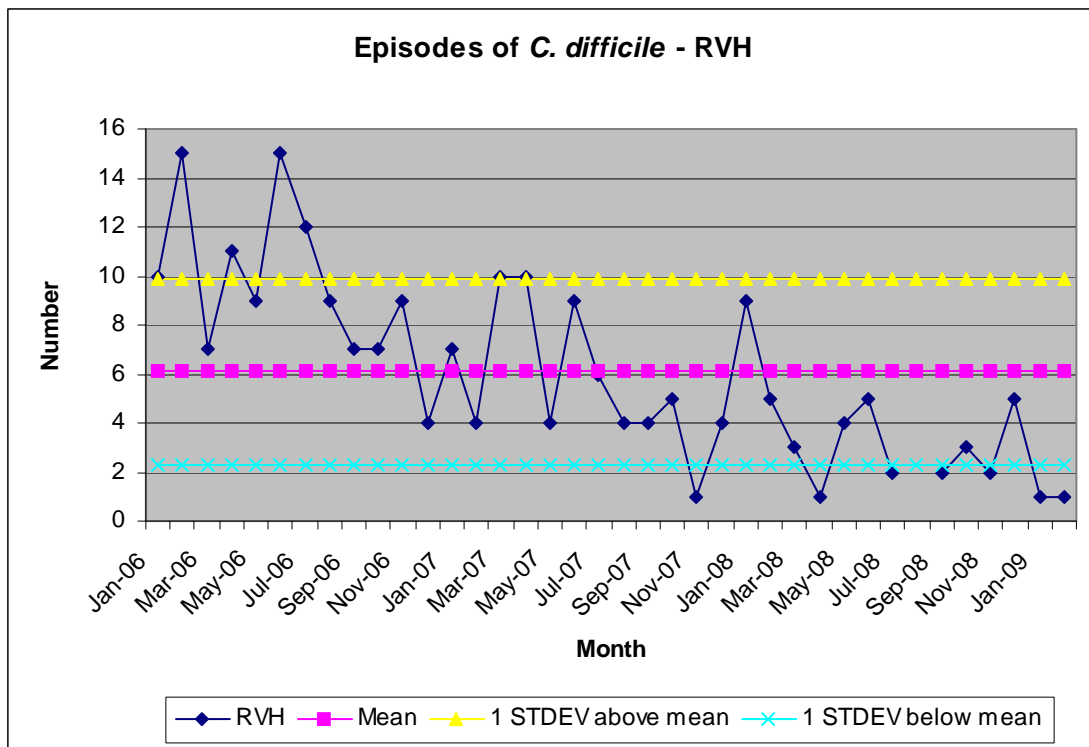
SJH	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year_2006	3	6	14	12	16	5	8	8	7	11	10	9
Year_2007	9	7	4	17	8	9	19	12	8	16	8	14
Year_2008	12	8	15	16	5	13	10	18	2	6	4	5
Year_2009	9	3										

