

Epidemiology and surveillance of meningococcal disease in Poland

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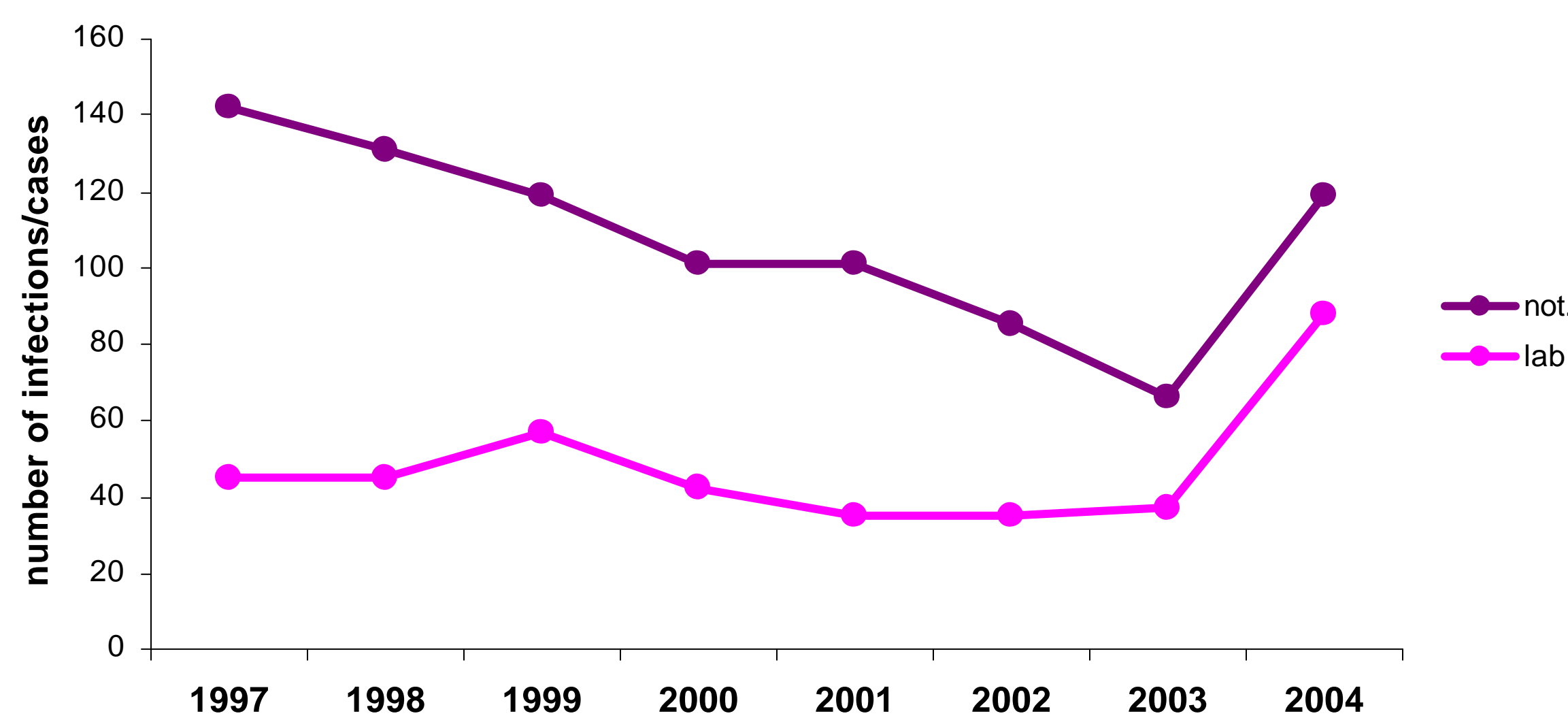
Introduction

In Poland we have two notification systems for invasive *Neisseria meningitidis* infections. The first one based on clinical data is run by the National Institute of Hygiene. Meningococcal meningitis has been notified since 1919, whereas notification of all invasive meningococcal disease (IMD) has been compulsory since late 2003. Based on this surveillance data the annual incidence of meningococcal meningitis in Poland since many years has been low, about 0.2-0.3 per 100,000 inhabitants (<http://www.pzh.gov.pl/epimeld>).

