

The burden of *Clostridium difficile* infection (CDI)

CDI

'Super-bug' *Clostridium difficile* infection (CDI) is a highly infectious but preventable bacterial infection of the colon that causes severe and potentially deadly diarrhoea.^{1,2,3}

A recent consensus report, contributed to by more than 1,000 European healthcare professionals, recognised the urgent need to tackle CDI in the European Union through improved antibiotic stewardship and national policies warranting consistent surveillance, prevention, diagnosis and treatment.⁴ The European Parliament has also quoted CDI in the Resolution on Patient Safety and Hospital Associated Infection, calling on Member States and the European Union to do more to address healthcare-associated infections (HAIs), such as CDI.⁵

As one of the top 10 HAIs in European hospitals,⁶ CDI imposes a significant clinical and economic burden to healthcare systems.⁷

Clinical impact & burden

In Europe the incidence and severity of CDI is increasing.^{8,9,10,11,12} With nearly 125,000 cases a year,⁶ CDI results in death for 9% (2% primary cause, 7% contributory) of all diagnosed patients.¹³ This suggests that CDI contributes to the death of around 11,000 people each year, or 1,000 each month across Europe,^{6,13} posing a major threat to healthcare systems and patients alike.

CDI is the most common cause of antibiotic-associated diarrhoea¹⁴ and a leading cause of nosocomial (hospital-acquired) diarrhoea.¹⁵ Despite growing recognition, one in 20 patients going into hospital will still acquire a nosocomial infection, with CDI being one of the most severe forms of these.⁶

Patients with CDI can stay in hospital for an extra one to three weeks^{16,17}, and are up to three times more likely to die in hospital (or within a month of infection) than those without CDI.^{18,19} The infection causes or contributes to death in two out of five people who die within three months of diagnosis.¹³

Recurrence has been identified as the greatest problem in the treatment of CDI²⁰ and exacerbates the clinical burden posed. CDI recurrence occurs in up to 25% of patients within 30 days of initial treatment with antibiotics (like metronidazole and vancomycin) that have a broad impact on the gut microflora.^{21,22,23} In addition, patients who have already had one recurrence have a 40% risk of a further CDI episode.²⁴



Patients who have already had one recurrence have a **40% risk** of a further CDI episode²⁴

Economic impact & burden

The financial impact of CDI on modern healthcare is significant, with costs currently estimated at €3 billion per year in the European Union, and expected to double over the next four decades.²⁵

Patients who acquire CDI stay in hospital for an extra one to three weeks^{16,17} at an additional cost of up to €14,000 per patient.²⁶

Patients with CDI have a 54% higher adjusted hospital cost compared with those without CDI.²⁷ An initial CDI infection is estimated to cost £13,146 to treat, with each recurrence costing an estimated £20,249 on top of this, due to prolonged hospital stay, ICU stay, high cost drugs and surgery.²⁸



CDI causes or contributes to death in **2 out of 5** people who die within 3 months of diagnosis¹³



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A 'hidden epidemic'

CDI is very much a 'hidden epidemic'. The true extent of its impact in Europe is unknown owing to international differences around disease awareness, variations in diagnostic procedures and the variable presence and methodology of national microbiological surveillance systems.^{13,15} Indeed, research has shown that, due to a lack of clinical suspicion and/or inadequate laboratory testing, an estimated 40,000 cases of CDI are potentially missed in Europe each year across 482 hospitals alone.²⁹ With around 8,000 hospitals in the EU,³⁰ the true figure is likely to be much higher.

CDI is associated with high-mortality¹³ and cost burden,²⁵ therefore reducing the incidence and recurrence of CDI is a priority for national governments, clinicians, payers and health authorities alike.

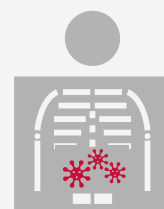
CDI costs estimated at
€3 billion
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Risk of epidemic

Clostridium difficile, sometimes referred to as *C. difficile*, bacteria are naturally present in the gut of up to 3% of healthy adults, usually without any problems. This is because the colonising *C. difficile* bacteria are kept under control by the 'good bacteria'.² An alteration in the balance of the gut microflora, often caused by broad-spectrum antibiotics which can reduce the number of 'good' bacteria, allows *C. difficile* to multiply and cause inflammation, severe diarrhoea and potentially life-threatening complications.^{1,2}

These spores can survive outside the human body for weeks, or even months, and are resistant to common disinfectants and alcohol²



C. difficile are highly infectious bacteria that produce spores which are shed in the faeces.² These spores can survive outside the human body for weeks, or even months, and are resistant to common disinfectants and alcohol.²

These *C. difficile* spores can then be transmitted between individuals or acquired from touching contaminated surfaces.^{2,31} As such, one infection can spread rapidly throughout the hospital environment and quickly lead to an outbreak.³¹

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