

# Infection Control Annual Report

2015/16

October 2016



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# Summary and progress against infection control objectives for 2015/16

This report collates and summarises information on healthcare associated infection that has been presented to commissioners of healthcare and the Trust Board throughout the year from April 2015 until the end of March 2016. It has been written for all those who use the Trust, either as patients, relatives of patients, visitors, or members of staff.

A key priority for the Trust in 2015/16 was to continue to control the number of cases of *Clostridium difficile* infection. In 2015/6, targets for reportable healthcare associated infections set by Cambridgeshire & Peterborough Clinical Commissioning Group (CCG) were achieved.

One key *C. difficile* control measure was the decant and deep clean programme of wards. This involved movement of an entire ward to an empty decant facility to allow it to be cleaned thoroughly while it was vacant. This was halted in 2015/6 due to operational and capacity issues. However, various measures were introduced in order to reduce the impact of this and the cleaning team was redeployed to provide an enhanced cleaning service, which could respond to requests by the infection control team (for example after a case of *C. difficile* or an outbreak). Another key control measure involved the scrutiny of all cases of hospital onset *C. difficile* cases with colleagues from the CCG. Of the 53 cases of *C. difficile* in 2015/16, no lapse in care was identified in 26. This was an improvement on the year 2014/15. These infections were classed as 'non-trajectory' for performance monitoring purposes by the CCG. This means that, for these patients, no financial penalties were imposed.

Other key objectives for 2015/16 were to maintain the low levels of MRSA bloodstream infection in the Trust and aim that no preventable infection should occur. One MRSA bacteraemia was assigned to the Trust. This was considered to be a contaminant of the blood sampling procedure and not a true infection. The patient therefore did not require treatment.

Work by the Estates and Facilities department continues to ensure that the risk of infection resulting from exposure to water remains as low as possible. No confirmed infections were seen in 2015/6, but the age of the hospital water distribution system has meant that a significant amount of maintenance work is required on an on-going basis.

Finally, antibiotic resistance has been an important issue in recent years. The Trust has implemented national guidance for the identification and management of the most resistant microorganisms. In 2015/6 multiply resistant organisms were introduced into the Trust on several occasions from outside, but these were managed very well and outbreaks were prevented.

I would like to thank everyone in the Trust for their continuing efforts to avoid all preventable infections in our hospitals. This is a key priority for us and we continue to be able to demonstrate real improvement to the care that we provide.

Dr J Ahluwalia

Medical Director/Director of Infection Prevention & Control

# Introduction

**Tackling infections is a key priority for Cambridge University Hospitals NHS Foundation Trust and our goal is that not a single preventable infection is allowed to develop.**

Infection prevention and control is an essential component of the work of the Trust and is reflected in our priorities.

## Trust priorities:

— embody a quality service which is all about people - patients, staff and partners:

- improving the experience of patients
- improving patient care and safety
- ensuring clinical excellence and effectiveness
- valuing our staff and partners
- striving for innovation in all we do
- achieving strong financial performance

These priorities keep us focused on what is important and drive us towards excellence - respecting each other as colleagues, working together for better patient care and sharing our goals as a developing and dynamic organisation.

This report provides an overview of the management structures, standards, policies and procedures supporting the prevention and control of infection at Cambridge University Hospitals NHS Foundation Trust. Infection control objectives have been set and are embedded in the Trust values of being **safe, kind and excellent** in all that we do.

The Trust's strategy for the management of risks associated with infection prevention and control is approved by the control of infection committee and compliance is monitored by the Trust board of directors and the Trust's clinical governance structures.

The strategy is based on the criteria contained within *The Health and Social Care Act 2008* and the *Code of Practice for the NHS on the Prevention and Control of Infections and Related Guidance* (Department of Health, 2015) and draws on previous and current advice from the Department of Health and Care Quality Commission.

The Trust's *Infection Control Annual Priorities and Audit Programme* has been developed to identify and monitor the implementation of national guidance and evidence based practice that will enable the Trust to achieve further reductions in healthcare associated infections (HCAI) and to meet the MRSA and *C. difficile* targets agreed with commissioners of healthcare services, in 2015/16 particularly the Cambridgeshire & Peterborough Clinical Commissioning Group (CCG).

# Context and compliance with the Code of Practice for the NHS on the Prevention and Control of Healthcare Associated Infections (2010)

The Care Quality Commission (CQC) was established by the *Health and Social Care Act 2008* to regulate the quality of health and social care and look after the interests of people detained under the Mental Health Act. In April 2009 the CQC took over the work of the Healthcare Commission, the Commission for Social Care Inspection and the Mental Health Act Commission.

The self-assessment in the *Saving Lives* balanced scorecard is used to monitor compliance with the *Code of Practice for the NHS on the prevention and control of infections and related guidance* (updated July 2015). The principle change between the 2010 and 2015 updates is criterion 3 which relates to appropriate antimicrobial use.

The Trust has registered with the CQC and declared full compliance with the nine compliance criteria detailed in the revised *Code of Practice*. CQC has a programme of unannounced visits to Trusts to assure compliance, but no infection prevention and control visit was made to the Trust in 2015/16. The compliance criteria are listed below:

- Criterion 1 Have systems to manage and monitor the prevention and control of infection. These systems use risk assessments and consider how susceptible service users are and any risks that their environment and other users may pose to them.
- Criterion 2 Provide and maintain a clean and appropriate environment in managed premises that facilitates the prevention and control of infections.
- Criterion 3 Ensure appropriate antimicrobial use to optimise patient outcomes and to reduce the risk of adverse events and antimicrobial resistance.
- Criterion 4 Provide suitable accurate information on infections to service users and their visitors and any person concerned with providing further support or nursing/ medical care in a timely fashion.
- Criterion 5 Ensure that people who have or develop an infection are identified promptly and receive the appropriate treatment and care to reduce the risk of passing on the infection to other people.
- Criterion 6 Ensure that all staff and those employed to provide care in all settings are fully involved in the process of preventing and controlling infection.
- Criterion 7 Provide or secure adequate isolation facilities.
- Criterion 8 Secure adequate access to laboratory support as appropriate.
- Criterion 9 Have and adhere to policies, designed for the individual's care and provider organisations, which will help to prevent and control infections.
- Criterion 10 Ensure, so far as is reasonably practicable, that care workers are free of and are protected from exposure to infections that can be

caught at work and that all staff are suitably educated in the prevention and control of infection associated with the provision of health and social care.

## Management structure

The Chief Executive has overall responsibility for the control of infection within Cambridge University Hospitals NHS Foundation Trust. Dr Jag Ahluwalia, Medical Director, is the Trust designated Director of Infection Prevention & Control (DIPC). He reports directly to the chief executive. Dr Susan Robinson acts as Deputy Medical Director with infection control responsibilities.

Infection control is reviewed regularly at meetings of the board of directors, management executive and divisional clinical meetings.

The day-to-day business of infection prevention and control is carried out by the infection control team (ICT). The ICT sit within the patient safety directorate and report directly to the medical director (DIPC) and Sharon McNally, the deputy chief nurse.

The main work of the ICT is to produce and implement the *Infection Control Annual Priorities and Audit Programme* and to resolve current infection control problems in the Trust by appropriate action or issue of advice. The content of the annual programme is based on the standards set out in the *Code of Practice for the NHS on the Prevention and Control of Infections and Related Guidance*, supported by corporate and local assessments of risk and surveillance and audit activity.

Rachel Thaxter remains the senior nurse in infection control. The ICT comprises 5.6 wte infection control nurses (ICN), 1 wte performance information analyst, 0.54 wte audit and surveillance nurse, 1.8 wte surgical site surveillance nurses, 1 wte healthcare assistant and 0.4 wte secretarial support.

Consultant medical microbiology support is provided by Dr David Enoch (also the designated infection control doctor (ICD)) and Dr Jumoke Sule. The Trust control of infection committee is chaired by Dr Nick Brown, the former Infection Control Doctor. The committee meets six times each year and has wide representation throughout the Trust. The Control of Infection Committee reports to the Trust quality committee. Minutes of the control of infection committee are circulated widely.

Each division within the Trust has a dedicated infection control group to review infection control performance and facilitate the implementation of infection control initiatives. Each clinical directorate has a designated medical consultant lead and senior clinical nurse lead for infection control, with clear roles and responsibilities. Infection control is a standing agenda item at divisional meetings. It is also included in staff induction, annual mandatory training and appraisal. Divisional directors are responsible for achieving the targets set for their clinical departments and performance against Trust and divisional targets is monitored within the monthly infection control performance reports at Trust and divisional meetings.

