Healthcare Associated Infection Board Report

Infection Control Team
February 2009

INTRODUCTION

From January 2009 all NHS Boards are required to provide a report on Healthcare Associated Infection (HAI) during the public session of their Board meetings. The purpose of the report will be to provide an overview/update of local activity related to the prevention and control of HAI, including local surveillance.

At present the requirement is to report data in the following areas:

- *Staphylococcus aureus* bacteraemias (SABs)
- *Clostridium difficile* Associated Diarrhoea (CDAD)
- Hand Hygiene Performance
- Cleaning Specification

The Scottish Government Health Department (SGHD) has requested a minimum data set from each Board as the first step in the process (See Appendix 1). The data set is requires the submission of raw data covering the periods November – December 2008.

Clostridium difficile Associated Diseases (CDAD) & *Staphylococcus aureus* Bacteraemias (SAB)

NHS Ayrshire & Arran Infection Control Team (ICT) has a well established and comprehensive local surveillance programmes collecting key HAI data. A single system Alert Organisms & Condition Surveillance programme was initiated in April 2006 and an Enhanced *Staphylococcus aureus* Bacteraemia surveillance programme was commenced in April 2007. These compliment the national mandatory surveillance programmes and allow real time data to be used by the ICT in directing resources and targeting key areas. It also allows rapid dissemination of information to individual wards, managers and committees. An explanation of the methodology used in the local surveillance programmes can be found in Appendix 2.

By Augusts 2009 Board reports will be required to feedback CDAD and SAB data in the form of Statistical Process Control (SPC) charts. SPC Charts take into account the natural variation that can occur over time and highlight where significant improvements or deteriorations take place. These charts have been used as the basis of local feedback in Ayrshire and Arran since early 2007. Therefore they have been included in this report ahead of the national timetable.

Another significant addition within this report is the inclusion of acquisition data. Using surveillance definitions the ICT in assessing each report will assign the most probable area of acquisition at ward, hospital and directorate level. It must be stressed that these are surveillance definitions of acquisition and the areas of acquisition are indicative rather than definitive. This approach has proven particularly successful with ward areas as it recognises that many areas may identify cases of an HAI but the patient was incubating the organism on admission or transfer to the ward.

Hand Hygiene

Hand Hygiene audit data is currently reported at 2 levels within the organisation

- feedback at an organisational level of audits undertaken as part of the national hand hygiene campaign
- feedback at ward level of audits undertaken either by the Hand Hygiene Team or local ward staff

The current structure of the local hand hygiene audit database does not allow analysis of the data to provide the breakdown of figures required by the template. Therefore the data contained within this report will be based on the data from the last reported national audit results from September.

A review of the local database to enable it to be more responsive to analysis and manipulation is currently being undertaken. Future reports will provide more in depth and real time analysis of hand hygiene audit results.

Cleaning Specification

Audits of local cleaning standards are undertaken routinely across all NHS Ayrshire & Arran premises. In line with national requirements they are undertaken at 2 levels:

- as part of the routine monitoring of cleaning specifications
- as peer reviews involving members of the public and infection control personnel

The current system of reporting is designed to feed into the national reporting systems rather than local real time analysis therefore the information presented here is based on the national audit reporting mechanism. A review of the system of the local analysis will be undertaken to establish a system that will allow more detailed real time analysis.

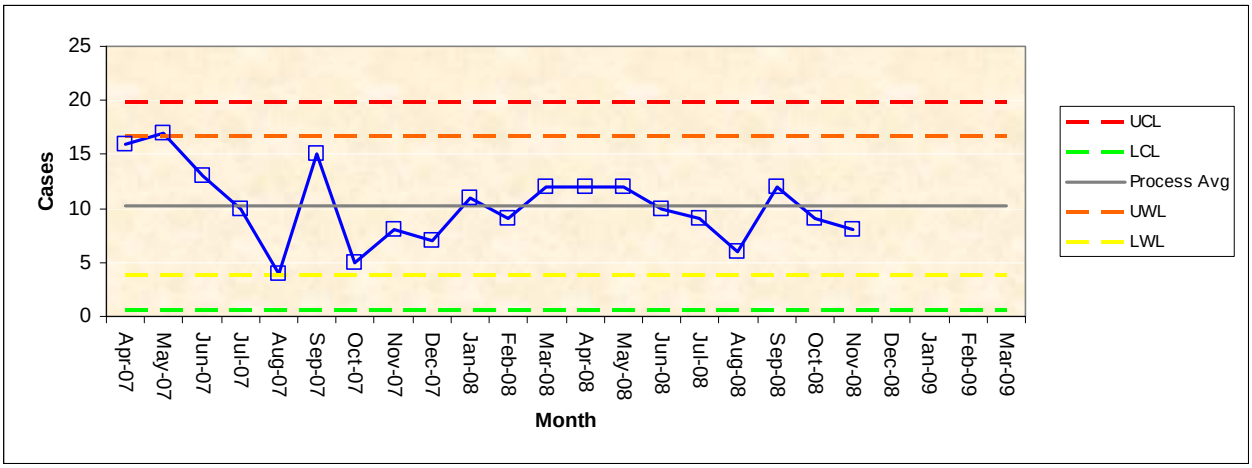
Summary

This report aims to ensure that the Board is provided with accurate and upto date data on key HAI indicators. Where possible the report has expanded on the minimum dataset. The structure of the report will be refined as the number of reportable areas increases and also in response to any feedback from those who receive the report.

Part 1

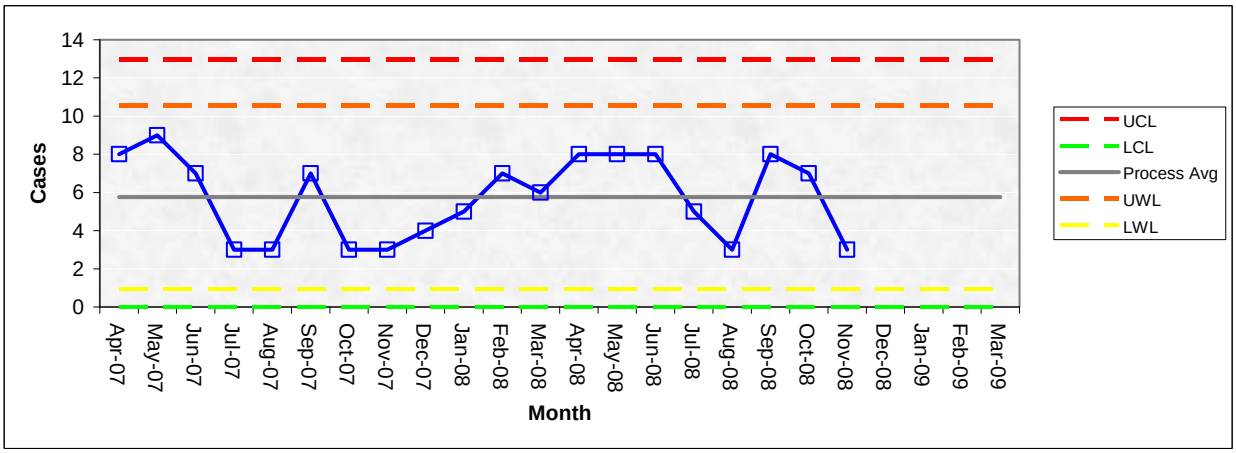
S*taphylococcus aureus* Bacteraemias

NHS Ayrshire & Arran Inpatient *Staphylococcus aureus* Bacteraemias
Apr 07 – Nov 08



Mean: Apr 07 – Nov 08

NHS Ayrshire & Arran Inpatient Hospital & Healthcare acquired *Staphylococcus aureus* Bacteraemias
Apr 07 – Nov 08

