Public Health England

Protecting and improving the nation's health

Biannual commentary on MRSA, MSSA and Gram-negative bacteraemia and *Clostridium difficile* infection from Independent Sector healthcare organisations in England

April 2017 to September 2017

Experimental Statistics
April 2018

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SUSTAINABLE DEVELOPMENT G⊕ALS

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Summary

One case of MRSA bacteraemia, 29 cases of MSSA bacteraemia, 69 cases of *E. coli* bacteraemia, 43 cases of *Klebsiella* spp. bacteraemia, 16 cases of *P. aeruginosa* bacteraemia and and 46 cases of CDI were reported between April and September 2017. These figures include all cases reported by the Independent Sector and do not take into account whether or not the infection was thought to be associated with the Independent Sector organisation. This document summarises the data and discusses key caveats. Below is a summary of key differences between the NHS and IS which should be considered (Table 1).

Table 1. Summary of key differences between the NHS and IS

Independent Sector Organisations	NHS acute Trusts
Data are not "apportioned" into cases thought to have been associated with the particular IS hospital admission.	Data are categorised into "Trust apportioned" and "non Trust apportioned" cases. "Trust apportioned" cases are those thought to have been associated with a given NHS Trust during a given hospital admission.
Primarily elective patient-mix	Broad patient-mix including emergency-based treatments
Constantly changing facility list	Mainly static list of providers
Large number of specialist facilities	Mainly general acute facilities
Organisations may comprise geographically diverse hospitals	Mainly local clusters of hospitals
Rates calculated using bed-days plus discharges due to the high proportion of day cases compared to the NHS	Rates calculated using bed-days (occupied beds at midnight[1])

Introduction

This report is the latest in a series of publications of HCAI surveillance data on MRSA, MSSA and Gram-negative bacteraemia and CDI reported by IS healthcare organisations to PHE. IS healthcare organisations providing regulated activities[2]

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[1] Available here: https://www.england.nhs.uk/statistics/statistical-work-areas/bed-availability-and-occupancy/bed-data-overnight/

[2] See: http://www.legislation.gov.uk/uksi/2010/781/contents/made

undertake surveillance on HCAIs and report to PHE as specified in the Code of Practice[3].

Patient level data is provided to PHE via the secure Data Capture System (DCS) and the data for this publication was extracted on 12 March 2018.

Presentation of data

- counts of MRSA, MSSA, and Gram-negative bacteraemia and CDI are presented by IS organisation[4] for the six month period April to September 2017
- the modified IS denominator (bed days plus discharges) is provided for the most recent financial year available (April 2016 to March 2017) as an indication of the size of each facility. For further information, please refere to Appendix 1.
- the hospital type (large hospital, small hospital[5], NHS treatment centre, diagnostic centre seeing mainly day case patients and women's health) is listed for the hospital(s) within a group; this indicates the type of service(s) provided[6]. This is correct as at 12 March 2018 as supplied to PHE
- the number of hospitals within an organisation is provided. This is correct as of 12 March 2018 and as supplied to PHE

The accompanying OpenDocument spreadsheet only includes data from those IS organisations that have reported at least once (either submitted a case(s), or have signed off their nil returns as correct) for the reporting period (April 2017 to September 2017). Some IS organisations included in the data tables may have not been reporting for the entire period. Such hospitals which may have opened or closed during the reporting period are listed in Appendix 2. This publication is therefore not a comprehensive list of IS organisations. Cases amongst renal patients have been excluded pending a separate publication.

Duplicate reporting between the IS and NHS

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[3] The Health and Social Care Act 2008 (2010). Code of Practice on the prevention and control of infections and related guidance. Department of Health. Gateway Reference: 14808

[4] An IS organisation can comprise a group of hospitals owned by one company or a single hospital. It is possible to identify a group versus a hospital using the "number of hospitals in organisation" field

[5] Large hospital: ≥50 beds, small hospital: <50 beds

[6] Where a group comprises more than one hospital type, all types are listed

Data entered onto the DCS by the NHS and IS are collected in two parallel systems. Please contact PHE for information on the de-duplication process.

