

# Quarterly analyses: Mandatory MRSA bacteraemia & *Clostridium difficile* infections (July, 2007 to September, 2009)



December 3, 2009

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## Links

***Clostridium difficile* Ribotyping Network for England & Northern Ireland (CDRN)**  
*This service provides timely access to C. difficile culture and ribotyping.*

## Antimicrobial Resistance & Reference Laboratory (ARMRL)

*This laboratory provides assistance in detecting and investigating antibiotic resistance.*

## Laboratory of HealthCare Associated Infection (LHCAI)

*This laboratory gives advice on outbreak investigations and monitors national trends in the distribution of strains.*

## Department of HealthCare Associated Infection and Antimicrobial Resistance

*This department manages national surveillance for a number of healthcare-associated infections.*

## Health Protection Report (HPR)

*This is the national public health bulletin for England and Wales, and is published every Friday by the HPA.*

## Suggested citation

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## INSIDE

### Meticillin-resistant *Staphylococcus aureus* (MRSA) bacteraemia

Quarterly analyses of MRSA bacteraemia from mandatory surveillance in England: July, 2007 ("Q3/2007") to September, 2009 ("Q3/2009")

### *Clostridium difficile* infections

Quarterly analyses of *Clostridium difficile* infection (CDI) from mandatory surveillance in England: July, 2007 ("Q3/2007") to September, 2009 ("Q3/2009")

### 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).

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## Future publications

### Monthly Mandatory MRSA and CDI Tables:

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## Introduction

*Staphylococcus aureus* is a common coloniser of human skin and mucosa, but can cause disease, particularly if there is an opportunity for the bacteria to enter the body. Meticillin-resistant *Staphylococcus aureus* (MRSA) are a type of *Staphylococcus aureus* resistant to meticillin and usually to some of the other antibiotics that are normally used to treat *Staphylococcus aureus* infections. Most patients who are colonized with MRSA do not go on to develop an infection.

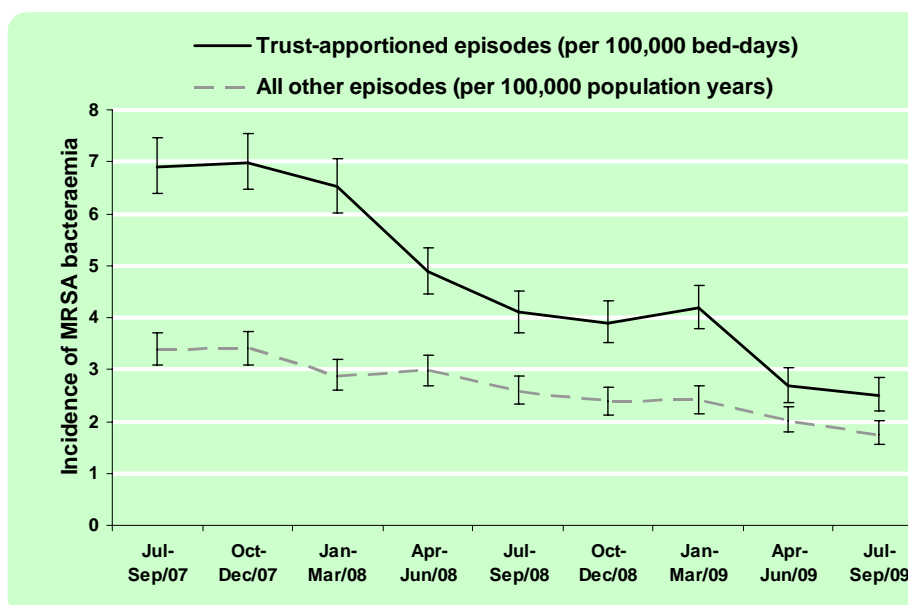
Reporting of MRSA bacteraemia by NHS trusts has been mandatory in England since April, 2001, with enhanced reporting (e.g. patient-level data) introduced in October, 2005. This Quarterly Report presents analyses for data collected from this surveillance scheme over the previous nine quarters (July, 2007 to September, 2009).

## Findings

The incidence of MRSA bacteraemia during the previous nine quarters is shown in Figure 1, and is divided into trust-apportioned episodes (this category includes patients presumed to have been infected while admitted to the trust based on the model outlined by the National Quality Board; see **Definitions** section for algorithm) and all other episodes.

The purpose of apportioning episodes to either acute trust or all other sources is to explore the changing epidemiology of MRSA bacteraemia. By distinguishing between trust apportioned and all other cases, we can conduct a more refined analysis of the disease in the relevant settings.

