**Summary of work activities**
Name
Intervention Epidemiology path (EPIET)
Cohort 2017

# Background

The ECDC Fellowship Training Programme includes two distinct curricular pathways: Intervention Epidemiology Training (EPIET) and Public Health Microbiology Training (EUPHEM). After the two-year training EPIET and EUPHEM graduates are considered experts in applying epidemiological or microbiological methods to provide evidence to guide public health interventions for communicable disease prevention and control.

Both curriculum paths are part of the ECDC fellowship programme that provides competency based training and practical experience using the 'learning by doing' approach in acknowledged training sites across European Union (EU) and European Economic Area (EEA) Member States.

## Intervention Epidemiology path (EPIET)

Field epidemiology aims to apply epidemiologic methods in day to day public health field conditions in order to generate new knowledge and scientific evidence for public health decision making. The context is often complex and difficult to control, which challenges study design and interpretation of study results. However, often in Public Health we lack the opportunity to perform controlled trials and we are faced with the need to design observational studies as best as we can. Field epidemiologists use epidemiology as a tool to design, evaluate or improve interventions to protect the health of a population.

The European Programme for Intervention Epidemiology Training (EPIET) was created in 1995. Its purpose is to create a network of highly trained field epidemiologists in the European Union, thereby strengthening the public health epidemiology workforce at Member State and EU/EEA level. Current EPIET alumni are providing expertise in response activities and strengthening capacity for communicable disease surveillance and control inside and beyond the EU. In 2006 EPIET was integrated into the core activities of ECDC.

The objectives of the ECDC Fellowship - EPIET path are:

- To strengthen the surveillance of infectious diseases and other public health issues in Member States and at EU level;
- To develop response capacity for effective field investigation and control at national and community level to meet public health threats;

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

*This portfolio does not represent a diploma. Fellows receive a certificate listing the theoretical modules attended and the 23-month training. Additionally, if all training objectives have been met, they receive a diploma.*

Stockholm, September 2018

- To develop a European network of public health epidemiologists who use standard methods and share common objectives;
- To contribute to the development of the community network for the surveillance and control of communicable diseases.

## Pre-fellowship short biography

Eve is a medical doctor who after two years basic training in paediatrics undertook a Masters in Public Health and then a four year medical specialty training in Public Health in Ireland.

## Fellowship assignment: Intervention Epidemiology path (EPIET)

On 10 September 2017, Eve Robinson started her EPIET fellowship at the French national agency for public health (Santé publique France), Saint Maurice, France under the supervision of Henriette de Valk. This report summarises the work performed during this fellowship.

# Methods

This portfolio demonstrates the competencies acquired during the ECDC Fellowship, EPIET path, by working on various projects, activities and theoretical training modules.

Projects included epidemiological contributions to public health event detection and investigation (surveillance and outbreaks); applied epidemiology field research; teaching epidemiology; summarising and communicating scientific evidence and activities with a specific epidemiology focus.

The outcomes include publications, presentations, posters, reports and teaching materials prepared by the fellow. The portfolio presents a summary of all work activities conducted by the fellow, unless prohibited due to confidentiality regulations.

# Results

The objectives of these core competency domains were achieved partly through project or activity work and partly through participation in the training modules. Results are presented in accordance with the EPIET core competencies, as set out in the EPIET scientific guide[1].

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[1] European Centre for Disease Prevention and Control. European public health training programme. Stockholm: ECDC; 2013. Available from: http://ecdc.europa.eu/en/publications/Publications/.pdf

# Fellowship projects

## 1. Surveillance

**Title:** *Evaluation of the sensitivity of the surveillance system for paediatric haemolytic uraemic syndrome in France, 2016-2017*

Haemolytic uraemic syndrome (HUS) is one of the most serious complications Shiga toxin-producing Escherichia coli (STEC) infection, mainly affecting children. In France, the surveillance of STEC is based on the surveillance of HUS in children aged under 15 years through a voluntary network of 32 paediatric units. In 2003 the sensitivity of the system was estimated at 70%. We reevaluated the sensitivity of the system and investigated HUS care pathways to determine if the current network based approach was an effective surveillance strategy.

