

# 9.1.0 Healthcare-associated infections (HCAI)

## Key Points

- In 2010, 1,696 new cases of Clostridium difficile-associated disease (CDAD) were notified. This represents a national crude incidence rate of 40.0 new cases per 100,000 population, a decrease of 10.6% from 2009
- Of the 1,696 new CDAD cases, 1,191 (70%) were reported from patients aged over 65 years
- In the voluntary enhanced surveillance scheme, 1,185 CDAD cases [1,094 (92%) new and 91 (8%) recurrent] were reported from 33 hospitals. The national CDAD incidence rate was 2.8 cases per 10,000 bed days used. Twenty percent of all CDAD cases were associated with the community, an increase from 13% in 2009. As in 2009, 10% of CDAD cases were associated with nursing homes. While the majority of patients experienced onset of symptoms in healthcare facilities, 27% had onset of symptoms in the community, an increase from 23% in 2009
- Of the 49 specimens for which ribotyping data were available (from five hospitals), the most common ribotypes reported were; 078 (n=8, 16%) followed by 013, 014, 015, 027 and 106 (n=4, 8% each)

## 9.1.1 Clostridium difficile-associated Disease

### New cases of *C. difficile*-associated disease

New cases of *C. difficile*-associated disease (CDAD) in persons two years or older have been notifiable in Ireland under the disease category "acute infectious gastroenteritis" (AIG) since May 2008. Recurrent CDAD cases are not currently notifiable.

There were 4,290 notifications of acute infectious gastroenteritis (AIG) in 2010, of which 1,696 (39.5%) were new CDAD cases. All cases were laboratory confirmed. This represents a national crude incidence rate (CIR) of 40.0 new CDAD cases per 100,000 population, a decrease of 10.5% from 44.7 cases per 100,000 population reported in 2009 (Table 1). Regional variation was observed in the incidence of CDAD (Table 1). However, this most likely reflects differences in laboratory diagnosis and reporting rather than true variation in disease incidence. Identification of seasonal patterns in the CIDR data is hindered by late and batch notifications from laboratories.

As in 2009, the majority of new cases were in female patients (59%) and in older age groups. The mean age of cases was 69 years (range 2-103 years) (Figure 1) with 1,191 cases (70%) reported in patients over 65 years. Of note, the 75-84 year age group had the highest number of cases (n=479), representing 40% of the over 65 year age group.

The majority of CDAD cases (67%) were notified by healthcare facilities. Patients classified as 'hospital inpatient' accounted for 73% of all such cases notified, 12% were classified as general practice patients, 3% as hospital outpatients or day patients, 3% as Emergency Department patients, 2% as 'other' and 7% as either 'not specified' or 'unknown'. However, this data does not provide information on the origin or onset of CDAD, rather it represents the location of the patient at the time of CDAD diagnosis. Information on the origin and onset of CDAD cases is collected as part of the enhanced surveillance system.

### *C. difficile* outbreaks

In 2010, five *C. difficile* outbreaks, all healthcare-associated and involving 31 patients, were notified (Table 2). One was linked to a hospital, three to nursing homes and one to a long-term care facility.

### C. difficile enhanced surveillance

Although the notifiable CDAD data provides important preliminary information on the burden of new cases of CDAD in Ireland, it represents an underestimate of the true burden of CDAD, as recurrent CDAD cases are not captured and it does not capture information on the origin or onset of CDAD. National collation of *C. difficile* enhanced surveillance commenced on a voluntary basis on 1<sup>st</sup> August 2009. Information on case type, origin, onset and severity of CDAD is collected using European Centre for Disease Control (ECDC) case definitions. By the end of 2010, 33 hospitals participated in the voluntary enhanced surveillance scheme, comprising 30 acute public hospitals (seven tertiary, 21 general, two specialist hospitals) and three private hospitals.

In 2010, 1,185 cases of CDAD were reported to the enhanced surveillance scheme. Of these, 1,094 (92%) were classified new CDAD cases (representing 65% of all the new CDAD cases reported through the notifiable AIG category) and 91 (8%) recurrent. Sixty percent (n=711 cases) originated within the reporting healthcare facility which corresponds to an overall national CDAD incidence rate of 2.8 cases per 10,000 bed days used. This rate is based only on the number of cases that originated in the participating healthcare facility and is calculated using data from the Business Intelligence Unit, Corporate Planning and Corporate Performance (CPCP) at the Health Services Executive for acute public hospitals and directly from acute private hospitals. There was a wide range in the incidence of CDAD among participating hospitals (range, 0 – 9.1 cases per 10,000 bed days used; median, 2.3). Tertiary hospitals showed a higher median incidence rate (CDAD rate = 2.8, n=7) compared to general hospitals (CDAD rate = 1.7, n=26). These differences may reflect differences in patient case mix, *C. difficile* ribotypes, laboratory testing protocols, antimicrobial policies and surveillance resources between hospitals. No obvious seasonal trend is distinguishable at present.