## Nursing quality metrics, including hand hygiene and High Impact Interventions

The Trust's nursing audit programme continued throughout 2015/16 using the nursing documentation audit tool and patient experience questionnaire. The senior nursing team (senior clinical nurses and senior sisters) are responsible for

undertaking the nursing documentation audit on five sets of patient notes on each ward weekly, and the patient experience questionnaire with up to five patients on each ward weekly. The audit tools, which are reviewed annually, include:

**Nursing Audit Tool** to review appropriate completion of documentation and compliance with standards for patient care, including monitoring of patient observations, nutrition, fluid balance, medicines administration, diabetes management, falls management, pressure area care, oxygen administration, intentional rounding and infection control (intravascular catheter care).

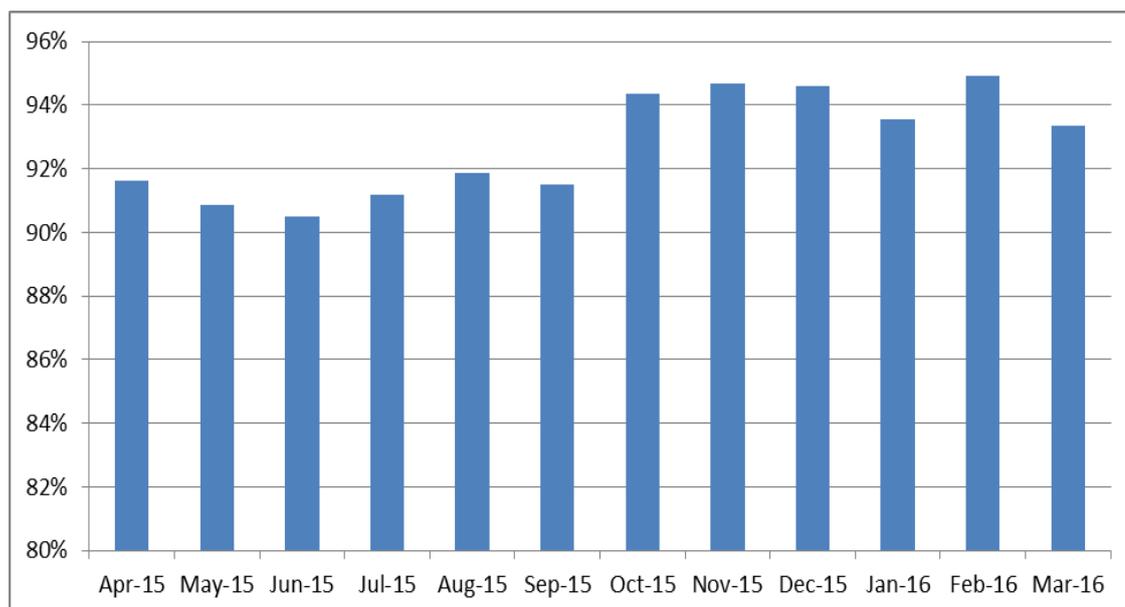
**Patient Experience Audit** including staff attitude, communication, discharge planning, privacy & dignity, pain management, mixed sex accommodation, nutrition and the infection control elements of hand hygiene and environmental cleanliness.

The nursing audit and patient experience audit results are reported in a Heat Scorecard, broken down to Trust/Divisional level and Ward/Divisional level using the red/amber/green traffic light system. The heat scorecards enable Wards/Divisions to identify areas of good practice quickly and areas where compliance is poor.

<b>Green - good</b>	<b>95% - 100%</b>
<b>Amber - fair</b>	<b>85% - 94%</b>
<b>Red - poor</b>	<b>0% - 84%</b>

The heat scorecards are included within a monthly **Nursing Quality Metrics (NQM) report**. The NQM report includes general Trust data (productivity, human resources, patient safety) and infection control data (hand hygiene, *C. difficile* infection, MRSA bloodstream infection, ward cleanliness). The reports are also available on the Trust electronic intelligence system (CHEQS) which enables easy access and a view of trend data.

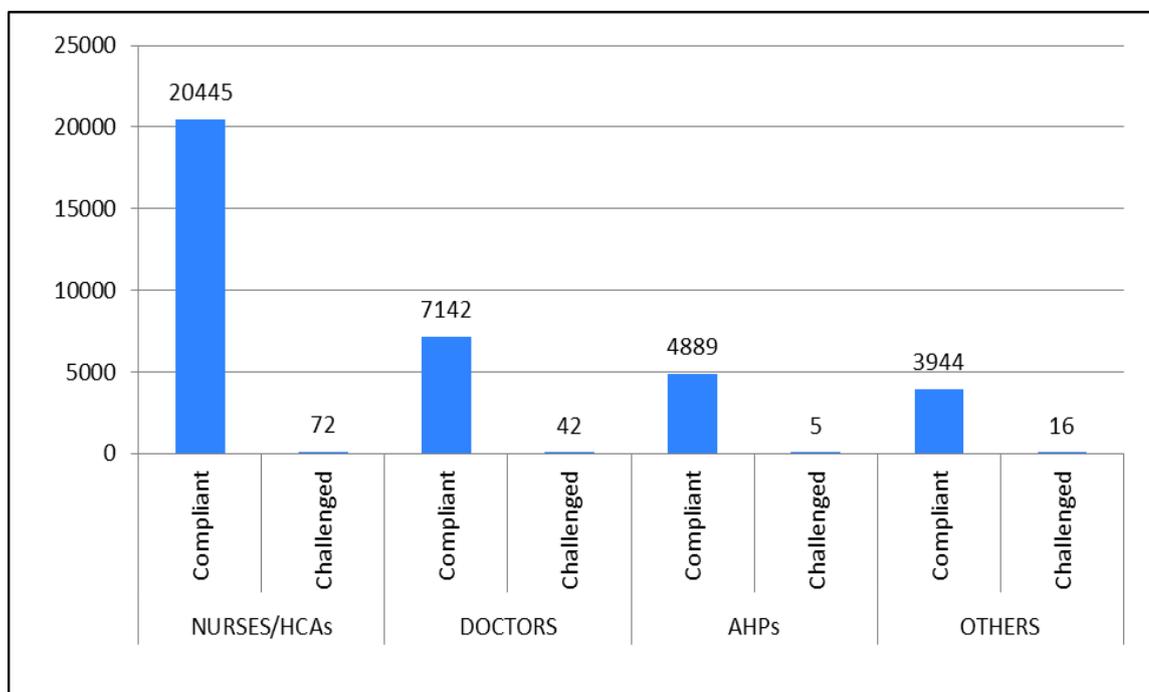
**Figure 1** NQM intravascular cannula care audit.



In addition to the nursing documentation audits and the patient experience questionnaire, wards continued to undertake fortnightly **hand hygiene**

**observational audits** of hand hygiene at the point of care. The results from the hand hygiene audits are reported monthly by staff group/Ward/Division/Trust and the overall results included within the Trust data section of the Nursing Quality Metrics report. A total of **36,555** hand hygiene opportunities were observed in 2015/16 and the overall compliance rate for the year was **99.6%**. Non-compliant staff performed hand hygiene after they were challenged by the auditor.

**Figure 2** Breakdown of hand hygiene compliance by staff group 2015/16.



The Department of Health High Impact Intervention (HII) care bundles set out the practical actions that clinical staff need to undertake to significantly reduce HCAI. Compliance with the HII is audited weekly within the nursing documentation audits and separate monthly audits; results are reported within the infection control performance report. The HII include guidance on:

1. Peripheral intravenous cannula care
2. Renal dialysis catheter care
3. Care for ventilated patients
4. Reducing the risk of *Clostridium difficile*

Compliance with the completion of documentation is audited within the nursing audit tool. The Trust-wide results of the infection control-related questions in the nursing audit for 2015/16 are shown in the Tables below.

**Table 1** Overall summary of Trust-wide compliance with infection control elements of nursing documentation audits (HII = high impact intervention)

	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16
HII 1 & 2 Peripheral iv cannula care bundle	91.6%	90.8%	90.5%	91.2%	91.9%	91.5%	94.4%	94.7%	94.6%	93.5%	94.9%	93.3%
HII 3 Renal dialysis catheter care bundle	99.2%	99.2%	93.3%	100%	95.8%	94.2%	100%	96.7%	99.2%	99.2%	95.8%	100%
HII 5 Care bundle for ventilated patients*	80.5%	50.0%	43.3%	95.5%	92.0%	96.0%	97.0%	97.5%	97.5%	98.0%	98.0%	98.5%
HII 7 Prevention of spread of <i>Clostridium difficile</i>	95.8%	94.4%	92.9%	90.0%	93.8%	97.5%	94.6%	100.0%	95.2%	97.2%	100%	100%

Part of the Commissioning for Quality and Innovation (CQUIN) programme, the **NHS Safety Thermometer (ST)** was introduced nationally in April 2012. The Safety Thermometer is used as an improvement tool for measuring, monitoring and analysing patient harms and 'harm free care'. The Safety Thermometer is a monthly point prevalence audit (auditing all patients on a given day each month) and involves four outcomes – falls, pressure ulcers, venous thromboembolism and urinary tract infections in patients with catheters. The 2015/16 data relating to harm recorded for patients with urine infections with catheters is shown in Table 2 below. The number of hospital acquired infections remains small.

