The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust

REPORT TO THE BOARD OF DIRECTORS (IN PUBLIC/PRIVATE)

RESPONSIBLE DIRECTOR:	REPORT FOR:		IMPACT ON BUSINESS:		
Dr Beverley Watson Medical Director	Decision		High	Med	Low
	Discussion	✓	✓		
	Information				
LEAD MANAGER:	**REPORT TYPE:**		**BAF REFERENCES & RAG:**		
Dr Ian Hosein MD MA FCAP FRCPath MBA Director of Infection Prevention and Control	Strategic				
	Operational	✓			
	Governance		**RELATED WORK: (PREVIOUS PAPERS TO COMMITTEE)**		
PEER ASSIST:	**PEER REVIEW:**				
CQC Domain: (safe, caring, effective, responsive, well-led)					

Meeting Date: 26th July 2016

Report Title: Infection Prevention and Control Annual Report

PURPOSE:					
SUMMARY:					
RISK ASSESSMENT (CROSS-REFERENCE WITH RISK REGISTER WHERE APPROPRIATE):					
Strategic / External	Operational/ Organisational	Financial	Clinical	Legal/ Regulatory	Reputational / Patient Experience
✓	✓	✓	✓	✓	✓
RECOMMENDATION/S:					

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Chief Executive: Dorothy Hosein
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The Queen Elizabeth Hospital NHS
King's Lynn
NHS Foundation Trust

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King's Lynn
NHS Foundation Trust

Infection Prevention and Control (IP&C)

Annual Report

April 1st 2015 – March 31st 2016

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May 22nd 2016

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Abbreviations and Brief Glossary

CPE : Carbapenemase–producing Enterobactereace

Cluster – when cases of infection appear in the same location and time-period

Endemic- Organism/Infection is always present in low levels (e.g. Norovirus infections in the wider community) with occasional higher levels (outbreaks/epidemics)

Outbreak- when there is a rate of infection higher than an endemic rate

OPAT- Outpatient IV Antibiotic Therapy

PHE : Public Health England

RCA: Root Cause Analysis

1.0 Executive Summary

This last year has been marked by times for celebration of performance punctuated by periods of worsening compliance to key infection prevention modalities leading to outbreaks.

The organisational culture change initiative from our *Aiming for Excellence* aligned all parts of the hospital to delivering the CQC metrics including patient safety. Yet, despite this, and an enormous amount of cross-organisational effort to embed good practice in ward hygiene using comprehensive action plans from October 2014 to date, lapses in our safety practices after the CQC inspection in June 2015 led to two outbreaks with *C. difficile* infection.

Because of the transmissible nature of organisms, any lapse in safety behaviour can lead to large increases in poor outcomes and hence outbreaks. In other terms, the transmissibility of organisms and infections can present with a multiplier effect leading to an outbreak as distinct to non-transmissible patient safety incidents. ***By corollary, the spread of infections with outbreaks in hospitals can be a sensitive indicator of a safety culture with poor compliance to the fundamentals of care.***

The efforts taken to embed good practice did have a positive impact on Norovirus spread in the Trust with our performance this last winter (1st September 2015- 31st March 2016) being the best in the organisation's recent memory. Thus, we have had a more than 90% improvement in Norovirus containment with less spread to patients or staff and fewer ward closures to the end of the financial year on March 31st 2016.
Investigation of the two outbreaks of *C. difficile* infections highlighted failures in ward compliance with key prevention measures such as the proper cleaning of commodes after each patient's use and inappropriate use of gloves and aprons which can act as contaminated sources for spread of this infection. The vital importance of clinical record documentation and ward-to-ward and medical-medical communication when patients are transferred between wards was also highlighted as requiring improvement. These led to the failure to isolate some patients quickly and also continuation of antibiotic courses which could have been rationalised or stopped. The outbreaks were brought under control by rigorous attention to compliance driven by an Outbreak Action Plan. The end-of-year total for *C. difficile* hospital-associated cases was 39 of which 33 cases occurred during the outbreak

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periods of June - August and October – December 2015. Since the agreed internal trajectory set by the Trust and CCG as a quality improvement outcome was no more than 27 cases, this was breached. However, the Trust met the NHS England externally set target of no more than 53 cases. The targets set by NHS England are the ones which are used for national comparisons.

The NHS England and CCG set target for MRSA is that there must be no positive blood cultures. There was one positive MRSA blood culture thereby breaching the target. This arose in a patient who was screened for MRSA with negative results on 5 separate occasions during the same hospital episode and who then became positive for MRSA in skin swabs providing convincing data that the organism was acquired during clinical care at QEH. Once acquired, the organism then invaded into the blood stream via a central venous line however, investigation indicated that the line insertion and care protocols were followed properly. The preventive controls for MRSA have led to less spread over the year and this (single) event was not part of a cluster of infections.

Staff immunisation for influenza was 46% which is a 2% improvement on 2014/2015, despite widespread staff concerns about the national vaccine failure last year. Our internal immunisation initiative via Occupational Health, IP&C and the Communications Department was launched as part of winter planning with close coordination amongst QEH, the CCG and Norfolk Public Health Department. Over the year, such coordination has led to proposals and initiatives for Norovirus prevention across West Norfolk, increasing uptake of pneumococcal vaccination in the community, and prevention of recurrent cellulitis in the elderly. Educational talks covering there topics have also been given to our local GPs e.g. via QEH-GP Acute Medicine Updates and were well received.

Going forward, the challenges will be:

- *The need for **Action Oriented Leadership** throughout the organisation to continue with our embedding of ward staff compliance in patient safety to further prevent C. difficile and MRSA infections and, to sustain the improvements with Norovirus control; this is to also equip the Trust to face emerging threats*

- *To embed better practice in all clinical communications including clinical record documentation*

- *To improve in the overall approach to infections with better diagnosis and management with concomitant better utilisation of antibiotics by junior medical staff- the "sepsis" training programme must be launched with the new national definitions*

- *To have a better Health Economy Approach to prevention and management of infections and particularly so in the elderly in their own homes or in residential care*

- *To have better engagement with the Eastern Pathology Alliance so that the quality of microbiology laboratory services improve - there must be a stronger emphasis on quality improvement in our contract monitoring process.*

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2.0 Introduction

This report summarises our performance over the last year with an attempt to give as much insight into either good or undesirable outcomes. Extensive data sets relating to IP&C are already available to the IP&C and Quality Committees and the Trust Board via other routes so data will be employed here where they relate directly to key targets or where they are about important prevention modalities e.g. hand hygiene and MRSA screening.

The report should be read as an interlinked document since information presented in detail in one part e.g. on hand hygiene, is then just referred to elsewhere.

3.0 Norovirus Prevention & Control

The images below show: Norovirus (top left) and some of the interventions made to prevent transmission- bottled water for patients, mobile sinks to enable handwashing especially where there were no sinks, facemasks with visors to protect against contamination by vomitus, better bed curtain management, alert signage for staff and visitors, unused patient teacups placed *facing down*.

