

Annual Epidemiological Report

September 2023

Bacterial Meningitis in Ireland, 2022

Key Facts

Since 2018, a marked reduction was observed in the number of notified bacterial meningitis cases (excluding those caused by *Neisseria meningitidis*). Some of this is likely to be attributable to the impact of measures introduced during the COVID-19 pandemic, which began in early 2020.

Year	No. Cases
2018	75
2019	64
2020	42
2021	32
2022	42

Among the bacterial meningitis cases not caused by other notifiable organisms reported during this period the organisms identified include:

Year	2018	2019	2020	2021	2022
<i>Escherichia coli</i>	6	9	5	7	2
<i>Staphylococcus aureus</i>	1	1	0	0	0
<i>Streptococcus agalactiae</i> Group B strep*	2	0	1	0	1
Other (including by organisms unknown)	9	9	12	5	8

*excluding those specified under 90 days of age

Other cases of *specified* bacterial meningitis caused by specified notifiable organisms notified since 2018 include:

Year	2018	2019	2020	2021	2022
<i>Haemophilus influenzae</i>	4	2	2	2	7
<i>Leptospira species</i>	0	0	2	0	0
<i>Listeria species</i>	3	5	1	3	5
<i>Streptococcus pneumoniae</i>	40	28	13	8	12
<i>Streptococcus pyogenes</i> (Group A Strep)	0	1	1	1	1
<i>Streptococcus agalactiae</i> (Group B strep*)	7	7	1	4	5
Tuberculosis	3	2	4	2	1

Suggested citation: HSE Health Protection Surveillance Centre. Bacterial meningitis, in Ireland, 2022. Dublin: HSE HPSC; 2023

© HSE Health Protection Surveillance Centre, 2023. Reproduction is authorised, provided source is acknowledged.

Epidemiology

Bacterial meningitis in Ireland, is caused by a variety of pathogens, including those caused by notifiable and non-notifiable organisms. The current report details notification for bacterial meningitis in Ireland excluding those caused by *Neisseria meningitidis* as this is separately notifiable under the disease invasive meningococcal disease (IMD). For further information 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 pathogen report. The figures presented in this report are based on data extracted from the Computerised Infectious Disease Reporting (CIDR) system on 14th August 2023. These figures may differ from those published previously due to on-going updating of notification data on CIDR.

Figure 1 presents no discernible pattern in the number of bacterial meningitis cases (specified and not otherwise specified), deaths or case fatality rates between 2004 and 2022 (excluding those caused by IMD). Most cases of bacterial meningitis not caused by other notifiable organisms between 2018 and 2022 occurred in those aged <1 year of age (Figure 2).

Bacterial meningitis *not caused by specified notifiable diseases*:

Between 2018 and 2022, a total of 78 cases of meningitis under this disease category were notified. Of these, 57 (73.1%) were case classified as confirmed, nine (11.5%) as probable and 12 (15.4%) were classified as possible (Table 1).

Most cases were less than one year of age (n=37/78; 47.4%) with fewer cases in those aged 65+ years (n= 15; 19.2%) and aged 45-64 years (n=11; 14.1%).

The causative pathogens were identified in 47 (60.3%) of cases (Table 2): 29 were attributable to *Escherichia coli* (37.2%) (Table 3).

Of the 78 cases, five deaths were reported, one each was associated with *Streptococcus agalactiae* (Group B Strep) and *Klebsiella pneumoniae*, with the other three having an infection with an unknown aetiology, of which one died from their infection, the second was awaiting a coroner's report at the time of writing and the third had no cause of death details reported.

Bacterial meningitis *caused by specified notifiable diseases*:

Among the 177 specified bacterial meningitis cases notified between 2018 and 2022, were: 101 (57.1%) cases of *Streptococcus pneumoniae* (Pneumococcus), 24 (13.6%) cases of *Streptococcus agalactiae* (Group B strep) under 90 days of age and 17 cases each (9.6% each) of *Haemophilus influenzae* and *Listeria* species (Table 3).

Seventeen deaths were reported (9.6% case fatality), most of which (12; 70.6%) were associated with *Streptococcus pneumoniae*.

