FELLOWSHIP REPORT

Summary of work activities

Alastair Donachie
Intervention Epidemiology path (EPIET)
Cohort 2016

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;

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

Before starting EPIET Alastair Donachie worked at the European Centre for Disease Prevention and Control (ECDC) for three and a half years where he contributed to the surveillance and response of communicable diseases at EU level, specialising in epidemic intelligence and risk assessment activities. He previously worked at ECDC as a trainee with the Food and Water-borne diseases and Zoonoses (FWD) programme and at the Swedish Institute for Infectious Disease Control as a student researcher during his Master's thesis.

Fellowship assignment: Intervention Epidemiology path (EPIET)

On 14th September 2016, Alastair started his EPIET fellowship at the Health Promotion and Disease Prevention Directorate in the Infectious Disease Prevention and Control Unit (IDCU) in Malta, under the supervision of Dr Maria-Louise Borg. His EPIET front line coordinators were Kostas Danis and Louise Coole. This report summarizes the work performed during the 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].

Fellowship projects

1. Surveillance

Title: Retrospective surveillance and enhanced case-finding of congenital rubella syndrome cases

Supervisor (s): Tarik Derrough

European national congenital rubella syndrome (CRS) surveillance data are insufficient for rubella elimination verification purposes. Supplemental CRS burden assessment methods are required to enable more accurate case reporting. With the aim of developing a generic protocol for retrospective CRS case identification in EU/EEA countries, we performed an extensive literature review of CRS burden assessment methods.

We used the PubMed search engine to retrieve peer-reviewed articles reporting on CRS burden assessments using case counts or incidence calculations published up to April 2017. We excluded seroprevalence studies and those based solely on routine surveillance data. We summarised study characteristics and CRS burden assessment

[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

methodologies, including prospective vs retrospective study type, study population, inclusion criteria, case definitions and data sources used.

We identified 771 articles reporting CRS burden assessments, published between July 1964 and March 2017. Forty-three papers remained after applying exclusion criteria, 25 (58%) of which were of retrospective design. Ten (23%) studies explicitly reported using WHO or EU case definitions. Data sources documented in retrospective studies were maternity and tertiary hospital records (n=11), laboratory registers (n=4), birth records (n=1), birth defect registries (n=2), pregnancy termination records (n=1), surveys (n=7), surveillance data (n=11), insurance and health system data (n=2), literature review (n=2), and immunisation programmes (n=2). Eleven (44%) studies used a combination of data sources. Where evaluated (n=4), retrospective studies reported higher sensitivity compared to routine surveillance data.

We suggest that countries measure CRS burden by reviewing maternal and tertiary care records, and supplement this core assessment using optional methods which are tailored to the country. This adaptable, generic protocol for retrospective burden assessment will support verification of rubella elimination in EU/EEA countries.

Role: Alastair, together with another EPIET fellow, conducted an extensive literature review and summarised all previous methods used for the retrospective surveillance and enhanced case-finding of CRS cases. He jointly wrote a final generic protocol which will be made available to EU/EEA Member States through the Regional Verification Commission for Measles and Rubella Elimination (RVC) and by publication on the ECDC website. An abstract was submitted to ESCAIDE 2018 and will be presented as a poster presentation.

Title: Descriptive analysis of salmonellosis and campylobacteriosis surveillance data in Malta 2007-2017

Supervisor (s): Maria-Louise Borg

In recent years, the number of cases of salmonellosis have been steadily rising in Malta. Following a question about the increase in cases of salmonellosis from the ECDC and to provide recommendations for the new food-safety strategy in Malta, an in-depth epidemiological overview of trends for all cases of salmonellosis was conducted for the period 2007-2017. A similar analysis was performed for all cases of campylobacteriosis for the same period.

Ten-year trends (2007–2017) were analysed with Poisson regression using a 95% level of confidence. Data was analysed for confirmed cases only and all analyses were conducted using STATA 12.0 and Microsoft Excel. Incidence rate ratios were calculated. The notification rates for each year were calculated using the number of confirmed cases per 100 000 inhabitants in the population as of 1 January for each respective year. Population data for each year was extracted from the National Statistics Office in Malta.