**Table 2** NHS Safety Thermometer results for patients with urinary catheters

	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16
No. of Catheter-associated urine infections (Total)	3	2	7	8	2	3	1	5	2	6	7	2
No. of catheter-associated urine infections (hospital acquired)	1	0	5	1	1	2	1	3	1	1	3	1
No. of catheter-associated urine infections (community acquired)	2	2	2	7	1	1	0	2	1	5	4	1

## Mandatory surveillance

The national mandatory surveillance programme specifies that certain infections must be reported by the Trust to the Department of Health. These infections currently include meticillin-resistant *Staphylococcus aureus* (MRSA) bloodstream

infections, positive tests for *Clostridium difficile* toxin, and bloodstream infections due to methicillin-sensitive *S. aureus* (MSSA) and *Escherichia coli*.

Each year a new local target for a reduction in MRSA and *C. difficile* cases is agreed with local healthcare commissioners.

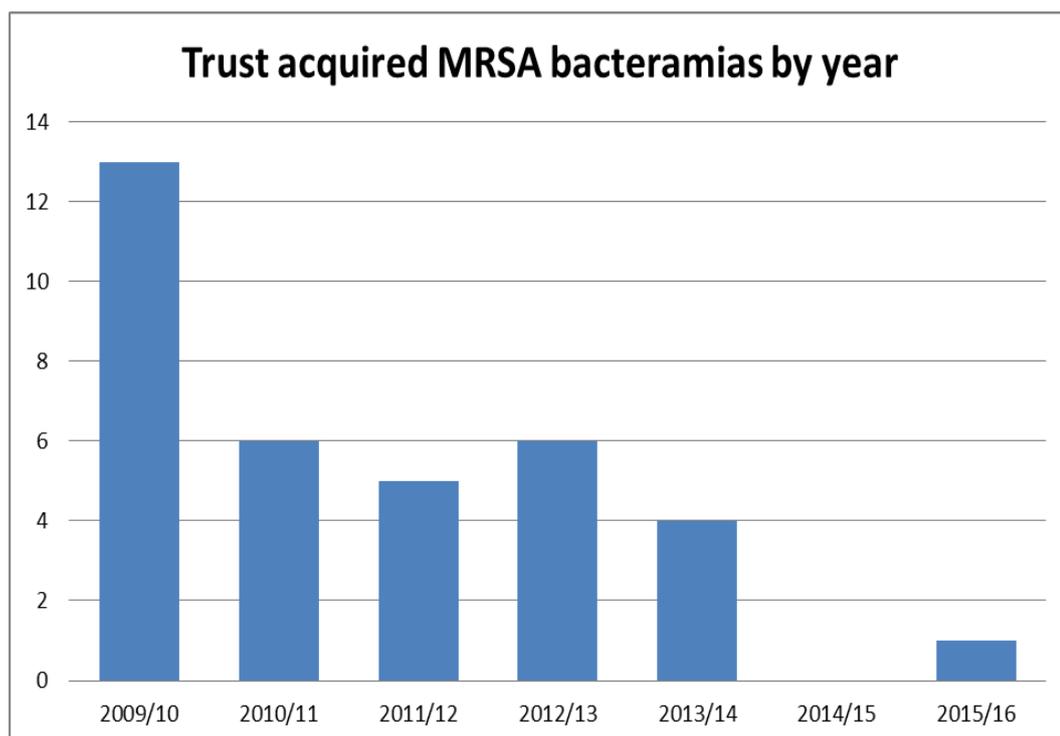
### **Methicillin-resistant *Staphylococcus aureus* (MRSA)**

The Trust works closely with community and other healthcare providers to prevent all MRSA infections wherever they occur. The aim is that no preventable MRSA bloodstream infection should occur.

Since historical data produced by the Trust included both hospital- and community-onset infections, for clarity, the total number of cases reported previously is shown together with the Trust acquired cases (Figure 3). However, targets agreed with healthcare commissioners apply to Trust-acquired infections only.

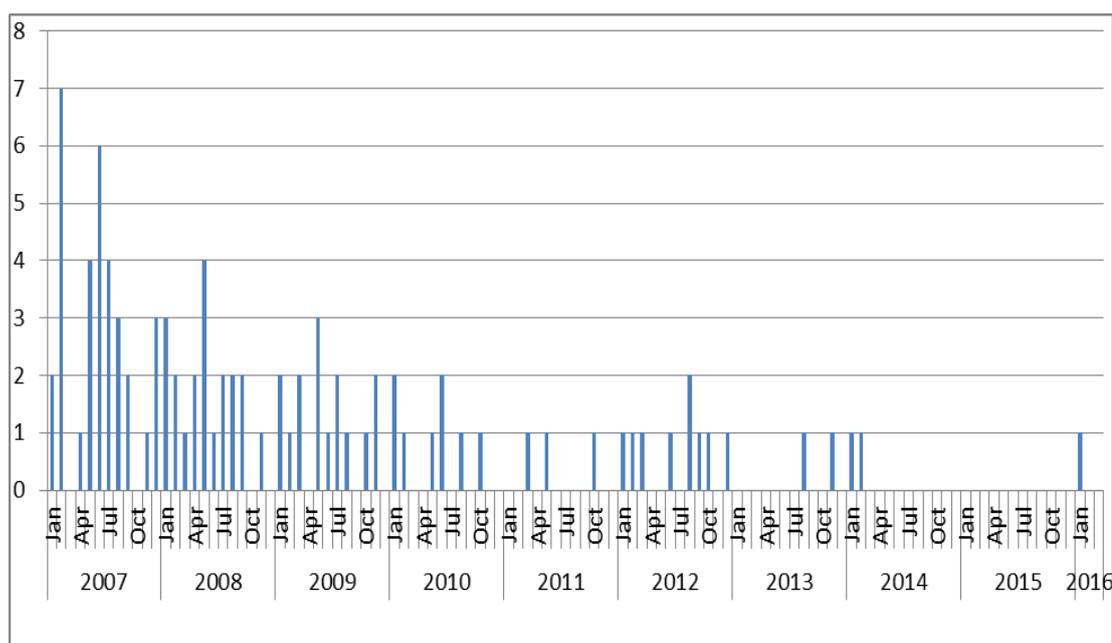
In 2015/16 there were 8 MRSA bloodstream infections in total; three of these were hospital acquired (defined as being diagnosed after 48h of hospital stay) but were all assigned as 'non-trajectory' cases as no lapse in care was identified on review. However, a blood culture taken on admission that subsequently turned out to be a contaminant of the blood sampling process (i.e. skin colonization and not a true infection) was assigned to the Trust as these should not occur.

**Figure 3** Number of Trust acquired MRSA bloodstream infections per year



All cases of MRSA bloodstream infection are examined in detail in order to establish the underlying predisposing factors and address these to prevent future infections.

**Figure 4** Number of Trust apportioned MRSA bloodstream infections per month



### ***Clostridium difficile* diarrhoea**

In 2015/16, there were 53 patients with *C. difficile* infection, compared to 54 in 2014/15 (Figure 6).

All cases of Trust attributed *C. difficile* infection continue to be reviewed in detail by a multi-disciplinary scrutiny panel, which includes representation from the local healthcare commissioners. The aim of the panel meetings is to establish if there were any lapses in care provided by the Trust to patients with *C. difficile* infection and to identify any actions that could be implemented to prevent any further cases. Twenty six of the 53 cases were considered by the review panel to be 'non-trajectory cases', whereby it was agreed they were unavoidable as best practice was followed. Twenty seven were therefore considered to be avoidable. Lapses in care that were frequently recognised as contributing to these cases included delays in time to isolation and delays in sending a sample. These and other themes were fed back to clinical staff to ensure learning (Figure 5).

