

# Annual Epidemiological Report

August 2018

## Bacterial Meningitis, Not Otherwise Specified, in Ireland, 2017

### Key Facts

25 cases of Bacterial Meningitis, NOS, were notified in 2017:

- 14 *Escherichia coli*;
- 1 case each of *Pseudomonas stutzeri* and *Streptococcus constellatus*;
- 9 cases with causative pathogen not specified
- 3 deaths due to infection

Other cases of specified bacterial meningitis notified in 2017 (excluding cases caused by *Neisseria meningitidis*) included:

- 1 *Haemophilus influenzae*;
- 2 *Streptococcus pyogenes* (Invasive Streptococcus Group A);
- 6 *Streptococcus agalactiae* under 90 days of age (Invasive Streptococcus Group B);
- 1 *Leptospira* species;
- 37 *Streptococcus pneumoniae*;
- 1 *Mycobacterium bovis*

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## Epidemiology

Apart from *Neisseria meningitidis*, which is the most common cause of bacterial meningitis in Ireland, other pathogens cause this disease, including those caused by non-notifiable organisms. For information on invasive meningococcal disease (*N. meningitidis*), see that annual report. Information on bacterial meningitis caused by specified notifiable diseases is summarised below and further pathogen-specific data are available in the relevant report. The figures presented in this report are based on data extracted from the Computerised Infectious Disease Reporting (CIDR) system between 8<sup>th</sup> and 29<sup>th</sup> August, 2018. Census data from 2016 were used to calculate 2016 incidence rates. These figures may differ from those published previously due to on-going updating of notification data on CIDR.

Bacterial meningitis caused by diseases not otherwise specified (NOS):

In total, 25 cases of meningitis under this disease category were notified in 2017, three of whom died from their illness. Fifteen (60%) were case classified as confirmed and five each (20%) were classified as probable and possible (Table 1). The causative pathogens were identified in 16 (64%) of cases (Table 2).

Prior to 1st January 2012, all cases of Group B streptococcus, also known as *S. agalactiae*, were notifiable under the 'Bacterial Meningitis (NOS)' disease category. In 2012, this changed when *Streptococcus agalactiae* in children <90 days of age was notifiable in its own right, including those which were meningitis-related. This has meant that the overall number of bacterial meningitis (NOS) cases has, as a result, declined between 2012 and 2017 compared to previous years. In other words, without this change there would have been 33 extra cases reported on CIDR under the bacterial meningitis (NOS) category between 2012 and 2017. Furthermore, there is evidence of an additional 58 possible meningitis-related cases of this disease in this same age group during this same six year period where *S. agalactiae* was either isolated from or detected in CSF specimens from patients that were not clinically categorised as having 'meningitis'. These 58 cases have been excluded from Table 3, which is a summary breakdown of all bacterial meningitis cases by their causative pathogen (both specified and not specified types except for meningococcal disease) between 2012 and 2017.

Among the bacterial meningitis (NOS) cases notified in 2017 were 14 caused by *Escherichia coli* (age range five days to 67 years; all but one was confirmed and none of which had their serotype details reported). There was one case each caused by *Pseudomonas stutzeri* and *Streptococcus constellatus*, both confirmed. There were nine other cases whose causative organism was not identified, four classified as probable and five as possible. Three deaths were reported, all caused by infection, one each due to *E. coli* and *S. constellatus* and another where the cause of infection was not identified.

## Bacterial meningitis caused by specified notifiable diseases:

### *Haemophilus influenzae*

One case of meningitis related *H. influenzae* was notified in 2017, aged 50-54 years old with an untyped strain. See Table 3 and the annual report on invasive *H. influenzae* disease for further details.

### *Streptococcus Group A infection (invasive) (Group A Strep)*

Two cases of *Streptococcus pyogenes* related meningitis were notified in 2017, compared to none in 2016. Both were male and aged five years or less (Table 3).

### *Streptococcus Group B infection (invasive) (Group B Strep) <90 days of age*

Six cases of *Streptococcus agalactiae* related meningitis under 90 days of age were notified to CIDR during 2017, (compared to two in 2016), all but one was male (Table 3). Four other cases were reported to be CSF positive for Group B Strep, but were not labelled as having clinical meningitis or any other clinical description.

### *Leptospira species*

One case of leptospirosis related meningitis was reported in a male aged 20-24 years.

