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Voluntary Trends in mandatory *Staphylococcus aureus* (MRSA and MSSA) and *Escherichia coli* bacteraemia, and *Clostridium difficile* infection (CDI) data for England up to October-December 2013

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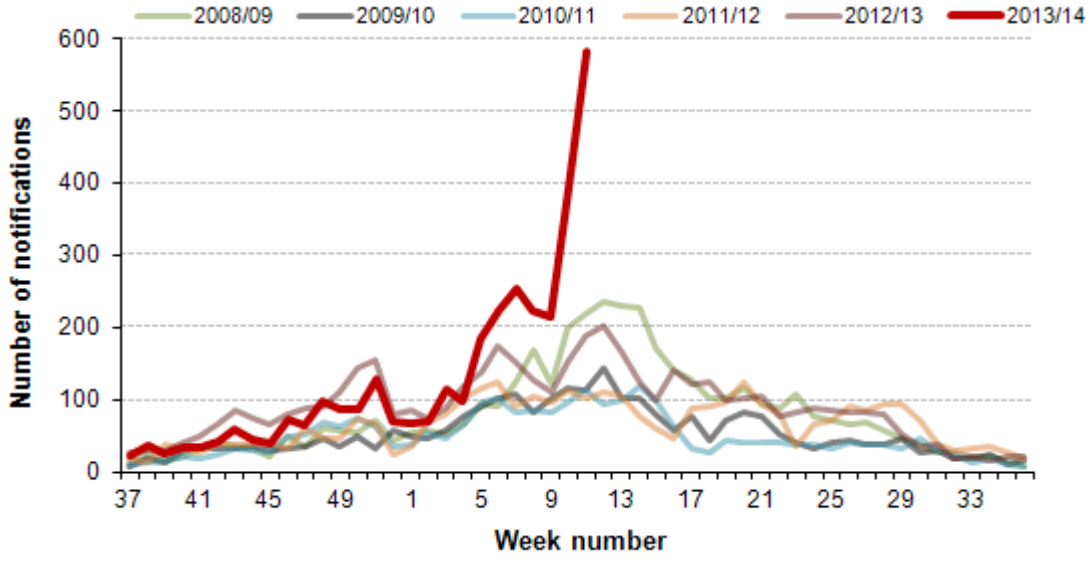
Group A streptococcal infections: update on seasonal activity, 2013/14

National surveillance data for group A (*Streptococcus pyogenes*; GAS) streptococcal infections continue to show increases in incidence above the seasonally expected levels for England. Further to the previous report of 4 March 2014 [1], scarlet fever notifications have escalated across the country. Routine laboratory reports and isolate referrals are showing early signs of a possible elevation of invasive group A streptococcal (iGAS) disease incidence.