**Figure 1. Incidence for trust-apportioned and all other episodes of MRSA bacteraemia, July-September, 2007 (Q3/2007) to July-September, 2009 (Q3/2009)**



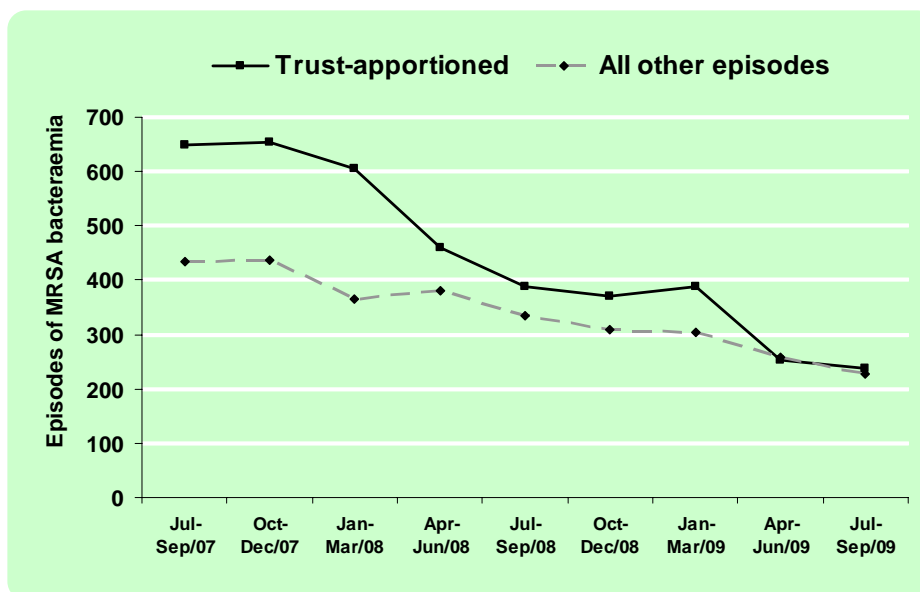
Among trust-apportioned episodes, there has been a decrease in the incidence of MRSA bacteraemia between Q2/2009 and Q3/2009, from 2.7 to 2.5 episodes per 100,000 bed-days, respectively. More dramatic decreases have been observed when compared with the same quarters in 2007 and 2008. The incidence has decreased from 6.9 episodes per 100,000 bed days in Q3/2007 to 4.1 episodes per 100,000 bed days in Q3/2008.

Incidence rates for all other episodes are based on England population estimates. In Q3/2009, the population incidence for these cases was 1.8 episodes per 100,000 populations, a decrease from 2.0 episodes per 100,000 population in the previous quarter (Q2/2009). The incidence in Q3/2009 is much lower than in Q3/2007 (3.4 episodes per 100,000 population) and in Q3/2008 (2.6 episodes per 100,000 population).

Overall, there has been a 57% decrease in the number of episodes reported during the surveillance period in England, from 1083 cases in Q3/2007 to 465 cases in Q3/2009 (Figure 2). Among trust-apportioned episodes, there has been a 63% decrease since Q3/2007, from 648 episodes to 237 episodes in Q3/2009. In comparison with the previous quarter (Q2/2009) there has been a 6% decrease, from 252 episodes.

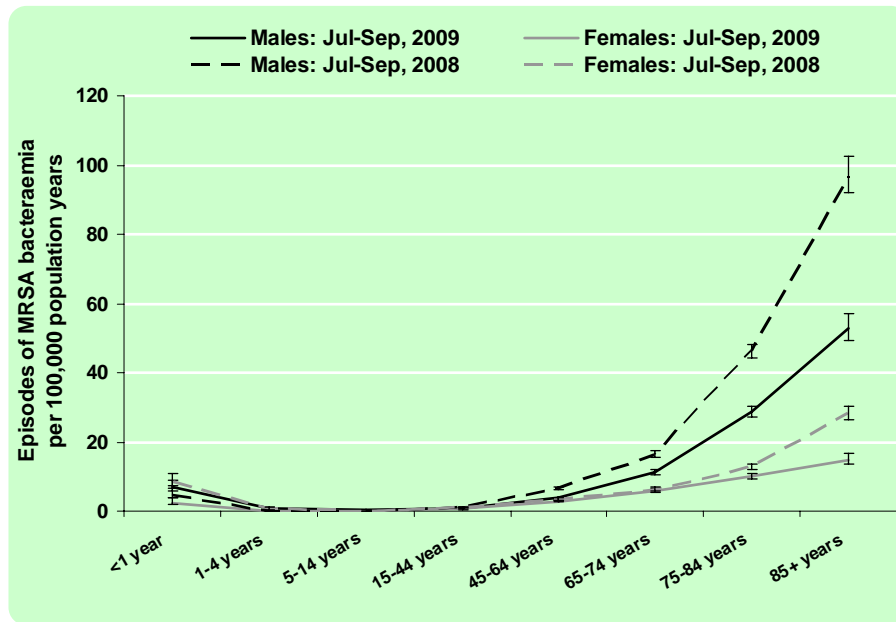
The number of all other episodes has decreased 48% from 435 episodes in Q3/2007 to 228 episodes in Q3/2009. There has also been a 12% decrease since the previous quarter (Q2/2009), when 259 episodes were reported. For the most recent two quarters of data (Q2 and Q3/2009), cases apportioned to acute trusts now account for approximately 50% of all episodes.

