Annual Epidemiological Report

September 2024

Haemophilus influenzae, in Ireland, 2022

Key Facts

During 2018 to 2022, the impact of the COVID-19 pandemic is evident from the marked reduction in the number of cases, particularly from Quarter 2, 2020 to Quarter 3, 2021. Since Q3-2021, the trend has been upward with the highest number of cases recorded to date in Q4-2022.

Year	No. Cases
2018	58
2019	63
2020	31
2021	18
2022	69

Non-typeable/non-capsular cases accounted for the majority of invasive *H. influenzae* cases notified during this five year period (n=147/239; 61.5%); the remaining cases were due to *H. influenzae* type f (n=21; 8.8%), type e (n=8; 3.3%), type b (n=6; 2.5%), type a (n=3; 1.3%), not type b (n=19; 7.9%) and isolates that were not typed (n=35; 14.6%)

Highest frequency of cases occurred in the 65+ year age group (n=104/239; 43.5%), followed by those aged 25-64 years (n=65; 27.2%), 0-4 years (n=41; 17.2%) and 5-24 years (n=29; 12.1%), a pattern consistent with what has been observed between 2004 and 2017.

In 2018 the completeness of the data on clinical diagnosis was the highest recorded since 2004 at 91.4% (n=53/58). Since then, this percentage has fallen to 69.8% (n=44/63) in 2019, 64.5% (n=20/31) in 2020, 50.0% (n=9/18) in 2021 before rising again to 69.6% (n=48/69) in 2022.

Twenty deaths were reported between 2018 and 2022; median age of fatal cases was 52.5 years (range 3 days-97 years), one each of types a, b and e infections, 16 non-typeable and one not typed infections. Nine of the 20 deaths (45.0%) occurred in those aged 65+ years.

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Epidemiology

The marked reduction in the number of reported cases between Quarter 2, 2020 and Quarter 3, 2021 coincided with restrictions to reduce the impact of the COVID-19 pandemic. That said, the upward trend in numbers since *H. influenzae* was made notifiable in 2004 appears to have resumed as indicated by the highest ever quarterly number of reported cases in Q4-2022 (Figure 1).

Figure 1 presents the trend in the Male to Female Ratio by year and by quarter over this duration, but no discernible, consistent pattern was observed (Figure 1).

One notable observation in recent years is the decline in the proportion of cases attributable to non-typeable infections. The proportion of type b cases observed has remained depressed since 2009 (Figure 2).

Between 2018 and 2022, non-typeable/non-capsular cases accounted for the majority of notified invasive *H. influenzae* cases (61.5%, n=147/239). The remaining cases were due to *H. influenzae* type f (8.8%; n=21), type e (3.3%; n=8), type b (2.5%; n=6), type a (1.3%; n=3), not b (7.9%, n=19) and isolates that were not typed (14.6%; n=35). Of the non typed isolates, 7 of these 35 cases (20%) were diagnosed by PCR testing only (Figure 2).

The median age of cases between 2018 and 2022 was 60 years (range 3 days to 97 years). The five-year, 2018-2022 incidence rates were highest amongst those aged 65+ years (16.3/100,000) and infants <1 year of age (12.4/100,000) (Table 1).

Cases occurring in elderly adults (65 years and older (n=104) accounted for 43.5% of all invasive *H. influenzae* notifications between 2018 and 2022, followed by children 0-4 years (n=17.2%; n=41) (Table 1).

Most cases between 2018 and 2022 among those aged 65+ years were associated with non-typeable infections (74.0%; n=77/104), followed by not typed (12.5%; n=13) and type f (9.6%; n=10).

Between 2018 and 2022, 20 deaths were reported; median age of fatal cases was 52.5 years (range 3 days-97 years), one each of types a, b and e infections, 16 non-typeable and one not typed infections. Nine of the 20 deaths (45.0%) occurred in those aged 65+ years. This age cohort (65+) accounted for most deaths reported (n=9/104; 8.7% case fatality ratio); followed by those aged 0-4 year (n=4/41; 9.8% case fatality ratio). Six deaths were attributable to infection. Apart from three cases where the death was not due to infection, two were awaiting attribution and for the remainder, the actual causes of death were not known, not specified or pending at the time of writing (Figure 4).

