

UNIVERSITY HOSPITALS BIRMINGHAM NHS FOUNDATION TRUST
BOARD OF DIRECTORS
THURSDAY 28 JULY 2016

Title:	ANNUAL INFECTION PREVENTION AND CONTROL REPORT APRIL 2015 – MARCH 2016	
Responsible Director:	Philip Norman, Executive Chief Nurse and Director for Infection Prevention and Control	
Contact:	Dr Pauline Jumaa, Consultant Microbiologist and Lead Infection Control Doctor; Dr Mark Garvey, Clinical Scientist in Infection Prevention and Control; Craig Bradley, Clinical Nurse Specialist in Infection Prevention and Control	
Purpose:	To provide the Board of Directors with an Annual Report which summarises the Infection Prevention and Control activity from April 2015 – March 2016	
Confidentiality Level & Reason:	None	
Annual Plan Ref:	Strategic Aim 4 : Quality of Services	
Key Issues Summary:	The annual report provides a summary of the Infection Prevention and Control activity from April 2015 – March 2016	
Recommendations:	The Board of Directors is asked to accept the Annual Report on Infection Prevention and Control	
Approved by:	Philip Norman	Date: 15 July 2016

UNIVERSITY HOSPITALS BIRMINGHAM NHS FOUNDATION TRUST

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ANNUAL INFECTION PREVENTION AND CONTROL REPORT APRIL 2015 – MARCH 2016

PRESENTED BY THE EXECUTIVE CHIEF NURSE

1. Introduction and Executive Summary

This report provides a summary of the progress with Infection Prevention and Control (IPC) from April 2015-March 2016.

As per the previous year, 2015/16 has been a challenging year with national objectives for Meticillin Resistant Staphylococcus Aureus (MRSA) and Clostridium Difficile Infection (CDI) aimed at delivering a zero tolerance approach to avoidable infections. 2015/16 was a disappointing year for infection prevention when compared to recent years, primarily due to the increase in MRSA bacteraemias seen within the Trust. The performance figures contained within this report show that the initial 5 months of the year had increases in MRSA. Then from September 2015 onwards, the performance showed a marked improvement in part due to a Trust wide MRSA reduction plan. No single factor has been found to account for the increase in MRSA at the beginning of the year; however it remains vitally important that the Infection Prevention and Control Team (IPCT), along with everyone else in the organisation, ensure that training and practices are maintained at the highest standards to ensure patient safety from Healthcare Associated Infections (HCAIs).

During 2015/16, there were a number of staff changes within the Infection Prevention and Control Team including the appointment of a new Lead Doctor for Infection Control and a new Principal Antimicrobial Pharmacist. There are new and planned appointments to nursing vacancies in early 2016/17 and this will further strengthen the team moving forward.

During 2015/16, eight Trust apportioned MRSA bacteraemias were reported. The Trust was issued with a contract performance notice by the Clinical Commissioning Group (CCG) in relation to the increased bacteraemias. Investigations into these cases showed no single factor has been found to account for the increase in MRSA, however there were some areas where care could have been improved and these lessons have been incorporated into guidance and practice where appropriate.

The number of MRSA acquisitions within the Trust continues to be monitored and detailed genotypic analysis of the isolates is being undertaken to identify

potential transmission links. By identifying these acquisitions infection prevention and control initiatives can be implemented to reduce the rate of transmission which will indirectly reduce the MRSA bacteraemia rate.

The number of Meticillin Sensitive Staphylococcus Aureus (MSSA) bacteraemias is reported nationally and there was no change in 2015/16 compared to the previous financial year. No national targets or objectives are set for MSSA bacteraemia; however more work specifically around device related MSSA infections is being undertaken within the Trust.

The Trust ended the year with 66 Clostridium Difficile Infection (CDI) cases, giving an overall rate of 16.5 cases per 100,000 bed days against a target of 17.3 cases. All patients with CDI are closely reviewed by the Infection Prevention and Control Team while in hospital with all hospital acquired cases having a Post Infection Review (PIR) in line with the national guidance to identify whether there were any potential lapses in care.

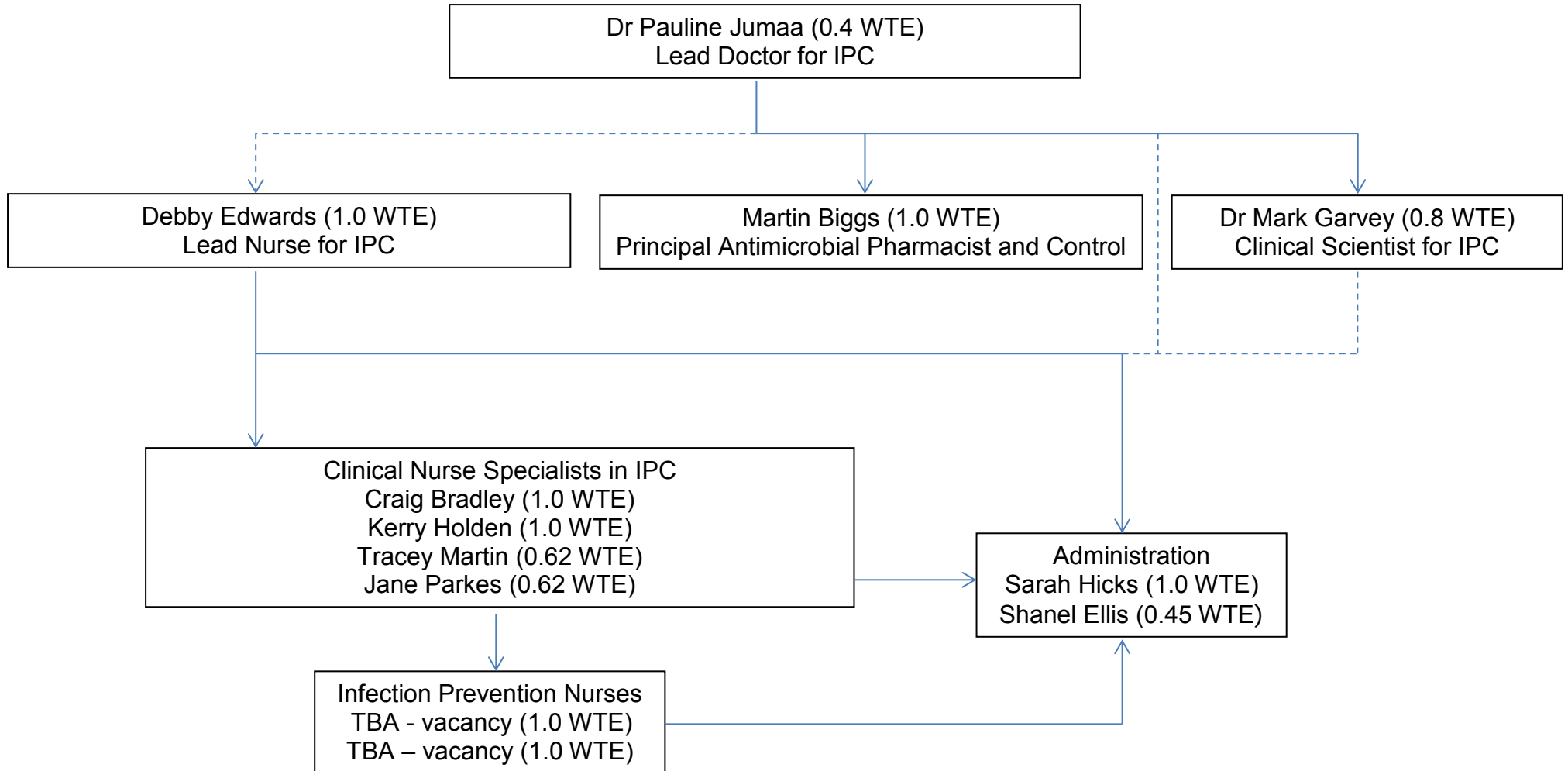
The Infection Prevention and Control Team have a leadership role, along with the Director of Infection Prevention and Control (DIPC), to continue to implement and to advise on good practice to further reduce Healthcare Associated Infections. All staff involved in healthcare need to recognise their role in reducing Healthcare Associated Infections and take individual responsibility for ensuring that the correct actions are followed. The nature of infections in general and Healthcare Associated Infections in particular, means we can never be complacent about infection prevention and control. We must continue to ensure that Healthcare Associated Infections are not considered inevitable or acceptable.

1.1 Infection Prevention and Control Team Structure 2015/16

In 2015/16 Dr Pauline Jumaa was appointed the new Lead Doctor for Infection Prevention and Control and Mr Martin Biggs was appointed as the new Principal Antimicrobial Pharmacist for the Trust. In addition, the team has recruited a new administrator for the team. The Executive Chief Nurse is the Director for Infection Prevention and Control (DIPC); the Infection Prevention and Control Team also consists of a Lead Nurse who is supported by a Clinical Scientist and the team of Infection Control Nurses (ICNs).

The Infection Prevention and Control Team structure is shown in Figure 1.

Figure 1. Infection Prevention and Control Team Structure



2. Infection Prevention Reporting Structure

The Infection Prevention and Control Group (IPCG) met monthly throughout 2015/16.

