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Annual Epidemiological Report

October 2018

Clostridium difficile infection in Ireland, 2017

Key Facts

- In 2017, 1,766 cases of *Clostridium difficile* infection (CDI) were notified to public health. Of these, 1,380 (78%) were classified as new cases, 123 (7%) as recurrent and 263 (15%) as unknown case type. The national crude incidence rate for new and recurrent CDI per 100,000 population was 3.4% lower than that reported in 2016 (32.4 versus 35.8). The majority of CDI was reported in patients aged ≥65 years (63%)
- There were 1,906 cases reported to the voluntary enhanced CDI surveillance scheme by 56 hospitals. Information collected on the origin of infection showed that healthcare-associated (HCA) CDI accounted for 59% (n=1,117) of all cases. This represents a national combined incidence rate for new and recurrent HCA CDI originating within the participating hospitals per 10,000 bed days used (BDU) of 2.2, unchanged from the rate in 2016
- Information on the patient's location at CDI symptom onset showed 40% of patients were in the community and 7% were in a long-term care facility
- There were just 320 *C. difficile* isolates with ribotyping data reported by 23 hospitals, representing 17% of all cases. The most frequently isolated ribotypes in 2017 were: 002 and 014 (both n=38; 12%), 078 (n=33; 10%) and 015 (n=24; 8%)

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Background

New cases of *Clostridium difficile* infection (CDI) in persons aged two years or older became notifiable in May 2008 to Departments of Public Health via the Computerised Infectious Disease Reporting (CIDR) system. In January 2012, both new and recurrent cases became notifiable[1].

Since August 2009, enhanced data on CDI origin, onset and severity is captured through the voluntary national enhanced surveillance system, rather than on CIDR, according to a standardised surveillance protocol[2]. By 2017, 56 acute hospitals (public: 45 and private: 11) participated in enhanced CDI surveillance.

Epidemiology

Notifiable *C. difficile* infection

There were 1,766 cases of CDI notified to Departments of Public Health in 2017. The national crude incidence rate for new and recurrent CDI per 100,000 population was 3.4% lower than that reported in 2016 (32.4 versus 35.8), as shown in Table 1.

Both the incidence and trend of notifications to Public Health have been decreasing over time as shown in Figure 1. The proportion of notifications assigned a case type (new or recurrent) decreased from 95% in 2015 to 85% in 2017. However, the proportion of those without an assigned case type increased from 5% in 2015 to 15% in 2018.

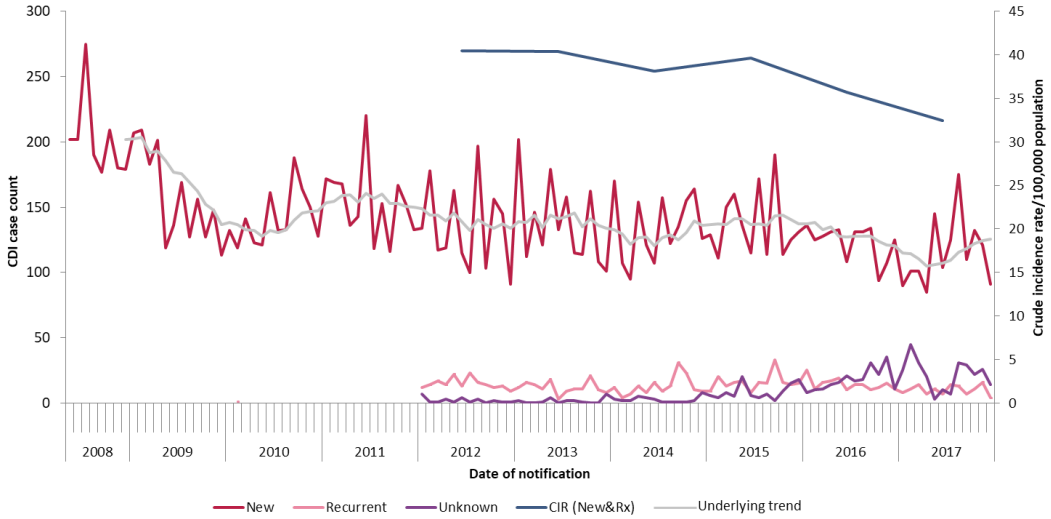
There were nine CDI outbreaks notified, all of which were healthcare-associated. Six were linked to hospitals and three to community hospitals/long-term care facilities.

