

# Meningitis caused by *Streptococcus agalactiae* in the Czech Republic

– data of the National Reference Laboratory for Streptococcal Infections and The National Health Information System database, 2008-2022



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## Background

*Streptococcus agalactiae* (Group B Strep, GBS) is opportunistic pathogen causing non-invasive as well as invasive diseases. GBS predominantly causes neonatal sepsis and meningitis, but can also cause invasive infections in elderly patients and patients with immunodeficiency. There is currently no vaccine against GBS. In the Czech Republic, prevention against GBS early-onset neonatal sepsis and meningitis consists in prenatal screening for GBS in the genital and rectal area of pregnant women. In the case of positive GBS status of pregnant woman, intrapartum antibiotic prophylaxis (IAP) is administered.

## Methods

The data about invasive GBS diseases are recorded in the National Health Information System (ISIN) database. GBS isolates are voluntarily sent to the National Reference Laboratory for Streptococcal Infections (NRL/STR) for serotyping. In the Czech Republic, surveillance program of invasive infections caused by GBS is not established. This paper analyses data on meningitis caused by GBS from ISIN database and laboratory NRL/STR database between 2008 and 2022. Meningitis cases are defined by the diagnosis in the ISIN or the material from which GBS was isolated.

## Results

Between 2008 and 2022, a total of 90 cases of GBS meningitis were recorded, 69 cases were listed in ISIN and 45 GBS isolates were sent to NRL/STR for serotyping, only 24 cases were both recorded in ISIN and GBS isolate sent to NRL/STR. 48 cases were in males, 42 cases in females – graph 1.

The overall average GBS meningitis morbidity between 2008 and 2022 reached 0.057/100,000 inhabitants (the highest in 2008 – 0.096/100,000 inhabitants, the lowest in 2020 – 0.028/100,000 inhabitants) – graph 2. Age-specific morbidity was highest in children under one year of age – on average 3.611/100,000 inhabitants (the highest in 2010 – 7.662/100,000 inhabitants, the lowest in 2017 – 1.751/100,000 inhabitants) – graph 3.

The serotype was determined for 45 isolates causing GBS meningitis. The most prevalent serotype was serotype III (30 cases), followed by serotype V (10) and Ia (3) – graph 4, 5.

Between 2008 and 2022, 6 deaths due to GBS meningitis were recorded. Serotype was examined in 3 cases with fatal outcome and all 3 cases were due to serotype V – graph 2.

## Intrapartum antibiotic prophylaxis (IAP)

IAP has been recommended in the Czech Republic since 2004.

