



Infection report

Volume 9 Number 21 Published on: 19 June 2015

Bacteraemia

Voluntary surveillance of *Clostridium difficile*, England, Wales and Northern Ireland: 2014

These analyses are based on data extracted from the Public Health England (PHE) voluntary surveillance database, the Second Generation Surveillance System (SGSS), on 21 January and 18 February 2015 for the period 2010-2014. The data presented here differ in some instances from data in earlier publications due to the inclusion of late reports.

The report includes analyses of the trends, age and sex distribution, geographical distribution and level of ascertainment of cases of *Clostridium difficile* (*C. difficile*) in England, Wales and Northern Ireland.

Rates were calculated using 2013 mid-year resident population estimates based on the 2011 census for England, Wales, and Northern Ireland [1,2]. Geographical analyses were made based on the residential location of the patient with reference to the Public Health England Centre areas created in April 2013, when Public Health England was established.

For data from the mandatory surveillance of *C. difficile* in England, see:

<https://www.gov.uk/government/collections/clostridium-difficile-guidance-data-and-analysis>

Key points

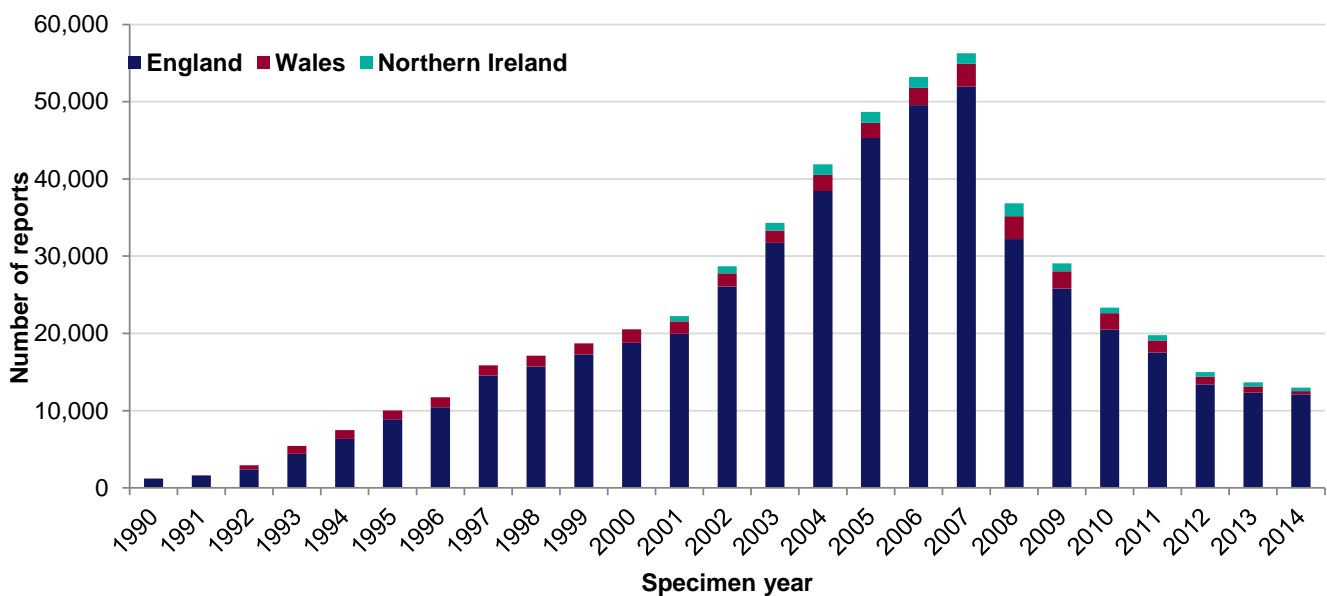
- this report describes laboratory reports of *C. difficile* for the period of January to December 2014 that were submitted on a voluntary basis to PHE from laboratories in England, Wales and Northern Ireland. *C. difficile* infection is usually diagnosed by detection of *Clostridium difficile* toxins from diarrhoeal stool specimens in conjunctions with a first-step/screening method, but cases detected using alternative methods such as culture may also be reported to the voluntary surveillance scheme.

