

The burden of *Clostridium difficile* associated disease in England



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INTRODUCTION

During the past decade, the incidence of *C. difficile* associated disease (CDAD) in England has increased dramatically (Figure 1). For most of this time, surveillance has been conducted through the voluntary reporting of positive *C. difficile* laboratory results to a national database (voluntary surveillance). To improve the accuracy and completeness with which CDAD is monitored, in January 2004 it became mandatory for hospitals to report all cases of CDAD in people of 65 years and over (mandatory surveillance).

Voluntary and mandatory surveillance provide interesting information on the burden of *C. difficile* in England. In this poster, data from both are described and compared. In addition, findings from a recent survey of hospital infection control clinicians, which gives insights into potential inaccuracies in the way data are collected, and possible explanations for recent trends in incidence, are presented.

Boxes A and B describe the voluntary and mandatory surveillance schemes, and the survey of infectious disease clinicians, respectively. The HPA's Centre for Infections is a publicly funded body responsible for the monitoring and surveillance of communicable diseases in England, including healthcare associated infections.

Box A: Comparison of voluntary and mandatory surveillance for CDAD

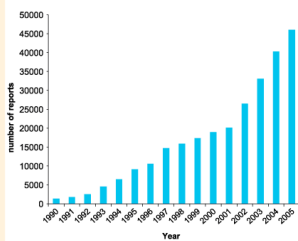
Voluntary surveillance	Mandatory surveillance
Introduced in 1990	Introduced in January 2004
Part of a system which voluntarily monitors a range of infectious diseases	Specifically monitors CDAD
Most data submitted electronically, some through paper records	Data submitted electronically
Continuous data entry from laboratories	Data collected quarterly from National Health Service Hospitals
Additional information on reported cases may include details of age, sex, detection methods used, and antibiotic susceptibilities	A minimum data set. Since hospital laboratories were believed to be overstretched, they were not required to submit details of age, sex or other factors on reported cases
Patients of all ages	Patients aged 65 years and over only
No testing criteria	Laboratories required to test all diarrhoeal stool samples from patients aged 65 years and over. Diarrhoeal stools are defined as those that take the shape of their container. Non-diarrhoeal stools should not be tested for CDAD
No reporting criteria or requirement	Laboratories required to report all <i>C. difficile</i> toxin positive samples detected in patients aged 65 years and over who have not been diagnosed with CDAD in the preceding four weeks
Samples may originate from any acute and community health care source	Laboratories required to test and report samples submitted from all acute and community health care sources (except private wards within an NHS hospital)

Box B: The *C. difficile* survey of infectious disease clinicians in 2005

A questionnaire on various aspects of CDAD was sent to the clinician in charge of infection prevention and control in each of the 173 acute NHS hospitals in England in October 2005. Clinicians from 150 out of 173 hospitals responded. Data were obtained on three areas: surveillance, laboratory investigation, and prevention and control of CDAD. This poster only describes information obtained about surveillance.

Summary data on burden of CDAD

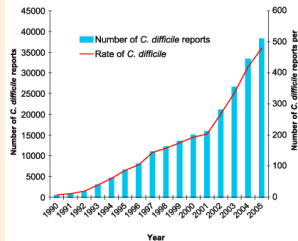
Figure 1: Numbers of positive *C. difficile* specimens from people of all ages reported through voluntary surveillance: England 1990-2005*



*provisional data

The number of positive *C. difficile* reports has increased dramatically since 1990. Both the numbers and rate of reports have increased in people aged 65 years and over (Figure 2).

Figure 2: Number and rate of positive *C. difficile* specimens in people of 65 and over reported through voluntary surveillance: England 1990-2005



During the first 12 months of mandatory surveillance, 44,385 cases were reported. Provisional data suggest that the numbers of cases reported in 2005 were substantially greater (Table 1).

Table 1: Numbers of cases of CDAD reported through mandatory surveillance in England in 2004-2005 (people aged 65 years and over)

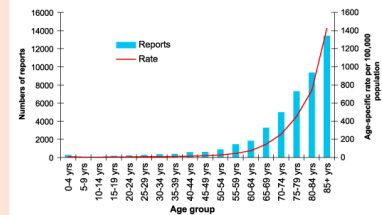
Year	Total number of cases reported*
2004	44385
2005	50836

*provisional data

Age-specific data

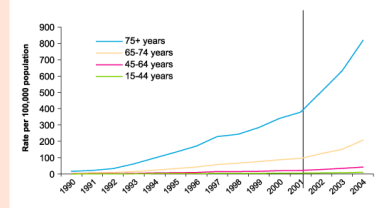
Age-specific data on people under 65 years are only available from the voluntary surveillance scheme.