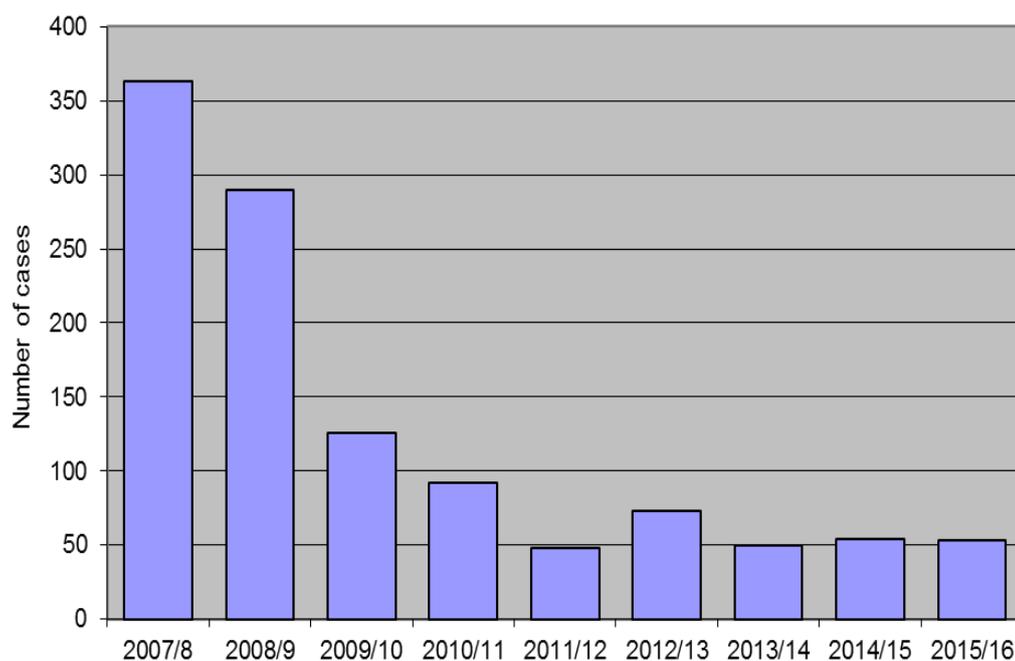
The target for 2016/17 has been set at no more than 49 hospital-acquired cases.

**Figure 5** Reasons for lapses in care for trajectory cases 2015-16 and 2014-15.

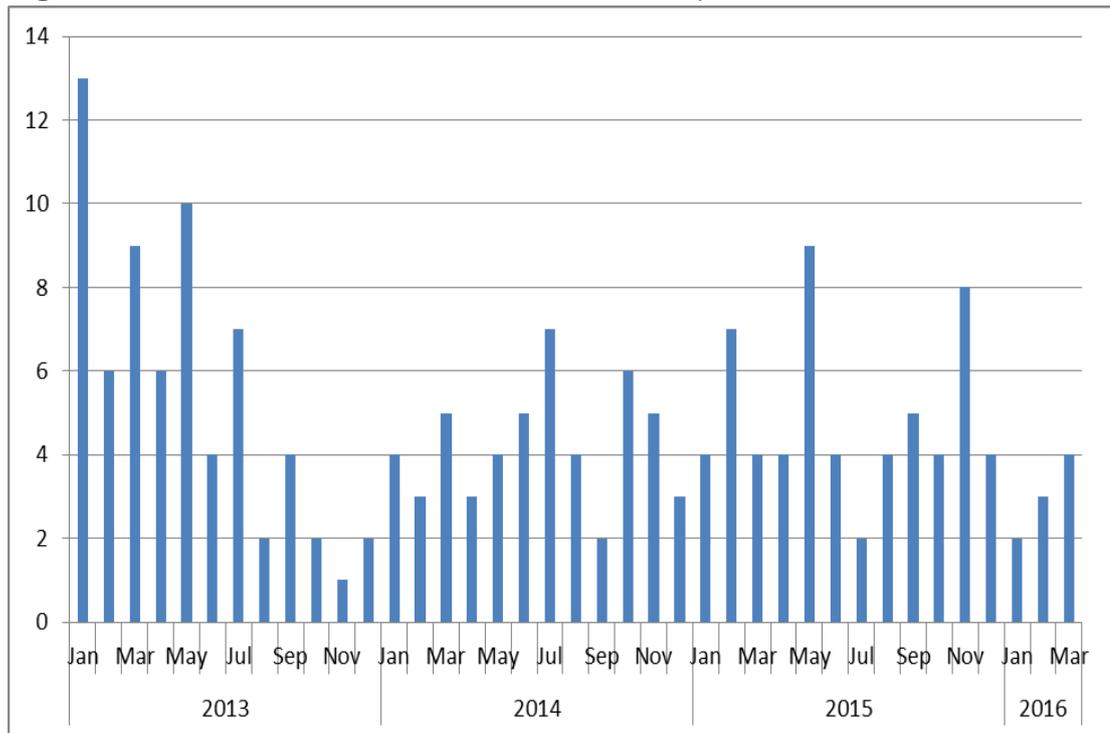
<b>2015/2016</b>	
<b>Reasons for lapses in care</b>	<b>Number of cases</b>
Delay in sample collection	8
Delay in isolation	7
Delay in sample collection and isolation	6
Delay in isolation precautions	1
Delay in sample collection and inappropriate ward movement	1
Delay in sample collection and lack of documentation	1
Delay in sample collection and poor documentation	1
Hand hygiene scores poor	1
Inappropriate CDT management from previous admission	1
<b>Total number of cases</b>	<b>27</b>

2014/2015	
Reasons for lapses in care	Number of cases
Delay in sample collection	12
Delay in sample collection and isolation	10
Delay in isolation	6
Delay in sample collection and barrier nursing	1
Delay in sample collection and cleaning score 92.4% in May	1
Delay in sample collection and prolonged use of antibiotics and EPIC issue	1
Hand hygiene audit in April and May were under 95%	1
Prolonged use of Meropenem	1
Wrong sample collection	1
Wrong sample collection and prolonged use of antibiotics	1
<b>Total number of cases</b>	<b>35</b>

