

# Prevalence/incidence of maternal group B streptococcal colonisation in European countries

## A systematic review

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# 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.

CDC. *MMWR* 1996; 45: 1–24.

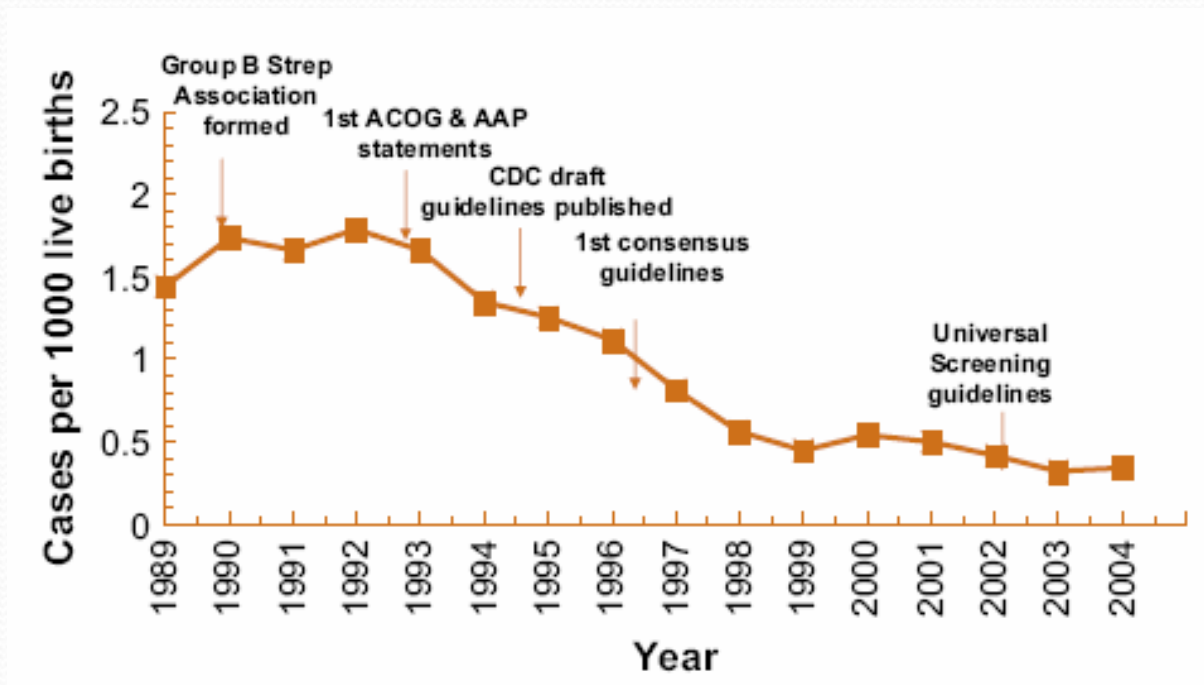
Bedford H et al. *BMJ* 2001 Sep 8; 323(7312): 533–536.

Heath PT et al. *Lancet* 2004 Jan 24; 363(9405): 292–294.

Schrag SJ et al. *N Engl J Med* 2000 Jan 6; 342(1): 15–20.

# Incidence of early-onset GBS disease in the US 1989–2004

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



Rouse DJ et al. *Obstet Gynecol* 1994;83:483-94.  
Heath PT et al. *Best Pract Res Clin Obstet Gynaecol* 2007



# 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

Schrag SJ et al. N Engl J Med 2002 Jul 25; 347(4): 233–239.  
Heath PT et al. Best Pract Res Clin Obstet Gynaecol 2007.

- 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.

Smaill F. Cochrane Database Syst Rev, 2000.