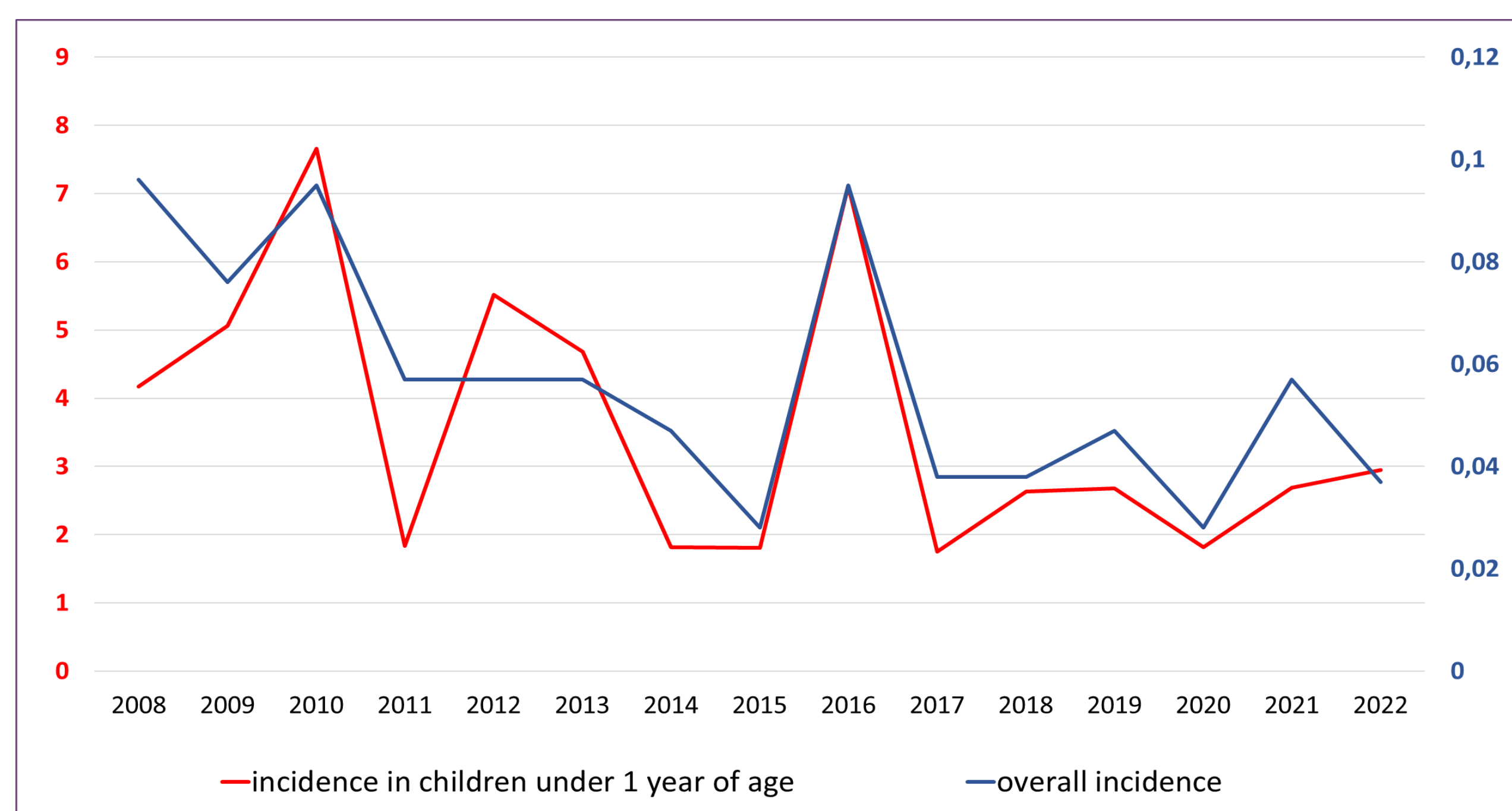
IAP is indicated in the following cases:

- positive result of GBS screening in the pregnancy (positive GBS culture from vaginal or rectal swab at 35–37 weeks of gestation)
- GBS bacteriuria detected at any time during pregnancy
- previous child with invasive GBS infection in neonatal age
- unknown result of GBS screening at the beginning of labor and at the same time if any of the following factors are present:
  - delivery before 37+0 gestational week
  - rupture of membranes > 18 hours
  - intrapartum fever (temperature > 38°C)
  - positive rapid test for GBS (does not replace cultivation screening)

