

Portsmouth Hospitals NHS Trust



Antimicrobial resistance

- “Antimicrobial resistance poses a catastrophic threat. If we do not act now, any one of us could go into hospital in the future for minor surgery and die because of an ordinary infection that cannot be treated” Dame Sally Davies – 2013
- "There are few public health issues of greater importance than antimicrobial resistance (AMR) in terms of impact on society. This problem is not restricted to the UK. It concerns the entire world and requires action at local, national and global level.”
UK five year AMR strategy.

Infections

- Bacterial - MRSA, C.Diff, E.Coli, Tuberculosis
- Viruses - Influenza, HIV
- Parasites - Malaria
- Fungi - Candida

Antimicrobial resistance is resistance to any infections

Antibiotic resistance is resistance to by bacteria

Parasites - Malaria

- Chloroquine resistance first appeared in 1957 in Thailand and spread to Africa
- By 1973 90% of Malaria falciparum was resistant
- Sulphadoxine / pyrimethamine replaced chloroquine – resistance soon developed.
- New drug Artemisinin – resistance now been established in Far East - possibly related to counterfeit drugs

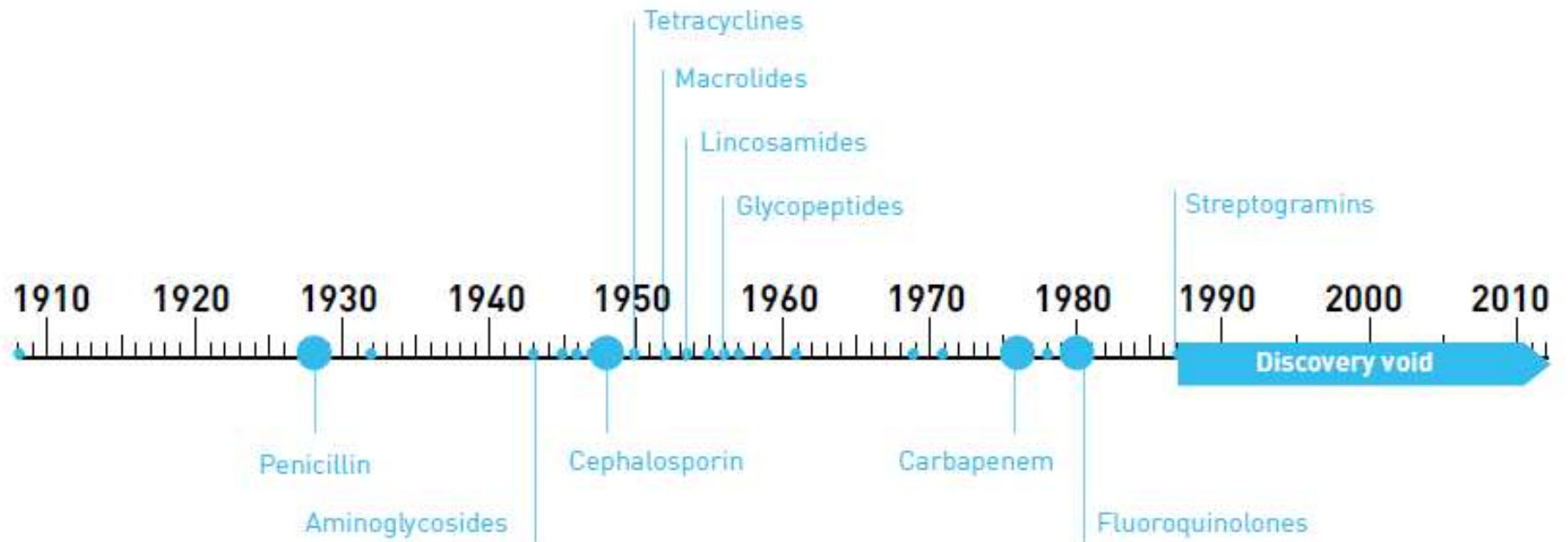
Viruses

- HIV is developing resistance to anti-retrovirals

Bacterial infections

- MRSA and C.Diff infections have fallen by 80% in last 10 years
- Now replaced by other bacteria such as E.Coli and Klebsiella (normal gut bacteria)
- About 5,000 people a year die of bloodstream infections – 50% of which are caused by drug resistant organisms.
- Increased drug resistance mirrors increased antibiotic use
- No new classes of antibiotics have been developed since 1987

