Annual Epidemiological Report: *Streptococcus Pneumoniae* (invasive) in Ireland, 2025

May 2026

Invasive *Streptococcus pneumoniae* disease (IPD) in 2025: key points

- In 2025, 575 confirmed cases of invasive pneumococcal diseases (IPD) were reported in Ireland, among which there were 5 (0.9%) IPD related deaths; case fatality ratio among all IPD notifications was 3.8% (22/575).
- The incidence rate was 11.2 per 100,000 population, an increase compared to 2024 (9.5 per 100,000 population).
- Age specific incidence rates (ASIR) were highest in those aged 85 years and over (77.0 per 100,000 population), followed by those aged 75-84 and 65-74 years (45.8 and 25.8 per 100,000 population respectively).
- In 2025, 84.2% of the confirmed IPD notifications had an isolate submitted for serotyping.
- The most common serotypes among those aged ≥5 years and older were 8, 4, 9N, 3 and19A. In children <5 years of age, the predominant serotypes were 19A, 15B, 23B.
- In 2025, compared to 2008, the greatest impact due to PCV has been seen in children <5 years of age where the incidence due to PCV7 serotypes has declined by 93.3% (p<0. 001). The incidence of disease due to the additional six serotypes covered by the PCV13 declined by 53% in those <2 years of group.
- A significant indirect impact was also observed in those aged 65 years and older with declines in incidence of serotypes from the PCV7 serotypes in 2025, compared with 2008 (77%; p<0. 001).
- An increase in incidence due to non-vaccine types was also seen in all age groups in 2025 compared with 2008. The incidence rate increased in those aged 65 and over.

Surveillance of invasive *Streptococcus pneumoniae* disease (IPD)

- Since 2004 *Streptococcus pneumoniae,* the causative organism for invasive pneumococcal disease (IPD), is a notifiable disease in Ireland.
- Clinicians and laboratories are legally obliged to notify this infection.
- For this report notification data for IPD was extracted from Computerised Infectious Disease Reporting (CIDR) system on 5th May 2026.
- These figures may differ slightly from those previously published due to ongoing updating of notification data on CIDR.
- For calculation of incidence rates, we have used 2022 census data from the Central Statistics Office (CSO) for calculating rates in 2020-2025.
- Enhanced surveillance (including outcome, risk factors, vaccination, serotype) of IPD notifications is undertaken on children and adolescents <15 years of age by Departments of Public Health.
- Since April 2007, the Irish Pneumococcal Reference Laboratory (IPRL) has provided a typing service to Irish laboratories for all invasive *S. pneumoniae* isolates.

Pneumococcal conjugate and polysaccharide vaccines

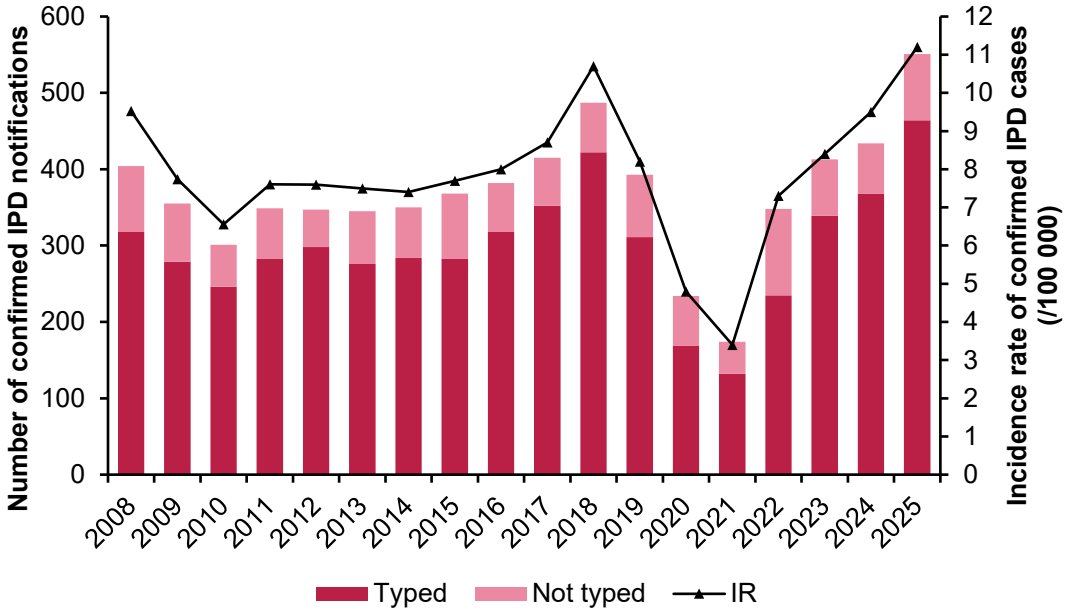
- In September 2008, the 7-valent pneumococcal conjugate vaccine (PCV7) (protects against seven types of pneumococcal bacteria) was introduced into the Irish infant immunisation schedule at 2, 6 and 12 months of age.
- A catch-up campaign was also implemented at that time, targeting children <2 years of age.
- In December 2010, the 13-valent PCV vaccine (protects against 13 types of pneumococcal bacteria) (PCV13) replaced PCV7 in the infant schedule.
- In December 2016, due to the introduction of the new meningococcal B vaccine (Men B) into routine immunisation, the third dose of PCV13 was shifted to 13 months of age for children born on or after 1st October 2016.
- One dose of pneumococcal polysaccharide vaccine (PPV23) is recommended for all those aged 65 years and older, and for those other age groups at increased risk of pneumococcal infection since 1996.