Haemophilus influenzae

Seventeen cases of meningitis related *H. influenzae* were notified between 2018 and 2022, aged 1 month to 83 years, six with a non-typeable strain, five were untyped, two each of type f and not type B and one each of type a and type b infections. The latter two cases died with one

attributable to infection and the other awaiting attribution at the time of writing. See Table 3 and the annual report on invasive *H. influenzae* disease for further details.

Listeria species

Seventeen cases of listeriosis related meningitis were notified between 2018 and 2022 (Table 3), aged two weeks to 97 years. Among the serotypes identified were five type 4b, four type 1/2a and one type 1/2. Eleven of the cases had an underlying medical condition, one of which was <1 year of age and was also notified a Herpes Simplex type 6 viral meningitis.

Leptospira species

Two cases were reported between 2018 and 2022 (Table 3), aged 44-48 years, one of which was confirmed.

Mycobacterium tuberculosis complex

Between 2018 and 2022, 12 cases of *tuberculosis* related meningitis were reported (Table 3), one was aged 10 months, another aged 2 years and the remainder aged 17 to 90 years. One death in a 50-54-year-old was reported, with the cause of death not known.

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

Twenty-four 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 between 2018 and 2022 (Table 3). Two deaths were reported, one of which caused by the infection. An additional 11 cases (not shown in Table 3) were reported to be CSF positive for Group B Strep but were reported as having clinical meningitis (and no other clinical information provided).

Streptococcus pneumoniae

Between 2018 and 2022, a total of 101 cases of pneumococcal related meningitis were notified (Table 3), with an age range of between 2 months and 84 years. Twelve pneumococcal meningitis-related deaths were reported, aged between 11 and 84 years with five of them due to infection and two others awaiting attribution. Of the 101 cases, nine (8.9%) were aged <1 year, 21 (20.8%) aged 1-24 years, 14 (13.8%) aged 25-44, 27 (26.7%) aged 45-64 and 30 (29.7%) aged 65+ years.

Streptococcus pyogenes (Group A strep)

Four cases of bacterial meningitis caused by Group A strep were reported during 2018 to 2022 (Table 3), the cases were aged 4-38 years, one case aged 10 years died from their infection.

Further information available on HPSC website:

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

Acknowledgements

HPSC wishes to thank all who provided data for this report: Departments of Public Health, Irish Meningitis & Sepsis Reference Laboratory and other Microbiology Laboratories

Report prepared by:

Piaras O’Lorcain, Geraldine Casey, Eimear Keane, Vaccine Preventable Disease (VPD) team

Table 1. Number and percentage of bacterial meningitis (not caused by other notifiable diseases) cases reported by case classification, Ireland, 2018-2022

Case Classification	2018	2019	2020	2021	2022	2018-2022
Confirmed	11	14	10	12	10	57
Probable	5	2	2	0	0	9
Possible	2	3	6	0	1	12
Total	18	19	18	12	11	78
% Confirmed	61.1	73.7	55.6	100.0	90.9	73.1

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

Table 2. Number and percentage of bacterial meningitis (not caused by other notifiable diseases) cases reported with and without an identified causative organism, Ireland, 2018-2022

Causative Organism	2018	2019	2020	2021	2022	2018-2022
Known	11	13	6	11	6	47
Unknown/Not specified	7	6	12	1	5	31
Total	18	19	18	12	11	78
% Known	61.1	68.4	33.3	91.7	54.5	60.3

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

Figure 1. Number of bacterial meningitis cases and deaths (excluding invasive meningococcal disease (IMD) with % Case Fatality Ratio, Ireland, 2004-2022