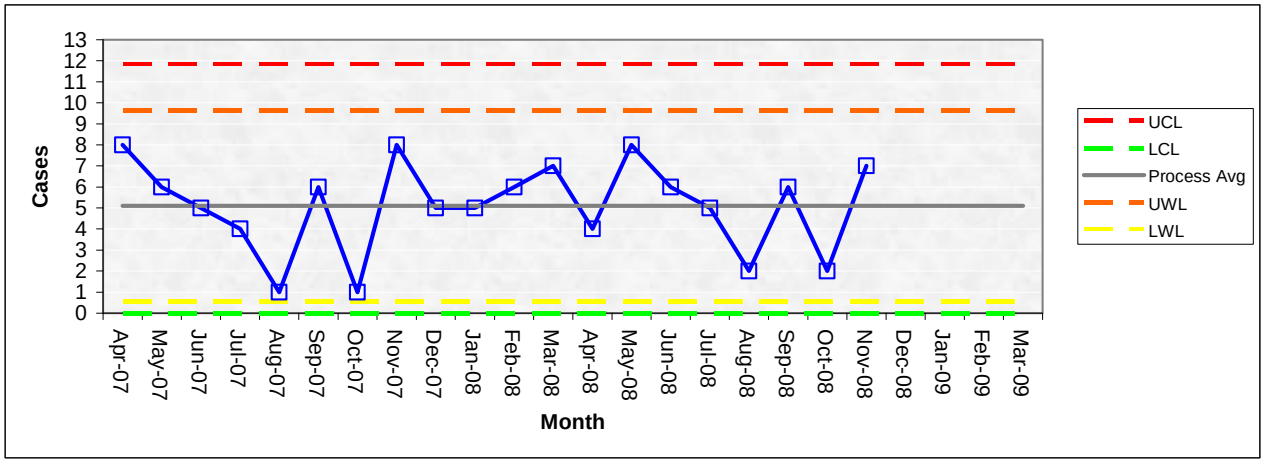


Mean: Apr 07 – Nov 08

Comment:

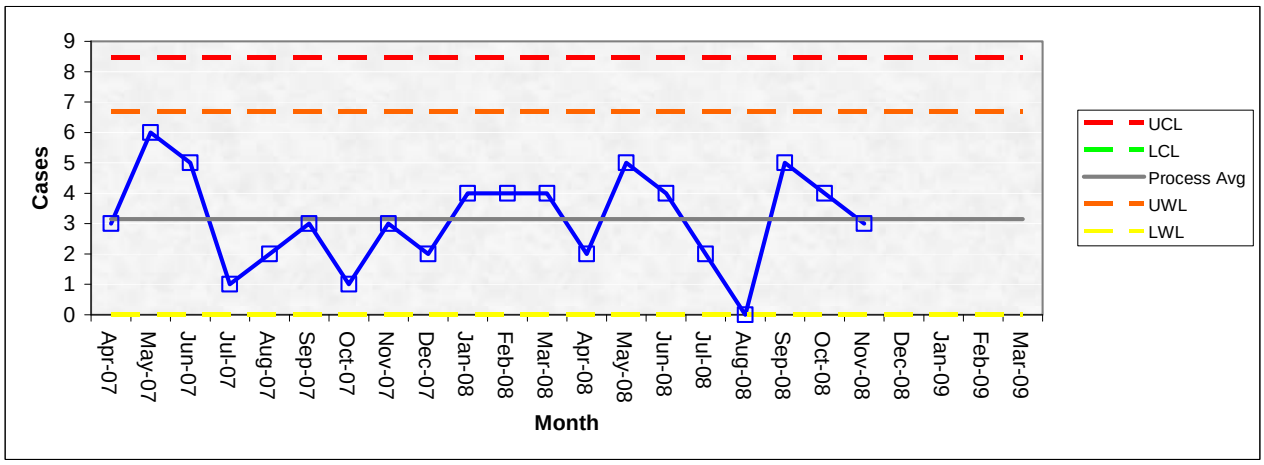
- The laboratory results IT system changed in December and temporary measures for reporting to the ICT are currently in place. As a result the December figures have been omitted from this report until a quality assurance check can be undertaken to verify that all SABs have been reported to the ICT.
- There was a fall below the mean in both identified and acquired SABs in November

Crosshouse Hospital Inpatient *Staphylococcus aureus* Bacteraemias
Apr 07 – Nov 08



Mean: Apr 07 – Nov 08

Crosshouse Hospital Inpatient Hospital & Healthcare Acquired *Staphylococcus aureus* Bacteraemias
Apr 07 – Nov 08

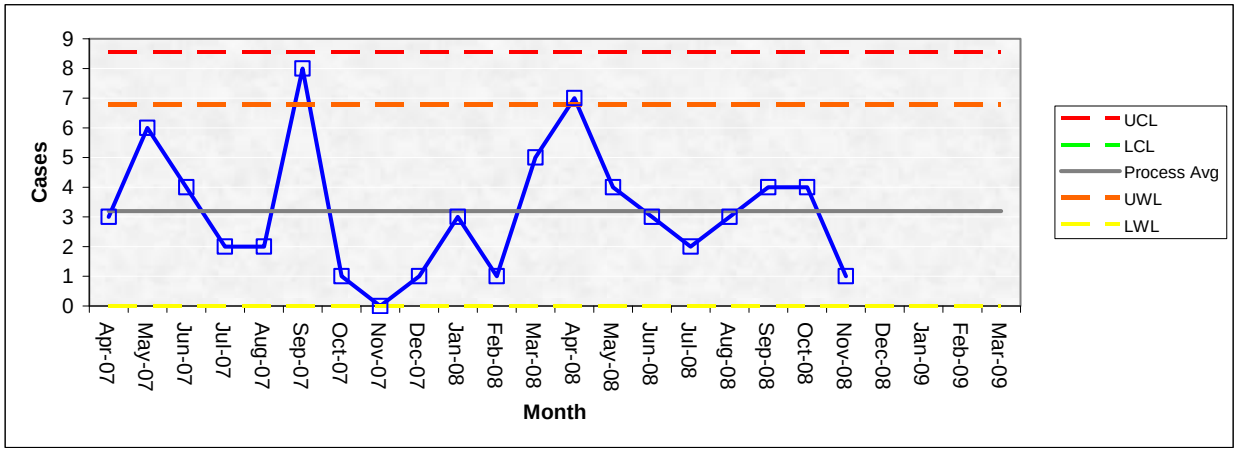


Mean: Apr 07 – Nov 08

Comment:

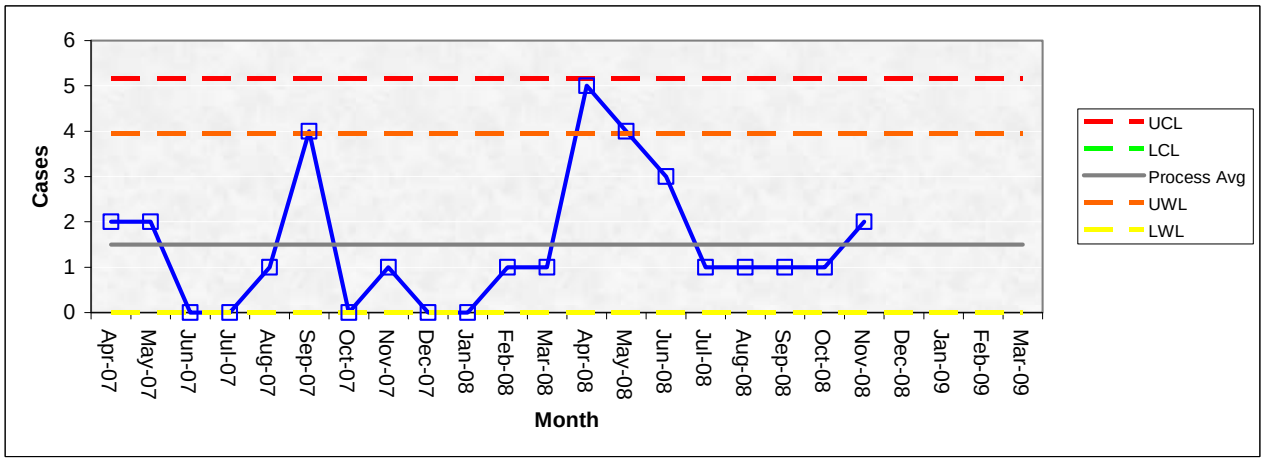
- There was a sharp increase in identified SABs in November
- However the number of hospital and healthcare SABs fell for the 2nd consecutive month