National PCV vaccine uptake

- National PCV vaccination coverage is monitored in children at 12 and 24 months of age.
- Following PCV introduction in 2008, uptake of the recommended number of doses among the first cohorts vaccinated was high, at 88% and 89% for children aged 12 months in 2009 and 2010, respectively.
- Higher uptake was reported for subsequent birth cohorts, with between 90-92% of children at 12 and 24 months of age reported as being age appropriately vaccinated since 2011.
- Uptake of three doses of PCV by 12 and 24 months of age decreased after pandemic and was 83.5% and 81.3%, in 2025 respectively. https://www.hpsc.ie/a-z/vaccinepreventable/vaccination/immunisationuptakestatistics/immunisationuptakestatisticsat12and24monthsofage/

Number of confirmed invasive pneumococcal disease (IPD) notifications by typing status and the incidence rate (IR) of confirmed IPD in Ireland, 2008-2025

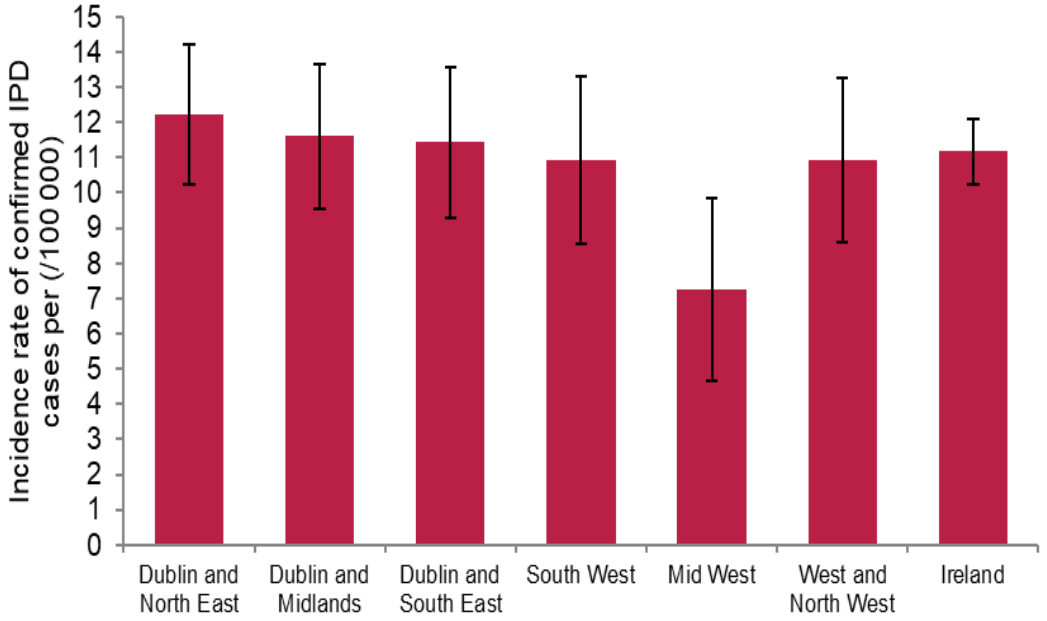
- Focusing on the confirmed IPD notifications, 575 cases were notified in 2025 (11.2/100,000; 95% CI 10.3 - 13.3/100,000)
- An increase of 17.8% in the number of cases compared with 2024 (9.5/100,000; 95% CI 8.6 - 10.3/100,000)
- In 2025, the incidence of confirmed IPD was higher compared with 2008 (9.5/100,000; 95% CI 8.6 – 10.5/100,000; 404 cases)
- In 2025, 84.2% (464/551) of cases had an isolate submitted for serotyping, less than the proportion of cases in 2024 (84.8%), 2023 (82.1%) and in 2008 and 2009, when 79% of notifications had an isolate typed
- Twenty-four cases were confirmed by PCR only
- In 2025, 70.5% of notifications (31/44) relating to children <5 years of age had an isolate submitted for serotyping; seven cases were confirmed by PCR



Data source: CIDR

Crude incidence rate of confirmed invasive pneumococcal disease notifications by RHA area, 2025

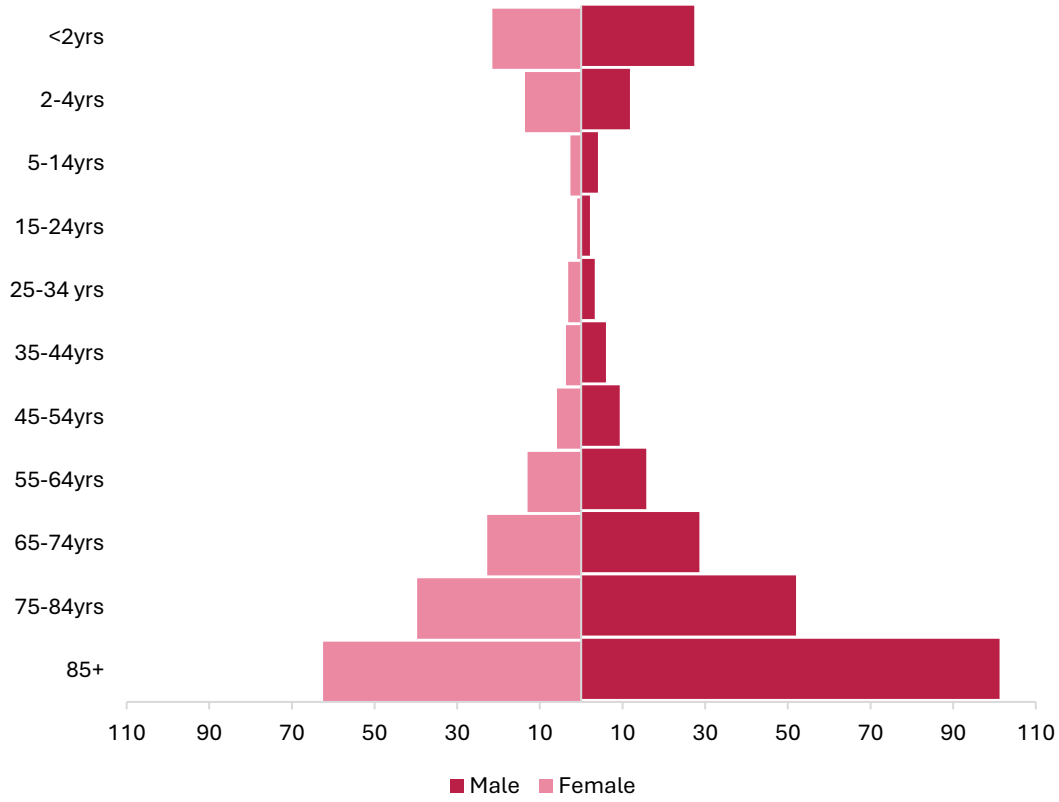
- During 2025, the incidence rates by RHA area ranged from 7.3 per 100,000 (Mid West) to 12.2 per 100,000 (Dublin and North East.
- However, the incidence rates in each of the six areas were not statistically different from the national rate.