**Figure 2. Counts of trust-apportioned and all other episodes of MRSA bacteraemia, July-September, 2007 (Q3/2007) to July-September, 2009 (Q3/2009)**



The incidence of all episodes of MRSA bacteraemia stratified by age and sex for Q3/2008 and Q3/2009 is presented in Figure 3. For both periods the highest incidence was observed among patients aged 65 years and over and the very young (< 1 year of age). Although the incidence in those aged 65 and over is greater among males than females, the incidence rate has decreased in the last year among both patient groups.

**Figure 3. Incidence of all episodes of MRSA bacteraemia by patient sex and age, July-September, 2008 (Q3/2008) and July-September, 2009 (Q3/2009)**



Key patient demographic data for Q3/2008 and Q3/2009 are presented in Table 1. No marked changes have been observed, with MRSA bacteraemia affecting more males (~60%) than females. Most affected patients (>80%) are admitted for emergency treatment, with less than 10% of patients having been admitted for an elective procedure. Almost 80% of affected patients were admitted from home with just over 10% transferred from another hospital, and a further 9% admitted from a care or nursing home.

**Table 1. Patient sex and admission status for trust-apportioned MRSA bacteraemia, July-September, 2008 (Q3/2008) and July-September, 2009 (Q3/2009)**

	July to September 2008	July to September 2009
	Number of episodes (%*)	Number of episodes (%*)
<b>Patient sex:</b>		
Females	136 (36.5%)	97 (41.8%)
Males	237 (63.5%)	135 (58.2%)
<i>Not known</i>	16	5
<b>Admission Method:</b>		
Emergency	289 (83.8%)	176 (81.5%)
Waiting list	29 (8.4%)	12 (5.6%)
Other	27 (7.8%)	28 (13.0%)
<i>Not known</i>	44	21
<b>Admission source:</b>		
Home	283 (77.1%)	175 (79.2%)
Nursing/residential home	35 (9.5%)	18 (8.1%)
Other hospital	39 (10.6%)	25 (11.3%)
Other	10 (2.7%)	3 (1.4%)
<i>Not known</i>	22	16

\* As a percentage of total known.

The incidence of trust-apportioned MRSA bacteraemia in Q3/2008 and Q3/2009 by trust type is presented in Table 2. There have been no changes in the proportion of episodes reported by trust types, with the large acute trusts and teaching trusts accounting for approximately 65% of all episodes. However, there have been decreases in incidence for all trust types in the past year. Decreases in the number of episodes have been observed for large trusts (42%), followed by teaching trusts (40%), small trusts (39%), and medium trusts (32%).

**Table 2. Incidence of trust-apportioned MRSA bacteraemia by trust type, July-September, 2008 (Q3/2008) and July-September, 2009 (Q3/2009) †**

Trust category	July to September 2008		July to September 2009	
	Number of episodes (%)	Incidence per 100,000 bed days	Number of episodes (%)	Incidence per 100,000 bed days
Small	41 (10.5%)	4.1	25 (10.5%)	2.5
Medium	73 (18.8%)	3.0	50 (21.1%)	2.0
Large	139 (35.7%)	4.0	80 (33.8%)	2.3
Teaching	130 (33.4%)	5.5	78 (32.9%)	3.3
Specialist	3 (0.8%)	1.6	3 (1.3%)	1.6
Specialist children's	3 (0.8%)	4.5	1 (0.4%)	1.5

† 2008/09 FY KH03 data were used as bed-day denominator for both periods.

The incidence, by specialty, of MRSA bacteraemia for trust-apportioned episodes is shown in Table 3. These data are recorded for ~90% of all episodes and the three specialties General Medicine, General Surgery, and Geriatric Medicine together account for about 65% of all episodes with an identified specialty.

**Table 3. Incidence of trust-apportioned MRSA bacteraemia by specialty, July-September, 2008 (Q3/2008) and July-September, 2009 (Q3/2009)<sup>†</sup>**

Specialty	July to September 2008		July to September 2009	
	Number of episodes (%*)	Incidence per 100,000 bed days	Number of episodes (%*)	Incidence per 100,000 bed days
Cardiology	7 (2.0%)	1.9	7 (3.1%)	1.9
Cardiothoracic Surgery	9 (2.5%)	5.9	3 (1.3%)	2.0
Clinical Haematology	7 (2.0%)	5.2	6 (2.6%)	4.5
Gastroenterology	19 (5.3%)	8.1	5 (2.2%)	2.1
General Medicine	114 (31.8%)	5.3	81 (35.7%)	3.8
General Surgery	65 (18.2%)	6.0	45 (19.8%)	4.2
Geriatric Medicine	47 (13.1%)	3.5	31 (13.7%)	2.3
Nephrology	15 (4.2%)	11.5	8 (3.5%)	6.1
Paediatrics	8 (2.2%)	1.2	7 (3.1%)	1.1
Trauma & Orthopaedics	28 (7.8%)	2.8	9 (4.0%)	0.9
Urology	10 (2.8%)	4.6	8 (3.5%)	3.6
Other named specialty	29 (8.1%)	-	17 (7.5%)	-
Specialty not known	31	-	10	-

<sup>†</sup> July-September, 2008 HES data for 167 acute trusts were substituted for July-September, 2009 bed-day denominators.

