Summary of work activities
Katerina Chaintarli
Intervention Epidemiology path (EPIET)
Cohort 2015

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 the 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;

- 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.

Fellows develop core competencies in field epidemiology mainly through project or activity work, but also partly through participation in training modules. Outputs are presented in accordance with the EPIET competency domains, as set out in the EPIET scientific guide[1].

Pre-fellowship short biography

Katerina Chaintarli is a Doctor in Veterinary Medicine (DVM) and has a Masters in veterinary epidemiology. She has previously worked at the European Medicines Agency and Public Health England and has a particular interest in antimicrobial resistance, vaccines and zoonosis.

Fellowship assignment: Intervention Epidemiology path (EPIET)

On 14 September 2015, Katerina started her EPIET fellowship at the Health Protection Surveillance Centre (HPSC), Dublin Ireland, under the supervision of Dr Suzanne Cotter, Specialist in Public Health Medicine. This report summarizes the work performed during the fellowship.

Fellowship portfolio

This portfolio presents a summary of all work activities (unless restricted due to confidentiality regulations) conducted by the fellow during the ECDC Fellowship, EPIET path. These activities include various projects, 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.

This portfolio also includes a reflection from the fellow on the field epidemiology competencies developed during the 2-year training, a reflection from the supervisor on the added value of engaging in the training of the fellow, as well as a reflection by the programme coordinator on the development of the fellow's competencies.

Fellowship projects

1. Surveillance

Evaluation and Comparison of the National TB surveillance system in Ireland before and after the introduction of the Computerised Electronic Reporting System.

In 2011, the TB enhanced surveillance system in Ireland was incorporated into the Computerised Infectious Disease Reporting system (CIDR) and became available nationwide. The aim of this evaluation was to study and compare the completeness, timeliness, simplicity, usefulness and flexibility between the systems before and after the inclusion of TB surveillance data on CIDR in 2011.

Completeness of key variables was assessed examining the field completion. Chi-square test was used to determine the significance of proportions of completed fields in each system. The main median time intervals in notification process were calculated. Distribution of intervals between both systems was compared using Wilcoxon Rank Sum-Test. An online questionnaire including questions on simplicity, flexibility and usefulness was sent to everyone involved in TB surveillance. Descriptive analysis of results was conducted.

A total of 4007 TB notifications were captured before and 1776 after the introduction of CIDR. Completeness of core questions was higher in the old system but varied for enhanced questions. There was no significant difference in completeness for most demographic variables. Time and diagnosis related variables were more complete in the old

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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/epiet/Documents/Scientific%20guides/EPIET%20Scientific%20Guide_C2016.pdf

system while variables on drug susceptibility, HIV and laboratory tests after treatment were more complete on CIDR (Chi-Square P-value<0.05). The median time intervals significantly increased in CIDR compared to the previous reporting system (Wilcoxon Rank Sum-Test P-values<0.05). 24 people responded to the survey (88.9% response rate). The majority thought that CIDR is simpler (37.5%), more useful (41.7%) and more flexible (29.2%) compared to the old system.

This study demonstrated that the electronic surveillance did not improve completeness and increased the time of the notification procedure. Simplicity, usefulness and flexibility were improved but qualitative methods should be applied to further explore these results.

Role and outputs: Katerina was the principal investigator. She wrote the protocol (1), exported the data from the national database, did the data cleaning and analysis; wrote the report (2) and the manuscript (3). This work has been presented as poster at ESCAIDE 2016 (4) and at the Winter Scientific Meeting 2016 in Dublin (5)

Supervisor(s): Dr Joan O'Donnell - Specialist in Public Health Medicine (TB), HPSC

Decrease in the uptake of seasonal influenza vaccine in persons aged 65 years and older in Ireland since the 2009 influenza A (H1N1)pdm09 pandemic.

In Ireland, seasonal influenza vaccination is recommended for persons aged 65 years and older and is free for medical/GP cardholders. There is a year-on-year variation in the uptake and anecdotally the 2009 pandemic is thought to have influenced a decline follwoing the pandemic season and the pandemic vaccination programme. We conducted this study to determine whether the uptake has been influenced by the 2009 pandemic, age or deprivation status.

