Voluntary surveillance of *Clostridium difficile* in England, Wales and Northern Ireland, 2007

Key Points

- This update describes reports of *Clostridium difficile* (faecal) samples made to the HPA in 2007 from laboratories in England, Wales, and Northern Ireland.
- There were 57,247 reports in 2007, comprising 52,980 from England, 2,883 from Wales and 1,384 from N. Ireland. This was a 4.1% increase in the number of *C. difficile* laboratory reports compared to 2006.
- The incidence rate of *C. difficile* per population has increased in England and Wales from 101 to 104 and 76 to 97 samples per 100,000 population respectively, and decreased in Northern Ireland from 82 to 79 samples per 100,000 population.
- Around 80% of all reported cases are in the 65 years and over age group.

Surveillance of *C. difficile* laboratory faecal samples in England and Wales was introduced in 1990 as part of the Public Health Laboratory Service's voluntary monitoring of infectious diseases. In 2001, this surveillance was extended to include Northern Ireland[1]. Most of the information is received through electronic reporting to the HPA's database (LabBase) by NHS laboratories; the remainder are obtained from paper records. Additional information on reported cases may include patient details such as age and sex, and details of detection methods used.

Mandatory reporting of *C. difficile* in people aged 65 years and over was introduced in England in January 2004, and adapted to include people aged between 2 and 64 years in April 2007. This surveillance scheme brings in greater participation and reporting, but it has not replaced voluntary reporting of cases of *C. difficile* disease, which contains additional valuable information regarding detection methods. Furthermore, voluntary surveillance allows comparison of trends over a longer time period as well as inter-country comparisons. The results of the two systems are not directly comparable for a number of reasons. For example, unlike the mandatory system, the voluntary system may include specimens that are not toxin-producing. Furthermore, some laboratories may not report data to the voluntary scheme as they have difficulties sending laboratory data electronically which substantially hinders complete reporting.

This report covers voluntary reports of *C. difficile* faecal samples made to the HPA in 2007 for all ages from laboratories in England, Wales, and Northern Ireland. Age specific rates of *C. difficile* were calculated using Office of National Statistics 2007 mid-year resident population estimates as denominators. Data were analysed and displayed according to current regional HPA boundaries.

In 2007, the HPA received 57,247 reports of *C. difficile* laboratory samples, a 4.1% increase on the 54,968 reports received during 2006 (Table 1, Figure 1). The 2007 total comprised 52,980 samples from England, 2,883 from Wales and 1,384 from Northern Ireland. This reflected an increase of 3.3% in England, an increase of 28% in Wales, and a decrease of 3.1% in Northern Ireland.

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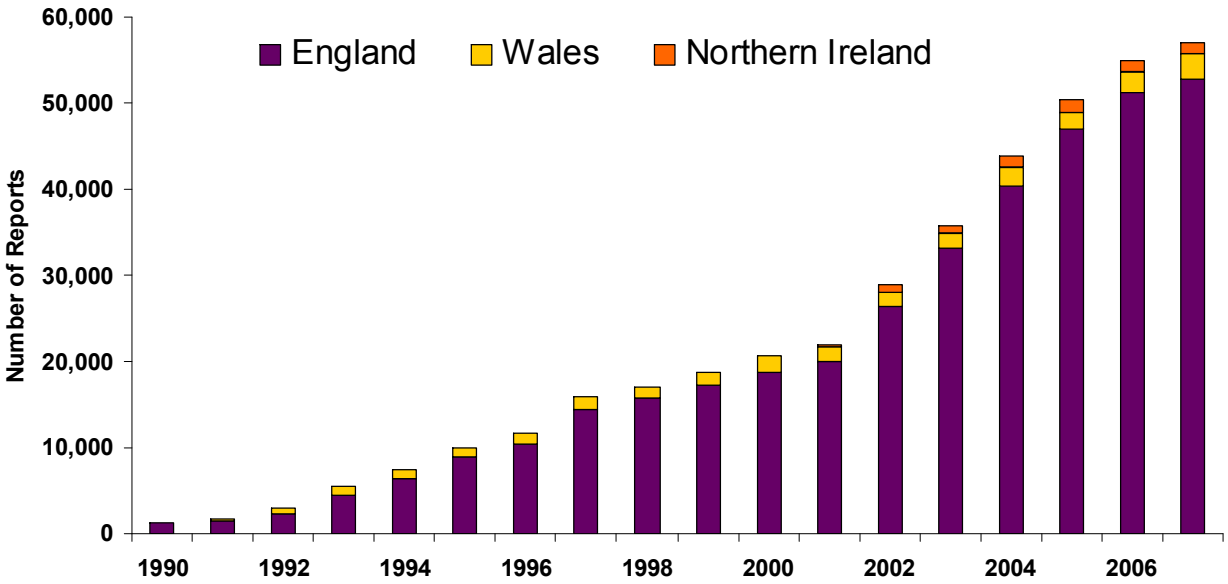
Table 1. Total voluntary reports of *C. difficile* in England, Wales and N.Ireland 1990-2007***