Paediatric hospital services within and outside of the surveillance network were requested to complete a questionnaire regarding the number of HUS admissions in 2016 and 2017. Questions relating to care pathways were also asked including if the hospital typically cared for or transferred HUS cases, where cases were transferred to, and if it offered a specialised nephrology service. We estimated the sensitivity of the surveillance system by dividing the number of cases notified to the surveillance system by hospitals responding to the questionnaire by the number of admissions reported through the questionnaire.

The response rate was 66% (21/32) for network hospitals and 44% (99/224) for non-network hospitals. Amongst non-network hospitals: none reported offering a specialised nephrology service; the majority (n=73, 75%) reported systematically transferring cases for care. Amongst those who reported where they transfer cases to (n=67), all but one listed a network hospitals. Amongst network hospitals: four reported not offering a specialised nephrology service and one reported that they did not take care of HUS cases. Hospitals which responded to the questionnaire notified 76 cases in 2016 and 122 in 2017 compared to 91 and 145 cases reported through the questionnaire, respectively, resulting in a sensitivity of 87% in 2016 and 84% in 2017.

The sensitivity of the surveillance system has improved since 2003. Few cases were cared for outside of network hospitals and the majority of non-network hospitals reported systematically transferring cases to network hospitals suggesting that few cases will be missed by focusing surveillance on network hospitals. Howevere as paediatric services undergo occasional reorganisation, with some services downgrading or upgrading the level of care they provide, the composition of the network should be reviewed periodically.

**Role:** *Principal-investigator*. I undertook a literature review of HUS surveillance systems to inform the methodology. I undertook a feasibility review of undertaking a capture-recapture study using the national hospital discharge database. I developed the study protocol, the list of paediatric services, the questionnaire and invitation letters. I uploaded responses and analysed the data. I undertook an analysis of hospital discharge data. I prepared a report for internal use [1], a short summary for dissemination to other stakeholders and participants, and a manuscript for submission to a peer reviewed journal [2].

**Supervisor(s):** *Gabrielle Jones, Mathias Bruyand, Henriette de Valk*

**Title:** *Surveillance of hospitalised dengue cases during a large outbreak in La Réunion, 2019*

La Réunion, in the Indian Ocean, is a French overseas department. Dengue serotype-2 (DENV-2) has been circulating since 2017 leading to a large outbreak with 6,801 laboratory-confirmed cases in 2018. In 2019 a second epidemic wave is onging, with 9,200 cases as of week 16, including a DENV-1 cluster. Surveillance of dengue hospitalisations was implemented to monitor outbreak severity.

We aimed to identify cases hospitalised for greater than 24 hours or severely ill. Laboratories routinely notified diagnoses and we investigated those originating from a hospital service. Clinicians were also encouraged to spontaneously report hospitalisations. We collected data on clinical and biological signs, risk factors, and outcomes using a standardised form. We classified severity using WHO definitions.

In 2018 we identified 156 hospitalisations (2% of cases) compared to 273 (3% of cases) as of week 16, 2019. Across both periods the male-to-female ratio was 0.9 and the median age was 62 years. Among those with a returned surveillance form, the proportion of severe dengue was 18% for both periods (34/196 in 2019; 27/156 in 2018). The most frequent severe complications were renal impairment (39%), liver impairment (24%), and hemorrhage (18%). Alert signs were reported for 67% of non-severe cases in 2018 and 61% in 2019. In both periods, 3 of 6 deaths amongst hospitalised cases were directly attributable to dengue.

Thus far the proportion of hospitalisations identified in 2019 exceeds that of 2018, potentially due to improved sensitivity. The similar proportion of severe cases, does not suggest increased severity. This surveillance improved the understanding of the outbreak and its burden on the population and should continue, particularly given the risk of endemisation and co-circulation of other serotypes.

**Role:** *Co-investigator.* I managed the day to day operation of the surveillance system during April and May 2019. I produced a surveillance report for the first quarter of 2019 [3] including a short summary for dissemination to surveillance partners. I undertook an evaluation of the sensitivity of the system for the period January to March 2018 through a capture-recapture study. I developed a protocol for the system. I presented the results at ESCAIDE 2019 [4].

