Quarterly Epidemiological Commentary: Mandatory MRSA, MSSA and *E. coli* bacteraemia, and *C. difficile* infection data (up to July–September 2012)



13th December 2012

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Data sources, definitions, and links

Sources of data and definitions used for these analyses as well as listings of HPA and other national web pages.

Note: All references to quarterly data are based on calendar year definitions, and NOT financial year definitions (e.g. Q1 2009 refers to January-March 2009 and NOT to April-June 2009).

Citation

Health Protection Agency. Quarterly Analyses: Mandatory MRSA, MSSA and *E. coli* Bacteraemia and CDI in England (up to July-September 2012). London: Health Protection Agency, December 2012.

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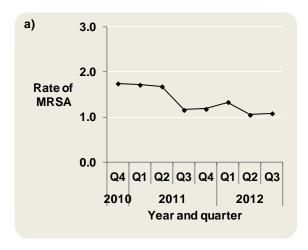
Section 1: Epidemiological analyses of Staphylococcus aureus bacteraemia data

MRSA Bacteraemia

- Between Q4 2010 and Q3 2012, the rate of Trust apportioned cases per 100,000 bed-days decreased by 38%, from 1.75 to 1.08. Over the same period the rate of total MRSA cases per 100,000 population declined by 32% from 2.51 to 1.71. The Q2 2012 rate of 1.69 represents a 30% decrease on the corresponding quarter in 2011, when it was 2.41 (Figure 1).
- The total number of MRSA bacteraemia reports has decreased by 14% when compared to the same period last year – from 266 in Q3 2011 to 228 in 2012. This is part of an overall decrease of 55% since Q2 2009 when there were 510 reports.
- Trust apportioned reports showed a greater reduction of 62% between Q2 2009 when there
 were 251 reports to 96 reports in Q3 2012. Q3 2012 Trust apportioned reports (96)
 represent a 7% decline compared to Q3 2011 when there were 103 reports (Table 1).

Figure 1: Quarterly rates of MRSA bacteraemia, October 2010-September 2012

a) Trust apportioned rate (per 100,000 bed-days) b) All reports (per 100,000 population)



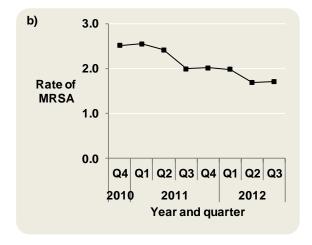


Table 1: MRSA bacteraemia counts by quarter, April 2009-September 2012

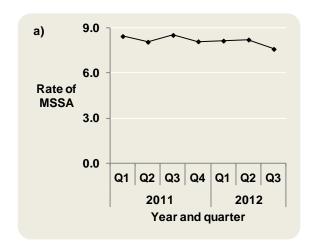
Year and quarter		Trust apportioned reports	All reports	
2009	Q2	251	510	
	Q3	237	462	
	Q4	237	443	
2010	Q1	279	483	
	Q2	198	421	
	Q3	186	396	
	Q4	155	331	
2011	Q1	149	333	
	Q2	148	319	
	Q3	103	266	
	Q4	105	269	
2012	Q1	117	262	
	Q2	93	223	
	Q3	96	228	

MSSA Bacteraemia

- Both Trust apportioned and population rates were stable over the 7 quarters although there was a slight decrease in both rates in the most recent quarter. The highest Trust apportioned rate was in Q3 2011 with 8.54 per 100,000 bed-days whilst the lowest was in Q3 2012 with 7.60 per 100,000 bed-days. The highest population rate was 16.92 per 100,000 population in Q2 2012 whilst the lowest was15.95 per 100,000 population in Q3 2012, the most recent quarter (Figure 2).
- A total of 15,324 reports of MSSA bacteraemia were made between January 2011 and September 2012 of which 4,943 were Trust apportioned.
- There was little fluctuation in the number of reports between the quarters (Table 2).