Earliest Specimen Year	England	Wales	Northern Ireland	Total
1990	1172	22	-	1194
1991	1591	70	-	1661
1992	2423	506	-	2929
1993	4439	993	-	5432
1994	6387	1083	-	7470
1995	8905	1134	-	10039
1996	10440	1290	-	11730
1997	14541	1331	-	15872
1998	15721	1397	-	17118
1999	17279	1438	-	18717
2000	18812	1744	-	20556
2001	20064	1599	345	22008
2002	26357	1710	930	28997
2003	33201	1587	1016	35804
2004	40414	2114	1388	43916
2005	47023	1957	1412	50392
2006	51284	2255	1429	54968
2007	52980	2883	1384	57247

* Data for 2007 are provisional (data was extracted on 4th March 2009)
** Northern Ireland reports included from 2001

Figure 1. Trends in total voluntary reports of *C. difficile* isolated from faecal specimens under the voluntary reporting scheme: England, Wales and Northern Ireland 1990 - 2007***



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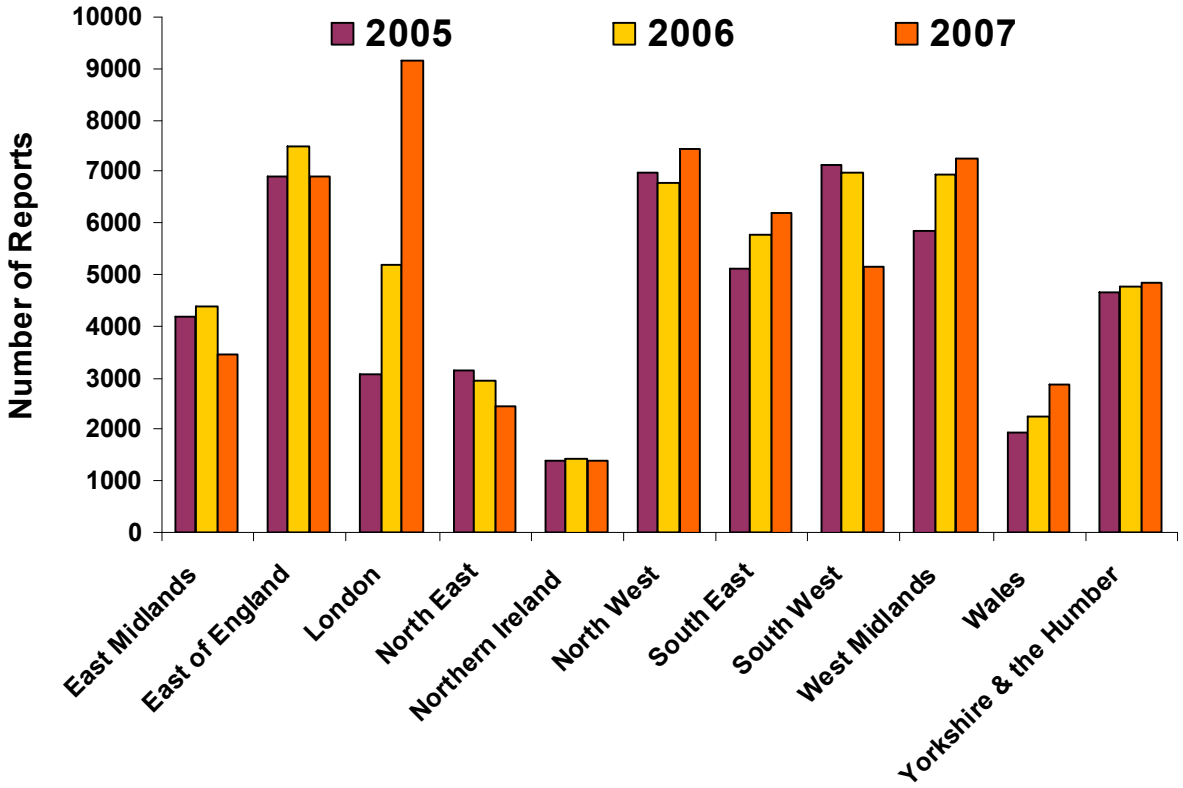
Laboratory reports received under the voluntary reporting scheme