Aggregated seasonal influenza vaccine uptake data (2004-2015) by health authority area and age group were obtained from the national database. The Haase-Pratschke relative deprivation score (2011) was applied to these same areas. Using Poisson regression model, we estimated the associations between uptake before and after the pandemic, age and deprivation status.

The median uptake was 62% before the pandemic (2004-2009) and 59% after (2010-2015). After adjusting for age, season and deprivation status, overall people aged ≥ 65 years were less likely to receive the seasonal influenza vaccine after the pandemic compared to before (Risk Ratio (RR)=0.89, 95% Confidence Interval (CI): 0.82-0.96). Vaccine uptake increased with age; both those in the "70-74" and "above 75" years age groups were more likely to receive the vaccine compared to those aged 65-69 years (RR=1.18, 95%CI:1.14-1.24; RR=1.34, 95%CI:1.28-1.39 respectively). There was no significant association between uptake and deprivation score. Areas with the highest/lowest uptake remained consistent across all seasons.

This study demonstrated that seasonal influenza vaccine uptake increased with age but decreased after the influenza pandemic. Qualitative studies should be undertaken to explore whether changes in public funding and/or people's perceptions on the risks of disease and the vaccine influenced the uptake. No association was found between uptake and deprivation status but disaggregated data are required to further explore this.

Role and outputs: Katerina was the principal investigator. She obtained the data from the national database, did the analysis and wrote the manuscript which has been accepted for publication at the Irish Medical Journal (6). This work has been presented orally at ESCAIDE 2016 (7) and as a poster at the Winter Scientific Meeting in Dublin, Ireland (8)

Supervisor(s): Dr Lisa Domegan - Surveillance scientist (Influenza), HPSC

Annual report for the seasonal influenza vaccine uptake in persons aged 65 years and older attending GP clinics and pharmacies for vaccination.

HPSC produces every year a report for the seasonal influenza vaccine uptake in persons aged 65 years and older. The claims for payment from GPs/pharmacies for influenza vaccination of patients with medical cards/GP visit cards are used to calculate the uptake. The aim of this project was to analyse the surveillance data for the season 2014/15 and produce the annual report.

The average influenza vaccine uptake nationally in medical/GP visit card holders aged 65 years and older attending GP clinics and pharmacies for vaccination was 60.2% between September 2014 and August 2015. This uptake increased compared to that reported for the 2 previous seasons (59.4% and 56.9% respectively) but remained lower than the EU target (75%). Pharmacy claims accounted for 4.4% (n=12,097) of all paid influenza vaccine claims and GP claims accounted for 95.6% (n=263,846). Variation in vaccination coverage was observed between age groups, with the highest uptake (65.3%) in those aged 75 years and older and the lowest uptake in those aged 65-69 years (49.8%). Slight variation in vaccination coverage was also observed between different regions, ranging from 55.7% in the east to 63.7% in south-east.

Work on increasing awareness within the wider community about the value of influenza vaccination for those at risk of influenza complications should be supported to improve vaccine coverage. The need for a national immunisation register is necessary to estimate more timely and accurately influenza vaccination uptake rates in all risk groups including individuals aged 65 years and older and health care workers.

Role and outputs: Katerina was the principal investigator. She obtained the data from the national database, did the analysis and wrote the report (9).

Supervisor(s): Dr Suzanne Cotter

Creation of surveillance databases for cholera, measles, malnutrition, vaccine coverage, internally displaced populations (IDPs) and wounded in Haiti.

In Port-au-Prince (Haiti), Médecins Sans Frontières (MSF) have an emergency and cholera response unit which is a treatment centre for cholera but also a surveillance centre for infectious diseases. The aim of the project, which was part of an international assignment with MSF, was to identify gaps of the current surveillance system and create new surveillance databases for cholera, measles, malnutrition, vaccine coverage, internally displaced populations and wounded.

All the existing data and databases were reviewed and weaknesses related to data collection, data management and data analysis were identified. The national staff at the project were collecting the surveillance data either by phonecalls or visits to hospitals and health authorities but they were not using a systematic approach for all areas and diseases. Data were entered and stored in different excel databases without a consistent format and, as a result, there were various databases even for the same disease. MS-Excel was used to store the data but they were not analysed systematically to monitor changes in the trends.

