

# Electronic Surveillance Systems: An opportunity for improving efficiency and effectiveness in the prevention of infection

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## Introduction

Healthcare associated infections (HCAI) increase mortality, healthcare costs, length of stay and threaten patient safety. Surveillance has long been considered vital to the prevention of infection (Haley et al, 1985). Health care organisations in Wolverhampton have expanded surveillance year on year, however, local investment in advanced electronic surveillance software (ICNet) provided the Infection Prevention Team the opportunity to redesign infection prevention services based on information and intelligence. The risks contributing to bloodstream infections (BSI) and Clostridium difficile Infection (CDI) were a priority. An approach was developed to identify and manage risks and costs across the Wolverhampton Care Economy providing evidence of effectiveness of interventions with a focus on productivity and patient safety.

## Methods

A review by the local Infection Prevention Team of all systems of data capture (paper and electronic) and outcomes in terms of intelligence was undertaken in December 2011 prior to the upgrade to an advanced electronic surveillance system (ICNet). An action plan was developed with a 3 month plan to fully utilise surveillance software currently in use (ICNet Version 6) prior to the implementation of the advanced version.



## Initial Findings

- There was a high level of repetition of patient information with documentation of the same information occurring up to 4 times for each patient.
- Surveillance data was based largely on numbers only. There was frequent confusion when numbers were required at short notice.
- Minimal data was collected on each alert organism / condition. The source of a bacteraemia would be known and antibiotics consumed prior to a case of C difficile. However, there were gaps in the data and there was no frequent analysis of data leading to gaps in intelligence.
- There was a risk of loss of patient identifiable patient information due to paperwork being transported by hand between areas.
- There were several delays in communication between the lab and individual team members.

### Surveillance priorities were then set as below:

- Compliance with information governance principles.
- Elimination of written patient information.
- Improve intelligence on key priorities (CDI and BSI) to influence reduction strategies.
- Understanding local costs of HCAI.

## Results

Hand written patient identifiable information was eliminated. The advanced electronic software enabled full security of data with unlimited user licences meaning that access could be on a need to know basis. Stand-alone databases were also removed with relevant information being transferred in question format to extended properties, all of these relate to policy monitoring or intelligence development. Process developed for monthly analysis of information.

Data for the Clostridium difficile dashboard is the result of the consistent collection of data using the electronic surveillance and is presented monthly to the executive-led Infection Prevention and Control Committee. The dashboard includes time to isolation and treatment, comparisons with other organisations regionally, use of HPV, compliance with antimicrobial therapy guidelines. Similar data is also provided to the CCG for quality monitoring. A sample of data relating to CDI is provided below:

Figure 1 - Time to isolation in inpatients

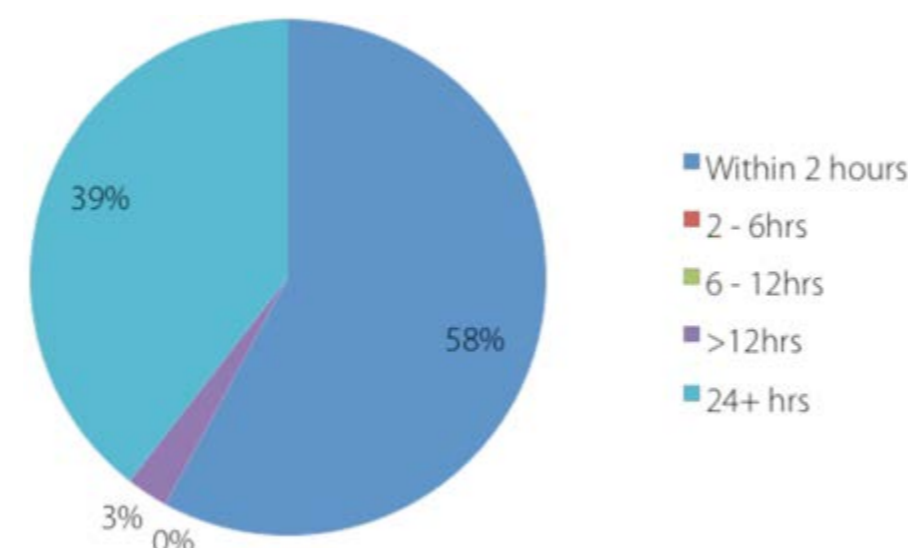


Figure 2 - No delay in time to treatment in inpatient beds

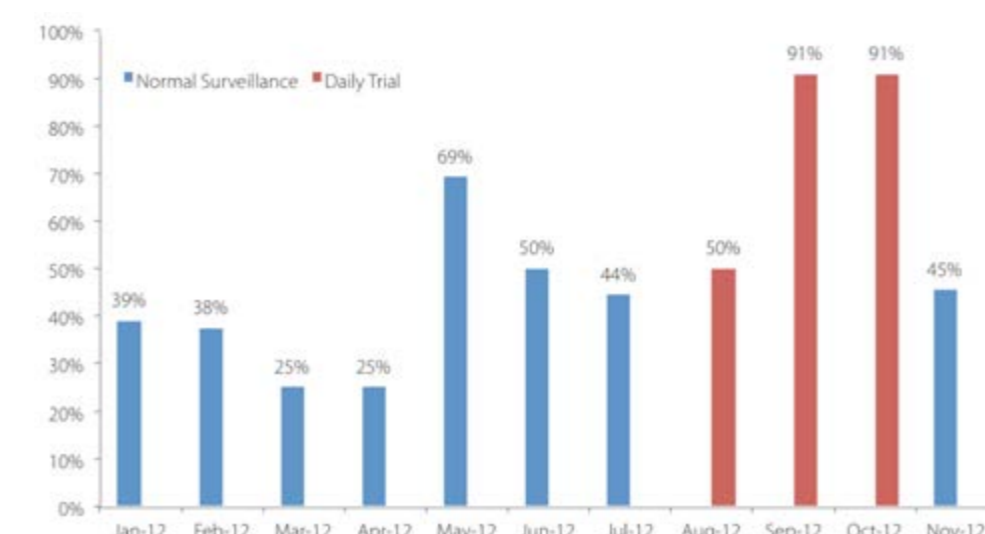


Figure 3 - Compliance with use of hydrogen peroxide vapour on discharge from single room (inpatients)

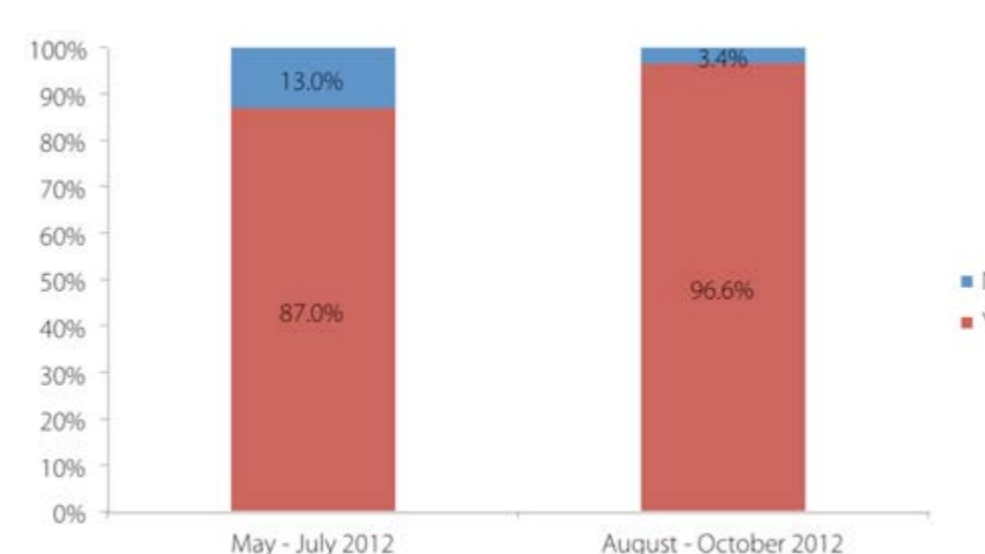


Figure 4 - CDI PCR positive rate per 10,000 bed days by ward compared to same time previous year