The overall rate for all of England, Wales and Northern Ireland was 103 *C. difficile* laboratory reports per 100,000 population in 2007. The rates of *C. difficile* laboratory reports for the overall population were 104 per 100,000 population in England, 97 samples per 100,000 in Wales and 79 samples per 100,000 in Northern Ireland.

Since 2006, the population rate has increased from 101 to 104 *C. difficile* samples per 100,000 population in England, from 76 to 97 samples per 100,000 population in Wales and has decreased from 82 to 79 samples per 100,000 in Northern Ireland.

The large increase observed for London is due to patient screening that was undertaken at an acute trust. Many of these reports for C. difficile have no detectable toxin.

Figure 2. Laboratory reports of *C. difficile*: English health regions, Wales and Northern Ireland 2005 – 2007*



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

Around 80% of all reported cases are in people aged 65 years and over. There has been a 22% increase in the number of samples in people under 65 years since 2006 from 8,976 to 11,540. The proportion of total samples reported which were from people under 65 years has increased from 16% to 20%.

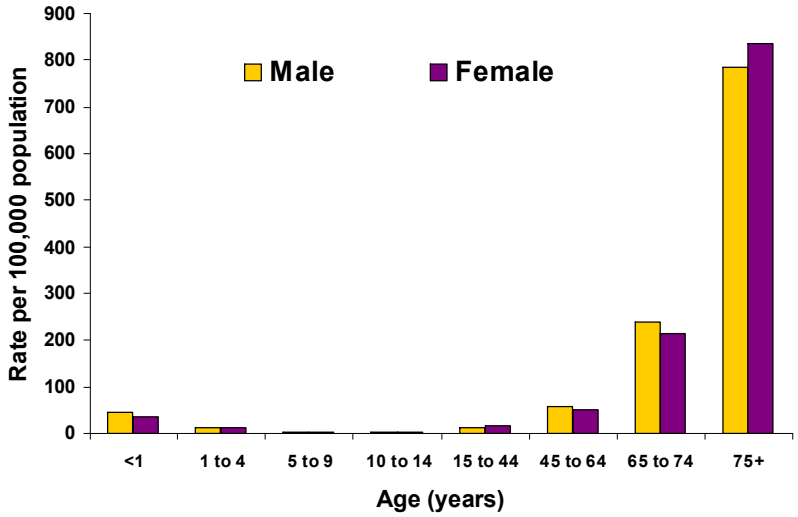
C. difficile rates are markedly higher in older age groups: age-specific rates of *C. difficile* reports were 53 per 100,000 population in people aged 45-64, 226 per 100,000 population in people aged 65-74 and 811 per 100,000 population in people aged 75 years and older.

Table 2. Age and sex distribution of laboratory reports of *C. difficile* in England, Wales, and Northern Ireland, 2007.

Age Group	Male	Female	Sex not specified	Total	Rate per 100,000		
					Male	Female	Total
<1 year	160	118	4	282	44.7	34.6	40.4
1 to 4 years	159	166	1	326	11.9	13	12.4
5 to 9 years	67	45	0	112	4.2	2.9	3.6
10 to 14 years	59	60	0	119	3.4	3.6	3.5
15 to 44 years	1502	1839	16	3357	12.9	16	14.5
45 to 64 years	3843	3480	21	7344	56.3	49.5	53
65 to 74 years	5234	5127	35	10396	239.2	212.6	226
75+ years	12999	22028	100	35127	769	833.4	810.7
Age not specified	37	59	88	184			
All ages	**24060**	**32922**	**265**	**57247**	**87.7**	**115.9**	**102.5**

Compared to 2006, the number of *C. difficile* reports increased by 6% in males, and 3% in females. Overall, there were 116 *C. difficile* laboratory reports per 100,000 population in females, and 88 per 100,000 population in males. In the group with the highest rates (people aged 75 years and over), rates were higher in women compared to men. In the 65-74 year age group, rates were higher in men.