3.1 <u>What is the Issue?</u>

- Norovirus presents as a syndrome with acute gastroenteritis causing nausea, abdominal pain, vomiting and diarrhoea
- It is a faecal-oral, oral-oral agent in that the virus must make its way from vomit or diarrhoeal stool to then be ingested by someone else
- The only host for this virus is the human species and it affects the UK population throughout the year but most frequently in winter hence the classical name, *Winter Vomiting Disease*
- The illness is endemic in the community at all times in the year and the virus can therefore make its way into a hospital at any time of the year

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- It has a minimal infective dose of a few particles in the mouth and it can contaminate food and the environment leading to ingestion and illness.
- Despite it being a self-limiting illness lasting around 2-3 days amongst most people (>95%), some patients are admitted to hospitals because of diagnostic uncertainty by GPs or Emergency Departments, or concerns about dehydration
- The impact of this agent on QEH prior to this last winter has been significant with viral spread within the hospital to patients and ward closures: the CCG and Public Health Authorities have previously cited QEH for failure to prevent this virus spreading at the hospital.

3.2 How have we been addressing this?

A more focussed approach to prevention of this virus causing infections at QEH was launched in November-December 2014 with a number of initiatives targeting staff understanding of the virus, the required hygienic behaviour and also environmental controls.

All initiatives pivoted around the mechanisms by which we could block the movement of the virus from person to person. We have added to the initial inputs month on month in a dynamic approach and examples from that time to date of this report include:

3.3 Staff Education and Internal Communications:

- Training that whilst alcohol gel is ineffective, the virus could be removed by handwashing
- Deployment of mobile sinks and placement of permanent ones at key locations e.g. the staff restaurant to encourage handwashing
- Campaign run with the Communications Department named " Be Effective , Not Infected" highlighting key messages including the strap line :
  Not in their Mouth, Not in Your Mouth …
- Rapid environmental cleaning via nursing, housekeeping and domestic staff
- Guidance on use of facemasks with visors, gloves and plastic aprons (PPE)
- Audits on use of PPE to ensure that staff were not walking through wards with PPE *even when thought to be not contaminated*
- Key action points given to silver on-call staff to ensure out-of-hours response to viral ingress is rapid
- Directive that staff must not consume food /drink in clinical care areas
- Directive for staff hygiene in serving food or drink to patients or providing pills
- Linking of ward hygiene *with overall safety behaviour* on a given ward

3.4 Case Diagnosis

- Emphasis on use of syndromic clinical features of viral gastroenteritis to trigger a rapid response to prevention
- Regular medical reviews of suspected patients to rule viral gastroenteritis in or not
- Sampling of stools to detect the virus

3.5 Stakeholder Engagement:

Campaign above included getting key messages via our Communications Department out to the wider public via radio and local papers and to nursing and residential homes and GPs.

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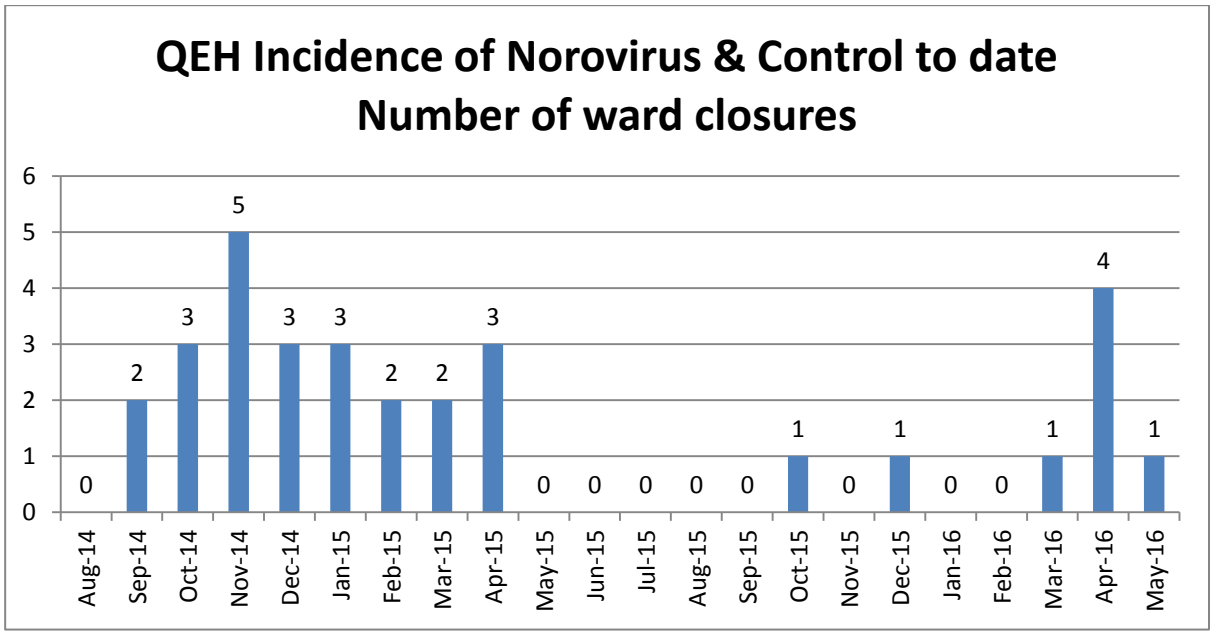
3.6 How have we been performing and why?

The data to hand demonstrates significant improvement with the same influx of patients from the community **in winter 15/16 vs. winter 14/15 i**n terms of the number patients who acquired the illness at the Trust and the number of ward closures.

The preventive systems worked since the messages about Norovirus impact have been understood and acted upon with rapid responses to viral ingress.

3.7



3.8 What must be done for improvement?

Having achieved an excellent standard of staff behaviour and operational management of Norovirus ingress over this last winter, what remains is that this must be sustained since the virus can strike at any time. We have shown a tremendous capacity to defeat this virus but, with that, there must be no complacency in maintaining all standards given before.

If we truly are Aiming for Excellence in Quality & Safety, then the strap line for QEH now must be:

Excellence in Work at All Times …

That we have had 4 wards closed in this new year (April 2016) is a cause for serious concern with winter 2016/2017 ahead- initial investigations indicate significant slippage in ward staff knowledge and standards

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4.0 Mandatory Surveillance for MRSA & C. difficile (targets set nationally) and MSSA and E. coli (no targets set).

Blood stream infections due to Methicillin-resistant *Staphylococcus aureus* (MRSA) and diarrhoea due to *Clostridium difficile* have nationally set (and CCG agreed) failure targets.

Since 2011, blood stream infections due to Methicillin-sensitive *Staphylococcus aureus* (MSSA) and *Escherichia coli* (E. coli) have been added to national mandatory surveillance for all trusts without failure targets.

MRSA bloodstream infections- Target 15/16= 0; Performance 15/16=1

Target 16/17=0 ……

The images above show MRSA on a Blood agar plate and a skin abscess from this organism.

4.1 What is the Issue?

Staphylococcus aureus (SA) colonises circa 40% of the human population at any time and is therefore part of the normal human microbiome. In the colonised individual, the organism's habitat is the human skin and hence it has a propensity for adhering to skin. When this organism is resistant to the antibiotic "methicillin" i.e. MRSA, it is resistant to all other penicillin-type antibiotics and it is commonly resistant to other (non-penicillin based) classes of antibiotics. Because of this resistance, the mortality rate from this organism was quite high in the early 1990s and ***public pressure caused two key government actions:***

- The launch of the Modern Matrons to prevent spread of MRSA and C. difficile (which was emerging as a national problem) by ensuring hygienic practices in patient care. This was in contrast to the historical designation of just one matron for each hospital

- The introduction of national surveillance systems for MRSA in Blood Cultures to drive reduction in infections.