- there were 12,985 reports of *C. difficile* in 2014, comprising 12,120 reports (93.3%) from England, 429 reports (3.3%) from Wales and 436 reports (3.4%) from Northern Ireland. Overall, the total number of reports decreased by 5% in comparison to 2013
- between 2013 and 2014, the reported incidence of *C. difficile* per 100,000 population decreased from 22.9 to 22.5 in England, from 26.1 to 13.9 in Wales and from 28.9 to 23.8 in Northern Ireland
- the majority reported cases (74.1%) were in the 65 years and over age group.
- comparison of voluntary reporting with the mandatory surveillance dataset showed a case ascertainment rate of 87.5% in 2014.

Trends in episode numbers and rates

There were 12,985 reports of *C. difficile*-positive faecal specimens to SGSS (LabBase2 previously) in 2014, a 5% decrease in comparison to 2013 (figure 1, Appendix table 1). The overall total in 2014 comprised 12,120 (93.3%) reports from England, 429 (3.3%) from Wales, and 436 (3.4%) from Northern Ireland; these represented 1.7%, 46.8% and 17.6% decreases since 2013, respectively.

Figure 1. Voluntary laboratory reports of *C. difficile* positive faecal specimens: England, Wales and Northern Ireland* 1990-2014**



* Northern Ireland reports included from 2001

** Data extracted on 21st January and 18th February 2015

There was a decrease in the number of *C. difficile* voluntary reports in England from 12,331 to 12,120 (1.7%) between 2013 and 2014 (table 1). During this time, the percentage change in cases varied by PHE centre. The largest decreases were observed in Thames Valley (27%, 274 to 200), East Midlands (12.2%, 1,393 to 1,209) Kent, Surrey and Sussex (11.6%, 835 to 733) and Greater Manchester (10.4%, 880 to 778). Conversely, laboratories in Cumbria and Lancashire (24.9%, 482 to 602), Anglia and Essex (19.1%, 841 to 1,002) and London (8.2%, 952 to 1,030) reported the highest year-on-year increase in the number of reports.

In terms of the 5-year trend, the number of *C. difficile* reports decreased in all PHE centres between 2010 and 2014. On average, the total number of reports decreased by 40.8 % in England between 2010 and 2014, and this ranged from 19.6% in Cumbria and Lancashire to 77% in Thames Valley (table 1).

A decreasing trend in the number of positive specimens was also observed in Wales and Northern Ireland with reductions of 80% (2,140 to 429) and 37.3% (695 to 436) between 2010 and 2014, respectively (table 1).

Table 1. Voluntary laboratory reports of *C. difficile*: PHE centres, Wales and Northern Ireland 2010- 2014*

PHE centre	2010	2011	2012	2013	2014
London	1,940	1,466	1,042	952	1,030
South Midlands and Hertfordshire	631	482	435	445	406
East Midlands	1,636	1,583	1,159	1,393	1,209
Anglia and Essex	1,423	1,088	979	841	1,002
West Midlands	2,607	2,244	1,707	1,760	1,846
Cheshire and Merseyside	1,600	994	541	512	553
Cumbria and Lancashire	749	609	519	482	602
Greater Manchester	1,881	1,660	1,149	880	778
North East	944	908	846	747	729
Yorkshire and Humber	2,055	2,000	1,326	1,351	1,274
Avon Gloucestershire and Wiltshire	1,033	950	871	813	739
Devon Cornwall and Somerset	909	1,079	819	613	631
Wessex	805	785	682	433	388
Kent Surrey and Sussex	1,406	953	919	835	733
Thames Valley	869	736	406	274	200
England	20,488	17,537	13,400	12,331	12,120
Northern Ireland	695	689	602	529	436
Wales	2,140	1,564	988	806	429
E, W, NI	23,323	19,790	14,990	13,666	12,985

* Data extracted on 21 January and 18 February 2015

The overall rate of *C. difficile* in England, Wales and Northern Ireland was 22.1 per 100,000 in 2014, a 5% decrease from 23.3 per 100,000 population in 2013 (table 2).