Training sessions were organised for the staff at the project where they became familiar with the principles of outbreak investigation, surveillance of infectious diseases, epidemiological indicators and mapping tools. New excel databases were developed for cholera, measles, malnutrition, vaccine coverage, internally displaced populations and wounded where incidence was calculated automatically. Cut-off values were used to flag high incidence in the databases which would indicate a need for action. Maps where incorporated in the databases to help visualise the changed in the trends.

Role and outputs: Katerina was the principal investigator. She reviewed the data and databases, created new databases, prepared the teaching materials and delivered the teaching sessions to the project staff.

Supervisor(s): Annick Lenglet – MSF, Operational Centre Amsterdam

Competencies developed:

While doing my surveillance projects at HPSC, I applied and advanced several epidemiological and statistical skills related to evaluating surveillance systems following the ECDC guidelines, being involved in routine surveillance and developing annual reports, conducting trend analysis and using regression models to analyse surveillance data. These projects allowed me to produce several outputs including reports and manuscripts for publication as well as present the results to national and international conferences. During my international mission in Haiti, I learned the needs of a surveillance system in low-resource settings and managed to re-organise and build databases that improved the surveillance and reporting of important public health issues. That contributed to a better knowledge of the role of the field epidemiologist in developing countries which will help me in future international assignments.

2. Outbreak investigations

Social network analysis and epidemiology of a nosocomial outbreak of OXA-48 like Carbapenemase-producing Enterobacteriaceae in Ireland, 2016

In August 2016, a large acute care hospital in Ireland reported an outbreak of OXA-48 like Carbapenemase-producing Enterobacteriaceae (CPE), ongoing since mid-2015. We described the epidemiology and transmission patterns of the outbreak to identify factors contributing to patient colonisation and infection, in order to target screening and implementation of control measures.

We defined a case as a patient with OXA-48 CPE positive result from a clinical or screening sample between January 2015 and October 2016. We collected information from hospital databases and patient charts on case-patient demographics, antibiotic use, clinical characteristics, ward movements and laboratory results. We constructed a bipartite network analysis to illustrate interactions between patients and wards, to better understand the transmission network and high-risk locations in the hospital.

We identified 63 case-patients (median age: 73, 51% male) colonised or infected with OXA-48 CPE. Most were admitted from home (94%) for emergency care (54%). The bacteria isolated included *Escherichia coli* (33%), *Enterobacter cloacae* (25%) and *Klebsiella pneumoniae* (23%). Among cases, we observed higher than average hospital antibiotic consumption and length of stay (89% versus 37%; 22 versus 7 days, respectively). Ninety percent had at least one co-morbidity, and 75% underwent an invasive procedure. The network visualisations and metrics identified two wards central to propagating the outbreak and helped target the screening of patients and their contacts.

Uncontrolled nosocomial transmission of OXA-48 with different *Enterobacteriaceae* species developed into an extensive outbreak. Higher antibiotic consumption, existing comorbidities, invasive procedures and longer hospital stays were observed among cases. In complex outbreaks of antimicrobial resistant infections, social network analysis is a useful tool to supplement descriptive epidemiology, to rapidly identify high risk wards and target patient screening.

Role and outputs: Katerina was the principal investigator of the epidemiological part of the outbreak. She was involved in the data collection and the writing of the report (10). She entered, cleaned and analysed the data. She conducted the network analysis and wrote the manuscript as a joint first author (11). This work was presented orally at the Summer Scientific conference 2017 in Dublin (12) and as a poster at TEPHINET 2017 (13).

Supervisor(s): Dr Helena Murray

Investigation of a national measles outbreak linked to a single imported case in Ireland, April - September 2016.

Measles incidence has declined in Ireland in recent years, but the European elimination target (<1 case per million) has not yet been reached. In April 2016, a case of measles was confirmed in an adult who travelled within Ireland while infectious. Cases subsequently arose in five of the eight public health regions around the country.

A national outbreak control team was convened. Extensive contact tracing was undertaken for each case. A variety of samples were used to confirm or rule out measles: primarily oral fluid samples, serum, or throat swabs. Laboratory confirmation was defined as measles virus detection on PCR testing, or measles-specific IgM. Genotyping was performed for the primary case, and for most subsequent cases including those where epidemiological links were uncertain.