Interpreting the data

What the data show

- Table 1. Counts of MRSA bacteraemia by Independent Sector Healthcare Organisation; April to September 2017
- Table 2. Counts and rates of *Clostridium difficile* infection by Independent Sector Healthcare Organisation; April to September 2017
- Table 3. Counts and rates of MSSA bacteraemia by Independent Sector Healthcare Organisation; April to September 2017
- Table 4. Counts and rates of *E. coli* bacteraemia by Independent Sector Healthcare Organisation; April to September 2017
- Table 5. Counts of *Klebsella* spp. bacteraemia by Independent Sector Healthcare Organisation; April to September 2017
- Table 6. Counts of *P. aeruginosa* bacteraemia by Independent Sector Healthcare Organisation; April to September 2017

What the data do not provide

- the data does not provide a basis for comparisons between different IS organisations due to their variable size and range (case mix) of patients seen
- the data does not provide a basis for reliable comparison of data on MRSA, MSSA or Gram-negative bacteraemia and CDI between the IS and NHS

A full discussion of these issues is presented elsewhere[7].

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[7] The reasons behind this are discussed in Commentary on Reporting of *C. difficile* infections and MRSA bacteraemia from the Independent Sector, published 2009

Specific data caveats

Below is a list of specific caveats to be considered in relation to the published data.

Data quality

Not all IS organisations have signed off their data or submitted data for the reporting period. Data for such organisations may not yet be finalised and therefore may not be accurate. IS organisations that have not signed off their data for the time period are indicated in the data tables in blue.

Duplicate entries

Data has only been de-duplicated against the NHS dataset for cases reported via the DCS. If a case is reported by an IS provider and a NHS Acute Trust the IS case is excluded as a duplicate entry if it meets any of the criteria below:

- both the IS provider and NHS Acute Trust have reported a patient location of "NHS Acute Trust"
- neither the IS provider or NHS Acute Trust have reported a patient location of "NHS Acute Trust", and the IS case has an earlier specimen date
- neither the IS provider or NHS Acute Trust have reported a patient location of "NHS Acute Trust", both cases have the same specimen date and the IS cases was entered before the NHS case

Cases are only de-duplicated if they are reported by both IS providers and NHS Acute Trusts. Multiple cases reported within an IS provider or between multiple IS providers are not de-duplicated. Additionally, NHS number, which is one of the variables used to de-duplicate records, is not always known for patients treated in the IS, so potential duplicate records entered onto the DCS may not be identified.

Organisational changes

Some IS organisations included in the data tables may have not been open for the entire reporting period, whilst others may have closed over this time. This may reduce the count of MRSA, MSSA and Gram-negative bacteraemia and CDI in such IS organisations compared to those which have been open for the whole period. However, they will also reduce the denominator information provided, so any rate calculated still has validity over the shorter period. Such organisations are listed in Appendix 2.

Summary of the data

- data was extracted on 12 March 2018
- 25 organisations are included in this report, 11 of which are groups of more than one hospital and the remaining 14 are single hospitals

MRSA bacteraemia (Table 1)

- one MRSA bacteraemia case was reported from April to September 2017 by HCA International.

CDI (Table 2)

- a total of 46 CDI cases were reported from April to September 2017 by the following organisations: HCA International [25 cases]; Nuffield Health [4 cases]; Spire Healthcare and The London Clinic [4 case each]; BMI Healthcare (GHG) and BUPA Cromwell Hospital [3 cases each]; Royal Hospital for Neuro-disability [2 cases]; Ramsay Health Care UK [1 case]

MSSA bacteraemia (Table 3)

- a total of 29 MSSA bacteraemia cases were reported from April to September 2017 by the following organisations: HCA International [8 cases]; BMI Healthcare (GHG) [6 cases]; The London Clinic [5 cases]; Ramsay Health Care UK [3 cases]; BUPA Cromwell Hospital [2 cases]; Spire Healthcare [2 cases]; Nuffield Health, The Hospital of St John & St Elizabeth [1 case] and The Kent Institute of Medicine & Surgery (KIMS) [1 case each]