The rate of *C. difficile* positive samples varied between PHE centres and between England, Wales and Northern Ireland in 2014 (figure 2). In particular, the rate in England, Wales and Northern Ireland decreased by 1.7%, 46.8% and 17.6% (22.9 vs. 22.5, 26.1 vs. 13.9 and 28.9 vs. 23.8 per 100,000 population, respectively) since 2013. Regionally, the year-on-year percentage change in *C. difficile* ranged from a 24.9% increase in Cumbria and Lancashire (from 24.5 per 100,000 population to 30.6 per 100,000 population) to a 27.0% decrease in Thames Valley (from 13.3 per 100,000 population to 9.7 per 100,000 population).

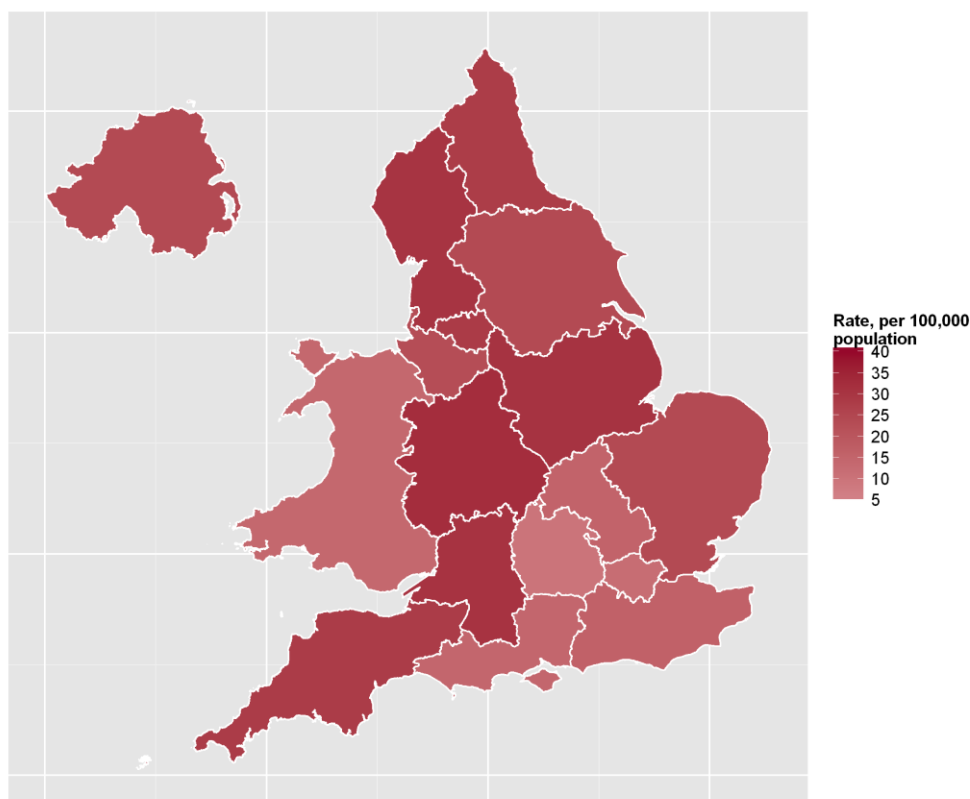
Although the rate per 100,000 population increased in some PHE centres in 2014, the overall 5-year trend still exhibited a decreasing tendency. The overall rate for England, Wales and Northern Ireland decreased by 45.5 % between 2010 and 2014 from 40.6 to 22.1 per 100,000 population, with Wales reporting the largest reduction (80.2%, from 70.2 to 13.9 per 100,000 population, respectively) during this period.