\* As a percentage of total **named** treatment specialties.

## Introduction

*Clostridium difficile* infection (CDI) is an important healthcare-associated infection and is the predominant cause of antibiotic-associated diarrhoea among hospitalised patients. Its manifestations range from asymptomatic colonisation of the intestine, to mild diarrhoea through to severe disease in the form of pseudomembranous colitis, and toxic megacolon which can lead to death. The risk of infection is higher in the healthcare setting due to a combination of risk factors including susceptible (older) population, antibiotic use, and the possibility for cross-infection.

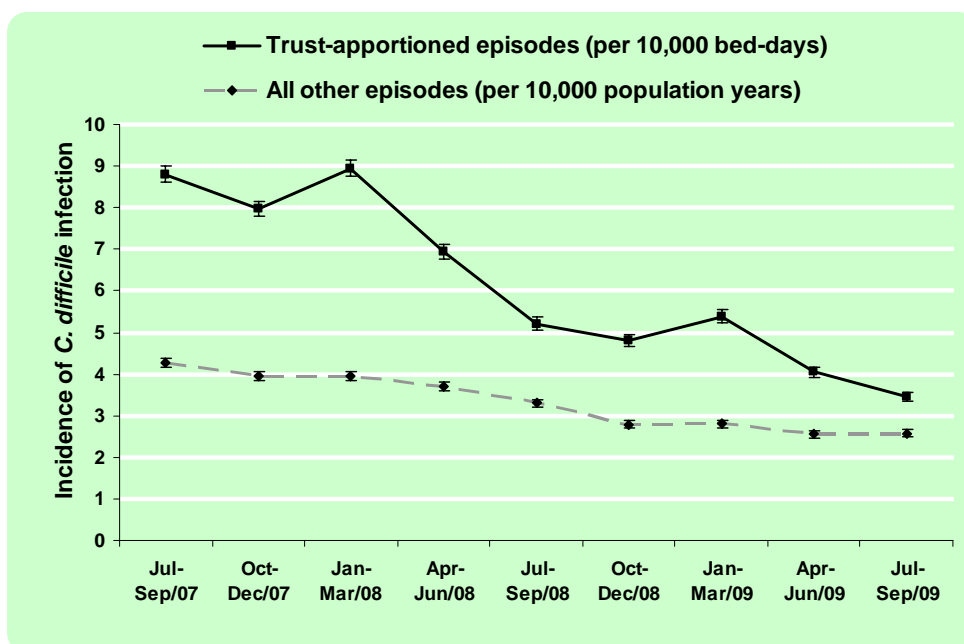
Since 2004 it has been a mandatory requirement to report all episodes of CDI in NHS acute Trusts in patients aged 65 years and over. In April, 2007 enhanced surveillance for CDI was introduced and it became mandatory to report all episodes of CDI in patients aged 2 years and older.

## Findings

The incidence of trust-apportioned (this category includes patients presumed to have been infected while admitted to the trust; see **Definitions** section for algorithm) and all other episodes of CDI have decreased between Q3/2007 to Q3/2009 (Figure 4). The rate of the decrease has been greatest among the trust-apportioned cases: from 8.8 episodes per 10,000 bed days in Q3/2007 to 3.4 episodes per 10,000 bed days in Q3/2009. The incidence dropped from 4.0 episodes per 10,000 bed days between Q2/2009 and Q3/2009.

By comparison the rate of decrease in the population incidence rate for all other episodes has been shallower. Between Q3/2007 and Q3/2009 the rate fell from 4.3 episodes per 10,000 population to 2.6 episodes per 10,000 population.

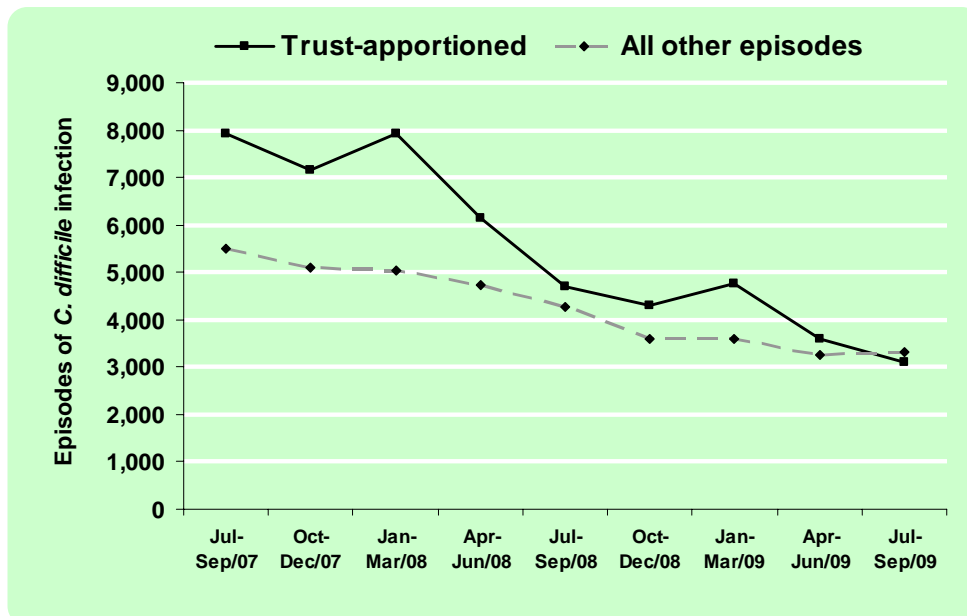
**Figure 4. Incidence for trust-apportioned and all other episodes of CDI, July-September, 2007 (Q3/2007) to July-September, 2009 (Q3/2009)**