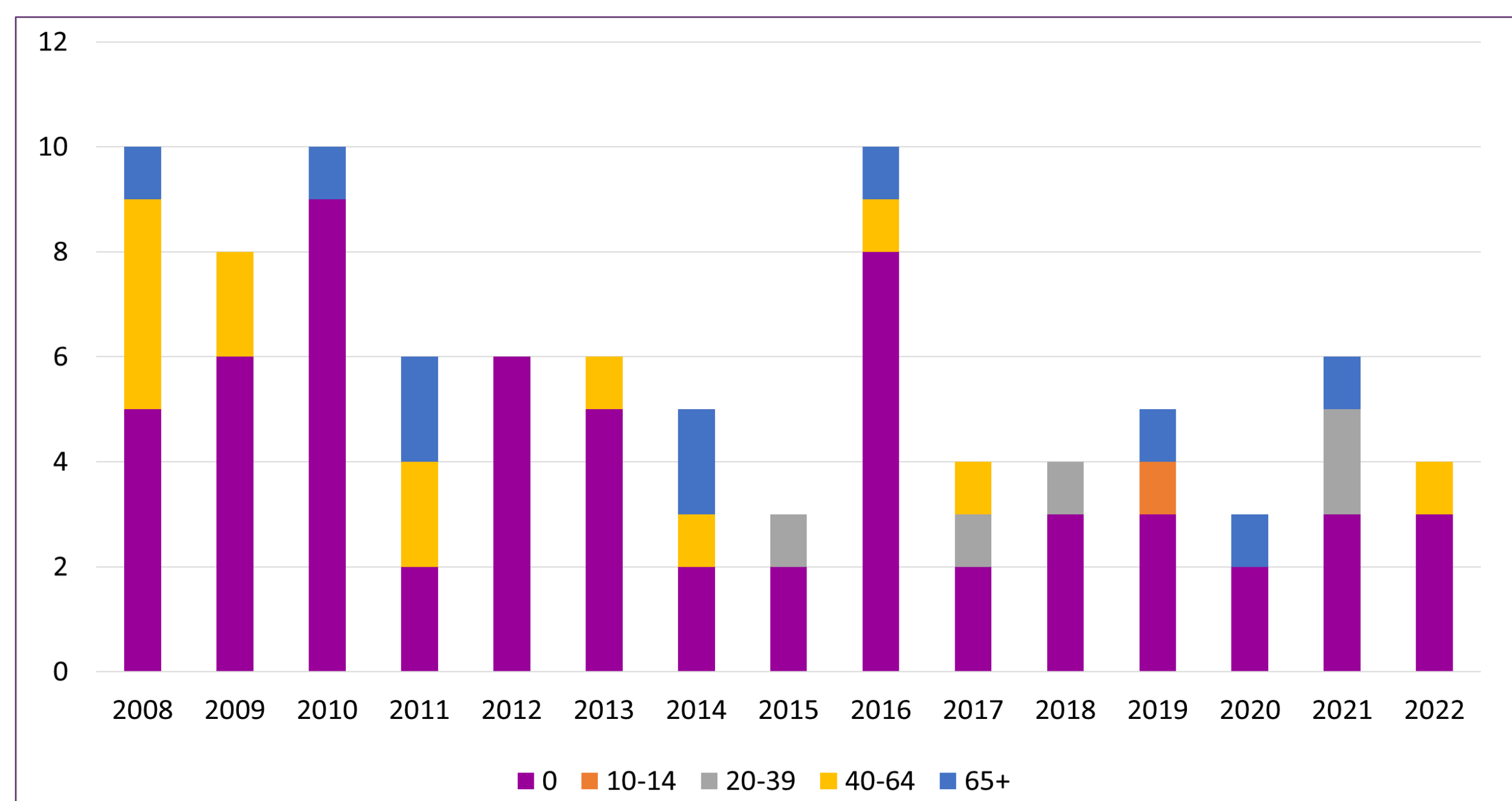
IAP is given at the beginning of labor and then at regular intervals until the end of labor. The antibiotic of first choice is penicillin G IV or ampicilin IV. In case of penicillin allergy, 1st generation cephalosporins or clindamycin is administered [1,2].