Ethnicity details were poorly captured with 166 out of 239 cases (69.4%) between 2018 and 2022 recorded as not specified or not known.

Trends in five year rolling average number of cases between 2008 and 2022 reveal a steady increase in HSE Health Region HSE Dublin and Midlands and HSE Dublin and Southeast up to 2018; peak averages were delayed by a year until 2019 and in HSE Dublin and Northeast, the peak average was reached in 2015. All areas except HSE Dublin and Northeast indicated a resumption in an upward trend in 2022 (Figure 5).

An annual breakdown by clinical diagnosis between 2018 and 2022 is presented in Table 2. In 2018, 91.4% of cases (n=53/58) had a clinical diagnosis, but since then the level of completeness declined to 50% (n=9/18) in 2021 before increasing to 69.6% (n=48/69) in 2022. Septicaemia or pneumonia accounted for most cases during this five-year period (41.4%; n=99/239); clinical presentation was not specified for a minority of cases (27.2%; n=65). Four confirmed cases of epiglottitis-related *H. influenzae* were also reported, one each of type b, f, non-typeable and not typed. (*Note a clinical epiglottitis-related H. influenzae without any laboratory confirmation or with identification only from a non-sterile site meets the possible case definition criteria).*

In total, six cases of *H. influenzae* type b (Hib) were reported between 2018 and 2022, with three in 2022; three of the six were aged over 31 years and the remainder were two years of age or less. Among the case aged under two years old, two cases were under 4 months of age, and one child who died due to infection. One case was incompletely vaccinated and two cases were age appropriately vaccinated.

Since September 2008, the *Haemophilus* type b booster dose has been administered at 13 months of age as part of the routine childhood immunisation schedule in addition to the three doses given during infancy (at 2, 4 and 6 months of age). No total vaccine failures have been reported since 2011 (Figure 6). Vaccination is routinely recommended for those with asplenia, hyposplenia and haematopoietic stem cell transplant recipients. For information on uptake of *Hib* vaccination, please refer to the National Immunisation Advisory Committee guidelines on *H. influenzae* available at https://www.hse.ie/eng/health/immunisation/hcpinfo/guidelines/chapter7.pdf

The figures presented in this summary are based on data extracted from the Computerised Infectious Disease Reporting (CIDR) system on 05th September 2024. These figures may differ from those published previously due to on-going updating of notification data on CIDR.

Further information available on HPSC website:

http://www.hpsc.ie/a-z/vaccinepreventable/haemophilusinfluenzae/

Acknowledgements

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Report prepared by:

Eimear Keane, Piaras O'Lorcain, Vaccine Preventable Disease (VPD) team

Figure 1. **Number of invasive *H. influenzae* cases by year & quarter, gender, and male to female (M:F) ratio, Ireland, 2004-2022**