Salmonellosis showed a slightly increasing trend from 2007-2016 but this was not statistically significant. Highest notification rate was detected in the age group <1 year followed by 1-4 year-old children. *S.* Typhimurium and S. Enteritidis together accounted for over 56% of all reported serovars. Most salmonellosis and campylobacteriosis cases were domestically acquired and showed clear seasonality with a noticeable increase in the summer and early autumn. The most commonly reported suspected sources of infection were household. Cases of campylobacteriosis showed a statistically significant increasing nine-year trend in Malta from 2007-2016. Highest notification rates were detected in children under 1 and 1-4 years of age. *C. Jejuni* and *C. Coli* were the two most commonly reported serotypes.

Future public health measures for reducing the number of human salmonellosis and campylobacteriosis cases should target improving personal hygiene and food safety practices in the home.

Role: Alastair was the lead investigator. He described the national surveillance systems, analysed national surveillance data on salmonellosis and campylobacterisosis and wrote two summary reports to provide recommendations for the new food-safety strategy in Malta.

Title: Quarterly IDCU surveillance reports

Supervisor (s): Maria-Louise Borg, Tanya Melillo

Six quarterly newsletter reports were distributed to over 2000 health practitioners across Malta to increase awareness and provide recommendations for the prevention and control of infectious diseases. This newsletter included surveillance data for all mandatory diseases reported during each quarter. The content of the newsletters included a descriptive analysis of surveillance data and covered topics such as chikungunya, plague, hepatitis A among MSM, measles, legionnaires' disease, food-borne illnesses, tuberculosis and travel vaccinations.

Role: Alastair was the lead investigator. He described and analysed national surveillance data and contributed to the design, format and content of the newsletters.

Title: Monitoring community-based surveillance systems in Dollo Zone, Somali Region, Ethiopia, May-June 2017

Supervisor (s): Sandra Downing

In March 2017, an outbreak of AWD (Acute Watery Diarrhoea) was disrupting the emergency response to the malnutrition crisis in Dollo Zone, Somali region, Ethiopia. Between March and June, Médecins Sans Frontières (MSF) implemented community based surveillance using local community healthcare workers in Dollo Zone. This included collecting data such as population counts, Middle Upper Arm Circumference (MUAC) screening measurements, measles and AWD surveillance and mortality surveillance.

Routine monitoring of community-based surveillance and weekly epidemiological outputs provided updates on important health indicators such as morbidity, mortality e.g. crude mortality rates in children under 5 years, for the malnutrition crisis, measles and AWD outbreaks. In addition, descriptive analysis of MUAC screening results and information on daily admissions to the ITFCs (Inpatient Therapeutic Feeding Centres) and ATFCs (Ambulatory Therapeutic Feeding Centres) in Dollo Zone provided information for decision makers on the malnutrition crisis so that resources and interventions could be allocated accordingly.

Role: Alastair was the lead investigator. He maintained community based surveillance systems and produced short weekly surveillance reports.

2. Outbreak investigations

Title: *Outbreak of lymphogranuloma venereum (LGV) among men who have sex with men (MSM) in Malta, 2018*

Supervisor(s): Valeska Padovese

LGV is a sexually transmitted infection caused by the invasive L serovars, L1, L2 and L3, of *Chlamydia trachomatis*. Since 2003, when the first outbreak of LGV among MSM was reported in the Netherlands, several outbreaks have been documented in Western European countries. In March 2018, the Genitourinary Clinic (GUC) in Malta detected a cluster of LGV cases and unexpected increase in LGV diagnoses in MSM with five cases reported, a significant increase compared to previous years (two cases in 2017 and one case in 2013).