Ayr Hospital Inpatient *Staphylococcus aureus* Bacteraemias
Apr 07 – Nov 08



Mean: Apr 07 – Nov 08

Ayr Hospital Inpatient Hospital & Healthcare Acquired *Staphylococcus aureus* Bacteraemias
Apr 07 – Nov 08

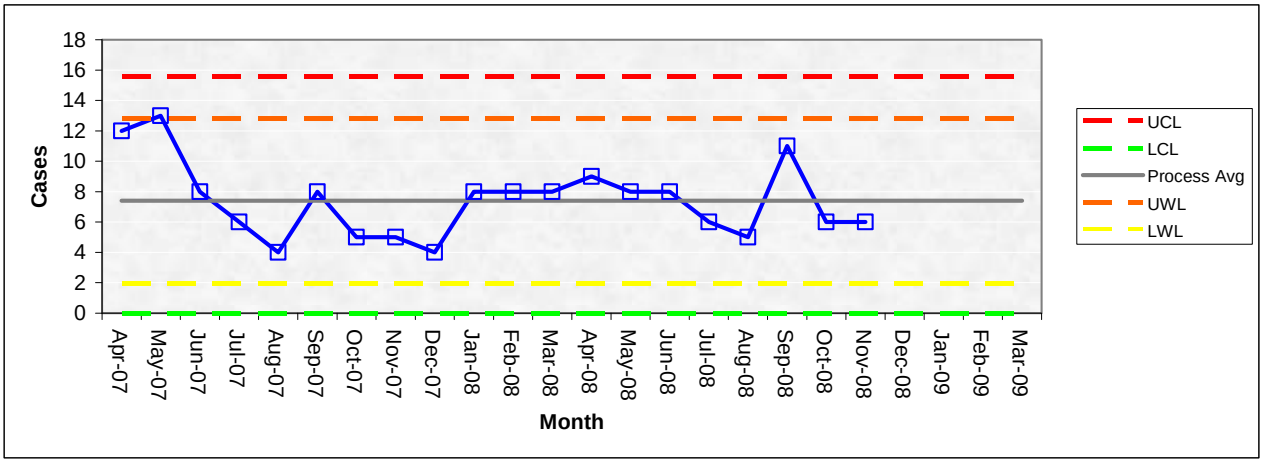


Mean: Apr 07 – Nov 08

Comment:

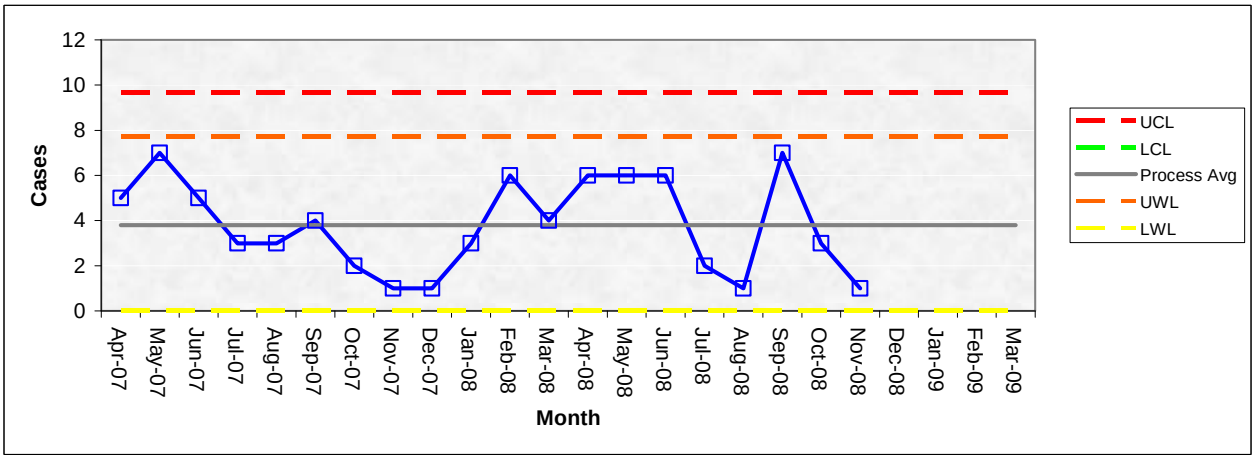
- There was a drop in the number of identified SABs in November to the lowest level since February 2008
- There was a slight rise in hospital and healthcare acquired SABs in Ayr

Integrated Care & Emergency Services *Staphylococcus aureus* Bacteraemias
Apr 07 – Nov 08



Mean: Apr 07 – Nov 08

Integrated Care & Emergency Services Hospital & Healthcare Acquired
***Staphylococcus aureus* Bacteraemias**
Apr 07 – Nov 08

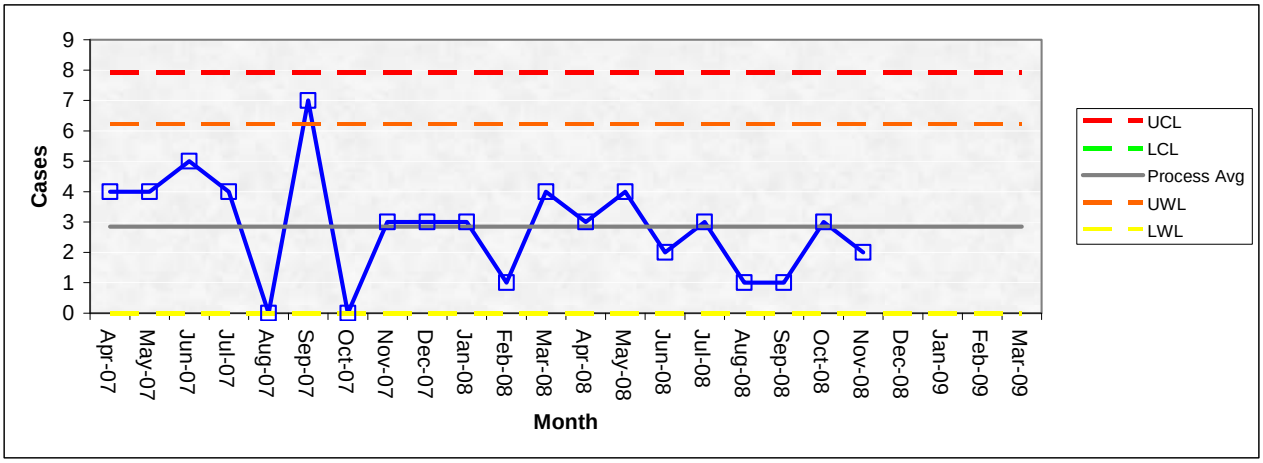


Mean: Apr 07 – Nov 08

Comment:

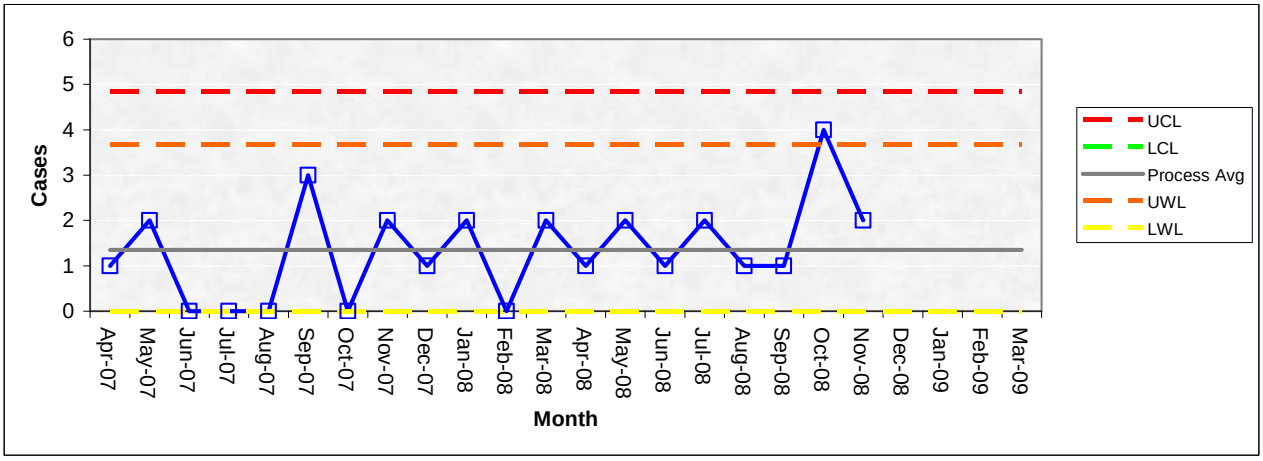
- Following the recent re-focussing exercise in Ayrshire & Arran the SAB database has been retrospectively amended to reflect the new directorate structure and assumes that the newly established directorates have been in place since the database's inception.
- Identified SABs in the Integrated Care & Emergency Services directorate remained stable just below the mean
- Hospital and healthcare acquired SABs in the directorate continued to fall from the peak in September

