Antimicrobial susceptibility of invasive *Haemophilus influenzae*, 2014

The antimicrobial susceptibility of 56 invasive isolates of *H. influenzae* referred to ESR in 2014 was tested (see table). Ampicillin, amoxicillin-clavulanate, cefaclor and cefuroxime minimum inhibitory concentrations (MICs) were determined by Etest on Haemophilus test medium. Cefotaxime, ciprofloxacin, clarithromycin, co-trimoxazole, rifampicin and tetracycline susceptibilities were determined by disc diffusion on Haemophilus test medium. MICs and disc diffusion zone diameters were interpreted according to the Clinical and Laboratory Standards Institute's criteria.[1]

Two (3.6%) of the 56 isolates were serotype b. Four (7.1%) isolates produced β-lactamase. Thirteen (23.2%) isolates were ampicillin resistant, but not β-lactamase producing – so-called BLNAR (β-lactamase-negative, ampicillin-resistant) *H. influenzae*. Two of the β-lactamase producing isolates appeared to also have the BLNAR mechanism of resistance, that is, an altered penicillin-binding protein (PBP).

Antimicrobial resistance among *Haemophilus influenzae* isolates from invasive disease, 2014

Antibiotic[1]	Number tested	Number resistant[2]	Percent resistant
Ampicillin	56	17	30.4
Amoxicillin-clavulanate	56	15	26.8
Cefaclor	56	15	26.8
Cefuroxime	56	15	26.8
Cefotaxime	56	0	0.0
Ciprofloxacin	56	0	0.0
Clarithromycin	56	0	0.0
Co-trimoxazole	56	7	12.5
Rifampicin	56	0	0.0
Tetracycline	56	0	0.0

1 Results for the full range of antibiotics tested are presented. Many are not appropriate for the treatment of invasive *H. influenzae* disease or the chemoprophylaxis of contacts.

2 All β-lactamase-negative, ampicillin-resistant (BLNAR) *H. influenzae* have been categorised as resistant to ampicillin, amoxicillin-clavulanate, cefaclor and cefuroxime, in line with the Clinical and Laboratory Standards Institute's recommendations, although they often test as susceptible to these antibiotics in standard susceptibility tests.

Trends in ampicillin resistance and β-lactamase production among invasive *H. influenzae* over the last 10 years are shown in the figure below. Over this period, generally about half the ampicillin-resistant isolates have been β-lactamase producers, with the other half being BLNAR *H. influenzae*, although this was not the case in 2014 when only 23.5% of the ampicillin-resistant isolates produced β-lactamase.

[1] Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing; twenty-fourth informational supplement. Wayne, PA, USA: CLSI; 2014. CLSI document M100-S24.

Ampicillin resistance and β-lactamase production among invasive *Haemophilus influenzae*, 2005-2014