



## EPIET REPORT



# Summary of work activities

Sabine Maritschnik (Sabine Kasper)  
European Programme for Intervention  
Epidemiology Training (EPIET), 2011 cohort

## Background

### Pre-fellowship short biography

Sabine Maritschnik received a Bachelor of Science in Nutritional Sciences from the University of California at Berkeley in 2004 and finished her Master of Public Health in 2007 at the University of Texas Health Science Center in Houston. At this time, she also finished her dietetic internship and received her credential as a Registered Dietitian. In 2008, Sabine started working at the Department for Infectious Disease Epidemiology at the Austrian Agency for Health and Food Safety in Vienna, Austria.

### EPIET assignment

As a Member State Track EPIET fellow, Sabine remained in the Department for Infectious Disease Epidemiology in Vienna, Austria, for the duration of the fellowship (2011–2013).

## Fellowship projects

### Surveillance project

#### Evaluation of the Austrian *Salmonella* surveillance system

**Background:** The Austrian *Salmonella* surveillance system is a national, case-based system which has been in place since 1996 and collects clinical, epidemiological and laboratory information on salmonellosis cases reported to district public health officers (DPHOs). In 2009, the new 'National electronic Reporting System' (NeRS) replaced the paper-based data reporting process. DPHOs enter data directly into an electronic database. Our aim was to assess data completeness and timeliness after (and simplicity before and after) implementation of NeRS and its ability to reliably monitor salmonellosis trends.

**Methods:** We assessed simplicity by comparing the number of data transfer steps from local to national level before and after implementation of NeRS. We used the 2009–2011 NeRS dataset to assess completeness and timeliness.

---

*The views expressed in this publication do not necessarily reflect the views of the European Centre for Disease Prevention and Control (ECDC).*

Stockholm, May 2014

© European Centre for Disease Prevention and Control, 2014. Reproduction is authorised, provided the source is acknowledged.

Excluding automatically generated data, we calculated the cumulative proportion of complete case records for nine single data entry fields and timeliness by the mean difference between diagnosis and reporting date.

## Results

**Simplicity:** The NeRS eliminated two steps in the case data reporting process between local and national level.

**Data completeness:** Outcome was complete in 100% (6917/6917) of case records, diagnosis date in 83.7% (5791/6917), notification date in 84.9% (5870/6917), symptoms in 90.3% (6244/6917), epidemiological criteria in 90.8% (6277/6917), infection source in 90.3% (6246/6917), hospitalisation in 68.1% (4708/6917), foreign travel-associated illness in 93.4% (6460/6917), and country of travel destination was given in 98.5% (1054/1070) of case records.

**Timeliness:** Between 2009 and 2011, mean time per case between diagnosis and reporting was 0–36 hours.

**Conclusion:** After implementation of the NeRS, the simplification and acceleration of data reporting and the achieved high completeness rate should enable public health authorities to reliably monitor salmonellosis trends in real-time.

Status: Completed

## Outbreak

### **A foodborne outbreak of *Salmonella* Enteritidis PT 8 possibly due to food safety failure in a restaurant, Upper Austria, 2012**

**Background:** The outbreak was managed and investigated by the district public health authorities in collaboration with the AGES Department of Infectious Disease Epidemiology. The objective was to assess the extent of the outbreak and identify the source of infection in order to propose preventive measures.

**Method:** To determine common food exposures, investigators performed a descriptive epidemiological study of restaurant patrons. We defined a confirmed primary case as gastroenteritis (defined as diarrhoea and/or vomiting) in a person who (1) ate at the restaurant X in Upper Austria between May 31 and June 7, 2012 with disease onset within four days after visit of the restaurant and who (2) had a microbiologically confirmed infection with *Salmonella* Enteritidis. A probable case fulfills criteria (1) of a confirmed case. We defined a secondary case as gastroenteritis in a person who (1a) did not eat in the restaurant but had an epidemiological link to a primary case (household contact, family contact) and (2a) who then fell ill within four days after contact to this case, or who (1b) ate at the restaurant and (2b) fell ill more than four days after visiting the restaurant but had an epidemiological link to a primary case. Microbiological and trace back investigation of selected foods, and environmental investigation in the restaurant kitchen were conducted.

**Results:** A total of 65 cases were identified due to passive and active case finding; 59 were primary cases and 45 were laboratory confirmed with a *S. Enteritidis* PT 8 infection. Twelve cases were hospitalized. Interviews with 55 primary cases about consumed food at the restaurant showed that 87.3% (48/55) ate dishes containing chicken, dishes containing duck were eaten by 81.8% (45/55), pork containing dishes by 58.2% (32/55), and beef containing dishes by 52.7% (29/55) of cases. A total of 4 out of the 35 food samples taken for microbiological testing were positive for *S. Enteritidis* PT 8, including chicken breast, chicken filet, frozen pork and marinated beef. The trace-back investigations showed that the chicken originated from a country outside of the EU, while the beef came from Austria. The origin of the pork meat was unknown. Results from the food inspector showed insufficient kitchen hygiene and no HACCP concept in place.