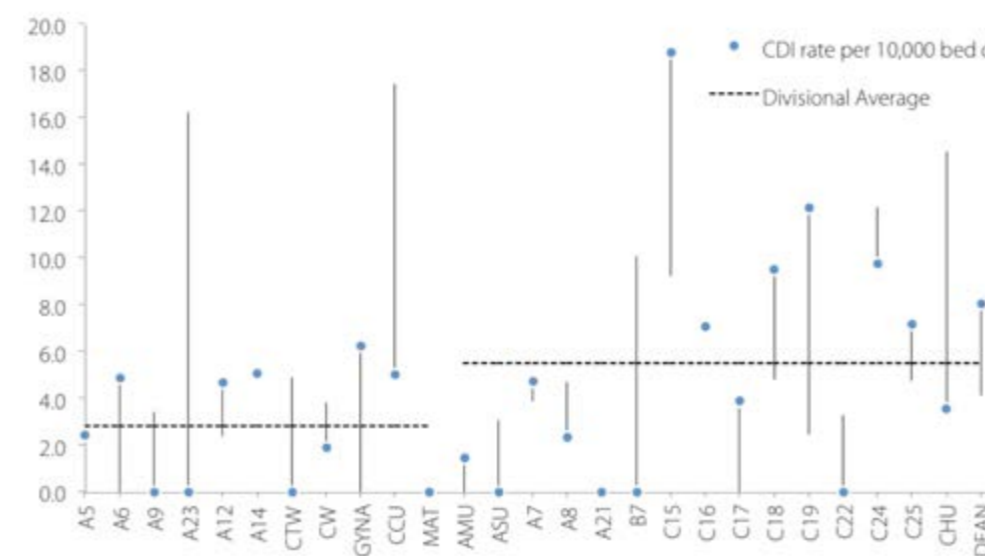
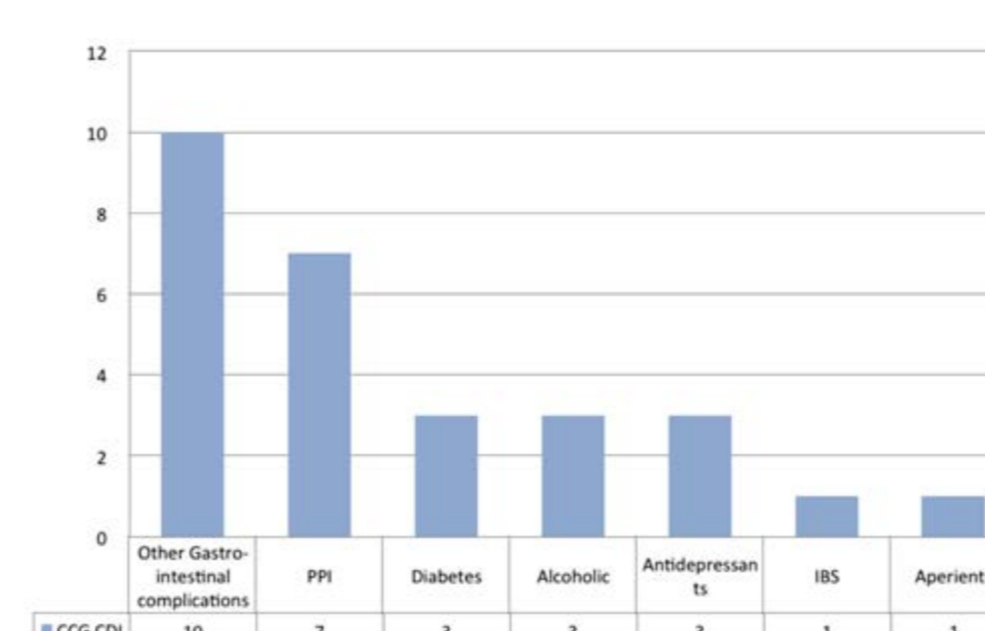


Figure 5 - Co-morbidities in patients with CDI in Wolverhampton City CCG



Baseline Characteristics of CCG attributable CDI Patients.