**Supervisor(s):** *Muriel Vincent, Aurélie Etienne, Luce Menudier*

## 2. Outbreak investigations

**Title:** *Outbreak of Salmonella Newport associated with a raw goats' milk cheese, France, 2018*

*Salmonella* spp. are a leading cause of foodborne illness and a common cause of foodborne outbreaks (FBO) in France. Both a syndromic FBO surveillance system and a laboratory surveillance system aim to detect *Salmonella* outbreaks. Between 2 to 8 August 2018, five familial clusters of gastrointestinal illness due to *Salmonella* spp. were reported in one region. Investigation identified common exposure to a raw goats' milk cheese, from which *Salmonella* spp. were also isolated, leading to an international product recall on 10 August. On 22 August, a national increase in *Salmonella* Newport was detected through laboratory surveillance. Concomitantly isolates from the earlier clusters were confirmed as *S*. Newport. Interviews with a selection of the new laboratory identified cases revealed exposure to the same cheese, including exposure to batches not included in the previous recall. The outbreak affected 153 cases, with 139 being confirmed through whole genome sequencing, including 6 cases in Scotland. *S*. Newport was detected in the cheese and in milk of one supplying goat. The outbreak highlights the risks associated with raw milk products. Consumers, particularly those at increased risk of severe illness should be aware of these risks. The outbreak also demonstrates the advantages of both surveillance systems: mainly the timeliness of the FBO system and the precision of WGS laboratory system and is a reminder of the value still offered by more traditional surveillance systems despite other technological advances.

**Role:** *Principal investigator*. I undertook an initial analysis to confirm the event. I liaised with regional departments who undertook the case interviews and participated in meetings with the ministry of agriculture regarding the product and environmental investigations. I liaised with the reference laboratory regarding the confirmation of cases and WGS. I maintained the line-listing of cases and undertook regular descriptive epidemiology during the outbreak. I prepared a manuscript for submission to a peer reviewed journal [5].

**Supervisor(s):** *Nathalie Jourdan-da Silva*

**Title:** *Ongoing outbreak of Salmonella 4.5.12:i:- , France, 2018—present*

In April 2018, the French national reference center for *Escherichia coli*, *Shigella* and *Salmonella* (FNRC-ESS) identified of cluster *Salmonella* enterica serotype 4,5,12:i:-cases on WGS. Outbreak investigations were commenced to determine the extent of the outbreak and source in order to implement control measures.

A case was defined as a person with a laboratory confirmed *Salmonella* 4.5.12:i:- isolate within 5 cgMLST alleles from the reference strain, in a sample taken after December 2017. Investigations included the following: interviewing of cases, or their guardians, between April and August 2018 on risk exposures in the week prior to symptom onset; analysis of food purchase data retrieved from loyalty cards; a case control study; traceback investigations of suspect sources by the ministry of food and agriculture; and sequencing of *Salmonella* 4.5.12:i:- isolates from food samples received by the food and environmental health agency. European colleagues were also notified of the outbreak.

As of June 2019, 211 cases were identified, with sampling dates between December 2017 and May 2019.Forty-eight percent (n=101) occurred between January and June 2018, with the peak in March 2018 (n=35). Some cases continue to be detected (<4 per week in 2019). Between January and June 2018, 74% of cases were children compared to 44% in 2019. Interviews with 74 cases and loyalty card data of 39 cases did not reveal any common exposures. The case control study showed a significant association with dried pork sausage but traceback investigations did not identify a common producer amongst the supermarkets frequented by cases. One related food isolate was identified from a small French pork sausage producer with only a localised distribution network. Five other EU countries have identified 57 cases with a related isolate, with an outbreak in Denmark of 35 cases found to be associated with minced beef.

