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## Introduction

Meningococcal disease is a notifiable disease caused by infection with the bacterium *Neisseria meningitidis*. It is a significant cause of morbidity and mortality, particularly in children and young people. Health Protection Scotland and the Scottish *Haemophilus Legionella* Meningococcus and Pneumococcus Reference Laboratory (SHLMPRL) have undertaken national enhanced surveillance of meningococcal disease since 1999.<sup>1</sup> National surveillance combines enhanced surveillance with laboratory diagnoses, and provides data on the epidemiology of the disease, serotype distribution, MLST and clinical presentation.

A vaccine targeted against some serogroup B (Men B) strains is being considered by the Joint Committee for Vaccination and Immunisation (JCVI) for potential inclusion into the UK immunisation schedule.<sup>2</sup>

This poster presents the epidemiology of invasive Men B in Scotland from 1999-2012 and discusses the potential implications for meningococcal B vaccine introduction.

## Methods

Every diagnostic laboratory in Scotland refers all invasive isolates of *Neisseria meningitidis* (i.e. isolates from blood, CSF and other normally sterile sites) and provides information on all clinical meningococcal disease diagnoses to the SHLMPRL.<sup>3</sup> Information received with each isolate and clinical diagnosis includes the case's name, age, clinical presentation, vaccination status and outcome.

Data on the Scottish population for each of the years 1999 to 2012 were obtained from the General Registrar Office for Scotland.<sup>4</sup>

## Results

### Overall numbers and incidence

Between 1999 and 2012, 991 cases of Men B were reported to Health Protection Scotland, equating to a mean annual incidence of 1.4 cases per 100,000 population (95% CI 1.3-1.5 cases per 100,000 population). Incidence peaked in 2000 with 2.3 cases per 100,000 population, decreasing steadily to 0.7 cases per 100,000 population in 2012, following a small increase in 2011 (Figure 1).

### Age specific incidence

Where age was known, more than half of all cases reported were in children under five years of age (535/989; 54.1%) and the highest incidence was observed in children under one year of age with a mean annual incidence of 36.4 cases per 100,000 population. The lowest incidence was observed in those aged 25 years or older with a mean annual incidence of 0.4 cases per 100,000 population (Figure 2).

However, the age specific incidence across age groups has decreased steadily over the study period (Figure 3).

FIGURE 1: Number of cases and incidence of Meningococcal disease serogroup B in Scotland, 1999-2012

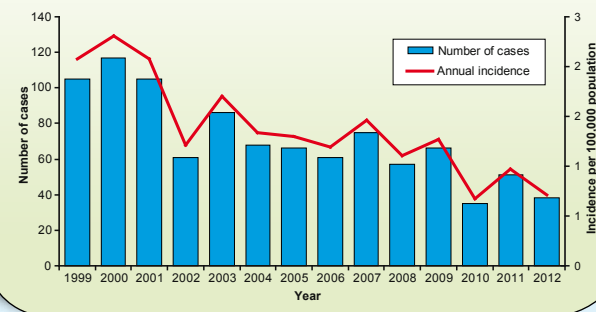


FIGURE 2: Number of cases and age specific incidence of meningococcal disease serogroup B cases, 1999-2012

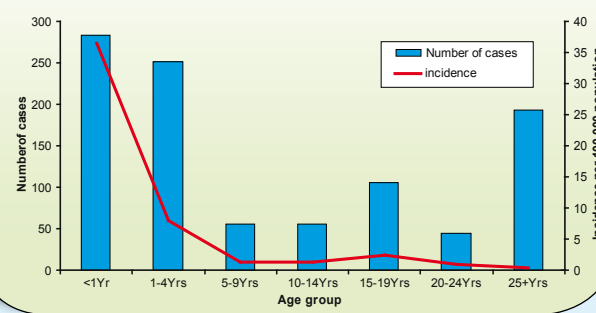
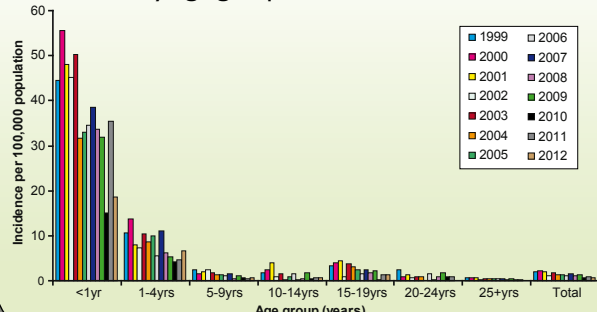


FIGURE 3: Meningococcal disease serogroup B incidence by age group, 1999-2012



### MLST distribution

During the study period, MLST results were available for approximately one third of isolates (301/991; 30.4%). In total, 133 MLST types were identified, the most common were MLST 41 (27 cases; 9.0%), MLST 213 (25 cases; 8.3%) and MLST 275 (19 cases; 6.3%) (Table 1).