Integrated Care & Partner Services *Staphylococcus aureus* Bacteraemias
Apr 07 – Nov 08



Mean: Apr 07 – Nov 08

Integrated Care & Partner Services Hospital & Healthcare Acquired
***Staphylococcus aureus* Bacteraemias**
Apr 07 – Nov 08



Mean: Apr 07 – Nov 08

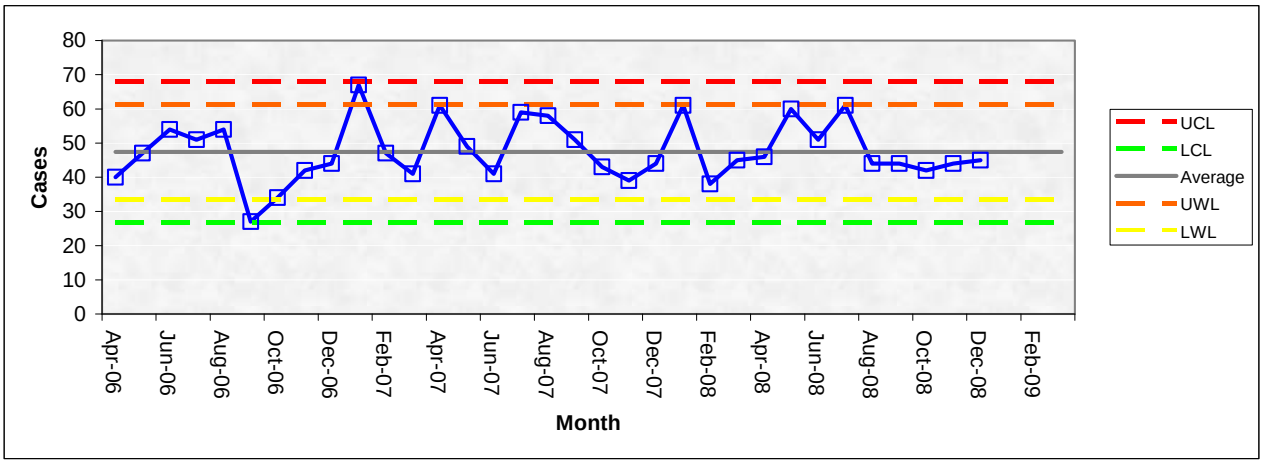
Comment:

- Identified SABs in the Integrated Care & Partner Services directorate fell from the peak in October
- Hospital and healthcare acquired SABs in the directorate fell back below the mean

Part 2

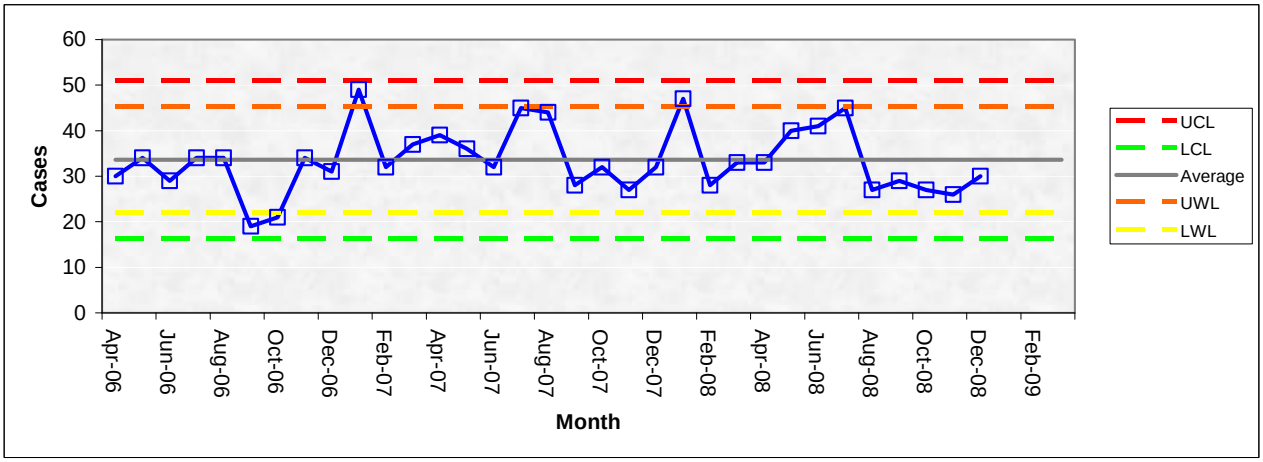
Clostridium difficile Associated Disease

NHS Ayrshire & Arran Inpatient Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08



Mean: Apr 06 – Mar 08

NHS Ayrshire & Arran Probable Hospital Acquired Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08



Mean: Apr 06 – Mar 08

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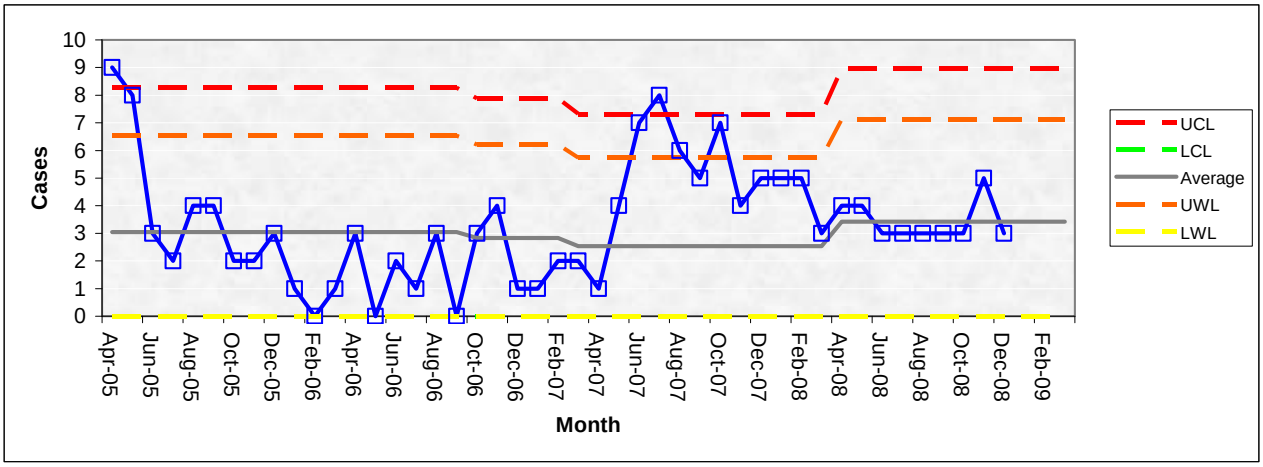
Comment:

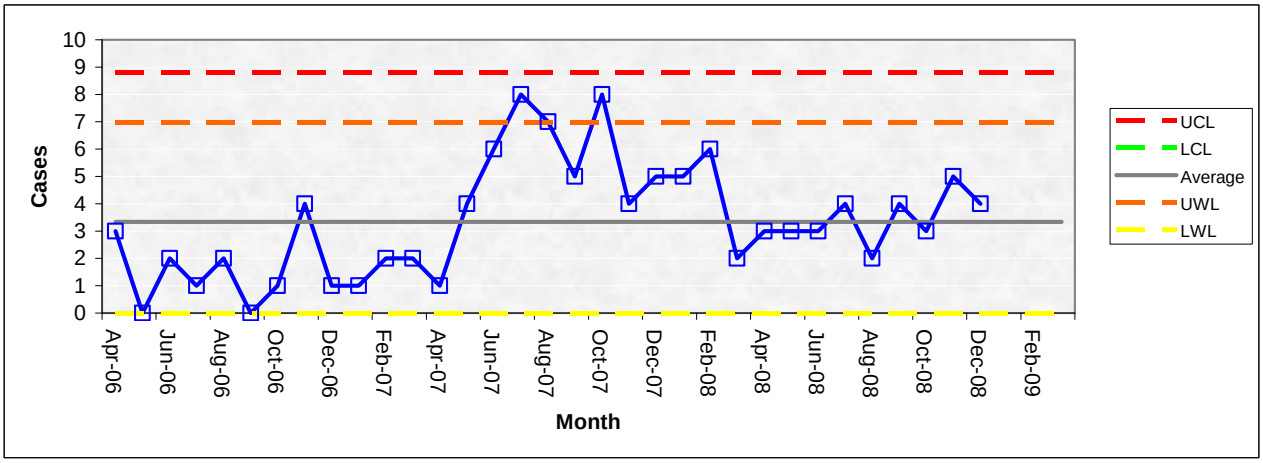
- Identified cases of *Clostridium difficile* remain stable just below the mean for the 5th consecutive month. This is the longest sustained period below the mean since the current database was established in April 2006
- Acquired cases of C. diff remained below the mean for the 5th consecutive month. The longest sustained period since the current database was established.

Ayrshire Central Hospital
Cases of *Clostridium difficile* Associated Diarrhoea Apr 05 – Dec 08



Mean: Apr 06 – Mar 08

Ayrshire Central Hospital Probable Acquired Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08

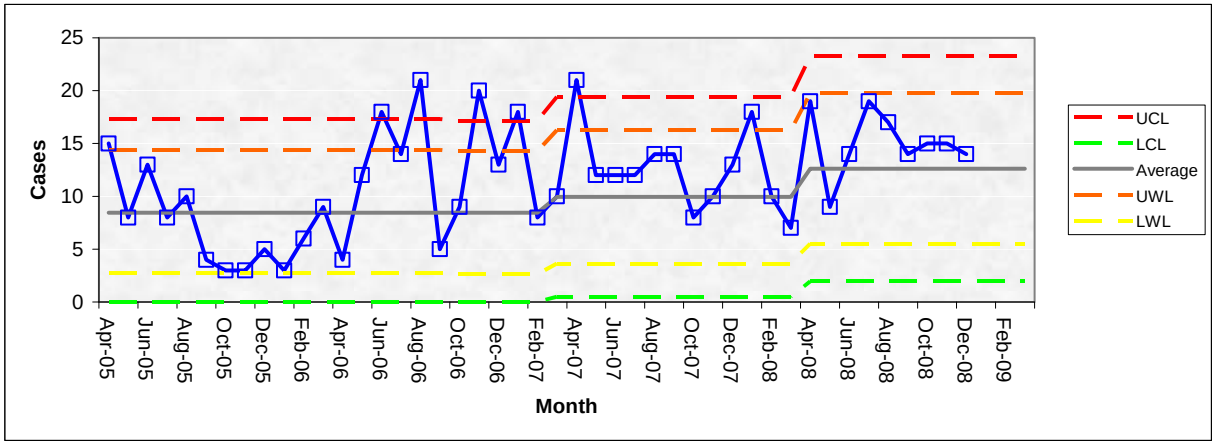


Mean: Apr 06 – Mar 08

Comment:

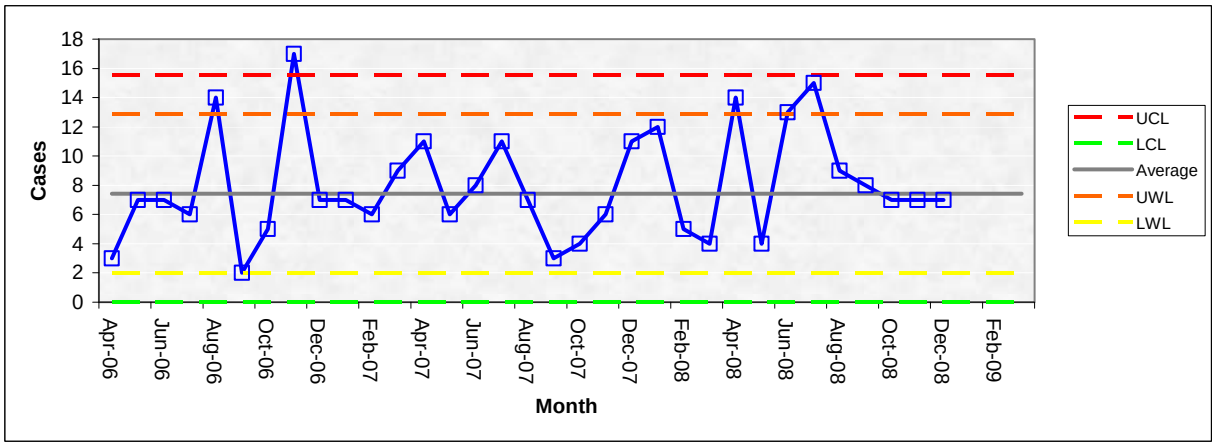
- Identified cases fell slightly. Cases have remained stable during 2008 and at lower levels than that experienced in the second half of 2007 though lower levels have been achieved historically
- Acquired cases of C. diff fell slightly though they remain above the mean for the 2nd consecutive month

Ayr Hospital Cases of *Clostridium difficile* Associated Diarrhoea
Apr 05 – Dec 08



Mean: Apr 06 - Mar 08

Ayr Hospital Probable Acquired Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08

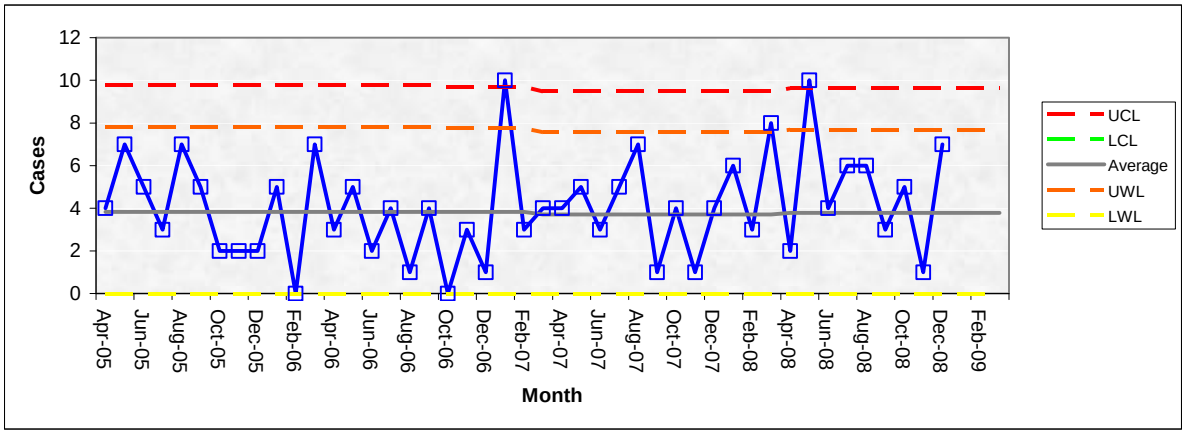


Mean: Apr 06 – Mar 08

Comment:

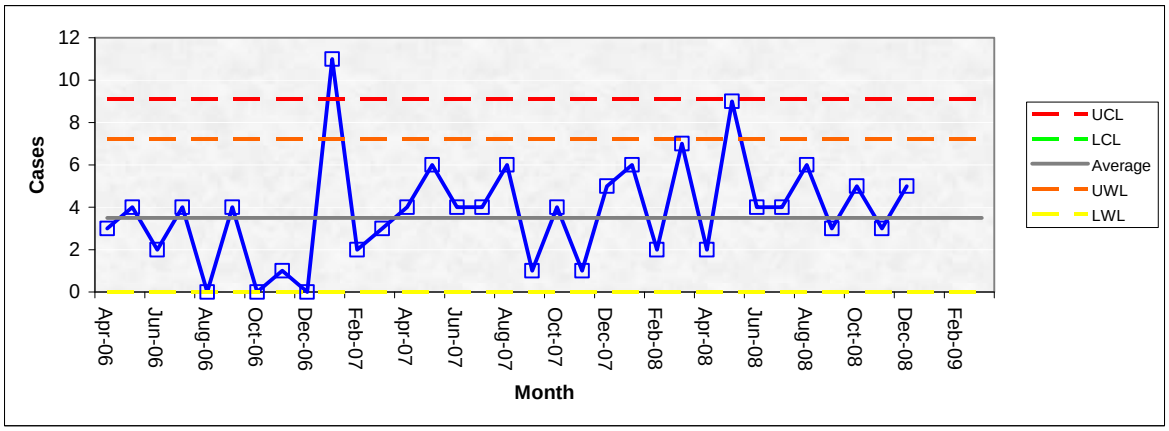
- Identified cases remain stable though they remain above the mean for the 7th consecutive month
- Acquired cases remain stable around the mean

Biggart Hospital
Cases of *Clostridium difficile* Associated Diarrhoea
Apr 05 – Dec 08



Mean Apr 06 – Mar 08

Biggart Hospital
Probable Acquired Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08

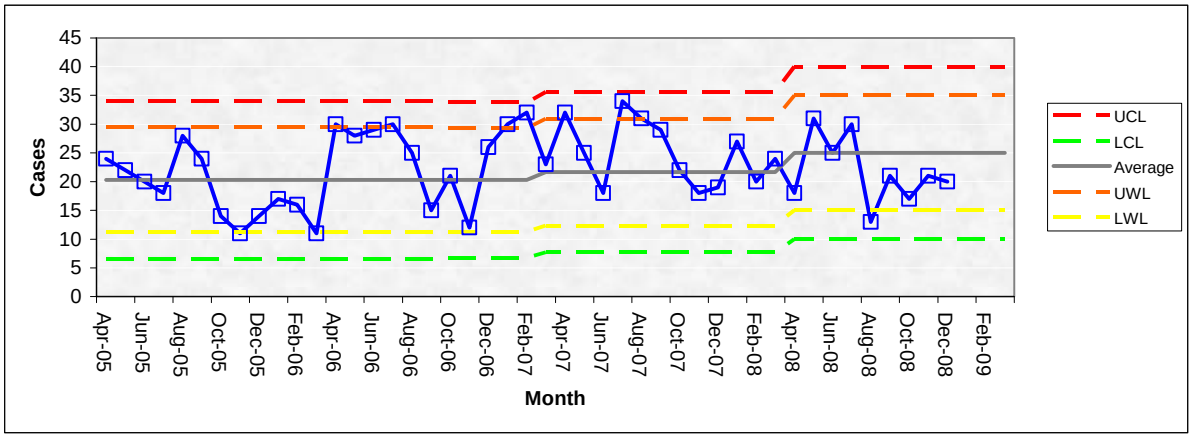


Mean: Apr 06 – Mar 08

Comment:

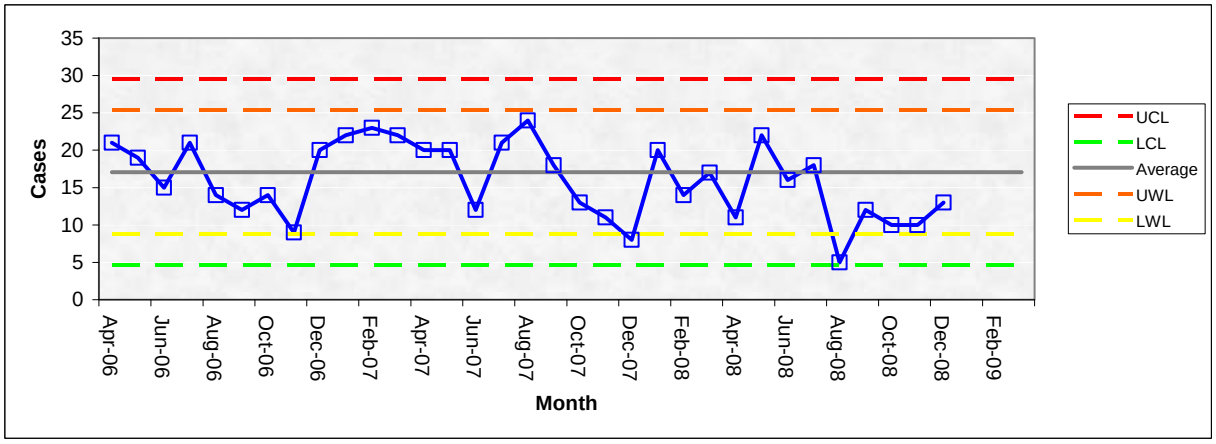
- There was a sharp increase in identified cases to there highest level since may 2008
- Acquired cases rose slightly above the mean

Crosshouse Hospital
Cases of *Clostridium difficile* Associated Diarrhoea
Apr 05 – Dec 08



Mean: Apr 06- Mar 08

Crosshouse Hospital
Probable Acquired Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08

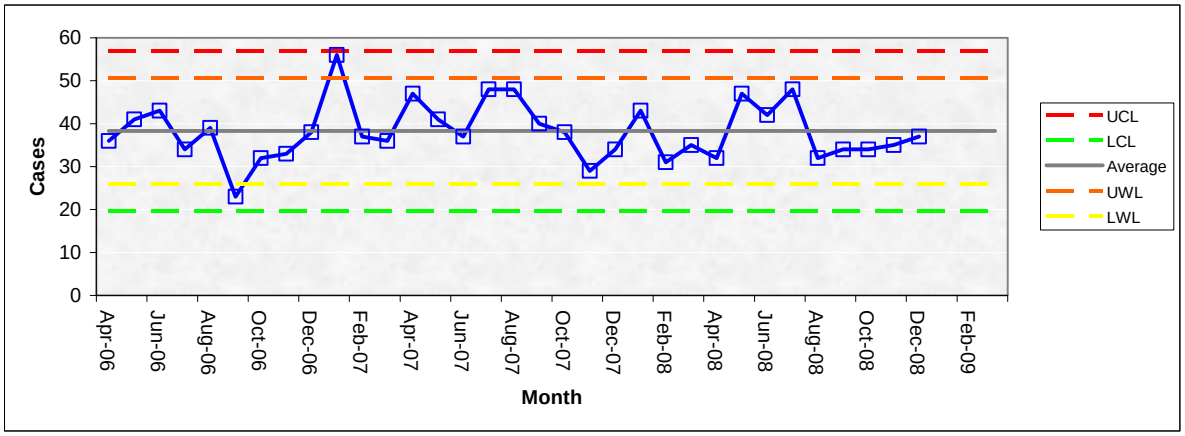


Mean: Apr 06 – Mar 08

Comment:

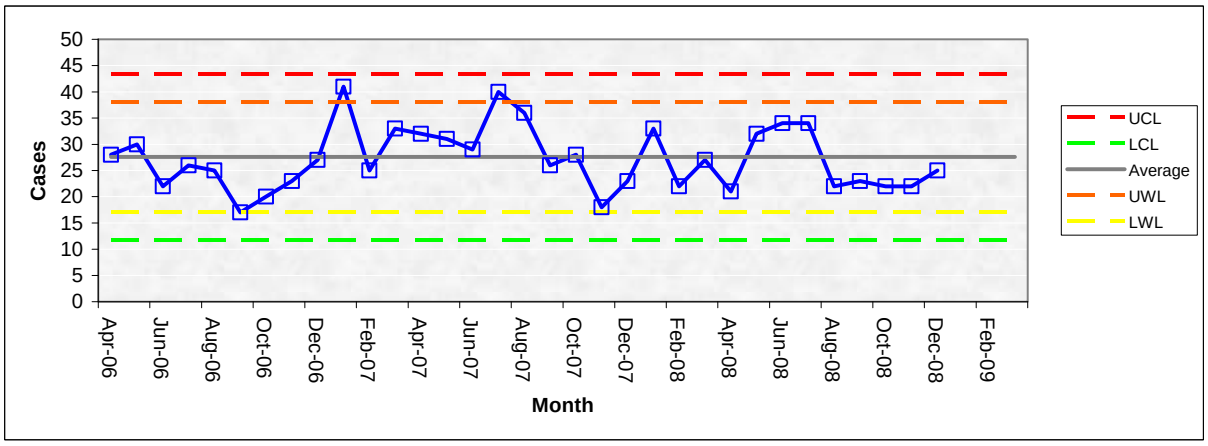
- Identified cases remained below the mean for the 5th consecutive month. The longest sustained period below the mean since March 2006
- Acquired cases rose slightly but remained below the mean for the 5th consecutive month. The longest sustained period since the current database was established