We conducted a retrospective analysis of data from the 1 January to 31 June 2018 at the GUC in Malta. Nucleic Acid Amplification Tests (NAATs) for *Chlamydia Trachomatis* (Ct), *Neisseria gonorrhea* (Ng), *Mycoplasma genitalium* (Mg) and *Trichomonas vaginalis* (Tv) from urine, throat, rectal and vaginal samples are routinely performed at the GUC. Positive rectal swabs for *Ct* infection in MSM were genotyped for LGV, irrespective of their HIV status and the presence of anorectal symptoms. Active contact tracing was conducted for all confirmed LGV cases, including those who engaged in group sex. Specialised nursing personnel at the GUC clinic performed counselling. Sexual contacts and partners were advised to visit the GUC clinic for testing.

Since 1 January 2018, 40 positive samples of rectal *Ct* were tested for serovars L1, L2 and L3. Of which, 13 (33%) were positive for LGV. Of these, six cases were part of three small group sex clusters identified with different MSM sexual networks; four confirmed cases in LGV cluster 1 and two confirmed cases each in LGV clusters 2 and 3.

The detection of the first known clusters and overall increase in LGV diagnoses among MSM in Malta in 2018 coincides with upward trends in chlamydia, gonorrhoea and syphilis. Contributing factors could be the high rates of partner change facilitated by the use of dating apps and risky behaviours such as unprotected anal intercourse, co-infection with other STIs, group sex and chemsex. Our data suggests a need for a strengthened public health response to raise awareness of LGV among clinicians and MSM in Malta. Clinicians should maintain a high index of suspicion for LGV in HIV-positive and other STI co-infected MSM with rectal symptoms.

Role: Alastair supported the outbreak investigation with contact tracing, descriptive analysis and wrote the outbreak report. A late-breaker abstract was submitted to ESCAIDE in 2018. A manuscript is ongoing in which Alastair is lead author.

Title: *Cluster of hepatitis A cases among men who have sex with men in Malta, 2017*

Supervisor(s): Maria-Louise Borg

Since February 2016, the number of cases of hepatitis A virus (HAV) infection among men who have sex with men (MSM) has been increasing in Europe. In 2017, the Infectious Disease Prevention and Control Unit (IDCU) in Malta detected the first clusters of HAV among MSM. We investigated to identify the likely routes of transmission and implement control measures.

Confirmed HAV cases are routinely reported to the IDCU. We defined cases as MSM with positive anti-HAV IgM since 01/01/2017 with reported sexual activity 50 days prior to disease onset. We traced close sexual contacts of cases and actively followed them up by offering HAV vaccination and advice on prevention and control measures.

In 2017, 26 confirmed HAV cases were reported in Malta, of which 21 (81%) were males and five (19%) were females. Of the 21 male cases, 14 (67%) were known to be MSM. This was a significant increase in HAV cases compared to previous years. Between January and March 2017, three cases of HAV infection were identified in MSM, all of whom were epidemiologically linked. The index case acquired infection after attending a gay party in Italy. From May-October 2017, 11 additional cases of HAV among MSM were reported including one new cluster in July (n=2). All MSM reported having multiple sexual partners and were unaware about HAV risk. Contact tracing of all HAV cases in 2017 identified 81 close sexual and/or household contacts. Fifteen (83%) sequenced isolates matched the VRD_521_2016 strain linked to the ongoing European HAV outbreak among MSM

Sexual transmission of HAV may sustain the outbreak among MSM. This outbreak highlighted the need for raising awareness about the risk of sexual transmission of HAV among MSM and promoting HAV vaccination. We recommended conducting cross-sectional studies to identify knowledge and risk behaviours contributing to HAV infection and to estimate HAV vaccination coverage among MSM in Malta.

Role: Alastair was the principal investigator. He collected data, conducted contact tracing and performed the descriptive analysis. This work was presented as a poster presentation at ESCAIDE in 2017.

Title: *Norovirus outbreak among staff working at a local food processing company in Malta, February-March 2017*

Supervisor(s): Maria-Louise Borg, Tanya Melillo

On 03/03/2017, the Infectious Disease Prevention and Control Unit (IDCU) in Malta was notified about an outbreak of gastroenteritis affecting employees of a food processing company since 28/03/2017. We aimed to identify the source and implement control measures.

