A multilocal measles outbreak among travelers returning from a mass gathering –

The case for adolescent and adult vaccination

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Introduction

Immunisation programmes for measles virus (MV) containing vaccine (MCV) focus usually on children.

In September 2010, a multistate measles outbreak in Germany affected predominantly adolescents and adults who had recently returned from a youth meeting in Taizé, Saône-et-Loire, Burgundy region, France.

Taizé is home to an ecumenical Christian community of Protestant and Catholic tradition. Meetings draw annually thousands of young people from around the world.

The outbreak was investigated to study factors for MV spread and elimination in a period of changing MV epidemiology.
Methods

- Measles cases reported in Germany in September 2010 who had visited Taizé, France, in August or September 2010 were considered.
- Patients were identified by reviewing measles notifications and from communications received after publication of a public health notice in the German epidemiological bulletin [Epid Bulletin 38/2010, p390].
- Patients or caretakers were interviewed by local health authorities about their history of travel, measles, and MV vaccination status.
- Diagnostic confirmation of cases was sought by laboratory detection of MV-specific IgM, and by MV genotyping.
- We attempted to trace possible opportunities for common exposure by matching information on the individual site of accommodation (tents, dormitories) and reported participation in daily activities.
Results

- Twelve measles cases with sojourn in Taizé in August 2010 were identified from notifications received in 11 districts of three German federal states (Figure 1).
- Case #13 with sojourn in Taizé but with unknown arrival and departure dates was identified by contact tracing of two MV cases without other known MV exposure.
- All other cases reported that they had been in Taizé on at least one weekend day between Friday 27 and Sunday 29 August 2010 (Figure 2). Opportunities for contact were manifold (e.g. meals, prayers, practical work or theme workshops). One or possibly more index cases remain unidentified.
- Patient age ranged from 9 to 32 years (median 16.5). Ten Patients were female.
- No case reported a history of clinical measles.
- Measles was laboratory confirmed in 10 primary cases by IgM or by change in IgG antibodies. Genotyping suggests a common chain of MV transmission (Figure 3).
- Five primary cases resulted in
  - 17 second generation cases (age range 2-47, median 15 years)
  - 7 third generation cases (age range 5-18, median 13 years).
- Only one of the second generation cases had received a single dose of MCV. All other primary, second or third generation cases were unvaccinated.
Active case finding yielded measles cases in 11 geographically distant districts of 3 German federal states.

Pilgrims had used different means of transportation, i.e. chartered bus, private car, hitchhiking.

Road distances to Taizé varied between 390 and 740 kilometers (median 520 km).
**Figure 2. Dates of sojourn at Taizé and reported onset of prodromi and rash of measles patients, Germany, September 2010**

<table>
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<tr>
<th>CASE</th>
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- **Date of onset of prodromi (if reported)**
- **Date of onset of rash**
- **Date of measles notification**
- **Dates of sojourn in Taizé (arrival to departure)**
- **Incubation period, 7 to 18 days before onset of rash**

* Case #13 was identified by tracing the probable exposure source of measles cases with onset of rash on 14 September 2010.
Figure 3. Phylogenetic relationships within MV genotype D4

MVs detected in Germany from mid-September until end of October 2010 were compared with prototypic MVs representing predominant D4 sub-variants in Western Europe.

One case of MV infection (Villingen-Schwenningen. DEU/37.10) acquired in Taizé and five presumed secondary cases are located on the same branch of the tree, confirming the suspected transmission links.

Phylogenetic analysis is based on a 456 nt sequence encoding the C-terminus of the MV N protein.

The tree was constructed by the neighbour-joining method using MacVector program, version 11.1.2.
Conclusions

This multilocal outbreak illustrates

- the risk of exposure to measles virus at mass gatherings,
- a shift in MV infection age towards and beyond adolescence,
- the potential for a long-distance spread of measles virus by mobile, nonimmune adolescents and adults.

Public health policy should recognize the importance

- of a proactive information of adolescents and young adults
- to address gaps in individual measles immunity
- by vaccinating nonimmune adolescents and young adults.
Nota bene - The Taizé Community recommends that visitors of its meetings have an up-to-date vaccination status.

Source: http://www.taize.fr/en_article9243.html, reviewed 03-12-2010
Acknowledgements

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