Membership comprises of:

- Executive Chief Nurse/Director for Infection Prevention and Control (Chair)
- Deputy Chief Nurse (Deputy Chair)
- Lead Doctor in Infection Prevention and Control
- Lead Nurse for Infection Prevention and Control
- Clinical Scientist in Infection Prevention and Control
- Clinical Nurse Specialist for Infection Prevention and Control
- Principal Antimicrobial Pharmacist
- Associate Director of Nursing (for all 4 Divisions)
- Divisional Directors or Deputy (for all 4 Divisions)
- Director of Facilities and Estates
- Allied Health Professional representative
- Lead Nurse for Quality & Clinical Standards
- Head of Facilities
- Health and Safety Lead
- Head of Risk and Compliance
- Head of Estates (Quarterly attendance)
- Occupational Health Lead Nurse (Quarterly attendance)
- Decontamination Advisor (Quarterly attendance)
- Cross City Clinical Commissioning Group (CCG) Lead for Infection Prevention and Control
- Public Health England representative

The Chief Nurse also has monthly meetings with the Lead Doctor and Lead Nurse for Infection Prevention and Control.

Members of the Infection Prevention and Control Team sit on the following Groups within the Trust:

- Health and Safety Steering Group
- Water Safety Group
- Medical Devices Group
- Decontamination Group
- Continence Action Group (CAG)
- Emergency Planning Committee
- Antimicrobial Steering Group
- Preventing Harm Meetings
- Product Evaluation Group
- Equipment Standards Group

A member of the Infection Prevention and Control Team also attends the Divisional Matrons meetings. Senior Infection Prevention and Control Nurses undertake regular clinical walkabouts with their respective Matrons for each

clinical area. Members of the Infection Prevention and Control Team attend relevant meetings of Groups dealing with developments, procurement and commissioning when appropriate.

A Consultant Microbiologist sits on the Medicines Management Advisory Group. The Consultant Microbiologists continue to work with the Principal Antimicrobial Pharmacist in monitoring, auditing and providing education on the use of antimicrobials, and an Antimicrobial Steering Group meets regularly. The Ward Pharmacists monitor antimicrobial use around the hospital.

The Infection Prevention and Control Team meets formally every week to discuss a range of topics including; Governance, assessing progress against the annual programme of work, performance targets, discussion and resolution of issues, review of surveillance data and ensure necessary information, including feedback from groups, committees and meetings attended, is disseminated appropriately to the wider team.

At every Board of Directors meeting the Chief Nurse as part of the Care Quality Report gives an overview of the most recent infection prevention performance data. All members of the Board of Directors, therefore, have access to information concerning the Trust's performance against the external and internal infection prevention targets and other infection related issues.

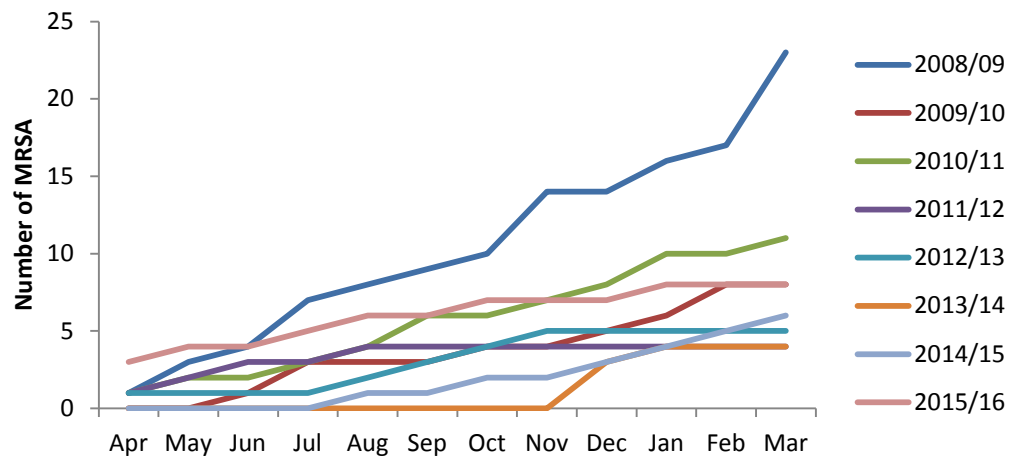
3. Performance

3.1 MRSA bacteraemia

During 2015/16 the objective for Trust apportioned MRSA bloodstream infections was 0, and the outturn for the year was 8 cases. Overall there were 13 MRSA bacteraemias reported, 8 of which were Trust apportioned and 5 non-Trust apportioned. Figure 2 shows the annually number of bacteraemias from 2008-2016. All cases have been investigated using the Post Infection Review (PIR) process and have been discussed at the Chief Executive Root Cause Analysis (RCA) review meetings. Action plans to address learning points have been developed and are being monitored to ensure implementation.

In response to the increased number of bacteraemias seen during the beginning of 2015/16 with a total of six MRSA bacteraemias reported by August 2015 the Trust was issued a contract performance notice. An MRSA reduction plan was implemented in conjunction with the Clinical Commissioning Group (CCG) focusing on the following: mandatory training, hand hygiene, saving lives, screening and decolonisation, personal protective equipment, surveillance data on the clinical dashboard, clean environment, antimicrobial stewardship, invasive devices and investigations such as post infection reviews and root cause analysis reviews.

Figure 2. Cumulative annual number of MRSA bacteraemias from 2008-2016



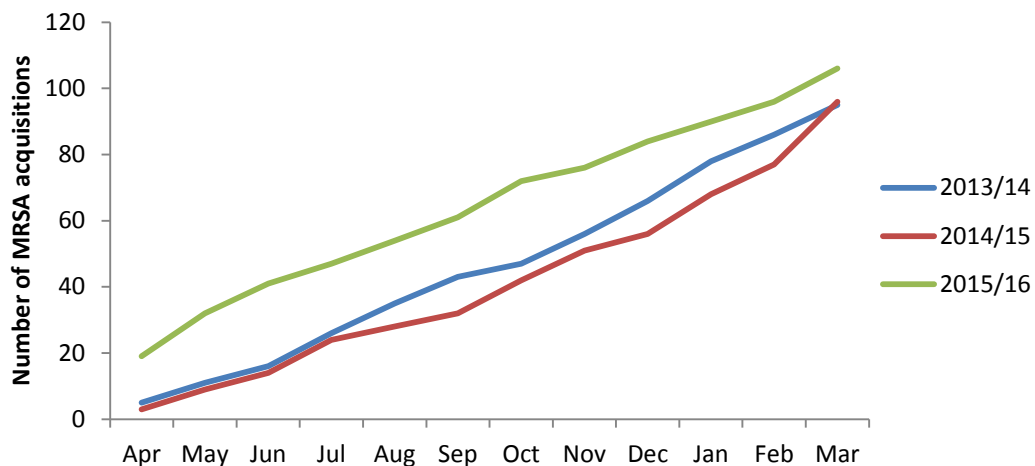
As for 2015/16 the national approach to MRSA bacteraemias will be the same for 2016/17. There is a zero tolerance approach and any case will need an urgent post infection review across the relevant health economy to assess to which organisation the case will be apportioned. The process requires a transparent, thorough and timely response, not only to the investigation, but also to the follow up of any learning and action points.

3.2 MRSA acquisitions

Universal admission screening for MRSA has enabled the Trust to monitor the acquisition of MRSA at the Trust and use this as another key performance indicator (KPI) for the organisation.

Figure 3 shows the number of MRSA acquisitions across the Trust from 2013. The performance for 2015/16 had deteriorated compared with that of 2014/15. This corresponded with the increase in MRSA bacteraemias seen within the Trust. While there was no obvious reason for the increase, renewed efforts are being made to reinforce the importance of infection prevention and control across the Trust in line with the MRSA reduction plan.

Figure 3. Cumulative attributable MRSA acquisitions since 2014

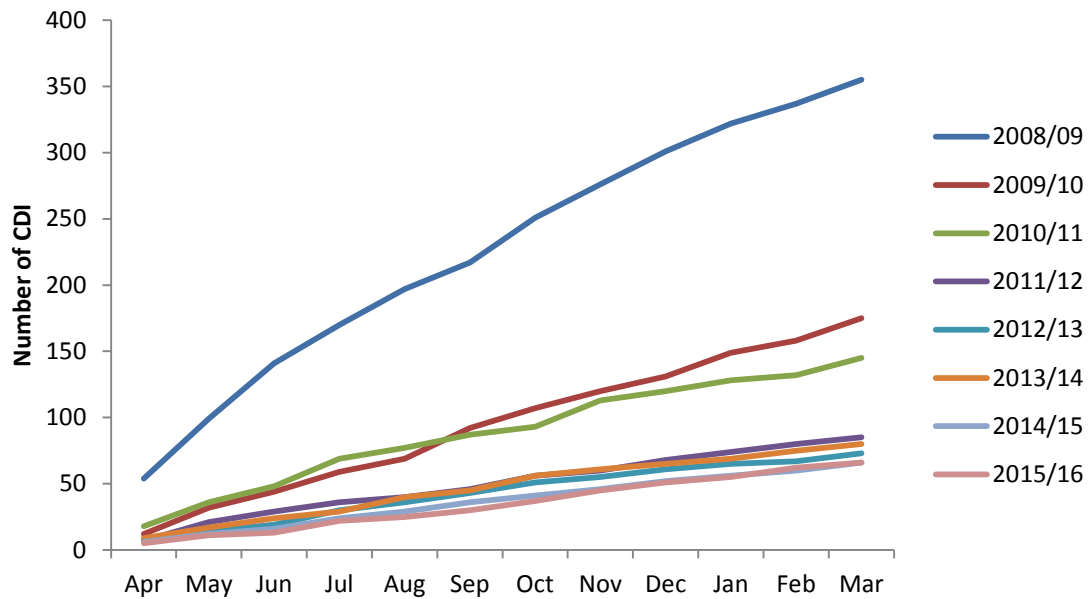


3.3 Clostridium Difficile Infection (CDI)

Objectives for the number of CDIs for Acute Trusts and Clinical Commissioning Groups were set for the year 2015/16 by the Department of Health, based on nationally set target and performance rates of each Trust and Clinical Commissioning Group. The objective for Trust apportioned cases of CDI for 2015/16 was a rate of 17.3 cases per 100,000 bed days; Trust performance was 66 cases giving an overall rate of 16.5 cases per 100,000 bed days. Figure 4 shows the number of Trust apportioned cases annually 2008-2015.