Table 2. Region-specific rates of *Clostridium difficile* in England, Wales and Northern Ireland, 2010-2014, per 100,000 population *

PHE centre	2010	2011	2012	2013	2014
London	24.1	17.9	12.5	11.3	12.2
South Midlands and Hertfordshire	23.8	18.0	16.1	17.0	15.5
East Midlands	42.8	41.2	30.0	35.8	31.1
Anglia and Essex	34.8	26.4	23.6	20.1	24.0
West Midlands	46.8	40.0	30.3	31.0	32.5
Cheshire and Merseyside	66.6	41.3	22.4	21.1	22.8
Cumbria and Lancashire	38.3	31.1	26.4	24.5	30.6
Greater Manchester	70.7	61.8	42.5	32.4	28.7
North East	36.5	35.0	32.5	28.6	27.9
Yorkshire and Humber	39.1	37.8	24.9	25.3	23.9
Avon Gloucestershire and Wiltshire	44.3	40.4	36.7	34.0	30.9
Devon Cornwall and Somerset	41.5	49.0	36.9	27.5	28.3
Wessex	30.7	29.7	25.6	16.2	14.5
Kent Surrey and Sussex	31.7	21.3	20.4	18.3	16.1
Thames Valley	43.3	36.3	19.9	13.3	9.7
England	38.9	33.0	25.0	22.9	22.5
Northern Ireland	38.5	38.0	33.0	28.9	23.8
Wales	70.2	51.0	32.1	26.1	13.9
E, W, NI	40.6	34.1	25.7	23.3	22.1

* Data extracted on 21st January and 18th February 2015

Figure 2. Geographical distribution of *Clostridium difficile* rates per 100,000 population, England, Wales and Northern Ireland: 2014*

