



FELLOWSHIP REPORT

Summary of work activities

Anna Maisa

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;

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.

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- 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 EPIET, Anna worked as a scientific adviser for three years at a federal state public health department in North Rhine-Westphalia, Germany. Anna graduated as a biologist and completed her PhD in virology at the Philipps-University Marburg, Germany, in 2009, followed by a postdoc fellowship in biomedical laboratory-based research at the Burnet Institute, Melbourne, Australia. In 2016, she had volunteered for an international mission providing diagnostic support in Guinea, West Africa, during the enhanced surveillance period after the Ebola Outbreak.

Fellowship assignment: Intervention Epidemiology path (EPIET)

In September 2016, Anna started her EPIET fellowship at the Public Health Agency, Belfast, Northern Ireland, under the supervision of Neil Irvine. This report summarizes 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 guide¹.

Fellowship projects

1. Surveillance

Supervisor(s): Neil Irvine, Philip Veal

Evaluation of the VTEC surveillance system in Northern Ireland, 2015-2016

An enhanced surveillance database for Verocytotoxin-producing E.coli (VTEC) was introduced in 2013 in Northern Ireland (NI) to complement the existing clinician, laboratory and Environmental Health reporting. The evaluation of surveillance arrangements was triggered by an increased number of VTEC cases reported since 2014 and changes in laboratory diagnostic methods.

Surveillance staff was interviewed and current literature and PHA reports reviewed to describe the VTEC surveillance system. In order to describe the laboratory surveillance, microbiologists were interviewed about VTEC testing procedures, laboratory methods and reporting. Evaluation of key attributes (simplicity, timeliness, data quality) of the VTEC surveillance system was performed by linking data collected on the case management system, routine electronic laboratory reporting system, and the enhanced surveillance database. Usefulness of the surveillance system was assessed using an online survey for staff and external stakeholders.

The evaluation showed that the VTEC surveillance system is a complex and resource intensive system. Interpretation of surveillance data is complicated by variation in laboratory capacity to detect VTEC genes and to identify serotypes

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>

other than O157. While urgent reporting for public health case management purposes is both complete and timely, routine electronic notification of laboratory data is incomplete and less timely. The surveillance system outputs are valued, although there is a lower than expected awareness among staff and external stakeholders.

Current arrangements are effective for O157, but limited for other VTEC disease due to differences in laboratory capacity. All laboratories should have access to PCR testing, identification of serotypes other than O157, and further characterisation in the reference laboratory. Reporting of VTEC through routine electronic laboratory arrangements should be improved. Outputs should be promoted to stakeholders.

Role:

Anna was the principal investigator. She wrote the study protocol, linked and analysed the surveillance data, developed a questionnaire for the laboratory and web based survey for internal and external stakeholders. Anna presented the project at a FETP mini project review and wrote the internal evaluation report (4). Her presentation on the laboratory survey results to participating microbiologists is being used to inform testing policy in NI (13).

Supervisor(s): Neil Irvine

Euro-GASP sentinel surveillance of antimicrobial resistance of *Neisseria gonorrhoeae* in Northern Ireland, 2015-2017

In Northern Ireland (NI), disease notification data indicated a 3-fold increase in gonococcal infections between 2010 (n=206) and 2017 (n=679). Since 2015, NI has participated in a Europe-wide sentinel surveillance system (Euro-GASP) to monitor the emerging antimicrobial resistance of *Neisseria gonorrhoeae* to first-line treatment with ceftriaxone and azithromycin. We compared routine laboratory and sentinel surveillance antimicrobial susceptibility data since 2015 in order to inform testing and surveillance policy.

Isolates were collected for culture from patients presenting at the Belfast Genito-Urinary Medicine (GUM) clinic during September to December of each year (study period) and epidemiological information was collected for each individual. Antimicrobial susceptibility of sentinel isolates was performed at the Public Health England (PHE) reference laboratory using the agar dilution technique. Minimum inhibitory concentrations (MIC) were interpreted using European Committee on Antimicrobial Susceptibility Testing (EUCAST) breakpoints. Routine antimicrobial susceptibility data was reported from local laboratories in NI using Etest and EUCAST breakpoints, however, antibiotic susceptibility testing panels varied across different laboratories.