	Under 65	65+	Total
2012/13 Annual	7 (10.8%)	58 (89.2%)	65
2013/14 Qtr 1	8 (44.4%)	10 (55.6%)	18
Total	15 (18.1%)	68 (81.9%)	83

A similar approach is now applied to hospital and community acquired device related bacteraemia (DRHAB/DRCAB) cases. An example of this information is provided below.

Figure 6 - Source data of DRAHB's 2013/14

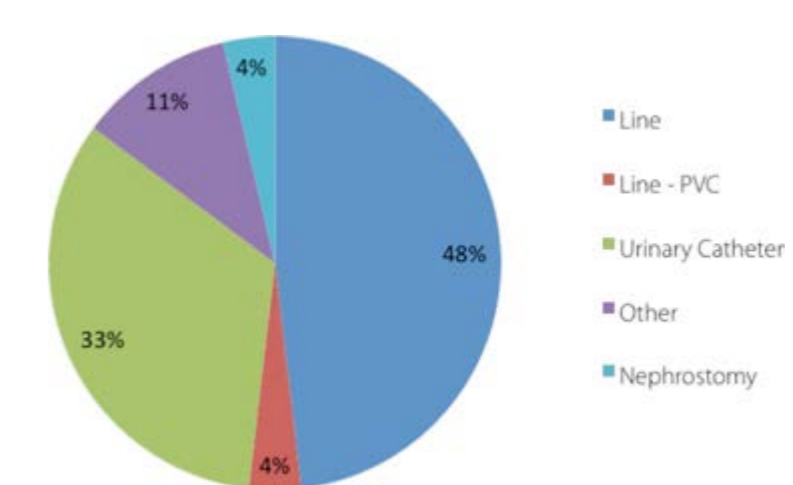


Figure 7 - Urinary Catheter DRCAB and Rate per 100,000 Device Days, April 12 - July 13.