## Conclusions

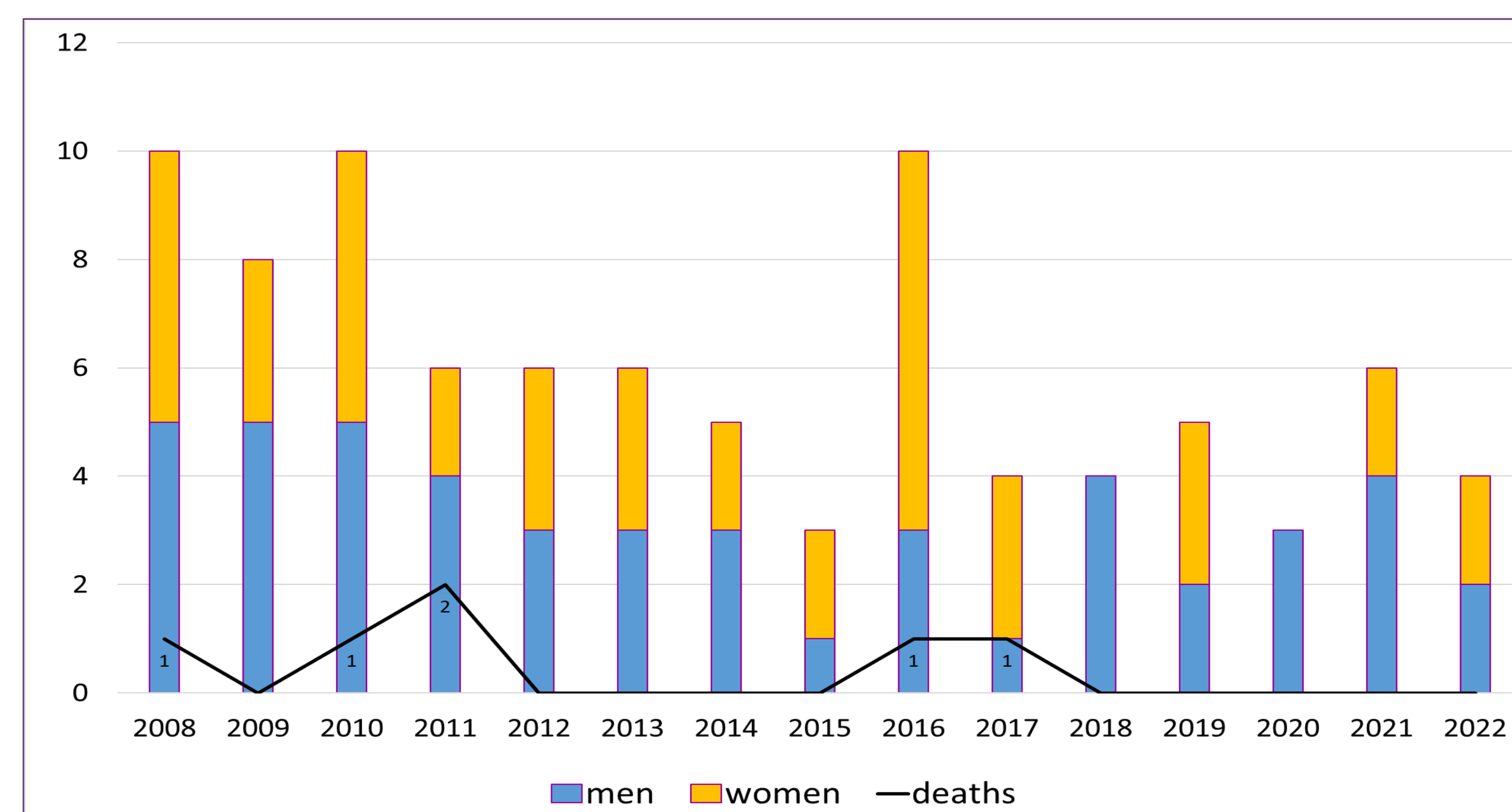
Overall average morbidity of GBS meningitis between 2008 and 2022 was low, the highest morbidity was observed in children under one year of age. Serotype III was the most prevalent in our dataset. In the Czech Republic, the surveillance program of GBS meningitis is not established and morbidity and mortality can be expected to be higher than reported in this paper.