**Figure 6** Number of Trust-acquired *Clostridium difficile* infections per year



**Figure 7** Number of *Clostridium difficile* infections per month

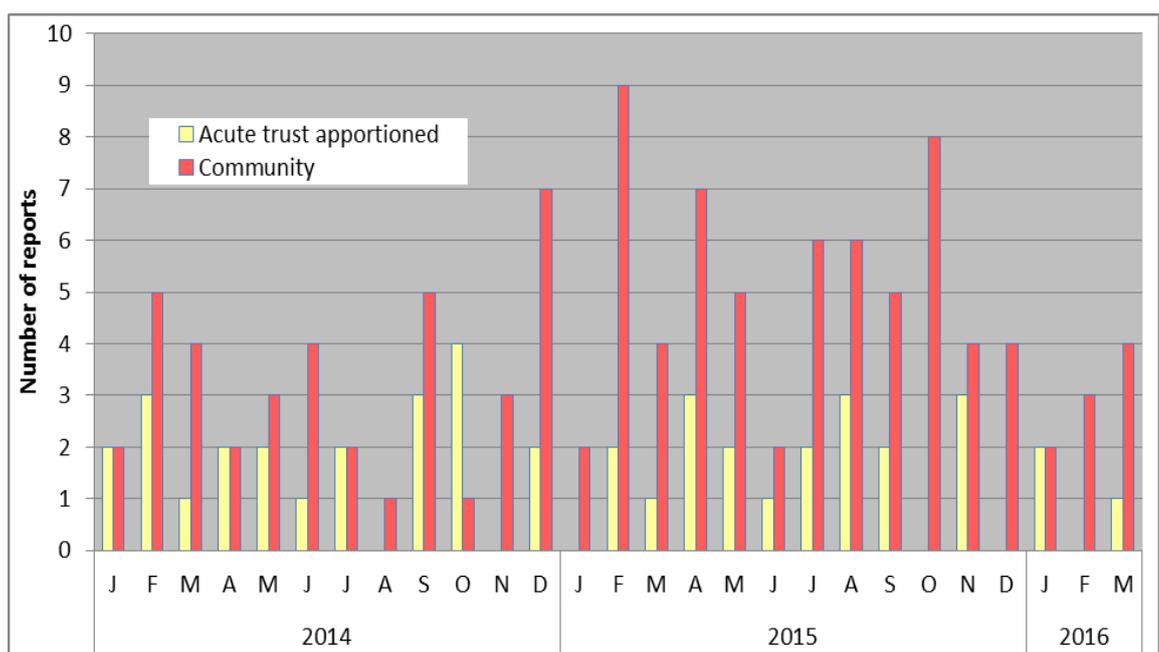


### **Meticillin-sensitive *Staphylococcus aureus* (MSSA) and *Escherichia coli***

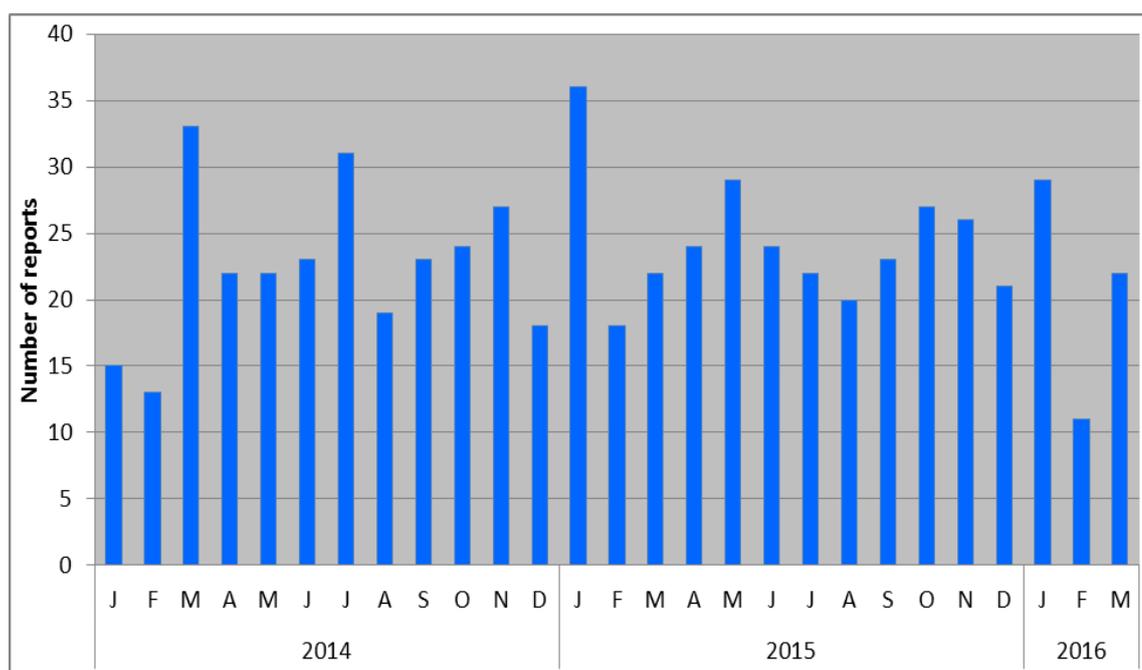
MSSA and *E. coli* blood stream infections are part of the national mandatory surveillance and therefore these infections are reported to the Department of Health each month.

These data are shown in Figures 8 and 9 below for completeness. Currently, no targets are applied to these infections.

**Figure 8** Number of meticillin-sensitive *Staphylococcus aureus* blood stream infections per month



**Figure 9** Number of *Escherichia coli* blood stream infections per month



## Surgical Site Surveillance

Surgical procedures can be complicated by infection. This is usually a minor infection of the surgical wound, although more serious infections occasionally occur. The risk of infection varies with the particular type and site of surgery. Surgery associated with the gastrointestinal tract, for example, has a much higher infection rate than 'clean' surgery, such as the elective insertion of a prosthetic hip joint.

On-going surveillance of surgical site infection for various types of surgery is used within the Trust as one measure of the quality of surgery, to identify areas where further investigation or improvement might be required, and to contribute to the mandatory reporting of orthopaedic implant surgery surveillance mandated by the Department of Health.

Surgical Site Surveillance (SSS) is performed for individual types of surgery in blocks of three months at a time.

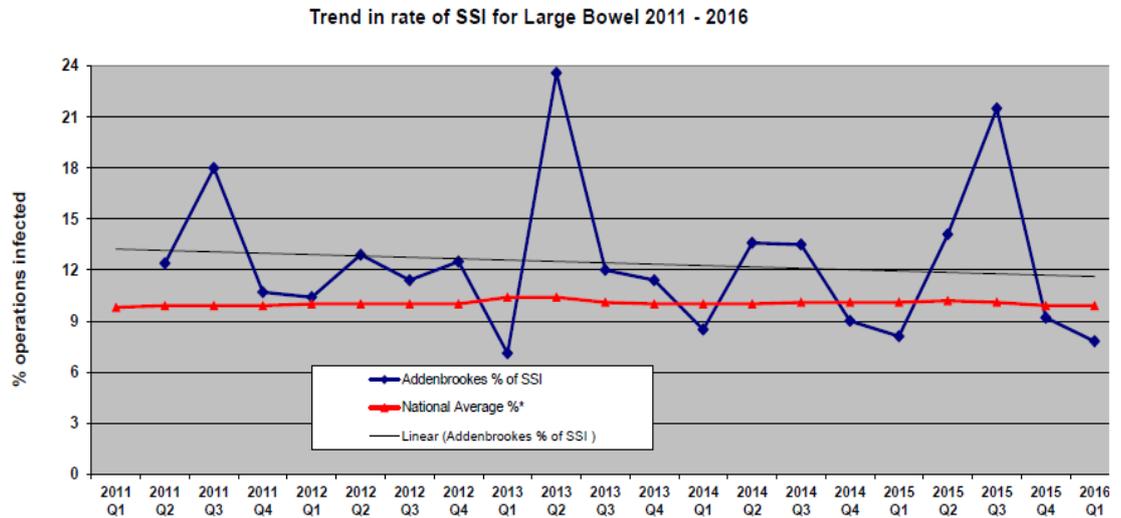
During 2015/16, (period ending March 2016) surveillance was performed for total knee replacement surgery, large and small bowel surgery and gastric surgery (graphs below).

For many years, surgical site infection rates in the Trust for orthopaedic knee replacement surgery have been equivalent to or below the national mean rate for all participating NHS Trusts (<1%). The number of infections seen following this type of surgery is very low.

Rates of infection following large bowel surgery and small bowel surgery appear to fluctuate and the trust has received high outlier letters from Public Health England (PHE) at which point the SSS nurses inform the relevant surgeons, the DIPC, Lead Infection Control Nurse and Infection Control Doctor. Meetings have taken place with the lead SSS nurse, infection control doctor and the team of upper gastrointestinal surgeons to discuss ways of possibly improving our SSI rates. Gastric surveillance is undertaken by only five NHS Trusts within England. This patient group, by its very nature, generally involves complex procedures and inpatients with multiple co-morbidities. The total number of procedures assessed as part of

the surveillance in this category is very low compared with the more common procedures, thus making the data less robust. This in part reflects the nature of the specialist activity of the Trust. Therefore the PHE usually combine the last four periods for gastric surveillance together as they use this data instead of the current period due to the low numbers participating in this category. Infection rates for individual surgeons were similar.

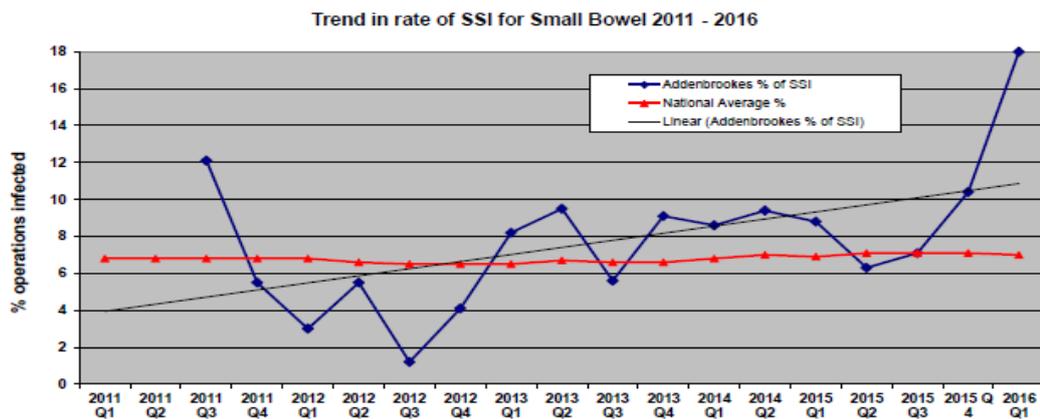
**Figure 10** Rate of surgical site infection for large bowel surgery



Period	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2013 Q4	2014 Q1	2014 Q2	2014 Q3	2014 Q4	2015 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1
Addenbrookes % of SSI		12.4	18	10.7	10.4	12.9	11.4	12.5	7.1	23.6	12	11.4	8.5	13.6	13.5	9	8.1	14.1	21.5	9.2	7.8
National Average %*	9.8	9.9	9.9	9.9	10	10	10	10	10.4	10.4	10.1	10	10	10	10.1	10.1	10.1	10.2	10.1	9.9	9.9
Actual Number of SSI at Addenbrookes		15	23	13	10	16	13	19	7	21	11	13	9	15	15	9	9	18	23	10	9
Number of Patients seen		121	128	121	96	124	114	152	99	89	92	114	106	110	111	100	111	128	107	109	115