Scarlet fever

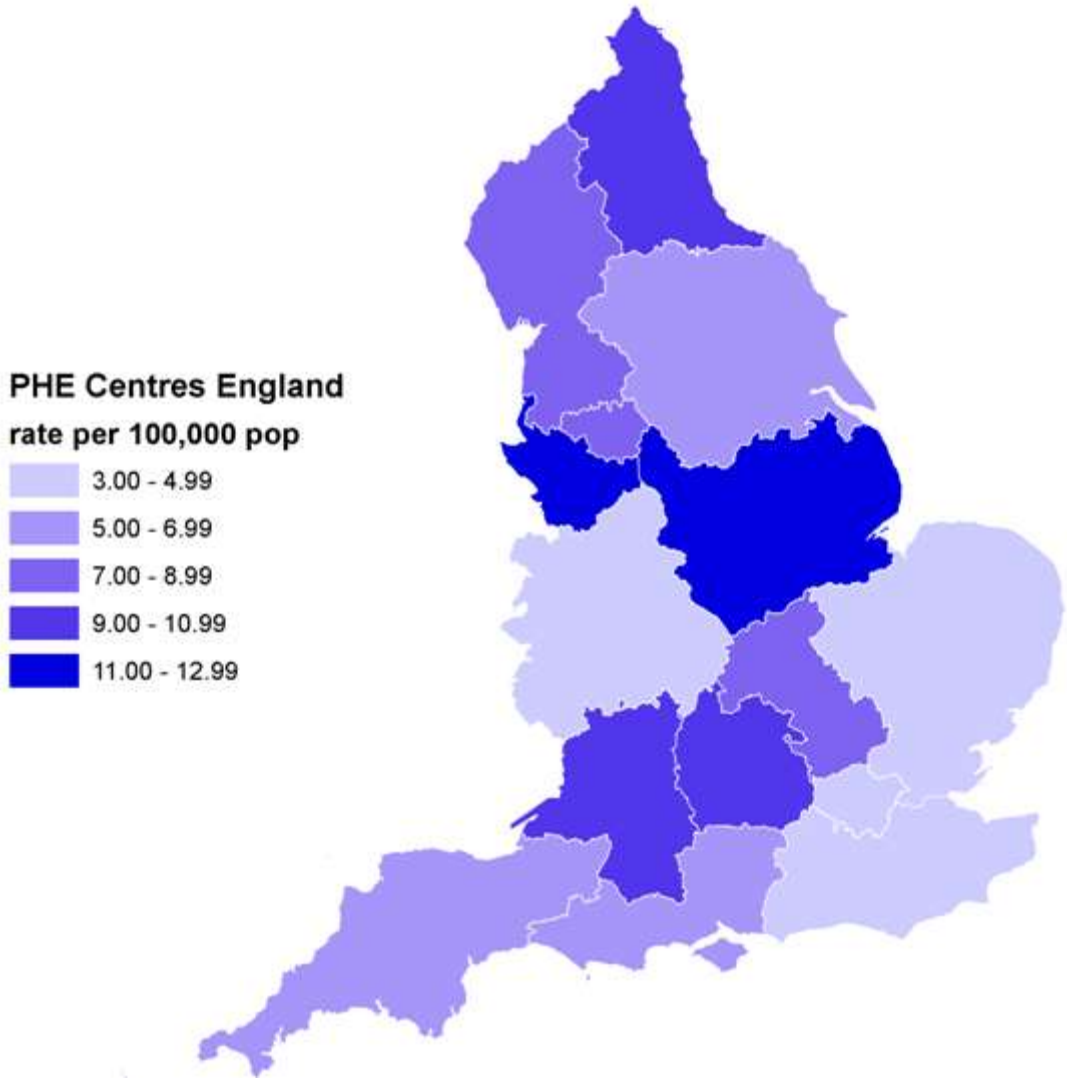
Routine monitoring of surveillance data identified widespread increases in scarlet fever notifications in February 2014 compared to recent years (figure 1). These increases continued into March, with weeks 10 and 11 of 2014 being particularly high, where numbers of notifications surpassing levels seen in the last peak year (2008/09). A total of 3548 notifications of scarlet fever have been made so far this season in England (weeks 37 2013 to 11 2014) compared to an average of 1420 (range: 807 to 2622) for this same period in the previous 10 years. The last season to have this level of scarlet fever activity was 1989/1990 where 4042 notifications were received by week 11. The age distribution of cases notified so far for this season remains similar to previous years, with 87% being children under 10y (median 4y).

Figure 1. Weekly scarlet fever notifications in England, 2008/09 onwards



The increase in scarlet fever has been seen across different areas in England with the highest rate of notifications per 100,000 population being in Cheshire and Merseyside (13.0), East Midlands (11.9), Avon Gloucestershire and Wiltshire (10.6), Thames Valley (9.5) and North East (9.7) (figure 2). Four PHE Centre areas are reporting an incidence of scarlet fever similar to last year, North East, Yorkshire & Humber (6.4), Wessex (5.3) and Greater Manchester (8.1) although their rates were relatively high last year (9.5, 6.8, 5.7 and 8.5 in 2013 respectively).