### Severe CDAD

As for notifiable CDAD, most cases reported through

the enhanced surveillance scheme were female (56%) and in the over 65 age group (72.5%). Seventeen (1.6%) severe cases were reported: four patients requiring surgery and intensive care unit (ICU) admission, one requiring surgery only and 12 requiring ICU admission without surgery. Forty-nine deaths were reported, of which three were directly attributed to CDAD and 33 were not directly attributed to CDAD. The cause of death for the remainder was either unknown or not specified.

### Onset & origin of CDAD

#### Onset: Patient location when symptoms of CDAD commenced

Seventy-three percent (n=862) had onset of CDAD symptoms in a healthcare facility – healthcare onset (HCO), with 82% (n=707) of these occurring in the reporting hospital, 5% (n=46) in another hospital and 10% (n=85) in a nursing home. The remainder (n=22) had onset in another unspecified healthcare facility or unknown. However, 27% (n=321) of all CDAD cases had onset of symptoms in the community, an increase from 23% in 2009.

#### Origin

The majority of cases, 77% (n=911), were healthcare-associated:

- 90% (n=824) of these patients experienced onset of CDAD symptoms at least 48 hours following admission to a healthcare facility (healthcare-onset, healthcare-associated)
- 9% (n=86) patients experienced symptom onset in the community within four weeks of discharge from a healthcare facility (community-onset, healthcare-associated)

Of the 911 healthcare-associated CDAD cases, 80% (n=725) CDAD originated in the reporting hospital, 7% (n=66) in other hospitals and 10% (n=91) in nursing homes, with the remainder (n=29) in another unspecified healthcare facility or unknown.

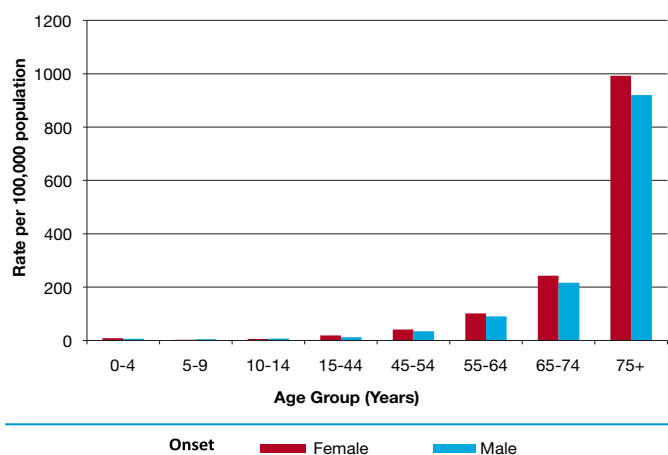


Figure 1. Age and Sex distribution of CDAD in Ireland, 2010 (Source, CIDR)

\*Rates calculated using 2006 census data

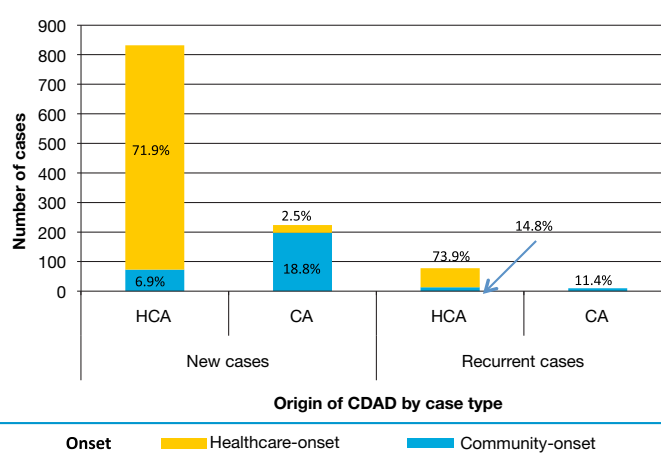


Figure 2. Origin and Onset of CDAD Cases, 2010

(Source, *C. difficile* Enhanced Surveillance System)