We inspected the company, identified all employees though Human Resources, and collected data on risk exposures using self-administered questionnaires. We defined cases as company employees with at least two episodes of vomiting or diarrhoea in 24 hours since 28/02/17. We calculated risk ratios (RR) and 95% confidence intervals (95%CI). Stool samples were collected and analysed.

Of 514 employees, 272 (53%) responded; 55 (20%) met the case definition with onset dates from 28/02/2017-04/03/2017. Five (9%) cases required hospitalisation. Fifty-three (96%) cases ate from the canteen from 27/02/2017 - 02/03/2017. Eating in the canteen was associated with illness (RR: 11; 95% CI: 2.7 - 43). No significant food exposures were identified. Eleven of 26 (42%) stool samples were positive for norovirus. Of these, 3 were food handlers in processing plants; 8 were canteen food handlers, of which 3 (38%) were asymptomatic.

Environmental inspections identified deficiencies in food safety practices; food handlers preparing canteen food were also responsible for cleaning the toilets and premises of the company.

Environmental and epidemiological evidence suggest this point source outbreak occurred due to cross-contamination of canteen food and/or inadequate adherence to food hygiene practices. To prevent further cases, food processing was temporarily suspended, positive food handlers were excluded, the company's premises was disinfected and staff responsibilities revised. This outbreak highlights the potential role of asymptomatic food handlers in norovirus transmission and the importance of reinforcing adherence to personal hygiene and food safety practices.

Role: Alastair was the lead investigator for this outbreak investigation. He collected data, performed the descriptive and analytical epidemiology and wrote the final outbreak report. This work was presented as oral presentations at ESCAIDE and the MAPHM symposium in 2017.

Title*: National outbreak of Salmonella Give in Malta linked to a local food manufacturer, October 2016*

Supervisor(s): Maria-Louise Borg, Tanya Melillo

Salmonella Give is a rare serotype across Europe. In Malta, an average of one case per 100,000 was reported annually from 2007-2015. On 15/10/2016, five cases of *S.* Give were detected. We investigated to identify the source and implement control measures.

We conducted a descriptive epidemiological investigation. Confirmed cases were defined as persons with laboratory-confirmed S. Give infection with disease onset since 1 October 2016. Suspected cases were defined as persons with gastroenteritis with disease onset since 1 October 2016 and epidemiologically linked to a confirmed case. To enhance case-finding, physicians working in the Accident & Emergency Department (A&E) at the main public hospital in Malta were requested to report all patients presenting with fever and gastroenteritis since 1 October 2016. Local laboratories were alerted to report all preliminary Salmonella results directly to the IDCU during the same period. We collected data on risk exposures from cases by telephone interviews using questionnaires. Whole Genome Sequencing (WGS) was performed on human, food and animal isolates.

Thirty-six human cases were reported between October and November 2016, 10 (28%) of whom required hospitalisation. Twenty-six (72%) cases were linked to four restaurants. *S.* Give was isolated from ready-to-eat antipasti served by three restaurants which were all supplied by the same local food manufacturer. Food-trace back investigations identified S. Give in packaged bean dips, ham, pork and an asymptomatic food handler at the manufacturer; inspections found inadequate separation between raw and ready-to-eat food during processing. WGS indicated two genetically distinguishable strains of S. Give with two distinct clusters identified; one cluster linked to the local food manufacturer and a second linked to veterinary samples.

Epidemiological, environmental and WGS evidence pointed towards cross-contamination of raw and ready-to-eat foods at the local manufacturer as the likely source of one cluster. Severity of illness indicates a high virulence of this specific serotype. To prevent future cases and outbreaks, adherence to food safety practices at manufacturing level need to be reinforced.

Role: Alastair was the lead investigator for this outbreak investigation. He collected data and performed the descriptive analysis. This work was presented as oral presentations at ESCAIDE and the Malta Association of Public Health Medicine (MAPHM) symposium in 2017. It was also presented as a poster presentation at TEPHINET in 2017 and won 3rd best poster prize. A manuscript was submitted and published in a peer-reviewed journal.