Data source: CIDR

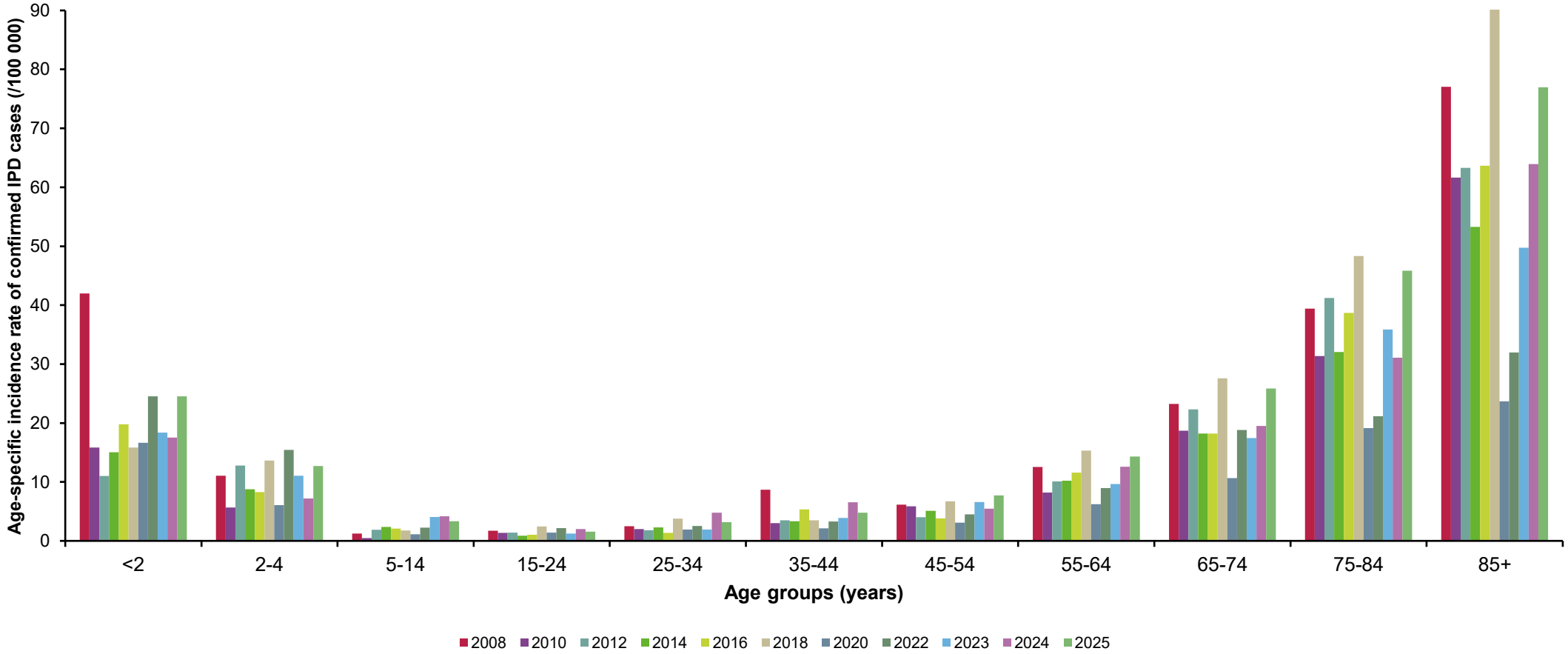
Crude incidence rate of confirmed invasive pneumococcal disease notifications by age group and gender, 2025

- Slightly more males (n=315, 54.8%) than females were reported with IPD.
- The median age of cases was 65 years (range 1 month to 101 years).
- Those aged 65 years and older accounted for approximately half of cases (51.3%, n=295).
- Within this age category the age specific incidence rate (ASIR) was highest in the oldest age groups; ≥85 years of age (77.0/100,000; n=65); 75-84-year age group (45.8/100,000; n=115); 65–74-year age group (25.8/100,000; n=114).
- In children <2 years of age the ASIR was 24.5 cases per 100,000 population (n=28).



