

Current epidemiology of meningococcal disease in the UK and Europe

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European epidemiological patterns



- In common with most temperate climates (north America, Australasia)
 - Low incidence of endemic disease
 - Seasonal increase each winter, mainly affecting in children under five
 - Overall, serogroups B and C predominate
- Within Europe data collected from 28 countries 1999-2009

	1999	2009
Overall incidence	1.90 /100,000	0.92/100,000
Range	0.17-14.33/100,000	0.21-3.01 /100,000

Reported incidence of IMD, Europe 2009



Trends in IMD in Europe, 1999-2009

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Serogroup distribution in Europe, 2009





Incidence of IMD in Europe



- Wide range of incidence of IMD in Europe
 - Ranking of countries has remained largely the same over time
 - UK and ROI are amongst the highest incidence countries
- Overall incidence declined between 1999-2009
 - Decline in serogroup C between 2000-2003 due to use of MCC vaccine
 - Less dramatic decline in serogroup B cause of decline unclear

Overall incidence of IMD and serogroup B and C cases England and Wales, 1998/99-2010/11

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Deaths from confirmed IMD England and Wales, 1998/99-2010/11





Total IMD cases due to capsular groups other than B and C



Trends in IMD 1998/99-2010/11 England and Wales



- Incidence of IMD has declined markedly since 1998/99
 - Initial decrease due to major decline in serogroup C cases
 - Subsequent decline in serogroup B infections
- Deaths due to IMD have also declined
- Minor increase in serogroup Y since 2007
- Good baseline for potential vaccine introduction

Surveillance for serogroup B vaccines



- Vaccines aiming to have broad coverage against serogroup B infection now in late stages of development
- Should have activity for other serogroups
- Licensed on the basis of immunogenicity
- Likely to need multiple doses

 Particularly in young infants
- What is the potential role in the UK?

Age specific incidence of IMD and serogroup breakdown, 2006/7-2009/10



Serogroup breakdown by age group, 2006/7-2009/10



Serogroup B incidence and CFR by age group





Recent epidemiology of IMD



- relevance to new vaccines
- Vast majority (~90%) of cases due to serogroup **B** infection
 - Non-B serogroups become relatively more important with age
- Low overall case fatality ratio ~5.3%
 - Lower for group B (5.1%) than group C (12.5%)
 - CFR increases with age
- Highest incidence of IMD infection in infants
 - High number of cases up to the age of 5 years
 - Minor secondary peak in cases and CFR in teenagers

Age distribution of cases in under 2 year olds





The role of serogroup B vaccines in the UK



- For direct protection against cases of IMD with new vaccines
 - prevent serogroup B infections in infants and young children
 - Achieve protection by 5 months of age
- Teenagers form a less important target group
 - Unless vaccine also offers indirect protection from reduced carriage rates

Post licensure monitoring of serogroup B vaccines



- Incidence of / deaths from serogroup B infection
 - Vaccinated and unvaccinated cohorts
- Vaccine coverage by age and cohort
 - Estimate direct and indirect protection
- Possible role for carriage studies
- Vaccines unlikely to cover all invasive strains
 - Potential for cases of vaccine "escape"
 - Potential for replacement disease
- Monitor diversity of serogroup B infections

Distribution of major phenotypes of serogroup B, Europe 1999-2006





MenB clonal complex by age group 2006/7-1009/10

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Serogroup B diversity



- Secular trends in strains contributing to disease across UK and Europe
 - Potential for emergence of different strains in absence of vaccination programme
- Highly variable organism
 - Small number of major clonal complexes that contribute to invasive disease
 - Small variation between strains causing disease at different ages

Assessing potential coverage of new vaccines

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- Relatively short term baseline for assessment (one year)
- Mainly limited to serogroup B
- Mainly based on invasive cases (not carriage strains)
- Systems for post-marketing surveillance of vaccine typing being developed by manufacturers
 - Being set-up in collaboration with national reference laboratories

Challenges for post-marketing surveillance



- Currently methods and reagents for typing are in control of manufacturers
- Determining expression of vaccine antigens requires isolates from cases
 - Needs central collection/collation of isolates
 - Unable to monitor coverage in non-culture confirmed cases
 - Need to improve use of throat swabs in suspected cases
- Number of vaccine components may be important
 - ? Ability to tease out the impact of single and multiple components



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