# 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.
- Hand searched journals: Acta Obstetricia et Gynaecologica Scandinavica, European Journal of Obstetrics and Gynaecology, British Medical Journal, Lancet, Clinical Microbiology and Infection.
- 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

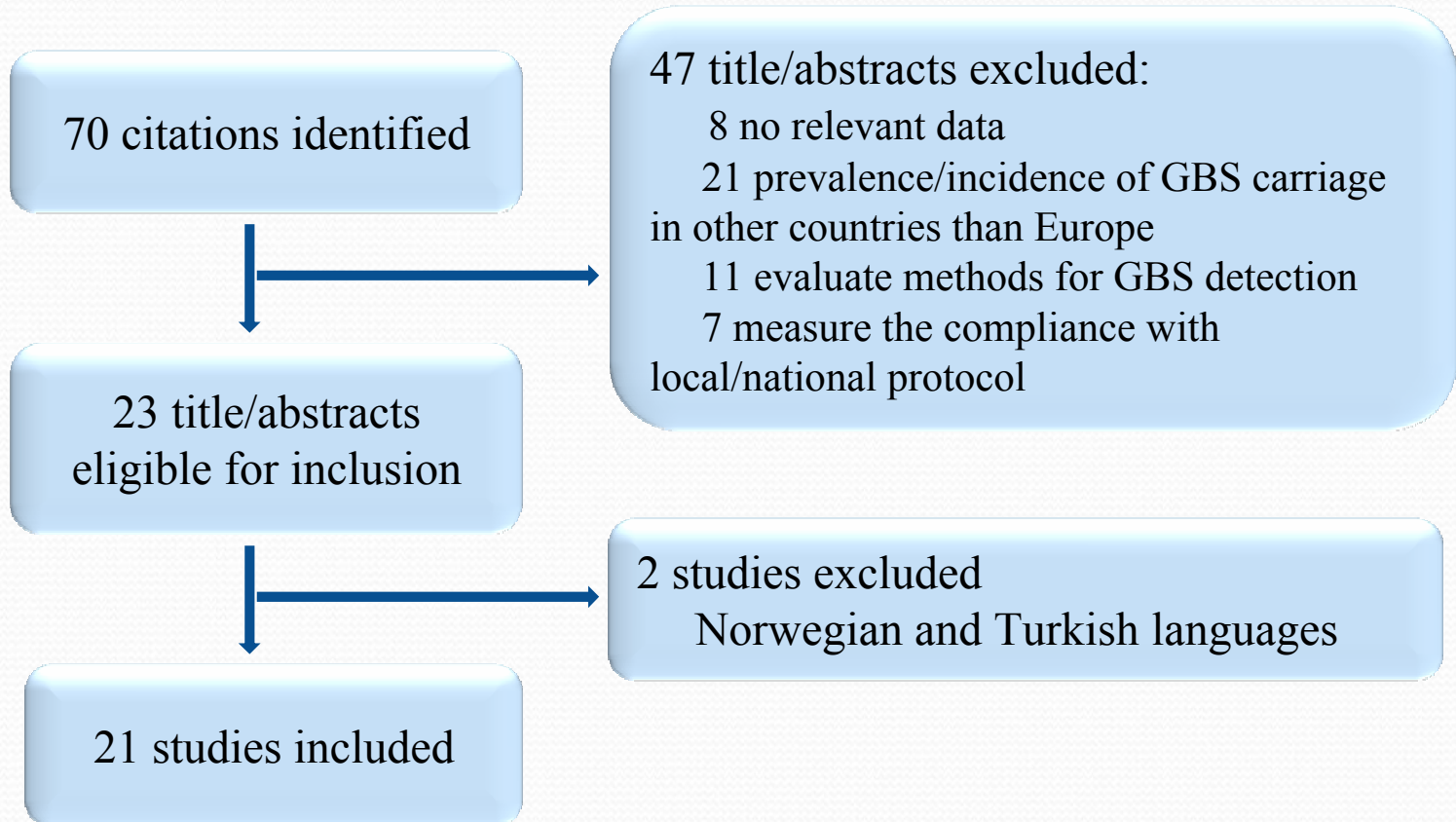
The quality was graded into 3 categories:

$\geq 6$  “yes” answers– high, 4 to 5 – moderate,  $\leq 3$  – 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





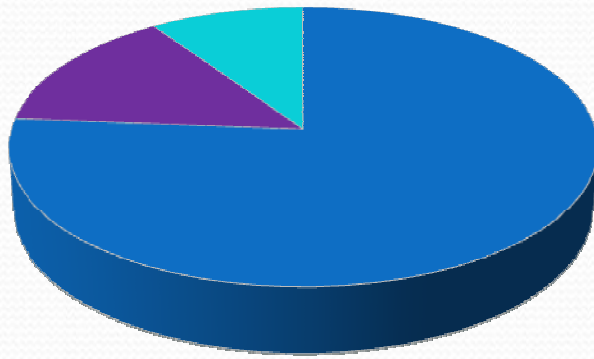
# Distribution of countries

24 093 women, 13 countries

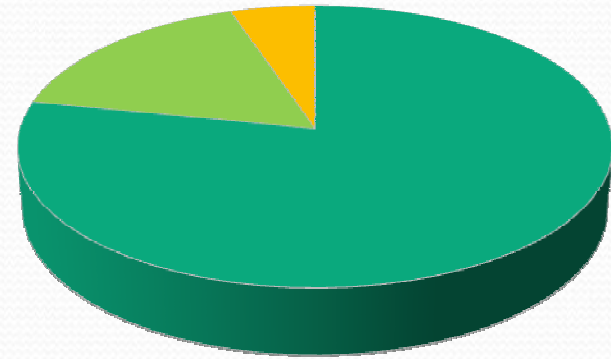


- Eastern Europe