Following on from the initial MRSA surveillance, government targets for Trusts were then set for reduction of MRSA in Blood Cultures and that target is now zero for all Trusts in England. Surveillance and targets for C. difficile soon followed.

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4.2 How have we been addressing this?

The *Be Effective, Not Infected* campaign referred to under "Norovirus" also incorporated MRSA and C. difficile with the messages that fundamental hygiene plays the key role in prevention of spread. Where there were specific issues for each pathogen, these were additionally noted e.g. antibiotic controls for C. difficile and MRSA which do not apply to Norovirus. The following are some interventions made to prevent MRSA spread and Blood Stream Infection.

- Reinforcement of staff hand hygiene awareness and training with regular audits as part of High Impact Interventions; wards with poorer performance received more training from IP&C staff as part of Special Supportive Measures
- Reintroduction of admission screening for MRSA in a wider set of patients from November 2014.
- Additional weekly screening of all inpatients for MRSA
- Isolation of MRSA colonised or infected patients in single rooms
- Use of skin "decolonising" agents for patients. This is to reduce the amount of MRSA on the skin thereby decreasing the potential for invasion from the skin into the blood stream. This also reduces the probability or getting MRSA as a contaminant in a blood culture bottle which is still checked against the target of zero.
  Octenisan (skin decolonising agent) use was instituted on 5 medical wards after observed spread with clusters of MRSA; this agent also acts on MSSA.
- Education on antibiotic usage for medical staff (see later under "Antimicrobial Stewardship" for more information).
- Prevention and treatment of infected skin ulcers since these can be colonised by MRSA and then invaded (principally led by the Trust's Tissue Viability Service).
- Training in Aseptic Non-Touch Technique (ANTT) – this is a nationally and internationally accepted practice framework for aseptic procedures such as applying a dressing to a skin ulcer, inserting a urinary catheter, or drawing blood for culture. By standardising aseptic practice across the Trust, the risk of patients acquiring blood stream infections (e.g. MRSA, MSSA, and E.coli) and also blood culture contamination will be reduced. The ANTT training programme was launched at QEH in October 2015 by the Lead Nurse for Infection Prevention & Control.

4.3 What has been our Performance and Why?

Hospital	QEH	JPH	N&N
Number of MRSA in Blood Cultures 15/16	1	1	2

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There was 1 MRSA bloodstream infection associated with the Trust. A full Root Cause Analysis process was undertaken and an action plan formulated which was shared with the CCG. Key findings were that:

a. the organism had been acquired by the patient whilst in the hospital and

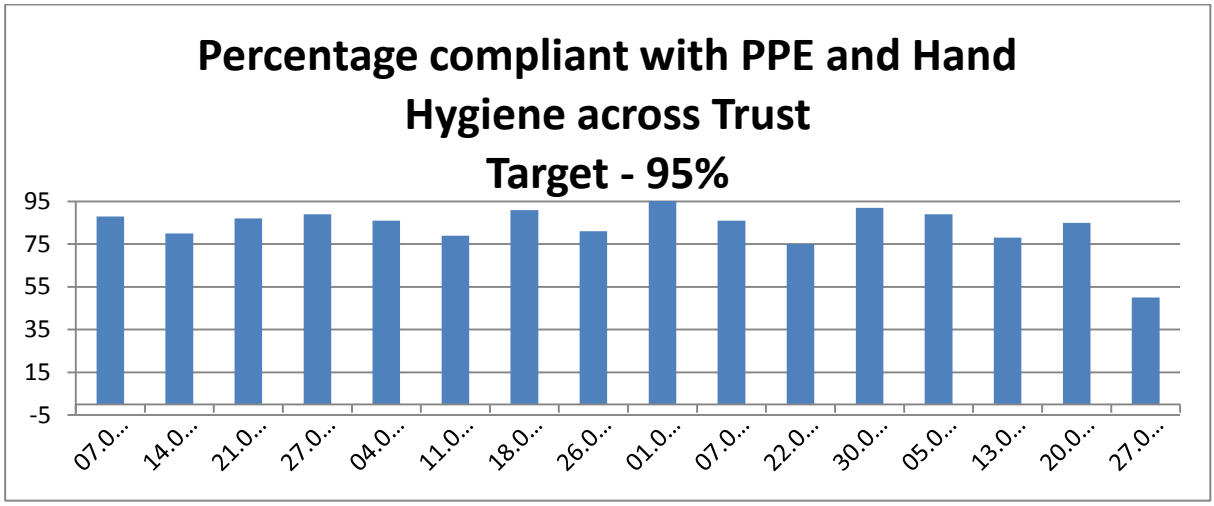
b. it had invaded to cause blood stream infection via a vascular line

The patient concerned was MRSA negative on admission and also on repeated in-patient screens; the patient then became positive providing conclusive data that the organism was acquired by the patient here at QEH.

As for the infection itself arising from invasion of the blood stream, the RCA indicated that the requirement for vascular line insertion and the protocols used for this and subsequent care of the line were to standard.

The failure was therefore in basic hygiene leading to the patient acquiring the organism. The variation in core hygiene across the Trust is too great as can be seen from the graph presented below on hand hygiene compliance and also proper usage of PPE (for non-compliance with PPE consider the non-removal of gloves which may be contaminated). This non-compliance is the likely cause of 5 distinct episodes of MRSA colonisation clusters from February 2015 to October 2015.

4.4



4.5 What must be done for improvement?

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Going forward:

- **There must be more leadership in clinical areas for maintenance of standards with immediate challenge of inappropriate behaviour over the entire 24-hour period of *each and every* day.**

- Staff hand hygiene and proper use of PPE must improve to 95% and be maintained with less variation (+/- 3%)

- The MRSA admission screening monthly average across the Trust is 90% with low dips to 80% - this variation must stop and screening must increase to 95% and stay at that figure with minimal variation (+/-3%); admission screening one year ago was averaging 53%/month.

- The compliance with skin decolonising protocols must be included in ward performance dashboards to ensure administration

- Pharmacists and ward medical staff must take a more active role assuring the proper use of antibiotics (including the use of MRSA protocols) on a daily basis and via frequent structured ward audits.

- ANTT training to increase from the current 33% of staff trained to 95%. Invasive devices such as cannulae predispose patients to local skin infection and to Blood Stream Infection, including MRSA or MSSA, if not managed effectively. The introduction of new IV cannulation packs designed to reduce infections together with associated ANTT training in their use will increase the number of staff trained in ANTT (Business Case with Finance Department.) Without the new packs we expect to reach 95% of staff trained 12 months from now; with the new packs this will take 4 months.

- There must be continual efforts to prevent primary skin ulceration or progression of existing ulcers via full adherence to policies and protocols issued by the Tissue Viability Service

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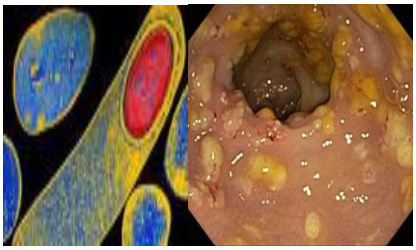
5.0 *Clostridium difficile* Infection (CDI)

Target 15/16= 53; Performance 15/16=39 (33/39 in two outbreaks)

Target 16/17= 53; ……

The L-R images below show: C. difficile (with internal spores which can contaminate the environment, patient-care equipment and the hands of staff), the bowel appearance with micro-abscesses caused by C. difficile, toilet signs asking patients having loose stools to alert staff, a commode with green tape marking it as clean and ready for use, and the Xenex Ultraviolet Light Device for isolation room decontamination (loaned to the Trust without any charge or linkage to rent or purchase).



