

The *Escherichia coli* Bacteraemia Quality Premium: Is a 10% reduction possible using Quality Improvement Techniques?

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Background

- Clinical Commissioning Groups (CCGs) are leading on achieving a Quality Premium to reduce *E. coli* bloodstream infections by 10% by April 2018 using a whole health economy approach¹.
- UCLH is adopting Quality Improvement methodology via Life QI Software to address this challenge with the benefit of a HIS funded Ayliffe fellow.

Method

- An improvement project team including the Ayliffe fellow, infection control, Camden CCG, Commissioning Support Unit, Public Health England, UCLH Improvement, a continence nurse and hospital epidemiologist was assembled. Qualitative themes emerged through discussion and aims were scoped and defined. A project charter with SMART objectives was agreed upon.
- Baseline hospital onset *E. coli* bacteraemia rates for the financial year (FY) 2016-2017 were plotted on a Statistical Process Control Chart (SPC) and Pareto chart to highlight focused areas of work.
- The first 30 sets of consecutive notes with hospital onset *E. coli* bacteraemia from April 2017 were reviewed for preventable themes.

Statistical Process Control Chart – Weekly Baseline Hospital Onset *E. coli* bacteraemias FY2016-2017

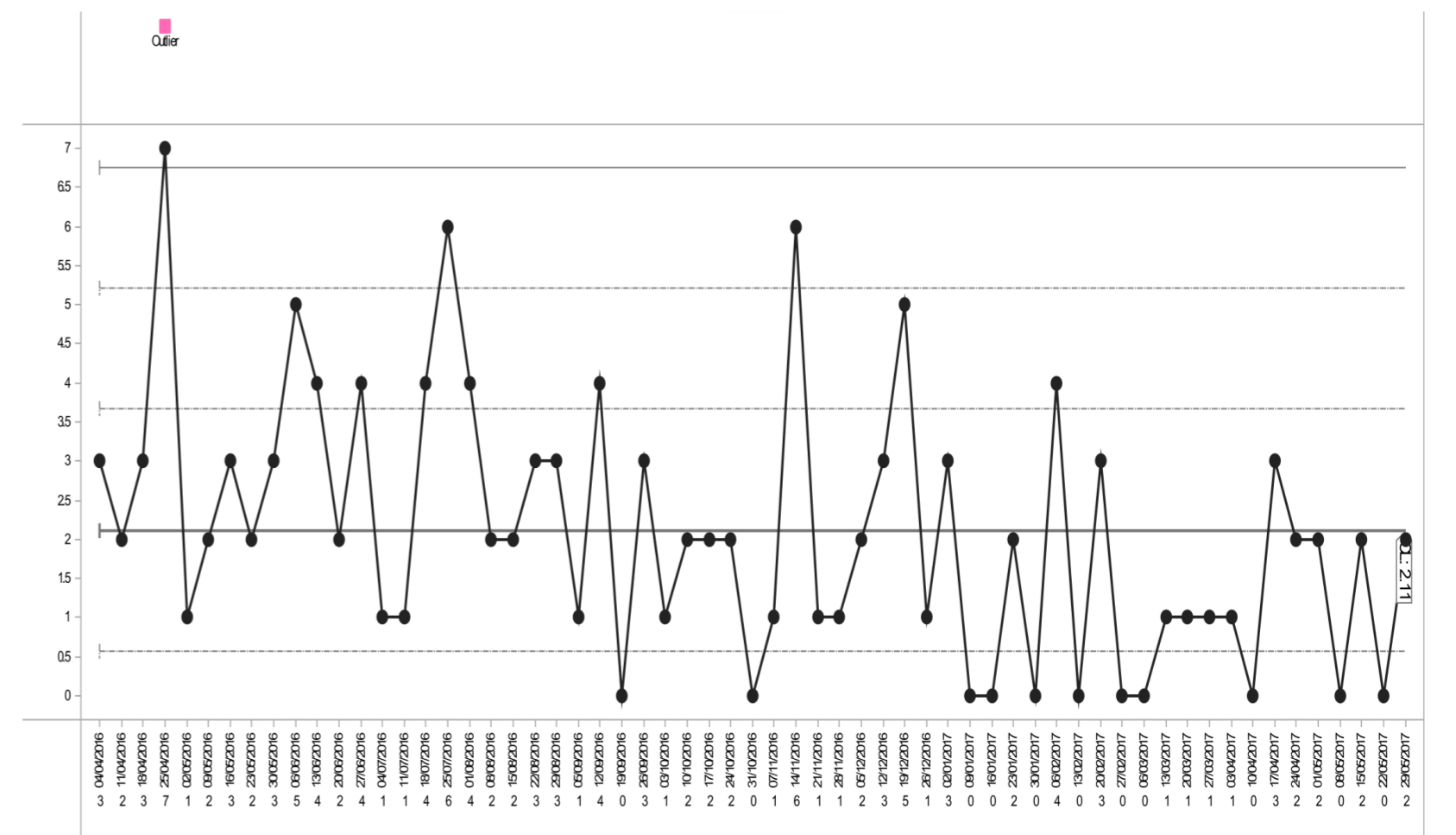


Fig. 1 – Pre-intervention baseline SPC chart demonstrates expected seasonal variation² in *E. coli* cases with a statistically significant outlier on 18/4/16 representing Special Cause Variation. This may have been due to seasonal effect and the bank holiday weekend.

Where were most Hospital Onset *E. coli* Bacteraemias drawn at UCLH in 2016-2017?