- Scandinavia
- Western Europe
- Southern Europe

# Design and setting of studies

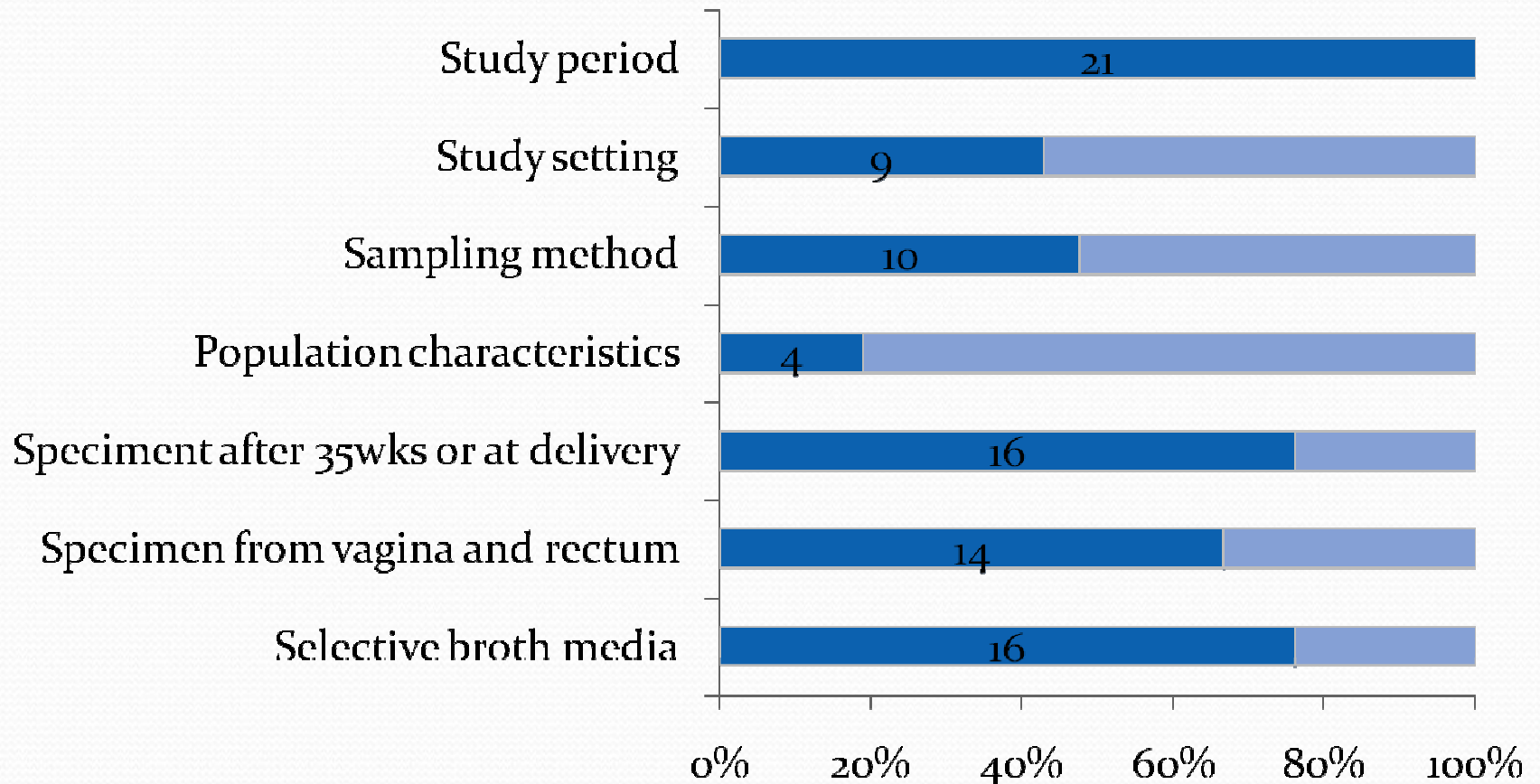


- Cross-sectional
- Cohort
- Case-control



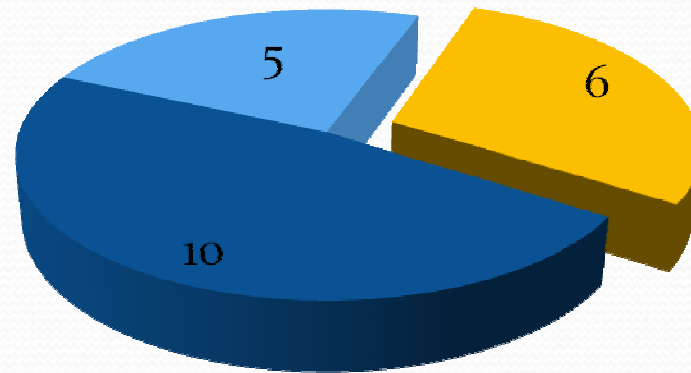
- Hospital-based
- Community-based
- National data