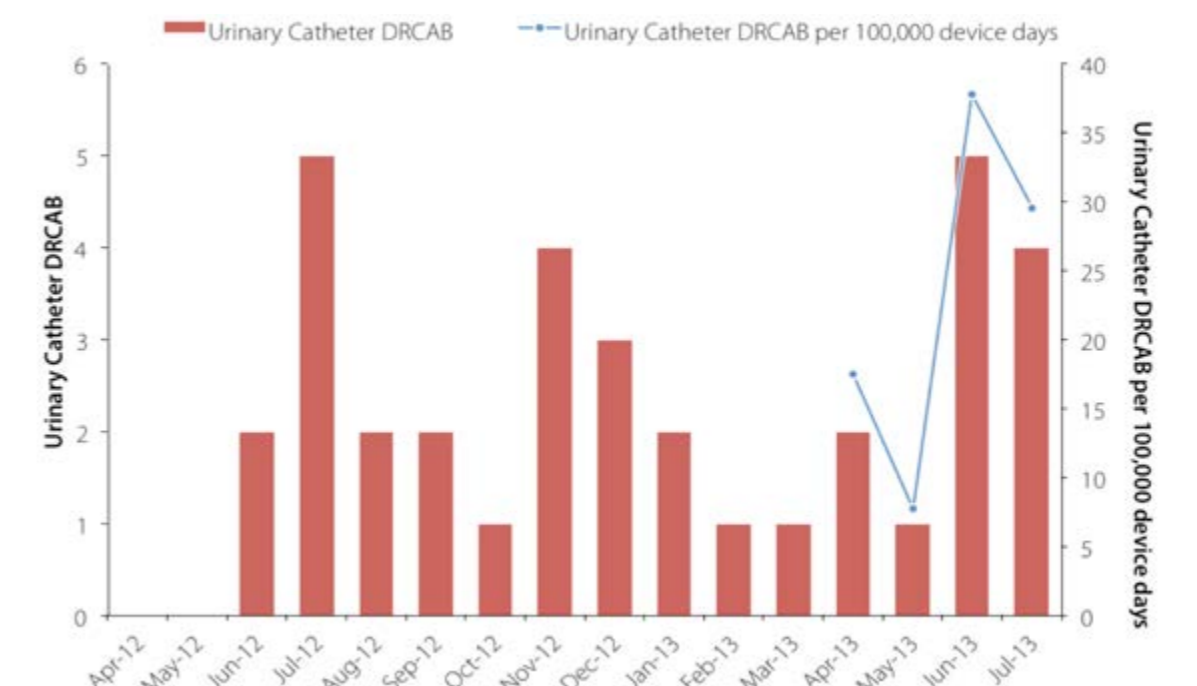
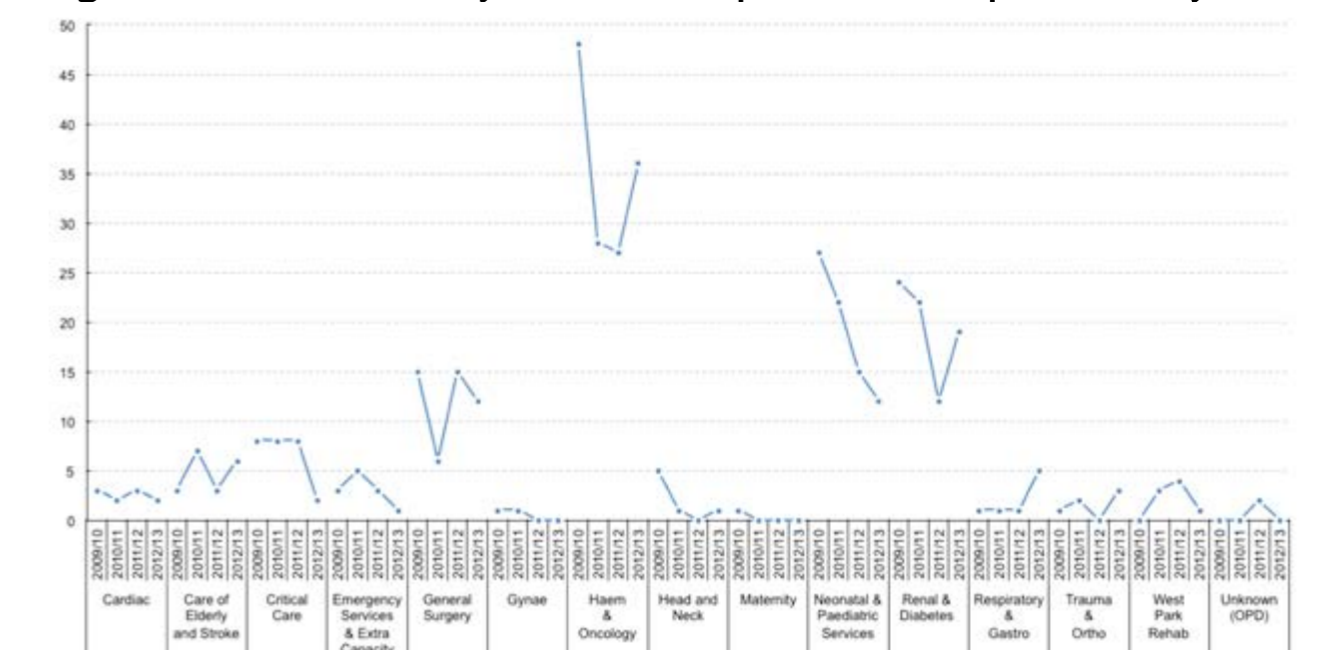


Figure 8 - DRHABs by ward compared with previous year



## Conclusion

Intelligence gained from efficient electronic surveillance informs the annual programme of work and action plans for the reduction of specific infections. Through a process of financial engagement the Infection Prevention Team is working with the Finance Department to fully understand the local costs of HCAI as a subsequent step.

Detailed, accurate and timely surveillance data forms the basis of this approach. Through demonstrating successful prevention strategies, accurately costing business cases and identification of the return on investments, Infection Prevention Teams can gain organisational attention, attach project monies and continue to drive infection down even in times of financial restraint.

## References

Haley RW, Culver DH, White JW, et al. The efficacy of infection surveillance and control programs in preventing nosocomial infections in United States hospitals. American Journal Epidemiology 1985; 121:182e205.