Resistance to azithromycin decreased over time from 14% (5/36) in 2015 to 7.7% (1/13) in 2016 and to 5% (1/20) in 2017 in the tested sentinel isolates. Within the NI routine laboratory surveillance none of the isolates were resistant to azithromycin in 2015, 10% (19/185) in 2016, and 7.1% (19/266) in 2017. Of the 5 resistant sentinel isolates in 2015, 2 had been identified as susceptible through local laboratory reporting, and 3 had not been tested against azithromycin locally. All sentinel isolates in 2015-2017 were susceptible to ceftriaxone. Ceftriaxone resistance was reported in 0.5% (1/207) of routinely tested isolates in 2015, for which reference laboratory confirmation is not available. No ceftriaxone resistance was reported in 2016 and 2017.

These data highlight the complementary benefit of the routine laboratory and sentinel surveillance arrangements. The extent of azithromycin resistance is decreasing, but still of concern. No confirmed resistance to ceftriaxone has been reported. We recommend that routine laboratory surveillance should be continued and improved, including standardising local laboratory testing panels. The sentinel scheme should be continued, using reference laboratory methodology to both complement routine laboratory surveillance and allow comparison with other European countries.

Role:

Anna was the principal investigator. Anna organised ongoing sentinel surveillance with the GUM clinic and PHE, updated the questionnaire and SOP, analysed surveillance data and wrote the internal report for the 2015, 2016 and 2017 collection period (5). She presented the results for the 2015 study period at ESCAIDE 2017 (8). She also gave two oral presentations on gonorrhoea epidemiology and AMR surveillance in NI to GUM at regional meetings (14, 15).

2. Outbreak investigations

Supervisor(s): Jillian Johnston

Measles outbreak linked to an imported case in Belfast, Northern Ireland, June-July 2017

In 2017, measles outbreaks occurred in Europe, including genotype B3 cases in Romania. In June-July 2017, two unlinked measles cases were reported in NI with rash onset two days apart. This occurred in the context of uptake of one-dose measles vaccine at 95% at two and 97% at five years of age. We searched for other cases and contacts to prevent further spread.

Confirmed cases were laboratory-confirmed by PCR; probable cases had typical clinical symptoms and an epidemiological link to a confirmed case. Confirmed cases were interviewed to obtain epidemiological information and identify contacts. Hospital records were searched for potentially nosocomially-exposed cases. PCR positive specimens were genotyped. Contacts were offered prophylaxis according to national guidelines.

In June-July, six cases (five confirmed, one probable) were identified. The primary case (probable) travelled from Romania within the incubation period. Ages of cases ranged from nine months to 33 years (median 7.5 years). All cases were unvaccinated NI residents, including two Romanian and two other foreign nationals. Two nosocomially associated and two community cases were directly or indirectly linked to the index case. All confirmed cases were genotype B3. We followed-up 290 contacts, including 30 vulnerable; six contacts received post-exposure measles vaccine and 13 immunoglobulin.

This outbreak likely seeded from Romania, but was quickly contained through intensive public health action and high childhood vaccination coverage. Retrospective case finding helped to identify transmission routes. Evidence of nosocomial transmission reinforces the need to maintain awareness among healthcare professionals to consider measles in the differential diagnosis. We recommend providing regular travel advice for the public. To increase vaccine uptake amongst the Roma population in Northern Ireland PHA should be building on the working relationships with the Roma Community Officers during the outbreak to improve engagement with the population and raise awareness on the importance of vaccinations.

Role:

Anna was a member of the outbreak investigation team. She participated in outbreak control meetings, provided epidemiological support, created a timeline for the exposure history of cases and wrote the outbreak report (6). Anna presented the outbreak at a national conference (10).

Supervisor(s): Lucy Jessop

Risk behaviours of homeless people who inject drugs during an outbreak of hepatitis C, Northern Ireland, 2016-2017

During July-September 2016, one acute and three cases with recently acquired hepatitis C (HCV) infection in homeless people who inject drugs (PWID) were reported in one city in Northern Ireland. A multi-disciplinary team including homeless and addiction services investigated to identify and interrupt chains of transmission.