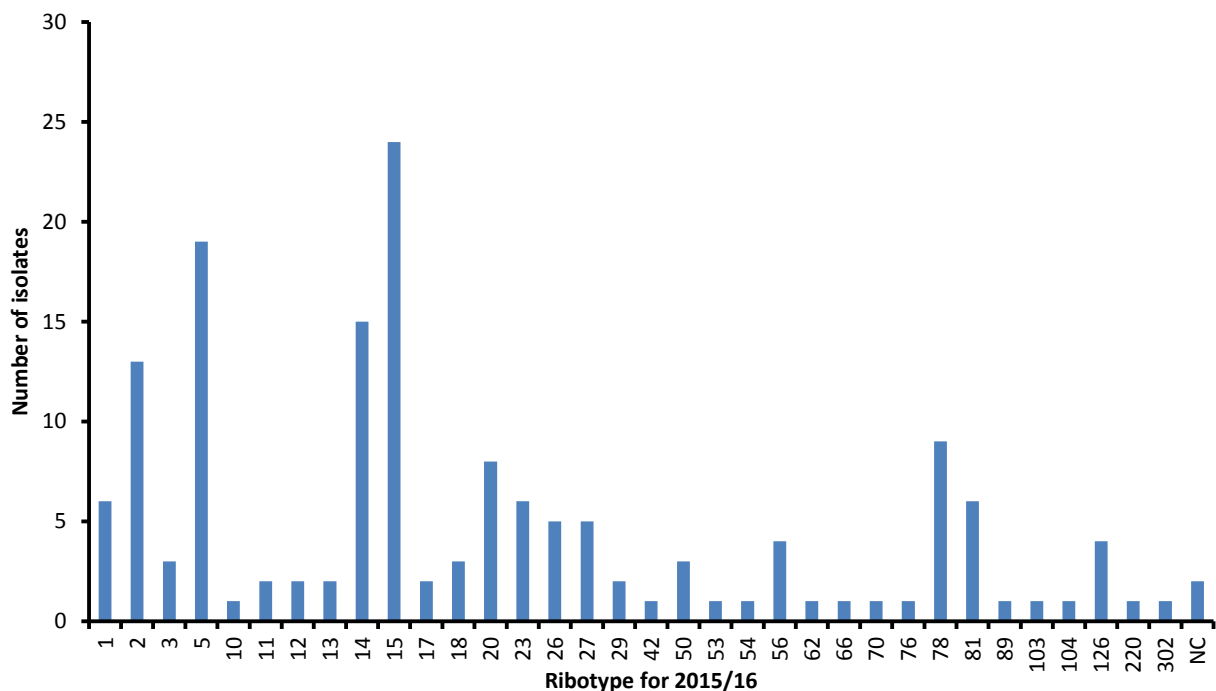
NHS England published CDI objectives for Acute Trusts and Clinical Commissioning Groups for 2015/16. NHS England calculated these objectives and encouraged Commissioners to consider sanctions for breach of CDI objectives only where those CDIs were associated with lapses in care. With agreement from Commissioners all Trust apportioned cases of CDI were reviewed against avoidability criteria, using a similar process to that described for MRSA bloodstream infections, and those deemed unavoidable were excluded from consideration of local penalties. A £10,000 fine is incurred for every avoidable case above the target. Of the 66 Trust apportioned cases, 23 (34%) were deemed to have some potentially avoidable factors, most commonly related to deviations from best practice in timely taking of stool specimens, appropriateness of stool testing and timely isolation of symptomatic patients. For 2016/17 the same post infection review tool developed by this Trust which has been recommended for use across England will be used to review any CDI case.

Figure 4. Cumulative annual number of Trust apportioned CDIs from 2008-2015



Although numbers of CDI cases continue to reduce, there is always concern around possible transmission of CDI in hospital. In order to investigate this, strains have been sent for typing in cases where there were possible clusters in clinical areas, generally increased numbers in particular areas. Figure 5 shows the ribotype results for the Trust in 2015/16. For 2015/16 as in previous years, the picture was one of extremely diverse ribotypes with very little evidence of possible transmission and no particular endemic strains to the organisation.

Figure 5. Number of different Clostridium Difficile ribotypes during 2015/16



3.4 Escherichia coli (E. coli) bacteraemias

Mandatory surveillance of E. coli commenced in June 2011. The intention is to allow assessments to be made nationally on the possible reasons for the increasing number of cases seen over recent years. The continuing relevance of this surveillance system is not fully clear as it is well known that many of these infections arise from the patient's own normal flora and that there is little that can be done to prevent the majority of these. The Trust has robust data on E. coli bacteraemias for the past 4 years. We have seen a year on year increase in the number of E. coli bacteraemias since implementation of mandatory surveillance. During 2015/16 there was a slight increase compared to the last financial year with 98 Trust apportioned and 225 non-Trust apportioned cases of E. coli infections. Figure 6 shows the total number of E. coli bacteraemias over the year.

Urinary tract infections (UTIs) are the most common source of an E. coli bacteraemia (Figure 7). The NHS Safety Thermometer tool looks for the presence or absence of harms, one of these being UTIs in patients with a urinary catheter. National data from the Safety Thermometer shows around 22% of patients at the Trust have a urinary catheter in situ making us a potential higher user for catheter insertion, literature shows catheterising patients can increase the risk of acquiring UTIs. The Infection Prevention and Control Team have used an UTI post infection review tool during 2015/16 in patients where a new harm has been identified through the Safety Thermometer, with the aim of identifying any lessons to be learnt in this group of patients. This work has been fed into the Continence Action Group (CAG).

Figure 6. Cumulative total number of Trust apportioned E. coli bacteraemias from 2013-2016

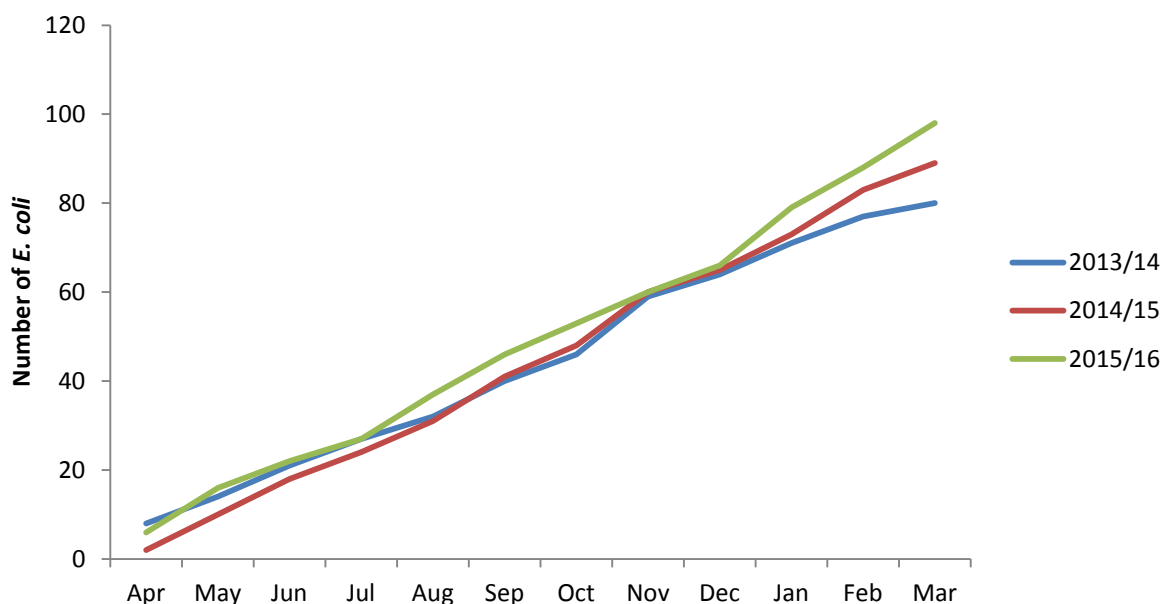
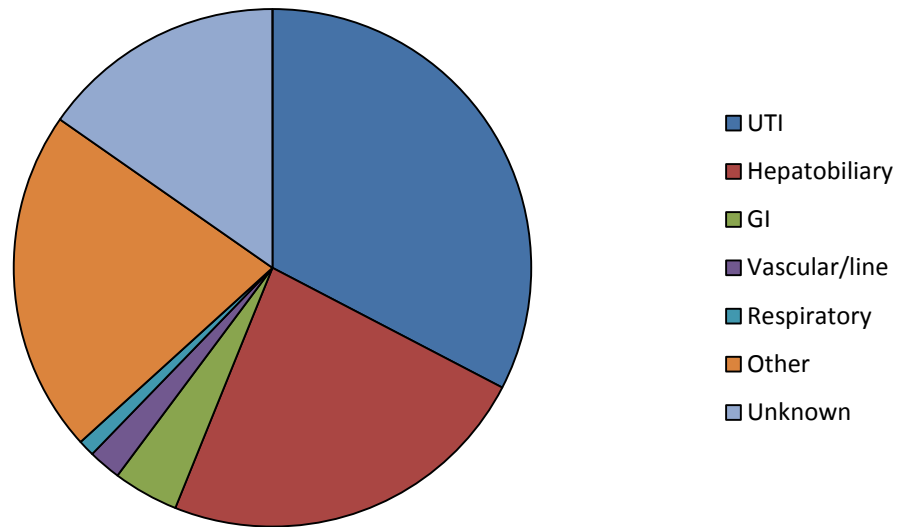


Figure 7. Source of *E. coli* bacteraemia infections during the financial year 2015/16.