5.1 What is the Issue?

Clostridium difficile can cause an acute colitis (with abdominal pain, fever and diarrhoea) in both the community and hospital settings. Because of the high mortality associated with the most severe forms of the illness and, the fact that hospitals cited for serious failings in general have also had significant problems with the spread of C.difficile infection, the government also instituted national surveillance systems and targets for Trusts for this infection.

The organism produces spores which can persist in the environment and contaminate hands, gloves and patient-care equipment, and then be ingested by patients leading to production of a toxin which causes bowel inflammation. Hand, environmental and equipment decontamination is vital then to prevent spores from patient A being ingested by patient B. Thus, we can readily grasp the importance of the **proper** decontamination of items which are more likely to be faecally contaminated such as commodes, bed pans, toilets seats and toilet raisers.The spores are resistant to alcohol gel and related products but can be removed by proper handwashing. Patients who have recently had or are currently on antibiotics are more likely to become ill from this organism so a key aspect of the prevention of C.difficile infection is to also have proper controls over antibiotic prescribing in both the wider community and hospital (see under Antibiotic Stewardship).

5.2 How have we been addressing this?

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Staff Education and Training

- Nurses, doctors, housekeepers and all other staff groups on wards have been instructed in key prevention modalities via :
    - staff induction
    - staff mandatory training sessions
    - ward–based training

- Emphasis has been placed on the pathways by which a patient may ingest the organisms and prevention of this by: cleaning of commodes and related items, not using gloves on pill rounds (and other training/interventions as described before under Norovirus prevention). Also introduced were:
    - Need for all patients to have stool charts completed from the time of admission and throughout their stay
    - Encouragement of patients who are self-caring and hence using the toilets to report any loose stool to the nursing staff (notices placed in patient toilets)
    - The need for stool sampling in the acute units since any result post 72 hours is checked as hospital-associated
    - The stopping of samples being sent on patients with loose stools attributable to laxative use since this is not a clinical condition and may detect a C. difficile carrier state (i.e. no infection) which is still checked by the government as a clinical case.
    - Use of UV marker pens in staff training to ensure that commodes and bed pans are properly decontaminated (mark made by pen is only visible under UV light – it is removed by proper decontamination) –see photo of test commode with
    - fluorescence of mark under UV pen light).

- Introduction of an IP&C ward checklist covering key preventive modalities which is audited by the matrons

- Training and enablement of better antibiotic prescribing and administration (see Antibiotic Stewardship)

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5.3 How have we been performing and why?

A comprehensive action plan to improve hospital infection prevention which contained specific measures for C. difficile infection was launched in November 2014 and this, together with other quality and safety initiatives being undertaken as part of *Aiming For Excellence,* led to a marked reduction in cases/month up to mid - June 2015.

After the CQC inspection, there was an immediate outbreak of C. difficile cases from mid - June to August 2015. This outbreak was brought under control by stringent assurance of all previous initiatives only to be followed by an even bigger outbreak from October to December 2015. An external review of our commode cleaning done in October 2015 by Vernacare demonstrated that over 50% of commodes/bed pans placed as ready for reuse were grossly contaminated (see photos) and hence carried a very high risk for transmission of C. difficile.

The rigor of assurance brought both outbreaks under control providing evidence that both outbreaks occurred because compliance to hygiene standards had lapsed significantly. A ward checklist was introduced in October 2015 in an attempt to drive assurance on a 24-hour basis and this has since been modified to become a matron assurance tool with audits being undertaken by the matrons. The graphs below show:

a. Cases /month including those associated with the two outbreaks

b. The data on Commode cleaning (as one example of a key, measurable procedure to prevent transmission of C. difficile)

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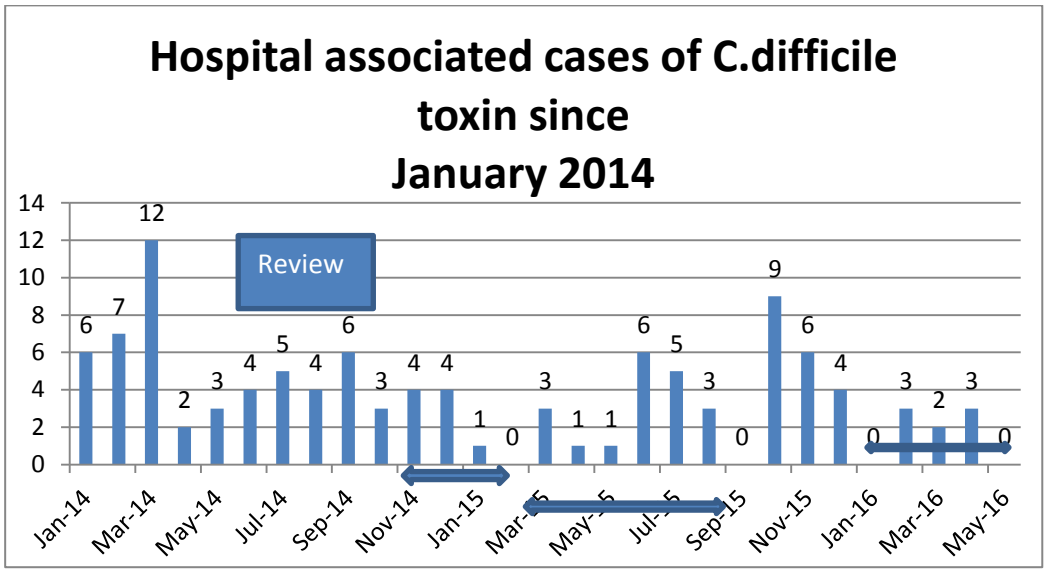
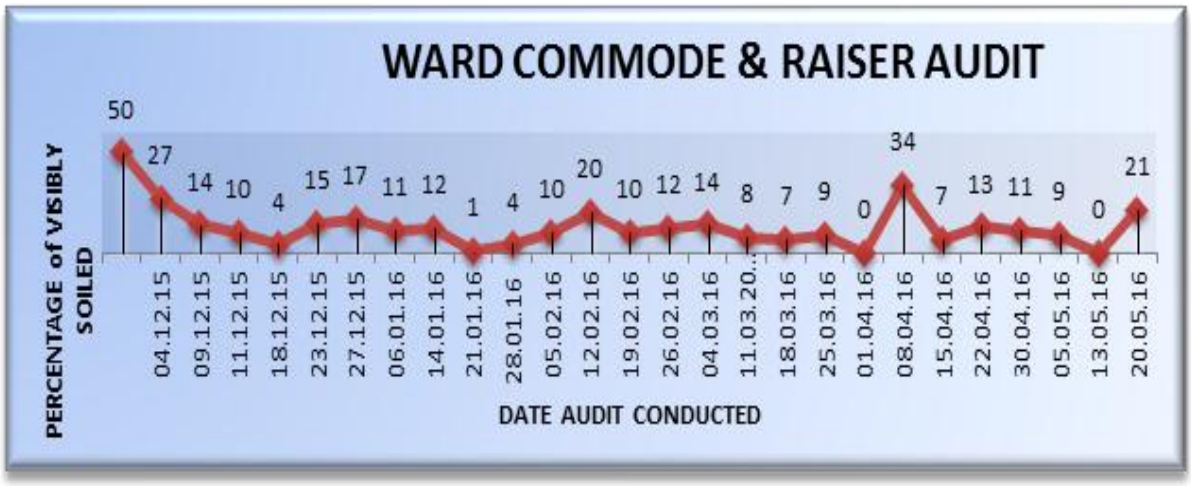


Commode and Toilet Raiser Audits from October 2015 (50% soiled)

5.5



More structured audits have been done in the Trust since the Vernacare one in October 2015 and the graph shows **the variation in percentage of commodes** still showing some soiling post-decontamination across the Trust.