Table 1. CDI notifications reported to CIDR, 2016-17

Mandatory CIDR notifications to public health	2017	2016
Number of notifications	**1,766**	**1,871**
Number of new notifications	1,380 (78%)	1,483 (79%)
Crude incidence rate* (new & recurrent cases)	32.4	35.8
Number of outbreaks	9	7

*Crude incidence rate is the number of new and recurrent notifications per 100,000 population, calculated using the 2016 census data, excluding children <2 years. (Source: CIDR)

Figure 1. Number of CDI notifications by month and case type in Ireland, 2008 – 2017



Source: CIDR

Enhanced surveillance of *C. difficile* infection

There were 1,906 CDI cases reported to the voluntary enhanced surveillance scheme by 56 hospitals (96% of public and 92% of private hospitals reported patients with CDI) (Table 2). Since 2012, participation in enhanced surveillance has stabilised, with all tertiary and general hospitals providing data.

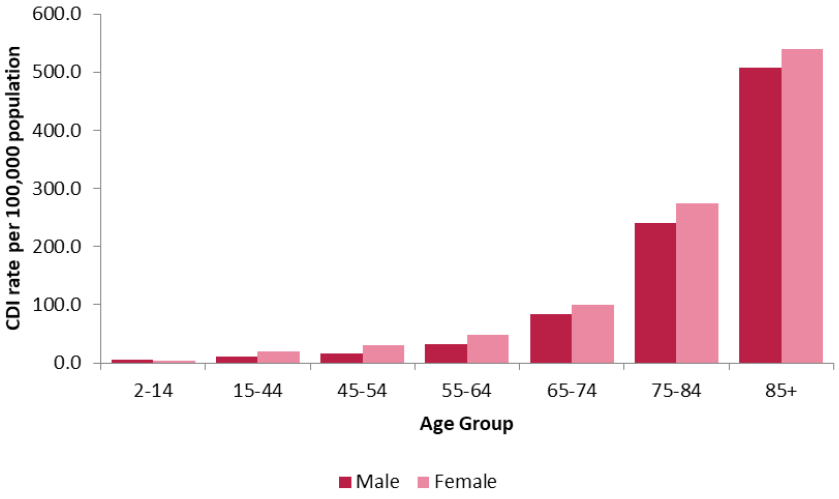
Of 1,906 cases in 2017, 1,604 (84%) were new, 9% recurrent and 6% of unknown case type. The majority of cases occurred in females (60%), as shown in Figure 2. The mean age was 66.4 years (range: 2-101), with the highest proportion (n=1,220; 64%) in patients ≥65 years.

Table 2. CDI cases reported to enhanced surveillance system in Ireland, 2016-17

Voluntary enhanced surveillance system cases	2017	2016
Cases reported to enhanced surveillance system	**1,906**	**1,877**
Number of new cases	1,604 (84%)	1,566 (83%)
Number of hospitals participating	56 (45 public, 11 private)	54 (45 public, 9 private)
CDI incidence rate* (all hospital-acquired cases)	2.2	2.2
Origin: Location where infection was acquired		
• Healthcare-associated cases	1,117 (59%)	1,116 (60%)
– *Reporting hospital*	*883 (79%)*	*830 (74%)*
– *Long-term care facility*	*154 (14%)*	*186 (17%)*
– *Other hospital*	*72 (6%)*	*88 (8%)*
– *Unknown healthcare facility*	*8 (1%)*	*12 (1%)*
• Community-associated cases	463 (24%)	459 (24%)
• Discharged within 4-12 wks from HCF	139 (7%)	133 (7%)
• Unknown origin	187 (10%)	169 (9%)
Onset: Location where patient symptoms occurred		
• Healthcare onset	1,052 (55%)	1,047 (56%)
– *Reporting hospital*	*835 (79%)*	*772 (74%)*
– *Long-term care facility*	*140 (13%)*	*192 (18%)*
– *Other hospital*	*52 (5%)*	*63 (6%)*
– *Unknown location*	*25 (2%)*	*20 (2%)*
• Community onset	752 (40%)	735 (39%)
• Unknown onset	102 (5%)	95 (5%)
Severity		
Requiring ICU admission or colectomy	44 (2.3%)	30 (1.6%)

*CDI rate is the number of new and recurrent cases per 10,000 bed days used. Bed days used data provided by HSE Business Information Unit (Source: HPSC)