Data source: CIDR

Age specific incidence rate of confirmed invasive pneumococcal disease notifications by age group, in Ireland, 2008-2025



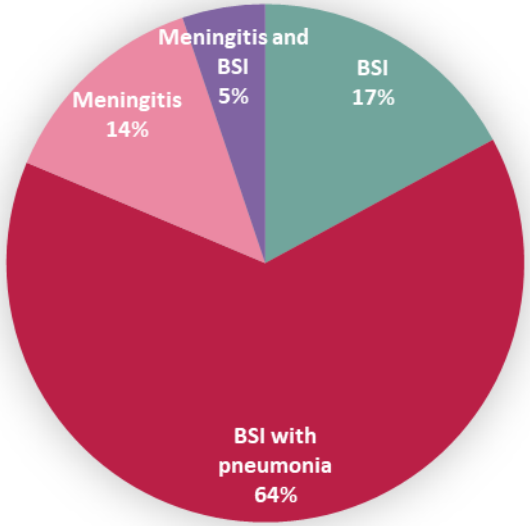
- A statistically significant decline (61%) in IPD incidence was seen in children <2 years of age when compared with 2008 (42/100,000; n=52; p<0.0000), highlighting the positive impact of the introduction of PCV7 and PCV13 in 2008 and 2010 respectively.

Clinical diagnosis information, 2025

- In 2025, a clinical diagnosis was reported for 193 of the 575 confirmed cases (33.6%), which included BSI with pneumonia (n=124), meningitis (n=36), from these 10 had meningitis and BSI; and only BSI for the remainder (n=33).

- The percentage of information on clinical diagnosis and risk factors significantly decreased in comparison to pre pandemic years. For the years during and after pandemic in 2020, 2021, 2022 and 2024 it decreased to 46.6%, 29.4%, 26.7% and 38.3% respectively.

- In 2018, 2017, 2016, 2015 and 2014, the clinical diagnosis was reported for 438 of the 510 (86%), 388 of the 415 (94%), 313 of the 381 (82%), 229 of the 368 (62%) and 168 of the 350 (48%) confirmed cases, respectively).



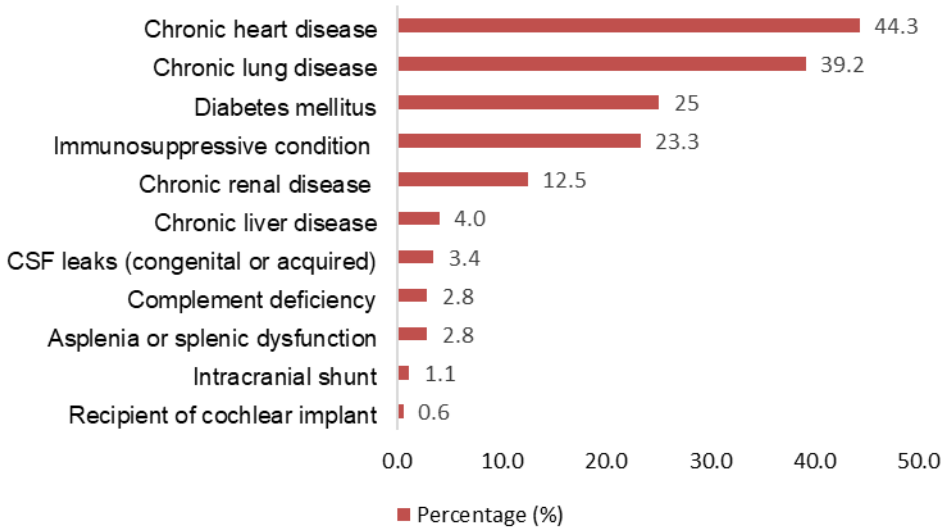
	Number of cases	Percentage (%)
BSI	33	17.1%
BSI with pneumonia	124	64.2%
Meningitis	26	13.5%
Meningitis and BSI	10	5.2%
Total	193	100.0%

Medical risk factor information, 2025

- Medical risk factors for IPD were reported for 176 (30.6%) confirmed cases; 55 cases (9.6%) did not have an identified risk factor; for the remaining 344 (59.8%) cases this information was either unknown, under investigation or not specified.

- The main medical risk factors reported included chronic heart disease (n=78; 44.3%), chronic lung disease (n=69; 39.2%), diabetes (n=44; 25.0%), immunosuppressive condition or therapies (n=41; 23.3%), chronic liver disease (n=7; 4.0%) and renal diseases (n=22; 12.5%).

- It should also be noted that being aged 65 years and older is also a recognised IPD risk factor; 295 (51.3%) cases in 2025 were in this age group, of whom 120 (40.7%) also reported a medical risk factor.

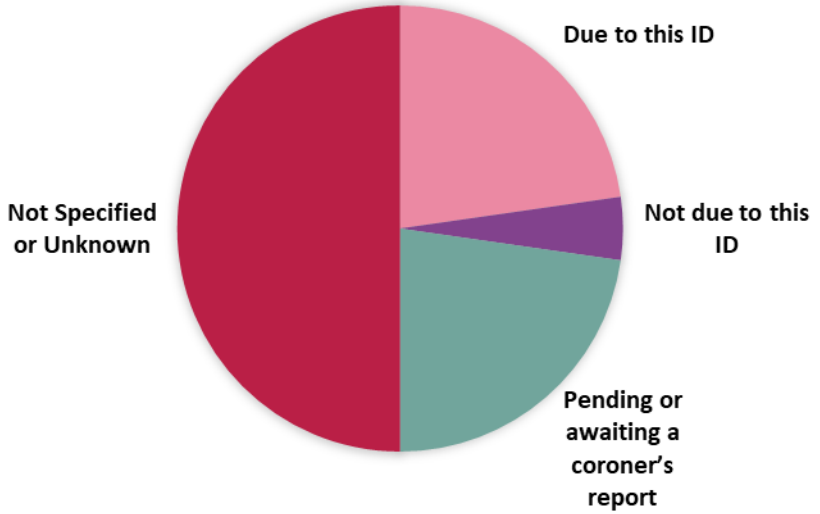


Medical risk factors*	Number of cases	Percentage (%)
Chronic heart disease	78	44.3
Chronic lung disease	69	39.2
Chronic liver disease	7	4.0
Chronic renal disease	22	12.5
Diabetes mellitus	44	25.0
Asplenia or splenic dysfunction	5	2.8
Immunosuppressive condition or therapies	41	23.3
Complement deficiency	5	2.8
CSF leaks (congenital or acquired)	6	3.4
Intracranial shunt	2	1.1
Recipient of cochlear implant	1	0.6