The young age profile of cases during the increase seen in 2018 suggest a distinct outbreak due to a food source commonly eaten by children. The results of the case control study would be in keeping with this hypothesis. The low number of ongoing cases, with an older age profile, suggest either a) a continuous source, potentially through a different or multiple food items due to contamination early in the food chain or b) that the outbreak strain is a common circulating strain now recognised due to routine WGS by the FNRC-ESS. The inability to identify a common producer of dried pork sausages amongst cases in 2018 is in keeping with the multisource hypothesis while the detection of a matching isolate in a product which could not explain the majority of cases could be explained by either. The identification of cases of the same strain, and links to beef products in other countries could also be explained by either hypothesis. To determine if French and European cases are part of a single outbreak or not, ongoing sharing of information on human cases, and human and food isolates with comprehensive traceback investigations should continue.

**Role:** *Co-investigator.* Of note his outbreak investigation was first led by a previous EPIET fellow. Since his departure I undertook a reanalysis of the case control study after further cases were interviewed, maintained the line listing and regularly updated the descriptive epidemiology. I undertook rapid literature review to identify the sources of *Salmonella* outbreaks affecting mainly children. I analysed loyalty card data to try to identify a common product. I presented results to the Grippenet.fr team from which controls were sourced for the case-control study and prepared a feedback summary for the controls who participated. I wrote an outbreak report [6].

**Supervisor(s):** *Nathalie Jourdan-da Silva*

**Title:** *Outbreak of Salmonella Agona associated with internationally distributed infant milk products, France, 2017*

S*almonella* Agona is an uncommon cause of salmonellosis in infants in France, although in 2005 an outbreak associated with infant milk products manufactured in a single facility occurred. In November 2017, the FNRC-ESS identified eight isolates from infants over eight days. We investigated to identify the extent of the outbreak and a possible common exposure.

We defined a case as an infant with symptom onset after 1 January 2017 and a *S.* Agona isolate within the outbreak cluster on whole genome sequencing (WGS). Caregivers of 37 cases were interviewed on exposures. WGS was performed on all *S.* Agona isolates received by the NRC in 2017 (n=96), eight isolates from the 2005 outbreak, and all other Salmonella Agona isolates from infants since 2000 (n=98).

We identified 38 cases (median age 4 months; 58% female) across France. Symptoms onset was in April 2017 for one, and between August and December 2017 for all others. Preceding onset, 36 cases (97.3%) consumed infant milk products manufactured at the same facility implicated in 2005. Phylogenetic analysis revealed 2017 and 2005 outbreak isolates, and 27 isolates received between 2010 and 2016 clustered within 20 single-nucleotide-polymorphisms.

Prompt epidemiological and traceback investigation suggested a single facility producing infant milk products as the source of the outbreak. This allowed for rapid control measures to be implemented including the recall of implicated products, alerting caregivers of product consumers, and alerting international authorities. Retrospective WGS determined a link with the 2005 outbreak. This, and the identification of interepidemic cases suggest the persistence of the pathogen in the facility for 12 years.

**Role:** *Co-investigator*. I participated in outbreak control meetings. I analysed historical data on *Salmonella* and *S.* Agona, including data on retrospective WGS results, to investigate the link with the 2005 outbreak. I undertook regular descriptive epidemiology which was included in updates to the ministry of health. I prepared a manuscript which was published [7] and presented a poster on the outbreak at ESCAIDE [8].

**Supervisor(s):** *Nathalie Jourdan-da Silva*

## 3. Applied epidemiology research

**Title:** *Mortality and health survey, Walikale, Democratic Republic of the Congo, 2017*

During humanitarian crises, health information systems are often lacking and surveys are a valuable tool to assess the health needs of affected populations. In 2013, a mortality and health survey undertaken by Médecins Sans Frontières (MSF) in the conflict affected Walikale territory of North Kivu, Democratic Republic of the Congo (DRC), indicated mortality rates exceeding humanitarian crisis thresholds and a high burden of mortality and morbidity due to malaria. In late 2017, after a period of relative stability, MSF reassessed the health status of the population through a second survey to guide ongoing operations.

A two-stage cluster survey, selecting villages using probability proportional to size and households using random walk procedures, was conducted. Household members were interviewed on morbidity and mortality, healthcare use, vaccination status, and bed-netbednet availability.