Figure 2. Age and gender distribution of CDI in Ireland, 2017



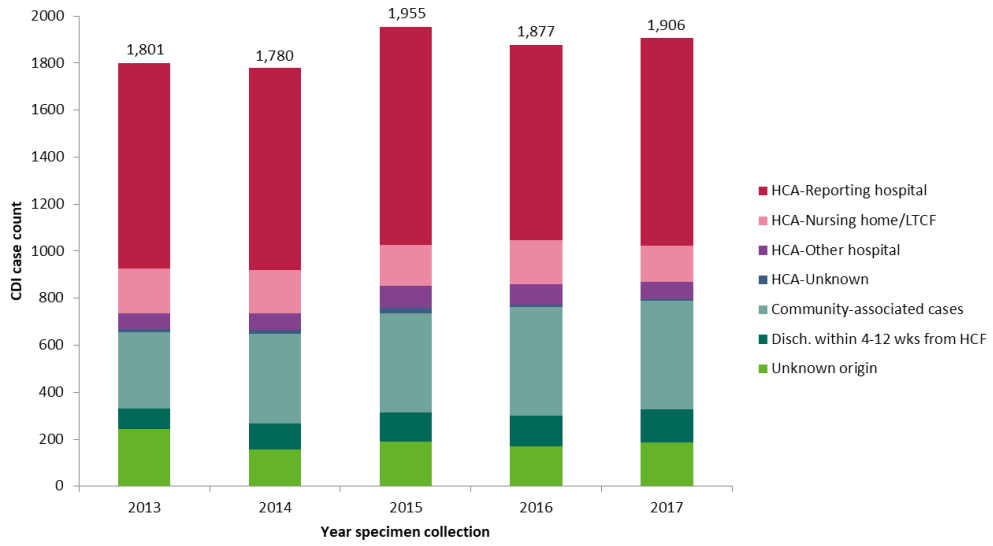
*Rates calculated using 2016 census data excluding children <2 years (Source: HPSC)

Origin of infection

Of all reported cases (new, recurrent and unknown case type), 1,117 (59%) originated within a healthcare facility, with 46% (n=883) of all cases originating within the reporting hospital (Figure 3). The incidence rate of healthcare-associated (HCA) CDI was 2.2 per 10,000 bed days used (BDU) unchanged from 2016, as displayed in Figure 4. The incidence rate of new HCA-CDI was 2.0 (1.95 in 2016); of recurrent was 0.2, (0.3 in 2016) and unknown case type was 0, stable with 2016.

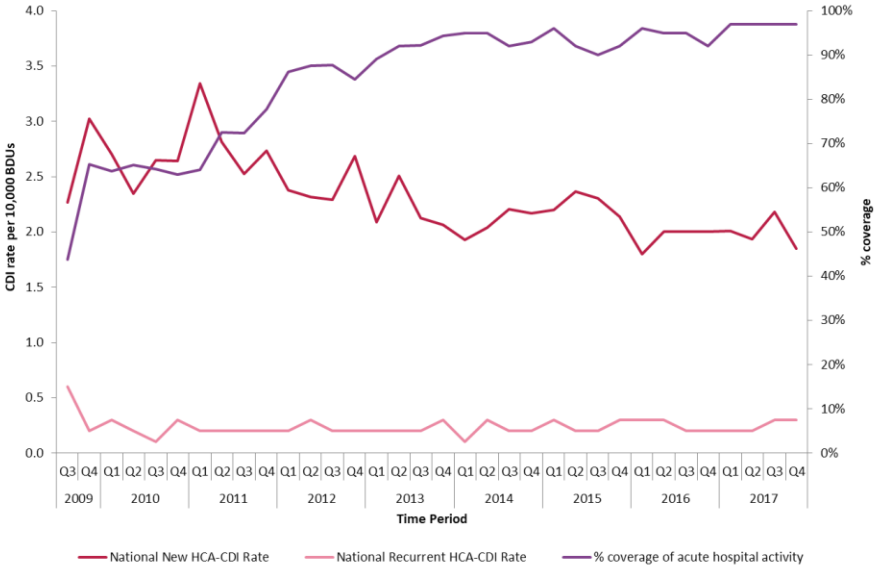
Similar to 2016, 24% (n=463) of all CDI cases were community-associated (CA).

Figure 3. Origin of CDI in Ireland by facility type, 2013-2017



Source: HPSC

Figure 4. Quarterly national rate of healthcare-associated CDI (new and recurrent) in Ireland, 2009-2017



Source: HPSC

Location at symptom onset

CDI symptom onset occurred in a healthcare facility (healthcare onset; HO) for 55% (n=1,052), while 40% (n=752) had symptom onset in the community (community-onset; CO). The location at CDI onset was unknown for 5% (n=102). Of HO cases, 79% had onset in the reporting hospital, 5% in another hospital, 13% in a long-term care facility and for 2%, the type of healthcare facility was unknown. The proportion of CO cases increased from 29% (n=513) in 2013 to 40% (n=752) in 2017.