Over the last 30 years, no major new types of antibiotics have been developed



Antibiotic resistance

- Mutation of bacterial DNA
 - Chance mutation
 - Transfer of DNA strands between bacteria – plasmids

Risk increases with inadequate antibiotic treatment

Risk increases with inappropriate antibiotic use

Bacterial infections

- Tuberculosis - In 2012 there were 450,000 new cases of multi-resistant TB across the world, appearing in 92 different countries. Cases in the UK have increased 4-fold in the last 10 years - WHO concerned about emergence of 'untreatable TB'.
- Multidrug resistant gonorrhoea has been recorded in 10 countries. Progressive development of resistance over time - there now remains just 1 type of antibiotic active and it is possible that gonorrhoea could become untreatable once again.

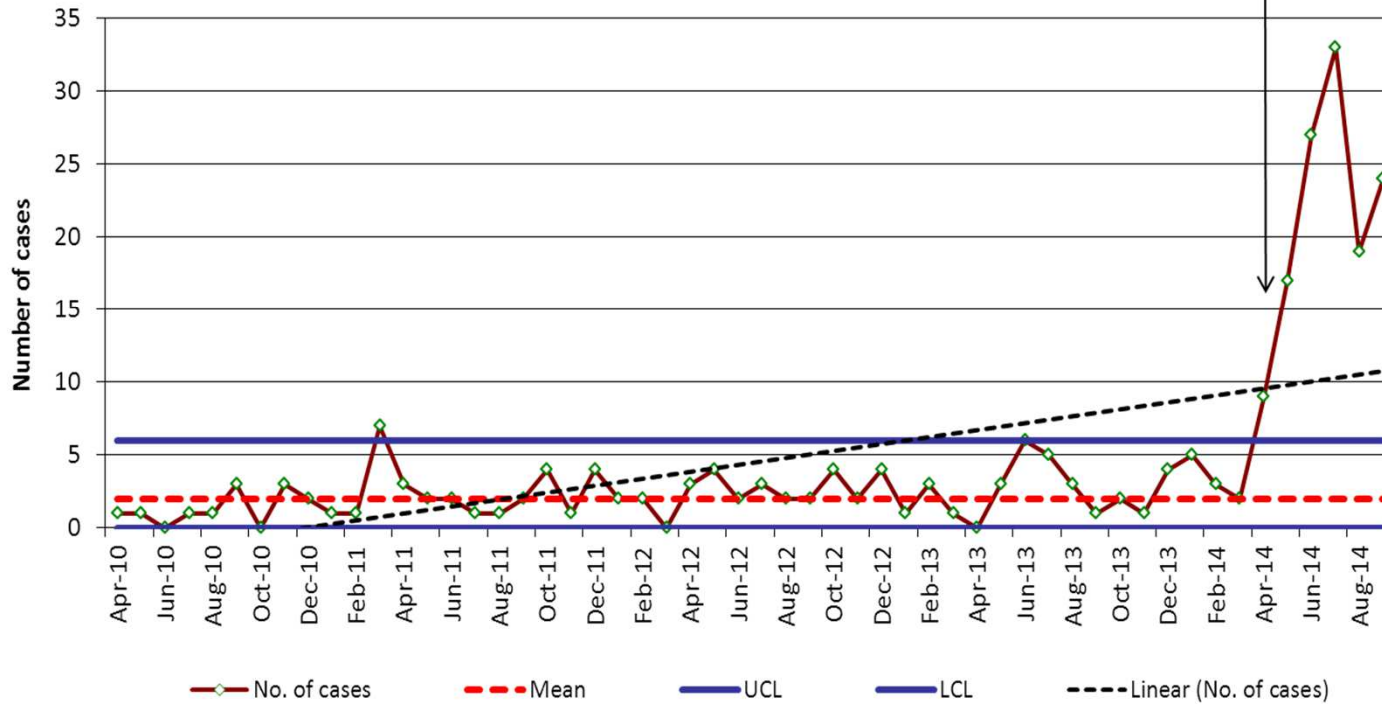
Bacterial infections – Centre for Disease Control (CDC) in USA identified new emerging ‘superbugs’ that were “urgent, serious and concerning threats to humankind”.