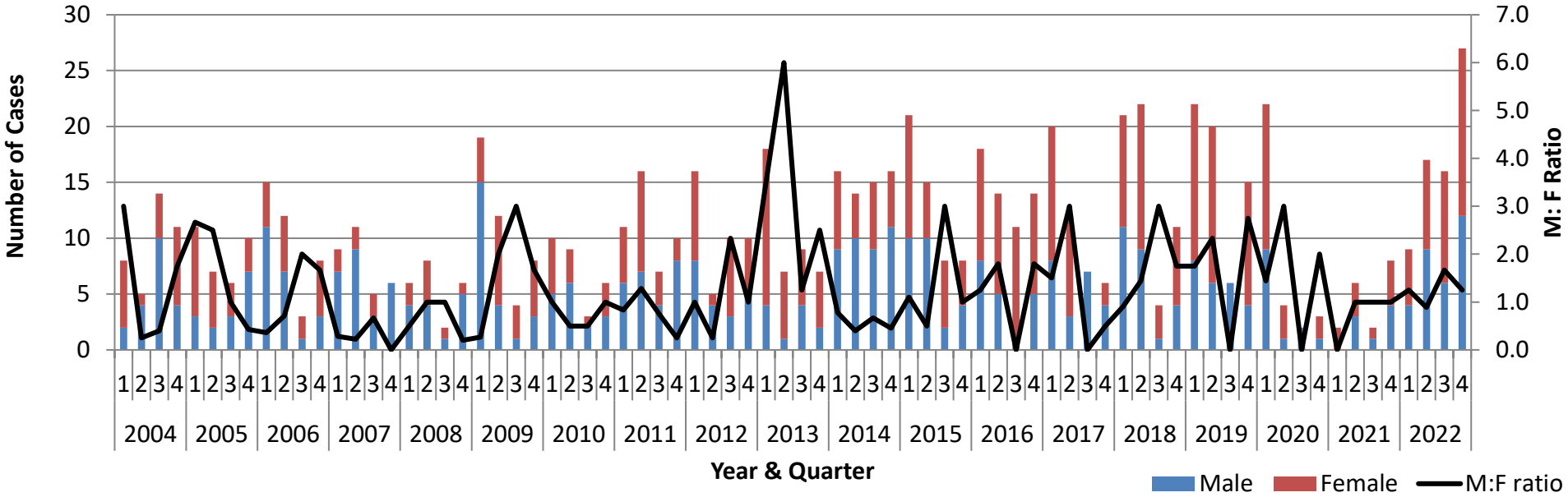

Figure 2. **Number of invasive *H. influenzae* cases and proportion of cases attributable to type b and non-typeable strains with 95% confidence intervals, Ireland, 2002-2022**

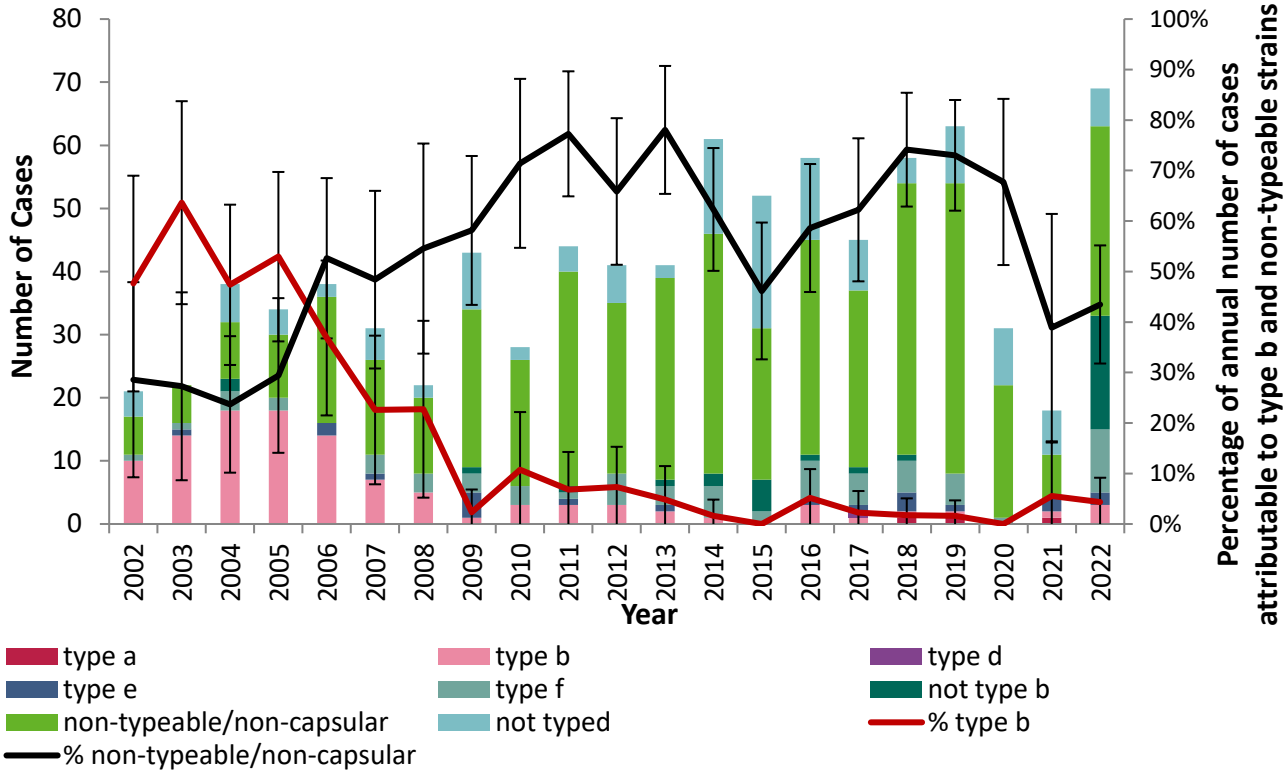

Figure 3. **Number of invasive *H. influenzae* cases by age group and type, Ireland, 2018-2022**