Figure 11: CDI rates Liberton



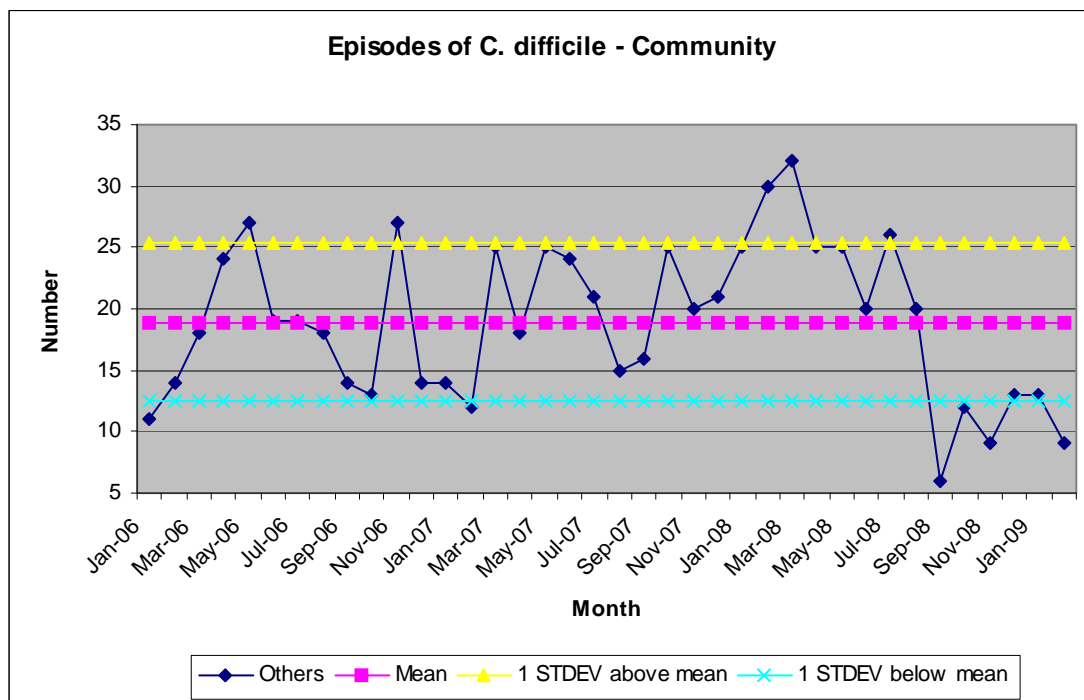
Liberton	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year_2006	30	14	8	15	20	10	13	10	8	11	6	7
Year_2007	10	17	8	12	11	10	7	6	5	9	16	10
Year_2008	9	15	20	12	4	1	2	3	3	1	2	3
Year_2009	4	3										

Figure 12: CDI rates Royal Victoria Hospital Edinburgh



RVH	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year_2006	10	15	7	11	9	15	12	9	7	7	9	4
Year_2007	7	4	10	10	4	9	6	4	4	5	1	4
Year_2008	9	5	3	1	4	5	2		2	3	2	5
Year_2009	1	1										

Figure 13: CDI rates Community



Community	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year_2006	11	14	18	24	27	19	19	18	14	13	27	14
Year_2007	14	12	25	18	25	24	21	15	16	25	20	21
Year_2008	25	30	32	25	25	20	26	20	6	12	9	13
Year_2009	13											

4.2.2 Current HEAT status

NHS Lothian rates show working well toward a 30% reduction. It is anticipated that NHS Lothian will achieve a reduction on previous annual figures (Table 2).

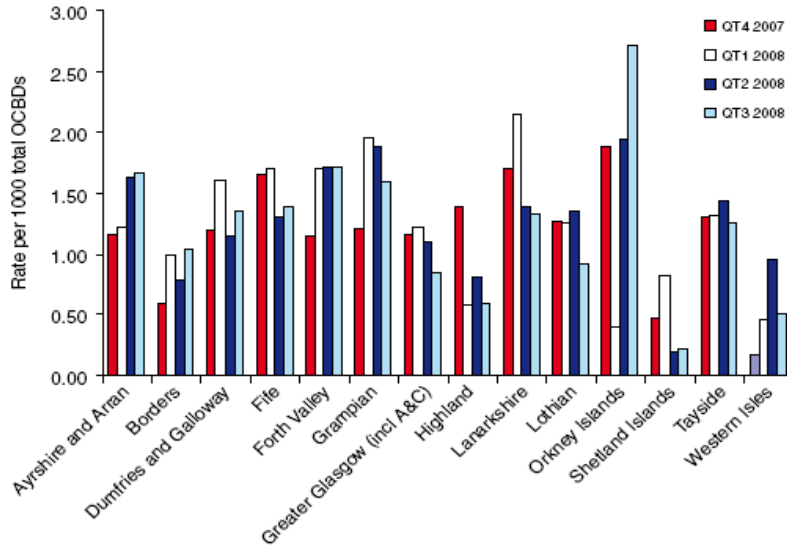
Table 3: NHS Lothian *Clostridium difficile* HEAT Target