Other: Alastair was also involved in all aspects of five other outbreak investigations. He conducted descriptive analysis on all five and analytical investigation on two. Four were gastroenteritis outbreaks involving healthcare institutions and one was a gastroenteritis outbreak linked to a local restaurant.

3. Applied epidemiology research

Title: *Measles Vaccination Coverage Survey in Somali Region, Ethiopia, June 2017*

Supervisor (s): Sandra Downing

In May 2017, concurrent outbreaks of AWD (Acute Watery Diarrhoea) and measles were hampering the emergency response to the malnutrition crisis in Dollo Zone, Somali region, Ethiopia. Following a measles mass vaccination campaign (MVC) by Médecins Sans Frontières (MSF) of children aged 6 months to under 15 years in Wardher town from 20-27 May, a vaccination coverage survey was needed to determine whether a mop up campaign was needed.

A two-stage, cluster-sampling vaccination coverage survey was undertaken in Wardher town (Kebeles 1-4 and 4 IDP camps) from 4-6 June 2017. At the first stage, 4 Kebeles and 4 IDP camps were selected using a probability proportional to the Kebele size. At the second stage, 12 households were selected by simple random sampling using a GPS based method. We collected data on age, gender, vaccination status, vaccination history, proof of vaccination and reasons for non-vaccination.

In total, 943 children aged 6 months to under 15 years in Wardher town were sampled. Measles vaccination coverage following the MVC was found to be 98% (95% CI: 97%-99%). Of the 943 (98%) whose head of household/caretaker reported that their child had received a measles vaccination in the MVC, 901 (96%) also had a vaccination card. Overall, 56% of those surveyed had never received a previous vaccination for any infectious diseases in their lifetime prior to the measles vaccination in the MVC. Nineteen (2%) were not vaccinated in the recent MSF measles MVC. Most common reasons for non-vaccination were the family was away, the child was sick or the child was out in the bush.

Measles coverage of children aged 6 months to under 15 years in Wardher town was high and exceeded the 95% target. This indicated that the recent MVC was successful in achieving its target and suggested that a vaccination mop up campaign in Wardher town should not be considered a priority at this stage.

Role: Alastair was the lead investigator for this study. He designed the protocol, implemented the study in the field and performed the analysis. He also trained and supervised a team of 12 people. He wrote a final report for MSF. This work was presented as an oral presentation at a MAPHM Continuing Professional Development (CPD) event in Malta in 2017 and at the Vaccinology module in Cardiff in 2018.

Title: *Study protocol for a survey on the behaviour, needs and interventions affecting HIV and other STI transmission in men who have sex with men (MSM) living in Malta 2017-2018*

Supervisor (s): Maria-Louise Borg

Between 2009 and September 2016, there was a significant increase in the number of new HIV diagnoses in Malta. In line with this increase in HIV diagnoses, there was an exponential rise in the number of new HIV diagnoses among men who have sex with men (MSM) with a 14-fold increase from only three diagnoses in 2009 to 45 diagnoses in 2015, and a 66% increase from 2014 to 2015 alone. There is currently limited information available about the sexual knowledge, attitudes and behaviours of MSM living in Malta and how these factors may be contributing to the recent rise in new HIV and other STI diagnoses.

A study protocol was developed for the implementation of an internet survey for MSM living in Malta to identify, describe and analyse the sexual knowledge, attitudes, behaviours and needs contributing to HIV and other STI transmission. The study population is MSM living in Malta who are aged 18 years or older, who provided anonymous informed consent to participate in an online survey. We estimated that a sample size of 376 would be required. Participants will directly input their own data into the online survey tool. The survey will collect information on specific indicators developed by the European Centre for Disease Prevention and Control (ECDC) and used previously in the European MSM Internet Survey (EMIS) 2010. These indicators include demographic data, sexual health and wellbeing, sexual risk behaviour, prevention needs and intervention coverage.

Proportions will be calculated using the total number of non-missing answers as denominators and categorical variables compared using the chi-squared test. Means of numerical variables will be compared using the student t-test. Data will be cleaned and analysed using STATA version 12.