The end of year total for C. difficile cases was 39 cases of which 33 occurred in the outbreak periods as follows:

June/July/Aug = 14 cases
Oct/Nov/Dec = 19 cases
Total = 33 cases

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Four medical wards had 5 or 6 cases.

Benchmarking data is below:

TRUST	NNUH	QEH	JPUH
Total acute cases 2015/16	48	38	29
Official failure targets 2015/16	Not more than 49	Not more than 53	Not more than 17

5.6 Why did we get the C. difficile outbreaks?

The information below indicates that the cause of the two outbreaks was spread of C. difficile from patient to patient:

- Of 33 cases across the Trust during the outbreak periods, 22 cases clustered on 4 medical wards
- There was clear evidence of failure to maintain standards
- No changes in antibiotic policies or prescribing behavior had occurred to explain the occurrence of the outbreaks
- The outbreaks were brought under control by rigorous audits, including out of hours, of staff behavior and ward hygiene.
- Typing showed many strains but could not include unknown carriers (there were 42 community cases in the last year indicating wider carriage of this organism).

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5.7 What should be done for sustainable improvement?

- The matron undertaking hygiene and safety audits done by day now must also include nights and weekends
- All new staff must have reinforcement instruction in ward safety behavior post-induction training
- There must be more oversight by ward managers of samples sent to the laboratory (or not sent as the case may be)
- The clinical interface with the EPA laboratory should be able to permit aborting the testing of samples that were sent in error
- The IT infrastructure involving the EPA Laboratory - QEH interface must be upgraded so that clinicians here can determine if samples have been received by the lab and the status of processing; all other aspects of the EPA contract need a quality review to help that organization improve its services to QEH
- The laboratory methods for detecting C. difficile must be modernized
- There should be more training for junior medical staff in the diagnosis and management of infections and use of antibiotics. This should include history taking, physical examination, the generation of differential diagnoses, sampling for laboratory investigations, imaging, timely review of accumulating data and adjustment of differentials, the proper use of medical terminology in infection, communication of information and documentation.
- Clinical staff, microbiologists and external reviewers must appreciate the value and limitations of typing of organisms in hospital epidemiology when trying to prove or disprove cross-infection

6.0 Methicillin-Sensitive *Staphylococcus aureus* (MSSA) bloodstream infections

6.1 What is the Issue?

See part explanation under "MRSA" before. Though not antibiotic resistant like MRSA, MSSA can also cause serious infection in both the wider community setting and hospital.

Government instituted surveillance systems in order to better understand the epidemiology of MSSA infections and this is focused on MSSA in the blood stream but there is no target set for reduction. The national approach to this organism is also quite distinct to MRSA since no patient screening or isolation is required for carriage of the organism.

6.2 How have we been addressing this?

Since MSSA and MRSA spread the same way, the controls for MRSA given before (hand hygiene, care with vascular access, prevention of skin ulcers etc) also apply to MSSA except in two areas:

1. We do not screen patients for MSSA since there is no national advice that this should be done

2. We do not isolate patients who are just carriers of MSSA since there is no national advice that this should be done

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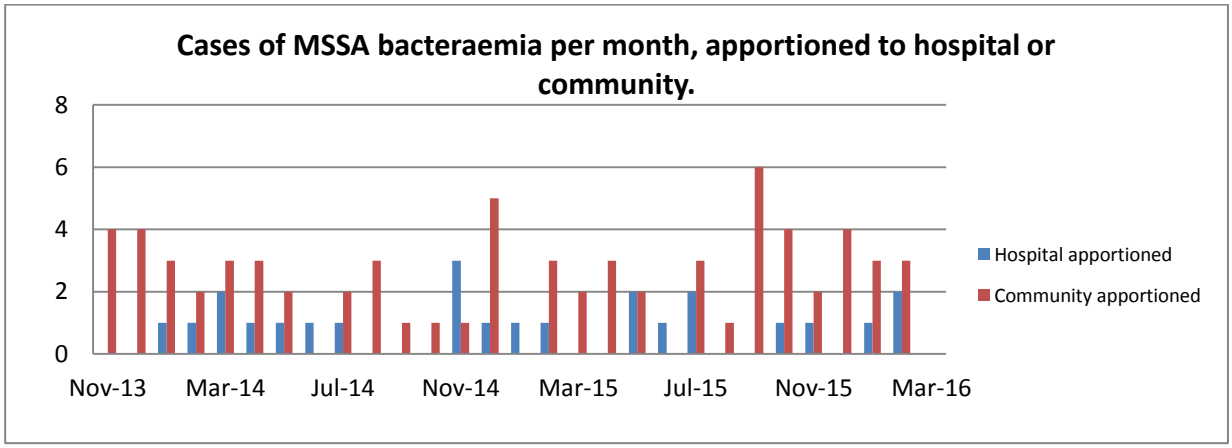
Wide usage of the skin antiseptic Octenisan instituted on 5 medical wards after observed spread with clusters of MRSA would also lead to prevention of MSSA infection since this agent also reduces the amount of MSSA on the skin of patients.

6.3 What has been our Performance and Why?

The table below shows both hospital-associated and community cases of MSSA positive blood cultures.

6.4



The significant burden of MSSA causing infections in the wider community is clear.
Whilst formal root cause analysis meetings are not held for MSSA cases as they are for MRSA and C. difficile cases, the data to hand indicates that most of the hospital associated cases are from:

- Conditions in the community causing blood stream infection which are documented 48 hours after admission to hospital e.g. endocarditis, osteomyelitis - some of the patients with these conditions may not be very ill when first seen and hence initial blood cultures may not be done
- Invasion via skin ulcers, whether acquired in the community or at QEH
- Invasion via vascular access devices
- Blood culture contamination

The community burden arises from:

- An ageing population
- Underlying skin ulcers from vascular insufficiency syndromes and diabetes mellitus with recurrent skin infections
- Endocarditis (infection of the heart valves)
- The increasing number of patients with long-term urinary catheters

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6.5 What must be done for improvement?

