



Short report

# Outbreak of *Clostridium difficile* ribotype 027 in a residential home

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## SUMMARY

This article reports a significant outbreak of *Clostridium difficile* ribotype 027 infection in a residential care home in the UK. Five of six affected residents died within one month of diagnosis. Investigation of the facility revealed problems with hand hygiene and environmental cleaning. Affected residents had received a mean of 2.7 antibiotic courses in the two months preceding diagnosis. It is important to recognize that *C. difficile* outbreaks can occur in residential homes. There is a need for health- and social-care systems to work closely together to assure the safety of people in their care.

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## Introduction

Outbreaks of diarrhoea caused by *Clostridium difficile* are well recognized in hospitals and, to a lesser extent, nursing homes. However, there are few reports of outbreaks in residential care homes, which are not recognized as providing qualified nursing care. With hospitals making significant reductions in rates of *C. difficile* infection (CDI),<sup>1</sup> focus falls increasingly on acquisition of disease in nursing and care homes. This article describes a significant outbreak in a residential care home between February and June 2011.

## Methods

### Clinical setting

The studied care home is a converted house with approximately 30 residents, specializing in care of people with dementia. Most bedrooms are single rooms, and more than half have en-suite toilet facilities. There are two sluices, and five shared bath or shower rooms.

### Definition

A resident was defined as being affected if they had loose stools on more than one occasion, and a positive microbiological diagnosis of CDI.

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**Bacteriology**

Microbiological diagnosis was performed using enzyme-linked immunosorbent assay of toxins A/B in a stool sample (*C. difficile* ToxA/B II; TechLab, Blacksburg, VA, USA), and confirmed by detection of glutamate dehydrogenase and toxin in a subsequent combined assay (*C. Diff* Quik Chek Complete; TechLab). This testing method predated current UK guidance. Strains were typed using ribotyping and variable number tandem repeat (VNTR) analysis at the regional *C. difficile* reference laboratory.

**Results**

*Description of the outbreak*

Six residents were diagnosed with CDI over a five-month period, with the last five cases diagnosed within an 11-week period. The last five of the faecal samples were subsequently available for ribotyping. *C. difficile* ribotype 027 was found in all five samples. VNTR analysis showed that the five isolates were closely related as part of the same cluster, and two isolates were identical.

There were four females and two males amongst the affected residents, with a median age of 87 years (range 78–95 years). Five of the six patients died within one month of diagnosis (median seven days, range three to 26 days). Two death certificates reported causes other than *C. difficile*, two death certificates reported CDI as the direct cause of death, and one death certificate reported CDI as an indirect cause of death (Figure 1).

*Outbreak control measures*

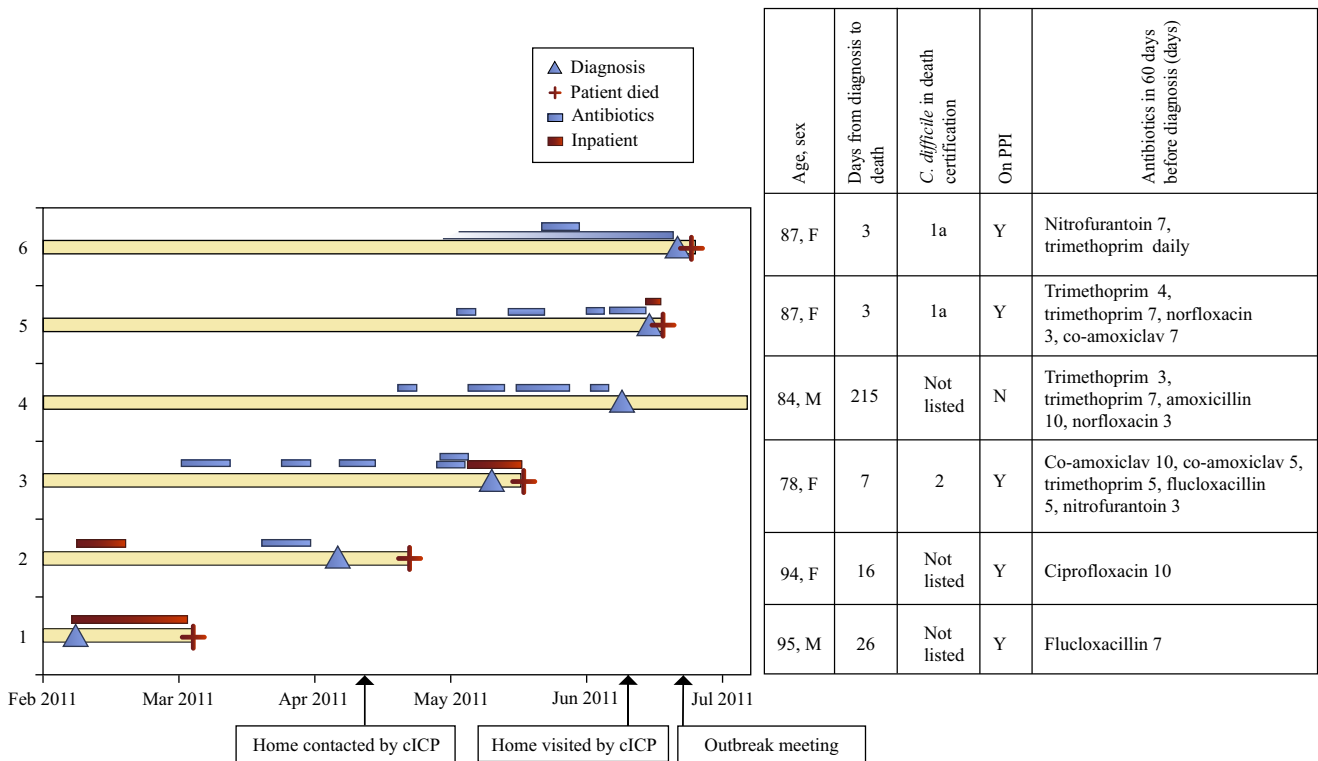
Following the first two cases, a community infection control practitioner contacted the management of the home. Internal audits of hygiene and cleanliness were reported to show good results, and a favourable report by an external healthcare body was noted. Educational support for staff was offered, but an offer for external audit was declined.

Two months later, another resident was diagnosed with CDI. A community infection control practitioner visited the home and a formal audit was convened for the next week. However, two further cases occurred in the days preceding the audit. A further case was identified retrospectively; this resident had been diagnosed with CDI during a hospital stay. The second of the initial cases was discovered to have had relapsing–remitting diarrhoea over a six-week period. This had been treated with ciprofloxacin by a general practitioner (GP), but no sample was sent until symptoms escalated. It is possible that this delay allowed heavy contamination of the home with *C. difficile* spores.

Affected residents were treated according to severity of infection, consistent with existing UK guidance. One resident was admitted to hospital due to the severity of symptoms, and subsequently died. Two other residents were treated in hospital, having been diagnosed there (Figure 1).

*Risk factors*

Thorough investigation by a community infection prevention practitioner discovered problems with handwashing, dirty



**Figure 1.** Timeline of outbreak and epidemiological data for affected residents including antibiotic prescriptions. Death certification 1a, direct cause of death; death certification 2, indirect cause of death; PPI, proton pump inhibitor; cICP, community infection control practitioner; *C. difficile*, *Clostridium difficile*; Y, yes; N, no.

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