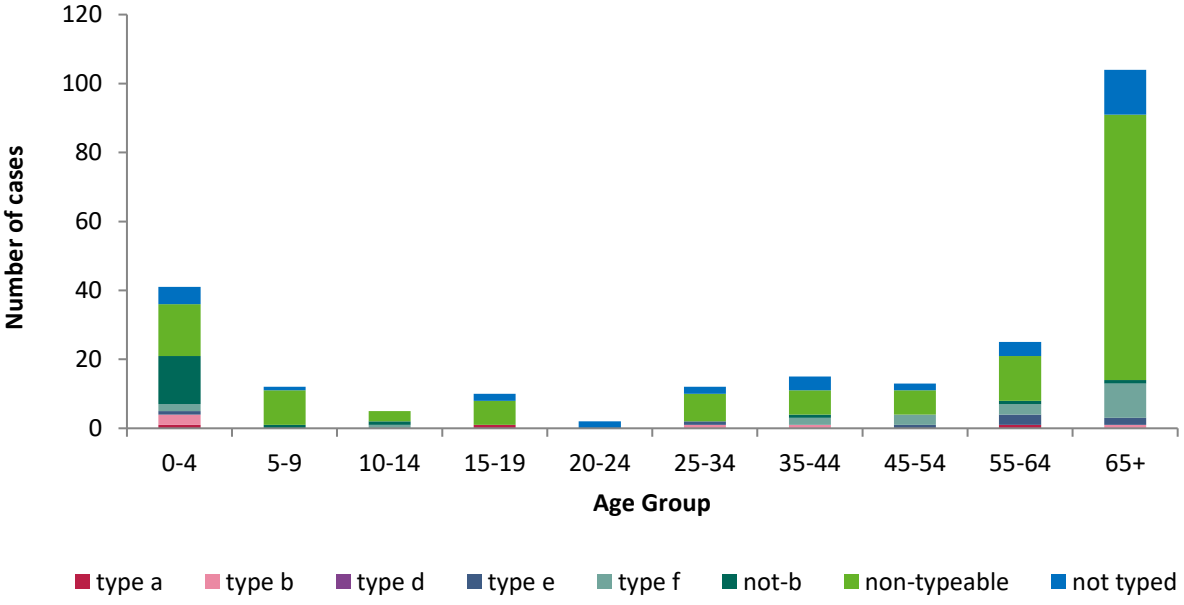

Figure 4. **Number of invasive *H. influenzae* cases and deaths by age group and cases fatality ratio, Ireland, 2018-2022**