There were 41 confirmed cases between April and September 2016. All sequenced cases were genotype B3 and were identical. Vaccination status was known for 34 cases, of whom 31 (91%) were unvaccinated. Eight cases (20%) were aged <12 months. Median age was 8 years (range 3 months to 40 years). Nine cases (22%) were nosocomial, and three cases (7%) were infected on separate international flights. Eighteen cases (45%) were known to have been hospitalised. The primary case was a child who was hospitalised after return from travel to another European country, but whose diagnosis was unrecognised by clinicians. The child was diagnosed retrospectively as measles PCR-positive on a stored throat swab.

This was a protracted, complex outbreak linked to a single imported case, with multiple routes of transmission and a high rate of hospitalisation. This outbreak demonstrated that Ireland remains at risk of measles outbreaks since vaccination rates are suboptimal and elimination targets are not achieved.

Role and outputs: Katerina was a co- investigator of the outbreak. She participated in the outbreak control meetings, did the data analysis and wrote the manuscript as a joint first author (14). This work was presented as a poster at ESCAIDE 2016 by another member of the outbreak control team (15).

Supervisor(s): Dr Suzanne Cotter

Competencies developed:

Being involved in two outbreaks, I had the opportunity to be part of outbreak control teams and liaise with all the stakeholders. I gained more experience in data collection and management and I led the statistical analysis. I did literature reviews and described the epidemics in terms of time, person and place. I had the opportunity to apply innovative methods in the outbreak investigation (e.g. network analysis) and I learnt more advanced methods of visualising and presenting the results (e.g. maps and interaction diagrams). My participation in these outbreaks gave me the opportunity to improve my communication skills by communicating the outbreak to the stakeholders, being actively involved in various epidemiological meetings, reporting the findings of the analysis to the stakeholders and contributing to decision making. Also, from the various modules and courses, I became more familiar with the different types of epidemiological studies used for outbreak investigation. My work in the two outbreaks allowed me to publish a rapid communication, produce outbreak reports and manuscripts and present the results at national and international level.

3. Applied epidemiology research

High prevalence of antibiotic resistance and ESBL-positive bacteria in an obstetrics emergency hospital and neonatal intensive care unit - Haiti, 2016.

In 2014, a sepsis outbreak from extended-spectrum beta-lactamase (ESBL) producing *Klebsiella pneumoniae* was observed in an obstetrics emergency hospital and neonatal intensive care unit (CRUO) in Haiti. Despite strict infection control/prevention measures, nosocomial transmission of Gram-negative bacteria continued in 2015/2016. We conducted a survey to i) estimate prevalence of colonisation with Gram-negative bacteria and prevalence of antibiotic resistance and ii) identify risk factors for colonisation with *K. pneumoniae* and ESBL-positive bacteria.

We collected rectal swabs of all neonates and women in triage and admitted in CRUO between 11-22 July 2016. Rectal swabs were cultured; Vitek2 GN was used for identification/susceptibility testing. We calculated prevalence and adjusted prevalence ratios (aPR) for ESBL-positive colonisation using poisson regression.

We collected swabs from 112 women and 64 neonates (99% response). Overall, 13% (15/112) of women and 27% of neonates (17/64) were colonised with *K. pneumoniae*. Colonisation with *K. Pneumoniae* was highest among women in the long-term post-delivery ward (20%;2/10) and among neonates in isolation (50%;3/6). Of all *K. pneumonia* isolates, 27% (4/15) among women and 59% (10/17) among neonates were resistant to first-line antibiotics (all ESBL-positive). Resistance of *K. pneumonia* isolates to second-line antibiotics was 20% (3/15) for women and 50% (1/2) for neonates. One *K. pneumoniae* isolate (ESBL positive) from a neonate was resistant for carbapenems (third-line antibiotics). Staying in CRUO for ≥2 days was associated with *K. pneumonia* colonisation (aPR=11;95%CI:1.6-81). Receiving antibiotics during hospitalisation was associated with colonisation with ESBL-positive bacteria (aPR=2.7;95%CI:1.2-6.4).

ESBL-positivity and resistance to first and second-line antibiotics for *K. pneumoniae* was prevalent throughout CRUO. Length of hospital stay was risk factor for colonization with *K. pneumoniae* and antibiotic consumption for colonisation with ESBL-positive bacteria. Regular evaluations of the appropriateness of existing antibiotic treatment protocols and strengthening infection prevention measures, especially in wards where patients stay longer, are necessary.