Results from the implementation of this protocol will generate useful data for the planning of HIV and STI prevention and care programmes for MSM in Malta and help monitor national progress in this area by comparing the results with those of previous surveys e.g. EMIS 2010.

Role: Alastair was the lead investigator. He developed and finalised the study protocol and survey questionnaire. The study protocol was adapted and partially implemented using survey questions from EMIS 2017.

4. Communication

Publications in peer reviewed journals

One publication as lead author in a peer reviewed journal (1)
One publication as co-author in a peer reviewed journal(2)
One additional manuscript is ongoing (local LGV outbreak among MSM in Malta) in which I am lead author

Conference presentations

Two oral presentations at ESCAIDE 2017, Stockholm, Sweden (3,4)
Two oral presentations at the MAPHM Symposium 2017, Malta (5,6)
One poster presentation at ESCAIDE 2017, Stockholm Sweden(7)
One poster presentation at TEPHINET 2017, Chiang Mai, Thailand(8)

Other presentations

Oral presentation at a CPD event for the MAPHM in 2017(9)
Oral presentation at the Vaccinology module in Bristol in 2018
Oral presentation about MSF mission in Ethiopia for students following a Master's programme in Humanitarian action at the University of Malta
Oral presentation on abstract writing for MAPHM trainees in 2018

Reports

Six quarterly IDCU surveillance newsletters for local doctors and health care professionals(10)
Seven outbreak reports(11–17)
Two IDCU surveillance reports on salmonellosis and campylobacteriosis(18)
One international mission report(19)
One vaccination coverage survey report from an international mission(20)
Three epidemiological summary reports from an international mission(21)
One surveillance protocol report for the retrospective surveillance and enhanced case-finding of CRS cases(22)
One research study protocol on HIV and STIs in MSM(23)

Other

Prepared a press release providing advice for the general public following the autochthonous transmission and outbreak of chikungunya virus in Italy in September 2017(24)
Organised and moderated the Career Compass event at ESCAIDE 2017 and is currently organising a second edition of the event for ESCAIDE 2018
Cohort representative in 2018

5. Teaching and pedagogy

1. EU Rapid Risk Assessment (RRA) exercise

Alastair co-facilitated the practical exercise EU Rapid Risk Assessment Exercise. The session was five hours in duration and took place during the Rapid Assessment and Survey (RAS) module in Athens in May 2017. The target audience for the session were 45 EPIET and EUPHEM fellows from cohort 2016.

Instructional Design:
Fellows were provided with background information about the context of the exercise. The fellows were divided into four groups and asked to work on one of the following outbreak scenarios:
1) Measles outbreak in Europe
2) Locally-acquired cases of yellow fever in Europe

One facilitator moderated each group discussion and provided insight on the topic.

Learning objectives - The main learning objectives for this exercise were to learn how to:

- Carry out a rapid risk assessment in Europe
- Describe the process, strengths and limitations of a rapid risk assessment
- Identify the necessary sources of information
- Formulate and communicate uncertainties, and make the necessary considerations when designing and recommending public health interventions to reduce risk
- Produce a rapid risk assessment presentation and report

Evaluation - The practical exercise was evaluated as part of the overall course evaluation. Fellows found the content of the exercise very useful and relevant. My role was primarily as a facilitator but I was also involved in developing the scenarios and overall design of the exercise.

2. *Course: Infectious disease epidemiology for undergraduate students*

Alastair developed a series of lectures on infectious disease epidemiology. The lectures were 1 hour in duration and took place at Mater Dei Hospital in Malta from the period September 2016 -December 2017. The target audience were first and third year undergraduate students from the University of Malta studying Physiotherapy and Occupational Health. Around 40 students attended the lectures.

Instructional design -The seven lectures covered the following topics: outbreak investigation, food-borne illnesses, food-borne illnesses case scenarios and meningoccoal meningitis. Interactive powerpoint presentations were used. Questions were asked during the lectures to stimulate discussion and encourage active participation.