Between Q3/2007 and Q3/2009, there has been a 61% decrease in the counts of trust-apportioned episodes and a 40% decrease in the number of all other episodes (Figure 5). Q3/2009 is the first quarter in which the number of episodes apportioned to acute trusts (3,100) is lower than all other episodes (3,323).

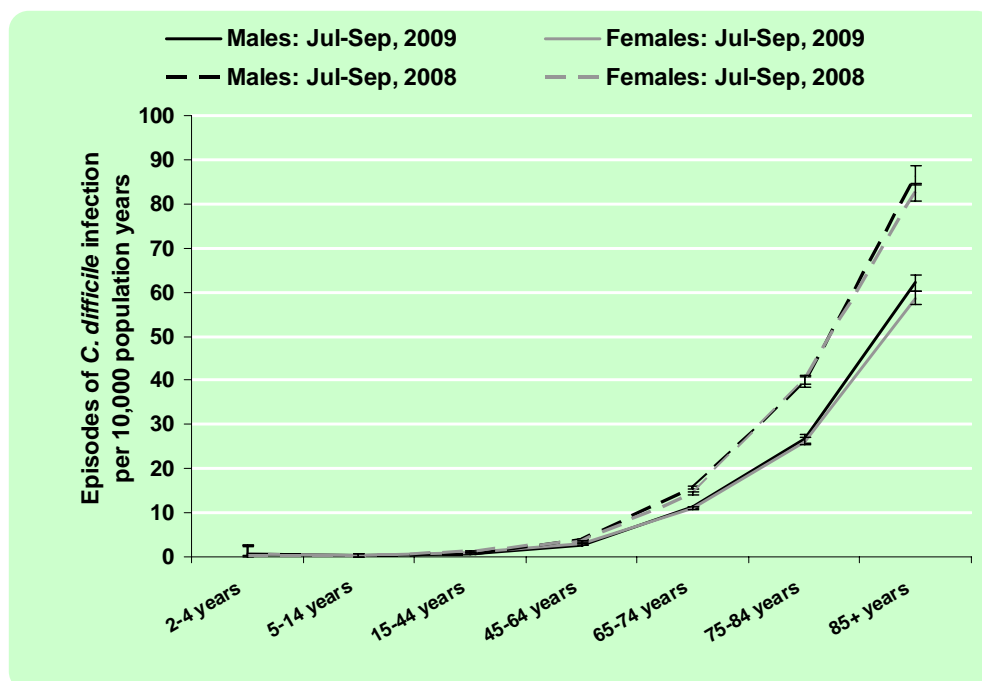
Although there is an overall decline over the period of nine quarters, in Q1/2008 and Q1/2009 there was an increase of around 10% in the number of episodes compared to the previous quarter. The pattern of seasonality is absent in the downward trend in the non trust apportioned case rate. This observation supports the suggestion that a winter increase in CDI in acute trust hospitals is due in part to increased hospital admissions for patients hospitalised with respiratory infections as well as increased bed occupancy. This is an area for further investigation.

**Figure 5. Counts of trust-apportioned and all other episodes of CDI, July-September, 2007 (Q3/2007) to July-September, 2009 (Q3/2009)**



The population incidence rates of CDI have a very clear age distribution with the largest rates of CDI occurring among elderly patients (Figure 6). There is a sharp rise in the number of cases in patients aged 65-74 years old compared with patients aged 2 to 64 years old with the former age group having between 7 and 9 times greater incidence of CDI. Within the older age groups the incidence of CDI increases considerably with a more than doubling of the rate between patients aged 65 to 74 years, 75 to 84 years and  $\geq 85$  years old. Between the third quarter of 2008 and 2009 the overall numbers of cases has decreased. The reduction is most pronounced in patients aged 65 and over with an average 29% decrease in counts of episodes of CDI. By comparison there was an average 9% decrease in the number of episodes across the younger age groups. This may suggest specific differences in the epidemiology of the disease within these broad age groups, however further exploration of this would require more refined analysis. In all age groups there is no difference in the rate of infection between the sexes.