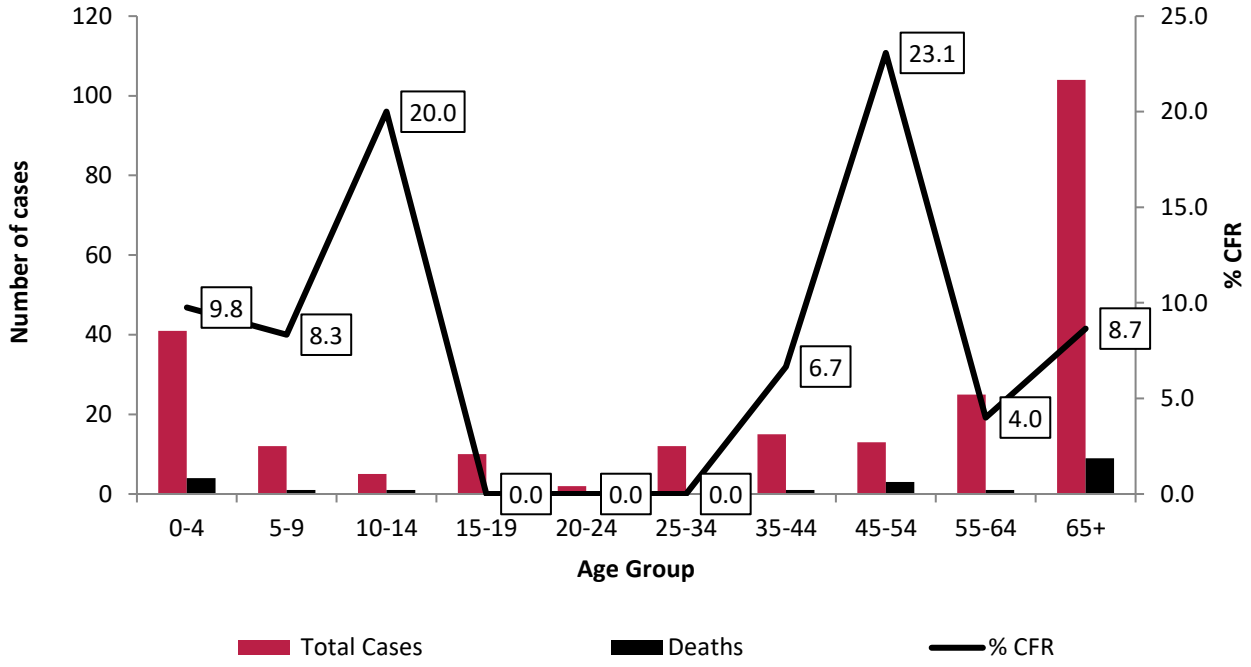

Figure 5. **Five year Rolling Average Number of invasive *H. influenzae* cases by HSE Health Region and Year, Ireland, 2008-2022**

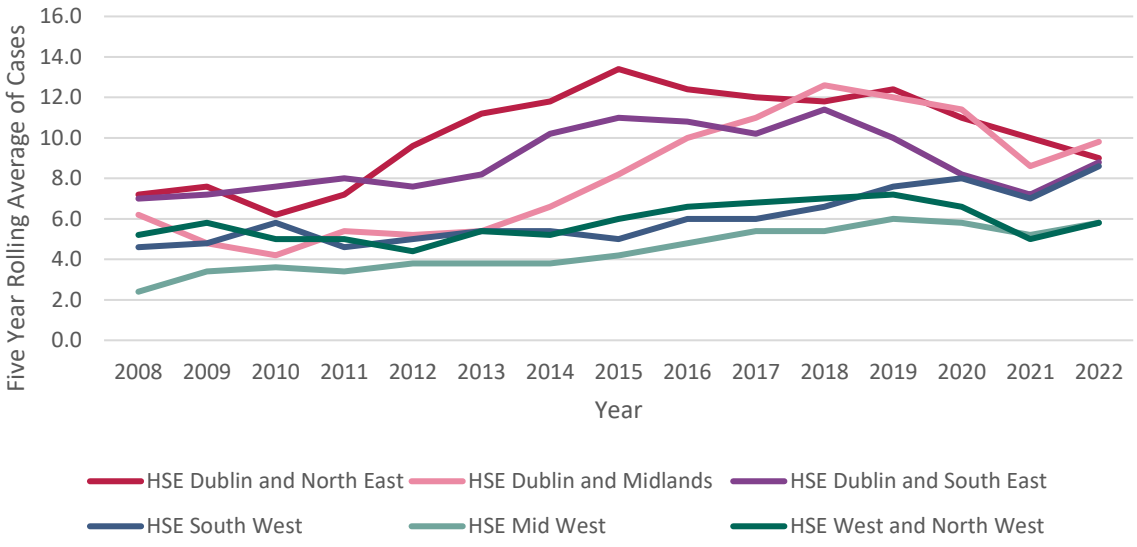

Figure 6. **Number of H. influenzae type b cases and total vaccine failures, Ireland, 1996-2022**