For the purposes of descriptive epidemiology, cases were PWID clients of homeless hostels with laboratory confirmed active HCV infection. Acute cases were defined as tested negative within six months; recent cases had a negative test within a year or were injecting less than a year. Injecting networks of cases were identified for testing. HCV positive specimens were referred to the reference laboratory for phylogenetic analysis. We undertook a cross-sectional survey using a structured questionnaire to elicit risk behaviours on a convenience sample of the identified PWID. A case-control comparison was performed using univariate and multivariable logistic regression, with cases defined on the basis of self-reported positive hepatitis C status.

Between July 2016 and December 2017, 156 PWID were tested. 45 (29%) cases were identified with 13 (29%) acute cases and 7 (16%) recently acquired infection. Four of six specimens analysed phylogenetically belonged to genotype 1A with two different lineages, the remaining two belonged to genotype 3A with two different lineages. All 68 survey respondents, including 12 cases, reported using heroin with 76% (48/63) injecting daily or more. 91% (10/11) of cases were currently homeless. Sharing needles and syringes was common (27%, 17/62 and 29%, 18/62) and more than half were sharing spoons and filters (58%, 36/62 and 53%, 33/62). The majority used needle exchange services (82%, 42/51), but 18% (9/51) reported insufficient clean equipment for their needs. 42% (5/12) of self-reported hepatitis C positive subjects and 33% (17/52) of HCV-negative PWID reported injecting more frequently in the past year. Hepatitis C positive individuals were more likely to be injecting in public toilets (AOR 17, 95% CI 0.71-400, $p < 0.05$) when compared to hepatitis C negative individuals.

Laboratory analysis indicated a predominantly genotype 1A cluster with multiple transmission chains. Survey results showed all respondents had risk behaviours additional to injecting, with an association between being HCV positive and injecting in public toilets. We recommend active surveillance with ongoing testing, expanding existing harm reduction programmes, including needle exchange, and access to bespoke services including substitution therapy.

Role:

Anna was the principal investigator for the behavioural study and a member of the outbreak investigation team. She participated in outbreak control meetings, wrote the analysis plan, developed a behavioural questionnaire including informed consent and liaised with the homeless team. Anna performed data entry, data analysis (descriptive and analytical epidemiology), incorporated expert statistical input and wrote the outbreak report (7). She provided a summary of the data to be presented at the Department of Health Northern Ireland to inform bespoke service for homeless and PWID. The work has been accepted as an oral presentation at ESCAIDE 2018 (11) and a manuscript for submission to a peer-reviewed journal is in preparation (2).

3. Applied epidemiology research

Supervisor(s): Declan Bradley

Vaccination against pertussis and influenza in pregnancy: a qualitative study of barriers and facilitators

Influenza and pertussis vaccination have been recommended for pregnant women in the UK since 2009 and 2012, respectively. In 2015, vaccine uptake was 55% for influenza and 63% for pertussis in pregnant women in Northern Ireland. We aimed to identify barriers and facilitators for pregnant women to be vaccinated.

Pregnant women were recruited on-street and through community networks. We undertook three focus group discussions and one in-depth interview. Two researchers independently undertook thematic analysis of transcripts using inductive coding and grouping codes into themes following discussion.

Sixteen pregnant women participated and six themes were identified. Information and knowledge: Vaccinated and unvaccinated women demonstrated similar levels of knowledge and desire for information, preferring direct communication with healthcare professionals. The influence of others: Some vaccinated participants reported firm endorsements of vaccination by healthcare professionals, while some unvaccinated women recalled neutral or reticent staff and warnings from family. Acceptance and trust: Many vaccinated women expressed trust of health professionals. Fear and distrust: Vaccinated individuals expressed concern about side-effects more than unvaccinated women. A few unvaccinated women expressed distrust of vaccines and healthcare systems. Responsibility for the baby: Both groups prioritised protecting the baby but unvaccinated participants were more concerned about vaccine-related harm. Accessing vaccination: Multiple appointments, lack of childcare, time off work and having responsibility to organise vaccination hindered some participants from getting immunised. Some women were willing to be vaccinated but did not recall being offered vaccination, or were not sufficiently motivated to make arrangements themselves.

Healthcare professionals have a vital practical and influential role in whether pregnant women get vaccinated. Involving midwives and improving convenience of vaccination access may increase uptake. Strategies to develop interventions should address these barriers to meet the needs of pregnant women.