Role and outputs: Katerina was the principal investigator of the project. She was involved in the data collection and she led the development of the data entry database, did the data entry, cleaned and analysed the data, wrote the report (16) and the manuscript (17). This work was presented orally at TEPHINET 2017 (18) and as a poster at the MSF Scientific Days 2017 in London (19).

Supervisor(s): Annick Lenglet

Association between Outpatient Antibiotic Use and Seasonal Influenza.

Outpatient antibiotic consumption in Ireland follows a pattern with a high degree of seasonal fluctuation. The winter peaks generally coincide with seasonal influenza activity and there is concern that some antibiotics could be inappropriately prescribed for viral respiratory illnesses.

We obtained the national outpatient antibiotic consumption data based on wholesaler volumes and calculated the mean monthly usage as defined daily doses (DDD) per 1,000 population (DID) between 2003 and 2016. We converted influenza-like illness (ILI) consultations data from the Irish sentinel GP network to an ILI rate per 100,000 population. We used multivariable time-series models to test whether the ILI rate above the set baseline threshold (20 consultations per 100,000 per week) was significantly associated with any of the antibiotics and we calculated the excess in antibiotic use within the period that ILI rate was above threshold. To assess the strength of the association the models were tested using the coefficient of variation of the root-mean-square error CV(RMSE).

The time series analysis showed that there is a significant seasonal pattern of total outpatient antibiotic use and ILI activity (P-value<0.001; CV(RMSE):9%). Specifically, consumption of specific quality indicators including penicillin, cephalosporin and macrolide was associated with ILI activity (P-value<0.001; CV(RMSE):12%, 12%, 10% respectively). Across all seasons, there was a 2% excess of total antibiotic use within the period when ILI rate was above baseline. Highest excess was observed during the 2003/04 season and the lowest during 2013/14. Looking at the specific quality indicators (penicillin, cephalosporin, macrolide) the average excess across all seasons was around 0.1% for each of them.

This study showed that showed that the excess in consumption on antibiotics was more likely to occur when the ILI activity exceeded the baseline threshold. Penicillins, cephalosporins and macrolides were the main quality indicators associated with ILI activity. Evidence from additional studies is required to fully support the hypothesis that antibiotics can be inappropriately prescribed for viral respiratory illnesses.

Role and outputs: Katerina was the principal investigator of the project. She was involved in the data cleaning, analysis and writing of the manuscript (20).

Supervisor(s): Ajay Oza

Prevalence of respiratory viruses infecting or co-infecting cases with clinical mumps presentation.

In the literature, there is strong evidence supporting the detection of Influenza A (H3N2) in patients with clinical mumps. Other viruses were also detected in patients with clinical mumps. The aim of the study was to identify the prevalence of other respiratory viruses in clinical mumps cases among students over 18 years old in Ireland.

This cross-sectional study was conducted in university student health clinics and all students presenting with clinical parotitis (clinical mumps) and aimed to recruit 200 participants. Students were invited to participate by providing an oral fluid and buccal swab to be tested for mumps and other respiratory viruses (Influenza A/A H3/B, Parainfluenza 1/2/3/4, Adenovirus, Human Metapneumovirus, Respiratory syncytial virus). The samples were sent and tested at the National Virus Reference Laboratory. Participants were also asked to complete a questionnaire regarding their symptoms, vaccination status, history of mumps and travel history and a descriptive analysis was conducted with these data.

Sixteen students from three universities across Ireland agreed to participate in the study and provided an oral/ buccal swab but only 9 of them completed the questionnaire. Half were males and half females between 20-24 years. Mumps RNA was detected at 9 patients but there was no patient where RNA/DNA of any other respiratory virus was detected. Ten students had only the first dose of MMR and 7 had both doses. The study will be continued after the end of the current fellowship in order to recruit more participants.

Role and outputs: Katerina was the principal investigator of the project. She wrote the protocol (21), submitted the application to the Ethics Committee (22), developed the questionnaire (23) and all the materials required for the study (consent form, invitation letters, information sheets). She recruited all the participants and entered the data collected for the study.