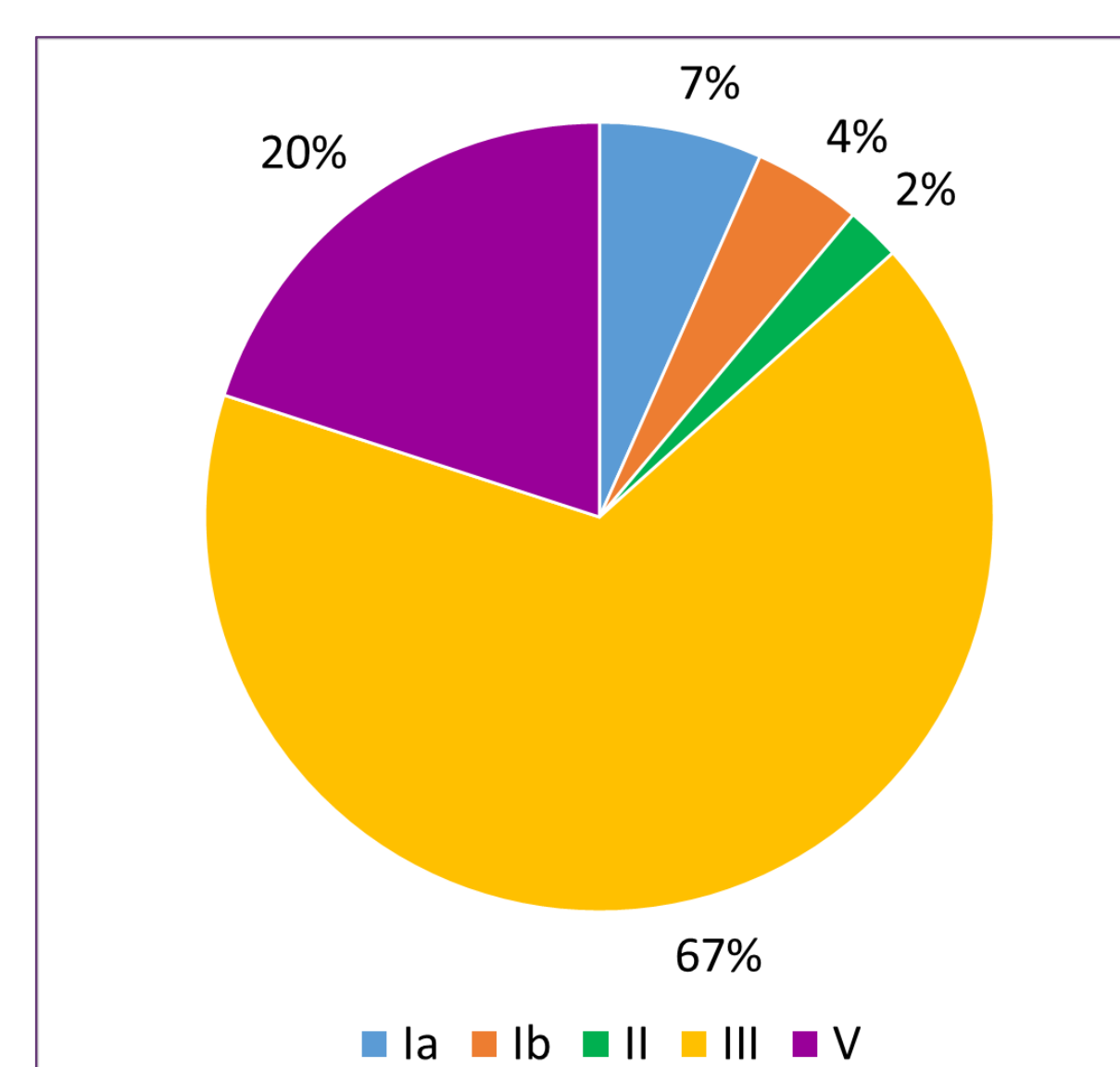
**Graph 2** – Overall incidence of the GBS meningitis (blue line), age specific incidence in children under one year of age (red line), data ISIN and NRL/STR, Czech Republic, 2008-2022