**Conclusions:** Although an analytical epidemiological study was not performed, we hypothesize that among dishes that were consumed by more than 50% of cases, dishes containing chicken were the most biologically plausible source of infection. Although, chicken was also the most frequently ordered dish among cases, it is possible that beef or pork containing dishes may have also been a source of infection due to cross contamination in the restaurant kitchen. How the outbreak strain was introduced in the restaurant kitchen remains unclear. Prior to reopening of the restaurant the food safety and hygiene failures were addressed as per request of the public health authorities. We recommend the implementation of a HACCP concept.

Status: Completed

### **Involvement in the multistate European *S. Stanley* outbreak, 2012**

**Description:** In Austria, *S. Stanley* is a rare serovar. Between 2002 and 2010, *S. Stanley* accounted for only a small percentage of all serovars registered by the National Reference Centre for Salmonella (NRC). In the first quarter of 2012, Belgium, Hungary and Germany reported an increase in the expected numbers of *S. Stanley* cases without documented travel history outside the EU. Following an alert on 29 June 2012, ECDC coordinated the investigation of this cluster between EU institutions and agencies and affected countries. In Austria, two local food-associated outbreaks of Nx-mono-resistant *S. Stanley* occurred: 32 cases belong to the 2011/local Carinthia outbreak and 62 cases to the 2012/local UA outbreak.

Together with the main investigator, Elisabeth Kanitz, I was involved in the local outbreak in Upper Austria (UA). I assisted in the study population selection, performed the data collection, data entry and analysis. In order to test the

hypothesis of a foodborne outbreak, we conducted a case-cohort study. The cohort included persons who had attended a religious town festival and consumed food at the festival. Cohort members were drawn from the village population (N=2000).

A case was defined as a person who (1) attended the festival on August 15, 2012 in town X in Upper Austria, (2) had consumed foods purchased at this festival and who (3) fell ill with symptoms of gastroenteritis between Aug 15 and Aug 20, 2012. A secondary case was defined as a person who either attended the festival on August 15, 2012 in a town in Upper Austria, and had exposure to foods purchased at this festival, but who fell ill with symptoms of gastroenteritis after Aug 20, 2012, OR who did not attend the festival but had a contact with a person who attended the festival and had a stool sample positive for Salmonella Stanley with Nx resistance.

Results of this investigation will be published shortly.

Status: Completed

### **Norovirus outbreak following a wedding in Vienna, 2012**

**Background:** On 18 September 2012, the Public Health Office of Vienna was informed about the occurrence of 20 cases of gastroenteritis among 53 wedding guests of a wedding reception at a hotel in Vienna on 14 September 2012. We, the Agency for Health and Food Safety, investigated to identify the agent and the potential sources in order to provide appropriate recommendations.

**Method:** We defined an outbreak case as a person who (1) attended the wedding reception on 14 September 2012 at a Viennese hotel, and (2) developed diarrhoea and/or vomiting within 72 hours of the reception dinner. A laboratory-confirmed case tested positive for the outbreak agent. Stool specimens from 11 hotel kitchen workers and 10 outbreak cases, and samples from relevant food items were tested for gastroenteritis causing pathogens. The outbreak was described by time, place and person. We conducted a retrospective cohort study among the wedding attendees. Information on consumption of food served at the wedding dinner was collected by using a self-administered questionnaire. Exposed persons were compared with unexposed persons by calculating relative risk (RR) and the 95% confidence interval (95% CI). The public health authority inspected the kitchen for hygiene and food safety failures.

**Results:** We identified 36 outbreak cases, including six cases of laboratory confirmed infection with Norovirus GII.6 (attack rate 36/53, 87%). The median age of the cases was 49 (16–75) and 44% were female. The cases occurred from 14 to 16 September, with a peak of cases on 16 September. Forty-six of the 53 wedding attendees (87%) participated in the cohort study. The univariate analysis indicated that participants who consumed smoked salmon (RR=3.05; 95% CI: 0.94–9.90), appetiser sandwiches (RR=1.76; 95% CI: 0.99–3.15) and mozzarella-tomatoes (RR=2.32; 95% CI: 0.94–5.71) were more likely than unexposed persons to develop the disease. In the multivariate analysis, by using a modified Poisson regression, these meals were no longer associated with disease. The 11 food kitchen staff workers and four food samples all tested negative for norovirus, and there were no kitchen hygiene failures identified.

**Conclusion:** The investigation of this NV outbreak among wedding guests indicated three raw food items, prepared by hand as the possible sources of infection. However, there was no strong evidence for association with disease found. The route through which the outbreak agent entered the hotel kitchen remains unclear. Our findings illustrate the limitations of an analytical and microbiological investigation of a possible foodborne norovirus outbreak: if the majority of the cohort at risk was exposed to all food vehicles for which norovirus is plausible, the ability to find convincing evidence for the outbreak source is severely compromised. Detection of norovirus in food remains methodologically challenging.