Of 1,117 cases associated with a healthcare facility, 975 (87%) experienced onset of CDI symptoms at least 48 hours following admission to a healthcare facility (HO, HCA). A further 12% experienced symptom onset in the community within four weeks of discharge from a healthcare facility (CO, HCA).

Of 463 CA cases, 422 (91%) experienced CDI symptom onset while outside a healthcare facility and without history of discharge from a healthcare facility within the previous 12 weeks (CO, CA). Forty (9%) cases experienced symptom onset within the first 48 hours of admission to a healthcare facility without a history of admission to or residence in a healthcare facility within the previous 12 weeks (HO, CA).

Severe CDI

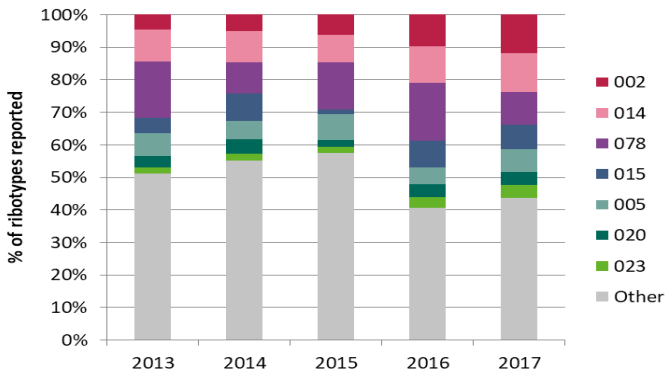
A severe case is defined as (i) a patient requiring admission to an intensive care unit (ICU) for treatment of CDI or its complications or (ii) requiring colectomy surgery or (iii) death within 30 days after diagnosis. Information on patient outcome is not currently collected in

CDI enhanced surveillance, so two markers of severity, surgery and ICU admission are captured. There were 44 severe CDI cases (2.3%) reported in 2017, an increase from 30 (1.6%) in 2016. Nine patients required both surgery and an ICU admission, seven required surgery only, 21 required ICU admission without surgery and seven required ICU admission with surgery status reported as unknown.

PCR ribotyping

Ribotyping information was reported for just 320 *C. difficile* isolates (17%). Ireland has no designated national *C. difficile* reference laboratory. The most frequent ribotypes reported in 2017 were; 002 (12%) and 014 (12%) with equal frequency, 078 (10%) and 015 (8%). This is a similar national profile to that of recent years (Figure 5).

Figure 5. Most frequently reported *C. difficile* ribotypes in Ireland: 2013-2017



Source: HPSC

Discussion

The collation of national CDI data through notifications and the enhanced surveillance system has provided a valuable insight into its epidemiology and burden in Ireland. While the number of cases reported to both systems increased in the past five years, contemporaneous reductions in both population and hospital-acquired CDI rates have been observed.

Since 2015, more CDI cases were reported to the voluntary enhanced surveillance scheme than to the mandatory notification system. Enhanced surveillance provides added value, demonstrating that the highest proportion of CDI cases originate in acute hospitals, but this is a trend which has reduced over time.

The proportion of cases associated with long-term care facilities has also reduced over time from 11% in 2013 to 8% in 2017.

The proportion of community-associated CDI was stable when compared with 2016 at 24%, but has been increasing since 2013, when 18% of all cases originated in the community.

Public health implications

The continued excellent participation in the voluntary CDI enhanced surveillance scheme ensures that valuable additional information is collected regarding the epidemiology and burden of CDI in Ireland. The National Clinical Guidelines on the Surveillance, Diagnosis and Management of CDI in Ireland[3] were updated in 2013 and endorsed by the National Clinical Effectiveness Committee in 2014.

Technical notes

Data used in this report were extracted from CIDR on 03/08/2018.

Crude incidence rates were calculated using census of the population denominator data (available from the Central Statistics Office www.cso.ie). The population aged 2 years and above was taken from Census 2016 for analysis of the 2014-2017 data and Census 2011 for analysis of the 2013 data. The data was presented per 100,000 population.

Hospital acquired rates of CDI were calculated using the denominator of bed days used (BDU) per quarter/year. BDU data were provided by the Business Information Unit of the HSE. The figures were presented per 10,000 BDU.

Further information available on HPSC website

http://www.hpsc.ie/a-z/gastroenteric/clostridiumdifficile/

Acknowledgements

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Report prepared by:

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