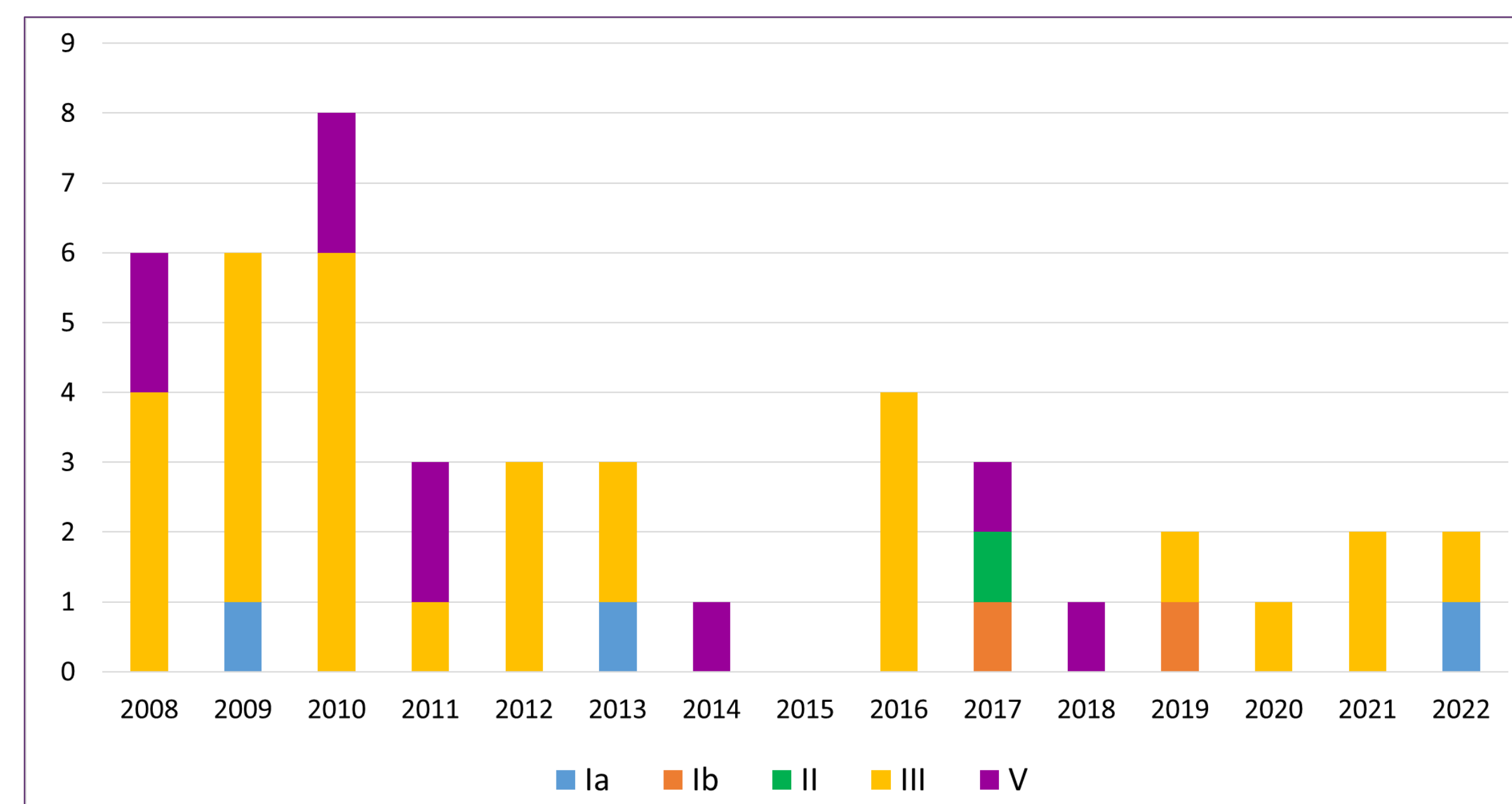
**Graph 3** – GBS meningitis cases by age groups, cumulative numbers, data ISIN and NRL/STR, Czech Republic, 2008-2022, n=90



**Graph 1** – GBS meningitis cases by sex, cumulative numbers, black line shows the numbers of deaths, data ISIN and NRL/STR, Czech Republic, 2008-2022, n=90



**Graph 4** – Serotypes causing GBS meningitis, data ISIN and NRL/STR, Czech Republic, 2008-2022



**Graph 5** – GBS meningitis cases by serotypes, cumulative numbers, data ISIN and NRL/STR, Czech Republic, 2008-2022, n=45

[1] Měchurová, Vlk, Unzeitig. Doporučený postup při diagnostice a léčbě streptokoků skupiny B v těhotenství a za porodu. Česká gynekologie, 69, 2004, č.5, 421-422

[2] Měchurová, Vlk, Unzeitig. Diagnostika a léčba streptokoků skupiny B v těhotenství a za porodu – doporučený postup. Česká Gynekologie 2013; 78(Supplementum):11-14