The sample included 5,711 persons in 794 households. The crude mortality rate (CMR) and under-five mortality rate (U5MR) were 0.98 per 10,000 persons/day (95% confidence interval (CI) 0.78-1.2) and 1.3 per 10,000 persons/day (95% CI 0.82-2.0), respectively. The most frequently reported causes of death were fever/malaria (31%), diarrhoea (15%) and respiratory infections (8%). In 89% of households at least one person was reported as falling ill in the previous two weeks, and 58% sought healthcare. Cost was the main barrier amongst 58% of those who did not seek healthcare. Coverage of measles-containing-vaccine was 62% in under-fives. Sufficient bed-netbednet coverage (1 bed-netbednet/2 people) was reported from 17% of households.

The second survey illustrates that although mortality is now just below crisis thresholds, the area still experiences excess mortality and has substantial health needs. The study results have supported the further expansion of integrated community case management to improve access to care for malaria, diarrhoea and respiratory infections. Such surveys are important to orient operations to the health needs of the population being served and also highlight the ongoing vulnerability of populations after humanitarian crises.

**Role:** *Co-investigator.* I undertook the analysis for the survey which involved data cleaning and preparation, analysis to take account of the complex survey design and interpretation of the results in the context of the previous study, global indicators and targets, and goals. I liaised with the rest of the study team and field team to make recommendations I prepared the study report [9] and a manuscript [10] which is under review by a peer reviewed journal. I presented the study as a poster at ESCAIDE 2018 [11].

**Supervisor(s):** *Isidro Carrion Martin, Manson Unit, MSF UK*

**Title:** *Seroprevalence of toxoplasmosis amongst pregnant women in France*

Toxoplasmosis during pregnancy can result in congenital anomalies or foetal death. In France, early antenatal screening with subsequent monthly screening of seronegative women has been recommended since 1978. We investigated trends in Toxoplasma infection seroprevalence amongst pregnant women in France between 1995 and 2016, to inform ongoing debate on the current policy.

We used data from the National Perinatal Survey, which collected sociodemographic information through self-administered questionnaires from all women giving birth over a one-week period in 1995, 2003, 2010 and 2016. Serological results were extracted from medical records and linked with questionnaire responses. Women were seropositive if IgG or IgM Toxoplasma antibodies were detected. We calculated adjusted prevalence ratios (aPR) by sociodemographic factors using Poisson regression, stratified by nationality and survey year.

Toxoplasma serology was available for 55,923/57,879 (96%) women over all four surveys. Amongst French women, seroprevalence decreased from 54.3% in 1995 to 31.3% in 2016 (p<0.001), and similarly amongst women from North Africa (51.5% to 39.9%; p<0.001). In all surveys, seroprevalence amongst French women was higher in those over 35 years (aPR=1.5; 95%CI 1.4-1.7) and in women in French overseas territories (aPR=1.8; 95%CI 1.6-2.0), Paris (aPR=1.2; 95%CI 1.1-1.3) and Southwestern regions (aPR=1.2; 95%CI 1.1-1.4) compared to central regions.

Toxoplasma infection seroprevalence amongst pregnant women experienced a relative decrease of 42% in 21 years. Higher prevalences amongst older women may reflect higher risk of exposure in the past. Persistent geographical differences may reflect dietary or environmental differences. While pregnant women are more susceptible to toxoplasmosis, the current risk of infection might be lower, suggesting that continued intensive screening may not be cost-effective. French health authorities should reevaluate the screening policy considering these results.

**Role:** *Principal investigator.* I prepared and analysed data from the national perinatal study. The project also involved a literature review to better understand congenital toxoplasmosis and its prevention, and potential reasons for the decreasing prevalence. I presented at ESCAIDE 2018 [12] and a prepared a manuscript for submission to a peer reviewed journal [13].