For QEH

Sustainable improvement in (as mentioned before under MRSA) –

- Hand hygiene
- Proper use of PPE
- Care of vascular access devices
- Reduction of blood culture contamination
- Prevention and management of skin ulcers

For The Community:

Addressing the following in all long-term care facilities and patient's homes:

- Hand hygiene
- Proper use of PPE
- Care of vascular access devices
- Prevention and management of skin ulcers
- Care of long term urinary catheters

7.0 Escherichia coli (E coli) bloodstream infections

7.1 What is the Issue?

During the 1990's it was noted that there was an increasing rate of positive blood cultures in hospitals with gram-negative organisms, the paradigm of which was E coli. Additionally, these organisms were noted to be antibiotic resistant. Because of these observations, government instituted mandatory surveillance (with no target) of all blood cultures with E.coli detected in hospitals with the aim of better understanding what was driving the increase.

7.2 How have we been addressing this?

E coli is a normal part of human bowel flora and it is associated for the most part with intra-abdominal and urinary tract infections in the wider community without any healthcare interventions. Thus, patients who develop pyelonephritis or acute diverticulitis will have E. coli as a major pathogen. The preventable element of blood stream infections in hospital antibiotic sensitive and resistant E. coli would be:

- Prevention of invasion via central vascular lines

  The Trust has a vascular-access group chaired by Dr John Gibson which produces guidelines for vascular line insertion and care

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- Prevention of catheter-related urinary tract infections; training in urinary tract catherisation is done by the specialist nurse in this service

- Prevention of surgery related intra-abdominal infections

  This remit falls within good surgical practice and there are guidelines for use of antibiotics in surgery

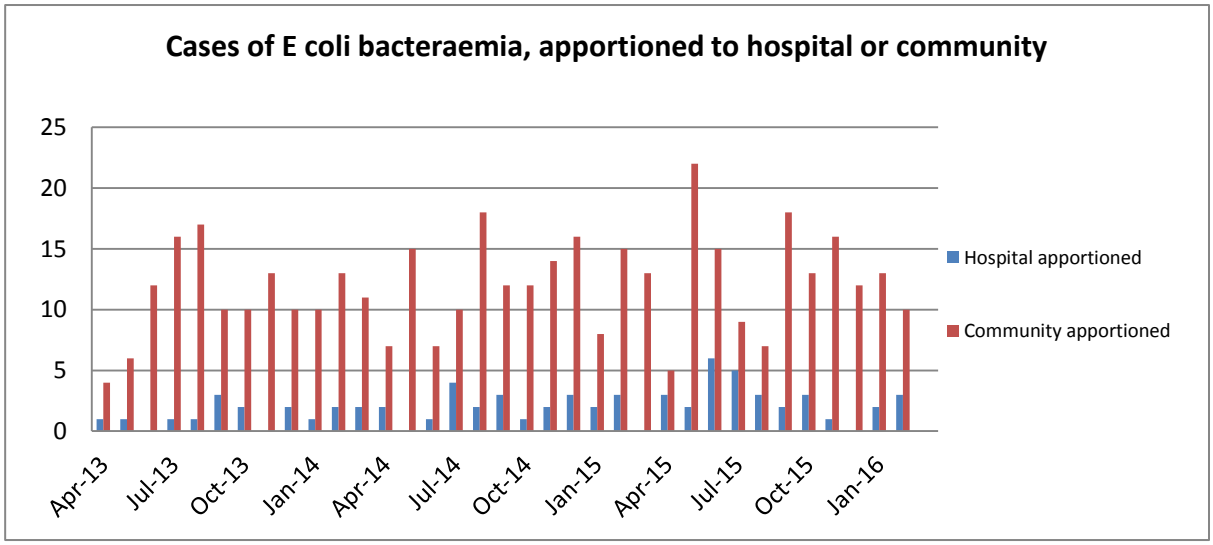
- Attention to core hand hygiene and use of PPE

  (as discussed before)

- Rational use of antibiotics

  (see under Antimicrobial Stewardship)

7.3 What has been our Performance and Why?



The significant burden of E.coli causing infections in the wider community is clear.
Whilst formal root cause analysis meetings are not held for E.coli cases as they are for MRSA and C. difficile cases, the data to hand indicates that most of the hospital associated cases are from:

- Conditions in the community causing blood stream infection which are documented 48 hours after admission to hospital e.g. diverticulitis, cholecystitis, colo-rectal carcinoma, pyelonephritis and endocarditis - some of the patients with these conditions may not appear to be quite ill when first seen and hence blood cultures may not be done immediately on admission
- Invasion via indwelling urinary catheters
- Invasion via vascular access devices

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The community burden arises from:

- An ageing population
- Underlying colonic inflammatory or malignant conditions
- Gallbladder disease
- The increasing number of patients with long-term urinary catheters

7.4 What must be done for improvement?

For QEH

Sustainable improvement in:

- Hand hygiene
- Use of PPE
- Care of vascular access devices
- Insertion and management of urinary catheters; audits need to be done to ensure proper use of urinary catheters across all QEH services
- Maintaining good surgical practices
- Antimicrobial Stewardship (see later)

For The Community:

Addressing and improving the following in all long-term care facilities and patient's homes:

- Hand hygiene
- Use of PPE
- Care of long-term urinary catheters
- Long term prevention and care plans for abdominal conditions
- Approach to infection diagnosis and management in the community with rational antibiotic utilization

8.0 Surgical Site Infection (SSI) Surveillance

8.1 What is the Issue?

Infections can occur as a result of surgery. The government has mandated that infections following hip and knee implant surgery are reported nationally to PHE and be subject to scrutiny with national benchmarking.

8.2 How have we been addressing this?

The audit department reviews the case records of patients who have undergone orthopaedic surgery as given – cases thought to be infected are reported to PHE.

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8.3 What has been our Performance and Why?

The Trust received a high infection rate alert in orthopaedics from PHE in October 2015. The cases sent to PHE were reviewed by a senior orthopaedics registrar and presented at an orthopaedics department audit meeting in December 2015 attended by the Trust DIPC. Of the 5 cases originally reported to PHE, we found that:

-1 was not infected
- 2 were deep infections acquired at QEH
-1 was a deep infection acquired at the Sandringham hospital
-1 was a superficial infection

These findings would remove QEH as a high outlier but they were not accepted by PHE as correct since all were reported originally as infected.

8.4 What must be done for improvement?

- The original cases must be reviewed again with a West Norfolk Public Health representative in attendance
- 3-monthly meetings must be undertaken and led by the Orthopaedics' department wherein all cases that might be infected are discussed in depth; this meeting must be attended by a microbiologist and a Trust audit department representative so that any data generated can then be reported to PHE
- This process can then be used to establish surveillance in all other areas of surgery and led by those services; though not made mandatory by government, this would be optimal professional practice.

9 Antibiotic Stewardship

9.1 What is the Issue?

The UK government and the WHO have been stating for a number of years now that antibiotic resistance is a current and increasing threat to the human population at large and the lives of patients. Recent documents are below:

- Government report on antibiotic resistance by Jim O'Neal, May 2016

- The Economist front page, May 2016.