*Not mutually exclusive

IPD death notifications, 2025

- The outcome field was completed in 42.4% (n=244) of the IPD notifications in 2025, versus 87.1% in 2018, 97% in 2017, 85% in 2016, 56% in 2015 and 39% in 2014.
- Among those whose outcome was reported, case fatality ratio among IPD notifications overall was 9.0% (22/244).
- For 5 (27.7%) patients who died, the cause of death was reported as due to IPD, in one patient it was not due to IPD, for five patients cause of death was pending or awaiting a coroner's report. For the remaining 11, the cause of death was not specified or was unknown.
- Most of these deaths (n=20) occurred in adults (age range 50-89 years) and two in children under 18 years of age.



Cause of death	Number ofcases	Percentage(%)
Due to this ID	5	22.7
Not due to this ID	1	4.5
Pending or awaiting a coroner's report	5	22.7
Not Specified or Unknown	11	50.0
Total	22	100.0

Impact of pneumococcal conjugate vaccines (PCV)

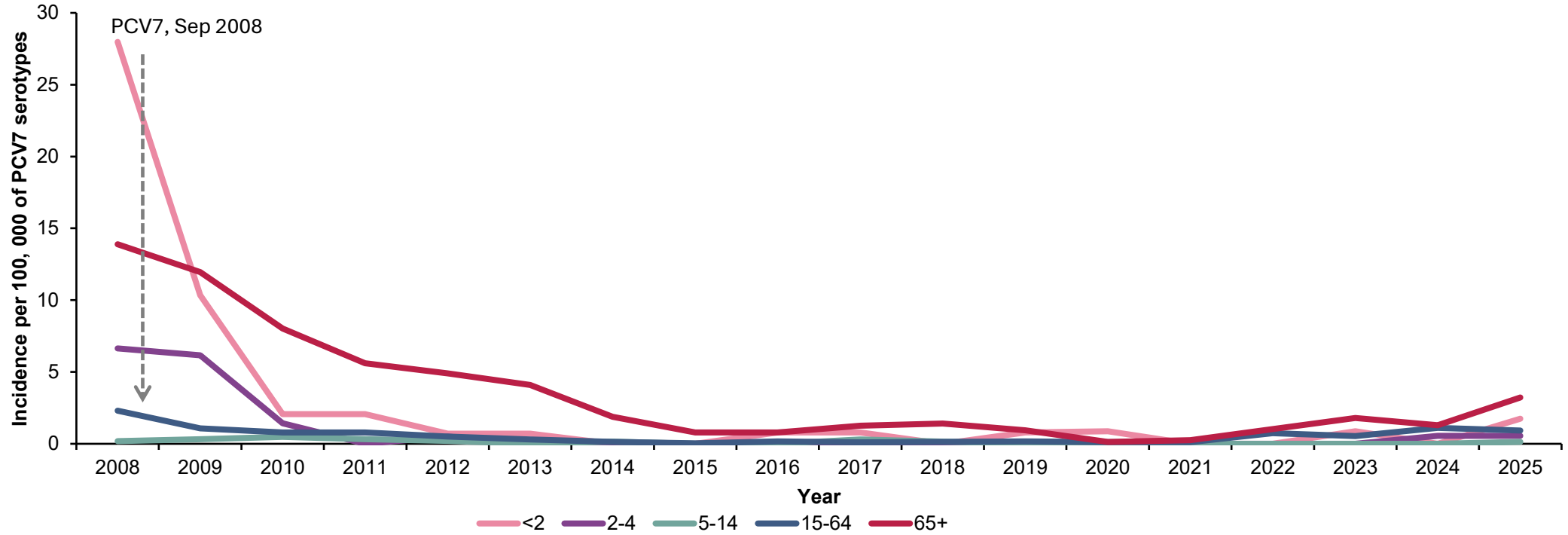
- Serotyping data from the IPRL were used to assess the impact of the PCV programme on the distribution and burden of *S. pneumoniae* serotypes associated with IPD.

- In 2025, of the 575 confirmed IPD notifications reported in CIDR, 24 were confirmed by PCR only, 464 (84.2% 464/551) had isolates sent for serotyping.

- 12.9% of IPD infections were due to PCV7 serotypes (4, 6B, 9V, 14, 18C, 19F and 23F);
- 20.9% were associated with the six additional serotypes included in PCV13 (1, 3, 5, 6A, 7F and 19A);
- the remaining 66.2% of infections were due to non- PCV13 vaccine types.

- Since introducing PCV7 to the Irish childhood immunisation schedule towards the end of 2008, there has been a substantial reduction in the overall burden of IPD disease associated with serotypes included in the vaccines in use.