### *Listeria species*

Two cases of listeriosis related meningitis were notified in 2017, males aged between 50 and 84 years. One serotype was identified, type 1/2a. Of the two cases, one had an underlying medical condition reported (Table 3).

### *Streptococcus pneumoniae*

In 2017, 37 cases of pneumococcal related meningitis were notified, unchanged in the previous year (Table 3). The median age was 46 years (range five days to 91 years). Five pneumococcal meningitis-related deaths were reported during 2017, four of whom died from their infections. Of the 37 cases, eight were vaccinated with either the PCV13 (one case aged 1-4 years) or PPV23 vaccine (seven cases aged between 30-85+ years), four aged <1 year were incompletely vaccinated with PCV13 and 19 were not vaccinated with either vaccine and six had a vaccination status that was either unknown or not specified. Table 4 presents the vaccination status, serotype and additional risk factor, if any, for each case.

### *Mycobacterium tuberculosis complex*

One case of *M. bovis* related meningitis was reported in a female aged 10-14 years.

## Further information available on HPSC website:

<http://www.hpsc.ie/a-z/vaccinepreventable/bacteriameningitis/>

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**Table 1. Number and percentage of bacterial meningitis (NOS) cases reported by case classification, Ireland, 2012-2017**

Case Classification	2012	2013	2014	2015	2016	2017	2012-2017
Confirmed	12	6	13	16	5	15	67
Probable	12	10	2	7	5	5	41
Possible	5	5	8	9	5	5	37
<b>Total</b>	<b>29</b>	<b>21</b>	<b>23</b>	<b>32</b>	<b>15</b>	<b>25</b>	<b>145</b>
% Confirmed	41.4%	28.6%	56.5%	50.0%	33.3%	60.0%	46.2%

Note: Meningitis related-*Streptococcus agalactiae* <90 days of age excluded

**Table 2. Number and percentage of bacterial meningitis (NOS) cases reported with and without an identified causative organism, Ireland, 2012-2017**

Causative Organism	2012	2013	2014	2015	2016	2017	2012-2017
Known	11	6	13	17	5	16	68
Unknown/Not specified	18	15	10	15	10	9	77
<b>Total</b>	<b>29</b>	<b>21</b>	<b>23</b>	<b>32</b>	<b>15</b>	<b>25</b>	<b>145</b>
% Known	37.9%	28.6%	56.5%	53.1%	33.3%	64.0%	46.9%

Note: Meningitis related-*Streptococcus agalactiae* <90 days of age excluded

**Table 3. Annual notifications of all bacterial meningitis (not otherwise specified and specified, but excluding *Neisseria meningitidis*), Ireland, 2012-2017**

Notified under	Causative organism	2012	2013	2014	2015	2016	2017	2012-2017
<i>Haemophilus influenzae</i> disease (invasive)	<i>Haemophilus influenzae</i>	3	2	7	5	1	1	19
Leptospirosis	<i>Leptospira</i> spp.	1	0	0	0	0	1	2
Listeriosis	<i>Listeria</i> spp.	2	2	1	6	4	2	17
<i>Streptococcus pneumoniae</i> infection (invasive)	<i>Streptococcus pneumoniae</i>	37	33	39	32	37	37	215
Streptococcus Group A infection (invasive) (iGAS)	<i>Streptococcus pyogenes</i>	1	3	0	4	0	2	10
Streptococcus Group B infection (invasive) (Group B Strep) < 90 days of age	<i>Streptococcus agalactiae</i> †	11	5	5	4	2	6	33
Tuberculosis*	<i>Mycobacterium</i> spp.*	4	3	1	2	0	1	11
<b>Total Bacterial Meningitis, specified, excluding <i>Neisseria meningitidis</i></b>		<b>59</b>	<b>48</b>	<b>53</b>	<b>53</b>	<b>44</b>	<b>50</b>	<b>307</b>
	<i>Enterococcus faecium</i>	1	0	0	0	0	0	1
	<i>Enterococcus species</i>	0	0	1	0	0	0	1
	<i>Escherichia coli</i>	7	4	8	15	4	14	52
	<i>Escherichia coli</i> / <i>Haemophilus influenzae</i>	0	0	0	0	1	0	1
	Group C Streptococcus	1	0	0	0	0	0	1
	<i>Klebsiella pneumoniae</i>	0	0	1	0	0	0	1
	<i>Micrococcus luteus</i>	0	0	1	0	0	0	1
	<i>Pasteurella multocida</i>	0	0	0	1	0	0	1
Bacterial Meningitis, not otherwise specified	<i>Pseudomonas stutzeri</i>	0	0	0	0	0	1	1
	<i>Staphylococcus aureus</i>	1	0	0	1	0	0	2
	<i>Staphylococcus aureus</i> & <i>Staphylococcus capitis</i>	1	0	0	0	0	0	1
	<i>Streptococcus agalactiae</i> **	0	1	1	0	0	0	2
	<i>Streptococcus constellatus</i>	0	0	0	0	0	1	1
	<i>Streptococcus salivarius</i>	0	1	0	0	0	0	1
	<i>Streptococcus suis</i>	0	0	1	0	0	0	1
	Unknown	2	2	1	4	3	0	12
	Not specified	16	13	9	11	7	9	65
<b>Total Bacterial Meningitis, not otherwise specified</b>		<b>29</b>	<b>21</b>	<b>23</b>	<b>32</b>	<b>15</b>	<b>25</b>	<b>145</b>
<b>Total Bacterial Meningitis, specified and not otherwise specified, but excluding <i>Neisseria meningitidis</i></b>		<b>88</b>	<b>69</b>	<b>76</b>	<b>85</b>	<b>59</b>	<b>75</b>	<b>452</b>