Figure 2. Rate per 100,000 population scarlet fever notifications in England by Public Health England Centre, week 37, 2013, to week 11, 2014

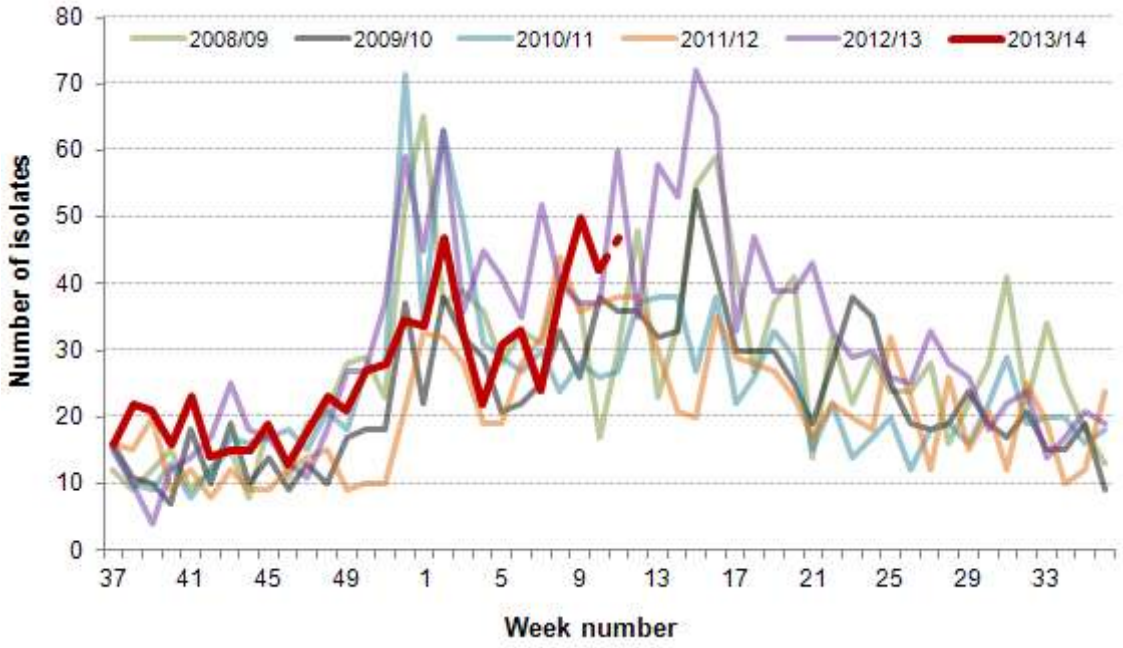


A total of 680 iGAS isolates, defined as isolation of GAS from a normally sterile site, were referred to the Respiratory and Vaccine Preventable Bacteria Reference Unit at Colindale PHE from laboratories in England, Wales and Northern Ireland for specimens taken this season (week 37 2013 to 11 2014), a slight increase on the average (621 reports) but within the range (509-755 reports) for the same period in the previous five years (figure 3).

Three English regions have referred slightly higher than average (2009 to 2013) iGAS isolates for January and February 2014 (combined), East Midlands (25 isolates), London (39 isolates) and the North West (44 isolates). All other regions in England are referring lower numbers of isolates than normal for this time of year.

Antimicrobial susceptibility results from routine iGAS laboratory reports for the season so far indicate erythromycin non-susceptibility is at 6%, which is within the usual range. The susceptibility testing of iGAS isolates against other key antimicrobials (tetracycline (11%), clindamycin (2%) and penicillin (0%)) indicate no changes in resistance. There have been no reports of penicillin resistance in iGAS isolates in England to date.

Figure 3. Weekly count of sterile site GAS isolates referred to the national reference laboratory, England, 2008/09 onwards



Characterisation of iGAS isolates referred to the Respiratory and Vaccine Preventable Bacteria Reference Unit from laboratories in England is identifying a slight shift in the *emm*/M-type distribution, with an increase in *emm*3 in February, with 23% of referrals being *emm*3 (compared with 16% in January). Given the increased severity of disease associated with *emm*3 strains, this warrants increased monitoring.

