1.8 *Streptococcus pneumoniae* (invasive)

Summary

Number of cases in 2008: 465
Number of cases in 2007: 361
Number of deaths in 2008 17
Number of deaths in 2007: 18
Crude incidence rate, 2008: 11/100,000

Invasive infections due to *Streptococcus pneumoniae* are notifiable in Ireland since January 2004 and data on these notifications are collated in the Computerised Infectious Disease Reporting (CIDR) system. For the purposes of this report the term invasive pneumococcal disease (IPD) will be used to describe these infections.

In 2008, 465 cases of IPD (11/100,000) were notified in Ireland, increasing from 361 cases (8.5/100,000) in 2007 (figure 1), representing a 29% increase. There has been a steady increase in IPD notifications each year since 2004. However, this increase is considered to be a reflection of improved reporting of IPD cases by laboratories in particular, through the infectious disease notification system, with the result that the notification figures now more closely reflect the IPD figures as reported through the European Antimicrobial Resistance Surveillance System (EARSS) (figure 1).

In 2008, 405 (87.1%) IPD cases notified were classified as confirmed, 59 (12.7%) as probable and 1 as possible (0.2%). Of the 161 (34.6%) cases that has a clinical diagnosis reported, 49.1% (n=79) had a clinical diagnosis of meningitis and/or septicaemia, 48.4% (n=78) had pneumonia and other diagnoses accounted for the remainder (2.5%); muscoskeletal infection (n=2), abscess (n=1) and soft tissue (n=1).

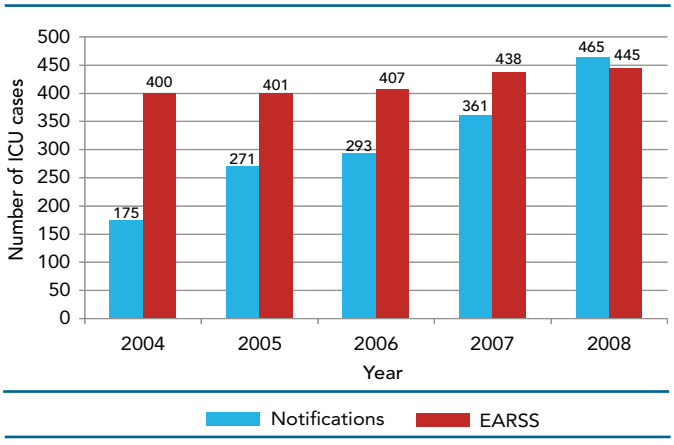

Figure 1. Annual number of invasive pneumococcal disease cases reported through the infectious disease surveillance system and the EARSS, 2004-2008

More cases occurred in males (57%; n=265) than in females (43%; n=200). Cases ranged in age from 1 week to 93 years with a median age of 59 years. The elderly i.e. those aged 65 years and older accounted for the greatest proportion of case (42%, n=195), followed by children <5 years of age (15.7%, n=73) (figure 2).

Similar to 2007, in 2008 the incidence of IPD was high in the very young and very old and was relatively low in the age groups in between (figure 2). In children, the incidence was highest in infants <1 year of age (50.8/100,000), followed by the 1 year old children (34.7/100,000). In the age groups thereafter the incidence declined and did not exceed 14 cases per 100,000 in those aged 2-64 years.
In the elderly the incidence increased considerably, almost doubling between each of these age groups, from 28.9 cases per 100,000 in the 65-74 year olds, to 48.3 cases per 100,000 in the 75-84 year olds to the highest incidence rate of all of 89.5 cases per 100, 000 in those aged 85 years and older (figure 2).

Outcome was reported for only 25% (n=115) of the notifications in 2008 and therefore the figures presented in this section will underestimate the mortality due to IPD in Ireland. Based on the data available, 17 deaths associated with IPD infection were reported in 2008. Three deaths occurred in children (all < 5 years of age) and the remainder (n=14) were in adults, age range 28-90 years. The clinical presentation for 16 of the 17 deaths was reported; 13 had meningitis and/or septicaemia and three had pneumonia.

The IPD notification figures presented in this report are based on data extracted from the Computerised Infectious Disease Reporting (CIDR) system on 11th

September 2009. These figures may differ slightly from those previously published due to ongoing updating of notification data on CIDR. EARSS data were obtained from the Whonet database at HPSC.

A collaborative pilot-project was established in April 2007 between RCSI Beaumont Hospital, The Children's University Hospital, Temple Street and HPSC to offer a typing service to Irish Microbiology laboratories for all isolates of *Streptococcus pneumoniae* submitted. Amongst the isolates typed to date, this includes 379 isolates (excluding duplicates etc.) with a specimen date in 2008. Based on the results from these 379 isolates, 32 different serotypes were identified. The most common serotypes in circulation were 14, 4, 9V, 7F, 8, 23F and 6B accounting for over half (52.5%) of the isolates typed (figure 3). The seven serotypes contained in PCV7 occurred in the 12 top most prevalent serotypes associated with IPD in Ireland in 2008. Sixty nine percent of isolates from children aged <2 years had serotypes covered by PCV7.