Role:

Anna was the principal investigator. She wrote the study protocol, provided input for funding application, and decided with the research team on a research market company to perform focus groups, interviews and to provide the transcripts. She developed a participant information sheet, consent form and discussion guide for the focus groups and interview participants and submitted the project to a research ethics committee for ethical approval. Anna analysed the data independently with a second researcher. As a result of local presentation of this study, educational information material on vaccination in pregnancy has been revised. The results of this research project also led to the initiation of a pilot study with community midwives, where midwives would recommend and offer vaccination to pregnant women during their antenatal appointment. Anna gave an oral presentation on the project at a national conference (9). A manuscript has been published in a peer-reviewed journal with Anna as lead author (1).

Supervisor(s): Lynsey Patterson

*Epidemiology and risk factors of community-associated *Clostridium difficile* infections in Northern Ireland, 2012-2016*

Community-associated *Clostridium difficile* infection (CA-CDI) represents almost half of all CDI in Northern Ireland, yet the understanding of the epidemiology of these infections is limited. We aimed to describe CA-CDI and identify potential risk factors for future targeted interventions.

We used population-based routine surveillance data from 2012-2016 to describe socio-demographic factors and case fatality for all CA (hospital onset ≤ 2 days after admission or community onset >4 weeks after hospitalisation, $n=1303$) and hospital-associated (HA-CDI) (community onset within 4 weeks after hospital discharge or hospital onset >2 days following hospitalisation, $n=1356$). Of these, 483 CA- and 287 HA-CDI cases with disease community onset (CO) were routinely administered a paper questionnaire on potential risk factors (socio-demographic, healthcare contact, selected medication use, travel history, and infant contact). We compared risk factors between HA and CA CDI cases in a case-case study. We used simple and multilevel logistic regression models to conduct univariate and multivariable analysis calculating adjusted odds ratios (AOR), 95% confidence intervals (CI) and likelihood ratio test p -values.

CA-CDI cases had lower odds of being male (AOR 0.71, 95% CI 0.58-0.87; $p<0.001$), and higher odds of living in rural rather than urban settlement (AOR 1.5, 95% CI 1.1-2.1; $p=0.05$). RT078 is the most prevalent ribotype among both groups (26% vs 24%, $p=0.36$). 30-day CDI-specific death was lower in CA-CDI than HA-CDI (7% vs. 11%, $p<0.001$). While there was no statistically significant increased odds for most risk factors, comparing COCA- and COHA-CDI, we observed similar exposure to gastric acid suppressants and antimicrobial therapy in the four weeks prior to CDI (50% vs. 55%, $p=0.11$ and 18% vs. 20%, $p=0.5$, respectively).

CA-CDI cases are more likely to be female and live in rural settlements. However, our analysis of community onset cases suggests that risk factors for HA-CDI may be equally important for CA-CDI. Opportunities to safely reduce antibiotic and gastric acid suppressants use should be investigated in all healthcare settings.

Role:

Anna was the principal investigator. She wrote the study protocol, organised data access agreement with the Health and Social Care Business Services Organisation to complement the dataset, performed data linkage, analysed the data (descriptive and analytical epidemiology) and incorporated expert statistical input. Anna wrote an executive summary and compiled recommendations for the surveillance team for future enhanced surveillance arrangements in Northern Ireland. This work has been accepted as a poster presentation for ESCAIDE 2018 (12) and a manuscript for submission to a peer-reviewed journal is in preparation (3).

4. Communication

Publications

1. Maisa A, Milligan S, Quinn A, Boulter D, Johnston J, Treanor C, Bradley DT. Vaccination against pertussis and influenza in pregnancy: a qualitative study of barriers and facilitators. *Public Health*. 2018 Jul 11;162:111-117.
2. Maisa A, Semple S, Griffiths A, Ngui SL, Verlander NQ, McCaughey C, Doherty L, Jessop L. Risk behaviours of homeless people who inject drugs during an outbreak of hepatitis C, Northern Ireland, 2016-2017. [submitted]
3. Maisa A, Ross G, Verlander NQ, Fairley D, Bradley DT, Patterson L. Epidemiology and risk factors of community-associated *Clostridium difficile* infections in Northern Ireland, 2012-2016 [submitted]