Analysis of scarlet fever notifications over the last century suggest cyclical patterns of incidence, with resurgences occurring on average every four years [2]. The last peak year for scarlet fever was 2008/09, with superficial manifestations of GAS infection tending to mirror those of invasive disease [3]. Whilst the enhanced media coverage and public health alerts may have increased case ascertainment, the escalation prior to this suggests a genuine increase in disease

incidence. The reasons behind this increase are unclear but may be attributable to a natural cycle in disease incidence. The potential for changes in virulence of circulating strains or increased incidence in particular risk groups remain possible and as such continued vigilance remains essential.

Clinicians, microbiologists and HPTs should continue to be mindful of potential increases in invasive disease and maintain a high index of suspicion in relevant patients as early recognition and prompt initiation of specific and supportive therapy for patients with iGAS infection can be life-saving. Invasive disease isolates and those from suspected clusters or outbreaks should be submitted to the Respiratory and Vaccine Preventable Bacteria Reference Unit at Public Health England, 61 Colindale Avenue, London NW9 5HT.

Guidelines on infection control in schools and other childcare settings, including recommended exclusion periods for scarlet fever, can be found on the following on: http://www.hpa.org.uk /Topics/InfectiousDiseases/InfectionsAZ/SchoolsGuidanceOnInfectionControl/

FAQs on scarlet fever can be found on:
http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ScarletFever/

Guidelines for the management of close community contacts of invasive GAS cases [4] and the prevention and control of GAS transmission in acute healthcare and maternity settings [5] are also available on the web: http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ StreptococcalInfections/Guidelines.

References

1. Public Health England. Group A streptococcal infections: seasonal activity, 2013/14. *Health Protection Report* 2014; **8**(9): Infection (News) Report. Available from: http://www.hpa.org.uk/hpr/archives/2014/hpr0914_AA_GASnws.pdf.

2. Lamagni T, Dennis J, George R, Efstratiou A. Analysis of epidemiological patterns during a century of scarlet fever. *European Scientific Conference on Applied Infectious Disease Epidemiology*; 18 November 2008; Berlin, Germany; 2008.

3. Dennis JN, Lamagni TL, Smith GE, Elliot AJ, Loveridge P, George RC *et al* (2008). Use of primary care syndromic data to forecast rises in invasive group A streptococcal disease. *Health Protection Conference,* 15 September 2008; Warwick.

4. Health Protection Agency Group A Streptococcus Working Group. Interim UK guidelines for management of close community contacts of invasive group A streptococcal disease. *Commun Dis Public Health* 2004; **7**(4): 354-361.

5. Steer JA, Lamagni TL, Healy B, Morgan M, Dryden M, Rao B *et al*. Guidelines for prevention and control of group A streptococcal infection in acute healthcare and maternity settings in the UK. *J Infect 2012* Jan; **64**(1):1-18.

Infection report
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HCAI

Trends in mandatory *Staphylococcus aureus* (MRSA and MSSA) and *Escherichia coli bacteraemia*, and Clostridium difficile infection (CDI) data for England up to October-December 2013

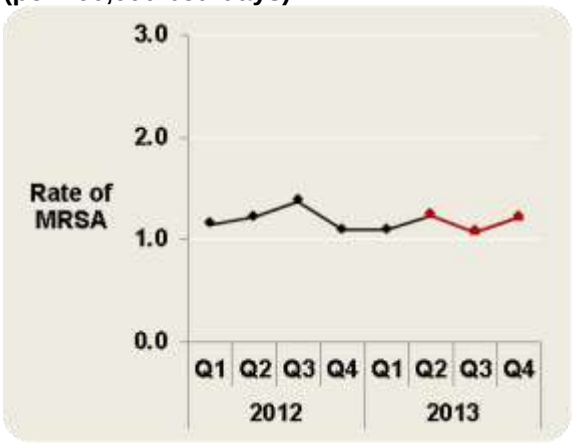
This quarterly epidemiological commentary describes recent trends for mandatory surveillance of *Staphylococcus aureus* (MRSA and MSSA [1]) and *E. coli* [2] bacteraemia, and *Clostridium difficile* infections [3] reported by NHS acute Trust hospitals in England up to October-December 2013.