One objective of this project was to establish the serotype distribution of IPD isolates in circulation in Ireland prior to the introduction of the pneumococcal conjugate 7-valent vaccine (PCV7, Prevenar) to the childhood immunisation schedule, which took place in September 2008. This objective has been achieved. The current focus of the project is to continue offering a typing service in order to effectively monitor the impact of introducing PCV7, to investigate vaccine failures and to inform future public health policy regarding immunisation schedules and the value of introducing expanded valency vaccines following their licensing. The pilot typing project continues throughout 2009. However, permanent funding of this project is critical to ensure the above very important health protection objectives can be delivered on.

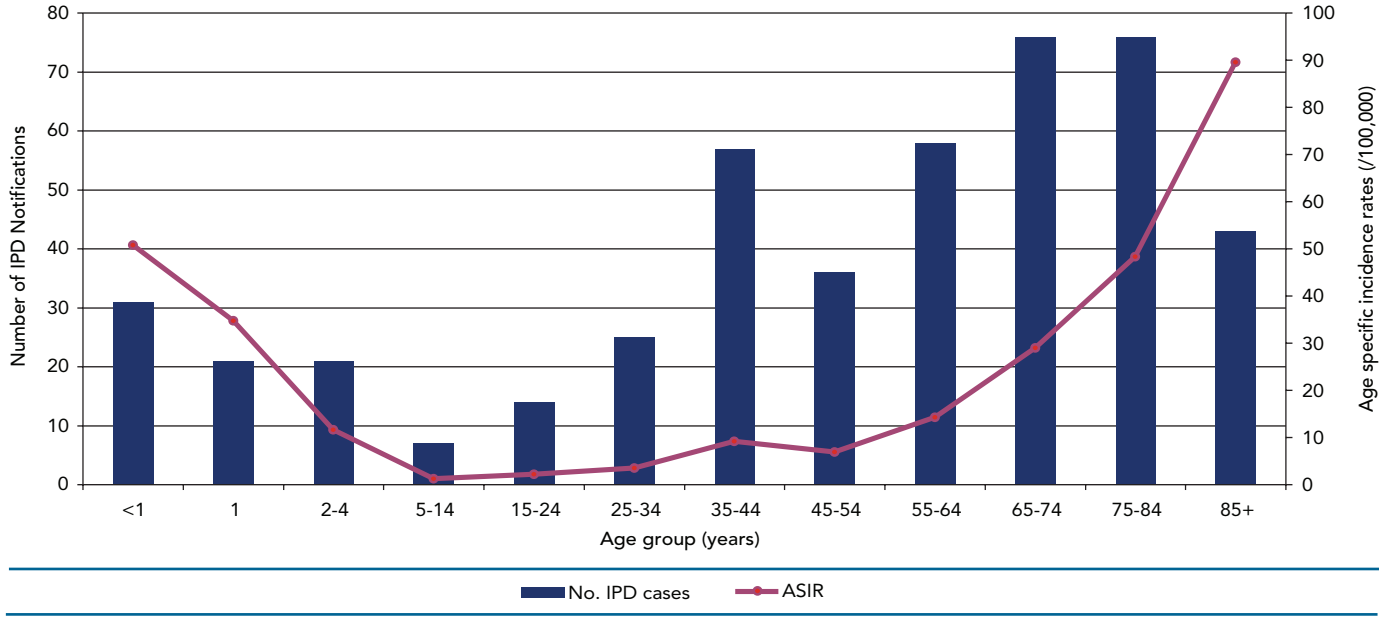

Figure 2. Number and age specific incidence rates (ASIR) of invasive pneumococcal disease notifications by age group, 2008

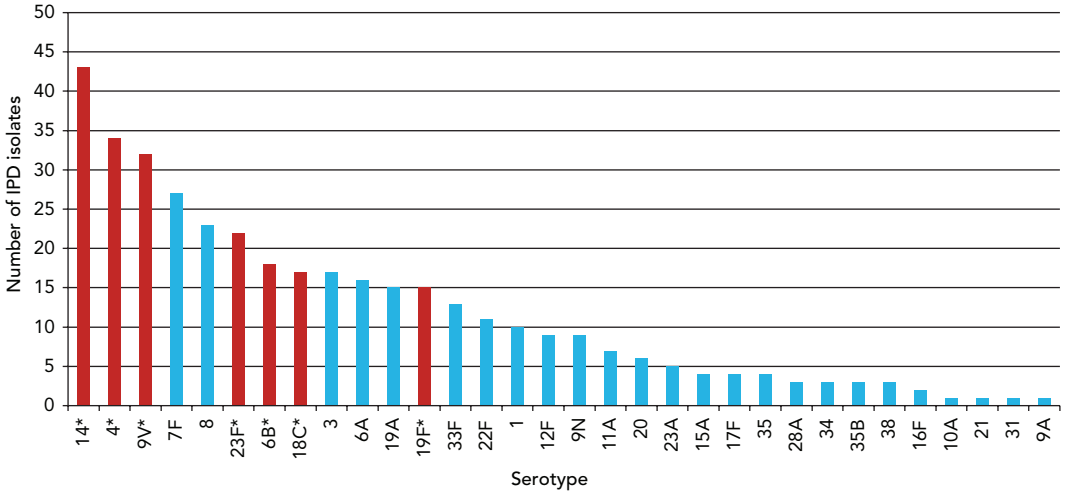

Figure 3. Serotype distribution of invasive Streptococcus pneumoniae isolates in Ireland, 2008 (n=379)

**Bars highlighted in red indicate serotype is covered by PCV7 vaccine*