Reports

4. Evaluation of the VTEC surveillance system in Northern Ireland, 2015-2016. Public Health Agency, Northern Ireland [Internal project report]
5. Gonococcal Antimicrobial Surveillance in Northern Ireland, 2015-2017. Public Health Agency, Northern Ireland [PHA confidential internal report]
6. Outbreak of Measles Disease in Belfast, Northern Ireland, June-July 2017. Public Health Agency, Northern Ireland [PHA outbreak report]
7. Risk behaviours of homeless people who inject drugs during an outbreak of hepatitis C, Northern Ireland, 2016-2017. Public Health Agency, Northern Ireland [PHA outbreak report]

Conference presentations

8. Maisa A, Patterson L, Quah S, Byrne P, Cole M, Irvine, N. Need for standardisation of antimicrobial policy and surveillance for *Neisseria gonorrhoeae* in Northern Ireland, 2015. ESCAIDE 2017, 6-8 November 2017, Stockholm, Sweden. [oral presentation]
9. Maisa A, Milligan S, Quinn A, Boulter D, Johnston J, Treanor C, Bradley DT. Barrier to and facilitators of vaccination in pregnancy: a qualitative study in Northern Ireland, 2017. Public Health Research and Science Conference 2018, 20-21 March 2018, Warwick University, England. [oral presentation]
10. Maisa A, McKeown G, Johnston J. Measles outbreak linked to an imported case in Belfast, Northern Ireland, June-July 2017. 5 Nations Health Protection Conference, Belfast, 23-24 April 2018. [oral presentation]
11. Maisa A, Semple S, Griffiths A, Ngui SL, Verlander NQ, McCaughey C, Doherty L, Jessop L. Risk behaviours of homeless people who inject drugs during an outbreak of hepatitis C, Northern Ireland, 2016-2017. ESCAIDE 2018, 21-23 November 2018, Saint Julian's, Malta. [oral presentation]
12. Maisa A, Ross G, Verlander NQ, Fairley D, Bradley DT, Patterson L. Epidemiology and risk factors of community-associated *Clostridium difficile* infections in Northern Ireland, 2012-2016. ESCAIDE 2018, 21-23 November 2018, Saint Julian's, Malta. [poster presentation]

Other presentations

13. Laboratory survey on the diagnostics of gastrointestinal pathogens in Northern Ireland. Northern Ireland Regional Microbiology Audit Group Meeting, 25 Oct 2017. [oral presentation]
14. Antimicrobial surveillance for *Neisseria gonorrhoeae* in Northern Ireland, 2015-2017. Regional GUM Audit and Education Day, 15 May 2018. [oral presentation]
15. Epidemiology and antimicrobial surveillance for *Neisseria gonorrhoea* in Northern Ireland. PHA Gonorrhoea prevention and control group meeting, 3 July 2018. [oral presentation]

Other

- Report template for quarterly STI data feedback report
- Executive summary for the *Clostridium difficile* project including recommendations for enhanced surveillance

5. Teaching and pedagogy

Case study facilitation on “Gastroenteritis outbreak in Sweden”

Anna facilitated a case study on a “Gastroenteritis outbreak in Sweden” in one group during a 4h epidemiology training session for PHA staff, including surveillance staff, health protection nurses, Public Health Specialist Registrars and health protection consultants (Dec 2016). The learning objectives were to interpret an epidemic curve, calculate attack rates, calculate and interpret relative risks, interpret stratified analysis, identify effect modification among risk factors, identify confounding among risk factors, list the necessary environmental and laboratory investigations. The session had not been formally evaluated, but the facilitators received positive verbal feedback from the participants.

Reflection

I was facilitating one group for this case study and was successful in engaging everyone in the group, despite them having varying levels of background scientific knowledge. This reinforced to me the need to fully understand my audience, and how people are best engaged when the material is presented in ways that are understandable and meaningful to them. I also reflected that to become more confident in teaching, I need to firstly ensure my own confidence in the topic and key concepts covered in a case study.

Lecture on “Communicable Disease Surveillance”

Anna gave a lecture on “Communicable disease surveillance” (90 min in 2017 and 60 min in 2018) including three short practical exercises for the MSc Public Health students of Queen’s University Belfast. The learning objectives for this lecture were to define and describe different types of surveillance, to identify key information that is required when establishing a surveillance system, to describe the components of a surveillance system and to interpret surveillance information. Anna evaluated the lecture using an evaluation survey to inform future content and delivery of the lecture. While the lecture was generally well received, some students would like to have more international as well as local examples included and more overview slides with basic concepts. Anna also completed a reflective note for this teaching activity.