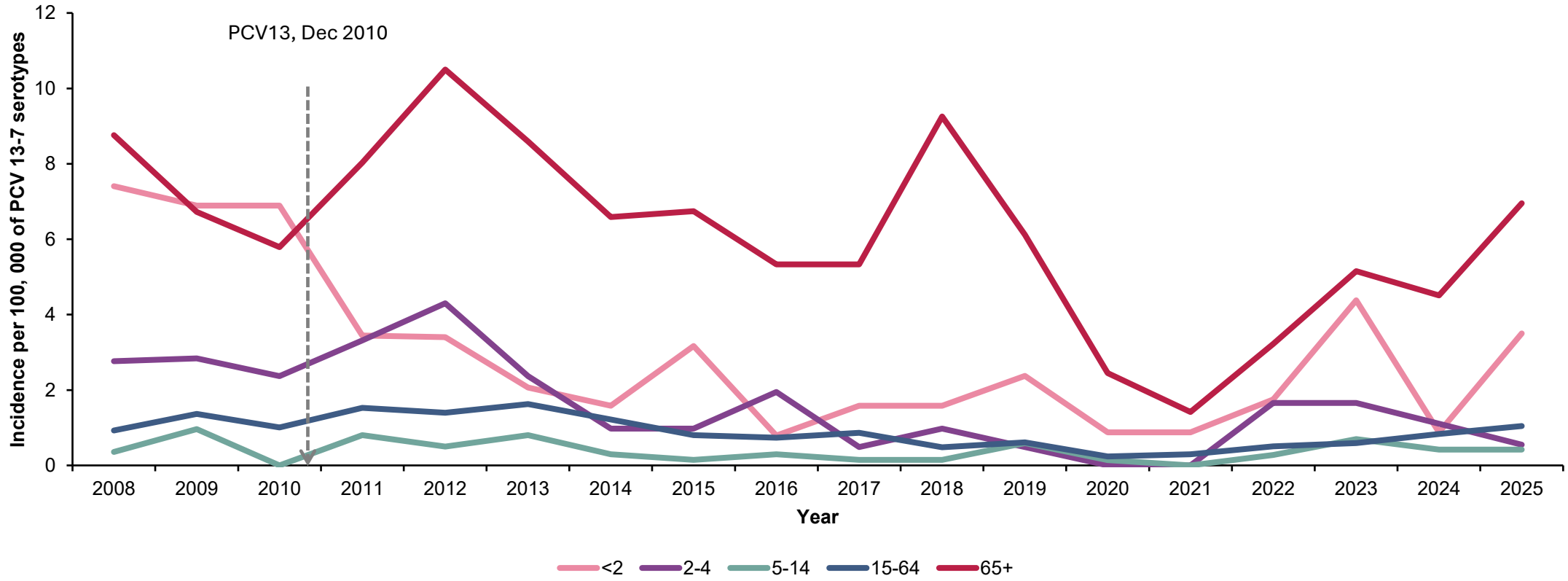
Age specific incidence rate by age group of confirmed invasive pneumococcal disease cases due to PCV7 serotypes, in Ireland, 2008-2025



- Reductions in the incidence of IPD due to PCV7 serotypes have been seen in all age groups.
- Overall, the incidence of IPD due to PCV7 serotypes has significantly declined in 2025 compared with 2008 (72% decline, p<0. 001).
- The greatest impact has been seen in children <5 years of age where the incidence due to PCV7 serotypes has declined by 93.3% (p<0.001).
- The slight increase in PCV 7 serotypes were observed among those aged 65 and over compared to 2024.

Data source: Irish Pneumococcal Reference Laboratory

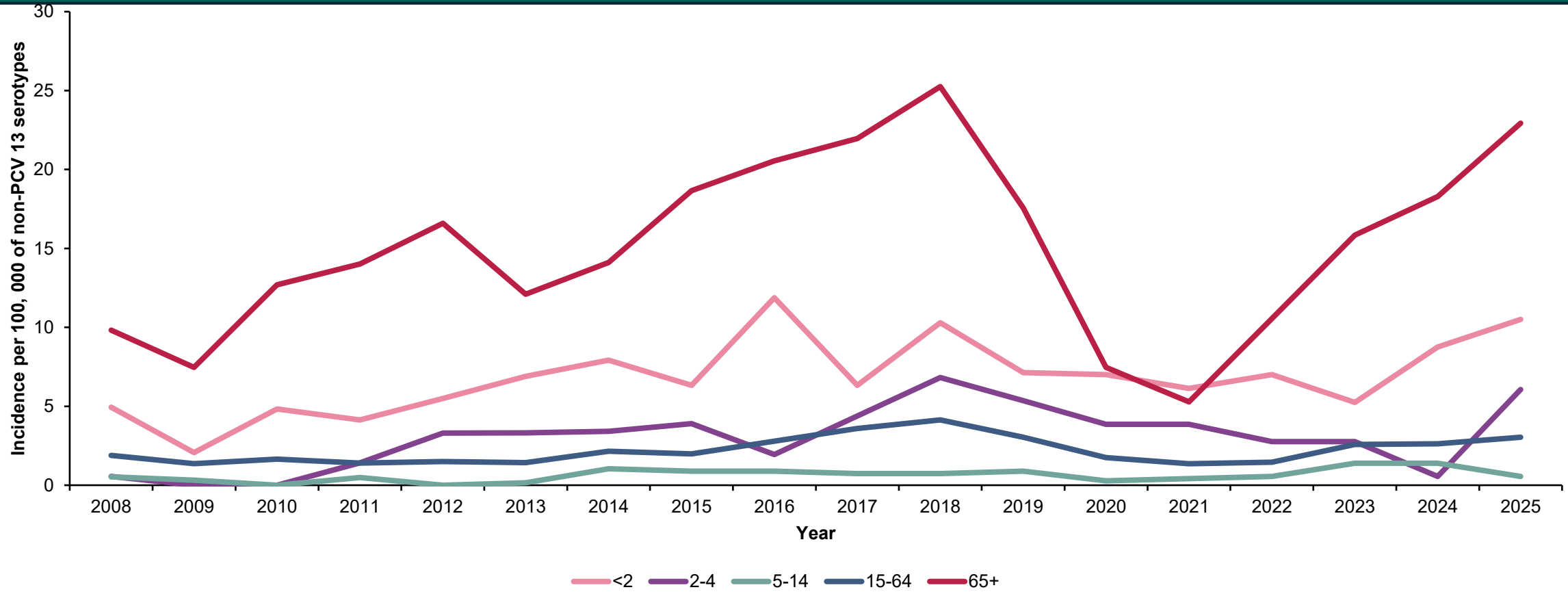
Age specific incidence rate by age group of confirmed invasive pneumococcal disease cases due to the additional six serotypes covered by PCV13 in Ireland, 2008-2025



