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**Nationales Referenzzentrum
für Meningokokken und *H. influenzae***

Data from the NRZMHi for *H. influenzae* in 2024

1. Introduction

The tasks of the National Reference Laboratory for Meningococci and *Haemophilus influenzae* (NRZMHi) assigned by the Robert Koch Institute for the surveillance of **invasive *Haemophilus influenzae* disease** include serotyping of clinical isolates from blood or cerebrospinal fluid (CSF) and the detection of antibiotic resistance against β-lactam antibiotics. In 2024, all in all 1525 submissions were analyzed including submissions from 1365 patients with invasive infections. The NRZMHi could confirm the diagnosis *Haemophilus influenzae* in 1310 cases where disease isolates were available. In five cases, *H. influenzae* was detected and serotyped by PCR from submitted DNA or native material. In six cases *H. parainfluenzae* and in one case *H. haemolyticus* from blood was detected. Furthermore, eleven *H. influenzae* isolates derived from primarily sterile sites other than blood or CSF. These cases do not meet the criteria of the reference definition for a notifiable invasive infection.

In 1269 invasive cases, *H. influenzae* was detected from blood, in 37 invasive cases from cerebrospinal fluid (CSF) only. Additionally, there were four invasive cases where *H. influenzae* was isolated from both, blood and cerebrospinal fluid (CSF). Detection of *H. influenzae* from these materials must be notified according to the German Infection Protection Act (IfSG).

As in previous years, the majority of blood or CSF isolates was uncapsulated, also known as non-typable *H. influenzae* (NTHi, 1149 isolates, 88 %), followed by Hif as the most frequent capsular serotype (80 cases; 6 %). In 2024 Hib showed the third highest frequency among the serotypes (30 cases; 2,3 %), followed by Hia (28 cases, 2,1 %). Hie was found in 23 cases (1,8 %). Neither Hic, nor Hid were isolated.

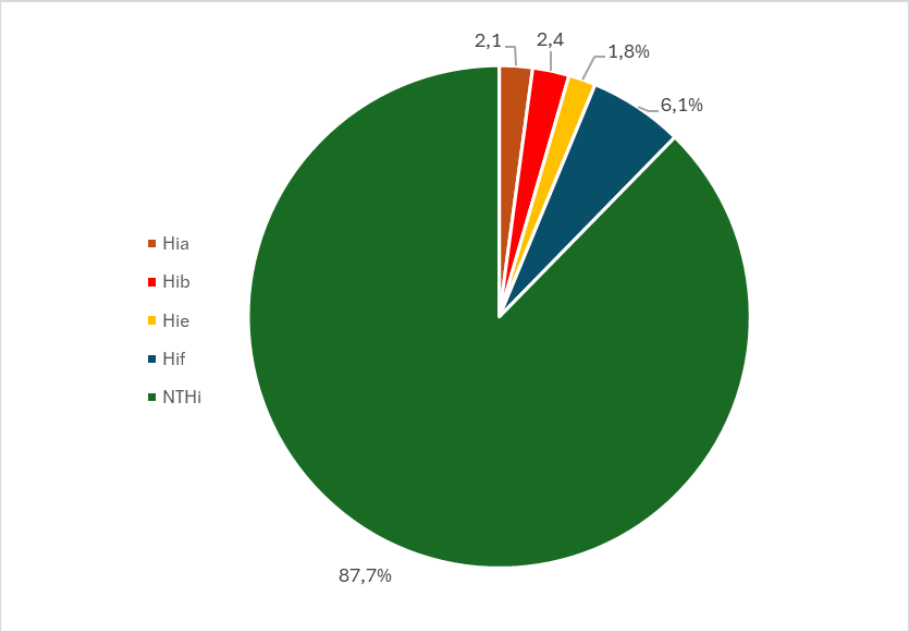
Among the analyzed cases, the age group most affected was > 40 years (1166 cases; 89 % of all cases). In addition, a significant percentage of cases (59 cases; 4,5 %) was found in children aged <5 years, 3,0 % (40 cases) of which was <1 year.

The NRZMHi analyzed the frequency of ampicillin resistance using gradient agar diffusion tests. In one of the total of 1310 cases, no viable isolate was available for testing. 395 isolates (30 %) were ampicillin resistant (MIC > 1 µg/ml), of which 207 (14 % of all tested isolates) showed β-lactamase production. The NRZMHi has tested all isolates for cefotaxime susceptibility. Resistance to cefotaxime was found in 28 isolates (2,0 %).