Figure 2: Quarterly rates of MSSA bacteraemia, January 2011-September 2012

a) Trust apportioned rate (per 100,000 bed-days) b) All reports (per 100,000 population)



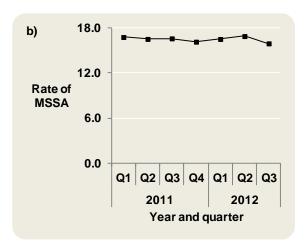


Table 2: MSSA bacteraemia counts by quarter, January 2011 – September 2012

Year and quarter		Trust apportioned reports	All reports
2011	Q1	735	2,199
	Q2	698	2,190
	Q3	724	2,224
	Q4	702	2,165
2012	Q1	728	2,183
	Q2	711	2,234
	Q3	645	2,129

Section 2: Escherichia coli bacteraemia data

- The rate of *E. coli* bacteraemia was stable over the five quarters: the highest rate was 64.98 per 100,000 in Q3 2012 while the lowest was 58.30 per 100,000 in Q1 2012 (Figure 3).
- A total of 40,819 reports of *E. coli* bacteraemia were reported between July 2011 and September 2012 (Table 3).
- There was little variation in the number of reports from quarter to quarter; the highest number of reports was seen in Q3 2012 with 8,674 reports, while the lowest was observed in Q1 2012 with 7,698 reports.

Figure 3: Quarterly rates of *E. coli* bacteraemia reports per 100,000 population, July 2011-September 2012

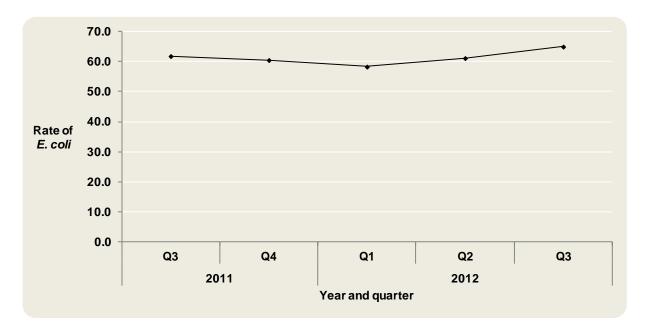


Table 3: Quarterly counts of all *E. coli* bacteraemia reports, July 2011-September 2012

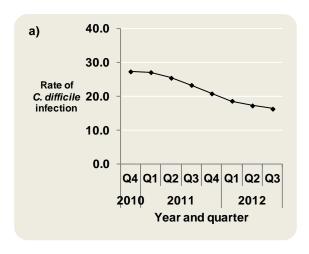
Voor and	auartar	Total <i>E. coli</i>
Year and quarter		bacteraemia reports
2011	Q3	8,275
	Q4	8,098
2012	Q1	7,698
	Q2	8,074
	Q3	8,674

Section 3: Epidemiological analyses of Clostridium difficile data

- Between Q4 2010 and Q3 2012, the rate of Trust apportioned cases per 100,000 bed-days decreased by 40%, from 27.37 to 16.32. Over the same period the rate of total CDI cases per 100,000 population declined by 24% from 38.85 to 29.72. The Q3 2012 rate represents a 22% decrease on the corresponding quarter of 2011, when the rate was 38.28 (Figure 4).
- The number of Trust apportioned CDI reports have decreased by 6% between Q2 2012 and Q3 2012, from 1,507 to 1,424. This is part of an overall decrease of 60% since Q2 2009 when there were 3,605 reports (Table 4).
- Conversely the total reported number of CDI reports have increased by 6% between Q2 2012 and Q3 2012, ending a decrease seen since Q3 2011. However an overall decrease of 44% has been observed since Q2 2009.