MRSA Bacteraemia

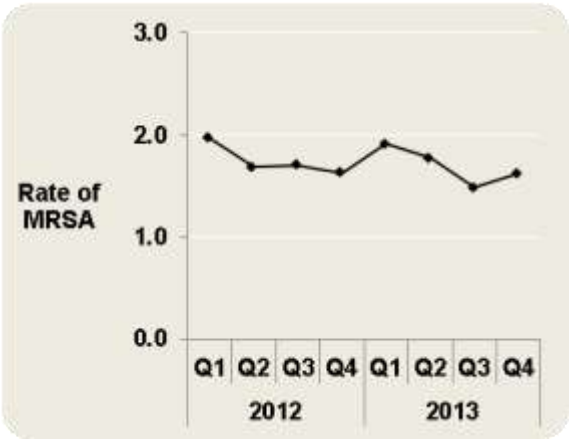
- From April 2013 all NHS organisations reporting positive cases of MRSA bacteraemia are required to complete a Post Infection Review (PIR)*. MRSA bacteraemia cases from April 2013 are now published by PIR assignment rather than apportionment. This is reflected here.
- The total number of MRSA bacteraemia reports has remained static at 219 reports compared to the same period last year. In the intervening periods the total count of cases has ranged from 200 (Q3 2013) to 252 (Q1 2013).
- There has been a slight decrease between Q3 2013 and Q4 2013 for both Trust assigned and CCG assigned reports from 91 reports to 105 reports and from 109 reports to 114 reports respectively. The proportion of Trust assigned reports has shown little variation from Q2 2013 with approximately 45% of reports being Trust assigned.

Figure 1: Quarterly rates of MRSA bacteraemia, January 2012- December 2013

a) Trust apportioned/assigned rate (per 100,000 bed-days)**



b) All reports (per 100,000 population)



* Please refer to http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317138536251 for more information.

** ***Note:*** *From Q2 2013, MRSA cases have been reported by assignment rather than apportionment. This is reflected in Figure 1a where Trust assigned rates (per 100,000 bed days) are presented in red from Q2 2013 to Q4 2013. Please refer to Table 1b for trust assigned reported cases and rates.*

Table 1a: MRSA bacteraemia counts and rates by quarter, July 2010 – December 2013

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2010	**Q3**	186	2.09	396	2.98
	Q4	155	1.75	331	2.49
2011	**Q1**	149	1.72	333	2.54
	Q2	148	1.71	319	2.41
	Q3	103	1.21	266	1.99
	Q4	105	1.21	269	2.01
2012	**Q1**	117	1.31	262	1.97
	Q2	94	1.10	224	1.68
	Q3	96	1.13	229	1.70
	Q4	92	1.08	219	1.63
2013	**Q1**	116	1.32	252	1.91
	Q2	N/A	N/A	237	1.78
	Q3	N/A	N/A	200	1.48
	Q4	N/A	N/A	219	1.62

Table 1b: MRSA bacteraemia counts and rates by PIR assignment, April 2013-December 2013

Year and quarter		Trust assigned reports	Trust assigned rates (per 100,000 bed-days)	CCG assigned reports	CCG assigned rates (per 100,000 population)
2013	**Q2**	107	1.24	130	0.97
	Q3	91	1.08	109	0.81
	Q4	105	1.22	114	0.85

MSSA Bacteraemia

- Trust apportioned and population rates have remained relatively stable over the 8 quarters. A decline of 11.1% Trust apportioned rates has been noted between Q1 2013 and Q4 2013 from 7.71 to 6.87 per 100,000 bed-days. The population rates over the same period displayed a smaller decline of 4.1% from 17.11 to 16.41 per 100,000 population (Figure 2), suggesting overall rates have not varied greatly.