NHS Board	LOTHIAN	ACTUAL CDIFF
2006-07 total CDIFF number	1535	1535
Reduction (%) to be achieved by 31/3/2011	30	
Expected CDIFF number at 31/3/2008	1420	1469
Expected CDIFF number at 31/3/2009	1305	953 (Apr-Feb 09)
Expected CDIFF number at 31/3/2010	1190	
Expected number of CDIFF at 31/3/2011	1075	

4.2.3 National context – HPS quarterly national report January 2009

The overall quarterly rate was 1.15 cases of CDAD per 1000 total OCBDs, NHS Lothian is below the national average with 0.92 cases, showing a reduction of 30% from previous quarter.

Figure 14: NHS Scotland CDI Rates



4.2.4 Current/new initiatives to assist in reducing cases

These include:

- An antimicrobial management team reviewing usage of 3rd generation cephalosporins, which are reported as contributing to incidence of CDI.
- The expansion of reduction strategies, such as prudent antimicrobial prescribing, environmental cleaning and education into all medicine of elderly areas.
- The piloting of Root Cause Analysis for all new cases of CDI in Orthopaedics.
- Review and implementation of board-wide antimicrobial policy; the assessment of compliance with formulary at all hospital sites. This is a rolling programme, due to end May 2009, with the assessment of primary care prescribing in care homes project for completion by the end of August 2009.

4.3 Hand Hygiene programme

4.3.1 Short, medium and long term trends in compliance

Figure 17: NHS Lothian National Hand Hygiene Campaign Compliance



4.3.2 National context – most recent HPS national report

Hand hygiene compliance in NHS Lothian continues to improve, presently achieving 93% in the national audits (January 2009 Figures 17 & 18).

4.3.3 Current/new initiatives in promoting Hand Hygiene

The focus for this period has been to communicate the zero-tolerance approach to non-compliance with hand hygiene. Initiatives include;

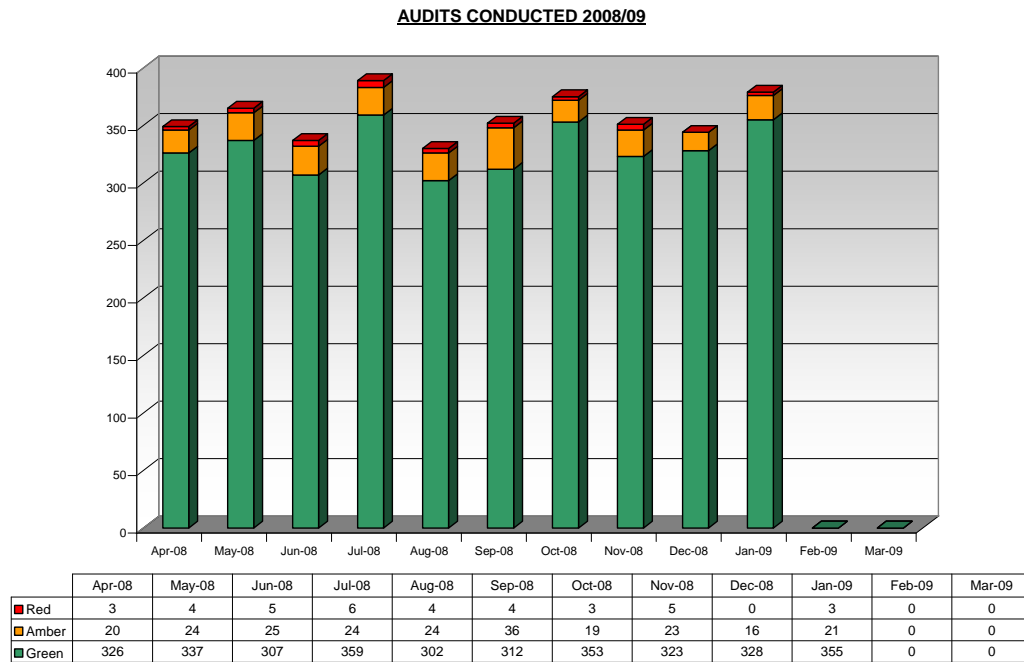
- Refining local hand hygiene audit tool – Clinical areas will audit hand hygiene monthly. Those achieving a hand hygiene compliance of less than 95% will be required to register this result via DATIX incident reporting system, as this will be considered a 'red' alert, requiring remedial action to be taken. This will include education and increase in monitoring to weekly until sustained above 95% for 4 consecutive weeks.
- Review of Corporate Induction Hand Hygiene E-Learning package to ensure reflects the 5 key moments, bare below elbows philosophy and adjustment of multiple choice test pass standard to 100%.