Reflection

I learned how encouraging interaction with the presenter can help keep the audience engaged. I also learned the importance of leaving enough time for questions and discussions. I used the results of the evaluation to re-structure the lecture for the second year and to improve my time management, which was particularly important as I had to reduce the lecture for the second year by 30 min.

Case study facilitation on “Gastroenteritis outbreak in Sweden” and “Trichinosis in France”

Anna facilitated two case studies on outbreak investigation (“Gastroenteritis outbreak in Sweden” and “Trichinosis in France”; 2.5 h each in March 2017 and 2018) for the MSc Public Health students of Queen’s University Belfast. The learning objectives for this training event were to describe the steps in an outbreak investigation, to develop a case definition, to interpret an epidemic curve, to choose an appropriate control group for a case-control study, to calculate and interpret attack rates, relative risks and odds ratios, to perform stratified analysis, to identify effect modification and confounding among risk factors and to list the necessary environmental and laboratory investigations after completing both case studies. The training event was not evaluated. In preparation, a student learning needs assessment using a web-based survey was performed to assess their level of knowledge. Anna also completed a reflective note for this teaching activity.

Reflection

Facilitating these case studies has given me greater confidence in working with a larger group and keeping everyone engaged during the exercise. On reflection, I should have explained the key concepts of confounding and effect modification with simpler examples. I also started with the easier case study in the second year I was facilitating the case studies. I had initially thought that the students would be better able to concentrate at the beginning of the session when I started with the more challenging case study, but I now realise that the first case study contained some concepts which would lead in easily to the more complicated case study.

Case study facilitation on “Campylobacter in Greece”

Anna facilitated a case study (“Campylobacter in Greece”) during the bi-monthly meeting for the PHA Specialist Registrars (2.5 h in April 2018). This involved adapting the case study specifically for this group. Key objectives which the participants wished to address were to learn how to use Excel for descriptive epidemiology, how to familiarise oneself with and clean raw data for an outbreak investigation using Excel functions, such as Pivot tables, Filters and VLOOKUP functions, and how to create an epicurve. All Specialist Registrars found this session to be very useful.

Reflection

By engaging with individuals with different levels of knowledge about Excel I learned how to explain basic concepts while giving others the opportunity to move on within the exercise. On reflection, I feel this was a good example of how preparation for a teaching event can reinforce one’s own technical skills in the topic area.

6. EPIET/EUPHEM modules attended

1. Introductory Course, 26 Sep-14 Oct 2016, Spetses, Greece
2. Outbreak Investigation Module, 5-9 Dec 2016, Berlin, Germany
3. Multivariable Analysis Module, 13-17 Mar 2017, Zagreb, Croatia
4. Rapid Assessment and Survey Methods Module, 8-13 May 2017, Athens, Greece
5. Project Review Module, 28 Aug-1 Sep 2017, Lisbon, Portugal
6. Time Series Analysis Module, 20-24 Nov 2017, Bristol, England
7. Vaccinology, 11-15 Jun 2018, Cardiff, Wales
8. Project Review Module, 27-31 Aug 2018, Lisbon, Portugal

7. Other training

1. Daily health protection briefings at the Public Health Agency Northern Ireland
2. Lectures for statistics in medicine at Queen’s University Belfast (Oct 2016)
3. ESCAIDE 2016, 27 Nov – 01 Dec 2016, Stockholm, Sweden
4. FETP Mini Project Review, 9-10 Mar 2017, Bristol, England
5. FETP masterclasses on exceedance calculations (Feb 2017), case-case and case-chaos study design (Apr 2017), infectious disease modelling (May 2017), case-cohort and venue-based case-control study design (Jul 2017), multilevel modelling (Dec 2017),
6. Volunteering for an event organised by PHA using the e-bug resources (<http://www.e-bug.eu/>) for children at the W5 Science Education Centre in Belfast (18 Nov 2017)
7. ESCAIDE 2017, 6-8 Nov 2017, Stockholm, Sweden
8. Attended Specialist Registrars’ meetings for CPD sessions on time management (Jan 2018) and chairing skills (Jun 2018)
9. FETP Lab4Epi, 16-17 Jan 2018, Colindale, England
10. FETP HCAI, 18-19 Jan 2018, Colindale, England
11. FETP Mini Project Review, 5-6 Mar 2018, Nottingham, England
12. PHE conference: Public Health Research and Science Conference 2018, 20-21 Mar 2018, Warwick University, England
13. 5 Nations conference, 23-24 Apr 2018, Belfast, Northern Ireland
14. ESCAIDE 2018, 21-23 Nov 2018, St. Julien, Malta