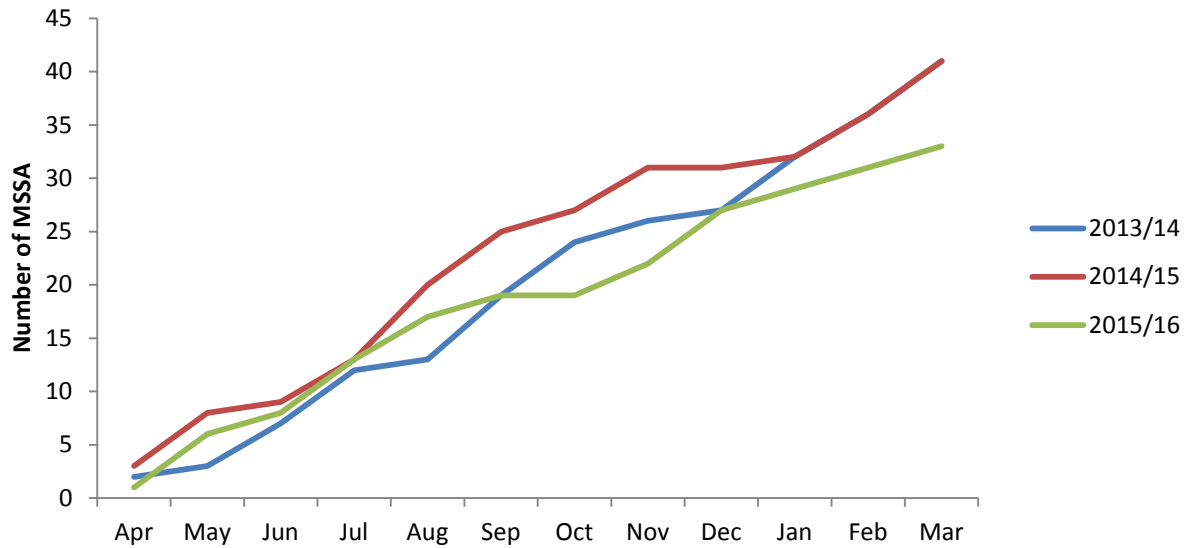


3.5 Methicillin Sensitive Staphylococcus Aureus (MSSA) bacteraemias

National mandatory surveillance of MSSA bacteraemia began in January 2011. During 2015/16 there were 33 Trust apportioned cases and 56 non-Trust apportioned cases; a decrease in numbers compared to the previous financial year. Figure 8 shows the annual numbers of MSSA bacteraemias over the past three years.

Similarly to *E. coli* bacteraemias, many of these represent infections that cannot be predicted or prevented, however all cases are reviewed to assess whether they were related to the presence of a medical device such as a peripheral or central venous access device or urinary catheter as this may assist in determining any key actions for improvement. Of the 33 Trust apportioned cases: 40% were associated to intravenous lines, 15% were predominantly secondary to skin or soft tissue infections, 9% were due to respiratory sources, 3% were due to endocarditis, 3% due to urosepsis, 30% being other sources. Surveillance data shows the majority of Trust apportioned MSSA bacteraemias are related to devices which is not an uncommon picture nationally. In 2015/16 the Infection Prevention and Control Team have implemented post infection reviews of Trust apportioned MSSA bacteraemias within clinical haematology where central venous access device/s are indicated as the source to scope the practice in this high risk patient group.

Figure 8. Cumulative total number of Trust apportioned MSSA bacteraemias between 2013-2016



3.6 Glycopeptide Resistant Enterococci (GRE) bacteraemia

During 2015/16 there were 25 Trust apportioned and 4 non-Trust apportioned cases a slight increase in the numbers compared to the previous year, the majority occurring in patients who were either inpatients or had recently been inpatients. Figure 9 shows the total number of Trust Apportioned GRE bacteraemias over the past three years, as the Figure shows the number of cases has remained constant. Although numbers of cases remain low there is the potential for possible transmission of GRE in hospital. In order to investigate this, strains have been sent for molecular typing in cases where there were possible clusters. In general the typing data rarely identifies cross transmission; often diverse types with very little evidence of possible transmission are seen (Figure 10).

Figure 9. Cumulative total number of Trust apportioned GRE between 2013-2016

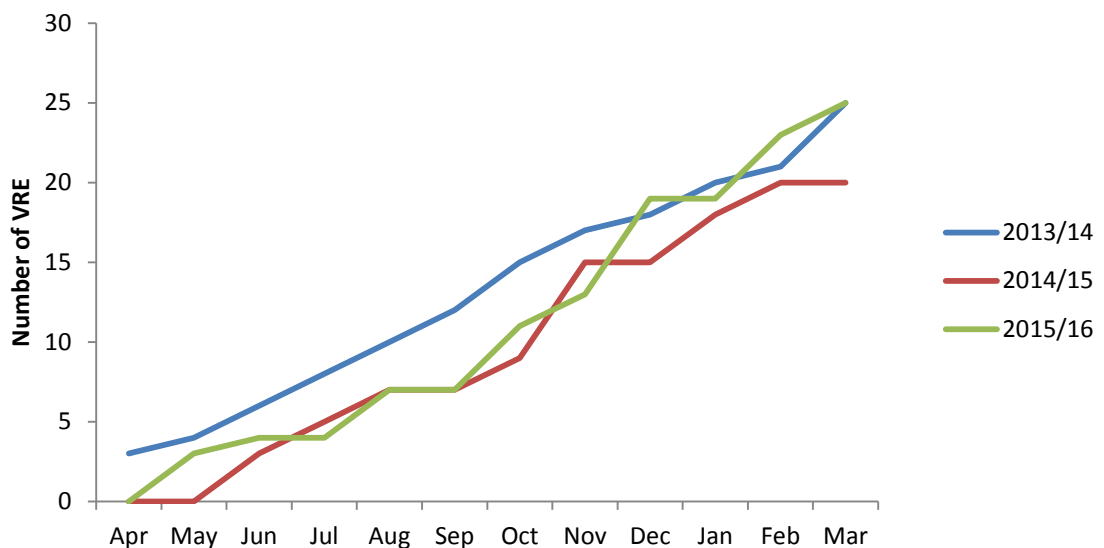
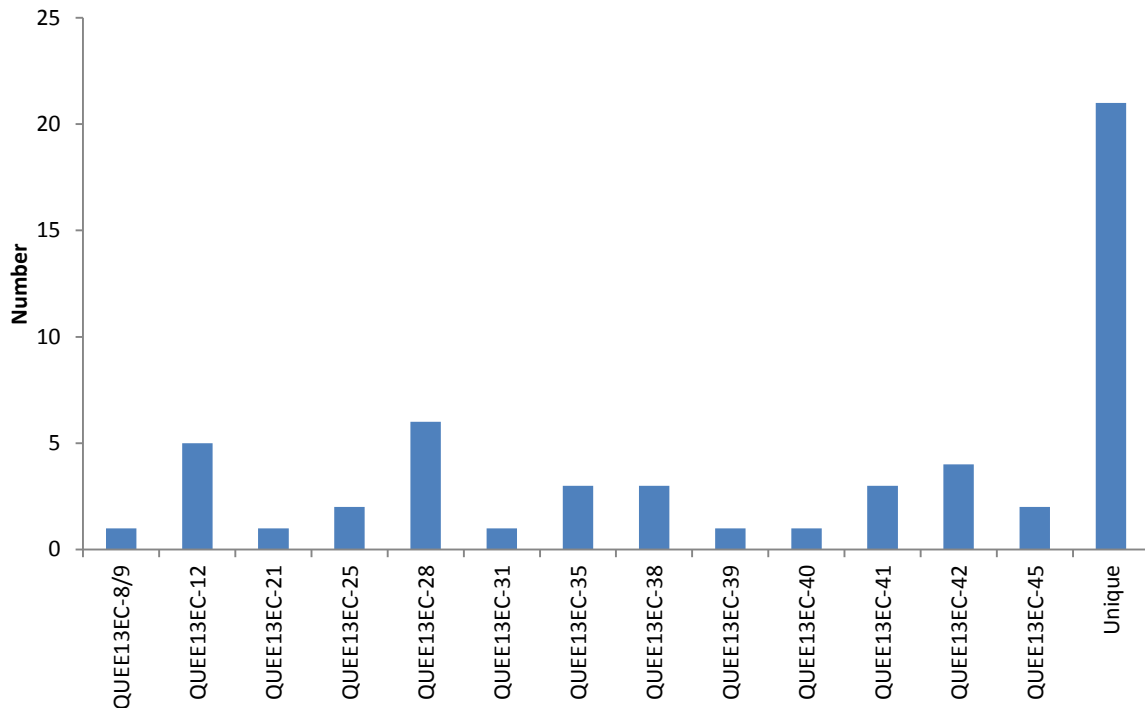