Supervisor(s): Dr Suzanne Cotter

Competencies developed:

All three research projects provided opportunities to work and gain experience on different infectious disease areas of major public health interest (AMR, Antimicrobial Consumption and Influenza, Mumps). By applying methodology (point prevalence survey) or statistical analysis (time series analysis, exact poisson regression) for the first time allowed me to gain more practical experience and broaden my knowledge. Working in Haiti with MSF was an opportunity to understand the challenges of conducting research in low-resource settings and gain experience on how NGOs operate. Being involved in the time series analysis project, I had the opportunity to advance my statistical skills and work on the areas of AMR and Influenza which are of great interest to me. With the mumps study, I developed the protocol, the application to the Ethics Committee, the questionnaire and all the study materials and that allowed me to acquire more experience on how to design cross-sectional studies. My interaction with the stakeholders of this study (public health regions and university health services) improved my communication skills and allowed me to be actively being involved in decision making.

4. Communication

Publications in peer reviewed journals

One rapid communication article has been published in Eurosurveillance (14) and one original article has been accepted for publication in the Irish Medical Journal (6).

Manuscripts submitted to peer reviewed journals (in review process)

One manuscript submitted to a peer-reviewed journal (3) and three other manuscripts in preparation for submission (11, 17, 20).

Conference presentations

International Conferences: One oral presentation (7) and two posters (4, 15) at ESCAIDE 2016 in Stockholm. One oral presentation (18) and one poster (13) at TEPHINET 2017 in Chiang mai. One poster presentation at the MSF Scientific Days in London (19).
National conferences: One oral presentation at the Summer Scientific Meeting 2017 in Dublin (12). One poster at the Winter Scientific Meeting 2016 in Dublin (5) and one poster at the Infectious Disease Society of Ireland annual scientific meeting 2017 in Galway.

Other presentations

Four internal presentations during the in-house HPSC Training and Research forum sessions. Two presentations at the EPIET Project Review modules and two at the Mini Project review modules in the UK. One presentation at HPSC in-house journal club.

Reports

One outbreak report (10), two surveillance reports (2,9) and one report for research project (16).

Other

Two protocols for surveillance and research studies (1, 21), one application to the Ethics Committee (22) and two booklets for STATA training sessions (24, 25).

5. Teaching activities

Lecture and Practical facilitation: An Introduction to STATA

Katerina developed and delivered a 2-hour training session on introduction to STATA on site at HPSC. The session included a presentation and a practical exercise. The attendees on the course included Public Health Specialists, Specialist Registrars, Surveillance Scientists and other scientific staff at HPSC. The session was delivered on 18 October 2016 and was evaluated with an online evaluation survey.

Supervisor(s): Dr Margaret Fitzgerald - Senior Surveillance Scientist, HPSC

Lecture and Practical facilitation: Descriptive Analysis in STATA

Katerina developed and delivered a 2-hour training session on descriptive analysis in STATA on site at HPSC. The session included a presentation and a practical exercise. The attendees on the course included Public Health Specialists, Specialist Registrars, Surveillance Scientists and other scientific staff at HPSC. The session was delivered on 25 October 2016 and was evaluated with an online evaluation survey.

Supervisor(s): Dr Margaret Fitzgerald

Lecture: 10 steps of outbreak investigation - Principles of surveillance - Epidemiological indicators - ECDC mapping tool.

Katerina developed and delivered a 4-hour training session on outbreak investigation, principles of surveillance, epidemiological indicators and the ECDC mapping tool at the cholera project in Port-au-Prince (Haiti) while on international mission with MSF. The session included presentations on these subjects and a practical exercise on the ECDC mapping tool. The attendees on the course included national and international staff of the MSF cholera project in Port-au-Prince, Haiti. The session was delivered on 17 August 2016 and was evaluated by the project coordinator who attended the training.

Supervisor(s): Annick Lenglet

Case study: Salmonella outbreak at a wedding reception in Dublin, Ireland (cohort study).

Katerina facilitated the case study above on two occasions (November 18th 2015 and 17th 2016) at the School of Veterinary Medicine, University College Dublin. The students were undergraduate veterinary students and each session lasted three hours.

Case study: An outbreak of trichinosis in France (case control study).

Katerina facilitated the case study above on five occasions. Three times at the School of Veterinary Medicine, University College Dublin (26/11/2015, 27/11/2016, 24/11/2016) and twice (21/01/2016, 07/04/2016) at the Medical school of Trinity College Dublin. The students were undergraduate veterinary students and each session lasted three hours.