The second notification system, based on laboratory-confirmed cases, was introduced in 1997 following the establishment of the National Reference Centre for Bacterial Meningitis (NRCBM).

The aim of the study is to present the results of laboratory-based surveillance of IMD in Poland in 2004.

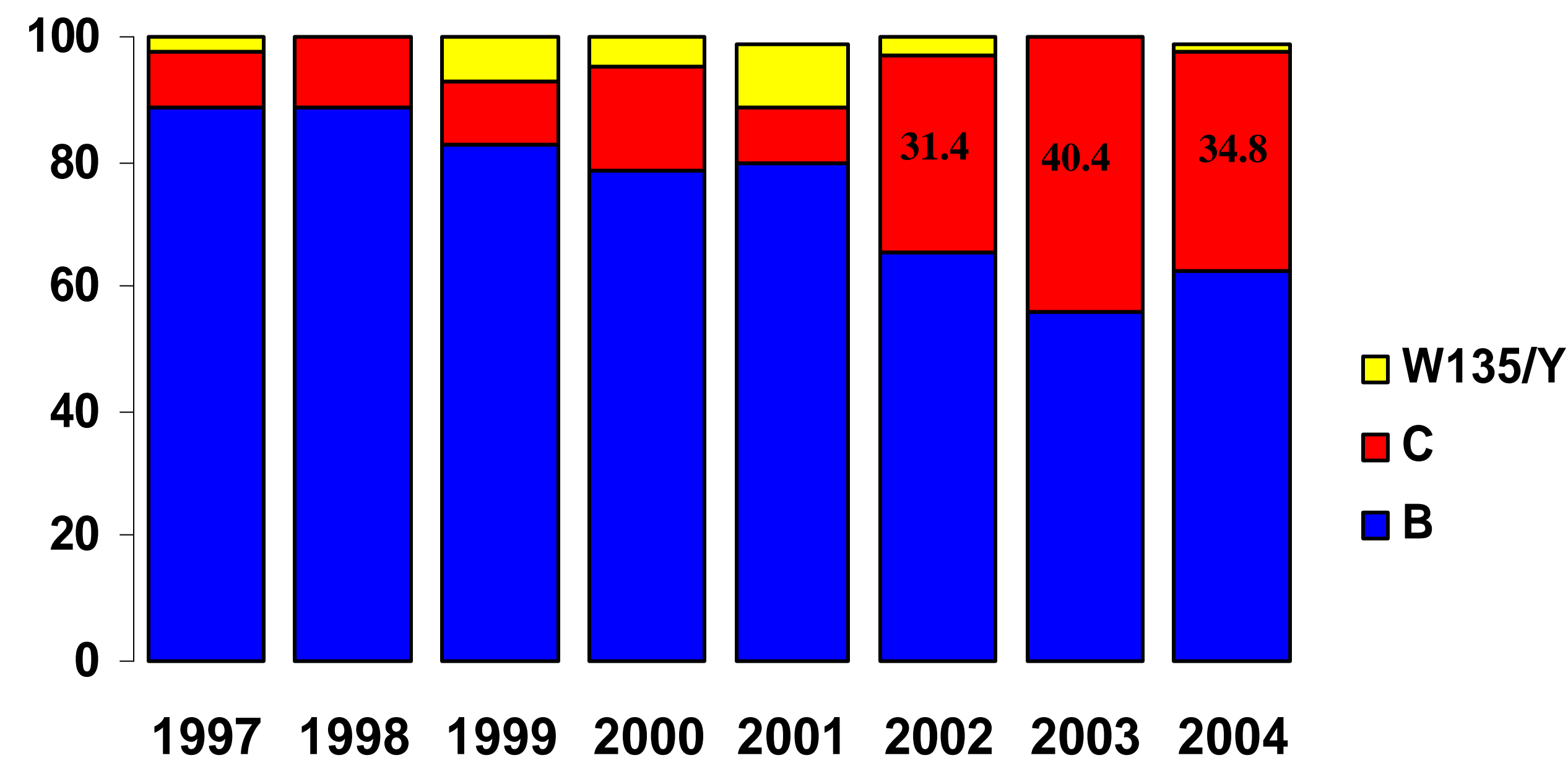
Figure 1. Meningococcal meningitis cases reported by notification system (not.) vs the NRCBM (lab) in Poland, 1997-04.



