UK Health Security Agency

Annual commentary on MRSA, MSSA and Gram-negative bacteraemia and *Clostridioides difficile* infections from independent sector healthcare organisations in England

April 2020 to March 2021

Experimental statistics

Contents

Executive summary

Between 1 April 2020 and 31 March 2021, 102 cases of *E. coli* bacteraemia, 69 cases of *Klebsiella* spp. bacteraemia, 24 cases of *P. aeruginosa* bacteraemia, 2 cases of MRSA bacteraemia, 21 cases of MSSA bacteraemia, and 54 cases of *Clostridioides difficile* infections (CDI) were reported by Independent Sector (IS) healthcare providers.

Ten of 24 IS healthcare organisations had bed occupancy data. Among IS providers with occupancy data, the highest incidence rate was in *E. coli* bacteraemia (9.9 per 100,000 bed days plus discharges, n = 100), while the lowest rate was in MRSA bacteraemia (0.2, n= 2). Incidence rates for the other infections were; *Klebsiella* spp. bacteraemia (6.8, n= 69), CDI (5.1, n= 51), *P. aeruginosa* bacteraemia (2.4, n= 24) and MSSA bacteraemia (2.0, n= 20).

These figures include all cases reported by the IS and does not take into account whether or not the infection was thought to be associated with the Independent Sector organisation. 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 classified based on onset of the bacteraemia of infection.	Data are categorised into 'Hospital-onset' and 'Community-onset' cases. 'Hospital-onset' 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])

1 Inpatient bed-days figures are available at Bed Availability and Occupancy Data – Overnight

Introduction

This report is the latest in a series of publications of HCAI surveillance data on MRSA, MSSA and Gram-negative (*E. coli*, *Klebsiella* spp. and *P. aeruginosa*) bacteraemia and *Clostridioides difficile* (CDI) reported by IS healthcare organisations to UKHSA. Independent Sector (IS) healthcare organisations providing regulated activities[2] undertake surveillance on HCAIs and report identified cases to UKHSA as specified in the Code of Practice[3].

Patient level data is provided to UKHSA via the secure Data Capture System (DCS) and the data for this publication was extracted on 1 April 2021.

Presentation of data

Counts and rates (per 100,000; calculated using bed days and discharges) of MRSA, MSSA, E. coli, Klebsiella spp. and P. aeruginosa bacteraemia and CDI are presented by IS organisation[4] for the 12-month period 1 April 2020 and 31 March 2021.

The modified inpatient bed-days IS denominator (bed days plus discharges) is provided for the most recent financial year available (April 2019 to March 2020) as an indication of the size of each facility.

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 31 March 2021 as supplied to UKHSA.

Additional information can be found in the accompanying OpenDocument Spreadsheet. Some IS organisations included in the data tables may have not been reporting for the entire period. Such hospitals are included in Appendix 2. Cases amongst renal patients have been excluded.

[2] See Health and Social Care Act 2008 (Regulated Activities) Regulations 2010

[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: >49 beds, small hospital: <50 beds

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

Interpreting the data

The data shows counts and rates of all reported cases of:

- MRSA bacteraemia by Independent Sector Healthcare Organisation – April 2020 to March 2021 (Table T1)
- MSSA bacteraemia by Independent Sector Healthcare Organisation – April 2020 to March 2021 (Table T2)
- *E. coli* bacteraemia by Independent Sector Healthcare Organisation – April 2020 to March 2021 (Table T3)
- *Klebsiella* spp. bacteraemia by Independent Sector Healthcare Organisation – April 2020 to March 2021 (Table T4)
- *P. aeruginosa* bacteraemia by Independent Sector Healthcare Organisation – April 2020 to March 2021 (Table T5)
- CDI by Independent Sector Healthcare Organisation – April 2020 to March 2021 (Table T6)

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
- a basis for reliable comparison of these infections between the NHS and IS organisations

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

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 highlighted in the accompanying OpenDocument Spreadsheet.

