

Annual Epidemiological Report

August 2019

Bacterial Meningitis, Not Otherwise Specified, in Ireland, 2018

Key Facts

18 cases of Bacterial Meningitis, NOS, were notified in 2018:

- 6 *Escherichia coli*
- 2 *Streptococcus agalactiae* over 90 days of age
- 1 case each of *Klebsiella pneumoniae*, *Staphylococcus aureus* and *Streptococcus anginosus*
- 7 cases with a causative pathogen not specified
- 2 deaths reported, but actual cause of death not specified

Other cases of specified bacterial meningitis notified in 2018 (excluding cases caused by *Neisseria meningitidis*) included:

- 4 *Haemophilus influenzae*
- 7 *Streptococcus agalactiae* under 90 days of age (Invasive Streptococcus Group B)
- 3 *Listeria* species
- 2 *Mycobacterium bovis*
- 40 *Streptococcus pneumoniae*

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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 on 24th July, 2019. 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, 18 cases of meningitis under this disease category were notified in 2018, two of whom died, but the actual causes of their deaths was reported as either not known or not specified at the time of writing. Ten (55.6%) were case classified as confirmed, five (27.8%) as probable and three (16.7%) were classified as possible (Table 1). The causative pathogens were identified in 12 (66.7%) cases (Table 2).

Table 3 summarises all bacterial meningitis cases by their causative pathogen (both specified and not specified types except for meningococcal disease) between 2013 and 2018.

Among the bacterial meningitis (NOS) cases notified in 2018 were: *Escherichia coli*, (*n*=6) (age range 1-5 months, all but one was confirmed and none of which had their serotype details reported); *Streptococcus agalactiae* (*n*=2) (age range 53-77 years); one case each caused by *Klebsiella pneumoniae*, *Staphylococcus aureus* and *Streptococcus anginosus*, all confirmed; causative organism not identified (*n*=7), of which five were classified as probable and two as possible.

Two deaths were reported, one in a four month old infant with a *Klebsiella pneumoniae* infection, but whose cause of death was not specified and, another in an adult aged 85+ years where neither causative organism or cause of death were specified.

Bacterial meningitis caused by specified notifiable diseases:

Haemophilus influenzae

Four cases of meningitis related *H. influenzae* were notified in 2018, aged 2-71 years, two with a non-typeable strain and one each with a type f and non-type b infection. See Table 3 and the annual report on invasive *H. influenzae* disease for further details.

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

Seven cases of *Streptococcus agalactiae* related meningitis under 90 days of age (based on the difference between the event date and date of birth) were notified to CIDR during 2018, (compared to six in 2017) (Table 3). An additional five cases were reported to be CSF positive for

Group B Strep, but were reported as having clinical meningitis (and no other clinical information provided).

Listeria species

Three cases of listeriosis related meningitis were notified in 2018, all females aged between 70 and 82 years. The serotypes identified were 1/2a, 4b, and for one, no serotype was reported. All three cases had an underlying medical condition (Table 3).

Mycobacterium tuberculosis complex

Two cases of *tuberculosis* related meningitis were reported, one was aged 80-84 years and the other aged 15-19 years.

Streptococcus pneumoniae

In 2018, 40 cases of pneumococcal related meningitis were notified, an increase of 8.1% from 37 cases in the previous year (Table 3). The median age was 56.3 years (range two months to 83 years). Two pneumococcal meningitis-related deaths (both adults) were reported, both of whom died from their infections. Of the 40 cases, five (12.5%) were aged <1 year. Of these, four of the five infants were reported as vaccinated but the number of doses was not provided; 26 (65%) of the 40 cases were reported as having risk factors, only five of whom were reported as vaccinated. Serotype 19A (included in PCV13) was identified for one of the infant cases reported as vaccinated (with an unknown number of dose or timing of dose prior to disease onset). Table 4 presents the reported vaccination status, serotype and additional risk factor, if any, for each case.

Further information available on HPSC website:

<https://www.hpsc.ie/a-z/vaccinepreventable/bacterialmeningitis/>

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Table 1. Number and percentage of bacterial meningitis (NOS) cases reported by case classification, Ireland, 2013-2018

Case Classification	2013	2014	2015	2016	2017	2018	2013-2018
Confirmed	6	13	16	3	15	10	63
Probable	5	8	9	6	5	5	38
Possible	10	2	7	6	5	3	33
Total	21	23	32	15	25	18	134
% Confirmed	28.6%	56.5%	50.0%	20.0%	60.0%	55.6%	47.0%

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, 2013-2018

Causative Organism	2013	2014	2015	2016	2017	2018	2013-2018
Known	6	13	17	5	16	11	68
Unknown/Not specified	15	10	15	10	9	7	66
Total	21	23	32	15	25	18	134
% Known	28.6%	56.5%	53.1%	33.3%	64.0%	61.1%	50.7%