Figure 3: Numbers and rates of *C. difficile* in people of all age groups reported through voluntary surveillance: England 2005



In 2005, older age groups still demonstrated the highest numbers and rates of *C. difficile*. However as Figure 4 shows, rates also appear to have been rising in younger age groups, particularly during the last 4 years.

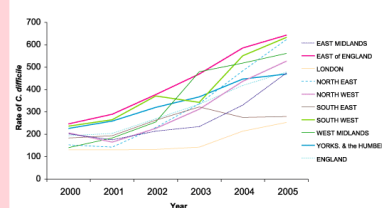
Figure 4: Age-specific rates of *C. difficile* from voluntary surveillance of positive laboratory reports: England 1990-2004



Regional variations

Figure 5 shows that although rates of CDAD are generally on the increase in most parts of England, this varies according to region.

Figure 5: Rate of *C. difficile* reports in patients over 65 between 2000 and 2005 by Region. Voluntary data



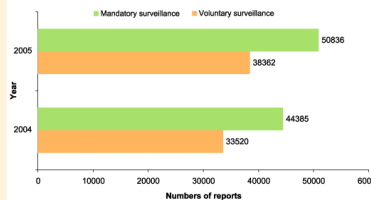
RESULTS

Accuracy and completeness of reporting

The results presented thus far suggest that the burden of CDAD in England is increasing substantially. However, other factors may be influencing the actual numbers of cases being reported through both voluntary and mandatory surveillance.

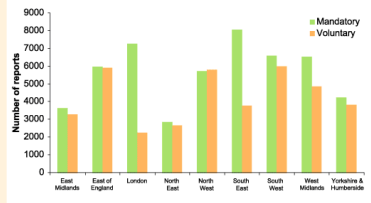
Comparison of the numbers of cases reported in people aged 65 years and over through the two surveillance systems suggests that there is under-reporting of cases in voluntary surveillance (Figure 6).

Figure 6: Numbers of *C. difficile* infections in people aged 65 years and over from voluntary and mandatory surveillance: England 2004-2005



This apparent under-reporting varies considerably according to region. Figure 7 compares different regions' reporting of CDAD in people aged 65 years through mandatory and voluntary surveillance.

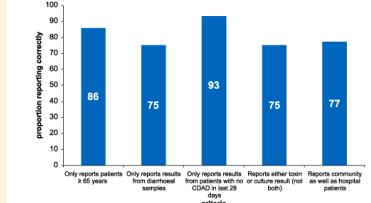
Figure 7: Number of Mandatory versus Voluntary *C. difficile* reports in patients over 65 years during 2005



Interestingly, those regions with the lowest recorded rates of *C. difficile* (London and the South East – see Figure 5) show the greatest disparities between mandatory and voluntary reporting.

In addition to disparities in voluntary reporting, the survey of infection control clinicians demonstrated that there were inconsistencies and inaccuracies in the way hospitals tested samples for and reported cases of CDAD for mandatory surveillance purposes.

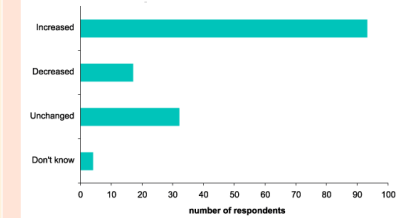
Figure 8: Proportion of hospitals adhering to the mandatory surveillance criteria



Views about incidence of infection over the past three years

A survey of US infectious disease physicians in 2005 found that nearly 40% of US infectious disease physicians had perceived an increase in cases of *C. difficile* during the preceding two years. We asked English infection control clinicians a similar question:

Figure 9: What has happened to the incidence of reported CDAD in your hospital during the past 3 years?



Of those infection control clinicians reporting an increase:

- 80% perceived an increase in actual numbers of cases.
- Over 75% thought that increased testing of samples and reporting of cases had also contributed.
- Over half of respondents (59%) indicated that they experienced consistently high background rates of infection from *C. difficile*, in addition to any increased frequency of outbreaks.

CONCLUSIONS

- Increasing numbers and rates of CDAD have been detected through both voluntary and mandatory surveillance of *C. difficile*
- Rates of CDAD are highest in older people but increasing in younger age groups
- Variations in the completeness with which different hospitals report positive *C. difficile* laboratory reports influences apparent regional discrepancies in the rate of CDAD obtained from voluntary surveillance
- Despite the availability of clear criteria for mandatory surveillance, there are substantial inconsistencies in hospitals' testing and reporting for *C. difficile*. This diminishes the mandatory surveillance scheme's ability to accurately measure the rate of *C. difficile* in the population
- Most infection control clinicians surveyed believed that reports of CDAD had increased in their hospitals during the preceding 3 years. Most who responded had perceived an increase in actual numbers of cases but many thought that increased testing and reporting had also contributed.

REFERENCES

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