- In 2025 the incidence of disease due to the additional six serotypes covered by the PCV13 declined by 53% (p=0.2173) in children <2 years of age compared with 2008

Data source: Irish Pneumococcal Reference Laboratory

Age specific incidence rate by age group of confirmed invasive pneumococcal disease cases due to non-vaccine types, in Ireland, 2008-2025



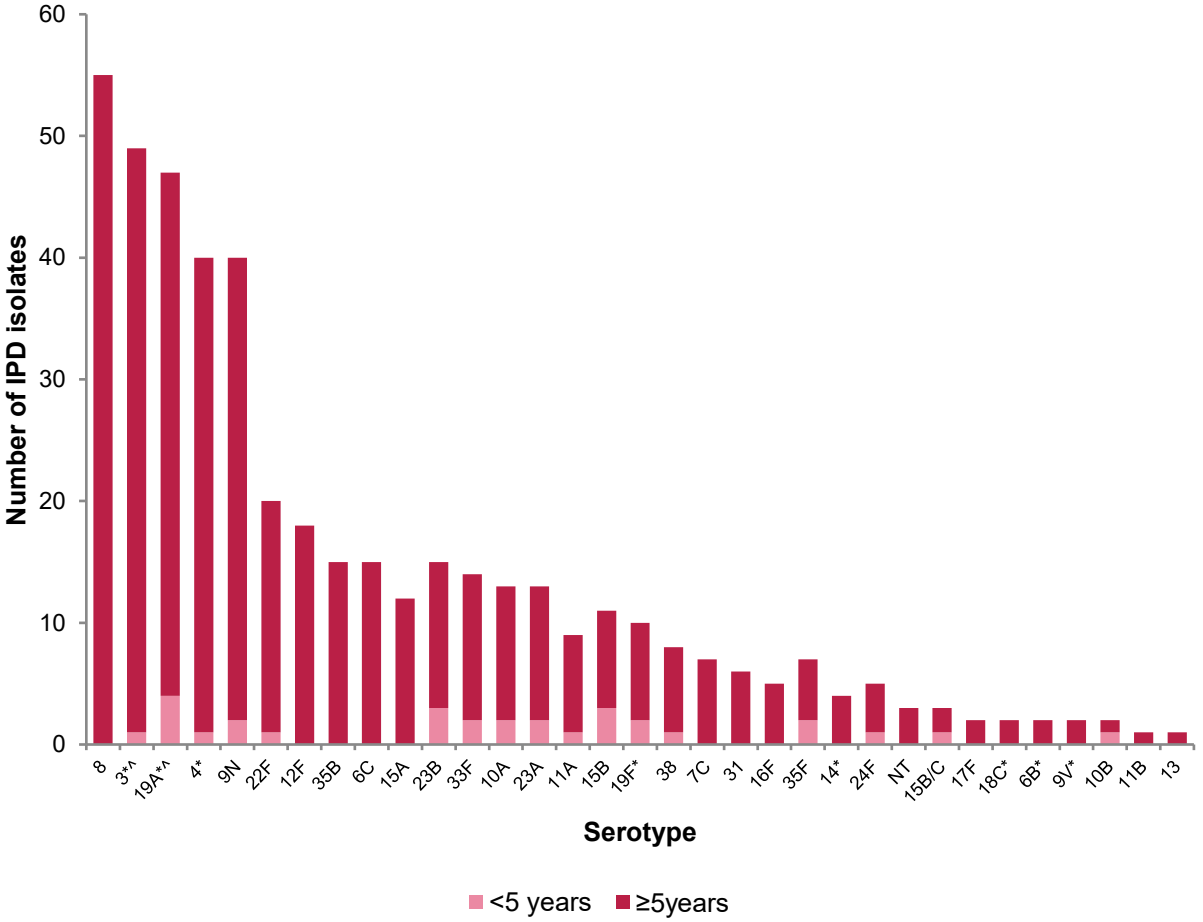
- An increase in incidence due to non-vaccine types (NVTs) was also seen in 2025 compared with 2008.
- In those aged 65 years and older there was a significant increase ($p<0.001$) in incidence rates
- There has been increase also in the incidence of NVTs among other age groups

Data source: Irish Pneumococcal Reference Laboratory

Serotype distribution of invasive *Streptococcus pneumoniae* isolates by age group (<5 or ≥5 years) in Ireland, 2025

- The predominant serotypes in circulation in 2025, were 8, 3,19A, 4, 9N (3, 4 and 19A included in PCV13 and PPV23; 8 and 9N included to PPV23), followed by serotypes 22F, 12F (not included to PCV13; included to PPV23).

- In children <5 years of age, the predominant serotypes were 19A,15B, 23B (19A included to PCV13; 15B included to PPV 23; 23B NVT type). All these serotypes accounted for 32.3% of the isolates serotyped in this age group.