4.4 Cleaning Services Specification Compliance

4.4.1 Short, medium and long term trends in compliance

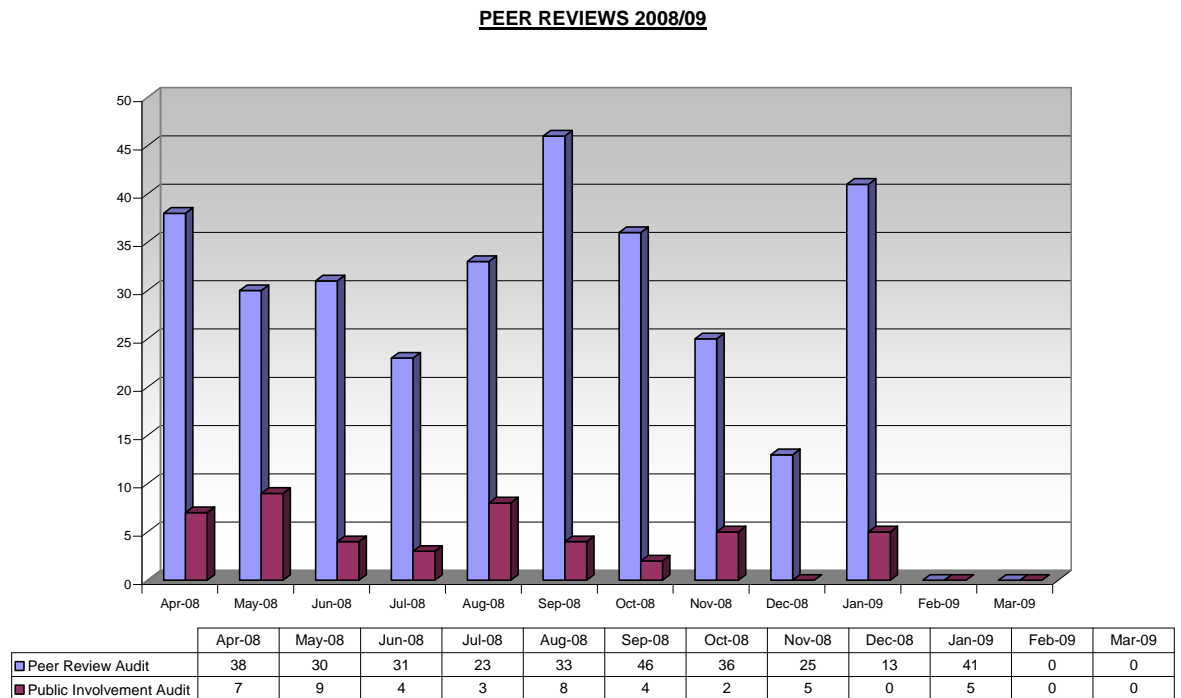
Year to date 3571 audits have been conducted. Of these; NHS Lothian is consistently achieving Green Status when reporting the National Monitoring results, averaging 94.7% over the year to date (April 08 to January 09)

Figure 19: NHS Lothian Cleaning Services Audits



To provide a degree of independent scrutiny within the monitoring system regular Peer Reviews are carried out by an Infection Control professional, periodically these Peer Reviews will include a Public Representative.