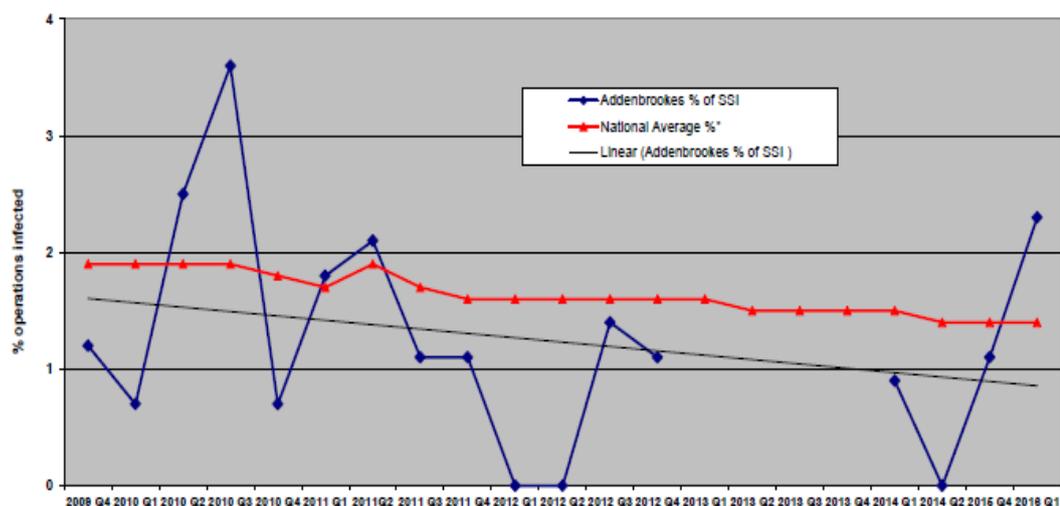
\*Surveillance was not conducted from January 2011 until end June 2011. (Recommended July 2011)

**Figure 11** Rate of surgical site infection for small bowel surgery



Period	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2013 Q4	2014 Q1	2014 Q2	2015 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1
Addenbrookes % of SSI			12.1	5.5	3	5.5	1.2	4.1	8.2	9.5	5.6	9.1	8.6	9.4	8.8	6.3	7.1	10.4	18
National Average %	6.8	6.8	6.8	6.8	6.8	6.6	6.5	6.5	6.5	6.7	6.6	6.6	6.8	7	6.9	7.1	7.1	7.1	7
Actual Number of SSI at Addenbrookes			8	3	2	5	1	3	5	6	4	7	6	6	7	5	5	7	11
Number of patients seen			66	55	66	91	81	74	61	63	71	77	70	64	80	80	70	67	61

**Figure 12** Rate of Surgical Site Infections for Total Knee Replacements  
Trend in rate of SSI for Total Knee Replacements 2009 - 2016

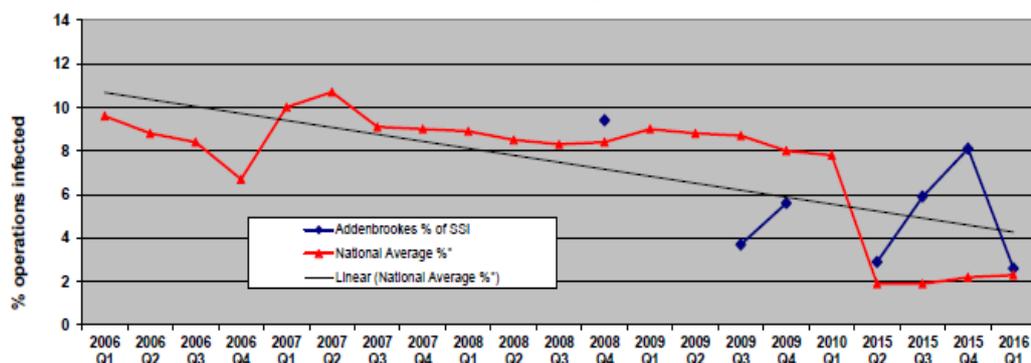


Areas where there are no figures means no surveillance took place.

Period	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2013 Q4	2014 Q1	2014 Q2	2015 Q4	2016 Q1
Addenbrookes % of SSI	1.2	0.7	2.5	3.6	0.7	1.8	2.1	1.1	1.1	0	0	1.4	1.1					0.9	0	1.1	2.3
National Average %	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
Actual Number of SSI at Addenbrookes							2	1	1	0	0	1	1					1	0	1	2
No of patients seen	84	138	81	83	141	109	96	91	89	43	70	70	93	nil	nil	nil	nil	108	96	92	86

**Figure 13** Rate of Surgical Site Infections for Gastric surgery

Trend in rate of SSI for Gastric surgery 2006 - 2016



Period	2006 Q1	2006 Q2	2006 Q3	2006 Q4	2007 Q1	2007 Q2	2007 Q3	2007 Q4	2008 Q1	2008 Q2	2008 Q3	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1
Addenbrookes % of SSI												9.4			3.7	5.6		2.9	5.9	8.1	2.6
National Average %	9.6	8.8	8.4	6.7	10	10.7	9.1	9	8.9	8.5	8.3	8.4	9	8.8	8.7	8	7.8	1.9	1.9	2.2	2.3
Actual number of SSI at Addenbrookes																		1	3	3	1
Number of patients seen																		34	51	37	38

# Water safety

The water quality team met over the course of the year to discuss matters related principally to *Legionella* spp. and *Pseudomonas aeruginosa*.

Legionella continues to be a problem in some outlets in C & D blocks. Some wards have outlets with high counts. There are also problems with the outpatient department building. This is caused by the piping being made of galvanised steel, which in parts is heavily corroded and there are areas with poor circulation. Some of the piping in C & D block has been replaced but some wards still need to be replaced.

Testing for *Pseudomonas aeruginosa* in augmented care areas is also required. Positive results were recorded from JVF intensive care unit. The problem was thought to be due to a problem with the taps so these have been replaced over the last year. This has led reductions in patients with infections due to *P. aeruginosa* and also to reductions in *Elizabethkingia meningoseptica*.

The water quality team introduced increased flushing and some areas have received point of use filters to address the immediate concerns. It has also proposed changes to the sampling regimen, as well as the introduction of a copper-silver ionisation plant to address these concerns.

# Antibiotic stewardship

## Prudent use of antibiotics

The Trust has an active programme of antibiotic stewardship with the objectives of promoting judicious antimicrobial prescribing and supporting initiatives aimed at reducing healthcare associated infections. The programme is overseen by the Trust Antimicrobial Stewardship Group (ASG), which is a sub-committee of the Joint Drugs and Therapeutics Committee. The group meets quarterly. The group is chaired by Dr Sani Aliyu, a consultant microbiologist and supported by the Trust antibiotic pharmacists and the lead consultant for antifungals. Recommendations from the group are implemented with the assistance of the pharmacy and microbiology teams.

## Antibiotic guidelines and policies

The Trust antimicrobial treatment guidelines continue to be regularly updated and available on Merlin. The guidelines also maintain restrictions on cephalosporin and quinolone use. A new trust wide surgical antibiotic guideline was launched in 2015. The guidelines are in line with national antibiotic stewardship principles and include a good summary of the pathogenesis of infection, likely infecting organisms, recommended diagnostic tests, treatment recommendations and IV to oral switch options. A sepsis guideline was introduced in Feb 2016 to support the national Surviving Sepsis campaign. There is ongoing work with the Epic team to improve the functionality of disease order sets so that antibiotic prescribing is tailored to specific indications, thus improving compliance and patient safety.

The antimicrobial stewardship team helped to draft the NHSE Regional Antifungal Guidelines and also supported revisions of the local Cambridgeshire and Peterborough CCG antibiotic guidelines. These guidelines continue to reflect the need for prudent antibiotic prescribing and the avoidance of high risk broad spectrum antimicrobials whilst providing a useful resource across the local health community.

## National Antibiotic Stewardship initiatives

Several national guidance documents have been published e.g. NICE Guidance on AMS, NHSE Patient Safety Alert, Revision of the HCAI Code of Practice guidance with a dedicated section

on AMS, Sep 2015 ESPAUR report, Lord Jim O`Neill reports (<http://amr-review.org/>). In response to this, the Antimicrobial Pharmacy team conducted a gap-analysis to address any gaps in the delivery of antimicrobial pharmacist-related services. The 2 main areas requiring improvement were: 1. Lack of an ongoing robust E&T training programme for doctors, pharmacy staff and nurses and 2. Lack of active participation of the antimicrobial pharmacists (1.6WTE) in antimicrobial stewardship ward rounds. Both these deficiencies are due to a shortage of specialist antimicrobial pharmacy staff. In response to this, an investment proposal is currently being developed.