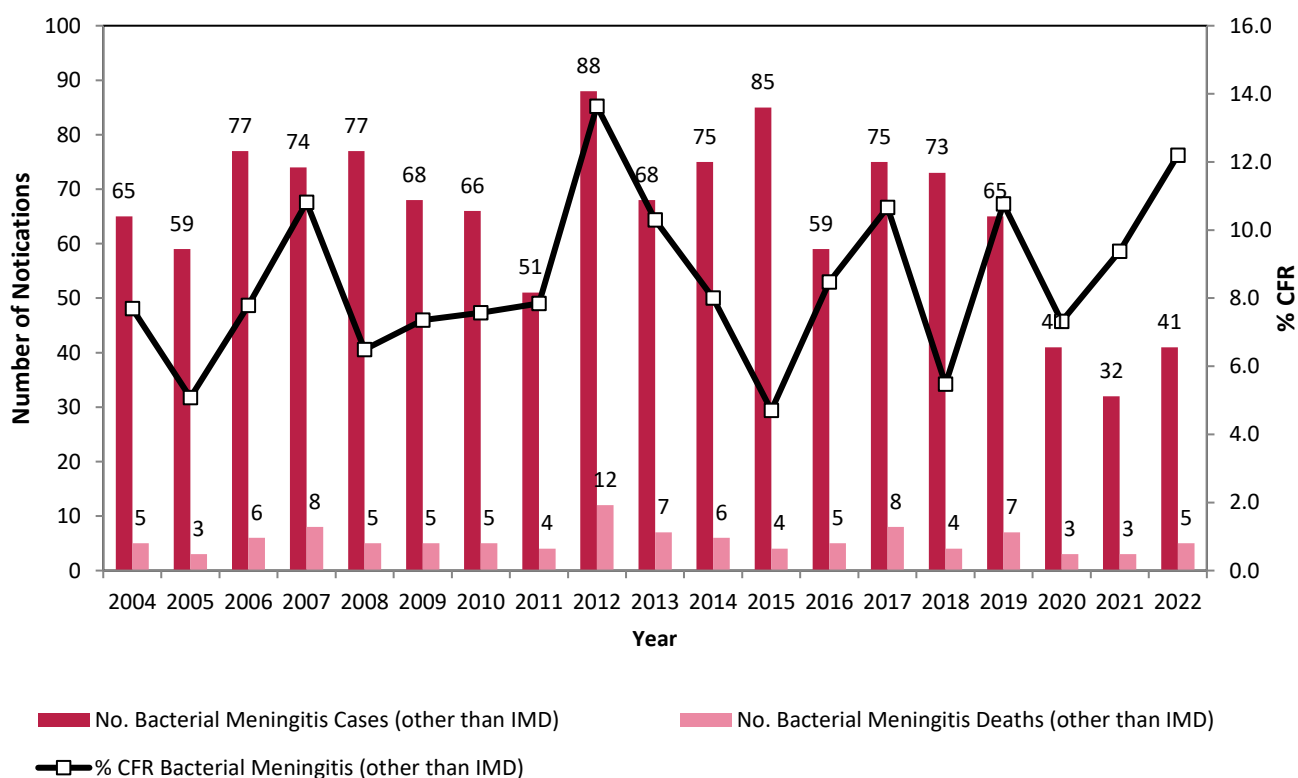
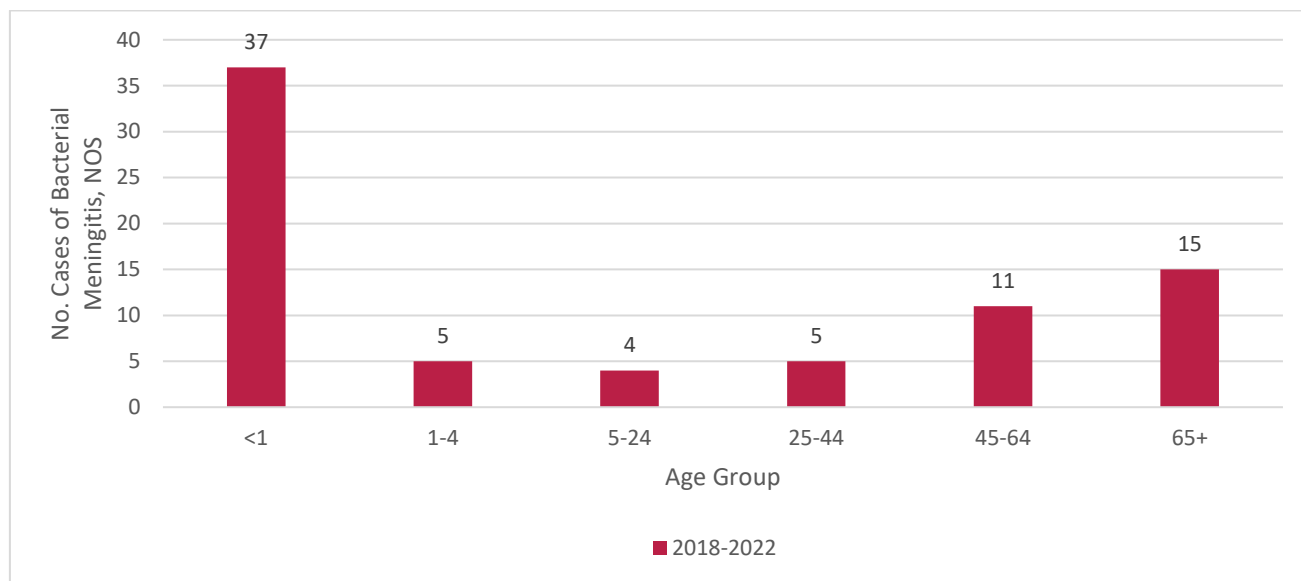