**Figure 6. Incidence of all episodes of CDI by patient sex and age, July-September, 2008 (Q3/2008) and July-September, 2009 (Q3/2009)**



There has been little change in key demographic markers between Q3/2008 and Q3/2009 (Table 4). Distribution of cases between males and females is broadly similar with 55% of CDI episodes occurring in females. The majority of patients who develop CDI during their stay at an acute Trust have been admitted from home (85%) and around 9% of patients have been admitted from nursing homes. The majority of cases of trust-apportioned CDI in both Q3/2008 and Q3/2009 occurred in patients who had been admitted as emergency admissions (88% in Q3/2008 and 85% in Q3/2009).

**Table 4. Patient sex and admission status for trust-apportioned CDI episodes, July-September, 2008 (Q3/2008) and July-September, 2009 (Q3/2009)**

	July to September 2008	July to September 2009
	Number of episodes (%*)	Number of episodes (%*)
<b>Patient sex:</b>		
Females	2,555 (55.8%)	1,653 (54.7%)
Males	2,022 (44.2%)	1,370 (45.3%)
<i>Not known</i>	109	77
<b>Admission Method:</b>		
Emergency	3,264 (88.4%)	2,284 (85.4%)
Waiting list	181 (4.9%)	151 (5.6%)
Other	247 (6.7%)	241 (9.0%)
<i>Not known</i>	994	424
<b>Admission source:</b>		
Home	3,280 (85.1%)	2,211 (85.1%)
Nursing/residential home	347 (9.0%)	233 (9.0%)
Other hospital	198 (5.1%)	134 (5.2%)
Other	28 (0.7%)	21 (0.8%)
<i>Not known</i>	833	501

\* As a percentage of total known.

In Q3/2008 the incidence of CDI trust-apportioned episodes for non-specialist trust types were comparable, ranging between 4.9 and 6.0 episodes per 10,000 bed days (Table 5). In Q3/2009 these had dropped to between 3.3 and 4.2 episodes per 10,000 bed days. This reflects a 30-41% decrease in the number of episodes in these trust types. At both time points the incidence of CDI for Teaching trusts was higher than for any other trust category at 6.0 and 4.2 cases per 10,000 bed days in Q3/2008 and Q3/2009, respectively.

**Table 5. Incidence of trust-apportioned CDI by trust type, July-September, 2008 (Q3/2008) and July-September, 2009 (Q3/2009) †**

Trust category	July to September 2008		July to September 2009	
	Number of episodes (%)	Incidence per 10,000 bed days	Number of episodes (%)	Incidence per 10,000 bed days
Small	543 (11.6%)	5.7	319 (10.3%)	3.3
Medium	1,138 (24.3%)	4.9	756 (24.4%)	3.3
Large	1,663 (35.5%)	5.2	1,070 (34.5%)	3.3
Teaching	1,297 (27.7%)	6.0	908 (29.3%)	4.2
Specialist	39 (0.8%)	2.2	44 (1.4%)	2.5
Specialist Children's	6 (0.1%)	1.7	3 (0.1%)	0.8

† 2008/09 HES data were used as bed-day denominator for both periods.

Specialist and specialist children trusts had the lowest incidence of CDI in Q3/2008 at 2.2 and 1.7 cases per 10,000 bed days, respectively. In Q3/2009 the incidence of cases in the specialist trusts had increased to 2.5, but the rate among the specialist children trusts had decreased to 0.8 cases per 10,000 bed days (50% decrease in the number of reports of CDI). Given the distinct age profile of CDI it is unsurprising that specialist children trusts have much lower rates than other trust categories. The observed increase in incidence for Specialist trusts is not significant and is due to reporting of small numbers (5 more episodes in Q3/2009 than in Q3/2008).

The number of trust-apportioned CDI episodes and the specialty-specific incidences of CDI for Q3/2008 and Q3/2009 are shown in Table 6. These data are completed for approximately 85% of all trust-apportioned episodes, with the remaining 15% either left blank or entered as not known. General Medicine, Geriatric Medicine, General Surgery were the most commonly cited specialties at which patients had developed CDI during both time periods, accounting for approximately 70% of all trust-apportioned CDI episodes. Between Q3/2008 and Q3/2009 these specialties showed reductions in the number of infections of 32% 47% and 38%, respectively. These reductions likely reflect improvement in infection control including antibiotic usage control, care bundles, *Saving Lives* programme, etc..

The highest rates of CDI infection for both time periods were in Critical Care Medicine (Q3/2009 10.6 per 10,000 bed days), Nephrology (Q3/2009 8.0 per 10,000 bed days), Medical Oncology (Q3/2009 7.6 per 10,000 bed days), and Clinical Haematology (Q3/2009 5.8 per 10,000 bed days).