Figure 20: NHS Lothian Peer Review Monitoring Cleaning Services



4.4.2 National context – most recent HFS quarterly national report

Figure 21: HFS quarterly national report

<i>Health Board</i>	<i>4th quarter</i>	<i>1st quarter</i>	<i>2nd quarter</i>	<i>3rd quarter</i>
	<i>Jan-March 2007/2008</i>	<i>April-June 2008/2009</i>	<i>July-Sept 2008/2009</i>	<i>Oct-Dec 2008/2009</i>
	<i>Total % Pass</i>	<i>Total % Pass</i>	<i>Total % Pass</i>	<i>Total % Pass</i>
SCOTLAND	96.1	96.1	96.0	95.5
Ayrshire and Arran	96.4	96.4	95.9	95.9
Borders	97.1	97.8	97.2	96.9
Dumfries and Galloway	97.3	97.3	97.4	97.2
Fife	96.5	96.5	97.0	97.2
Forth Valley	95.3	95.5	94.7	92.9
Grampian	97.3	97.2	97.1	96.2
Greater Glasgow and Clyde	96.3	96.2	96.4	96.4
Highland	95.3	95.1	95.3	95.5
Lanarkshire	96.0	95.5	94.8	95.0
Lothian	94.6	94.7	94.5	94.9
Orkney	95.2	92.8	96.1	93.0
Shetland	97.8	97.8	97.1	98.0
Tayside	95.8	96.1	95.9	95.7
Western Isles	95.6	95.9	95.6	95.7
The State Hospitals Board for Scotland	93.6	93.8	94.0	92.7
Golden Jubilee National Hospital	93.6	93.4	93.4	92.2
NSS Blood Transfusion Services			98.6	98.8
Scottish Ambulance Service				94.7

4.4.3 Current/new initiatives in improving cleaning

These include:

- Hypochlorite cleaning agent for use during infection outbreaks and post infection cleaning.
- Trial of a microfibre cleaning system at the Western General Hospital. The system including a trolley, microfibre cloths and mops is being tested in 5. The trial will compare cost, effort and effectiveness.
- Amber and Red audit, scoring below 90%, are rectified, as timely as practicable ensuring action is appropriate to secure sustainable improvement.
- As part of the KSF PDPR process all of NHS Lothian's Domestic staff are using the Domestic Assistants Workbook as a means of evidencing compliance with the appropriate KSF outlines.
- Introduction of steam cleaners as announced by SGHD will be progressed.

5. Significant HAI incidents / outbreaks, emerging threats

5.1 Increase incidence MRSA Cardiothoracic Unit RIE

Discharge screening of patients in the cardiothoracic unit has identified an increase in the level of MRSA acquisition above baseline rates. Between the 2nd February and 4th March 2009 nine patients have tested positive for MRSA. 6 patients are colonised and have been discharged with no treatment required. 3 patients have an MRSA infection requiring antimicrobial therapy. An HAI alert was submitted to SGHD and HPS on 25th February. An Incident Management Team is in place and all infection control precautions are in place.

5.2 Norovirus

A point prevalence report is submitted weekly to Health Protection Scotland. Norovirus levels within Scotland began to increase from October. To date (February 2009), a total of 66 incidents of gastro-enteritis have been investigated in NHS Lothian, with Norovirus confirmed in 45 instances (68%). 21 are unknown but presumed Norovirus on epidemiological grounds - the results are outstanding.