Learning objectives - The main learning objectives for these lectures were to:

- Describe and explain the 10 steps of an outbreak investigation
- Identify factors affecting food-borne illnesses
- Identify methods of preventing food-borne illnesses
- Understand the common organisms involved in food-borne illnesses
- Understand the role of the Infectious Disease Prevention and Control Unit (IDCU) in the management of food-borne illnesses locally
- Describe meningococcal disease in terms of the causative agent, risk groups, transmission, diagnosis, treatment, prevention and control
- Explain the importance of effective prevention and control strategies when there is a case of meningococcal meningitis.

Evaluation – Based on these lectures, exam questions for the students were prepared and graded. For the meningococcal meningitis lecture, all students completed and returned an evaluation form, using scores from 1-5 (1=Very Poor, 2=Poor, 3=Average, 4=Good, 5=Very good). This course received a mean score of 4.6.

Reflection

The teaching activities were important in helping me to learn how to develop and deliver course materials to different audiences. I also learnt how to adapt my teaching method to a specific audience. Facilitating at the RAS module helped me to consolidate my own learning and share my own experiences with fellows who were unfamiliar with the topic. It also improved my confidence and competence as a trainer. On reflection, if I was to facilitate a similar exercise again then I would like to create a new classical case-study from scratch to aid my own development as a trainer. Overall, I found the teaching activities and practical exercise enjoyable and rewarding experiences which I hope to repeat in the future, especially as developing response capacity such as risk assessment at a community and national level for public health threats is an important component of the programme.

6. EPIET/EUPHEM modules attended

1. Introductory Course, Spetses, Greece, 14th September-15th October 2016
2. EPIET Outbreak Investigation module, Berlin, 9th-13th December 2016
3. EPIET Multivariable Analyses module, Zagreb, 13th-17th March 2017
4. EPIET Rapid Assessment module, Athens, 8th-13th May 2017
5. EPIET Project Review module, Lisbon, 28th August-1stSeptember 2017
6. EPIET Time Series Analyses module, Bristol, 20th-24th November 2017
7. EPIET Vaccinology module, Cardiff, 11th-15th June 2018
8. EPIET Project Review module, Lisbon, 27th August-1st September 2018

7. Other training

1. Migration and Health training seminar, Malta, 25th October 2016
2. MSF Preparatory Pre-Deployment (PPD) course, Bonn, Germany, 23rd-28th March 2017
3. Statistics lecture and practical training using R, Malta, 19th January 2018

Discussion

Supervisor's conclusions

Alastair managed to successfully meet all the EPIET learning objectives during his fellowship at IDCU as evidenced by all the above mentioned outputs. Being a small team at IDCU, Alastair was involved in the day to day work of the unit and also in every step of the outbreak investigations. He therefore gained a lot of practical experience in outbreak management and often took the lead in collecting, describing and analysing outbreak data and producing reports. He was a lead member in interdisciplinary outbreak management teams and also went on the field to conduct risk assessments and collect data.

As IDCU functions as both a national and local unit Alastair was able to get exposure to infectious disease management at both strata, from field experience to international communication and collaboration, while appreciating the different challenges faced by small nation countries such as lack of availability of high level expertise and diagnostics such as whole genome sequencing. Alastair was also exposed to the management of an array of different infectious diseases, ranging from sexually transmitted disease, food-borne pathogens, vaccine preventable diseases and vector borne.

Alastair also managed to successfully fulfil his surveillance objectives through various projects including time series analysis (TSA) for *Salmonella* and Campylobacter. The outputs from the TSA projects are being used by the food safety commission to develop recommendations and influence policy. His regular contribution to the drafting of the IDCU quarterly infectious disease reports for clinicians was also invaluable to our unit. He also conducted descriptive analysis of surveillance data collected by the national GU clinic. Through day to day work and case management Alastair gained experience on how the infectious disease surveillance operates within the unit. He was also trained on how to operate our surveillance software and manage surveillance data. Alastair also gained experience on the set up of surveillance at international level through the CRS project for which he also developed recommendations and tools for future use. His surveillance competencies were further solidified through the monitoring of surveillance activities and data analysis during his mission in Ethiopia.