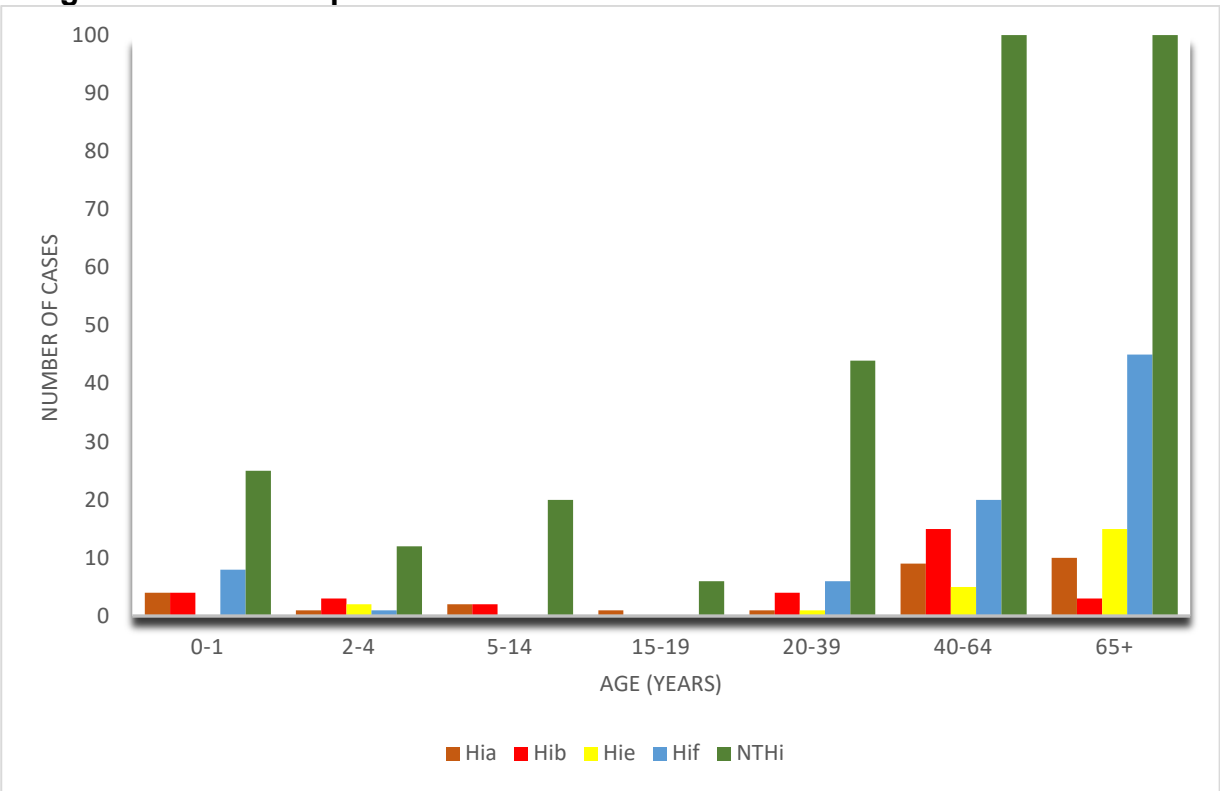
In 2024, the statutory notification system registered 1691 invasive *H. influenzae* infections. Since the NRZMHi transmits all laboratory results to the local health authorities in charge, the coverage of the laboratory surveillance can be estimated based on these data. Thus, a coverage of 78 % can be assumed for 2024.
In 2024, the number of cases of invasive *H. influenzae* infections continued to rise compared to the years in the COVID-19 pandemic from 2020-2022 and has already far exceeded the pre-pandemic level. The proportion of unencapsulated strains was unchanged compared to

2024. Among the encapsulated strains, the proportion of Hib increased from 1,8 % to 2,3 %, mainly due to increased case numbers in the 40-64 age group. Hib was therefore the second most common capsule type after Hif in 2024. The resistance rate to amipicillin has increased by 5 %. Resistance to cefotaxime has risen from 1,5 % to 2,0 % and is therefore at the same level as in 2022.

2. Serotype distribution of *H. influenzae* isolates from blood or CSF in 2024



3. Age distribution of patients with *H. influenzae* detected in blood or CSF



4. Serotype distribution in Federal States

	BW	BY	BE	BB	HB	HH	HE	MV	NI	NW	RP	SL	SN	ST	SH	TH	n.n.	Total
Hia	**4**	**5**	**1**	**2**	0	0	**2**	**1**	**1**	**3**	0	0	**3**	**1**	**3**	**2**	0	**28**
Hib	**3**	**2**	**1**	0	0	**4**	1	**2**	**1**	**9**	**3**	**1**	**2**	0	**1**	**1**	0	**30**
Hic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hie	**4**	**6**	**1**	0	**1**	0	**1**	**1**	**2**	**1**	0	0	**3**	**1**	0	**1**	**1**	**23**
Hif	**10**	**16**	**2**	**2**	0	**4**	**2**	**4**	**7**	**22**	**3**	0	**3**	0	**4**	**1**	0	**80**
NTHi	**155**	**186**	**53**	**37**	**14**	**27**	**68**	**28**	**103**	**268**	**54**	**11**	**42**	**25**	**35**	**19**	**27**	**1149**
Total	**176**	**215**	**58**	**41**	**15**	**35**	**74**	**36**	**114**	**303**	**60**	**12**	**53**	**27**	**43**	**24**	**28**	**1314**

BW: Baden-Württemberg, BY: Bayern, BE: Berlin, BB: Brandenburg, HB: Bremen, HH: Hamburg, HE: Hessen, MV: Mecklenburg-Vorpommern, NI: Niedersachsen, NW: Nordrhein-Westfalen, RP: Rheinland-Pfalz, SL: Saarland, SN: Sachsen, ST: Sachsen-Anhalt, SH: Schleswig-Holstein, TH: Thüringen

5. Ampicillin resistance in isolates *H. influenzae* from blood or CSF