# Quality assessment of studies





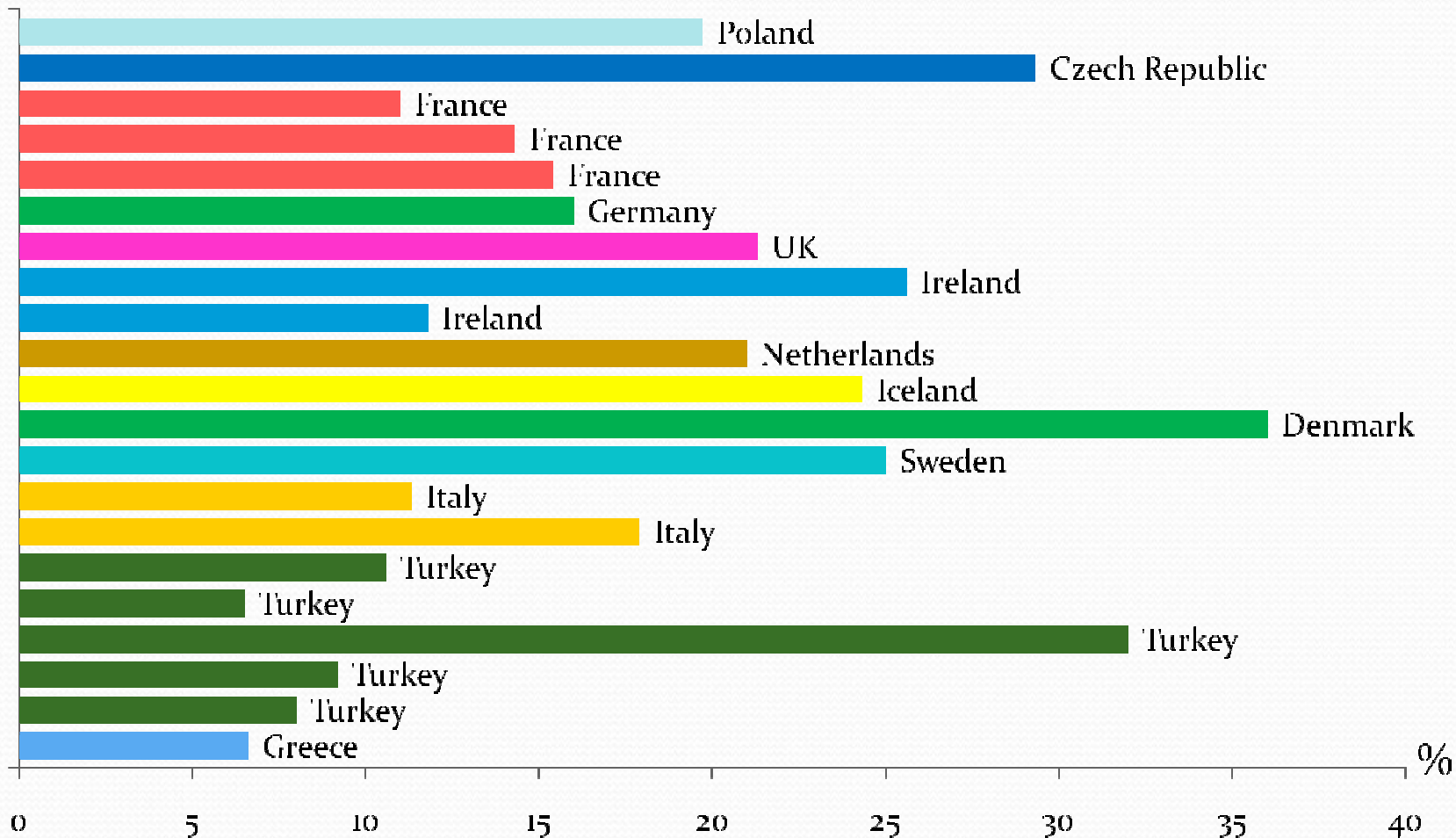
# Quality assessment of studies



- High ( $\geq 6$  "yes" answers)
- Moderate (4-5 "yes" answers)
- Low ( $\leq 3$  "yes" answers)

# Maternal GBS colonisation in Europe

Rates ranged from 6.5 to 36%



# Maternal GBS colonisation in Europe

Women originating from countries:

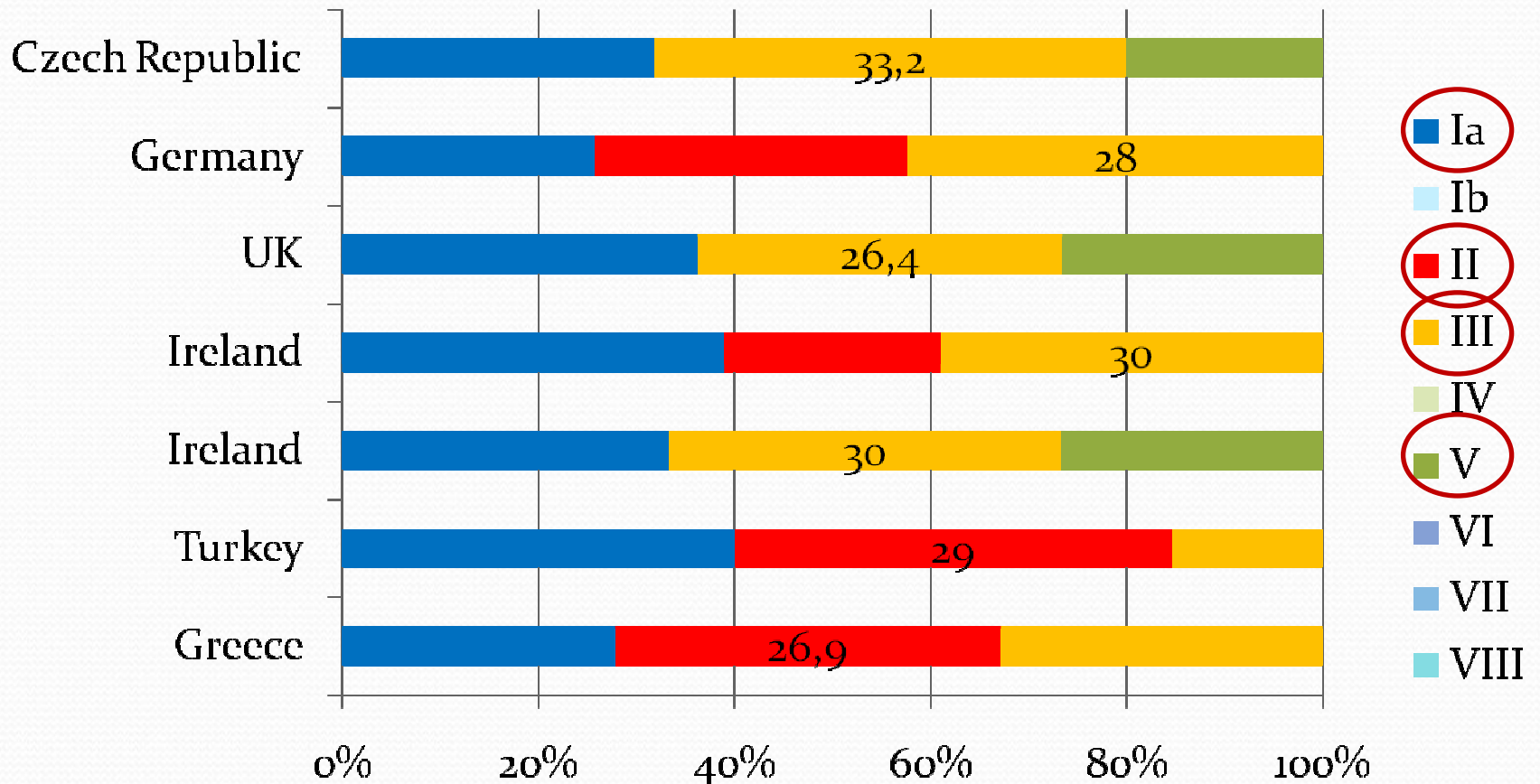
- in Africa 29%
- in Latin America 22%
- in Europe 21%
- in Asia 13%

Valkenburg –van den Berg AW et al.  
*Eur J Obstet Gynecol Reprod Biol* 2006;124:178-83.



# Serotype distribution of GBS isolates

n = 1360



# Antimicrobial resistance of GBS

Country	Erythromycin (%)	Clindamycin (%)
Czech Republic	3.8	3.2
France	14	-
Turkey	21.2	9.1
Turkey	13.5	2.7
Turkey	7	9
Turkey	20	20
Greece	7.5	7.5

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.