

DEATHS REGISTERED IN NORTHERN IRELAND WITH CLOSTRIDIUM DIFFICILE MENTIONED ON THE DEATH CERTIFICATE (2001-2005)



Introduction

1. There has been significant public interest regarding *Staphylococcus aureus* and its methicillin resistant-form commonly known as MRSA in recent years, and consequently there has been a growing interest in other similar bacterial infections. This report looks at one of those – *Clostridium difficile*.
2. *Clostridium difficile* (so called because when it was first discovered it was difficult to grow in the laboratory) is a cause of diarrhoea. Although in most cases it causes a relatively mild illness, occasionally and particularly in elderly patients, it may result in serious illness and even death. Infection is often associated with, and triggered by, the use of antibiotics prescribed to treat or prevent other conditions.
3. Trends in mortality are normally monitored using the underlying cause of death (the disease which initiated the train of events leading directly to death). However *Clostridium difficile* is not always recorded as the underlying cause of death. Those who die with *Clostridium difficile* are usually patients who were already very ill and it is instead their existing illness, rather than *Clostridium difficile*, which is often designated as the underlying cause of death. There is therefore an interest in the number of deaths where *Clostridium difficile* contributed to the death – only conditions which contribute directly to the death should be recorded on the death certificate. Results presented in this report identify deaths where the underlying cause was *Clostridium difficile* and also where *Clostridium difficile* was not the underlying cause but was a contributory factor in the death. (Further information on *Clostridium difficile* is provided in Annex A).
4. It is not possible to identify directly from the International Classification of Diseases, Tenth Revision all deaths where *Clostridium difficile* contributed to the death. However deaths caused by “enterocolitis due to *Clostridium difficile*” infection, can be identified using the International Classification of Diseases, Tenth Revision, code A.04.7. Additional work has also been done looking at the ICD codes that are related

to *Clostridium difficile* and then searching the cause of death text field on the death certificate. A detailed description of the method used to identify these deaths is given in Annex A.

5. For the period 2001 to 2005 the total number of deaths registered in Northern Ireland each year where “enterocolitis due to *Clostridium difficile*” was mentioned on the death certificate is given in the tables below. The report contains three tables:
 - Table 1: Number of deaths with *Clostridium difficile* mentioned and recorded as the underlying cause on the death certificate by registration year 2001-2005
 - Table 2: Number and percentage of deaths with *Clostridium difficile* mentioned on the death certificate by age at death, 2005
 - Table 3: Number and percentage of deaths with *Clostridium difficile* mentioned on the death certificate by underlying cause of death (ICD), 2005

Further information is available from NISRA on request.

6. The Communicable Disease Surveillance Centre (Northern Ireland) has also published detailed data regarding cases of *Clostridium difficile* in hospitals in Northern Ireland. This information can be obtained from the CDSC website see www.cdscni.org.uk.
7. Also published today by NISRA is a report on the number of deaths registered in Northern Ireland with Methicillin Resistant *Staphylococcus aureus* (MRSA) mentioned on the death certificate, which can be found on the NISRA website at: http://www.nisra.gov.uk/demography/default.asp?cmsid=20_45&cms=demography_Publications&release.

Table 1: Number of deaths with *Clostridium difficile* mentioned and recorded as the underlying cause on the death certificate by registration year 2001-2005

Year	2001	2002	2003	2004	2005^P	Total (2001-2005)
“Enterocolitis due to <i>Clostridium difficile</i>” mentioned on the death certificate	13	24	28	37	34	136
Of which “Enterocolitis due to <i>Clostridium difficile</i>” is the underlying cause of death	7	10	13	15	17	62
Underlying cause as a percentage of all mentions	54%	42%	46%	41%	50%	46%

^P Provisional data

8. Table 1 shows that the number of deaths with *Clostridium difficile* recorded on the death certificate has generally increased year on year over the period 2001 to 2004, but there was a small decrease in the number of mentions in 2005.
9. Between 2001 and 2005, *Clostridium difficile* was mentioned on 136 death certificates and 62 (46%) of those deaths had *Clostridium difficile* recorded as the underlying cause. In the period 2001-2005, there were 72,138 deaths registered and thus deaths with *Clostridium difficile* mentioned make up only 0.19% of all deaths.