In March 2016, a national CQUIN for antibiotic prescribing was launched in all hospitals in England. This CQUIN requires original data on antibiotic consumption and 72hr reviews to be submitted quarterly to PHE. For CUH the CQUIN amounts to about £700,000 and will be quite challenging for the team to deliver without a significant increase in supporting staff.

### **Antibiotic audits and performance reports**

Antibiotic performance reports continue to be compiled monthly since Feb 2012. These reports highlight key indicators for antimicrobial stewardship across CUH including compliance with stop/review dates, documentation of indications and more recently a requirement for a 72-hour review. The reports are disseminated to senior management on a regular basis. Individual wards with consistently poor performance are identified and feedback provided to the affected prescribers via email. A total of 6,205 antibiotics were audited in 2015/16 compared with 5,415 in 2014/15 and 5,352 in 2013/14. Since the launch of Epic in Oct 2014, the documentation of antibiotic indication has improved to 100%. There has also been a stepwise increase in the rates of compliance with stop review dates from an average of 82% in 2013/14 to 87% in 2014/15 and 92% in 2015/16.

Division-based rolling antimicrobial audits have been a key part of the Trust's antibiotic stewardship activities since 2012. The audits have an emphasis on assessing compliance with local guidelines. Information regarding appropriate antibiotic choice, dose, route and documentation is assessed by the antibiotic pharmacist and microbiologist. Feedback is provided by the ward pharmacist, the consultant microbiologist or the antibiotic pharmacist during departmental clinical governance meetings. In 2015/16, detailed antibiotic audits were conducted for Division A and C and the results presented at their clinical governance meetings.

An audit of therapeutic drug monitoring (TDM) was also conducted in July 2015. This demonstrated that almost a third of blood samples for antibiotic TDM levels were being taken at the wrong time and less than a third of abnormal results were being acted on. The results of the audit have been shared with the microbiologists and corrective measures to address this put in place. In November 2015 a trust wide audit of meropenem use showed that 63% of prescriptions were appropriate and were administered for the right duration but there were missed opportunities to de-escalate or stop therapy. This led to changes being made to the local guidelines on carbapenem use. A full list can be found via the Audit sections in the Pharmacy and Microbiology intranet pages.

### **Antibiotic support rounds**

Antibiotic support ward rounds, run by Dr Sani Aliyu, consultant medical microbiologist, have been in place since 2007. These are undertaken on the diabetes, colorectal, vascular and hepatobiliary units. This involves reviewing antibiotic prescriptions, dealing with complex infection issues and creating teaching opportunities on prudent antibiotic prescribing. The rounds also have the additional purpose of providing oversight and serve as an early warning system for detecting poor prescribing practice. In addition to this, weekly MDTs supported by a consultant microbiologist are also carried out on OPAT, multivisceral and haemato-oncology units.

## Antibiotic consumption monitoring and incident reporting

Antibiotic consumption reports (Defined Daily Doses or DDDs) are made available to the Antimicrobial Stewardship Group quarterly and any notable trends investigated. In addition to this, DATIX antimicrobial-related clinical incidents are analysed and presented at the quarterly ASG meetings. A review of 117 antibiotic-related clinical incidents reported in the first 6 months of 2016 showed that 19 (16%) incidents were due to missed doses, 18 (15%) had to do with wrong dosing and 14 (12%) arose from issues related to monitoring of drug levels (TDM).

## Antifungal stewardship

An active antifungal stewardship programme was originally developed in July 2013 and currently this is still ongoing and comprises a weekly virtual ward round to review patients on high-cost antifungals supervised by a consultant microbiologist and assisted by an antimicrobial pharmacist. Interventions made are documented in the AMS iVents as well as the progress notes. Several published peer-reviewed papers and conference presentations have also emanated as a direct result of this service. The team has been invited to sit on the national ESPAUR antifungal sub-group as a result of the work conducted at CUH.

## Education and training

In order to meet the full requirements of the Medical and Dental Corporate Induction Programme (Trust Policy mandatory training) doctors must complete web-based modules within 3 weeks of commencing their post. An eLearning Antimicrobial Prescribing resource has been developed and was launched in July 2013. The resource is currently being updated and in liaison with the Epic team new scenarios are being developed on the ehospital play hyperspace to provide stewardship training to doctors. Regular presentations are delivered to medical and pharmacy teams. In addition to invited talks for specific departments, the lead microbiology consultant for antibiotics has regular slots for lectures on antibiotic prescribing for undergraduate doctors, foundation year doctors and department of medicine medical staff (educational half days). The lead pharmacist for antibiotics has regular teachings for Pharmacists and technical staff.

As requested by Public Health England (PHE), every year the Antimicrobial Stewardship Team organise activities aimed at staff and patients for European Antibiotic Awareness Day (EAAD) held on the 18<sup>th</sup> November 2015. This year the team won a national UKCPA award and one of the activities was also written up and accepted for a peer-reviewed publication.

Further details about antibiotic stewardship activities can be obtained from the Connect website.

# Norovirus

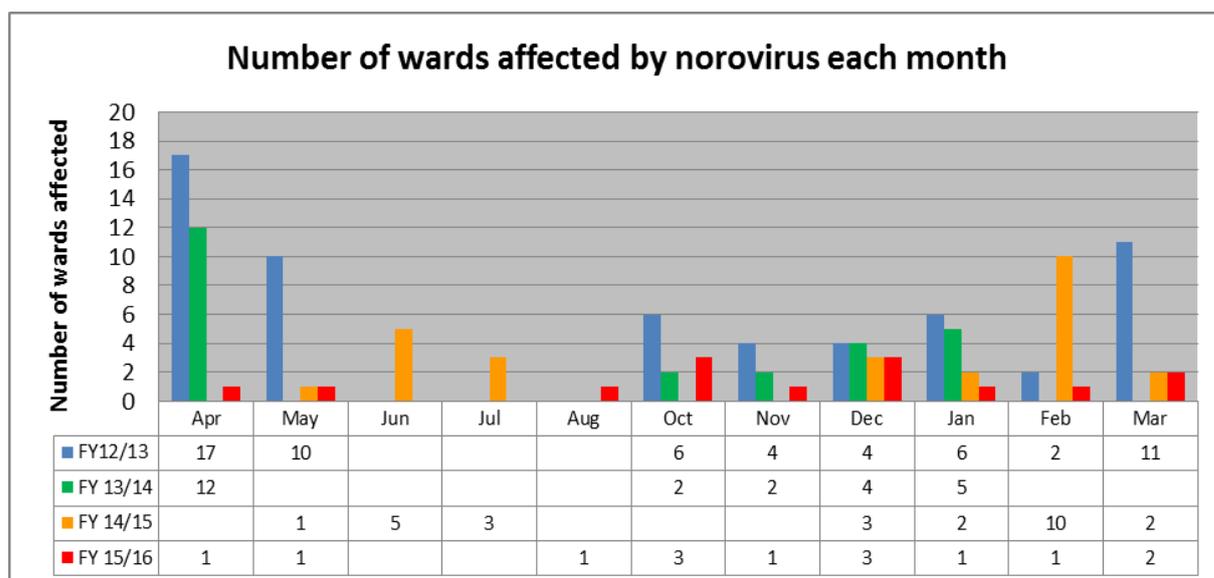
Norovirus infection is a short-lived vomiting and diarrhoeal illness, which is readily transmitted from one person to another. The virus can be caught from the environment or shared equipment that has become contaminated. It is responsible for outbreaks in institutions such as hospitals, schools and cruise ships. In hospitals, large numbers of patients, staff and visitors may be affected, which can disturb the normal working of the hospital and cause distress to those affected. It is difficult to prevent infection coming into the hospital when there are high numbers of infected people in the community who need admission and when patients incubating the virus may be transferred from referring hospitals.

Outbreaks of *norovirus* are usually more common in the colder months, but in recent years the *norovirus* season has extended into the spring with confirmed cases reported as late as May 2015 and a further bay closure in August 2015 with suspected infection.