Figure 2. Number of bacterial meningitis cases (not caused by other notifiable diseases) by age group, Ireland, 2018-2022*



*Excludes one case in 2020 case with an unknown age

Table 3. Annual notifications of all bacterial meningitis (excluding *Neisseria meningitidis*), Ireland, 2018-2022

Notified under	Causative organism	2018	2019	2020	2021	2022	2018-2022
<i>Haemophilus influenzae</i> disease (invasive)	<i>Haemophilus influenzae</i>	4	2	2	2	7	17
Leptospirosis	<i>Leptospira</i> spp.	0	0	2	0	0	2
Listeriosis	<i>Listeria</i> spp.	3	5	1	3	5	17
<i>Streptococcus pneumoniae</i> infection (invasive)	<i>Streptococcus pneumoniae</i>	40	28	13	8	12	101
Streptococcus pyogenes Group A infection (invasive) (iGAS)	<i>Streptococcus pyogenes</i>	0	1	1	1	1	4
Streptococcus agalactiae Group B infection (invasive) (Group B Strep) < 90 days of age	<i>Streptococcus agalactiae</i> †	7	7	1	4	5	24
Tuberculosis*	<i>Mycobacterium</i> spp.*	3	2	4	2	1	12
Total Bacterial Meningitis caused by other notifiable diseases excluding IMD		57	45	24	20	31	177
Bacterial Meningitis, not caused by other notifiable diseases	<i>Capnocytophaga canimorsus</i>	0	1	0	0	0	1
	<i>Eikenella corrodens</i>	0	1	0	0	0	1
	<i>Enterobacter cloacae</i> & <i>Staphylococcus capitis</i>	0	0	0	0	1	1
	<i>Enterobacter cloacae</i> complex	0	0	0	1	0	1
	<i>Enterococcus</i> species	0	0	0	0	1	1
	<i>Escherichia coli</i>	6	9	5	7	2	29
	<i>Klebsiella oxytoca</i>	0	0	0	0	1	1
	<i>Klebsiella pneumoniae</i>	1	0	0	2	0	3
	<i>Staphylococcus aureus</i>	1	1	0	0	0	2
	<i>Staphylococcus capitis</i>	0	1	0	0	0	1
	<i>Streptococcus agalactiae</i> **	2	0	1	0	1	4
	<i>Streptococcus anginosus</i>	1	0	0	0	0	1
	<i>Streptococcus thermophilus/salivarius</i>	0	0	0	1	0	1
	Unspecified	7	6	12	1	5	31
Total Bacterial Meningitis, not caused by other notifiable diseases		18	19	18	12	11	78
Total Bacterial Meningitis, excluding <i>Neisseria meningitidis</i>		75	64	42	32	42	255

*Tuberculosis meningitis figure for 2022 is provisional

†*Streptococcus agalactiae* < 90 days of age in 2018 to 2022-these figures do not show 11 additional 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

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