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

Duplicate entries

Data entered onto the DCS by the NHS and IS are collected in 2 parallel systems. This means that data on a single case may be entered by either an NHS trust or an IS organisation or both. 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 an NHS acute trust, the IS case is excluded as a duplicate entry if:

- the NHS case was reported with a patient location of 'NHS acute trust', and the IS case was reported with a patient location that is not 'IS provider'
- the NHS case was reported with a patient location of 'NHS acute trust', and the IS case was reported with a patient location of 'IS provider' but has a specimen date within 14 days (28 days for CDI) prior to the NHS case

Cases are only de-duplicated if they are reported by both IS providers and NHS acute trusts and are within the same episode length; 14 days for bacteraemia and 28 days for CDI. Multiple cases reported by one IS provider or by multiple IS providers only 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 these infections in such IS organisations, compared to those that were open for the whole period. However, this will also be reflected in their bed occupancy data, so any rate calculated still has validity over the shorter period. Such organisations are listed in Appendix 2.

Results

A total of 24 organisations are included in this report, 10 of which are groups of more than one hospital and the remaining 14 are single hospitals. Occupancy data[8] was available for 10 organisations. Individual rates for these organisations are included in the accompanying OpenDocument Spreadsheet.

E. coli bacteraemia (Table T1)

A total of 102 cases were reported from April 2020 to March 2021 by the following organisations; HCA International [57 cases]; The London Clinic [16 cases]; BUPA Cromwell Hospital [9 cases]; Circle Health [6 cases]; Aspen Healthcare and Nuffield Health [4 cases each]; Royal Hospital for Neuro-disability [3 cases]; Ramsay Health Care UK, Spire Healthcare and The New Victoria Hospital Ltd [1 case each].

Among IS providers that provided their modified inpatient bed-days, the incidence rate of *E. coli* bacteraemia for April 2020 to March 2021 was 9.9 cases (n=100) per 100,000 bed days plus discharges.

Klebsiella spp. bacteraemia (Table T2)

A total of 69 cases were reported from April 2020 to March 2021 by the following organisations: HCA International [36 cases]; The London Clinic [15 cases]; BUPA Cromwell Hospital [10 cases]; Aspen Healthcare, Circle Health and Spire Healthcare [2 cases each]; Nuffield Health and Royal Hospital for Neuro-disability [1 case each].

Among IS providers that provided their modified inpatient bed-days, the incidence rate of *Klebsiella* spp. bacteraemia for April 2020 to March 2021 was 6.8 cases (n=69) per 100,000 bed days plus discharges.

Pseudomonas aeruginosa bacteraemia (Table T3)

A total of 24 cases were reported from April 2020 to March 2021 by the following organisations: HCA International [11 cases]; The London Clinic [6 cases]; BUPA Cromwell

[8] Inpatient bed-days plus discharges. See Appendix 2 for further details

Hospital and Spire Healthcare [2 cases each]; Circle Health, Nuffield Health and Royal Hospital for Neuro-disability [1 case each].

Among IS providers that provided their modified inpatient bed-days, the incidence rate of *P. aeruginosa* bacteraemia for April 2020 to March 2021 was 2.4 cases (n=24) per 100,000 bed days plus discharges.

MRSA bacteraemia (Table T4)

A total of 2 cases were reported from April 2020 to March 2021 by the following organisations: HCA International [2 cases].

Among IS providers that submitted their modified inpatient bed-days data, the incidence rate of MRSA bacteraemia for April 2020 to March 2021 was 0.2 cases (n=2) per 100,000 bed days plus discharges.

MSSA bacteraemia (Table T5)

A total of 21 cases were reported from April 2020 to March 2021 by the following organisations: HCA International [11 cases]; The London Clinic [4 cases]; Spire Healthcare [3 cases]; BUPA Cromwell Hospital, Circle Health and Ramsay Health Care UK [1 case each].

Among IS providers that provided their modified inpatient bed-days, the incidence rate of MSSA bacteraemia for April 2020 to March 2021 was 2.0 cases (n=20) per 100,000 bed days plus discharges.

CDI (Table T6)

A total of 54 cases were reported from April 2020 to March 2021 by the following organisations: HCA International [24 cases]; Circle Health [8 cases]; BUPA Cromwell Hospital [7 cases]; Nuffield Health [4 cases]; Spire Healthcare, The Hospital of St John and St Elizabeth and The London Clinic [3 cases each]; Royal Hospital for Neuro-disability [2 cases].

Among IS providers that provided their modified inpatient bed-days, the incidence rate of *P. aeruginosa* bacteraemia for April 2020 to March 2021 was 5.1 cases (n=51) per 100,000 bed days plus discharges.

Appendix

Appendix 1: How to calculate bed-day plus discharge denominator

The denominator we intend to 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 they were in the hospital. A day case will count 1, a one night stay in the year will count 2.