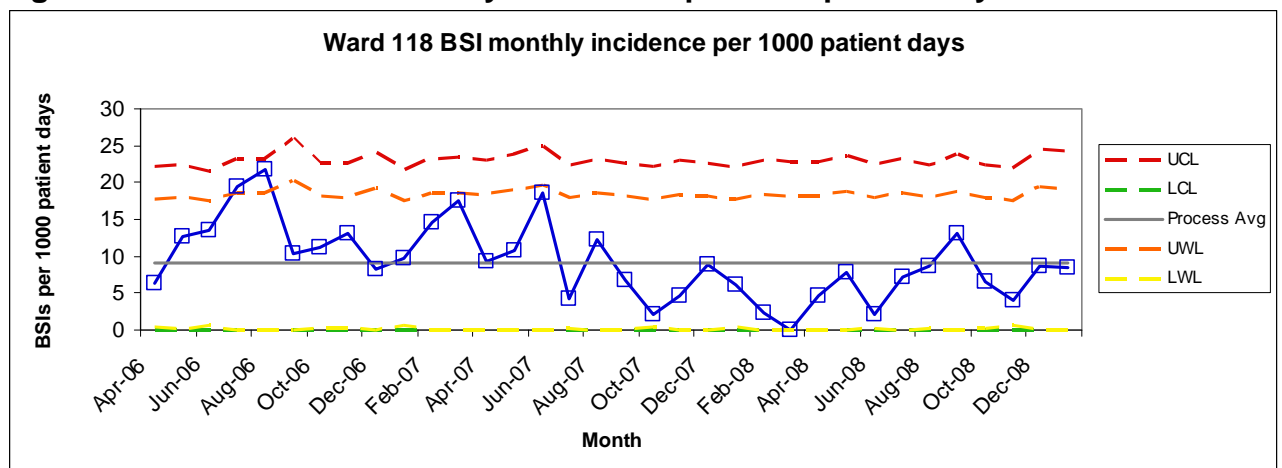
6. Surveillance

6.1 Critical Care Surveillance

6.1.1 Ward 118 RIE

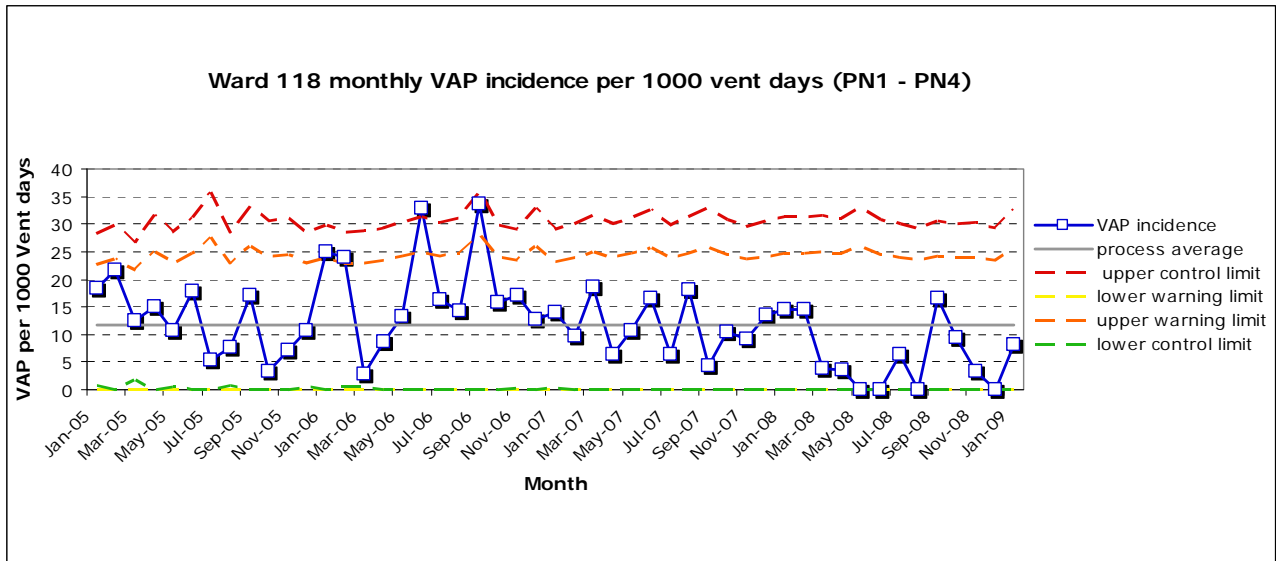
The following information has been analysed from monthly data collected as part of ongoing critical care surveillance. Since the time of the last report blood stream infections within critical care RIE remain below average. This has been the case in 17 out of the last 19 months. This is both clinically and statistically significant.