- The highest Trust apportioned rate was in Q3 2011 with 8.55 per 100,000 bed-days whilst the lowest was in the recent quarter,Q4 2013, with 6.87 per 100,000 bed-days. The highest population rate was seen in Q2 2013 with 17.46 per 100,000 population, whilst the lowest was in Q3 2012 with 15.85 per 100,000 population.

- Although there is slight fluctuation in the number of reports between the quarters, there are no substantial increases (Table 2).

Figure 2: Quarterly rates of MSSA bacteraemia, January 2012- December 2013
a) Trust apportioned rate (per 100,000 bed-days) b) All reports (per 100,000 population)

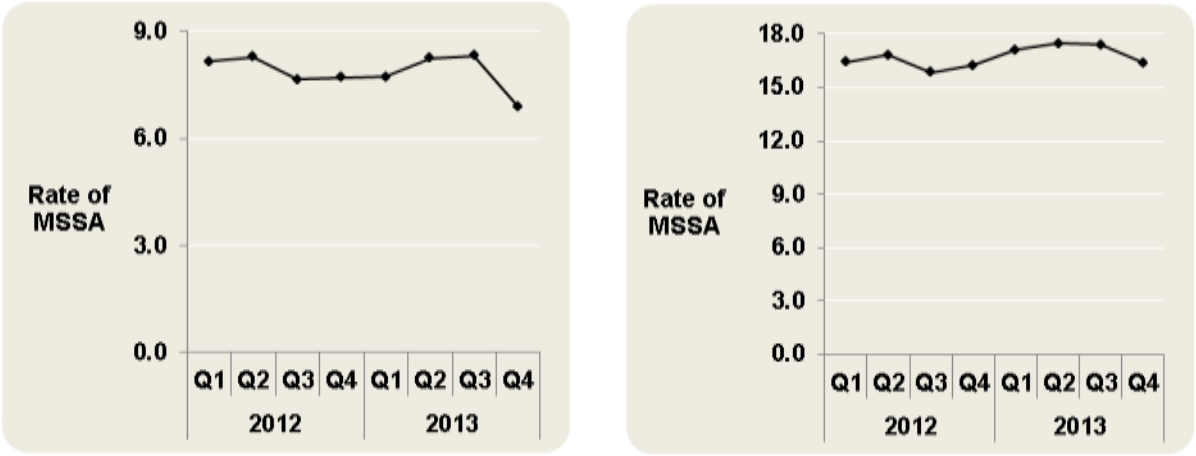


Table 2: MSSA bacteraemia counts and rates by quarter, January 2011- December 2013

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2011	**Q1**	735	8.46	2,199	16.79
	Q2	698	8.08	2,191	16.55
	Q3	725	8.55	2,226	16.63
	Q4	703	8.12	2,167	16.19
2012	**Q1**	728	8.16	2,183	16.41
	Q2	711	8.29	2,238	16.83
	Q3	648	7.64	2,131	15.85
	Q4	663	7.71	2,185	16.25
2013	**Q1**	678	7.73	2,257	17.11
	Q2	710	8.25	2,328	17.46
	Q3	701	8.32	2,344	17.38
	Q4	591	6.87	2,212	16.41

E.coli bacteraemia

- Mandatory *E.coli* bacteraemia surveillance commenced in June 2011. The rate of *E.coli* bacteraemia has been stable over the last eight quarters. There has been a slight rate decrease in the most recent quarter, Q4 2013, in line with the same trend seen in the same quarter in 2012. Since the commencement of *E.coli* bacteraemia surveillance, Q3 2013 demonstrates the highest rate of 66.82 per 100,000 population, while the lowest was 57.63 per 100,000 population in Q1 2013 (Figure 3).

- There was little variation in the number of reports from quarter to quarter; in line with the rates. The highest number of reports was seen in Q3 2013 with 9,009 reports, while the lowest was observed in Q1 2013 with 7,602 reports (Table 3).