The methodology for calculating the 2 components are listed below. These are then summed to create the denominator.

Bed-days in the financial year April 2020 to March 2021

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

Number in a bed at midnight at the end of the day 1 April 2020 + … +

Number in a bed at midnight at the end of the day 31 March 2020

If it is being derived from admission dates 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 that financial year are those who are admitted strictly before 1 April 2021 and discharged strictly on or after 1 April 2020. That is, the latest date they could have been admitted was 31 March 2021 and the earliest date they could have been discharged was 1 April 2020.

For these we work out

Discharge date or 1 April 2021 (whichever is earlier)

minus

Admission date or 1 April 2020 (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 2021.

Discharges in the financial year April 2020 to March 2021

This is the number of patients with a discharge date between 1 April 2020 and 31 March 2021 that is

Number of patients discharged on 1 April 2020 + … +

Number discharged on 31 March 2021

It should include any day cases that took place during the year.

Examples of bed-day and discharge calculations

Scenario 1

If a patient was admitted on 17 March 2020 and discharged on 1 April 2020, they will contribute

Bed-days in April 2020 to March 2021: 0

Discharges in April 2020 to March 2021: 1

Scenario 2

If a patient was admitted on 17 March 2020 and discharged on 2 April 2020 they will contribute

Bed-days in April 2020 to March 2021: 1

Discharges in April 2020 to March 2021: 1

Scenario 3

If a patient was admitted on 1 April 2020 and discharged on 1 April 2020 they will contribute

Bed-days in April 2020 to March 2021: 0

Discharges in April 2020 to March 2021: 1

Scenario 4

If a patient was admitted on 1 April 2020 and discharged on 3 April 2020 they will contribute

Bed-days in April 2020 to March 2021: 2

Discharges in April 2020 to March 2021: 1

Scenario 5

If a patient was admitted on 17 March 2020 and discharged on 1 April 2021 they will contribute

Bed-days in April 2020 to March 2021: 365

Discharges in April 2020 to March 2021: 0

Scenario 6

If a patient was admitted on 1 April 2020 and discharged on 23 April 2021 they will contribute

Bed-days in April 2020 to March 2021: 365

Discharges in April 2020 to March 2021: 0

Scenario 7

If a patient was admitted on 31 March 2021 and discharged on 23 April 2021 they will contribute

Bed-days in April 2020 to March 2021: 1

Discharges in April 2020 to March 2021: 0

Scenario 8

If a patient was admitted on 23 April 2021 and discharged on 23 April 2021 they will contribute

Bed-days in April 2020 to March 2021: 0

Discharges in April 2020 to March 2021: 0

Scenario 9

If a patient was admitted on 1 March 2021 and discharged on 19 June 2021 they will contribute

Bed-days =

Minimum of (discharge date, 1 April 2021) – maximum of (admission date, 1 April 2020)

= 1 April 2021 – maximum (1 March 2021, 1 April 2020)

= 1 April 2021 – 1 March 2021

= 31 days

Discharges = 0

Figures provided should be aggregated for each organisation (where an organisation owns more than hospital or facility) or for the individual hospital if an organisation comprises 1 hospital or facility.

Appendix 2: Organisational changes among IS providers during the reporting period; April 2020 to March 2021[9]

Table 2: Hospitals that closed, opened, changed ownership or ceased during the reporting; April 2020 to March 2021

IS provider name	Site name	Status	Month
Aspen Healthcare	Aspen THE CANCER CENTRE LONDON	Opened	April 2020
British Pregnancy Advisory Service	BPAS (Solihull)	Closed	April 2020
British Pregnancy Advisory Service	BPAS (NORTH LONDON DAY SURGERY UNIT)	Closed	April 2020
British Pregnancy Advisory Service	BPAS (Dorchester)	Closed	April 2020
British Pregnancy Advisory Service	BPAS Tamworth	Closed	April 2020
Transform Hospital Group Ltd	Transform Hospital Group – Pines Hospital	Opened	April 2020
Transform Hospital Group Ltd	Transform Hospital Group – Dolan Park Hospital	Opened	April 2020

[9] Correct as at 31 March 2021 and as supplied to UKHSA

About the UK Health Security Agency

The UK Health Security Agency is an executive agency, sponsored by the Department of Health and Social Care.

www.ukhsa.gov.uk

For queries relating to this document, please contact: IndependentSector@phe.gov.uk

Published: October 2021
Publishing reference: GOV-9674