- Drug resistant TB
- Drug resistant gonorrhoea
- Drug resistant Salmonella
- Carbapenemase producing enterobacter (CPE)
- Drug resistant Strep Pneumoniae
- Extended spectrum beta-lactamase producing organisms (ESBL's)
- Vancomycin resistant Enterococci (VRE's)
- Multi-drug resistant Pseudomonas
- Drug resistant Campylobacter

Extended Spectrum Beta Lactamase producing organisms

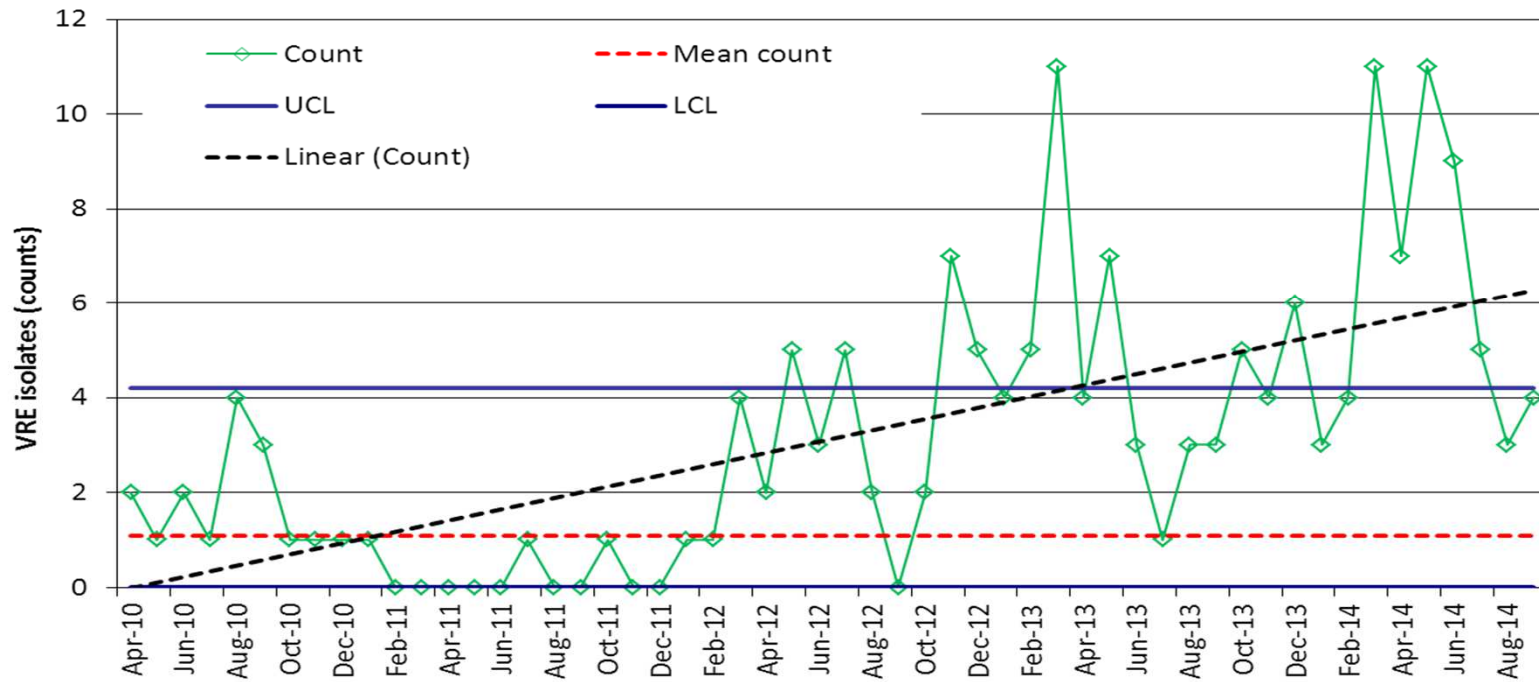
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ESBL producers > 48 hours from admission
SPC Chart - Apr 2010 - to date