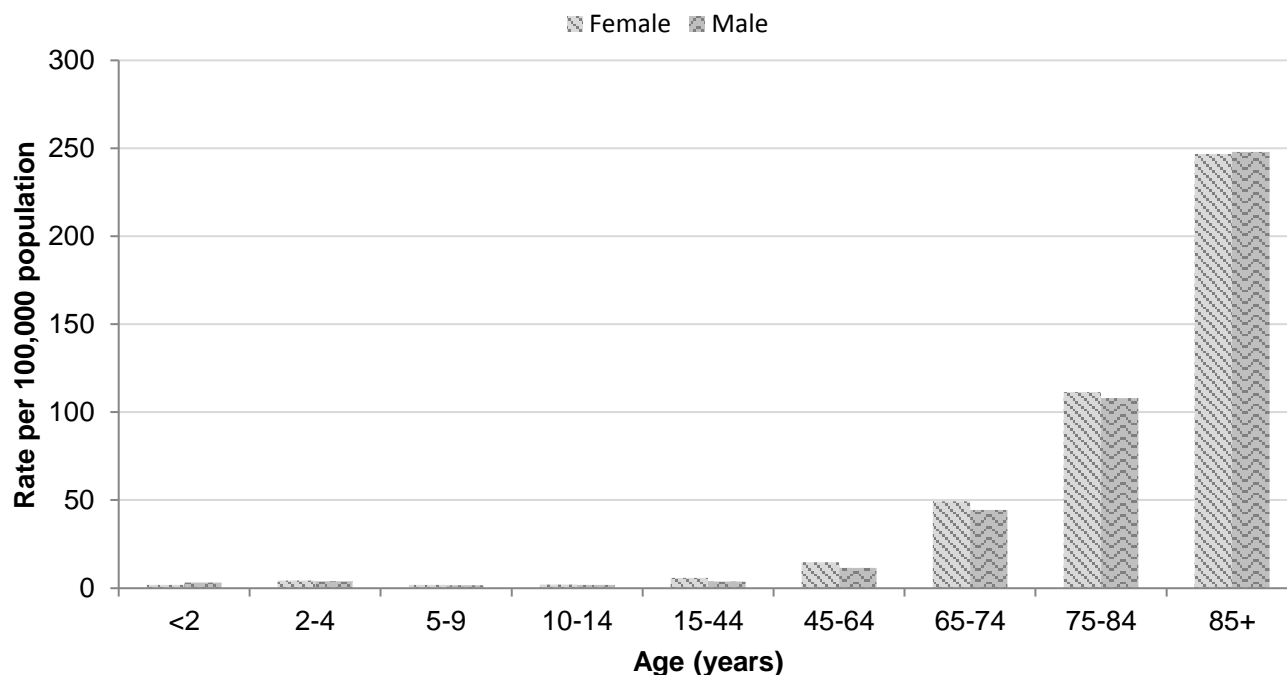


Age and sex-specific rates of *C. difficile*

The age distribution of reports did not change substantially in 2014 in comparison to reports from 2013 [3]. In 2014, the highest age-specific rate of 248.1 per 100,000 population was in 85+ age group, followed by 75-84 and 65-74 age groups (110.5 and 47.1 per 100,000 population, respectively) (figure 3, Appendix table 2). Overall, 74.08 % of *C.difficile* reports were in patients aged 65 years and over.

In 2014, the overall rate of *C. difficile* was higher in females (25.4 per 100,000 population) than males (18.3 per 100,000 population), which was a decrease of 7.6% and 6.6% in comparison to 2013 (27.5 and 19.6 per 100,000 population, respectively).

Figure 3. *Clostridium difficile* age and sex rates† per 100,000 population (England, Wales and Northern Ireland):2014*



† Rates are calculated using 2013 Office for National Statistics mid-year population estimates

* Data extracted on 21 January and 18 February 2015

Ascertainment: Comparison of *C. difficile* positive specimens from the voluntary laboratory reporting scheme versus *C. difficile* infections from the mandatory surveillance scheme in England

The following data compare *C. difficile* positive samples reported to the voluntary laboratory surveillance scheme with *C. difficile* reports to the mandatory surveillance scheme. In order for the data to be comparable, the laboratory reports from the voluntary surveillance scheme have been limited to England and among patients aged ≥ 2 years.

The number of *C. difficile* reports made to the voluntary surveillance decreased by 1.5% between 2013 and 2014 (12,231 vs. 12,048, respectively) (table 3) compared to the 0.01% increase in the number of reports made to the mandatory surveillance. Overall, the number of reports decreased in both the voluntary and mandatory surveillance by 62.4% and 66.2%, respectively between 2008 and 2014. The case ascertainment of *C. difficile* reported to the voluntary scheme has improved between 2008 (78.8%) and 2014 (87.5%), although the highest ascertainment was obtained in 2011 (91.3%).

Table 3. Ascertainment of *C. difficile* data for the mandatory and voluntary reporting schemes in England for patients aged 2 years and over in 2014

Year	Voluntary reports	Mandatory reports	% Ascertainment
2008	32,071	40,705	78.8
2009	23,672	27,620	85.7
2010	20,334	23,215	87.6
2011	17,476	19,144	91.3
2012	13,308	14,993	88.8
2013	12,231	13,767	88.8
2014	12,048	13,769	87.5

* Data extracted on 21st January and 18th February 2015

Discussion

- voluntary *C. difficile* reports peaked in 2007 (figure 1) but have since been decreasing in line with mandatory surveillance reports [4]. The observed trend is likely to reflect the introduction of measures focused on reducing incidence of *C. difficile* infection, such as enhanced infection control procedures with emphasis on hand washing, antibiotic prescribing policies and isolation of infected patients [5, 6], which coincided with the announcement of governmental targets in October 2007.
- the majority of region-specific *C. difficile* rates have decreased since 2010, with Wales showing the largest decrease (80.2%), followed by England (42.2%) and Northern Ireland (38.1%) between 2010 and 2014.
- the recent regional trends in *C. difficile* (2013 vs 2014) were slightly different. Wales still showed the greatest decrease between 2013 and 2014 (46.8%), followed by Northern Ireland (17.6%) and England (1.7%).
- age-specific rates show that *C. difficile* mainly affects older patients with the highest rate in people aged 85 years and older (248.1 per 100,000 population), followed by those aged 75 to 84 years and 65 to 74 years (110.5 and 47.1 per 100,000 population, respectively). Overall, 74.1% of all reports were in those aged 65 years and above. Similar trends were observed in previous years [3].
- the overall rate was higher in females than males (25.4 and 18.3 per 100,000 population, respectively). The reason for this gender disparity requires further investigation.
- case ascertainment has improved by 8.7% between 2008 and 2014 (78.8% to 87.5%); however case ascertainment in 2014 was 1.3% lower than in 2013. This should be interpreted with caution taking into account differences in testing algorithms between the two surveillance systems.