Discussion

Supervisor's conclusions

Anna has had a very successful Fellowship with the Public Health Agency (PHA) in Belfast. She has rapidly adapted to her new surroundings and become a much valued member of our Health Protection team.

Anna's work has made a significant contribution to the PHA. In particular her survey of risk behaviours in people who inject drugs has informed the response to an outbreak of hepatitis C, and has supported a successful bid for funding for the development of a new service for the homeless. Her description of an outbreak of measles seeded from Europe has identified the need for further projects to understand vaccination coverage in Roma people. Recommendations from a comprehensive evaluation of VTEC surveillance are now being taken forward. She has also shown a keen interest in teaching others, delivering input on both theoretical and practical aspects of epidemiology. In fully achieving her EPIET objectives she has shown huge enthusiasm and determination, with the ability to use initiative and work independently. She has also proved herself to be an excellent team player and has developed very successful working relationships with people from different disciplines both within and outside the PHA.

It has been very satisfying to see her further develop her scientific skills and make such good use of the EPIET programme opportunity. We wish her every success in her future career.

Coordinator's conclusions

Anna started her fellowship as an experienced epidemiologist with strong research background, and she also had conducted fieldwork for the Ebola outbreak response in Guinea. She was involved in four field assignments in the surveillance and research area, along with two outbreak investigations. Through her excellent skills and high commitment she has completed all of these, achieving all EPIET objectives and producing large amount of high quality outputs. Particular highlights are the running of the sentinel surveillance of antimicrobial resistance of *Neisseria gonorrhoeae* during her entire fellowship; her support in an outbreak investigation of hepatitis C in homeless people who inject drugs resulting in her leadership to conduct a cross-sectional study to elicit risk behaviours; and the conduct of the research studies on vaccination in pregnancy and community-acquired *Clostridium difficile* infection, from start to finish.

She is highly skilled and organised, able to work independently and effectively. Supported by excellent supervision and project availability at the site, her fellowship has been very successful. She improved her competencies working with several public health topics using novel methods such as qualitative or case-case studies. I believe that Anna has considerable professional and technical skills needed for epidemiological and public health related work.

Personal conclusions of fellow

I am very grateful for the professional and personal experiences gained during EPIET. The teaching and supervision through the central EPIET programme has provided me with a great foundation for my future career as an epidemiologist. The Public Health Agency in Belfast is a very good training site, which provided interesting projects and excellent supervision and support. Being exposed to a variety of public health topics has enabled me to broaden my knowledge of different infectious diseases and has reinforced to me how interventional epidemiology can have direct benefits for public health practice. The variety of my projects has also allowed me to learn new methods, including undertaking a qualitative study. I greatly value having had the opportunity to improve my skills in statistical analysis and scientific writing, and in working within multidisciplinary teams. In addition to the various training modules and conferences I have attended, I have also learned a great deal from my colleagues and cohort fellows.

Acknowledgements of fellow

I would like to thank my EPIET supervisor Neil Irvine for his patience, the fruitful discussions, and for teaching me a structured approach to epidemiology. Working with different project supervisors was a very enriching experience, and I acknowledge all my project supervisors for their professional guidance and sharing their expertise. Thank you to Lynsey Patterson for enduring all my stats questions and for the constructive and encouraging feedback.

I am very grateful for my frontline coordinators Kostas Danis, for his continuous and enthusiastic support and mentoring, and Frantiska Hrubá, for supporting me during the last months of my fellowship.

I would like to acknowledge all other EPIET coordinators and facilitators dedicated to the programme as well as the organisational team.

I would also like to thank my office mates at PHA for making these two years truly memorable and good craic.

Huge thanks to my peer cohort fellows and fellows from other cohorts, it's been a pleasure to be on this journey with all of you and learn from your experience!