Capture-Recapture Incidence of Invasive Pneumococcal Disease in Children in Germany, 2018-2019

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BACKGROUND

Surveillance of invasive pneumococcal disease (IPD) in children began in Germany in 1997. There are two independent surveillance systems for pediatric IPD, one by the German Nation Reference Center for Streptococci (GNRCS) and one by the German Pediatric Surveillance Unit (ESPED).

IPD became a mandatorily reportable disease in 2020, so an incidence calculation now will provide a useful comparison point to test the impact of this surveillance system change.

METHODS

Isolates from IPD cases in children aged 0 through 15 years were identified at the GNRCS through optochin sensitivity and bile solubility testing. Cases of IPD in children 0 through 15 years were identified by ESPED through survey responses from pediatric hospital clinicians.

We used the Lincoln-Peterson mark and recapture method to calculate the incidence of IPD in German children from July 2018 through June 2019. Matching of cases was based on date of culture collection, and the patients' birth date, sex, and postal code.

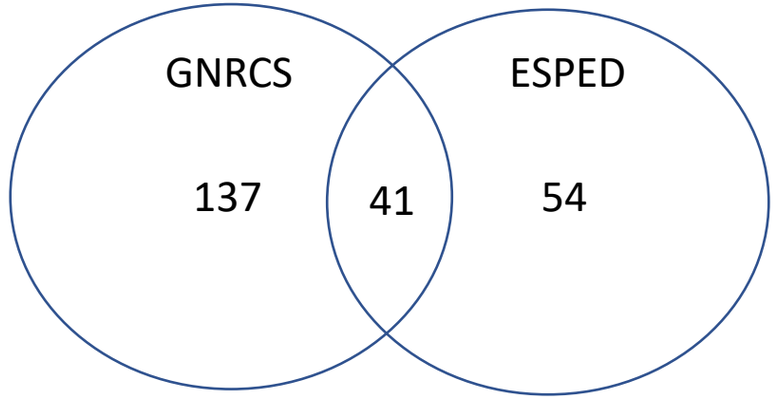
RESULTS

178 IPD cases were identified by GNRCS; 95 by ESPED. 41 cases were matches. The resultant IPD incidence for children 0-15 years old was 3.42 per 100,000. For meningitis cases, 62 cases of IPD were identified by the GNRCS and 46 were identified by ESPED. 26 were matches, which resulted in an incidence of 0.91 cases per 100,000.

Table 1: Incidence of IPD and meningitis among children of different age groups in Germany, in the pneumococcal season 2018-2019.

Age group	IPD per 100,000	Meningitis per 100,000
<2	14.03	3.95
2-4	5.44	1.22
5-15	0.81	0.24

Figure 1. 2018-2019 surveillance system sample sizes and matched cases for pediatric invasive pneumococcal disease in Germany



CONCLUSIONS

- Capture-recapture surveillance is a useful method of assessing IPD incidence in health systems that do not include IPD as a reportable condition.
- Children <2 continue to bear the majority of the burden of pediatric IPD and pneumococcal meningitis in Germany.