Educational outcome:

By developing and delivering these teaching assignments, I managed to study and understand more in depth epidemiological and statistical concepts. The interaction with the students and public health staff helped me understand the needs and gaps of the new public health professionals and motivated me to think of ways to address these. The development and delivery of the lectures during my mission in Haiti contributed to improving my language skills in French and realising the knowledge gaps of public health staff in low-resource settings.

6. Other activities

International assignment

International mission with MSF in Port-au-Prince, Haiti between July-August 2016. Projects:

1. Point prevalence survey in the MSF hospital "Centre de Référence pour les Urgences Obstétricales" (CRUO)

2. Surveillance of cholera, measles, malnutrition, vaccine coverage, internally displaced populations and wounded at the MSF cholera project

3. Training of MSF staff at the MSF cholera project on outbreak investigation, principles of surveillance, epidemiological indicators and the ECDC mapping tool

Conferences and Workshops attended

1. The Princeton-Fung Global Forum, 2-3 November 2015, Dublin, Ireland

2. ESCAIDE, 11-13 November 2015, Stockholm, Sweden

3. Controlling Foodborne Viruses Workshop organised by Safefood, 1 December 2015, Dublin, Ireland

4. Infectious Disease Society of Ireland Annual Scientific Meeting, 13 May 2016, Dublin, Ireland

5. Irish Faculty of Public Health Medicine Summer Scientific Meeting, 1 June 2016, Dublin, Ireland

6. Launch of MISI 2015 Findings, 10 June 2016, Dublin, Ireland

7. British Society for Antimicrobial Chemotherapy Workshop on Multi drug resistant Gram Negative infections, 26 October 2016, Dublin, Ireland

8. ESCAIDE, 28-30 November 2016, Stockholm, Sweden

9. Irish Faculty of Public Health Medicine Winter Scientific Meeting, 7 December 2016. Dublin, Ireland

10. Infectious Disease Society of Ireland Annual Scientific Meeting, 5 may 2017, Galway, Ireland

11. MSF Scientific Days, 19 May 2017, London, UK

12. Irish Faculty of Public Health Medicine Summer Scientific Meeting, 25 may 2017, Dublin, Ireland

13. TEPHINET, 7-11 August 2017, Chiang Mai, Thailand

Additional Training

1. On site training on the Computerised Infectious Disease Reporting (CIDR) system used nationally for surveillance of infectious diseases, 20 October 2015

2. Online training on Demographix® (online survey tool), 3 December 2015

3. Visit to the National Virus Reference Laboratory in Dublin, 7 January 2016

4. Training for literature search organised by the Health Service Executive Library in Dublin, 7 January 2016

5. Seminar for outbreak investigation in Galway (study day for Specialist Registrars), 18 January 2016

6. Visit to the TB reference laboratory at St James' hospital in Dublin, 26 January 2016

7. UNDSS online courses on Basic and Advance Security in the field, January 2016

8. MSF Pre-Deployment course in Bonn, 11-17 February 2016

9. Training on Developing Evidence based Clinical Guidelines in Dublin, organised by the National Clinical Effectiveness Committee, 2 March 2016

10. Mini Project Review in Belfast, 3-4 March 2016

11. ECDC on-line course on Abstract writing, April 2016

12. Training day on TB in Dublin (study day for Specialist Registrars), 18 April 2016

13. Training on Hospital InPatient Enquiry (HIPE) and ICD-10 Coding in Dublin organised by the Healthcare Pricing Office, 31 May 2016

14. On site training on Time Series Analysis (TSA) and the STATA TSA tool, 2 November 2016

15. Webinar on Antimicrobial Prescribing organised by the Health Care Associated Infection and Anti Microbial Resistance (HCAI AMR) Clinical Programme, 18 November 2016