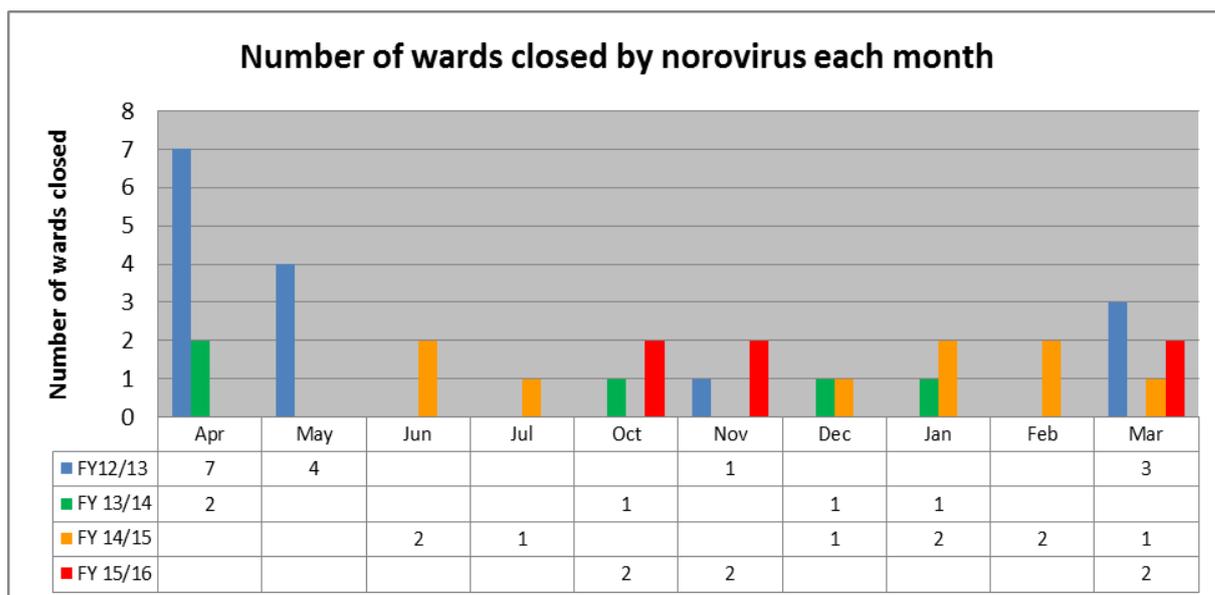
The Trust management of *norovirus* is based on the national *Guidelines for the management of norovirus outbreaks in acute and community health and social care settings* (2012). An escalation plan devised in 2012 is updated annually and continues to improve communication to staff and provide a clear stepped management plan to response to increasing numbers of areas affected and the impact on the Trust's activity at that given time.

The Trust reported that 2015/16 was a relatively quiet year for norovirus cases within the Trust. There were a total of 14 wards affected (requiring bay closures) 2015/16 compared to 26 in 2014/15. The numbers of whole ward closures due to *norovirus* was 6 in 2016/16 compared to 9 in 2014/15. The last four years of trends is demonstrated in Figures 14 and 15. These fluctuating figures year to year are not unusual and this highlights the need to maintain and update escalation plans each year so that the Trust is ready to manage numbers the symptomatic patients presenting. Prompt identification and isolation of symptomatic patients, attention to hand hygiene and maintaining high standards of environmental cleanliness are key to managing this virus. The closure of bays and wards, limiting patient movements and closing affected wards to visitors minimizes spread and allows the Trust to bring any outbreaks under control as quickly as possible.

**Figure 14** Number of wards affected by norovirus each month



**Figure 15** Number of wards closed because of norovirus each month



## Incidents related to infection

The Trust reports outbreaks of infection as serious incidents, as requested by NHS England. These include incidents where there has been an impact on the running of the hospital (ward closure, for example), or where there has been a severe impact on patient outcome.

Many of these incidents highlight the emerging problems faced by the Trust (and indeed the wider NHS) relating to patients transferred from other hospitals or areas of the world where the incidence of antibiotic resistance is much higher than it is locally. The Trust has particular expertise in the detection of these antibiotic resistance problems and had had considerable success in managing patients with multiply resistant organisms.

Communication issues are also highlighted, as the patients are often transferred to the Trust without potential infection issues being mentioned.

## Parainfluenza and other viral respiratory infections

As in previous years the season for respiratory infection extended into the spring and early summer although the numbers were lower than in 2014/15. We continued to identify patients with respiratory viruses, particularly parainfluenza, across a number of wards in May and the early part of June 2015. Some patients were admitted to and managed in side rooms but two bay closures in May (one oncology areas and one general medical area) and one in June (transplant ward) with respiratory infection were required to control further spread. The season for 2015 into 2016 started with very low numbers of cases in November and December. However, in January 2016 there were 26 cases identified, 68 in February and 92 cases in March 2016. Due to the Trust capacity problems and the high demand on isolation facilities, some symptomatic patients were admitted into bays which resulted in 3 bay closures in January, 9 in February and 6 in March. For the first time in many years one of the medical wards (respiratory) was closed in February as they were unable to accommodate all of their suspected and confirmed cases in the side rooms and patients with confirmed influenza were cohorted in the high dependency bay. An outbreak meeting was called and new admissions to

the ward were restricted to only those patients who required specialist respiratory care for two days. This allowed time for the contact patients to be re-screened and for the high dependency bay to be deep cleaned.

## **Endoscope reprocessing in outpatients**

In June 2015 Infection Control were informed that staff were experiencing difficulties with safely decontaminating the endoscopes used in Clinic 10. The Senior Clinical Nurse had informed health and safety as staff were complaining of feeling unwell when reprocessing the scopes so a risk assessment was required. The automated washer-disinfectors which had been installed in the clinic many years previously were breaking down frequently. In these situations the staff use an alternative approved method of manually decontaminating the scopes. In June, both of the washer-disinfectors were out of action so the staff were using the decontamination wipes for all of the scope reprocessing. The washer-disinfectors still had the chemicals within the machinery so it was not clear if it was the wipes, the chemicals in the washer-disinfectors or the room ventilation /environment that was causing the irritation to the staff problem. The ICNs gave advice regarding alternative areas to reprocess the scopes and advised the removal of the old washer-disinfectors as they were not repairable. New scopes were ordered so that they could be sent to sterile services to be reprocessed and the washer-disinfectors have been removed from the department.

## **MRSA**

There was one trust apportioned MRSA bacteraemia case reported for 2015/16 (a contaminant taken on admission to hospital).

Five patients acquired MRSA on one surgical ward between August and September 2015 which required input from the infection control team. The main problems highlighted by the investigation included a change in the acuity of the patients, an expansion of the ward (and not moving the handwash sink to the new entrance of the ward) and lack of a bedpan washer on the ward. Increased screening, enhanced cleaning and education / audit brought the incident to swift conclusion.

The proportion of trust acquired MRSA has always been higher within the medical wards and the incidence of new cases on the Rehabilitation ward was increasing from the beginning of 2015. The patients on this ward have an extended length of stay and the provision of side rooms is extremely limited. Regular screening was instigated and an MRSA cohort bay was needed for a short period of time to manage the inpatients with MRSA. The frequency of swabbing the patients was increased if new cases occur but as minimum all of the patients are swabbed monthly. The Infection Control Team also agreed to introduce a system to rescreen other long stay patients across the Trust and a mechanism to identify any inpatient who has not been swabbed for a long period and those who have not been swabbed for over 40 days are re-swabbed for MRSA.

## ***Elizabethkingia meningoseptica***

The increase in the number of patients on critical care wards (D3; JVF ICU and D4; IDA) colonised or infected with *Elizabethkingia meningoseptica* was first noted in 2013/14. This is an environmental bacterium associated with nosocomial infections and carbapenem resistance. Environmental screening was undertaken and positive cultures were obtained from taps and sinks on the wards. The taps on D3 / D4 were replaced (the work commenced in March 2015

and was completed by March 2016). It is too early to determine the success of this intervention but provisional data suggests the number of cases has fallen.

## **Neonatal Intensive Care Unit – Extended spectrum beta-lactamase (ESBL) producing Enterobacteriaceae.**

Eight babies were found to be colonized with an ESBL-producing strain (*E. coli* in seven babies and *Enterobacter cloacae* in one). No common source was found and there was no obvious link between the affected individuals. All isolates were from rectal screens and no patients had clinical evidence of infection / needed treatment. Increased screening, enhanced cleaning and education / audit brought the incident to swift conclusion.

## **Impact of eHospital**

As anticipated, the launch of eHospital resulted in a number of changes on the day to day working of the infection control team. Although access to records is much better, a number of reports needed to be built by the eHospital support workers to allow the ICNs to identify patients to review and results that needed actioning. This took some time. The mechanism to identify newly admitted patients with alert codes is more complex. It was expected that the old results / alerts would be automatically transferred into EPIC but this was not the case and the ICNs have to manually input the data.

There have been a number of significant delays in obtaining some laboratory results which has had an impact on the length of time that patients have needed to spend in isolation ,for example the patients waiting for CPE screens and Norovirus samples.

The change from Meditech to Beaker and the corresponding problems have had the biggest impact on the service provided by the ICNs.

## **Publications**

During 2015/16 the Trust was involved with a number of studies relating to outbreak investigation and management. These included studies led by Professor Sharon Peacock, Professor of Clinical Microbiology and colleagues in collaboration with the University of Cambridge and the Wellcome Sanger Institute.

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