Figure 22: Ward 118 BSI monthly incidences per 1000 patient days



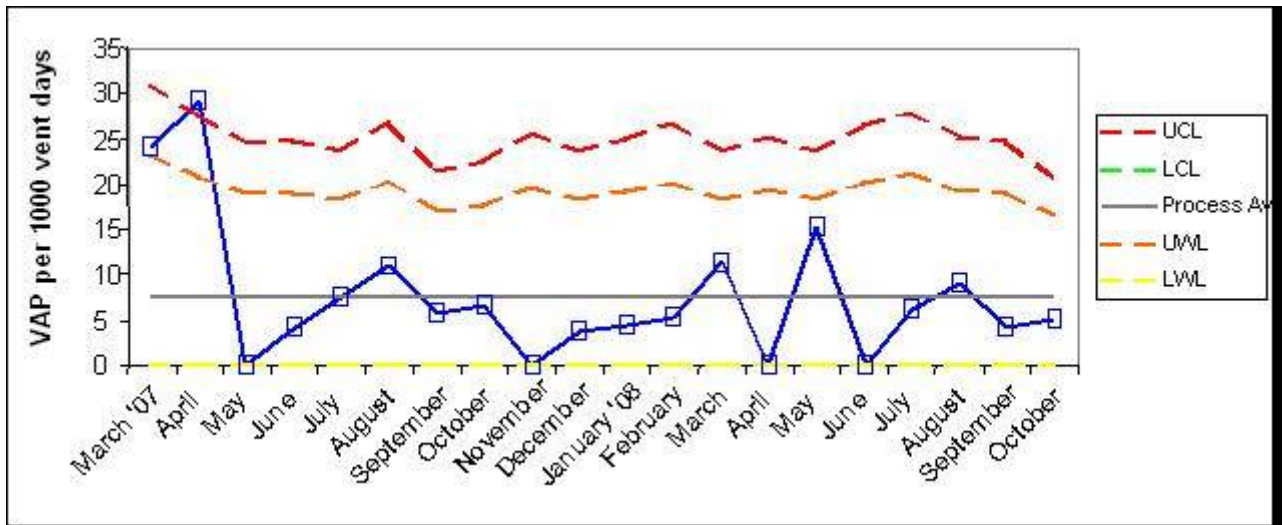
Ventilator Associated Pneumonia (VAP) rates are in control and remain below average in January. There has been a significant reduction in the numbers of VAPs occurring since introducing the VAP bundle in January 2008 as demonstrated in the chart below.