Figure 10. Typing of GRE during 2015/16



3.7 Multi-drug Resistant *Acinetobacter baumannii* (MDR-AB)

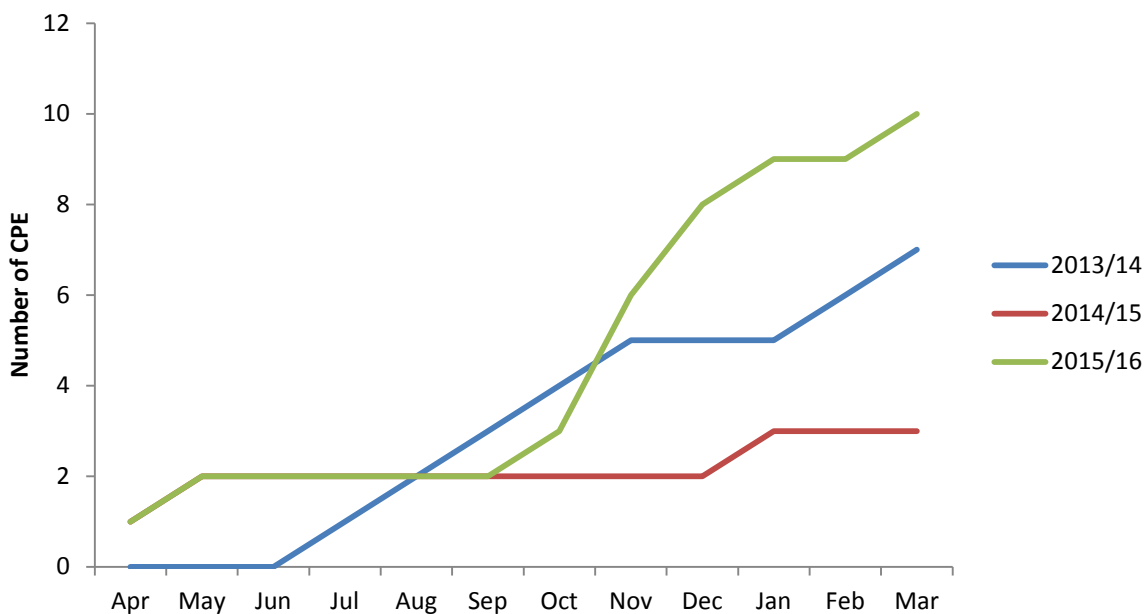
MDR-AB has been a challenge in healthcare settings for a number of years, and controlling the spread of this highly resistant pathogen is a global problem. Cases are often imported by patients who have received medical treatment abroad, and the Trust has seen importation of strains by military patients who have suffered combat related trauma in the past. During 2015/16 we saw a slight increase in cases with 3 MDR-AB reported. All three patients had medical care abroad highlighting the importance of medical history and travel history. The need for basic infection control measures including strict attention to decontamination of the environment remains vitally important in the control of this pathogen.

3.8 Carbapenemase Producing Enterobacteriaceae (CPE)

Carbapenems are the antimicrobials of last resort used to treat severe infections caused by multi-drug resistant organisms. Over the last decade, carbapenemase producing organisms (CPOs) have emerged worldwide, becoming a public health issue. Increasing incidence of CPOs continues to cause potentially serious and occasionally untreatable infections in healthcare settings. Acquisition of these bacteria is mainly nosocomial, being endemic in some countries around the world. The incidence of CPOs in the UK remains low, and implementation of Public Health England's (PHE) 'acute trust toolkit for early detection, management and control of CPE' has thus far, kept the emergence of widespread CPOs at bay. However these organisms have become endemic in some hospitals in London and the North West of England.

During 2015/16 there were 10 cases of CPE identified in patients treated at the Trust compared to 3 cases reported the previous year (Figure 11). These strains were predominantly associated with individuals who had received healthcare abroad; however we also saw increase in CPEs in patients from the local community. Evidence from other countries including the UK has shown the potential spread of these organisms within hospitals affecting local populations. In many cases these strains may have only one, or sometimes no, antibiotics which can be usefully employed for treatment, making this a potential concern to patient management and treatment. Further efforts are needed to prevent transmission with emphasis on the importance of identifying those patients at risk of carrying these strains and screening them for carriage, with colonised cases requiring strict isolation for the duration of their hospital stay. Initiatives to control the spread of CPE include an electronic admission question built into our electronic record identifying if patients have had healthcare abroad, following the national toolkit for management and control of CPEs and enhanced cleaning of a room or bay of known patients harbouring CPEs.

Figure 11. Cumulative CPE cases since 2013 until present



3.9 Pseudomonas Aeruginosa

Pseudomonas aeruginosa is a ubiquitous and important opportunistic pathogen in the healthcare setting, particularly affecting those with impaired host or mucosal immunity. It is found in a wide range of moist, nutrient-limited environments and may colonise hospital and domestic water taps, sinks, drains, toilets, and showers. *Pseudomonas aeruginosa* forms biofilms that allow persistence of micro-organisms in water systems for long periods, and this helps to explain why high colonisation rates may be seen in hospital water systems. Nosocomial *pseudomonas aeruginosa* outbreaks have previously been reported in some healthcare settings as associated with hospital water sources. Other potential routes of transmission include cross infection, for

example carriage on the hands of healthcare workers, and through contaminated medical equipment.

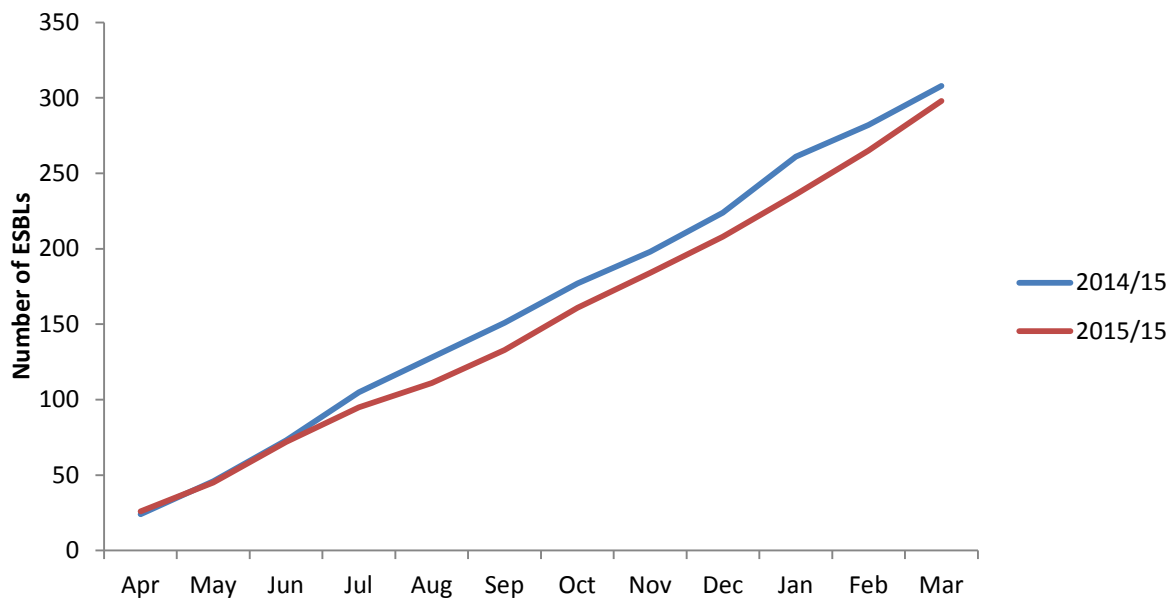
In the UK, the role of water in the transmission of *Pseudomonas aeruginosa* in healthcare settings has become an increased area of focus in response to a high-profile outbreak affecting a neonatal critical care unit in Belfast, Northern Ireland. In the Belfast outbreak the source was eventually determined to be wash hand basin taps. National guidance is now in place in England detailing procedures for routine water sampling on augmented care units, with directed interventions such as disinfection and replacement of high-risk plumbing parts required. The national guidelines recommend sampling water outlets in augmented care units on a six-monthly basis and taking remedial action for outlets which are positive for *Pseudomonas aeruginosa*. Additional general infection prevention and control precautions for dealing with high-risk outlets within clinical areas and routine surveillance of clinical isolates are recommended. The Trust Water Safety Group has implemented the guidance and monitors water sampling and clinical surveillance data taking action where any concerns are noted.

Water sampling in line with the national addendum has shown around 25% of the outlets on critical care were positive for *Pseudomonas aeruginosa* over a year, with results ranging from 5.5% to 20.6% in other augmented care areas. Clinical surveillance has shown water to patient transmission in the critical care unit. To reduce the risk of transmission healthcare institutions need to examine intrinsic, holistic and engineering factors – for example: the role of disposal of waste water, the installation of new tap outlets that are redesigned either to prevent contamination or enable decontamination, the cleaning of taps appropriately, and the frequency of water sampling to identify outbreaks. Healthcare workers also play a role in transmission and need to be educated accordingly. Further research is ongoing at the Trust with planned initiatives to further reduce the number of outlets being colonised with *Pseudomonas aeruginosa* including correct disposal of waste water, replacement of current tap units in critical care, appropriate cleaning of taps outlets and effective remedial work on any taps identified as being colonised.

3.10 Extended Spectrum β -lactamase (ESBL) producers

Bacteria that produce enzymes called extended-spectrum beta-lactamases (ESBLs) are resistant to many penicillin and cephalosporin antibiotics and often to other types of antibiotic. The two main bacteria that produce ESBLs are *E. coli* and *Klebsiella* species. The ESBLs that *E. coli* most often produce are called CTX-M enzymes. *E. coli* with ESBLs may cause urinary tract infections that can sometimes progress to more serious infections such as septicaemia. Resistance can make these infections more difficult to treat. Figure 12 shows the number of patients found to be colonised or infected with ESBL-producing organisms. The vast majority of these patients come into hospital from the community; it is unknown where or how these organisms are arising. Further efforts are needed to prevent transmission with colonised cases requiring isolation if presenting with diarrhoea and strict attention to hand hygiene.

Figure 12. Cumulative number of new ESBLs identified from 2014 to 2016



4. Outbreaks and incidents

4.1 Norovirus

Norovirus is a self-limiting diarrhoea and vomiting bug that usually lasts 48 – 72 hours. During 2015/16 no outbreaks of norovirus were reported by the Trust, recently outbreaks of norovirus have been occurring towards the end of spring. The Trust needs to remain aware of patients presenting with symptoms typical of norovirus including diarrhoea and vomiting.