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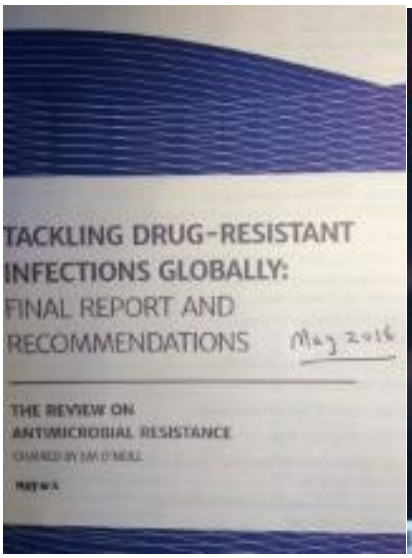

9.2 <u>How have we been addressing this?</u>

Whilst there are national programs to deal with this threat, hospitals are expected to use antibiotics as wisely as possible and this comes under the framework called **Antibiotic Stewardship**. We undertook:

- Introduction of an antibiotic app which allows junior doctors easy access to Trust antibiotic guidelines
- All mandatory training for consultant medical staff done by the QEH DIPC
- Audits of antibiotic prescribing done by the antibiotics pharmacist in conjunction with ward staff
- Ward pharmacist reviews of all prescribed agents including antibiotics
- Consultation on important clinical cases by medical microbiologists each day and on call – includes hospital and GP cases
- Daily ward round by medical microbiologists on ITU
- Regular review and updating of Trust Antibiotic Guidelines by microbiologists, the antibiotics pharmacist and clinical staff associated with the specialty concerned
- Use of benchmarking of antibiotic utilisation with other Trusts
- Rationalising use of Tazocin in particular as part of the Pharmacy Transformation project
- Regular teaching sessions by microbiologists and the antibiotics pharmacist to junior medical staff and medical students on infection and antibiotics
- QEH collaboration within sector to introduce a better prescription chart
  (this will enable antibiotic indications to be charted better)

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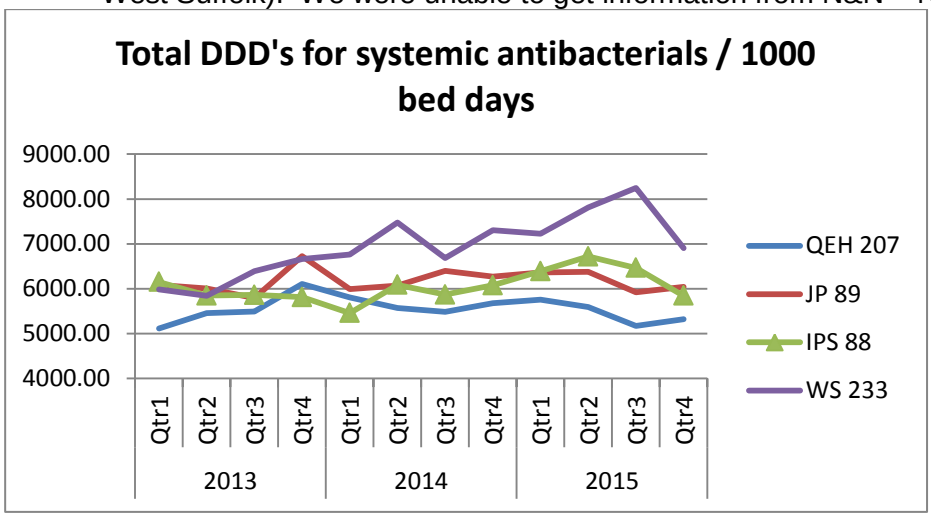
- Re-established the Outpatients IV Antibiotics Service (OPAT) to capacity for geographic areas covered by this service to facilitate better therapy as required and earlier discharge

9.3 What has been our Performance and Why?

Overall Antibiotic Utilisation- the graphs below show that when all major classes of antibiotic are combined, QEH performance is good and stable (JP- James Paget, IPS- Ipswich, WS- West Suffolk). We were unable to get information from N&N – Norfolk and Norwich.



- Root cause analyses of C. difficile cases showed:

➢ Insufficient information in clinical handovers leads to continuation of antibiotic therapy
➢ Clinical samples e.g. urine may not be sent for investigation
➢ Clinical terminology needs to be more precise - too many records and discussions employ the term "sepsis" as a catch-all term
➢ There is no way for QEH clinical staff to get information of what samples have been received by the microbiology laboratory at EPA – clinicians cite that too many samples are lost
➢ The OPAT service is at capacity

9.4 What must be done for improvement? (see also under C. difficile before)

- All items above must be strengthened

- There should be more training for junior medical staff in the diagnosis and management of infections and use of antibiotics. This should include history taking, physical examination, the generation of differential diagnoses, sampling for laboratory investigations, imaging, timely review of accumulating data and adjustment of differentials, the proper use of medical terminology in infection, communication of information and documentation; the Trust Sepsis educational programme must be launched using the new definitions

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- Hospital staff and GPs should have more access to epidemiological data from the EPA microbiology laboratory on antibiotic resistance trends

- The OPAT service should be expanded to cover more (existing) patients and more geographic areas

10 Occupational Health

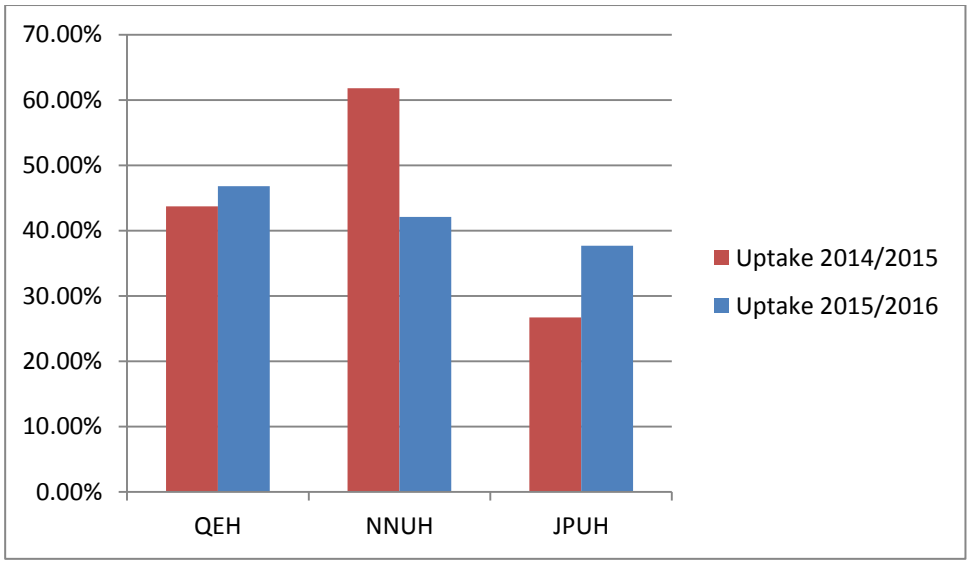
10.1 What is the Issue?

The Occupational Health Department provides both a prevention and interventional service for staff as regards infection risks and infections. Of particular interest are influenza vaccination, needle stick injuries and TB screening.

Influenza Vaccination

Our uptake has been better this year and continues our upward trend; this has been despite staff concerns about vaccine failure nationally the previous year.

10.2



10.3 What must be done for Improvement?

- Launch influenza campaign in July-August

- Focus on improving medical and AHP staff uptake (based on previous uptake data)

- Make influenza vaccination in staff a directorate performance metric

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Sharps' Injuries/Splashes (risk of blood borne viral infection)

11.0 Benchmarking Sharps/Splash injury rates across the region

1st April 2015-29th Feb 2016	QEH (462 beds)	JPH (400 beds)	NNUH (1200 beds)
Total	**76**	**66**	**176**
Rate/bed	**0.17**	**0.17**	**0.15**

We continue to have a high number of sharps injuries

11.1 What must be done for improvement?

- Data on injuries must be better analysed with feedback to directorates and staff groups
- Wider benchmarking should be done
- The Vascular Access Group to review staff training in use of sharps

12 Tuberculosis

This disease is an ever present threat and staff members who have latent infections may increase with our international intake - current data indicates an upward trend in staff with latent infections.