**Supervisor(s):** *MathieuTourdjman, Henriette de Valk*

**Title:** *Time series analysis of hepatitis A virus infection in France*
Starting in June 2016, a European-wide hepatitis A virus (HAV) outbreak, mostly affecting men who have sex with men, was observed through 2017 and 2018. HAV notifications in France, which had been decreasing, increased fivefold in 2017 compared to 2016. Sequencing confirmed outbreak strains for a sample of cases. However, comprehensive case attribution of non-sequenced cases was not possible. Our aim was to better understand the impact of the outbreak in France by quantifying the excess number of cases observed.

We used mandatory HAV notifications between 2006 and 2018. Using time-series analysis (TSA) we predicted monthly case numbers from June 2016 to December 2018, by modelling previous monthly data, adjusted for trend and seasonality. We estimated the outbreak duration and magnitude by deducting the predicted number of cases from the observed.

In 2017 and 2018, 3,391 and 1,523 HAV cases were notified respectively. Previously, the highest annual number of notifications was 1,548 in 2009, after which there was a continuous decrease to 697 in 2016, corresponding to a decrease of 0.93%/month (95%-confidence interval: 0.84%–1.0%, $p<0.001$). TSA showed a consecutive monthly excess of cases from January 2017 to December 2018, with the greatest excess of 460 cases in July 2017. The total excess of cases was 2,758 in 2017 and 945 in 2018. The number and magnitude of other identified HAV outbreaks in 2017 and 2018 was similar to previous years.

The significant and prolonged impact of this outbreak in France demonstrates the need for further investment in HAV vaccinations of at-risk groups. Increasing their low vaccination coverage, considered a key contributing factor to this outbreak, would mitigate against similar largescale outbreaks in the future.


**Role:** *principal investigator.* I undertook a descriptive analysis of HAV cases in France between 2006 and 2018. I prepared surveillance data for TSA and developed the TSA model. I prepared a report on the study and submitted an abstract on the work to ESCAIDE.

**Supervisor(s):** *Harold Noel, Julie Figoni*

## 4. Communication

## Publications

### *Publications in peer reviewed journals*

Jourdan-da Silva N, Fabre L, Robinson E et al. Ongoing nationwide outbreak of *Salmonella* Agona associated with internationally distributed infant milk products, France, December 2017. Euro Surveill. 2018;23(2):pii=17-00852. [7]

### *Manuscripts accepted by peer reviewed journals and awaiting publication*

Robinson E, Crispino V, Ouabo A, Soung Iballa FB, Kremer R, Serbassi ME, de Wit M, Carrion-Martin AI. Mortality and health survey, Walikale, Democratic Republic of the Congo, 2017: an example of the use of survey data for humanitarian program planning. *Conflict and Health*. In press. [10]

### *Manuscripts submitted to peer reviewed journals*

Robinson E, Travanut M, Fabre L, Larréché S, Guinard A, Vincent N, Clementine Calba C, Laure Meurice L, Le Thien MA, Fourgere E, Jones G, Fournet N, Le Hello S, Pardos-de-la-gandara M, Weill FX, Jourdan Da Silva N. Outbreak of *Salmonella* Newport associated with internationally distributed raw goats' milk cheese, France, 2018. [5]

### *Manuscripts in preparation*

Robinson E, de Valk H, Villena I, Le Strat Y, Tourdjman M. Decreasing seroprevalence of Toxoplasma infection amongst pregnant women in France: is it time to change the screening policy? [13]

Robinson E, Jones G, Bruyand M, de Valk H. Sensitivity of the peadiatric heamolytic surveillance system in France. [2]

## Reports

1. Interim outbreak report: ongoing outbreak of *Salmonella* 4.5.12:i:- , France, 2018—present. [6]

2. Evaluation of the sensitivity of the HUS surveillance system in France. [1]

3. Morbidity and Mortality Study, Walikale, Democratic Republic of the Congo, 2017. [9]

4. Surveillance of hospitalised dengue cases, La Réunion, January to April 2019. [3]

## Conference presentations

### Oral presentations

1. Robinson E, Tourdjman M, de Valk, H. Decreasing seroprevalence of Toxoplasma infection amongst pregnant women in France: is it time to change the screening policy? ESCAIDE; Saint Julian, Malta; November 2018. [12]

2. Surveillance of hospitalisations during a large outbreak shows severe dengue remains stable, La Réunion, 2018-2019. ESCAIDE; Stockholm; November 2019. [4]