16. Zoonosis Training Day in Dundalk organised by the North East Zoonosis Committee, 23 November 2016

17. Lab4Epi course in Colindale (London) organised by Public Health England, 17-18 January 2017

18. Microsoft Office Webinars organised by the Health Service Executive, January-February 2017

19. Mini Project Review in Bristol, 9-10 March 2017

20. Qualitative research and N-vivo training organised by C-STAR at University College Dublin, 14 March 2017

21. BMC webinar series on publication process, May-June 2017

22. Visit at the Department of Agriculture in Dublin, 9 May 2017

7. EPIET/EUPHEM modules attended

1. EPIET Introductory Course, Spetses - Greece 28 September to 16 October 2015

2. EPIET outbreak investigation module, Berlin 7-11 December 2015

3. EPIET module on Multivariable Analyses, Vienna 14-18 March 2016

4. EPIET RAS module, Athens 20-25 June 2016

5. EPIET Project Review Module, Lisbon 22-26 August 2016

6. EPIET module on Time Series Analyses, Bucharest 07-11 November 2016

7. EPIET Vaccinology Module, Stockholm 12-16 June 2017

8. EPIET Project Review Module, Lisbon 28 August to 1 September 2017

Supervisor's conclusions

Katerina has enthusiastically availed of the varied opportunities in training, outbreak investigations, missions and teaching offered to her during the course of her two year EPIET fellowship in Ireland and the associated EPIET modules and international outbreak investigations.

Prior to coming to Ireland Katerina already had many competencies in the area of epidemiology and public health (epidemiological analysis, data analysis, experience of different software packages) that she used to her/and our advantage when undertaking the various projects. With these skills she was able to quickly and efficiently undertake and complete very complex investigations. Additionally she used the project and training opportunities offered to her to further develop and consolidate her competencies in data analysis, investigations, communications and report writing. Coming from a veterinary background she used her time here to gain experience in areas that she had limited previous experience in human health protection (vaccines, outbreaks, AMR) which have resulted in her now being competent in a large number of public health and health protection areas. She used her knowledge (either prior or gained during the two year programme) and demonstrated to us how new software and IT technology can be used to map social and hospital networks – such graphics can more easily communicate the role of person to person spread (measles and nosocomial transmission). She has shown us that new data analytic tools are available that can assist in data analysis and presentation of results more efficiently than we were doing prior to her coming. Katerina's involvement in the large CPE outbreak was enormous as this was a particularly large outbreak with complex and numerous exposures and risk factors. Throughout her time here Katerina has

demonstrated the importance of good inter-personal and communication skills to progress challenging projects with a variety of stakeholders.

I am confident that Katerina has benefitted personally from the programme, but also that HPSC has benefitted enormously from having her with us for the past two years.

Coordinator's conclusions

During the two-year fellowship at Health Protection Surveillance Centre in Ireland, Katerina was involved in a considerable number of projects and public health activities, from outbreak investigations, including a social network analysis; surveillance, from the analysis of influenza surveillance data to the evaluation of the National TB surveillance system; and applied research linked to respiratory viruses. Katarina was also part of an international assignment with MSF that allowed her to developed further projects in both surveillance and applied research.

With a veterinarian background, Katerina has increased his knowledge in the field of infectious diseases and has applied various epidemiological methods in her projects with excellent outcomes as shown in this portfolio.

Katerina is an extremely competent professional working independently but at the same time seeking assistance when necessary. She has a very positive attitude and she is always willing to apply all what she learnt in the different projects

Based on my experience as her frontline coordinator, and knowing her personal and professional skills, I can highly recommend Katerina Chaintarli for any kind of public health work.

Personal conclusions of fellow

During the two years of my fellowship I was placed in a very good training site which provided me with learning opportunities and support in undertaking national and international projects. These helped me to broaden my existing knowledge in epidemiology and public health and acquire more practical experience as a field epidemiologist.

The variation in the projects I was involved allowed me to apply and, at the same time, advance my epidemiological and statistical skills. The opportunity to go to an international mission with MSF was an excellent way of gaining experience as a field epidemiologist in developing countries and understanding the challenges in low-resource settings. The support of my training site to any learning opportunity allowed me to attend a number of courses and conferences which contributed to my personal development and gave me the opportunity to meet people who play an important role in public health nationally and internationally.

The opportunities that EPIET provided to attend modules, to be involved in a variety of epidemiological projects, to visit various public health institutes and interact with public health staff internationally as well as being supervised and supported by experts have been an excellent way of learning and practicing epidemiology and also building a network of public health professional that share similar training experience and values. I would definitely recommend it to anyone that is interested in specialising in the field of epidemiology.

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