Figure 3: Quarterly rates of *E. coli* bacteraemia reports per 100,000 population, January 2012 – December 2013

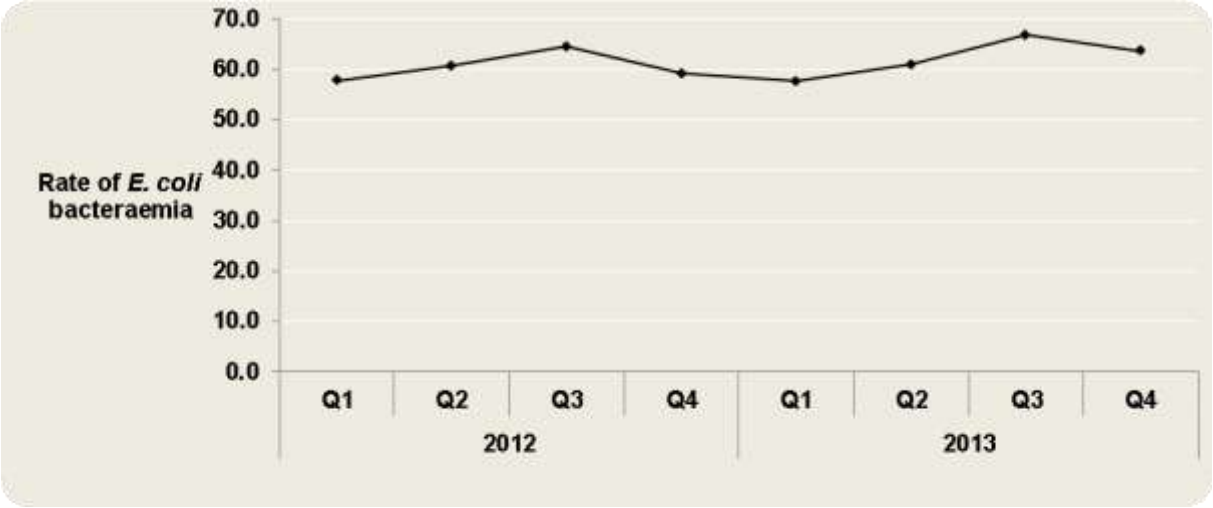


Table 3: Quarterly counts and rates of all *E. coli* bacteraemia reports by quarter, July 2011 – December 2013

Year and quarter		Total *E. coli* bacteraemia reports	Rate (per 100,000 population)
2011	**Q3**	8,275	61.82
	Q4	8,098	60.50
2012	**Q1**	7,698	57.88
	Q2	8,074	60.71
	Q3	8,676	64.52
	Q4	7,957	59.18
2013	**Q1**	7,602	57.63
	Q2	8,133	60.98
	Q3	9,009	66.82
	Q4	8,592	63.72

Clostridium difficile infection

- Between Q1 2012 and Q4 2013, the rate of Trust apportioned cases per 100,000 bed days has decreased by 20.3% from 18.07 to 14.41. Over the same period, the rate of total CDI cases per 100,000 population declined by 12.3% from 28.64 to 25.12 (Figure 4).

- The total number of CDI reports has decreased by 12% when compared to the same period last year – from 3,756 reports in Q4 2012 to 3,299 reports in Q4 2013. This is part of a gradual decrease of 44% since Q3 2010 when there were 5,909 reports (Table 4).

- Trust apportioned reports have declined by 53% between Q3 2010 and Q4 2013, from 2,632 reports to 1,239 reports respectively (Table 4).