### Poster presentations

3. Robinson E, Fabre L, Fournet N et al. Second *Salmonella* Agona outbreak associated with an infant milk production facility in France, 2017; 12 years after the first. ESCAIDE; Saint Julian, Malta; November 2018. [8]

4. Robinson E, Crispino V, Ouabo A et al. Ongoing high morbidity and mortality due to infectious diseases in Walikale territory, Democratic Republic of the Congo (DRC) 2017. ESCAIDE; Saint Julian, Malta; November 2018. [11]

## Other presentations

1. Ongoing outbreak of *Salmonella* 4,5,12:i:-, France. Santé publique France – US CDC Food and waterborne teams meeting; Saint Maurice, France; October 2018.

2. Incidence of *Salmonella* in children under five years of age, France, 2011-2017. Santé publique France – US CDC Food and waterborne teams meeting; Saint Maurice, France; October 2018.

3. Outbreak of results of case control study to investigate an outbreak of *Salmonella* 4,5,12:i:-, France. Meeting with Grippenet.fr team; Paris, France; November 2018.

4. *Salmonella* outbreak detection in France. EPIET Time series Module: Brussels, Belgium; November 2018.

## Other

1. Résultats de l'enquête alimentaire Short summary of the results of the case-control study for distribution to participants of Grippenet.fr from which controls were drawn.

## 5. Teaching and pedagogy

**Title:** *Development of online lecture on the investigation of outbreaks of gastrointestinal illness in long term care facilities*

- Training objectives: understanding of how outbreaks in LTCFs are detected and investigated and understanding of the role and responsibilities of the infectious disease doctor/Infection prevention and control doctor

- Target audience: medical doctors undertaking postgraduate specialisation in infectious diseases

## Reflection

The coordinator of the training programme asked SpF to develop a short lecture on this topic for the programme's online learning platform. To determine the learning objectives we reviewed the curriculum of the programme to determine what the learners already covered relating this topic –e.g. any previous training on outbreak investigation, reviewed. We also reviewed current guidelines on outbreaks in LTCFs and discussed internally to determine the potential role the learners will play in such an investigation in order to focus the lecture on their needs.

The most difficult aspect of the learning event was that the lecture could only be 10 minutes long. Therefore many aspects could only be briefly mentioned and we directed the learners to other sources for further detail.

A formal evaluation amongst the learners was not undertaken. However prior to it being made available on the platform it was reviewed by the training committee of the programme who provided positive feedback.

## Title: *STATA tutorials*

- Training objectives: to be able to perform basic statistical analysis using stata

- Target audience: Masters students and professional interns at SpF

## Reflection

The students had limited practical experience in statistical analysis beforehand but needed to be able to do some basic analysis as part of thesis projects. As the learners were focused on their project, the learning event veered more towards how to do specific analysis they needed rather than building up their understanding.

If doing the event again I would structure it as 2 or more sessions where we first went through the basics in general terms without a focus on a specific project, then given them time to apply their learning to their own projects, and then have another sessions where we could address any difficulties they faced.

A formal evaluation was not undertaken

## 6. Other activities

- Member of expert committee for the development of joint hepatitis and HIV screening guidelines for Europe