Material and methods

In 2004, the NRCBM collected 189 isolates of *Neisseria meningitidis*, 36 of *Streptococcus pneumoniae* and 32 of *Haemophilus influenzae* (the latter two species from meningitis only). Meningococci were identified to the species level by standard methods. Serogroups were determined by the slide agglutination method and, in the case of ambiguous results, by PCR. This PCR technique was also used for identification of the etiological agent directly from clinical materials in the case of a negative culture. Serotypes and serosubtypes were determined by the whole cell ELISA method. Minimal inhibitory concentrations (MICs) of the following antimicrobial agents were evaluated by agar dilution method according to CLSI (formerly NCCLS) guidelines: penicillin, ceftriaxone, rifampin and ciprofloxacin on Mueller-Hinton agar (MHA) with 5% of sheep blood and cotrimoxazole on MHA with 5% of lysed horse blood.

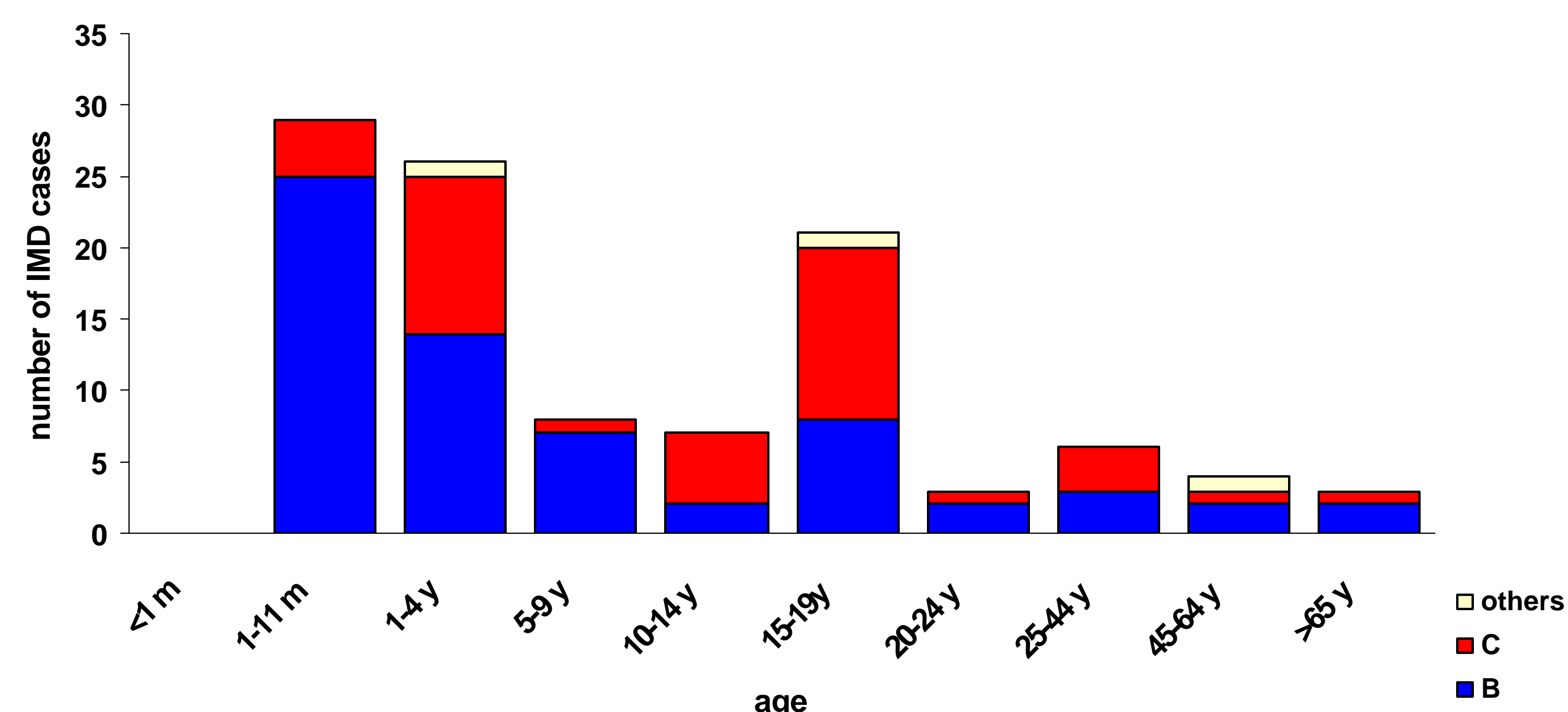
Figure 2. Distribution of meningococcal serogroups responsible for IMD in Poland, 1997-04.