**Table 6. Incidence of trust-apportioned CDI by specialty, July-September, 2008 (Q3/2008) and July-September, 2009 (Q3/2009) †**

Specialty	July to September 2008		July to September 2009	
	Number of episodes (%*)	Incidence per 10,000 bed days	Number of episodes (%*)	Incidence per 10,000 bed days
Cardiology	34 (0.9%)	0.9	29 (1.1%)	0.8
Cardiothoracic Surgery	62 (1.6%)	4.1	37 (1.4%)	2.4
Clinical Haematology	73 (1.8%)	5.6	76 (2.9%)	5.8
Clinical Oncology (previously Radiotherapy)	27 (0.7%)	3.0	21 (0.8%)	2.4
Critical Care Medicine	23 (0.6%)	10.6	23 (0.9%)	10.6
Ear Nose & Throat (ENT)	13 (0.3%)	1.5	4 (0.2%)	0.5
Endocrinology	12 (0.3%)	1.9	5 (0.2%)	0.8
Gastroenterology	143 (3.6%)	6.1	93 (3.6%)	3.9
General Medicine	1,421 (35.9%)	6.6	965 (37.0%)	4.5
General Surgery	568 (14.3%)	5.3	354 (13.6%)	3.3
Geriatric Medicine	947 (23.9%)	7.0	500 (19.2%)	3.7
Gynaecology	28 (0.7%)	0.9	17 (0.7%)	0.6
Infectious Diseases	12 (0.3%)	3.0	9 (0.3%)	2.2
Medical Oncology	61 (1.5%)	9.6	48 (1.8%)	7.6
Nephrology	107 (2.7%)	8.2	105 (4.0%)	8.0
Neurology	27 (0.7%)	2.2	15 (0.6%)	1.2
Neurosurgery	33 (0.8%)	2.6	30 (1.1%)	2.3
Obstetrics	2 (0.1%)	0.1	6 (0.2%)	0.2
Paediatrics	25 (0.6%)	0.4	17 (0.7%)	0.3
Rehabilitation	15 (0.4%)	1.5	28 (1.1%)	2.8
Respiratory Medicine (Thoracic Medicine)	14 (0.4%)	0.6	17 (0.7%)	0.7
Rheumatology	7 (0.2%)	1.2	7 (0.3%)	1.2
Trauma & Orthopaedics	236 (6.0%)	2.4	145 (5.6%)	1.5
Urology	54 (1.4%)	2.5	48 (1.8%)	2.2
Other Named Specialty	16 (0.4%)	--	11 (0.4%)	--
Specialty not known	726	--	490	--

† July-September, 2008 HES data for 167 acute trusts were substituted for July-September, 2009 bed-day denominators.

\* As a percentage of total named treatment specialties.

## Data Sources

### MRSA bacteraemia

Since April 2001, the HPA has undertaken mandatory surveillance of MRSA bacteraemia in England. Each of England's NHS acute trusts contribute data to the mandatory surveillance scheme and these data are used to monitor trends in MRSA bloodstream infection. Enhancements to MRSA bloodstream infection surveillance were introduced in October 2005 and include additional information about each infection episode (e.g. patient demographics, information on the patient's location, date of admission and care details at the time the blood culture was taken). Data for these analyses were extracted from the HPA's data capture system on 23rd October, 2009. Changes and updates to the data since this date will be reflected in the next publication.

### *Clostridium difficile* Infection (CDI)

The mandatory surveillance of CDI was introduced in January, 2004 for patients aged 65 years and over and originally required acute trusts to report aggregate number of cases per quarter. Enhancements to this surveillance were introduced in April, 2007. As well as requiring all acute trusts to start reporting episodes of CDI in patients between 2 and 64 years, the surveillance required acute trusts to report similar patient-level data that had been reported for MRSA bacteraemia since 2005. Data for these analyses were extracted from the HPA's data capture system on 23rd October, 2009. Changes and updates to the data since this date will be reflected in the next publication.

### Bed day data (not including specialty bed day)

For MRSA bacteraemia, 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 current surveillance year (e.g. substituting data from 2008/09 for 2009/10). These data are available at:

[http://www.dh.gov.uk/en/Publicationsandstatistics/Statistics/Perfomancedataandstatistics/Beds/DH\\_083781](http://www.dh.gov.uk/en/Publicationsandstatistics/Statistics/Perfomancedataandstatistics/Beds/DH_083781)

For CDI, the total annual (financial year) bed days are derived from HES data and are the aggregate episode durations for all finished episodes for patients aged 2 years and over, only. This data source has been used instead of KH03 data because the latter are not available on a patient-age basis.

### Specialty bed day data

For both MRSA bacteraemia and CDI, these are derived from the Hospital Episode Statistics (HES) dataset for each acute trust. Provisional HES data are NOT used; therefore analyses for the most recent quarter of data are based on substituting data for the same surveillance quarter in the most recent official HES dataset (e.g. Q2/2008 for Q2/2009). Total quarterly specialty bed days are calculated by aggregating quarterly episode durations (finished episodes only) for each specialty for all 167 acute trusts. MRSA specialty bed days are based on data for all patients, while CDI specialty bed days are based on data only for patients aged 2 years and over.

### Population data

National incidence rates are calculated using 2007 and 2008 mid-year resident population estimates which are based on the 2001 census for England. These are available at:

<http://www.statistics.gov.uk/statbase/Product.asp?vlnk=15106>

## Definitions

### Admission method:

- This identified how the patient was admitted to the acute trust (e.g. emergency, waiting list, maternity, etc) and is based largely on HES definitions.