- Reviewer for two articles for EuroSurveillance

## 7. EPIET/EUPHEM modules attended

1. Introductory course, 25 September–13 October 2017, Spetses, Greece

2. Outbreak investigation, 4–8 December 2017, Berlin, Germany

3. Multivariable analysis, 16—20 April 2018, Nicosia, Cyprus

4. Rapid assessment and survey methods, 14—19 May 2018, Athens, Greece

5. Project review, 27—31 August 2018, Lisbon Portugal

6. Time series analysis, 5—9 November 2018, Brussels, Belgium

7. Vaccinology, 24—28 June 2019, Rome, Italy

8. Project review module, 26—29 August 2019, Prague, Czech Republic

## 8. Other training

- Vaccination coverage survey scholar; WHO (online)
  - Module A1 -- Design a vaccination coverage survey, with a focus on objectives, scope and sample size calculation; 28 August –6 October 2017
  - Module A2 -- Review a protocol for a vaccination coverage survey, with a focus on sampling and steps to enhance data quality; 9 October –17 November 2017
  - Module A3 -- Data analysis for vaccination coverage surveys; 20 November –22 December 2017
- Molecular epidemiology for surveillance; SpF; Saint Maurice, France; 5—7 March, 2018
- Preparation for primary departure training, MSF; Bonn, Germany; January 2018,
- National STD Curriculum, STD Self-Study Modules – Syphilis; CDC/University of Alabama; online; April 2019
- National STD Curriculum, STD Self-Study Modules – Human Papillomavirus Infection; CDC/University of Alabama; online; April 2019
- GoData training; WHO/MS; London, UK (attended via a webinar); June 2019,
- Cross-border sharing of public health data: 2nd pilot course; ECDC Virtual Academy; July 2019

# Discussion

## Supervisor's conclusions

During the fellowship, Eve further developed her competencies in surveillance, setting up surveillance of severe hospitalized cases of dengue during a large outbreak in La Réunion in the Indian Ocean. She also carried out a detailed evaluation of the sensitivity of the surveillance system of Hemolytic Uremic Syndrome (HUS) in children in France and made valuable recommendations for strengthening of the system.

She was involved in three outbreaks of salmonellosis. The investigation of one of the outbreaks affected newborns and the investigation were carried out under very high political and media pressure. Eve carried out 3 studies: a study on the seroprevalence of toxoplasmosis and its determinants which lead to recommendations regarding the toxoplasmosis screening programme in France; she analyzed the data of a mortality and health survey undertaken by Médecins Sans Frontières (MSF) in the conflict affected Walikale territory of North Kivu; and she estimated the impact of a large outbreak of hepatitis A among men having sex with men in France by quantifying the excess number of cases observed, using time series analysis.

She established fruitful collaborations such as with the regional teams, and the reference laboratories, but also internationally.

Eve Robinson is a very competent epidemiologist. She works efficiently and her work is always of very high scientific quality. She can work independently, but a she also knows when to consult or refer to her hierarchy. She was a highly appreciated member of our team. She has a high work capacity, which enabled her to meet all the training objectives and get the best out of all the learning opportunities that the EPIET programme offers.

## Coordinator's conclusions

Eve is a medical doctor with a Public Health specialisation in Ireland and work experience including outbreak investigations.

During her fellowship, she evaluated the sensitivity of the French surveillance system for paediatric haemolytic uraemic syndrome, investigated three different Salmonella outbreaks, analysed the screening data of pregnant women to estimate their toxoplasmosis seroprevalence and conducted time series analysis of hepatitis A virus infection in France. She was working very independently and rigorously on these projects. She had strong analytical skills from the beginning, but was able to further strengthen her statistical skills through application of what she has learnt during the EPIET training modules. She is very motivated and a good team player.

Eve was result-driven in her work and is an excellent scientific communicator. During her fellowship, she gave two poster and two oral presentations at the ESCAIDE 2018 and 2019 to present and discuss the findings of her projects and outbreak investigations. In addition, she submitted three manuscripts to peer-reviewed journals and she is planning to submit two more manuscripts.

Following her interest in international public health she conducted the data analysis of a mortality and health survey in DRC on behalf of MSF and supported the surveillance of hospitalised dengue cases during a large outbreak in La Réunion in 2019. After her fellowship she will start working as epidemiologist for MSF in the Central African Republic. I wish her great success in the future.

## Personal conclusions of fellow

The EPIET programme and the opportunity to work in a different country whose health and public health structures differ to my previous experiences has been a very valuable experience. I have been exposed to different surveillance methods, different working relationships with partners, and pathogens I had no previous experience of. All these experiences have broadened my understanding of public health methodologies and its potential roles. The EPIET modules and opportunities to put the learning into practice during various projects have made me a more competent epidemiologist. I believe I will come back to my learning during the fellowship many times in the future, and that it has broadened my scope as a public health practitioner.

## Acknowledgements of fellow

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