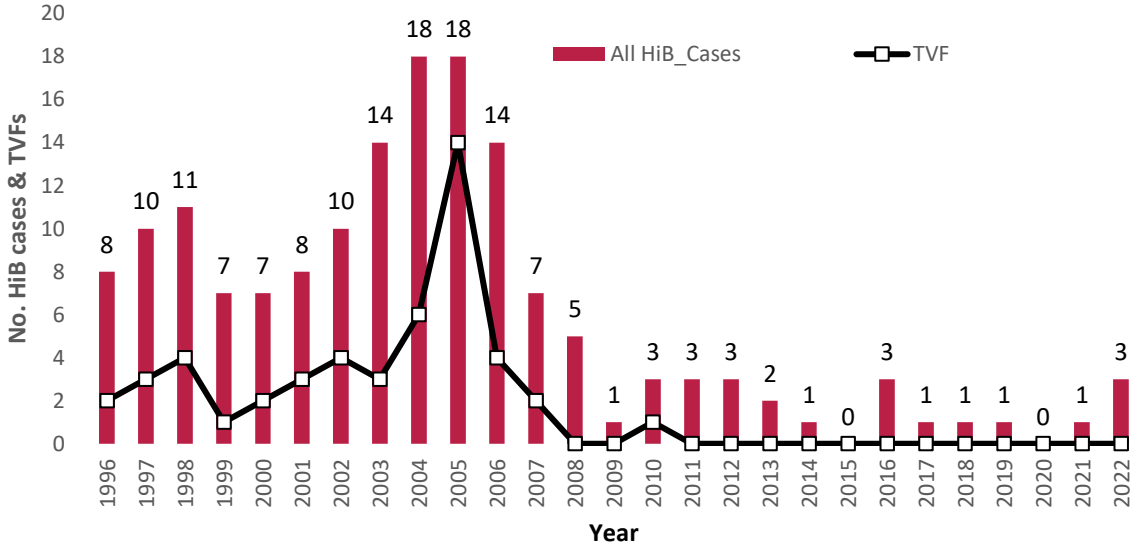

Table 1. **Number and age-specific incidence rates of invasive *H. influenzae* cases by serotype and age group, Ireland, 2018-2022**

Age group	type a	type b	type d	type e	type f	not-b	non-typeable	not typed	Total cases	Deaths	% CFR	ASIR - 2018-2022	% Total
0-4	1	3	0	1	2	14	15	5	41	4	9.8	12.4	17.2
5-9	0	0	0	0	0	1	10	1	12	1	8.3	3.4	5.0
10-14	0	0	0	0	1	1	3	0	5	1	20.0	1.6	2.1
15-19	1	0	0	0	0	0	7	2	10	0	0.0	3.3	4.2
20-24	0	0	0	0	0	0	0	2	2	0	0.0	0.7	0.8
25-34	0	1	0	1	0	0	8	2	12	0	0.0	1.8	5.0
35-44	0	1	0	0	2	1	7	4	15	1	6.7	2.0	6.3
45-54	0	0	0	1	3	0	7	2	13	3	23.1	2.1	5.4
55-64	1	0	0	3	3	1	13	4	25	1	4.0	4.9	10.5
65+	0	1	0	2	10	1	77	13	104	9	8.7	16.3	43.5
Total	**3**	**6**	**0**	**8**	**21**	**19**	**147**	**35**	**239**	**20**	**8.4**	**5.0**	**100.0**

ASIR, age specific incidence rate per 100,000 population calculated using Census 2016 data
NT/NC=non-typeable/non-capsular

Table 2 Number of invasive *H. influenzae* cases by clinical diagnosis, Ireland, 2018-2022

Clinical diagnosis	2018	2019	2020	2021	2022	2018-2022
Bacteraemia (without focus)	7	6	3	0	7	23
Cellulitis	0	0	0	0	0	0
Epiglottitis	1	1	0	0	2	4
Meningitis	3	2	2	1	6	14
Meningitis & septicaemia	1	0	0	1	1	3
Osteomyelitis	0	0	0	0	0	0
Other	6	8	1	3	11	29
Pneumonia	11	12	5	2	13	43
Septic arthritis	0	1	0	1	0	2
Septicaemia	24	14	9	1	8	56
Unspecified	5	19	11	9	21	65
Total	**58**	**63**	**31**	**18**	**69**	**239**
Cases With a Clinical Diagnosis	53	44	20	9	48	174
% Cases With a Clinical Diagnosis	*91.4*	*69.8*	*64.5*	*50.0*	*69.6*	*72.8*