Prevalence/incidence of maternal group B streptococcal colonisation in European countries
A systematic review

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WHO
The *Streptococcus agalactiae* (Group B streptococcus, GBS) - the leading cause of neonatal sepsis, pneumonia and meningitis in many industrialised countries.

- **Incidence**
  
  ~0.5 to 3 cases per 1000 live births.

- **Morbidity**
  
  GBS meningitis leaves half those infected with long-term neurodevelopmental effects at 5-year follow-up.

- **Mortality**
  
  Case-fatality rates for GBS disease are 10% in UK and 4.7% in USA.


IAP has been shown to be effective in reducing the incidence of early onset GBS disease in neonates

How to identify candidates for IAP?

Risk – based strategy
- 625 women with one or more risk factors need to be treated with IAP to prevent one case of EOND

OR

Culture – based screening strategy
- RR for early onset disease following screening-based vs risk-based IAP 0.46 (95% CI 0.36–0.60)
- 750 women who are GBS carriers need to be treated to prevent one case of EOND

• Maternal and neonatal GBS colonization rates have been found to vary between different countries or different ethnic groups within the same country.

• A Cochrane review on intrapartum antibiotics use for GBS colonisation concluded that better data on maternal risk factors for neonatal GBS infection in different populations are required.

Objectives

- To assess the prevalence/incidence of maternal group B streptococcal colonisation in European countries.
- To evaluate GBS serotype distribution and antimicrobial resistance from studies.
Search strategy

- Electronic databases Medline and Scielo, from 1996 to 2006 (in collaboration with the WHO specialised librarian).
- Reference list of retrieved articles.
- Unpublished data from Swedish study (Jacobsson Bo, personal communication, NFOG 2006, Sweden).
Search strategy

- Scanned all identified citations on the basis of titles and/or abstracts against the eligibility criteria.
- Evaluated the full-text published in English, French, Spanish, Portuguese, Polish, Russian and Lithuanian.
- Studies published in other languages were included in the review when abstracts provided sufficient information.
The study quality assessment using the following criteria:

- Description of study period
- Information about study setting characteristics
- Description of sampling method used
- Information about population characteristics: residence, ethnicity, complementary information (socioeconomic status, age, etc.)
- Information about specimen collection time
- Information about specimen collection site
- Description of laboratory methods used for GBS detection

The quality was graded into 3 categories:

≥ 6 “yes” answers – high, 4 to 5 – moderate, ≤3 – low
Data processing

- Data on the incidence or prevalence of GBS colonization in pregnant women were extracted.
- The serotype distributions of GBS isolates and data on antimicrobial resistance, if available, were collected.
Results

70 citations identified

47 title/abstracts excluded:
  8 no relevant data
  21 prevalence/incidence of GBS carriage in other countries than Europe
  11 evaluate methods for GBS detection
  7 measure the compliance with local/national protocol

23 title/abstracts eligible for inclusion

21 studies included

2 studies excluded
  Norwegian and Turkish languages

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Distribution of countries

24 093 women, 13 countries

- Eastern Europe
- Scandinavia
- Western Europe
- Southern Europe
Design and setting of studies

- Cross-sectional
- Cohort
- Case-control
- Hospital-based
- Community-based
- National data
Quality assessment of studies

Study period: 21
Study setting: 9
Sampling method: 10
Population characteristics: 4
Specimen after 35wks or at delivery: 16
Specimen from vagina and rectum: 14
Selective broth media: 16
Quality assessment of studies

- High (≥6 "yes" answers)
- Moderate (4-5 "yes" answers)
- Low (≤3 "yes" answers)
Maternal GBS colonisation in Europe

Rates ranged from 6.5 to 36%

- Poland
- Czech Republic
- France
- Ireland
- Germany
- UK
- Netherlands
- Iceland
- Denmark
- Sweden
- Italy
- Turkey
- Greece

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Maternal GBS colonisation in Europe

Women originating from countries:

- in Africa 29%
- in Latin America 22%
- in Europe 21%
- in Asia 13%

Valkenburg –van den Berg AW et al.  
Serotype distribution of GBS isolates

n = 1360

Czech Republic: 33.2%
Germany: 28%
UK: 26.4%
Ireland: 30%
Ireland: 30%
Turkey: 29%
Greece: 26.9%

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Antimicrobial resistance of GBS

<table>
<thead>
<tr>
<th>Country</th>
<th>Erythromycin (%)</th>
<th>Clindamycin (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>3.8</td>
<td>3.2</td>
</tr>
<tr>
<td>France</td>
<td>14</td>
<td>-</td>
</tr>
<tr>
<td>Turkey</td>
<td>21.2</td>
<td>9.1</td>
</tr>
<tr>
<td>Turkey</td>
<td>13.5</td>
<td>2.7</td>
</tr>
<tr>
<td>Turkey</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Turkey</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Greece</td>
<td>7.5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

All strains were susceptible to penicillin, ampicillin, cefazolin and vancomycin
Conclusions

- Maternal GBS colonisation rates varied in European countries from 19.7 to 29.3% in Eastern Europe, 11-21% in Western Europe, 24.3-36% in Scandinavia, and 6.5-32% in Southern Europe.
- Maternal GBS colonisation rates appear to vary between different ethnic groups within the same country.
- Serotype II was the most common in Southern Europe, while serotype III in other part of Europe.
- None of the group B streptococcus isolates in Europe were resistant to penicillin or ampicillin, whereas from 3 to 20% showed resistance to erythromycin or/and clindamycin.