### Admission source:

- This identifies where the patient was immediately prior to admission and are based on HES definitions.

### Apportioning of episodes:

- **MRSA bacteraemia trust-apportioned episodes:** Based on the National Quality Board's MRSA Objective stakeholder engagement document ([http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH\\_100641](http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH_100641)) it is expected that the

forthcoming MRSA Objective will apply to a broader range of organisations. The analysis of trust apportioned and all other reports is based on the model outlined by the National Quality Board.

This includes patients who are (i) in-patients, day-patients, emergency assessment patients; AND (ii) have had a specimen taken at an acute trust; AND (iii) specimen is **2 or more days** after date of admission (admission date is considered day '0').

- **CDI trust-apportioned episodes:** include patients who are (i) in-patients, day-patients, emergency assessment patients; AND (ii) have had a specimen taken at an acute trust; AND (iii) specimen is **3 or more days** after date of admission (admission date is considered day '0').
- **Non-trust-apportioned episodes ("all other episodes"):** These include all cases 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 bacteraemia and 28 days for CDI.

#### Incidence calculations:

- **MRSA bacteraemia 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:  

$$=100,000 * (\# \text{ episodes/mid-year England population}) * (\# \text{ days in year}/\# \text{ days in quarter}).$$
- **MRSA bacteraemia acute-trust apportioned incidence:**
  - This incidence is calculated using KH03 average bed day activity (see *Data Sources* above) and is calculated as follows:  

$$=100,000 * [\# \text{ episodes}/(\text{average KH03 bed day} * \# \text{ days in surveillance quarter})]$$
- **CDI population incidence (episodes per 10,000 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:  

$$=10,000 * (\# \text{ episodes/mid-year England population}) * (\# \text{ days in year}/\# \text{ days in quarter}).$$
- **CDI acute-trust apportioned incidence:**
  - This incidence is calculated using HES data (see *Data Sources* above) and is calculated as follows:  

$$=10,000 * (\# \text{ episodes/aggregate financial year HES bed days}) * (\# \text{ days in reporting year}/\# \text{ days in surveillance quarter})$$
- **Speciality bed-day incidence:**
  - Incidence values for MRSA bacteraemia and CDI are based on HES derived data for acute Trusts (see *Data Sources* above). The incidence denominator has been calculated by aggregating quarterly episode durations (finished episodes only) for each speciality for all 167 acute trusts. The incidence is calculated as follow:  

$$\text{(for MRSA bacteraemia)} = 100,000 * (\# \text{ episodes}/\# \text{ HES speciality bed days})$$

$$\text{(for CDI)} = 10,000 * (\# \text{ episodes}/\# \text{ HES speciality bed days})$$

#### Quarters:

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

#### Specialty:

- This defines the speciality under which the consultant is contracted and is based on HES definitions. Note that for these analyses Haematology has been merged with Clinical Haematology.

#### Trust category:

- These categories were jointly derived by the HPA and Department of Health in 2004 and are based on the trust budget and patient care.
- **Small Acute Trust:** A trust with 85% or more of its expenditure in acute specialties (medicine, surgery, A&E and maternity), an A&E department, all core acute specialties and an annual expenditure of up to £80million (based on Trust Financial Return data for 2002/03).

- **Medium Acute Trust:** A trust with 85% or more of its expenditure in acute specialties (medicine, surgery, A&E and maternity), an A&E department, all core acute specialties and an annual expenditure of between £80 and £130 million (based on Trust Financial Return data for 2002/03).
- **Large Acute Trust:** A trust with 85% or more of its expenditure in acute specialties (medicine, surgery, A&E and maternity), an A&E department, all core acute specialties and an annual expenditure of more than £130million (based on Trust Financial Return data for 2002/03).
- **Acute Teaching Trust:** A trust participating in teaching, which is attached with an undergraduate medical school.
- **Acute Specialist Trust:** A trust with restricted specialties.
- **Acute Specialist Children's Trust:** A trust with restricted specialties for children.

## Future publications schedule

[http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb\\_C/1218699398585](http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1218699398585)

## Useful links

### HPA's MRSA bacteraemia web pages:

[HPA's MRSA bacteraemia Mandatory Surveillance Scheme](#)

[HPA's monthly MRSA bacteraemia data tables](#)

[HPA's annual MRSA bacteraemia data tables](#)

### HPA's CDI web pages:

[HPA's CDI Mandatory Surveillance Scheme](#)

[HPA's monthly CDI data tables](#)

[HPA's annual CDI data tables](#)

[HPA's Clostridium difficile Ribotyping Network \(CDRN\)](#)

### Other web pages:

[Department of Health's Healthcare associated infection web page](#)

[Department of Health's Clean-Safe-Care](#)

[Care Quality Commission \(CQC\)](#)

[National Patient Safety Agency \(NPSA\)](#)

[NHS Choices](#)

[Hospital Episode Statistics \(HES\)](#)

[UK National Statistics' Publication Hub](#)