Changes to lab reporting.
Figures include ESBL and
Amp-C producers (April
2014)



Vancomycin Resistant Enterococci

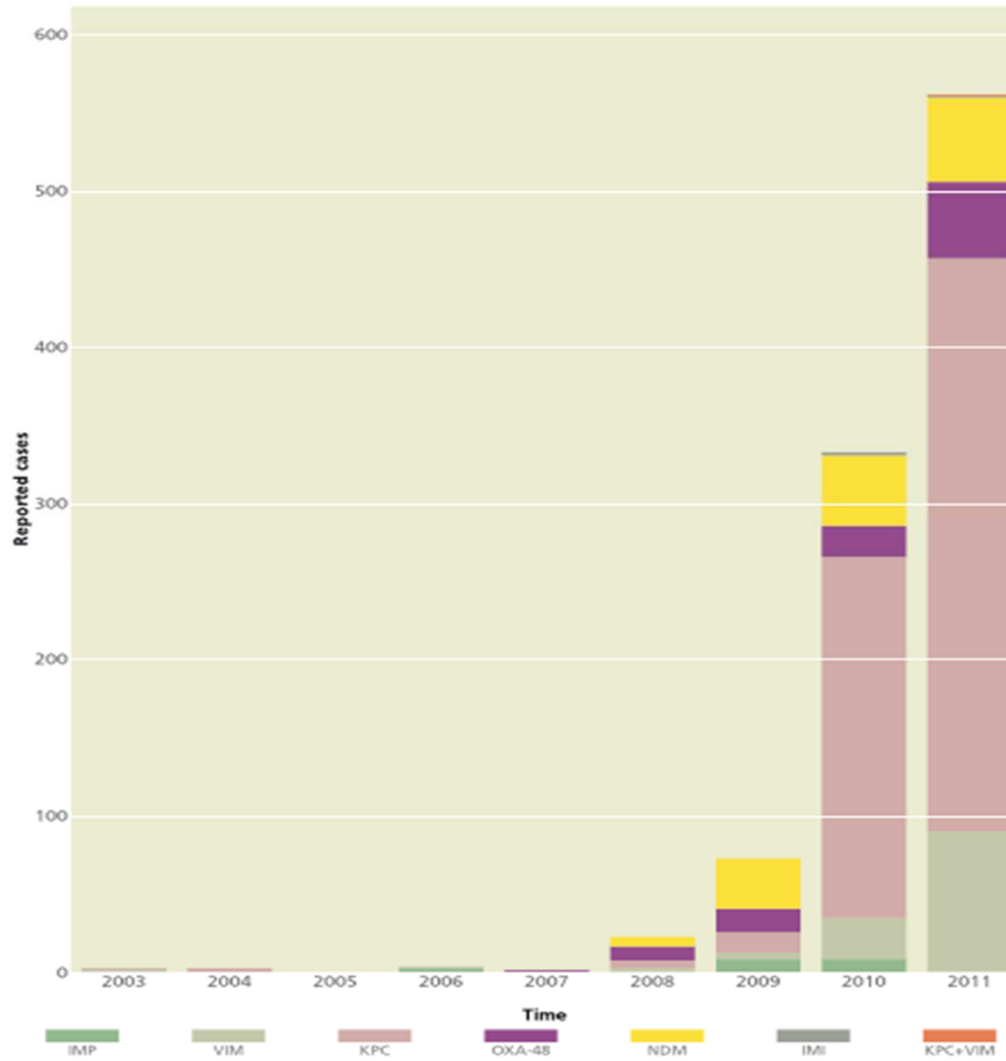
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All new VRE isolates taken at PHT
SPC Chart - Apr 2010 - to date



Carbapenemase Producing Enterobacter (CPE's)

- Appeared in USA in 2000. Subsequently found in Israel, Europe, middle and far east
- Clusters and outbreaks have occurred in UK
- Clusters can be isolated and managed effectively if detected early.
- In 2014 Public Health England produced an Acute trust toolkit for the early detection, management and control of CPE's.
- PHT have identified 2 cases of colonisation with CPE's in patients who had been treated in other hospitals.

