



Epidemiology and Surveillance of Meningococcal Disease in Ireland, 2006



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Background

Less than a decade ago, invasive meningococcal disease (IMD) was hyper-endemic in Ireland, with notification rates in excess of 14 cases per 100,000 population. This was the highest rate in Europe.

On average, 500 cases and 25 deaths were occurring annually. Serogroup B and serogroup C accounted for 60% and 30% of the cases, respectively.

The introduction in October 2000 of the MenC conjugate vaccine to the infant schedule and a catch-up for under 23 year olds had a huge impact in reducing the incidence of IMD due to this serogroup.

The epidemiology of IMD in Ireland is described, with particular reference to 2006 data.

Aims

To describe the epidemiology and surveillance of IMD in Ireland for 2006.

To describe the impact the serogroup C conjugate (MenC) vaccine introduced in 2000 has had on IMD epidemiology.

Methods

> IMD is a notifiable disease in Ireland with clinicians and laboratories obliged to notify.

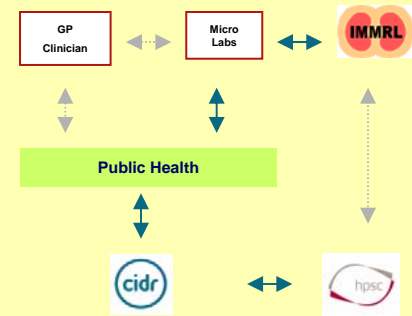
> The Irish Meningococcal and Meningitis Reference Laboratory (IMMRL) was established in 1996. In addition to providing a non-culture meningococcal diagnostic service for Ireland, it also encourages all laboratories to submit isolates of *N. meningitidis* for characterisation, including sub-typing.

> Case-based data on IMD notifications are available nationally since 1999. This enhanced system combines both clinical and laboratory information.

> Data on these cases are now on the Computerised Infectious Disease Reporting (CIDR) system.

> CIDR is the national web-based information system currently being implemented to manage the surveillance and control of infectious diseases in Ireland. Public Health, Microbiology laboratories, Reference Laboratories and HPSC have access to CIDR over a secure network.

Data flow for IMD Surveillance in Ireland



Blue lines indicate data flow within the CIDR system, while Grey lines relate to data flow outside CIDR

Results

IMD ~ Cases

In 2006, 209 cases of IMD were notified – 4.9/100,000.

This was a very slight increase from 2005 when 203 cases were notified – 4.8/100,000.

The epidemiology of IMD has remained largely unchanged over the last three years, with incidence rates now almost a third of what they were in 1999/2000 (Fig. 1).

Since the introduction of the MenC vaccine the incidence of serogroup C disease has declined from 3.7/100,000 in 2000 to 0.09/100,000 in 2006, a 97% reduction (Fig. 1).

Incidence of serogroup B disease has halved in recent years, from 8.1/100,000 in 1999 to 4.0/100,000 in 2005 and 2006.

Over the last three years incidence of IMD has remained largely unchanged (Fig. 1).

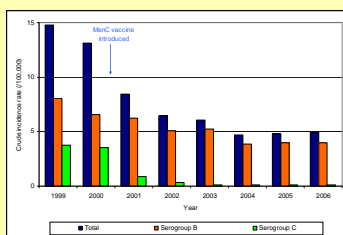


Fig. 1. Crude incidence rates of IMD in Ireland

IMD by Age

In 2006, cases ranged in age from 1 month to 84 years, median age was 2 years. The age specific incidence rates were highest in <1 year olds (85.1/100,000) followed by 1-2 year olds (46.2/100,000). Thereafter, the incidence declined considerably (Fig. 2).

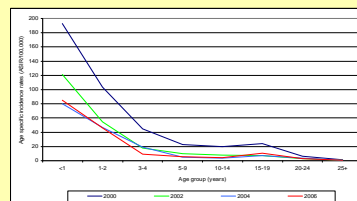


Fig. 2. Age specific incidence rate of IMD in 2000, 2002, 2004 and 2006

Since 2004 the age specific incidence rates for IMD have been very similar. Although the overall pattern of IMD by age group is unchanged since 2000, the incidence of the disease in all age groups under 25 years has declined by 55% or greater when 2000 and 2006 data are compared (Fig. 2).

Laboratory Confirmed Cases

In 2006, 88% of the notifications were laboratory confirmed.

Sixty one percent were confirmed by PCR alone, another 25% by both PCR and culture, 9% by culture alone, 3% by serology and 2% by microscopy.

Serogroup Distribution

In 2006, 81% of IMD cases were due to serogroup B, over half were in young children. Other serogroups accounted for just 4.8% of cases. The remainder were due to cases where no organism was detected (Fig. 3).

Since 2000 the proportion of cases due serogroup C, has declined dramatically from ~30% to <2%, whereas the proportion due to serogroup B has increased, >80% each year since 2003. The proportion non-serogroup B/C cases has not changed over the last eight years (Fig. 3).

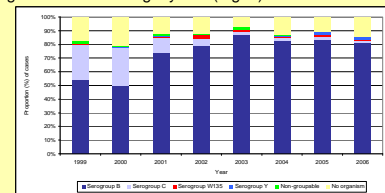


Fig. 3. Percentage distribution of IMD cases by serogroup, 1999-2006

IMD ~ Deaths

In 2006, there were five IMD related deaths in Ireland, which is a case fatality ratio of 2.4%. All five deaths were due to serogroup B, four in children <5 years and one in a young adult.

No serogroup C deaths have occurred in the past two years. Since 2001 five serogroup C deaths have occurred over the six-year period, compared to 11 in just 2000 alone.

Conclusions

- > Trends in the epidemiology of IMD in Ireland have remained largely unchanged over the last three years, with incidence rates now a third of what they were in 1999/2000.
- > The introduction of MenC conjugate vaccine in 2000 has nearly eliminated IMD due to serogroup C, reducing its incidence by 97%.
- > Serogroup B now accounts for 80% of IMD cases, with over half of these occurring in young children. All IMD related deaths in 2006 (n=5) were due to serogroup B.
- > Incidence due to non-serogroup B/C cases has not changed over the last eight years and remains low.
- > IMD no longer at hyper-endemic levels in Ireland, it is currently at endemic levels.

Final Comment

Despite the relative reduction of IMD, Ireland still has one of the highest rates of the disease in Europe, largely due to serogroup B and particularly in young children. Until an effective serogroup B vaccine for use in infants is developed and available, IMD will continue to be a serious public health concern, both in Ireland and globally

Acknowledgements

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