Despite advances in preventive strategies, Group B Streptococcus (GBS) disease is still a leading cause of severe neonatal infections. The Belgian National Reference Centre (NRC) routinely performs surveillances of GBS invasive cases.

To provide an overview of bacteriological characteristics of GBS causing early and late onset invasive diseases in infants during the year 2015, in Belgium:

- To characterize relevant epidemiological markers of the isolated GBS strains.
- Determination of their capsular polysaccharide (CPS) types and distribution.
- Determination of their pili types and distribution.
- Determination and description of their antimicrobial susceptibility profile.
- Determination and distribution of macrolide/lincosamide (MLS) resistance genotypes.

In Belgium, GBS invasive infection is not a notifiable disease, but a regular surveillance of diseases and characterization of GBS isolates is performed by the Belgian National Reference Centre (NRC) for Streptococcus agalactiae (GBS).

### Early-onset and Late-onset Diseases (EOD, LOD)

- A total of 44 GBS strains isolated from neonatal invasive diseases received by the NRC in 2015: 21 from EOD and 23 from LOD, see Figure 1, year 2015.
- Considering the incidence of GBS neonatal infections in Belgium, this collection represented for 2015 about 40% of GBS invasive diseases. Not shown, through the past decade, the number of laboratories participating has more than doubled, and therefore the number of reported cases.
- The ratio between EOD and LOD has evolved these recent years, EOD cases were higher than LOD in the beginning of the 21st century. In 2015, the number of LOD cases was higher than EOD, thanks to preventive strategies focused on EOD decrease, see Figure 1.

### Distribution of CPS types and pilis types

- A CPS type was assigned to all isolates:
  - The most prevalent CPS type was type III either among EOD cases (43.3%) or LOD cases (65.4%). See Figure 2.
  - Every isolate of GBS harboured at least one pilis gene or a combination of genes.
  - Pili genes were not evenly distributed among strains isolated from EOD or LOD. See Figure 3.
  - Among the EOD cases, the pilis genes P12a (33.3%) and the combination P11,P12b (33.3%) were predominant, closely followed by P11, P12b (24.8%).
  - Among the LOD cases, strains harboured mainly the combination of pilis genes P11,P12b (45.8%).

### Antimicrobial susceptibility profile

- **Susceptibility to beta-lactams**
  - All isolates were fully susceptible to penicillin with MICs ranging from 0.03 to 0.125 mg/L.
  - According to Kimura's procedure and interpretative criteria, no decreased susceptibility to beta-lactams was detected.

- **Susceptibility to macrolide-lincosamide**
  - Out of 44 isolates, 10 (22%) were resistant to erythromycin and clindamycin.
  - As shown in Figure 4 the major phenotype of resistance was dMLS (90% of resistant isolates), the constitutive resistant phenotype. The inducible, iMLS, phenotype was demonstrated in one resistant GBS; no isolate showed isolated resistance to erythromycin (M phenotype) or the L phenotype, isolated resistance to clindamycin.

- The distribution of the genes coding for resistance, ErmB, ErmTr, MefA and LsoC harbourd by these 10 isolates is shown in the following Figure 5.

### Results

**Figure 1**: Overview of the yearly distribution of GBS EOD and LOD cases (2002 – 2015).

**Figure 2**: Distribution of CPS types of 44 GBS strains isolated in 2015 from newborns with invasive disease: 21 EOD and 23 LOD.

**Figure 3**: Distribution of the pilis genotypes of 44 GBS strains isolated in 2015 from newborns with invasive disease: 21 EOD and 23 LOD.

**Figure 4**: Distribution of resistance phenotypes to macrolide-lincosamide among the 10 GBS isolates expressing resistance.

**Figure 5**: Distribution of the resistance genes to macrolide-lincosamide harboured by the 10 GBS isolates expressing resistance.

### Discussion & Conclusion

- In Belgium, GBS invasive disease is not a notifiable disease. Surveillance is organized by the NRC and strains are provided by Belgian laboratories belonging to a surveillance network. During the last decade, number of participating laboratories has increased impacting the number of reported cases.

- Bacteriological characteristics of GBS isolated from newborns with invasive disease (early and late-onset), CPS type distribution, pilis type distribution, rate and type of resistance to macrolide/lincosamide, were consistent with reported data among European countries and North America.