Results

Of the 189 meningococcal isolates collected by the NRCBM, 113 were from patients with IMD and 76 from asymptomatic carriers. Among patients, 66 meningococcal isolates were from cerebrospinal fluid (although there were 88 cases of meningitis), 46 from blood and one from sputum. Most cases occurred from January to March (n=39; 34.5%). Higher morbidity was observed among male patients (n=64, 56.6%). The highest incidence of IMD occurred in children under 5 years of age (n=55, 48.7%), with the majority of cases under 1 year.

Figure 3. Distribution of meningococcal serogroups responsible for IMD amongst age groups in Poland, 2004.



Among all laboratory-confirmed IMD cases (n=115) most isolates belonged to serogroup B (n=72; 62.6%), followed by serogroup C (n=40; 34.8%) and Y (n=2; 1.7%). One isolate was non-groupable. Meningococcal aetiology (serogroup B and C) was established directly from clinical material by PCR in two cases. Subsequent subtyping revealed that the most predominant phenotypes among serogroup B meningococci were B:15:P1.7,16 (n=9); B:22:P1.14 (n=8); B:NT:NST (n=8), B:22:P1.5 (n=6), B:22:P1.2,5 (n=6) and B:NT:P1.10 (n=6). Among serogroup C meningococci, the most common was phenotype C:2b:P1.2,5 (n=12; 30.8%). Seven isolates (6.2%) showed decreased susceptibility to penicillin. All meningococci were susceptible to ceftriaxone, rifampin and ciprofloxacin. Only 12.4% of isolates were susceptible to cotrimoxazole.

Among 76 carrier isolates 39 belonged to serogroup B (51.3%), 24 to serogroup C (31.5%), 4 to serogroup Y and 1 to W135. Eight isolates were non-groupable.

Conclusions

- In 2004, *N. meningitidis* remained the most common etiologic agent of bacterial meningitis in Poland.
- The NRCBM received twice as many meningococcal isolates from cases of IMD as in the previous year as a result of better co-operation with local laboratories and epidemiologists.
- Among IMD cases, serogroup B isolates predominated.
- The proportion of serogroup C isolates remains at a similar level to that observed in 2002, when an increased serogroup C was first observed.
- There is an increase in the number of cases caused by meningococci C:2b:P1.2,5 belonging to ST8 complex/Cluster A4.
- Although the proportion of meningococci with decreased susceptibility to penicillin increased last year, it still remains quite low.