Status: Completed

### **A Norovirus outbreak associated with a food handler following a wedding in Salzburg, Austria, 2012 [3]**

**Background:** On 12 October 2012, a public health directorate reported a suspected norovirus outbreak among guests of a wedding reception. We investigated the outbreak to confirm the causative agent, identify the source and propose preventive measures.

**Methods:** A probable case was a wedding guest with diarrhoea or vomiting with disease onset between 7 and 10 October 2012 and who consumed food at a wedding dinner on 6 October 2012. A confirmed case was a probable case with laboratory-confirmed norovirus infection. We conducted a retrospective cohort study among the wedding guests, comparing exposed persons with unexposed persons in univariate and stratified analyses (by gender) by calculating risk ratios (RR). Food safety authorities inspected the kitchen.

**Results:** Of 90 respondents (response rate 87%), 26 (29%) fulfilled the case definition, including two confirmed cases. There were no severe or hospitalised cases. Female guests were three times more likely to develop disease (95% CI: 1.4–7.2), compared to males. A mushroom dish was associated with disease only among females (RR 2.3; 95% CI: 1.2–4.3). Two of two tested diseased guests, and six of 14 kitchen staff tested positive for norovirus GII.4 Sydney. One norovirus positive kitchen staff member with diarrhoea was involved in the preparation of the wedding dinner. The kitchen inspection showed no documented food safety training, a legal requirement.

Conclusions: We report the first investigated outbreak caused by the novel norovirus GII.4 Sydney strain in Austria, which was likely due to infected, symptomatic kitchen staff. Based on the clinical presentation of the cases, this novel strain did not show more virulence than other outbreak strains. Gender-specific eating preferences may have put female guests at higher risk of infection. We recommend that public health authorities should monitor food handlers' annual training.

Status: Completed

## Research

Prevalence of asymptomatic colonisation with *C. difficile* at hospital admission, a cross-sectional study in a university hospital, Vienna, Austria, 2012–2013

Background: To our knowledge, this is the first study that measures the prevalence of asymptomatic CD colonisation among hospitalised patients in Austria. The primary objectives of the study are 1) to measure the overall prevalence of asymptomatic *C. difficile* (CD) colonisation among hospitalised patients at admission to selected wards of a university hospital in Vienna Austria, 2) to measure the prevalence of asymptomatic colonisation with a toxigenic *C. difficile* strain, *C. difficile* PCR ribotype (RT) 027 or RT 078 and with a resistant *C. difficile* strain, in order to assess the association between factors of the microorganism and asymptomatic colonisation. The study also aims to identify putative risk factors for carriage including antibiotic treatment, proton pump inhibitor use, previous stay at healthcare facility, and contact with animals.

Methods: The prevalence of asymptomatic CD colonisation is measured among study subjects at admission to the university hospital. In the cross-sectional study design, the odds and prevalence of exposure to putative risk factors were compared in study subjects with asymptomatic CD colonisation to study subjects without asymptomatic CD colonisation at admission. Assuming a proportion of asymptomatic colonisation of 3% among the non-exposed, we aimed to recruit approximately 1000 study subjects. Specimens from all patients admitted to selected wards will be screened for the *C. difficile* antigen and glutamate dehydrogenase (GDH) at admission, and positive specimens will be sent to the AGES National Reference Laboratory for *Clostridium difficile* for verification. The prevalence will be calculated as a proportion of asymptomatically colonised study subjects among all study subjects included at admission and provided with a 95% confidence interval. In the univariate analysis, we will calculate odds ratios and prevalence ratios and provide 95% CIs and p-values for each exposure under study.

Results: Study is currently on going (Status: 1 July 2013–10 October 2013 with 149 study subjects)

Conclusions: Study is currently ongoing

Status: Study protocol completed

## Scientific communication

- Oral presentation [1] at ESCAIDE 2012
- Poster presentation [2] at ESCAIDE 2013
- Manuscript [3] submitted, accepted and published

## References

1. Maritschnik S. Evaluation of the Austrian *Salmonella* Surveillance System following the implementation of a new electronic reporting system, 2012. Oral presentation at: ESCAIDE 2012, European Scientific Conference on Applied Infectious Disease Epidemiology; 2012 Oct 24–26; Edinburgh, UK.
2. Maritschnik S. A food handler-associated, foodborne Norovirus GII.4 Sydney 2012-outbreak following a wedding dinner, Austria, October 2012. Poster presentation at: ESCAIDE 2013, European Scientific Conference on Applied Infectious Disease Epidemiology; 2013 Nov 5–7; Stockholm, Sweden.
3. Maritschnik S, Kanitz EE, Simons E. A food handler-associated, foodborne Norovirus GII. 4 Sydney 2012-outbreak following a wedding dinner, Austria, October 2012. *Food Environ Virol.* 2013 Sep 12. [Epub ahead of print]. Available from: [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3825590/pdf/12560\\_2013\\_Article\\_9127.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3825590/pdf/12560_2013_Article_9127.pdf)