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, 2013-2018

Notified under	Causative organism	2013	2014	2015	2016	2017	2018	2013-2018
<i>Haemophilus influenzae</i> disease (invasive)	<i>Haemophilus influenzae</i>	2	7	5	1	1	4	20
Leptospirosis	<i>Leptospira</i> spp.	0	0	0	0	1	0	1
Listeriosis	<i>Listeria</i> spp.	2	1	6	4	2	3	18
<i>Streptococcus pneumoniae</i> infection (invasive)	<i>Streptococcus pneumoniae</i>	33	39	32	37	37	40	218
Streptococcus Group A infection (invasive) (iGAS)	<i>Streptococcus pyogenes</i>	3	0	4	0	2	0	9
Streptococcus Group B infection (invasive) (Group B Strep) < 90 days of age	<i>Streptococcus agalactiae</i> †	5	5	4	2	6	7	29
Tuberculosis*	<i>Mycobacterium</i> spp.*	3	1	2	0	1	2	9
Total Bacterial Meningitis, specified, excluding <i>Neisseria meningitidis</i>		48	53	53	44	50	56	304
Bacterial Meningitis, not otherwise specified	<i>Enterococcus</i> species	0	1	0	0	0	0	1
	<i>Escherichia coli</i>	4	8	15	4	14	6	51
	<i>Escherichia coli</i> / <i>Haemophilus influenzae</i>	0	0	0	1	0	0	1
	<i>Klebsiella pneumoniae</i>	0	1	0	0	0	1	2
	<i>Micrococcus luteus</i>	0	1	0	0	0	0	1
	<i>Pasteurella multocida</i>	0	0	1	0	0	0	1
	<i>Pseudomonas stutzeri</i>	0	0	0	0	1	0	1
	<i>Staphylococcus aureus</i>	0	0	1	0	0	1	2
	<i>Streptococcus agalactiae</i>	1	1	0	0	0	2	4
	<i>Streptococcus anginosus</i>	0	0	0	0	0	1	1
	<i>Streptococcus constellatus</i>	0	0	0	0	1	0	1
	<i>Streptococcus salivarius</i>	1	0	0	0	0	0	1
	<i>Streptococcus suis</i>	0	1	0	0	0	0	1
	Unknown		2	1	4	3	0	0
Not specified		13	9	11	7	9	7	56
Total Bacterial Meningitis, not otherwise specified		21	23	32	15	25	18	134
Total Bacterial Meningitis, specified and not otherwise specified, but excluding <i>Neisseria meningitidis</i>		69	69	76	85	59	75	74

*Tuberculosis meningitis figure for 2018 is provisional

†*Streptococcus agalactiae* < 90 days of age in 2013 to 2018-these figures do not include 51 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 40 pneumococcal meningitis cases reported, Ireland, 2018

Age Group (years)	Died	Cause of Death	Vaccination Status Complete	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	.	.	Y	U	0	.	.	No
	.	.	I	U	NA	23B	Not covered	
	.	.	I	U	0	19A	PCV13.	No
	.	.	Y	U	NA	24F	Not covered	Yes
	.	.	N	0	0	33F	PPV23	Under investigation
10-14	.	.	I	U	0	17F	PPV23	No
15-19	.	.	U	U	U	.	.	Yes
25-29	.	.	N	0	0	23A	Not covered	Yes
	.	.	N	0	0	23A	Not covered	Yes
30-34	.	.	U	U	U	.	.	Yes
	.	.	N	0	0	22F	PPV23	Yes
	.	.	N	0	0	35B	Not covered	No
40-44	.	.	N	0	0	.	.	Yes
	.	.	N	0	0	12F	PPV23	Yes
	.	.	U	U	U	.	.	Yes
45-49	.	.	N	0	0	.	.	Yes
	Died	Due to this ID	U	U	U	10A	PPV23	No
55-59	.	.	N	0	0	23B	Not covered	Yes
	.	.	N	0	0	.	.	Yes
	.	.	N	0	0	20	PPV23	No
	.	.	N	0	0	.	.	No
	.	.	Y	0	1	11A	PPV23	Yes
60-64	.	.	U	0	U	12F	PPV23	Yes
	.	.	N	0	0	9N	PPV23	Yes
	.	.	N	0	0	8	Not covered	Yes
	.	.	N	0	0	16F	Not covered	Yes
	.	.	N	0	0	12F	PPV23	Yes
	.	.	U	0	NA	.	.	Not known
65-69	.	.	N	0	0	.	.	Yes
	.	.	U	0	NA	15B/C	15B but not 15C covered by PPV23	Yes
	Died	Due to this ID	U	U	U	.	.	No
	.	.	N	0	0	35B	Not covered	Yes
	.	.	U	0	U	9N	PPV23	No
70-74	.	.	Y	0	1	31	Not covered	Yes
75-79	.	.	U	0	U	23B	Not covered	Yes
	.	.	Y	0	1	.	.	No
	.	.	N	0	0	28A	Not covered	No
80-84	.	.	N	0	0	23A	Not covered	Yes
	.	.	Y	0	1	19A	PCV13/PPV23	Yes
	.	.	Y	0	1	19A	PCV13/PPV23	Yes

- Vaccination Status: Y=Yes, N=No; I=incompletely vaccinated; U=Unknown; NA=not applicable or not available;
- Risk factors refer to the following conditions: Diabetes mellitus, Current smoker, Alcohol abuse, Chronic heart disease, Chronic lung disease, Chronic liver disease, Chronic renal disease / nephrotic syndrome, History of previous invasive bacterial disease, Immunosuppressive condition or therapies