

# Towards evidence-based public health management of sporadic cases of invasive meningococcal disease in Europe

Pawel Stefanoff,<sup>1</sup> Germaine Hanquet,<sup>2</sup> Wiebke Hellenbrand,<sup>3</sup> Sigrid Heuberger,<sup>4</sup> James Stuart<sup>5</sup>

1) Department of Epidemiology, National Institute of Public Health- National Institute of Hygiene, Warsaw, Poland

2) Consultant epidemiologist (independent), Brussels, Belgium.

3) Department of Epidemiology, Robert Koch Institute, Berlin, Germany.

4) Meningococcal Reference Laboratory, Austrian Agency for Food and Health Safety, Graz, Austria.

5) Consultant epidemiologist (independent), Ausseing, France.

## Background and aims

- Public health management of invasive meningococcal disease (IMD) cases varies in European countries.
- In some areas, however, eg. for IMD cases related to international travel, consistent approach to public health management across Europe is desirable.
- Based on an ECDC request, we performed a systematic literature review to identify evidence-based measures for prevention of subsequent disease in contacts of sporadic IMD cases.

## Methods

- We searched for abstracts of systematic reviews from the period 1990-2008 in Medline, Embase, Global health, Cochrane database of systematic reviews.
- We selected papers for inclusion in the evidence assessment using stated criteria (Box), examined reference lists in these papers for other relevant publications, and searched Google Scholar for citations of identified key papers.

### Inclusion criteria:

Experimental studies  
Observational studies (analytical studies with a comparison group)  
Case series >10 cases

### Exclusion criteria:

No comparison groups  
Case series ≤10 cases

- We asked for unpublished data from epidemiologists and microbiologists in Europe
- We assessed the evidence based on GRADE methodology, categorising quality of evidence (high /moderate / low / very low) and strength of recommendation (strong / weak).

## Results

### Should chemoprophylaxis be advised to...

#### ...household contacts?

- Direct evidence, moderate quality (4 papers).
- Meta-analysis of observational studies estimated a 85% risk reduction in household contacts treated with appropriate chemoprophylaxis versus untreated.

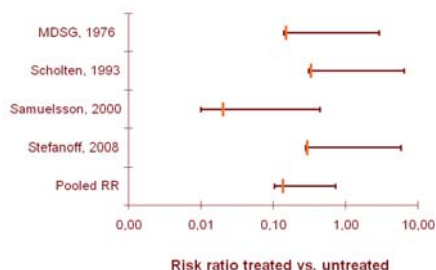


Figure 1. Estimate of effect of chemoprophylaxis to household contacts following a sporadic IMD case

#### ...inpatients at discharge?

- No direct evidence, very low quality evidence from studies assessing carriage after hospital treatment (3 papers)
- Weak evidence was found for persistent carriage of meningococci in the nasopharynx after inpatient treatment of IMD with non-eradicating antibiotics (pooled carriage rate 2.6% (0.0 – 5.5)).

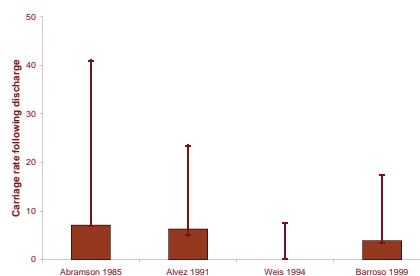


Figure 2. Estimated carriage rate on discharge from hospital index patients not given chemoprophylaxis

#### ...contacts in educational settings?

- No direct evidence, low quality indirect evidence from studies assessing incidence of secondary cases, (7 papers)
- Risk of secondary cases higher than baseline incidence in educational settings, but indirect evidence for risk reduction was shown only for preschool children (data not shown)

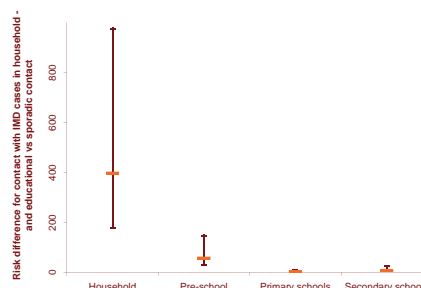


Figure 3. Estimate of risk difference for secondary IMD cases in educational setting in defined time interval following a sporadic IMD case, compared to background incidence in same time interval from 7 published studies. NOTE: Pooled estimates using a random effects model and weighting based on inverse variance (estimates based on 10 papers)

#### ...salivary contacts?

- No direct or indirect evidence is available
- Lack of risk related to drink sharing is supported by studies that do not show an independent risk from such contact, as well as by laboratory evidence that transmission by saliva by this route is very unlikely.

#### ...contacts sharing the same transport vehicle?

- No direct or indirect evidence is available
- No studies addressed the research question. Data on risk was very limited. No studies were found that established secondary transmission.

## Recommendations

- Chemoprophylaxis is recommended for household contacts of a case of IMD (STRONG).
- Chemoprophylaxis is recommended for patients with IMD before discharge from hospital (STRONG).
- Attending the same pre-school as a case of IMD is an indication for chemoprophylaxis (WEAK).
- Attending the same school/college as a case of IMD is NOT in itself an indication for chemoprophylaxis (WEAK).
- Sharing drinks or cigarettes with a case of IMD is NOT in itself an indication for chemoprophylaxis (WEAK).
- Sharing the same transport vehicle as a case of IMD is not in itself an indication for chemoprophylaxis (WEAK).