Table 2: Number and percentage of deaths with *Clostridium difficile* mentioned on the death certificate by age at death, 2005

	Age-group			Total
	Under 45	45-74	75+	
Deaths with <i>Clostridium difficile</i> mentioned (2005)				
Number	0	9	25	34
Percentage of deaths for all ages	0%	26%	74%	100%

10. Table 2 shows that deaths with *Clostridium difficile* recorded on the death certificate are primarily in the very elderly. In 2005 of the 34 deaths recorded which included a mention of *Clostridium difficile* nearly three quarters related to those aged 75 years or older. This compares to those aged 75 years or older accounting for 61% of deaths due to all causes.

Table 3: Number and percentage of deaths with *Clostridium difficile* mentioned on the death certificate by underlying cause of death (ICD), 2005

Underlying Cause of Death (ICD)	ICD10 code	Deaths with <i>Clostridium difficile</i> mentioned 2005	
		Number	Percentage of all causes
Infectious & Parasitic Diseases	A00-B99	18	53%
Neoplasms	C00-D48	2	6%
Diseases of the Circulatory System	I00-I99	10	29%
Diseases of the Respiratory System	J00-J99	1	3%
Diseases of the Digestive System	K00-K93	1	3%
Diseases of the Genitourinary System	N00-N99	1	3%
External causes of mortality	V01-Y98	1	3%
All Causes of Death		34	100%

11. Patients who die with *Clostridium difficile* are often already seriously ill with another condition. The table shows that where *Clostridium difficile* is mentioned on a death certificate, the most likely underlying cause of death is either Infectious & Parasitic Diseases (53%) or Diseases of the Circulatory System (29%). All deaths that have

Clostridium difficile recorded as the underlying cause of death are coded to Infectious & Parasitic Diseases.

Further Information

12. Further information on the statistics provided in this publication can be obtained from:

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Annex A

1. Enterocolitis due to *Clostridium difficile* is predominantly seen in patients who have been treated with broad spectrum antibiotics for other infections. The overuse of antibiotics may alter the normal intestinal balance of micro-organisms and increase the risk of developing *Clostridium difficile* thus leading to diarrhoea, etc. Those at highest risk of severe infection and death are the very elderly, those who had stomach or bowel surgery and/or long stays in healthcare settings.
2. The infection can spread from person to person because those suffering from *Clostridium difficile* associated disease shed spores in their faeces. Spores can survive for a very long time in the environment and can be transported on the hands of health care personnel who have direct contact with infected patients or with environmental surfaces (floors, bedpans, toilets etc) contaminated with *Clostridium difficile*.
3. Routine death statistics are usually based on a single cause for each death. This is the underlying cause of death, defined by the World Health Organisation as:
 - the disease which initiated the train of events leading to death; or
 - the circumstances of the accident/violence which produced a fatal injury.
4. Since 2001, in line with the rest of the UK, the tenth revision of the International Statistical Classification of Diseases, Injuries and Causes of Death (ICD10) is used to classify cause of death in Northern Ireland. The Tenth Revision of the International Classification of Diseases (ICD-10) does not include a specific code for *Clostridium difficile*.
5. *Clostridium difficile* causes a range of clinical illness with enterocolitis being its most common manifestation. The ICD10 code used for “enterocolitis due to clostridium difficile” is A04.7. In the period 1979 to 2000 the ninth revision of the International Statistical Classification of Diseases, Injuries and Causes of Death (ICD9) was used to classify cause of death. There is no ICD9 code for “enterocolitis due to clostridium difficile”.

6. For causes other than enterocolitis that are also known to be associated with *Clostridium difficile*, it is not possible to identify from ICD codes alone the number of deaths where *Clostridium difficile* actually contributed to the death. However it has been possible to identify a small number of additional deaths in which *Clostridium difficile* was mentioned on the death certificate but not coded as A.04.7 by examining, both electronically and manually, the cause of death written by the doctor on the death certificate. To assist this process research has been undertaken in England and Wales to identify which ICD codes are related to *Clostridium difficile*¹. The text of these records was then searched manually for mentions of *Clostridium difficile*, *C.difficile* or pseudomembranous colitis. This information has been used in the analysis undertaken for this paper.

7. Codes used to identify deaths where *Clostridium difficile* was the underlying cause of death (on deaths where *Clostridium difficile* was mentioned) were A04.7, A09, A41.4, and A49.8.

¹ "Deaths involving *Clostridium difficile*: England and Wales, 1999-2004". Health Statistics Quarterly 30, p56-60. Available at http://www.statistics.gov.uk/downloads/theme_health/HSQ30.pdf