12.1 What must be done for improvement?

- The Trust's TB service capacity is under review since this is the service which backs up Occupational Health.
- A TB MDT must be established with attendance by Trust microbiologist

13.0 Estates Management (from Estates)

13.1 Catering services

- All areas within catering services continue to score 5/5 from the Environmental Health Officer
- Infection Prevention & Control carries out an annual inspection of the main kitchen and the Hub restaurant to ensure that we are complying with national standards for food hygiene
- Implementation of ward pantry thermal disinfection dishwashers ensure that all cups, saucers and beakers are washed on the ward area thus reducing any possible cross infection.

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- Bottled water was trialled and has now been implemented as patient feedback was very positive and it allowed staff the measure the amount that had been consumed especially when on a hydration chart
- The Head Chef continues to train staff on Level 2 food safety for catering staff and ward staff that will be involved with serving food.

13.2 Domestic Services.

- Domestic services carry out cleaning audits to ensure that cleaning standards are met; this audit is carried out with a member of the ward staff to ensure we all work as a team with regards to the cleanliness of the hospital.
- The Red Admiral team continue to deep clean wards and act as a rapid response when bays/wards have been closed and need to be reopened.
- Implementation of the new I Mop has helped to speed the cleaning process
- Patients also complete a survey on the cleanliness of the ward that they are in and this is feed back to the wards and the domestic teams and reported through the performance review.

13.3 Water Safety

- External reviews confirm compliance with water safety controls across the Trust including for legionellosis

13.4 Ventilation Systems

- All theatre ventilation systems have been checked as part of a rolling programme and are to standard

13.5 Sterile Services and Endoscopy

- External and internal audits done are monitored via the Trust's decontamination committee

14.0 **<u>Stakeholder Engagement</u>**

- The Communications Department works closely with the local CCG to ensure that urgent messages are provided to GPs, Community Care, the media and also ensures timely internal updates on matters of infection

- As noted before there are links amongst the QEH DIPC, Norfolk Public Health and the CCG for matters relating to infection prevention in the health economy and these should be strengthened going forward.

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15.0 Emerging Infections

This section is to emphasise to the IP&C and Quality Committees and the Trust Board that the work undertaken and ***the actions required for improvement cited in this report have also been to prepare the organisation for more emerging threats***.

This term, "**Emerging Infections",** is an internationally and professionally recognized term for:

- Newly discovered bio-agents and associated infections
- Existing Infections which are moving to new epidemiologic spaces (e.g. new hosts or geographic locations, or indeed, both)
- Existing or New Agents which are more antibiotic-resistant

It is a broadly encompassing term and some threats do not fit neatly into a single category.

Thus, we already knew of the existence of Ebola Virus but what happened in West Africa recently was well beyond past patterns.

With substandard practices, an emergent threat could lead to infections in patients and staff and hospital infrastructure collapse.

With **excellence in practice at QEH,**

the very heart of *Aiming For Excellence*,

if there is emergence with ingress,

such threats are more likely to be contained.

The image below is a reminder of the dynamism in nature leading to new infections or the spread of existing ones. Whilst most are zoonotic i.e. organisms/infections in animals which spread to man, subsequent human-human spread can be catastrophic.

The most likely current and emergent threats to patients and staff which the Trust will face in the coming 2-years are:

- Norovirus
- MRSA and C. difficile
- Antibiotic-resistance and spread of CPEs (emergent)
- Influenza (can be emergent at any time)
- Tuberculosis (emergent)
- Travel-related Viral Infections (becoming more emergent)

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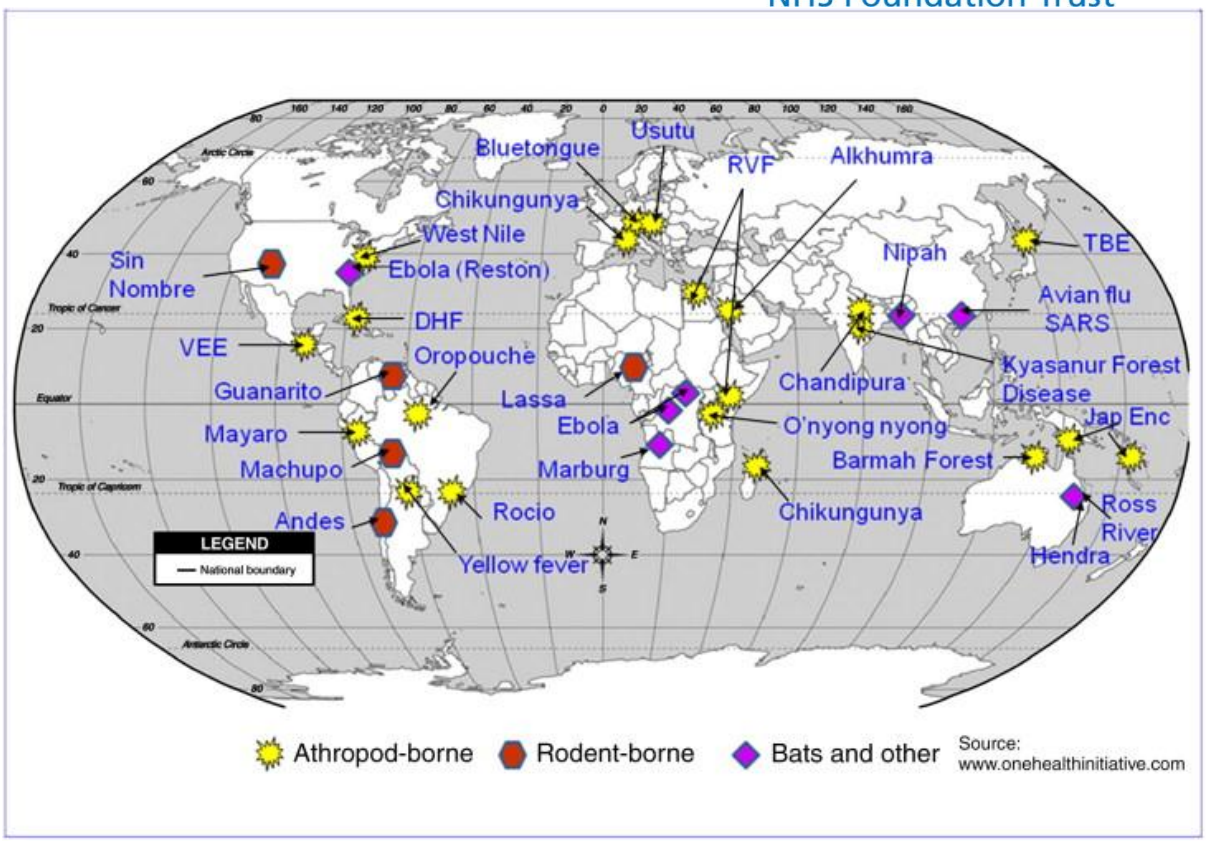

Some Emerging Infections

End of Report.----------

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