Integrated Care & Emergency Services Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08



Mean: Apr 06 – Mar 08

Integrated Care & Partner Services Probable Acquired Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08

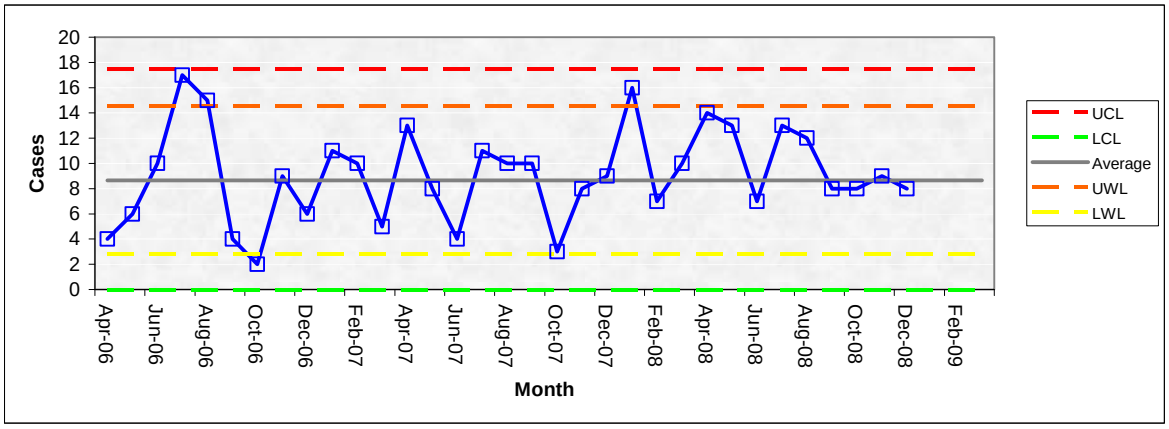


Mean: Apr 06 – Mar 08

Comment:

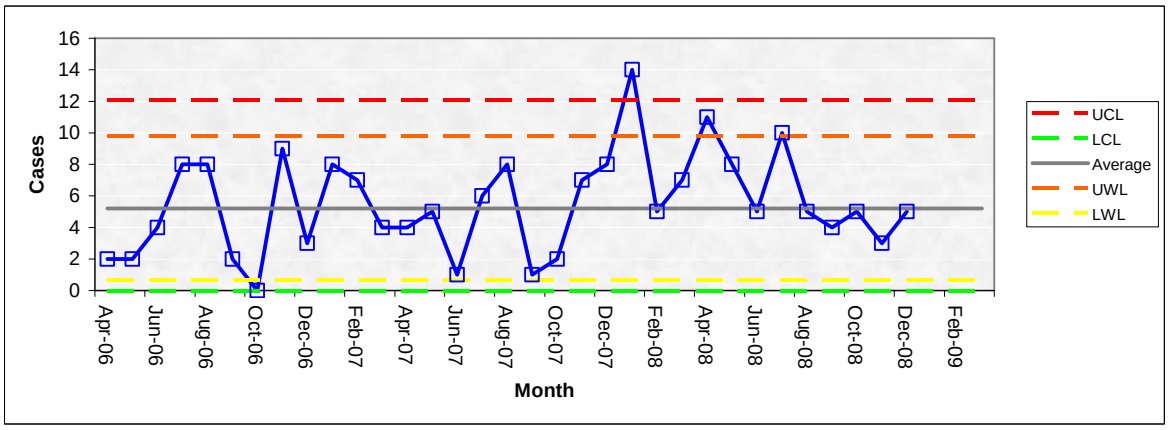
- See comments in SAB section re directorate structure
- Slight rise in identified and acquired cases but both remain below the mean for the 5th consecutive month. The longest sustained period since the current database was established.

Integrated care & Partner Services Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08



Mean: Apr 06 – Mar 08

Integrated Care & Partner Services Probable Acquired Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08

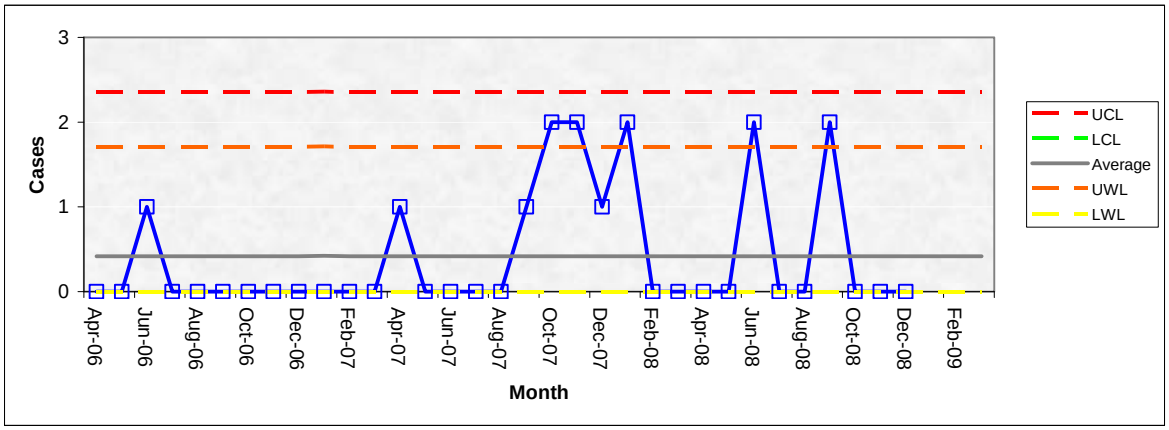


Mean: Apr 06 – Mar 08

Comment:

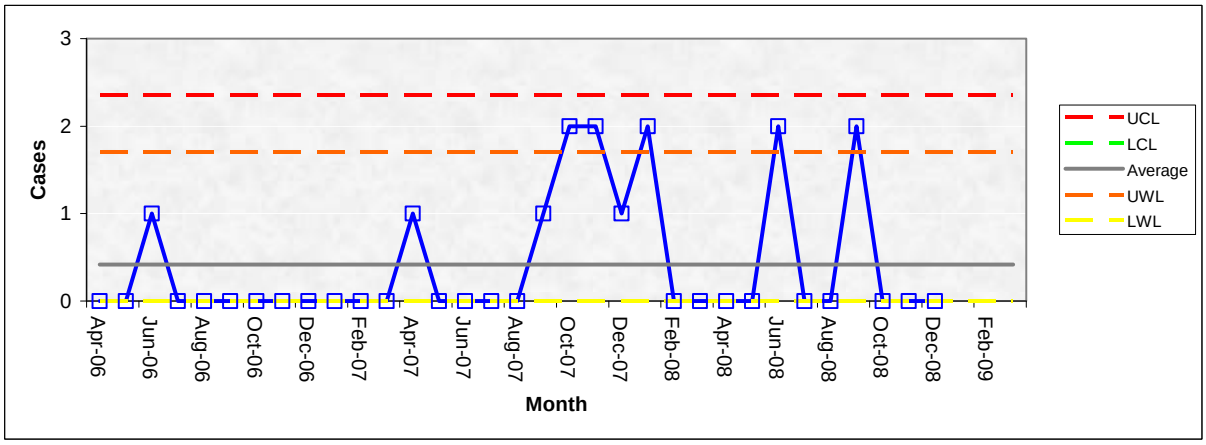
- Identified cases stable around the mean for the 4th consecutive month
- Slight rise in acquired cases. At or below the mean for the 5th consecutive month

Mental Health Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08



Mean: Apr 06 – Mar 08

Mental Health Probable Acquired Cases of *Clostridium difficile* Associated Diarrhoea
Apr 06 – Dec 08



Mean: Apr 06 – Mar 08

Comment:

- There were no identified or acquired cases of C. diff for the third successive month

Part 3

Hand Hygiene

	Compliance	Number of Observations
Staff Groups		
Nursing	93%	149
Medical	96%	46
Ancillary	97%	60
AHPs	100%	45
Hospital		
Ayr	93%	120
Ayrshire Central	95%	60
Biggart	100%	40
Crosshouse	98%	100
Board Compliance	95%	300

Hand Hygiene Compliance
NHS Ayrshire & Arran

The above data has been obtained from the audit undertaken between the 4th – 15th August 2008 as part of the National Hand Hygiene Campaign. A further audit was undertaken on the 3rd – 14th of November. The results of this audit are embargoed by Health Protection Scotland until the middle of January. A review of the local systems for recording hand hygiene audit results is currently being undertaken with a view to providing more comprehensive real time data for inclusion within future reports.