4.2 Seasonal Influenza

Moderate levels of influenza activity were seen in the UK community in 2015/16, with influenza A(H1N1)pdm01 the predominant virus circulating for the majority of the season. A(H1N1)pdm09-related activity peaked late, in week 11 of 2016, with influenza B peaking afterwards. The impact of A(H1N1)pdm09 was predominantly seen in young adults – the pattern of those affected being different in different parts of the UK. Peak admissions to hospital and critical care were higher than seen in the previous few seasons, but lower than the last notable A(H1N1)pdm09 season in 2010/11.

At the Trust there were ~71 laboratory confirmed cases of influenza A between 1 December 2015 and end of March 2016. This was lower than last year's cases of over 155, however still high compared to previous years. Influenza vaccine uptake in England was lower than last season in the elderly, in healthcare workers, in the under 65 year olds in pre-defined clinical risk group and in pregnant women. The Trust was no different with a decrease in influenza vaccine uptake from 50.17% to 35.78% of frontline staff. A new national CQUIN (commissioning for quality and innovation) has been put in place in 2016/17 to incentivise Trusts to get a target uptake of 75% or more in frontline staff.

4.3 Patient Advice and Liaison Services (PALS) Contacts

The Trust is committed to working in partnership with patients and staff to help improve patient experience. The PALS is part of this commitment to provide high standards of care and to support patients, carers and the public who use Trust services. During 2015/16 there were six complaints received by the Trust in relation to infection prevention and control issues. Some of the issues included: lack of information to the patient on infections, environmental cleanliness, issues over the personal hygiene of the patient concerned and lack of communication with the family regarding the patients infection status. The reoccurring issues around the six complaints included environmental cleanliness and patients acquiring an infection whilst in hospital. These issues are tackled in the everyday work of the Infection Prevention and Control Team, for example the teams work with Facilities has shown ongoing and continuous review of cleaning practices. Acquisitions of infections and periods of increased incidences of infections are reported through Datix incidents (incident reporting system), reported to the local Clinical Commissioning Group and reviewed through a post infection review.

4.4 Infection Prevention and Control Datix Incidents

Every incident (clinical/ non-clinical) or near miss at the Trust should be reported to the Risk Management Team via the online electronic reporting system Datix. Hospitals use Datix to improve safety for patients, healthcare workers, visitors and contractors. During 2015/16 the Infection Prevention and Control Team have worked with risk management to set up infection prevention and control incident reporting through Datix, reporting incidents such as: Serious Incidents Requiring Investigation (SIRIs), Post Infection Reviews (PIRs) and Periods of Increased Incidences of Infections (PIIs) for example. This enables more transparency to infection prevention and control incidents and enables feedback to patients and staff if any lapses in care are identified, via Duty of Candour. In addition staff can report any other infection prevention and control incidents enabling the Infection Prevention and Control Team to identify any areas for improvement. During 2015/15, 269 infection prevention and control incidents were reported through Datix which consisted off: 38% incidents relating to acquisitions of infections, 29% inadequate handover of the infection status of the patient by a clinical area, 12% with an issue related to the patients peripheral venous cannulae/line, 10% issue with the cleanliness of the clinical area, 6% sharps disposal issue, 3% due to inappropriate personal protective equipment and 2% due to inappropriate hand washing technique. All these incidents are formally worked through in the Datix incident reporting system and are feedback quarterly to the Infection Prevention and Control Group.

4.5 Serious Incidents Requiring Investigation (SIRIs)

The Trust has an Outbreak/Serious Incidents (SI) Policy and serious incidents are reported and managed in line with this policy. Outbreaks/Incidents are managed by post infection reviews held within seven working days wherever practicable and chaired by the Lead Microbiologist for infection prevention and

control supported by key healthcare professionals. If the subsequent post infection review investigation and sampling confirms that it is an SI a thirty day report is compiled, agreed with Directorates and submitted to the Commissioners. If results indicate that it is not an outbreak and other ward indicators are assessed to be the required infection prevention standards, then a request to downgrade the SI can be made to the Commissioners.

Frequent meetings are held to manage and monitor the outbreak/incident to discuss individual cases and arrange appropriate sampling or screening, support patient experience and care, inform staff, arrange appropriate decontamination of the affected areas and reduce the risk of spread to other areas whilst maintaining the operational function of the hospital and patient flow. Different outbreaks/incidents demand different responses but are managed with precision and collaborative working between the multi-disciplinary teams across the Trust.

5. Surgical Site Infections

Surgical site infection is a type of healthcare-associated infection in which a wound infection occurs after an invasive (surgical) procedure. Surgical site infections have been shown to compose up to 20% of all of Healthcare Associated Infections. Around 5% of patients undergoing a surgical procedure develop a surgical site infection.

A surgical site infection may range from a spontaneously limited wound discharge within 7–10 days of an operation to a more serious postoperative complication, such as a sternal infection after open heart surgery. Most surgical site infections are caused by contamination of an incision with microorganisms from the patient's own body during surgery. Infection caused by microorganisms from an outside source following surgery is less common. The majority of surgical site infections are preventable. Measures can be taken in the pre-, intra- and postoperative phases of care to reduce risk of infection.

Surgical site infections can have a significant effect on quality of life for the patient. They can be associated with increased morbidity and extended hospital stay. In addition, surgical site infections result in increased financial costs to healthcare providers. Advances in surgery and anaesthesia have resulted in patients who are at greater risk of surgical site infections being considered for surgery. In addition, increased numbers of infections are now being seen in the community as patients are allowed home earlier following day case and fast-track surgery.

Mandatory surveillance of surgical site infections started in 2004, specifying each Trust should conduct surveillance for at least 1 orthopaedic surgical category for 1 period in a financial year. The categories include: hip replacements, knee replacements, repair of neck of femur and reduction of long bone fracture. The Trust has a Trauma audit team which undertakes the mandatory surveillance, reporting on repair of neck of femur and hip replacement surgical site infections. In 2014/15 the Trust reported 0% surgical

site infections in hip replacements and 0.7% surgical site infections in repair of neck of femur fractures. During 2015/16 the Trust reported an increase in surgical site infections in repair of neck of femur fractures; 2.5% infections in quarter 1 and 3.4% in quarter 2.

Surgical site infection can account for a large proportion of Healthcare Associated Infections. A programme to deliver snapshot surveillance of infections following various types of surgery with the long term aim of making each specialty able to continuously monitor their own infection rates is a priority. One of the targets in the new financial year will be to identify specialities with increased rates of surgical site surveillance; one means of achieving this could be by the development of electronic surveillance systems. Manual snapshot surveillance in areas may need to be undertaken to validate the electronic systems. In addition compliance audits on National Institute for Health and Care Excellence (NICE) guidance for reduction in surgical site infections needs to be undertaken.

6. **Audit**

The Infection Prevention and Control Team have a comprehensive and wide audit programme for assurance purposes that has been successfully delivered during 2015/16.

Cleaning hands is one of the most important actions anyone can carry out to prevent infection. Hand hygiene audits are undertaken by the clinical area and are reported every month at the Infection Prevention and Control Group. Audits are undertaken weekly by the clinical area if hand hygiene compliance is above 90%, if compliance drops below 90% then daily audits are undertaken. Regular hand hygiene audits are performed by the Infection Prevention and Control Team to further validate the results.

Saving Lives 'high-impact interventions' are evidence based tools that allow staff to monitor compliance with clinical guidance and provide feedback so that compliance can improve consistently. High impact interventions provide the means to ensure that staff undertake clinical procedures correctly every time they are needed. The high impact interventions include guidance and tools for: central venous catheter care, peripheral venous catheter care, renal dialysis catheter care, prevention of surgical site infection, care for ventilated patients, urinary catheter care and reducing the risk of clostridium difficile. Saving lives audits are regularly undertaken by clinical areas every month and results are reported monthly at the Infection Prevention and Control Group.

A regular infection control audit of clinical areas is carried out an Infection Prevention Nurse. The audit consists of: observation of practice, review of care and management of patients with infections, observations on correct use of personal protective equipment, observations of environmental cleanliness and review of patient indwelling devices. The results of the audit are feedback to the clinical area and Matron.

A sharps audit was completed in February 2016 by the Trusts Sharps

provider. The survey endeavoured to: raise sharps awareness, assess practice, discuss problems and advise on compliance to current legislation. The overall compliance for sharps practice was 97.7%.

A Trust wide central venous catheter audit was completed towards the end of the financial year. The survey assesses numerous factors in relation to the catheter and care, for example: type, dressing, skin condition of the patient, evidence of infection etc. The results are due to be feedback to the Infection Prevention and Control Team, who will then disseminate these to the Divisions

A rolling programme of monthly independent environmental audits, led by the Estates Team, are in place to monitor the compliance of clinical and non-clinical areas against the national cleaning standards framework. Audit results are made available to areas with robust action plans monitored as part of a quarterly summary report to the Infection Prevention and Control Group.

The Facilities Team also actively support an ongoing ward decant programme involving, where capacity permits, the decant of clinical areas to aid the completion of a full maintenance and deep cleaning programme.

The Infection Prevention and Control Team are active members in the Patient Led Assessments of the Care Environment (PLACE) inspections. PLACE inspections assess the quality of the patient environment. The assessments see local people go into hospitals as part of teams to assess how the environment supports the patient's privacy and dignity, food, cleanliness and general building maintenance. During 2015/16, the Infection Prevention and Control Team took part in these assessment audits, driving improvements in the care environment.