Figure 4: Rates of *C. difficile* infection in patients aged 2 years and over, October 2010 - September 2012

a) Trust apportioned reports (per 100,000 bed-days) b) All reports (per 100,000 population)



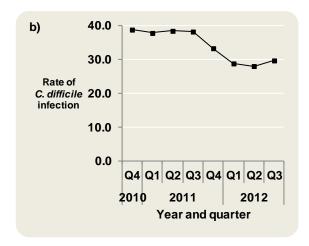


Table 4: CDI counts in patients aged 2 years and over by quarter, April 2009-September 2012

Year and quarter		Trust apportioned reports	All reports
2009	Q2	3,605	6,854
	Q3	3,097	6,407
	Q4	3,029	6,002
2010	Q1	3,489	6,341
	Q2	2,996	5,981
	Q3	2,632	5,909
	Q4	2,431	4,984
2011	Q1	2,358	4,833
	Q2	2,204	4,967
	Q3	2,043	4,994
	Q4	1,822	4,350
2012	Q1	1,610	3,711
	Q2	1,507	3,651
	Q3	1,424	3,867

Appendix

Bed day data

For *S. aureus* (MRSA and MSSA) bacteraemia and CDI, the average bed day activity reported by acute Trusts via KH03 returns is used to derive the bed day denominator for acute Trust incidence rates. Data for the most recently published year may be used to substitute values for the current surveillance year (e.g. substituting data from 2009/10 for 2010/11). These data are available at:

http://www.dh.gov.uk/en/Publicationsandstatistics/Statistics/Performancedataandstatistics/Beds/DH_083781 Historically Hospital Episode Statistics (HES) data was used for CDI rate calculation in order to allow the exclusion of patients aged under two from the denominator. This is the first time KH03 occupied bed data has been used to derive the CDI denominator. Given the minimal impact of patients aged under two on overall rates it seemed prudent to use a single denominator across organisms.

Population data

National incidence rates are calculated using 2010 and 2011 mid-year resident population estimates which are based on the 2001 and 2011 census for England, respectively. These are available at: http://www.statistics.gov.uk/statbase/Product.asp?vlnk=15106

Definitions

Apportioning of reports:

 MRSA bacteraemia Trust apportioned reports: The analysis of Trust apportioned and all other reports is based on the model outlined by the National Quality Board. (http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH_100641)

This includes patients who are (i) in-patients, day-patients, emergency assessment patients or not known; AND (ii) have had a specimen taken at an acute Trust or not known; AND (iii) specimen is **3 or more days** after date of admission (or admission date is null), where the day of admission is day '1'.

- **MSSA bacteraemia Trust apportioned reports:** The analysis of Trust apportioned and all other reports is based on the criteria applied to MRSA bacteraemia.
- CDI Trust apportioned reports: include patients who are (i) in-patients, day-patients, emergency assessment patients or not known; AND (ii) have had a specimen taken at an acute Trust or not known; AND (iii) specimen is 4 or more days after date of admission (admission date is considered day '1').
- Non-Trust apportioned reports ("all other reports"): These include all reports that are NOT apportioned to an acute Trust. The two categories are mutually exclusive.

Episode duration:

• The length of a patient episode is defined as 14 days for MRSA, MSSA and *E. coli* bacteraemia and 28 days for CDI, with the date of specimen being considered day '1'.

Incidence calculations:

- MRSA, MSSA and E. coli bacteraemia, and CDI population incidence (episodes per 100,000 population years):
 - This incidence is calculated on an annualised basis to allow comparisons with the HPA's annually published data and is calculated as follows:
 - =100,000* (# episodes/mid-year England population) * (# days in year/# days in quarter).
- MRSA and MSSA bacteraemia, and CDI Trust apportioned incidence:
 - This incidence is calculated using KH03 average bed day activity (see *Data Sources* above) and is calculated as follows:
 - =100,000*[# episodes/ (average KH03 bed day * # days in surveillance quarter)]

Quarters:

Q1= January-March; Q2=April-June; Q3=July-September; Q4=October-December