E. coli bacteraemia (Table 4)

- a total of 69 *E. coli* bacteraemia cases were reported from April to September 2017 by the following organisations: HCA International [32 cases]; The London Clinic [12 cases]; BMI Healthcare (GHG) [8 cases]; BUPA Cromwell Hospital [7 cases]; Nuffield Health [3 cases]; Ramsay Health Care UK and Spire Healthcare [2 cases each]; Aspen Healthcare, King Edward VII Sister Agnes and One Ashford Hospital [1 case each]

Klebsiella spp. bacteraemia (Table 5)

- a total of 43 *Klebsiella* spp. bacteraemia cases were reported from April to September 2017 by the following organisations: HCA International [25 cases]; The London Clinic [11 cases]; BUPA Cromwell Hospital [4 cases]; Nuffield Health [2 cases]; The Hospital of St John & St Elizabeth [1 cases]

P. aeruginosa bacteraemia (Table 6)

- a total of 16 *P. aeruginosa* bacteraemia cases were reported from April to September 2017 by the following organisations: HCA International [6 cases]; The London Clinic [5 cases]; Nuffield Health and Ramsay Health Care UK [2 cases each]; Aspen Healthcare [1 cases]

Appendix 1: How to calculate bed day plus discharge denominator

The denominator we use, which is more appropriate for shorter stay hospitals is:

Bed days in year + discharges in year

Instead of counting the number of midnights the patient was resident for, this counts the number of different days on which a patient was in the hospital. A day case will count as one, a one night stay in the year will count as two.

The methodology for calculating the two components are listed below. These are then summed to create the denominator.

Bed days in the financial year 2016 to 2017

This is the sum of the number of occupants in a bed each midnight during the year:

Those in a bed at midnight at the end of the day 1 April 2016 + number in a bed at midnight at the end of the day 2 April 2017 + ….+.those in a bed at midnight at the end of the day 31 March 2017.

If the bed days is being derived from admission and discharge dates, you work out the contribution that each patient makes to the year's bed days by a formula.

The only patients who can contribute a bed day to the year are those who are admitted strictly before 1 April 2017 and discharged strictly after 1 April 2016.That is, the latest date they could have been admitted being 31 March 2017 and the earliest date they could have been discharged being 2 April 2017.

For these we calculate:

Discharge date or 1 April 2017, whichever is earlier, MINUS admission date or 1 April 2016, whichever is later. Then add up over all the patients.

This counts the number of bed days the patient contributes to the year.

If the patient is still in hospital and does not yet have a discharge date then the first expression should be taken as 1 April 2017.

Discharges in the financial year 2016 to 2017

This is the number of patients with a discharge date between 1 April 2016 and 31 March 2017 ie:

Number of patients discharged on 1 April 2016 + number discharged on 2 April 2017 + …+ number discharged on 31 March 2017. It should include any day cases that took place during the year.

Examples of bed day and discharge calculations

If a patient was admitted on 17 March 2015 and discharged on 1 April 2016 they will contribute:

Bed days in April 2016 to March 2017   Zero
Discharges in April 2016 to March 2017 One

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If a patient was admitted on 17 March 2016 and discharged on 2 April 2016 they will contribute:

Bed days in April 2016 to March 2017   One
Discharges in April 2016 to March 2017 One

_____

If a patient was admitted on 17 March 2016 and discharged on 1 April 2017 they will contribute:

Bed days in April 2016 to March 2017   365
Discharges in April 2016 to March 2017   Zero

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If a patient was admitted on 23 April 2016 and discharged on 23 April 2016 they will contribute:

Bed days in April 2016 to March 2017   Zero
Discharges in 20162017   One

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If a patient was admitted on 1 March 2017 and is still in hospital today (03 October 2017) they will contribute:

Bed days = Minimum of (discharge date, 1 April 2017) - maximum of (admission date, 1 April 2016)

> = 1 April 2017 - maximum (1 March 2017, 1 April 2016)

> = 1 April 2017 - 1 March 2017

> = 31 Days

Discharges   Zero

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Figures should be provided aggregated for each organisation (where an organisation owns more than one hospital or facility) or for the individual hospital if an organisation comprises one hospital or facility.

Appendix 2: List of IS hospitals which opened, closed, changed ownership or ceased reporting during the reporting period (April 2017 to September 2017)[8]

There were no organisation changes over the time period.

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[8] Correct as at 12 March 2018 and as supplied to PHE