7. Antimicrobial Stewardship – Key Performance Indicators (KPI's) Medicine

During 2014/15, the Trust completed the antimicrobial KPI looking at adherence of prescribing to the Trust antimicrobial guidelines in medicine. The KPI was achieved with coincidentally adherence to guidelines over 70% being achieved. In addition the target of 80% of the prescriptions meeting 4 of the performance standards was surpassed also.

For 2016/17 the Trust has adopted the national Antimicrobial resistance CQUIN with support from the local Clinical Commissioning Group with an aim to further reduce antimicrobial consumption and to ensure when antimicrobials are prescribed they are reviewed appropriately within 72hours.

8. Training and Education

In 2015/16 the Infection Prevention and Control Team have continued to deliver a wide variety of education both within the Trust and externally.

It is mandatory for every member of staff to receive an annual infection

prevention and control update. In 2015/16, 8076 staff were trained resulting in a compliance rate of 94.2%. A slight increase compared to 2014/15 which had a compliance rate of 93%. This has been achieved through Trust Induction and both Trust and local mandatory training sessions. These sessions have been reviewed and updated to ensure they remain relevant with up to date content. During 2015/16, the team have created a video training package which is now delivered at all training sessions. The new hand hygiene training video has been incorporated into the education package making this more relevant and current. The Infection Prevention and Control Team are working in collaboration with Learning and Development to ensure appropriate role specific training, in addition to rolling out an e-learning package in the new financial year.

The Infection Prevention and Control Team have delivered informal and formal sessions on a variety of subjects and continue to support Registered Practitioner and Doctor Induction programmes. The team have tailor made annual infection prevention and control updates for Doctors in different specialities and Doctors of different grades making this more relevant. The team have also tailored infection prevention and control presentations for International fellows and the new Consultants mandatory training. On top of this the Infection Prevention and Control Team have delivered infection control training sessions/updates to numerous specialities and staff groups throughout the Trust, for example teaching and education sessions to: facilities staff, preventing harm meetings, Divisional quality meetings, Divisional governance meetings, care quality management group, antimicrobial steering group, Doctors grand round, Divisional monthly update meetings, volunteer sessions, Matron meetings and the Executive team. Nursing Assistants also receive an in depth infection prevention and control training session on their development programme including using the glow box, extra information on Clostridium Difficile and MRSA. The Infection Prevention and Control Team have also worked closely with Facilities empowering them to develop their own teaching package within infection prevention and control.

Sepsis is a potentially life threatening condition that arises when the body's response to an infection injures its own tissues and organs. Sepsis can lead to shock, multiple organ failure and potentially death especially if not recognized early and treated promptly. Sepsis can be caused by a huge variety of different microorganisms, most cases being caused by common bacteria. Sepsis recognition and management education is provided to all newly qualified registered nurses on their preceptorship course. From January to February 2016 sepsis education was also provided to staff within the Clinical Decisions Unit (CDU) as part of their preventing harm educational forum.

The Infection Prevention and Control Team have also given education sessions externally teaching on the University of Birmingham's undergraduate nursing programme. The Infection Prevention and Control Team have delivered lectures on infection prevention and control and Mycobacterium Tuberculosis (TB) (Figure 13). The Infection Prevention and Control Team have also given lectures on the undergraduate and postgraduate Medical

Microbiology courses delivered by the University of Birmingham on various nosocomial pathogens. The team have also delivered lectures at International conferences both within the UK and in Europe promoting best practice within infection prevention and control.

Figure 13. TB lecture given by the Infection Prevention and Control Team to the undergraduate nursing programme at the University of Birmingham on World TB day



Education and training will remain a key priority in the new financial year promoting best practice within infection prevention and control.

9. Facilities Update

The ongoing and continuous review of cleaning practices between Facilities and the Infection Prevention and Control Team has resulted in a simpler, auditable RAG (red, amber, green) rated set of standardised cleaning standards and the introduction of new (best practice) three-cloth sink cleaning technique. The Care Quality Commission (CQC) reported in 2015 that cleaning standards were 'good' at the Trust with Patient Led Assessments of the Care Environment (PLACE) reporting 98.55% for the environment. In April 2015/16, 1,900 areas were misted with H₂O₂ and 12,400 terminal cleans on bed spaces cleaned over the same timeframe. A total of 47 complete ward terminal cleans were completed in 2015/16; accompanied with 20,400 fresh curtain changes. Four complete wards were decanted to allow for both environmental and estates work to be carried out during the summer. The Trust independent monitoring team gave the environment an overall 95.84% rating in 2015/16 with 96% of patients also reporting their wards/clinical area as clean.

10. Research and Development

Research and Development is a key component of an infection prevention and control programme, particularly in a high profile teaching Trust such as UHB. Research can be used to develop science and evidence based practice to further drive infection prevention and control improvement. During 2015/16 the Infection Prevention and Control Team has been actively involved in numerous research projects highlighted by 4 peer reviewed journal articles being publishing and several team members giving presentations at

conferences and study days on its work throughout the year. At the annual international Infection Prevention Society conference in Liverpool the team gave two verbal presentations and presented 5 posters.

Research projects included work on the following:

- The role of *Pseudomonas Aeruginosa* in water transmission within augmented care
- The role of *Mycobacterium chimaera* in heater cooler units used in cardiac-pulmonary bypass surgery
- The role of decontamination and cleaning within a hospital environment
- Work on sepsis in patients with *clostridium difficile* infection and treatment of *clostridium difficile* using faecal microbiota therapy

Other studies are being planned with both external academic partners and internal clinical parties. Research development within the Infection Prevention and Control Team at the Trust will continue to flourish in the next financial year.

11. Infection Prevention and Control Initiatives

As outlined above, 2015/16 has been a year full of innovation for infection prevention and control. Initiatives have included work around MRSA, CDI, CPEs, MSSA, *E. coli*, environmental cleaning, water microbiology and hand hygiene.

MRSA has been challenging in 2015/16 highlighted by the increase in Trust apportioned MRSA bacteraemias seen within the Trust. An MRSA reduction plan was formulated to tackle the increase. The MRSA reduction plan focused on the following: mandatory training, hand hygiene, saving lives, screening and decolonisation, personal protective equipment, clinical dashboard, clean environment, antimicrobial stewardship, invasive devices and investigations such as post infection reviews and root cause analysis reviews.

One of the main initiatives to tackle the increase in MRSA bacteraemias has been the reintroduction of universal MRSA decolonisation in critical care. Isolation and decolonisation are the two main targeted control measures for reducing transmission of MRSA in hospitals. Universal MSRA decolonisation in critical care units is thought to reduce MRSA incidence and be a cost-effective method for controlling MRSA in this setting. In a previous year (2014) the Trust implemented a revised strategy for the control of MRSA and discontinued the use of universal decolonisation in critical care based on national surveillance reports. There was an increase in MRSA bacteraemias and acquisitions in the one year period following the changes compared to the previous 12 months. Given these increases in the incidence of MRSA bacteraemias universal decolonisation was reintroduced into critical care in the later part of 2015. There has been a decrease in the number of acquisitions and bacteraemias in the 6-month period following the reintroduction of routine decolonisation in critical care.

The Trust has utilised MRSA screening and clinical isolate data to further

clarify MRSA acquisitions within the Trust. This has enabled the teams to identify potential transmission links within the Trust, understand the epidemiology of this pathogen and use acquisitions as a predictor for an MRSA bacteraemia. MRSA acquisition data has also been used as an indirect quality for adherence to infection prevention and control practice. Areas where MRSA acquisitions are seen are reviewed by the Infection Prevention and Control Team observing practice formulating action plans if needed. Data is also shared with Divisions and presented at specialty meetings.

Clostridium Difficile infection continues to be a major burden to patients that can also cause increased morbidity and mortality. Although numbers of CDI cases continue to reduce, there is always the need to improve. At the Trust we have strengthened the national post infection review process adding more criteria into the review allowing more detail about the individual cases to be gathered. This has enabled robust action plans to be developed if any lapses in care have been identified. On top of this we undertook a Trust wide Clostridium Difficile road show in September 2015 to promote awareness of infection, treatment, monitoring of stool and infection control precautions.