* Denotes serotypes included in PCV7
*^ Denotes additional six serotypes included in PCV13 (PCV13-7)
Data source: Irish Pneumococcal Reference Laboratory

Public health implications

- Continued good quality IPD surveillance, including the monitoring of invasive *S. pneumoniae* serotypes, is crucial in order to identify any epidemiological changes in the disease, assess the impact of PCV13 on public health, and guide further vaccination strategies, as newer expanded valency vaccines become available and changes are made to PCV coverage, e.g. age or risk factor related.

- Striving to improve data quality is an essential part of IPD surveillance. A pneumococcal polysaccharide vaccine which offers protection against 23 serotypes (PPV23) is already recommended for elderly and risk groups and is important to give additional protection despite a lower vaccine efficacy than the PCV.

Acknowledgements

- Thanks are due to all the health care professionals involved in the surveillance of IPD in Ireland.
- In particular, we wish to thank all the laboratory scientists, consultant microbiologists, public health doctors/nurses/surveillance scientists, and others for forwarding pneumococcal isolates and for the work involved in the surveillance of pneumococcal disease in Ireland.
- We are also grateful for the assistance of staff in the Departments of Clinical Microbiology at the Royal College of Surgeons in Ireland and Temple Street Children's University Hospital, Dublin, Ireland.

Technical notes: Activities key to the surveillance of IPD in Ireland

Notifications: Clinicians and laboratories should notify all cases of IPD to the relevant Department of Public Health and data are inputted to the national Computerised Infectious Diseases reporting (CIDR) system for notifiable infectious diseases.

Typing: Laboratories should submit **all** invasive *S. pneumoniae* isolates to Temple Street Children's University Hospital for typing by address:

Irish Pneumococcal Reference Laboratory
which is housed with
Irish Meningitis & Sepsis Reference Laboratory,
Temple Street Children's University Hospital,
Temple Street, Dublin 1

Note: For each isolate sent to the IPRL, the patient's details are required on the form submitted in order that the results sent to the laboratory can be linked to the notification already made in CIDR.

Enhanced surveillance: Departments of Public Health perform enhanced surveillance on cases of IPD notifications and enter these data on CIDR.

Antimicrobial resistance: Laboratories should report data on antimicrobial resistance profiles of invasive *S. pneumoniae* isolates (from blood and CSF) to the European Antimicrobial Resistance Surveillance System Network (EARS-Net) at HPSC.

Technical notes: Laboratories: Submission of isolates for typing

For details regarding the submission of invasive *Streptococcus pneumoniae* isolates for typing, please contact:

Dr Mary Corcoran
Email: Mary.Corcoran@childrenshealthireland.ie
Nuala Kealy
Email: Nuala.Kealy@childrenshealthireland.ie
Tel.: 01 878 4854
General email: IMSRL@childrenshealthireland.ie
Link to sample request form:
https://www.cuh.ie/wp-content/uploads/2019/06/IMSRL-Request-Form-Edition-04.pdf

Address:
Irish Pneumococcal Reference Laboratory,
Irish Meningitis & Sepsis Reference Laboratory,
Temple Street Children's University Hospital,
Temple Street, Dublin 1

Technical notes: Departments of Public Health: IPD surveillance

IPD **enhanced surveillance form** is available at: https://www.hpsc.ie/a-z/vaccinepreventable/pneumococcaldisease/surveillanceforms/

Protocol for the enhanced surveillance of IPD is available at: https://www.hpsc.ie/a-z/vaccinepreventable/pneumococcaldisease/informationforhealthprofessionals/

Technical notes: Further information available on HPSC website

For further details on the surveillance and epidemiology of IPD in Ireland, please see:
Annual Reports on invasive *Streptococcus pneumoniae* infection available at: https://www.hpsc.ie/a-z/vaccinepreventable/pneumococcaldisease/epidemiologicaldata/annualreportsoninvasivepneumococcaldisease/

Quarterly and Annual EARSS Reports available at: https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/europeanantimicrobialresistancesurveillancesystemearss/ears-netdataandreports/

IPD case definition

- IPD case classification has changed over time.
- Between 2004 and 2011, in individuals with clinically compatible symptoms, the isolation or detection of *S. pneumoniae* from a normally sterile site was classified as a confirmed case; detection of *S. pneumoniae* antigen from a sterile site was classified as probable and detection from non-sterile site was classified as a possible case.
- In 2012, the previously used probable case definition became no longer applicable and any case in which *S. pneumoniae* antigen was detected from a normally sterile site was classified as confirmed and detection in urine was classified as possible.
- In July 2015, the case definition of *S. pneumoniae* was again amended; **only those cases of IPD meeting the laboratory criteria were classified as confirmed cases**, and urinary antigen detection (possible cases) is no longer notifiable. https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/europeanantimicrobialresistancesurveillancesystemearss/referenceandeducationalresourcematerial/spneumoniae/casedefinition/

Penicillin non-susceptible *S. pneumoniae* (PNSP)

- A separate surveillance strand (EARS-Net project), involving the microbiology laboratories and HPSC, is used to monitor in detail the antimicrobial resistance profiles of invasive *S. pneumoniae* isolates from blood and/or cerebrospinal fluid (CSF).

- In 2024 (latest data available), the proportion of penicillin non-susceptible invasive *S. pneumoniae* (PNSP) was 20.8%, (2.7% and 17.9% with high and intermediate level resistance, respectively) while 12.9% of isolates were resistant to erythromycin (Data source: HPSC/EARS-Net Ireland).

- The proportion of PNSP and isolates resistant to erythromycin decreased from 2022, when 16.5% of isolates were resistant. In 2024, the proportion of *S. pneumoniae* with resistance to erythromycin slightly decreased compared to 2023.

- For details on the antimicrobial resistance patterns of *S. pneumoniae*, please see the link on EARS-Net slide set, 2024 https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/europeanantimicrobialresistancesurveillancesystemearss/ears-netdataandreports/