(HCA: Healthcare-Associated, CA: Community-Associated)

Of the 20% (n=234) CDAD cases classified as community-associated:

- 89% (n=208) patients experienced onset of CDAD symptoms while outside a healthcare facility and without a history of discharge from a healthcare facility within the previous 12 weeks
- 11% (n=26) patients experienced symptom onset within 48 hours of admission to a healthcare facility, without residence in a healthcare facility within the previous 12 weeks

The origin of 3% (n=40) of cases was unknown, where onset of symptoms occurred within 4-12 weeks of a patient being discharged from a healthcare facility.

### **C. difficile PCR ribotyping**

Of the 49 samples (from five hospitals) for which ribotyping data were available, the most common ribotypes reported were: 078 (n=8, 16%) and 013, 014, 015, 027 and 106 (n=4, 8% each). In one hospital, all isolates of healthcare-associated CDAD from Q2 to Q4 2010 were typed. The most common ribotypes were 078 (n=5), 013 and 014 (n=4 each), and 015 (n=3).

In March 2009, national *C. difficile* ribotype data was collected for the first time as part of a one month pilot study. In addition to highlighting the burden of CDAD outside acute care facilities, this study demonstrated the overall predominance of ribotype 027 at this time (with over 40% of these originating from one hospital).

### **Conclusion**

The collation of national data on *C. difficile* through notification of new CDAD and the enhanced CDAD surveillance system of both new and recurrent case has provided a valuable insight into the burden of CDAD in Ireland. There was decline in the number of new CDAD cases reported in 2010 compared to 2009.

In 2010, 8% of all CDAD cases reported through the enhanced surveillance scheme were recurrent infections compared with 14% in 2009. This may represent an improvement in infection prevention and control

strategies and management of patients with CDAD. However, it may also reflect changes in laboratory testing protocols. Recurrent CDAD is difficult to manage clinically and can result in severe infection, places a burden on limited isolation resources and results in significant patient morbidity. Therefore, knowledge of the burden of recurrent CDAD in Ireland is essential to help guide preventative strategies.

During 2010, 20% of all CDAD cases were associated with the community, an increase from 13% in 2009 (70 of 522 cases) and 8% were associated with nursing homes, which is the same as in 2009 (42 of 522 cases). Moreover, 27% of all cases had onset of symptoms in the community compared with 23% in 2009. This indicates that *C. difficile* is not confined to hospitals and is increasingly common in community and nursing home settings. It is essential that CDAD is considered in the differential diagnosis of all patients presenting with diarrhoea and that specimens are sent in a timely fashion for laboratory diagnosis. Patients with CDAD in healthcare facilities must be isolated with contact precautions as outlined in national guidelines: <http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/Clostridiumdifficile/Publications/File,2936,en.pdf>.

All healthcare professionals must promote practices known to reduce the incidence of CDAD including; compliance with infection prevention and control measures, awareness of local CDAD surveillance data and prudent use of antimicrobials. The national guidelines for antimicrobial stewardship in hospitals in Ireland are available at: <http://www.hpsc.ie/hpsc/A-Z/MicrobiologyAntimicrobialResistance/gyforthecontrolofAntimicrobialResistanceinIrelandSARI/AntimicrobialStewardship/Publications/>

Table 1. Number of notified cases, crude incidence rate of CDAD in Ireland by HSE area, 2010, and total number with crude incidence rate for 2009 (Source, CIDR)

HSE Area	No. of cases	*CIR incl. 95% C.I.
East	681	45.4 (42.1-48.9)
Midlands	47	18.7 (13.4-24.0)
Mid West	95	26.3 (21.0-31.6)
North East	50	12.7 (9.2-16.2)
North West	90	38 (30.5-46.3)
South East	252	54.7 (48.1-61.7)
South	269	43.3 (38.1-48.5)
West	212	51.2 (44.5-58.3)
Total 2010	1696	40.0 (38.1-41.9)
Total 2009	1895	44.7 (42.8-46.8)

\* Rates calculated using 2006 census data

Table 2. *C. difficile* outbreaks reported in Ireland in 2010 by HSE area (Source, CIDR)

HSE Area	Outbreak location	Total number ill
East	Residential Home	11
Midlands	Residential Home	2
South	Residential Home	6
South	Hospital	2
North West	Community Hospital/ Long Stay Unit	10