Figure 23: Ward 118 VAP monthly incidences per 1000 patient days



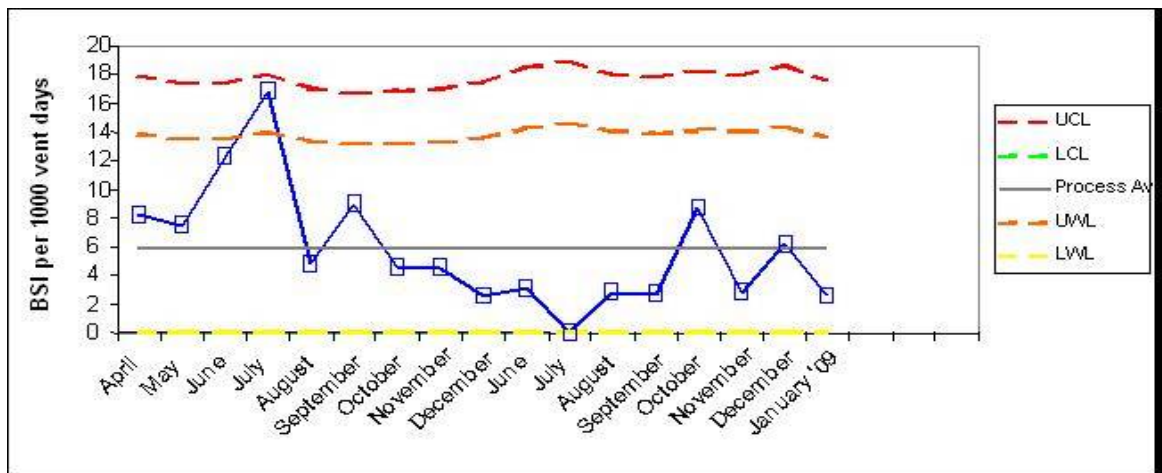
6.1.2 Ward 20 WGH

Figure 24: Ward 20 WGH VAP incidence per 1000 vent days



Neurological ventilated patients are twice as likely to develop a VAP as non-neuro ventilated patients. VAP rates are in accordance with this, with a neuro/non-neuro VAP rate of between 2:1 and 3:1. The VAP rate for January, although increased, remains within control.

Figure 25: Ward 20 WGH BSI incidence per 1000 patient days



6.1.3 St John’s Hospital

ICU at St John’s have been collecting infection data since May 2008 which is an insufficient length of time to produce significant statistical results.

St Johns Hospital incidence of VAP.

There has been only one incidence of VAP in St Johns in the last 9 months

St John’s Hospital BSI monthly incidences.

There have been 9 BSIs in total in the last 9 months.

6.2Mandatory Surgical Site Surveillance

NHS Lothian surveillance team actively follow up patients for 30 days post surgery. Review of patients developing infection post discharge identified majority with contributing factors such as body mass index above 40, diabetes or malignancy.

Infection control, tissue viability and clinical staff are working together to address the issue of post discharge infections.

Figure 28: Mandatory Surgical Site Surveillance Results Oct - Dec08

Site	Procedure	Number of procedures	Number of infections	Infection Rate	National Data set
RIE	Hip Arthroplasty	306	6	1.96%	1.31%
	C-sections	395	24	6.08%	6.65%
	Abdominal Hysterectomy	73	8	10.96%	4.33%
West Lothian	C-sections	188	8	4.26%	6.65%
	Abdominal Hysterectomy	30	0	0.00%	4.33%
Combine d Lothian Results for 2008	Hip Arthroplasty	1188	18	1.52%	1.61%
	C-sections	2258	108	4.78%	6.37%
	Abdominal Hysterectomy	389	28	5.91%	4.87%

6 Horizon scanning

- Following the impact of the Clostridium difficile pilot project, collaborative working with Clinical Effectiveness, Patient Safety, Antimicrobial Team and Clinical staff is in progress to expand the work into other areas. Based on the current trajectory, NHS Lothian should achieve over the 30% reduction target.
- NHS Lothian have recognised the risks to reaching the SAB Target of 40% by 2010 will be a challenge. However, recent collaborative work with clinical teams and setting of local targets has seen an impact on rates and it is anticipated on current performance NHS Lothian should achieve the government target of 30% and will reach the 40% NHS Lothian stretched target.

7 Progress on compliance with the national HAI programme

7.1 RAG status on HAI Action Plan

	Actions
PURPLE (complete)	20
GREEN (on track to complete by the deadline)	4
AMBER (substantially complete but either awaiting national materials or with some possibility of slippage beyond the deadline)	0
RED (unable to complete by the deadline)	0

7.2 Actions required and timescales for implementation:

- Personal Development Plans are to be in place by March 2009 and staff will be required to have an HAI related objective in the plan (Target date April 2009)
- HAI Education is part of Corporate Induction and Mandatory update programme. Work is ongoing to develop education strategy for antimicrobial prescribing (Target date April 2009)
- HAI budget requests were submitted as part of capital, maintenance and operational programme bids. Outcome of bids not yet released
- Work is on going on the implementation of recommendations Charge Nurse review (Target date December 2010)

Fiona Cameron
Head of Infection Control Services
16 March 2009