References

1. Office for National Statistics (ONS) mid-year population estimates for England and Wales. Available: <http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/2013/index.html>
2. Northern Ireland Statistics and Research Agency (NISRA) mid-year population estimates for Northern Ireland. Available: <http://www.nisra.gov.uk/demography/default.asp17.htm>
3. Voluntary surveillance of *Clostridium difficile*, England, Wales and Northern Ireland: 2013. Health Protection Report. Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/339374/Clostridium_difficile_voluntary_surveillance_2013.pdf
4. Public Health England. Annual Epidemiological Commentary: Mandatory MRSA, MSSA and *E. coli* bacteraemia and *C. difficile* infection data, 2013/14. Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/330529/HCAI_mandatory_surveillance_annual_epidemiological_commentary_2013_14.pdf
5. Department of Health. Save lives: Clean your hands. 4 May, 2012. <http://www.dh.gov.uk/health/2012/05/save-lives-clean-your-hands/>
6. Department of Health. Professional Letter – Chief Nursing Officer. Infection caused by *Clostridium difficile*, 2005. http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4125523.pdf

Acknowledgements

These reports would not be possible without the weekly contributions from microbiology colleagues in laboratories across England, Wales, and Northern Ireland, as well as colleagues in the regional offices of Public Health England.

Appendix

Table 1. Number of voluntary reports of *C. difficile* positive faecal specimens in England, Wales and Northern Ireland* Ireland 1990-2014**

Year	England	Wales	Northern Ireland	England, Wales & Northern Ireland
1990	1,171	22	-	-
1991	1,586	70	-	-
1992	2,419	509	-	-
1993	4,421	1,011	-	-
1994	6,353	1,117	-	-
1995	8,881	1,159	-	-
1996	10,425	1,303	-	-
1997	14,540	1,331	-	-
1998	15,721	1,397	-	-
1999	17,261	1,440	-	-
2000	18,779	1,740	-	-
2001	19,952	1,597	689	22,238
2002	26,059	1,713	928	28,700
2003	31,711	1,593	995	34,299
2004	38,447	2,078	1,380	41,905
2005	45,306	1,990	1,374	48,670
2006	49,570	2,207	1,409	53,186
2007	51,957	2,934	1,379	56,270
2008	32,216	2,954	1,668	36,838
2009	25,793	2,256	1,019	29,068
2010	20,488	2,140	695	23,323
2011	17,537	1,564	689	19,790
2012	13,400	988	602	14,990
2013	12,331	806	529	13,666
2014	12,120	429	436	12,985

* Northern Ireland reports included from 2001. ** Data extracted on 21 January and 18 February 2015

Table 2. Age and sex distribution of voluntary reports of *Clostridium difficile* in England, Wales and Northern Ireland, 2014*

Age group (years)	Female	Male	Unknown	Total	Rate per 100,000		
					Female	Male	Total
<2	14	24	3	41	1.9	3.1	2.7
2-4	46	44	0	90	4.2	3.9	4.1
5-9	32	29	0	61	1.9	1.6	1.8
10-14	31	31	3	65	2.0	1.9	2.0
15-44	666	428	3	1,097	5.7	3.7	4.7
45-64	1,109	841	14	1,964	14.7	11.5	13.2
65-74	1,409	1,181	6	2,596	49.3	44.5	47.1
75-84	2,069	1,591	18	3,678	111.5	108.0	110.5
85+	2,203	1,129	13	3,345	246.7	247.9	248.1
Unknown	2	3	43	48	-	-	-
Total	7,581	5,301	103	12,985	25.4	18.3	22.1

* Data extracted on 21 January and 18 February 2015