Carbapenamase producing Enterococci



Source: HPA. English National Point Prevalence Survey on Healthcare Associated Infections and Antimicrobial Use, 2011: Health Protection Agency, England; 2012. (Dr Susan Hopkins & Dr Alan Johnson, personal communication)

Bacterial infections – resistance stems from exposure to antibiotics and evolution

- Agricultural Industry
 - In US agricultural uses of antibiotics account for 80% of all use
 - In UK this is about 50%

- Medical industry
 - In the UK about 30% of all patients in hospital are on antibiotics

Graph 1 Human and veterinary use of modern cephalosporins

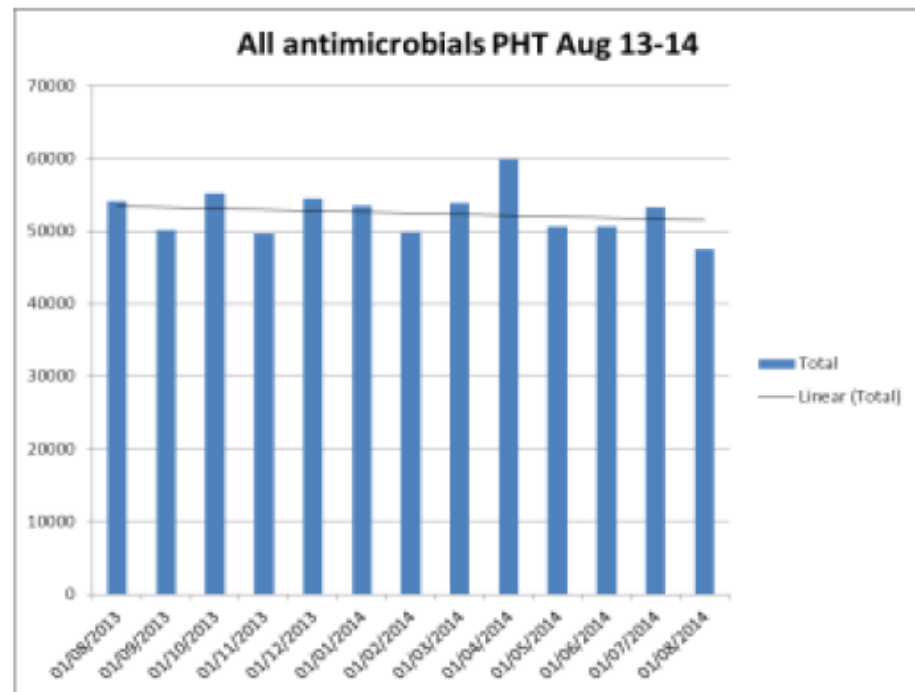


What are we doing?

- Early recognition of individuals who may be colonised / have an infection.
- Early detection – screening of suspected cases and contacts
- Early isolation of suspected / confirmed cases
- Effective treatment and decolonisation.
- Instigation of all infection prevention measures

What are we doing?

- Cleaning and decontamination
- Early communication on discharge or transfer.
- Audits of antibiotic prescribing – adherence to protocols etc
- Antibiotic app for junior doctors.



'People are getting seriously ill and are dying as a result of skin infections and diarrhoea. Common surgeries like knee replacement will become potential killers because of secondary infections that are untreatable. This is a global problem on par with, if not more serious than, nuclear security, international terrorism and climate change.'

**Minister of Health of the Netherlands Edith Schippers,
World Health Assembly, 20 May 2014**