Alastair fulfilled his research competencies through the MSF vaccination coverage survey. In addition he developed a study protiocol on HVI and STIs in MSM including the survey tool and bugeting for the survey. Meetings were organised with key stakeholders and NGOs in preparation for the survey. The study was eventually implemented through collaboration with EMIS with whom Alastair communicated regularly to ensure successful implementation and response to the survey. As data release was delayed by the EMIS team, it was not possible for Alastair to conduct in depth analysis of survey results by the end of the fellowship.

During his fellowship Alastair proved to be very proficient in conducting statistical analysis using STATA and was also trained on how to use R. He also proved to be an excellent communicator both in written and oral communication. He always presented results in a very simple and effective manner, appropriate to the respective audience be it at Ministerial level, health care professionals, university students and the general public. He presented on several occasions in both national and international conferences and also won a price for 3rd best poster presentation at

TEPHINET. He also wrote and published a manuscript on *Salmonella* Give and will soon also submit another manuscript based on a local LGV outbreak amongst MSM.

Through the direct links IDCU has with the University of Malta, Alastair also had the opportunity to deliver training sessions on epidemiology and outbreak management to undergraduates. He also worked closely with public health doctors and trainees and was involved in both teaching and in delivering talks on infectious disease epidemiology to public health professionals. He was also involved in teaching during the RAS module. Alastair has therefore successfully met both the communication and training objectives of the EPIET programme.

During his fellowship, Alastair proved to be a very good, effective, reliable and trustworthy member of the IDCU team. He has very good time management skills and was always able to deliver good quality outputs in a timely manner and fulfil all the EPIET training objectives. He was also able to take the lead and work independently whenever needed. He always conducted his work in a professional manner and followed ethical principles when handling confidential data. He is a highly engaged and committed in his work and has become an invaluable member of our team. He is a quick learner and also adapted easily to the different working environment. He has made a strong contribution to the work of the team and the profile of the unit. Moreover he has been able to capitalise on his previous experience and also his contacts and networks from previous work at ECDC to progress his work and that of the unit. I wish Alastair all the best in his future career choices. He will undoubtedly be successfull in his future endeavours and will be an asset to any team.

Alastair was the first fellow hosted at IDCU. He provided additional needed support to our unit as well as added value in terms of expertise from his previous work in ECDC as well as from the skills and lessons learned during the training modules. Having a fellow also allowed the site to benefit from the EPIET network and improve links with European networks. In fact, on several occasions IDCU collaborated with institutes hosting other fellows, including EUPHEM fellows. Their expertise and support in lab diagnostics proved to be very important especially in outbreak investigations. Alastair's work and expertise also helped to increase the visibility of IDCU locally as well as abroad.

Coordinator`s conclusions

Alastair has had a very successful fellowship and has achieved all his learning competencies. He has become very experienced at outbreak investigation and analysis and has also taken full advantage of the opportunities that both the site and the ECDC fellowship have afforded him, including an important overseas mission and a project supervised by ECDC. He integrated well into the site and made a significant contribution demonstrating the benefits of the EPIET fellowship programme. He has a strong appreciation of how the skills he has acquired in the programme can combine with broader public health skills to deliver improvement to the health of the population and make a genuine difference.

Personal conclusions of fellow

EPIET has been a rewarding and unique experience for me, both on a professional and personal level. I feel that I have been able to achieve much more than I ever imagined and have thoroughly enjoyed and embraced all the challenges it has brought. During the fellowship programme, I have acquired key technical skills in outbreak investigation, surveillance and applied epidemiological research, both through the support of my supervisors as well as participation on an international mission and an ECDC project. I have also further developed my interpersonal skills such as people management, cross-sector collaboration and effective risk communication. I believe these skills will be invaluable in the future when working with people from different countries both within and outside the EU. In addition, I really enjoyed the opportunity to collaborate with a large network of highly skilled public health epidemiologists and microbiologists. Overall, I feel this programme has been a very important and significant step in my career as an epidemiologist.

Acknowledgements of fellow

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