Figure 3. Age specific rates† of *C. difficile* from laboratory reports under voluntary reporting scheme: England, Wales and Northern Ireland 2007*

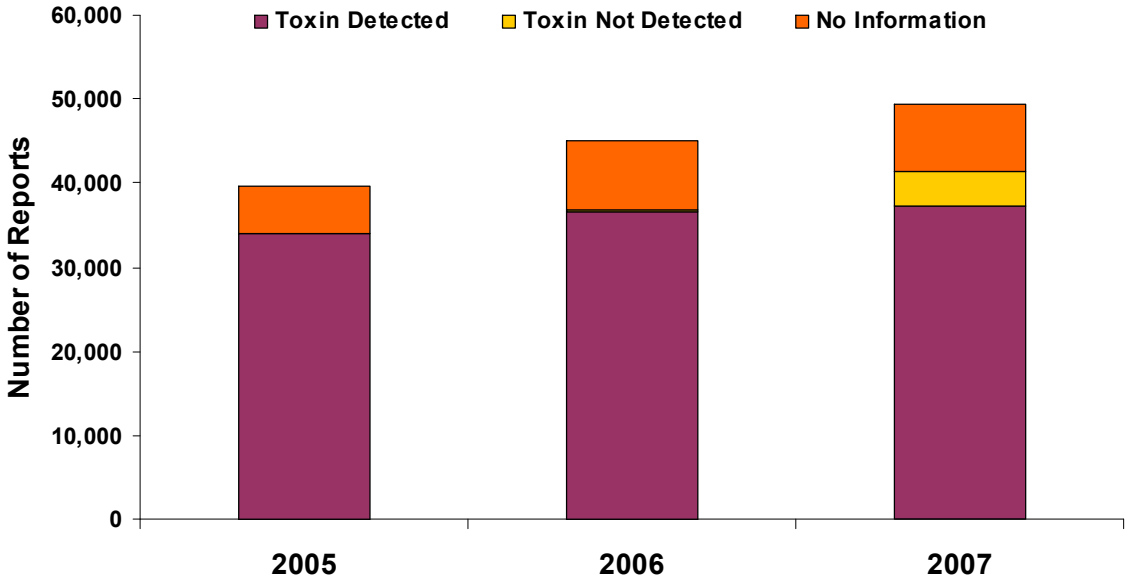


* Data from 2007 are provisional (data was extracted on 4th March 2009)
† Rates are calculated using 2007 ONS mid-year population estimates

Reports of toxin detection in *C. difficile*

In 2007, 65% of reports received by LabBase indicated that toxin had been detected and 13% did not contain any information on toxin detection. 7% of reports stated that toxin had not been detected which has increased from less than 1% in 2006.

Figure 4. Reports of toxin detection in *C. difficile:* England, Wales and Northern Ireland 2005-2007*



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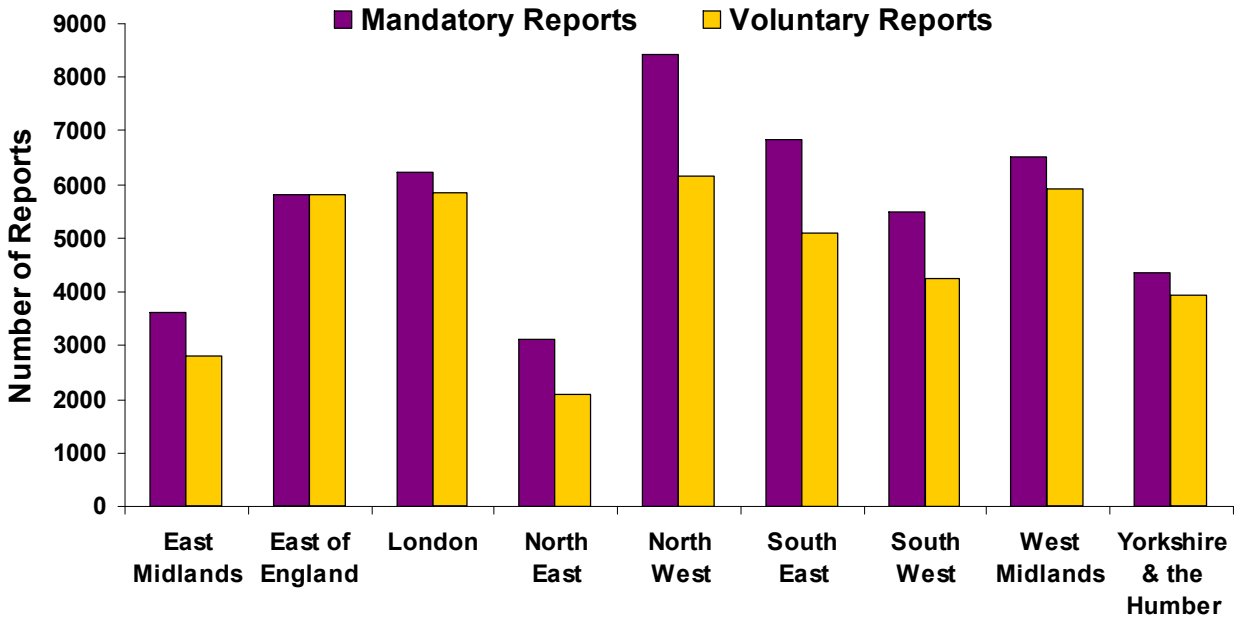
Ascertainment of *C. difficile* data for the mandatory and voluntary reporting schemes