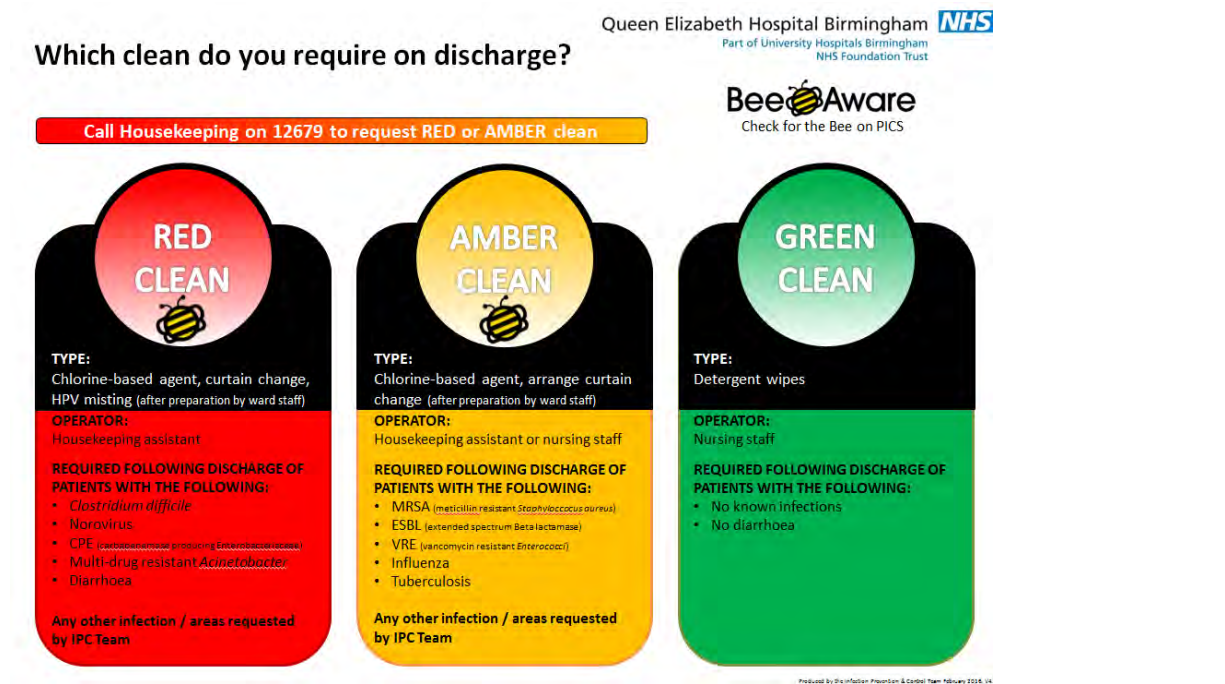
National guidance requires that the management of patients with Clostridium Difficile should include a regular review. Infection Control Nurses are uniquely placed to lead Clostridium Difficile ward rounds due to their experience and expertise in the management of the infection. Here at UHB we have instigated Infection Control Nurse led Clostridium Difficile ward rounds. Supported by Gastroenterology and Microbiology; ward rounds include patient assessment and treatment review to optimise the management of Clostridium Difficile infection for patients. The ward rounds provide an opportunity for a holistic nursing assessment including nutrition and hydration, skin integrity, bowel management and medicines review and optimisation. Patients are assessed early in the course of disease for faecal microbiota transplant (FMT) which if indicated is administered by the infection control nurse. Patients have rapid access to specialist advice from Gastroenterology and Microbiology Consultants via the ward round team. Improvement in the outcome of patients has been observed since implementation including an overall reduction in the level of severity, reduced mortality, reduction in recurrence rates and increased uptake of faecal microbiota transplant.

Over the last decade, **CPEs** have spread worldwide, becoming a public health concern. The Trust has been involved in the modification of the current national guidance on CPEs due to our experience in dealing with patients repatriated from abroad harboring these organisms. The decontamination methods the Trust has employed to render a room safe for re-use after these patients have been discharged has been used in national guidance and led to our work being published in a peer reviewed journal.

Contamination of hospital surfaces can contribute to the transmission of healthcare associated infections. The best way of reducing healthcare associated infections after hand hygiene is environmental control. The Infection Prevention and Control Team have worked closely with Facilities further improving cleaning techniques, making the procedures more robust

and easy to follow (Figure 14). Some of the changes have included changing of the wipes used within the Trust and the changing of the cleaning practices by Facilities. In addition to this the team have helped advise on new building works and the infection control risks associated with this. The team have also aided Estates in the annual deep cleaning of wards.

Figure 14. New cleaning traffic light poster used within the Trust to make cleaning easier to understand



Surveillance of **MSSA** bacteraemias has shown 40% of infections are line associated. Looking into these in more detail a number of cases have been associated with patients within clinical haematology and oncology. MSSA root cause analysis reviews have been undertaken in these specialities on line associated MSSA bacteraemias, enabling any potential lapse in care to be identified and addressed with robust action plans.

Similarly, surveillance of **E. coli** bacteraemias has shown 32% of infections are associated with urinary tract infections with a proportion of these being catheter associated. Any **E. coli** bacteraemias with the source of infection being a catheter acquired urinary tract infection undergo a root cause analysis review to identify learning points. Learning points are addressed through the Contingence Action Group. In addition, this root cause analysis tool is used for any new urinary tract infection identified through the mandatory safety thermometer surveillance undertaken by the Trust. Again learning points are fed back through the Contingence Action Group.

Cleaning hands is one of the most important actions anyone can carry out to prevent infection. Patient safety organisations in the UK and the World Health Organisation have focused on making hand hygiene routine behaviour in healthcare settings. Hand hygiene forms a major part of the Infection Prevention and Control Team's key priorities and every year initiatives are undertaken to further raise awareness of hand hygiene prompting this through

education and teaching to all staff within the Trust (Figure 15). Examples of promoting hand hygiene have included partaking in World hand hygiene awareness day with stands in the atrium for the public as well as road shows on clinical areas (Figure 16 and 17). Working with the Communications Department, hand hygiene is constantly being promoting to staff and public, via electronic bulletins and in QEHB news. In addition, a new hand washing video has been made and has been incorporated into the annual mandatory infection control training.

Figure 15. Photograph of the Infection Prevention and Control Team and the Deputy Chief Nurse promoting hand hygiene (picture supplied by UHB Communications Department)



Figure 16. Photograph of the Infection Prevention and Control Team and Nursing Students promoting hand hygiene (pictures supplied by UHB Communications Department)



Figure 17. Infection Prevention and Control Team with a stand at the Annual Nursing Conference promoting hand hygiene (pictures supplied by UHB Communications Department)



Water sampling in critical care has shown up to 25% of the outlets can be positive for **Pseudomonas Aeruginosa**. The Trust has taken steps to reduce the risk of transmission by examining intrinsic, holistic and engineering factors. Research is ongoing with planned initiatives to further reduce the number of outlets being colonised with pseudomonas aeruginosa including correct disposal of waste water, replacement of current tap units in critical care, appropriate cleaning of taps outlets and effective remedial work on any taps identified as being colonised. Work has influenced recently published national guidance on managing pseudomonas aeruginosa in augmented care units. In addition, education sessions on pseudomonas aeruginosa have been provided.

Mycobacterium Tuberculosis (TB) infects one-third of the world's population and is the most frequent infectious cause of death worldwide, accounting for 3 million deaths per year. Infection is acquired by inhalation of infectious droplets. Almost all UK TB is acquired through the respiratory route. The Infection Prevention and Control Team have undertaken education work on TB within the Trust focusing on early recognition, diagnosis and infection prevention and control precautions. The team has also participated in World TB day focusing on education and made strong links with regional TB nurses. In addition the Infection Prevention and Control Team have created a monthly TB incidence review panel to discuss any new case within the Trust to identify whether staff or patients have been exposed to TB; with action plans being developed if such an occurrence has been identified. One the infection prevention and control precautions for patients with active pulmonary TB infection includes the use of a filtered face-piece protection (FFP3) respirator when undertaking aerosol generating procedures. Staff need to be fit tested to wear an FFP3 respirator, the Infection Prevention and Control Team with the Health and Safety Team have reviewed the number of staff who are fit tested and how they are fit tested. From the review there is a need to increase the number of staff being fit tested for FFP3 respirators, however the current method is time consuming. The Trust has invested in an automated system called a portacount to test the fit of an FFP3 respirator. Four portacount machines have been procured and these will sit within the Divisions making fit

testing of an FFP3 respirator easier and will help to increase the number of staff which are fit tested.

Through peer reviewed publications and presentations by the Infection Prevention and Control Team at international conferences, the innovative work has gained interest from other Trusts around the country. As a result the Infection Prevention and Control Team have shared best practice by visiting various hospitals in the Shelford Group. This has also enabled the team to gain insight into what other teams are doing around the country enabling best practice to be shared and used within the Trust.

The Infection Prevention and Control Team have supported other departments within the Trust for example: working with the Tissue Viability Team by undertaking the annual foam mattress audit, reviewing the sexual health clinics from an infection prevention and control perspective, having nursing students shadowing the Infection Prevention and Control Team during their nursing course, having military staff shadow the team during their infection prevention and control courses and working with communications by participating in a TV documentary on infection prevention and control. This has enabled the team to broaden relationships across the Trust further embedding infection prevention and control practice within the Trust. The team have also supported the recent health and safety executive inspection of the Trust.

12. **Innovation and the future**

The Infection Prevention and Control Team have developed an ambitious but flexible and achievable programme of work over 2016/17 with the aim of ensuring that the Trust continues to improve infection prevention and control and continues to meet national standards and guidance. An update on the actions and work plan is provided as part of the regular Board of Directors updates around infection prevention and control.

The plan for the Infection Prevention Control Team in 2016/17 will ensure that:

- The Trust complies with relevant national guidance and policies specifically the Health and Social Care Act
- Incorporating the learning from Post Infection Reviews (PIRs), complaints and incidents
- Ensuring audits/reviews are undertaken providing robust assurance around the Trusts quality indicators for infection prevention and control
- Antibiotic stewardship is improved through the new antimicrobial CQUIN
- Education and training in infection prevention and control being at the forefront in all what we do.

To deliver the priorities and plans for 2016/17 the key actions will be:

- Antibiotic stewardship to be improved through the national CQUIN on reduction of antimicrobial consumption and timely review of antimicrobial treatment

- To audit compliance on National Institute for Health and Care Excellence (NICE) guidance for reduction in surgical site infections
- To continue to implement the MRSA reduction plan and audit compliance on this
- Implement a Clostridium Difficile action plan to further reduce the rates of clostridium difficile infection and audit compliance on this
- Establish effective Link Nurse programme
- Review the Saving Lives initiative with a view to reinforce agreed practice and reduce infection
- Continue to fully participate within the Trust's Infection Prevention and Control Group (IPCG)
- Strive for the best in patient care and innovation in infection prevention and control practice
- Deliver on online eLearning teaching package for infection prevention and control.

13. **Recommendation**

The Board of Directors is asked to accept the 2015/16 Annual Report on Infection Prevention and Control.

Philip Norman
Executive Chief Nurse
July 2016