\*Tuberculosis meningitis figure for 2017 is provisional

†*Streptococcus agalactiae* < 90 days of age in 2012 to 2017-these figures do not include 58 meningitis-related cases where the causative organism was isolated from or detected in CSF specimens from patients that were not clinically categorised as having 'meningitis'

\*\**Streptococcus agalactiae* for cases > 90 days of age only

NA not applicable

§Meningitis-related Lyme neuroborreliosis cases are not included in this report

**Table 4. Details of the 37 pneumococcal meningitis cases reported, Ireland, 2017**

Age Group (years)	Died	Cause of Death	Vaccination Status	No. of PCV13 / Prevenar 13 Doses	No. of PPV23 / Pneumovax 23 Doses	Serotype of Infection	Serotype Covered by Vaccine Type	Additional Risk Factors (excluding age 65+ years)
<1 year	.	.	I	U	0	9N	PPV23	No
	.	.	I	U	NA	NA	.	Not known
	.	.	I	U	NA	19A	PCV13, PPV23	No
	.	.	I	U	NA	19F	PCV13, PPV23	No
	.	.	N	0	0	NA	.	No
1-4	Died	Due to this ID	Y	U	N	24B	Not covered	No
10-14	.	.	U	0	NA	NA	.	No
	.	.	N	0	0	NA	.	No
30-34	.	.	Y	0	1	12F	PPV23	Yes
35-39	.	.	U	U	NA	9N	PPV23	Yes
	.	.	N	0	0	11A	PPV23	Yes
	.	.	U	U	U	3	PCV13, PPV23	No
	.	.	Y	0	1	24F	Not covered	Yes
	.	.	U	0	NA	10A	PPV23	Yes
40-44	.	.	Y	U	2	11B	Not covered	Yes
	.	.	N	0	0	12A	Not covered	Yes
	.	.	N	0	0	NA	.	Yes
	Died	Due to this ID	N	0	0	12F	PPV23	Yes
45-49	.	.	N	0	0	8	PPV23	Yes
	.	.	N	0	0	12F	PPV23	Yes
	.	.	N	0	0	12F	PPV23	Yes
55-59	.	.	N	0	0	17F	PPV23	Yes
	.	.	N	0	0	12F	PPV23	Yes
	.	.	N	0	0	23B	Not covered	No
	.	.	N	0	0	15A	Not covered	Not known
60-64	.	.	Y	0	1	NA	.	Yes
	.	.	N	0	0	12F	PPV23	Yes
	.	.	N	0	0	22F	PPV23	Yes
	.	.	N	0	0	NA	.	No
70-74	.	.	Y	0	1	NA	.	Yes
	.	.	U	0	NA	19A	PCV13, PPV23	Yes
	.	.	N	0	0	8	PPV23	No
	.	.	U	U	U	NA	.	Yes
80-84	Died	Not due to this ID	Y	0	1	NA	.	Yes
	Died	Due to this ID	N	0	0	19F	PCV13, PPV23	Yes
85+	.	.	N	0	0	23B	Not covered	Yes
	Died	Due to this ID	Y	0	1	NA	.	Yes

Vaccination Status: Y=Yes, N=No; I=incompletely vaccinated; U=Unknown; NA=not applicable or not available