Since 2004, regional differences in ascertainment have been appraised by comparing numbers of laboratory reports under the voluntary and mandatory systems for people aged 65 years and over in each English region. As of April 2007 it became mandatory for English Acute Trusts to report in addition cases for patients between the ages of 2 and 64.

Ascertainment of voluntary reports is greatest in the East of England region with 99.9% (a difference of 5 cases).

Figure 5. Ascertainment of *C. difficile* data for the mandatory and voluntary reporting schemes in England for patients aged 65 years and over in 2007*



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Conclusions

The data presented in this report show that the number of laboratory reports of *C. difficile* in people of all ages has increased every year since 1990. Between 2006 and 2007, the overall number of *C. difficile* laboratory reports received annually increased by 4.1%, and since 2001 *C. difficile* reports have increased by 160%. This increase could reflect further improvements in reporting and/or increase in disease incidence.

Compared to 2006, the rate of *C. difficile* laboratory reports per 100,000 population has increased in Wales (from 76/100,000), remained largely static in England (from 101/100,000) and decreased in Northern Ireland (from 82/100,000). Differences are likely due, in large part, to increased hospital testing (e.g. screening), and enhanced electronic laboratory reporting. The large increase in Wales may be attributable to increased Viral Gastroenteritis infections in the Winter of 07/08, increased hospital testing for *C. difficile*, etc.[2]

Most *C. difficile* disease is concentrated in the over-65s. However, this report shows that there has been a larger year-on-year (2007 vs. 2006) increase in reports of disease in the under-65s (20%) than in those aged 65 years and over (less than 5%). It is unclear if this is a real increase or a reporting artefact attributable to the introduction, in 2007, of mandatory reporting of toxin-positive CDI in patients aged 2 to 64 years.

Adherence to voluntary reporting of *C. difficile* disease varies across England. In three out of nine regions the reporting under the voluntary scheme comprised 90% or more of the total mandatory reports from the same region. Although the mandatory reporting scheme provides a more accurate estimate of national burden of *C. difficile* in England, the voluntary system allows the HPA to perform national trend analyses for data prior to 2007, when the mandatory reporting scheme included reports from patients aged under 65 years of age.

Although the relative impact of increased ascertainment and increased number of cases remains difficult to evaluate, the increase in laboratory reports strongly suggests that the public health impact of *C. difficile* infection remains important and may be increasing. This has also been highlighted by figures from the DH's mandatory surveillance of *C. difficile* in England, which were published recently. It is vital that there be ongoing surveillance of this disease.

Acknowledgements
We are grateful to microbiology colleagues in NHS acute trusts for their contributions to this reporting scheme, as well as efforts from colleagues in the regional offices of the Health Protection Agency.

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[1] HPA. *Clostridium difficile*: England, Wales and Northern Ireland, 2000 to 2002. *Commun Dis Rep CDR Wkly* 2003;13.

[2] Welsh Healthcare Associated Infection Programme. *All-Wales Clostridium difficile Report*. URL: http://www.wales.nhs.uk/sites3/page.cfm?orgid=379&pid=18490. Accessed 16 March, 2009.