### Clinical presentation

Clinical presentation was available for most cases (751/991; 76%). The most commonly reported clinical presentation was meningitis (320 cases; 43%), followed by septicaemia (222 cases; 30%), meningitis and septicaemia (177 cases; 24%) and other presentations (32 cases; 4%). However, clinical presentation was found to vary by age group; cases aged under five years were more likely to present with meningitis than septicaemia (OR=1.7, 95% CI 1.2-2.4, p<0.002).

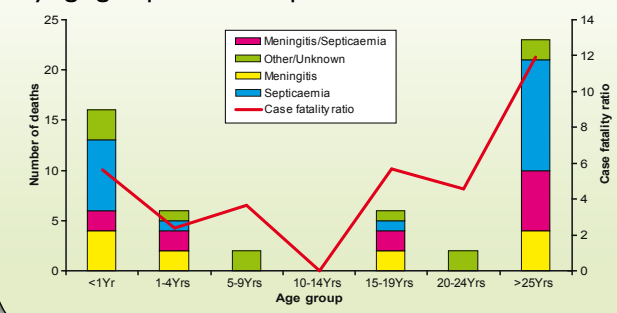
### Deaths

There were 55 deaths reported in the time period equating to an overall case fatality ratio (CFR) of 5.5%. However, CFR was found to vary by age and clinical presentation (Figure 4); cases aged 25 years and over were more likely to die (OR=3.2, 95% CI 1.8-5.7, p<0.0001) as were cases that presented with septicaemia (OR=2.5, 95% CI 1.2-5.5, p=0.01).

TABLE 1: MLST distribution of meningococcal disease serogroup B, 1999-2012

| MLST              | Number of cases | Percent      |
|-------------------|-----------------|--------------|
| 41                | 27              | 9.0          |
| 213               | 25              | 8.3          |
| 275               | 19              | 6.3          |
| 269               | 14              | 4.7          |
| 479               | 14              | 4.7          |
| 1161              | 13              | 4.3          |
| 162               | 8               | 2.7          |
| 340               | 7               | 2.3          |
| 1163              | 6               | 2.0          |
| 60                | 6               | 2.0          |
| 800               | 5               | 1.7          |
| 1167              | 4               | 1.3          |
| 154               | 4               | 1.3          |
| 461               | 4               | 1.3          |
| 1157              | 3               | 1.0          |
| 1195              | 3               | 1.0          |
| 283               | 3               | 1.0          |
| 32                | 3               | 1.0          |
| 43                | 3               | 1.0          |
| 5372              | 3               | 1.0          |
| Others (<1% each) | 127             | 42.2         |
| <b>Total</b>      | <b>301</b>      | <b>100.0</b> |

FIGURE 4: Meningococcal disease serogroup B deaths by age group and clinical presentation, 1999-2012



## Conclusions

Men B disease has declined significantly in recent years in Scotland but remains a significant source of morbidity and mortality, especially among young children; more than half of all cases occur in children under five years of age and the highest incidence is observed in children under one year of age.

The majority of cases presented with meningitis, septicaemia or a combination of both meningitis and septicaemia. However, younger children were more likely to present with meningitis. Approximately 5.5% of cases are known to have died, but death was found to be more likely in older age groups and those who presented with septicaemia.

As serogroup B accounts for around three quarters of laboratory confirmed cases in Scotland<sup>5</sup> and predominantly affects younger age groups, any ability to prevent these infections could have a substantial impact on the overall incidence of disease in Scotland.

## Acknowledgements

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## References

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2. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/225004/Minutes\\_Meningococcal\\_sub-committee\\_meeting\\_April\\_2013\\_-\\_final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/225004/Minutes_Meningococcal_sub-committee_meeting_April_2013_-_final.pdf)
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