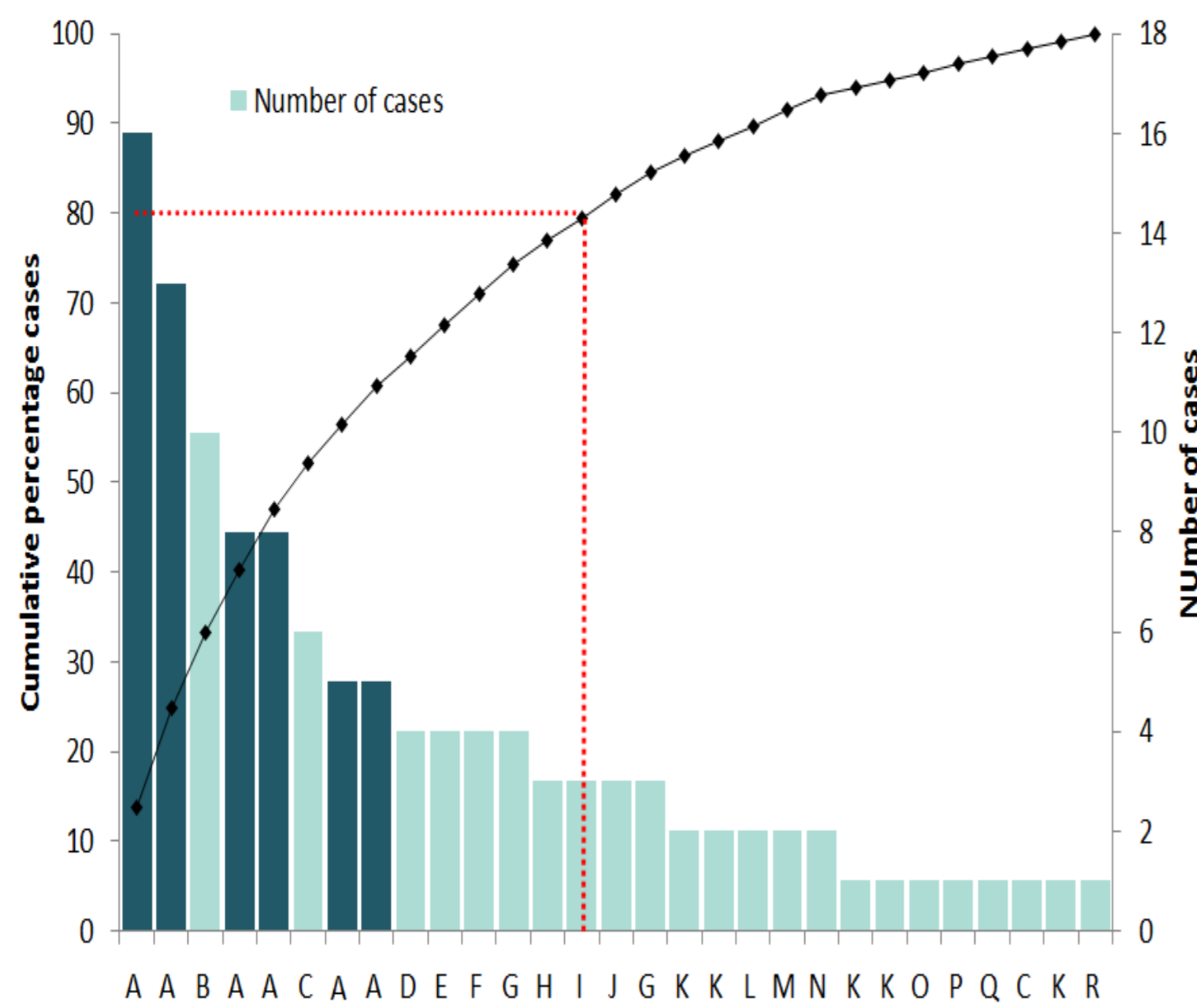


Fig.2 Pareto Chart – Hospital onset *E. coli* bacteraemias by ward for FY2016-2017. Letters on x-axis relate to clinical specialty. Haematology wards are highlighted in dark green.

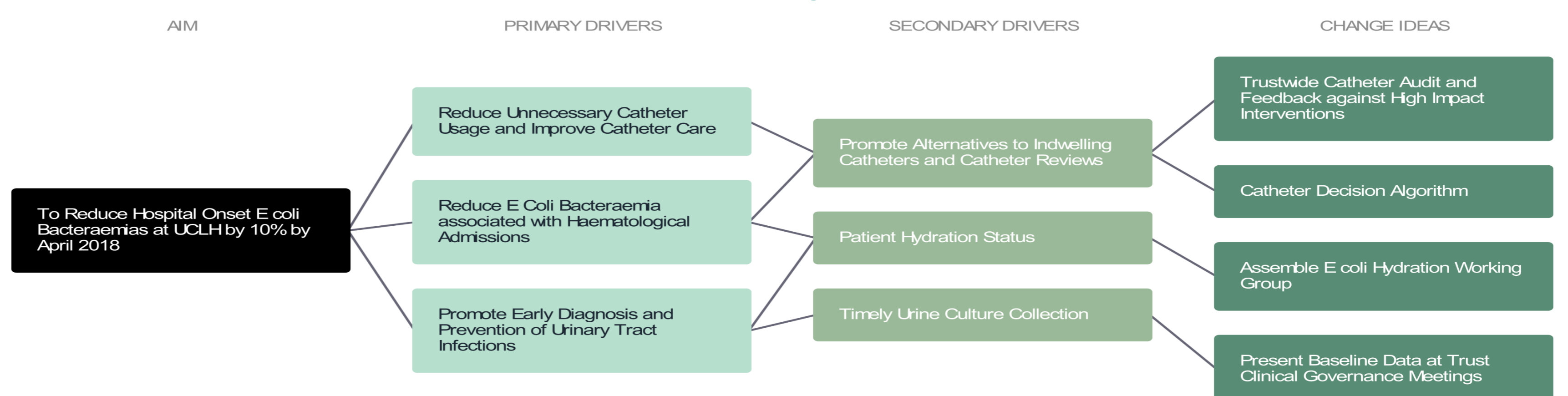
Results

- In 2016-17, UCLH had 269 *E. coli* bacteraemia cases. 152 were community onset and 117 hospital onset.
- Haematology admissions predominated (11/30 - 37%). The commonest underlying diagnosis was neutropenic sepsis (9/30 – 30%).
- 15 cases (50%) had a urinary catheter during their hospital stay. Documentation was confined to nursing notes.
- 10 (33%) had urine cultures taken on the same day or the day before an *E. coli* blood culture.
- Dehydration and constipation were common.

Conclusions

- Catheter training across the trust has been updated to include infection control and clear documentation in medical notes.
- Survey data has been presented at clinical governance meetings to microbiology, infectious diseases and haematology.
- The ambition was discussed at a CCG education day, deteriorating patient steering group and trust audit committee with intent to embed into trust wide audit and QI.
- The improvement plan was discussed with performance managers and presented at the executive shadowing programme.
- The outcome measure will be numbers of *E. coli* bacteraemias at UCLH. Statistically significant reductions will be detected by the SPC chart reviewed in response to PDSA (Plan-Do-Study-Act) cycles.
- Clinical fellowship funding has enabled high quality multidisciplinary survey, early feedback and board to ward engagement around a quality improvement cycle. We hope to achieve the 10% reduction as a result of this work.

Driver Diagram



Generated by LifeQI

Fig. 3 – Abbreviated Driver Diagram: Key change ideas on current focus of work

References
 1. Preventing healthcare associated Gram - negative bloodstream infections - an improvement resource. 2017;(May).
 2. Kiernan M. ARHAI *E. coli* subgroup final report