Part 4
Cleaning Specification Compliance

Hospital	Compliance Rate Oct- Dec (provisional)	Compliance Rate Jul - Sept
Acute		
Ayr	96.7%	96.7%
Ayrshire Central	94.9%	93.1%%
Biggart	97.2%	97.4%
Crosshouse	95.2%	94.7%
Community Hospitals		
Ailsa	96.7%	97.1%
Arran War Memorial	96.9%	97.1%
Arrol Park	96.1%	95.8%
Davidson	98.6%	97.8%
East Ayrshire Community	98.7%	99.3%
Kirklandside	96.9%	97.3%
Lady Margaret	96.8%	95.8%
NHS Ayrshire & Arran	**N/A**	**96.1%**

National Cleaning Specification Compliance

All sites are significantly above the 90% target established by the national monitoring framework.

The current reporting systems do not provide real time data. This will be reviewed in the near future.

Appendix 1
National HAI Reporting Template

	Issue	Board total	Hospital											Directorate			Staff group			
		BOARD TOTAL	Crosshouse	Ayr Hospital	Biggart Hospital	Ayrshire Central	Ailsa	Arran War Memorial	Arrol Park	Davidson	East Ayrshire Community Hospital	Kirklandside	Lady Margaret	Integrated Care & Emergency Service	Integrated Care & Partner Services	Mental Health	Nurse	Medical	Ancillary/other	AHP
1	Staph.aureus bacteraemias																			
	SAB numbers Dec 08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
	SAB numbers Nov 08	8	7	1	0	0	0	0	0	0	0	0	0	6	1	0				
	Mean monthly SAB Nov 07-Oct 08	9.75	6.2	3	0.33	0.17	0	0	0	0	0	0	0	7.1	2.6	0				
	MRSA numbers Dec 08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
	MRSA numbers Nov 08	1	0	1	0	0	0	0	0	0	0		0	0	1	0				
	MSSA numbers Dec 08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
	MSSA numbers Nov 08	2	7	0	0	0	0	0	0	0	0		0	6	1	0				
2	Cdifficile associated disease																			
	CDAD episodes Dec 08	45	20	14	7	3	0	1	0	0	0	0	0	37	8	0				
	CDAD episodes Nov 08	44	21	15	1	5	0	0	0	0	2	0	0	35	9	0				
	Mean monthly SAB Nov 07-Oct 08	47.9	21.9	13.6	4.8	3	0.7	1	0	0.7	0.8	0.4	0.2	36.8	10	0.8				
3	Hand hygiene programme																			
	Compliance score August 08	95%	98%	93%	95%	95%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	93%	96%	97%	100%
	No of observations August 08	300	100	120	60	60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	149	46	60	45
4	Cleaning specification compliance																			
	Compliance rate Oct-Dec 08	N/A	95.2	96.7	97.2	94.9	96.7	96.9	96.1	98.6	98.7	96.9	96.8	N/A	N/A	N/A				
	Number of audits Oct-Dec 08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
	Compliance rate previous quarter	N/A	94.7	96.7	97.4	93.1	97.1	97.1	95.8	97.8	99.3	97.3	95.8	N/A	N/A	N/A				
	Number of audits previous quarter	509	210	97	41	31	130													

Appendix 2
ALERT ORGANISM SURVEILLANCE METHODOLOGY

Introduction

The purpose of Alert Organism Surveillance system is not to identify every single case of an alert organism, but to ensure that trends are accurately and consistently identified and reported. The collection of data on patients with alert organisms and the interpretation and presentation of that data is complex and the methodology used to record one infectious disease may not be appropriate for another. Since April 2006 a single Alert Organism & Condition Surveillance System has been established within NHS Ayrshire & Arran.

The value of any surveillance system lies in ensuring that the analysis of the data is fed back to the relevant individuals and committees promptly in an easily understood manner and utilised to target resources in tackling HAI issues. This is achieved in 3 ways:

- The Infection Control Team (ICT) utilises the data to identify priority areas and to target resources and develop initiatives in those areas to reduce the risk to patients
- The feedback of HAI data to individual wards on a monthly basis ensuring that wards have accurate and upto date data to measure their progress on controlling HAI in their areas and to allow early intervention where problems may be developing. A comprehensive programme of monthly feedback to over 40 wards is now in place.
- The provision of regular reports to the Prevention and Control of Infection Committee, the NHS Board and senior managers.

Clostridium difficile

The clinical course of *Clostridium difficile* associated diarrhoea (CDAD) can range from a single episode of diarrhoea, through to prolonged severe diarrhoea. It can in rare circumstances cause pseudomembranous colitis, a potentially life threatening disease. CDAD is often characterised by relapses. Symptoms redevelop, sometimes several weeks after the initial symptoms have resolved. This recurrence maybe as a result of reactivation of the initial infection and could be considered a continuation of the previous episode or be a new acquisition of *C. diff* from another source and therefore be a new case.

Since it is difficult to determine whether a recurrence of CDAD is reactivation of the initial infection or a new acquisition of the organism the ICT have use the following definition to record *C. diff* cases:

> If recurrence of CDAD occurs more than 28 days after the last symptomatic episode and discontinuation of antibiotic therapy then it would be classed as a new case and recorded in the database.

If recurrence of CDAD occurs within 28 of the last symptomatic episode and discontinuation of therapy it would be classed as a continuation of the previous episode and not recorded in the database.

Statistical Process Control Charts

The number of alert organisms such as cases of CDAD will naturally vary from month to month. It is important that the ICT and the organisation can identify when this variation is "normal" and when it indicates a significant increase or decrease on the numbers experienced previously. Statistical Process Control Charts are a means of representing trends in data in a simple visual manner that can be easily understood by those unfamiliar with statistical analysis.

SPC takes the mean over an extended time (minimum of 24 months). It then sets upper and lower control limits at 3 standard deviations below and above the mean. These are known as the upper control limit (UCL) and lower control limit (LCL). All readings between the upper and lower control limits are assumed to arise as a result of natural variation and thus in statistical control. Readings above the upper control limit or below the lower control limit are assumed have been caused by some event or events and not as a result of natural variation.

The SPC charts in this report also contain upper warning lines (UWL) and Lower Warning Lines (LWL). These are set at 2 Standard deviations above and below the mean and are used to alert the ICT that significant changes may be occurring.

More detailed analysis of SPC Charts can also take place. There are a number of rules that can be used to identify significant trends within the data. These are:

- 8 or more consecutive points on the same side of the centre line
- Consecutive points alternately going up an down 13 times
- 6 successive points all going down
- A point wildly different from the others
- Points following a cyclical pattern
- 2 consecutive points falling outside the LWL & UWL

Interventions

The value of SPC charts lies in their ability to act as a trigger for intervention. The ward based reports are reviewed by the ICT monthly. Where a ward is above the upper control limit then a review is carried out by the ICT in conjunction with ward staff. The extent of the review will be dependent upon the number of cases that have occurred and the trend that has developed within the ward.

The review will utilize tools such as fishbone cause and effect charts and in the case of CDAD "The Checklist for Preventing and Controlling *Clostridium difficile* Associated Disease" recently issue by Health Protection Scotland.