Figure 4: Quarterly rates of *C. difficile* infection in patients aged 2 years and over, January 2012- December 2013

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

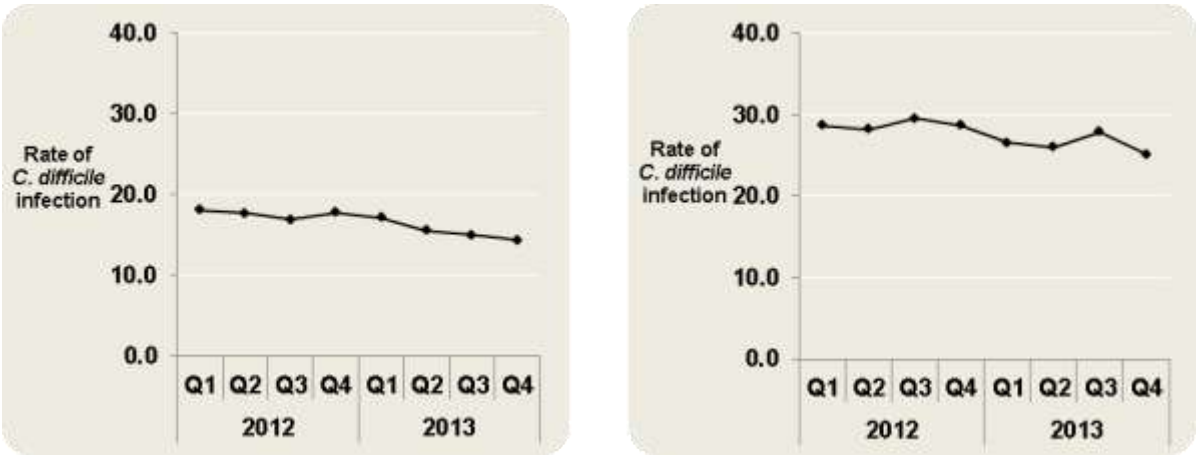


Table 4: *C. difficile* infection counts and rates in patients aged 2 years and over by quarter, July 2010 – December 2013

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2010	**Q3**	2,632	29.64	5,909	45.69
	Q4	2,431	27.37	4,984	38.54
2011	**Q1**	2,358	27.14	4,833	37.87
	Q2	2,206	25.53	4,967	38.49
	Q3	2,046	24.12	4,994	38.28
	Q4	1,824	21.07	4,350	33.34
2012	**Q1**	1,613	18.07	3,711	28.64
	Q2	1,517	17.68	3,656	28.22
	Q3	1,433	16.91	3,870	29.54
	Q4	1,527	17.76	3,756	28.67
2013	**Q1**	1,503	17.14	3,412	26.55
	Q2	1,343	15.60	3,382	26.03
	Q3	1,269	15.05	3,663	27.89
	Q4	1,239	14.41	3,299	25.12

Notes:

- ***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/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_100637.pdf) 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'.

  MRSA bacteraemia PIR assigned reports: As of the 1st of April 2013, all MRSA bacteraemia cases reported via the HCAI Data Capture System (DCS) are assigned to either an acute Trust or a CCG through the completion of a Post Infection Review (PIR). A case is deemed to be Trust assigned where the completed PIR indicates that an acute Trust is the organisation best placed to ensure that any lessons learned are actioned. Further information on the PIR process can be found on the following webpage: http://www.england.nhs.uk/ourwork/patientsafety/zero-tolerance/

- ***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').

- ***Total reports*:** These are all the cases reported by an acute Trust. They consist of Trust apportioned reports and reports NOT apportioned to the acute Trust.

Further epidemiological notes are available on the PHE website [4].

The next commentary will be published in June 2014.

References

1. Mandatory *Staphylococcus aureus* bacteraemia surveillance scheme [http://www.hpa.org.uk/web/HPAweb&Page&HPAwebAutoListName/Page/1191942169773].

2. Mandatory *Escherichia coli* bacteraemia surveillance scheme [http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/EscherichiaColi/MandatorySurveillance/]

3. Mandatory *Clostridium difficile* infection surveillance scheme [http://www.hpa.org.uk/web/HPAweb&Page&HPAwebAutoListName/Page/1179745282408].

4. Quarterly Epidemiological Commentaries on MRSA, MSSA, *Escherichia coli* bacteraemia and *C. difficile* infection [http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1259151891722