FELLOWSHIP REPORT

Summary of work activities
Andreea – Sorina Niculcea
Intervention Epidemiology path (EPIET)
Cohort 2018

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 ECDC Fellowship Programme Manual.

Pre-fellowship short biography

Prior to EPIET, Andreea worked at the National Institute of Public Health, Regional Centre of Public Health Bucharest, Romania since 2015. She is a medical doctor since 2012 (Carol Davila University of Medicine and Pharmacy, Bucharest, Romania) with specialization in epidemiology since 2015.

Fellowship assignment: Intervention Epidemiology path (EPIET)

On September 2018, Andreea – Sorina Niculcea started her EPIET fellowship at the National Institute of Public Health, National Centre for Communicable Diseases Surveillance and Control, Bucharest, Romania, under the supervision of Adriana Pistol and Alina Zaharia. 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

Title: *Setting up a salmonellosis sentinel surveillance system*

In Romania, salmonellosis is part of the seasonal surveillance system of Acute Diarrheal Diseases (ADD), that runs from May to October each year, and collects aggregated data of hospitalised cases of ADD, ADD cases diagnosed by the GP and the number of microbiological investigation performed on stool samples. The objective of this surveillance system is to evaluate the epidemiological potential of ADD in Romania and their microbiological profile. Additionally, all communicable diseases diagnosed in Romanian hospitals, including Salmonellosis, are reported on the Communicable disease unique reporting form, and uploaded monthly to the National Registry of Communicable Diseases. Unfortunately this system does not provide sufficient epidemiological data on any ADD cases (including salmonellosis) needed to guide the implementation of prevention measures and the number of cases is underreported.

The aim of this project was to establish a salmonellosis sentinel surveillance system accomplishing all key attributes, specially simplicity, acceptability and flexibility.

This project had three objectives: to set up a sentinel surveillance system that addresses the gap in the existing surveillance; to strengthen the laboratory capacity in identifying Salmonella serotypes and antibiotic resistance of Salmonella in three of the four Regional Public Health Centres; and to generate the first report from the sentinel surveillance system describing the data collected in the first quarter of the sentinel system and to provide a template for future reports.

The sentinel surveillance system began collecting data starting January 2020. In the first quarter of 2020, 10 out of the 20 sentinel hospitals reported 39 salmonellosis cases, out of which 38 were classified as confirmed. The distribution of confirmed cases of salmonellosis in Romania by week, showed a peak of reported cases in week five of 2020 and a decreasing trend was observed during this period. The median age of confirmed salmonellosis cases was 47 years (range 2-86 years). Most confirmed cases were observed in the age group 45-64 years (29%), followed by the age group over 65 years (26%), and the lowest number of cases in the age group 15-24 years (3%). The overall male to female ratio was 1:1.4, with the biggest difference in the age group >65 years (male to female ratio 1:4). Most common reported symptoms among reported cases were diarrhoea (95%), abdominal pain (87%) and fever over 38°C (76%). Laboratory identification of Salmonella group and antibiotic characterisation was performed for 32 stool samples (84%), of which 63% were group D, 13% were resistant to ampicillin and 3% to resistant to ciprofloxacin.

Role and outputs: *Andreea was principal investigator.*

Andreea wrote the project protocol, the national surveillance protocol (13), analysed surveillance data, developed the data reporting form, developed the data entry mask in EpiInfo7, performed data entry for antibiotic characterisation of strains in Whonet5, data analysis, and wrote the first quarter report (10), which will serve as the template for future reports.

Supervisor(s): Adriana Pistol

Title: *Routine national surveillance activities at the National Institute of Public Health*

On Clostridioides difficile Infections and Healthcare associated Infections

Between 2011 and 2012, Romania participated in the European Centre for Disease Prevention and Control (ECDC) point prevalence survey of healthcare-associated infections (HAI) and antimicrobial use in European acute care hospitals. This study showed that HAI, especially Clostridioides difficile Infection (CDI) represents a major public health issue in Romania's hospitals, in part due to a misuse of antibiotics (as prophylaxis and treatment).

Based on the results of this study a sentinel surveillance system of HAI identified in intensive care units (HAIICU) and surgical ward (HAISSI) from 8 hospitals was established in 2013, with 23 hospitals reporting as of 2015. Additionally, the laboratories of these hospitals participate in the 'European Antimicrobial Resistance Surveillance Network (EARS-Net)', which collect data on routine antimicrobial susceptibility testing (AST) results from invasive (blood and cerebrospinal fluid) isolates.

As Romania had one of the highest antimicrobial consumption in Europe and an increasing number of diarrheal disease cases reported, in 2014, a national surveillance system was established based on the CDI surveillance protocol developed by ECDC, which collects information on all cases identified in Romanian hospitals (public and private). As a response to the European and national concern on HAI, in 2016, a national routine surveillance system has been implemented of cases identified in all public and private hospitals

This information are analysed annually and presented to decision makers in order to guide public health policies.

Role and outputs: *principal investigator*

Andreea was responsible for routine surveillance activities of CDI and HAI, and performed tasks such as updating the methodology and reporting form to ECDC protocols (12), developing a data entry mask in EpiInfo7, training health professionals in using EpiInfo7, collecting and validating data reported by the district and regional public health authorities, analysing the data and writing a quarterly and an annual report (5, 6, 7). She was also the operational contact point for the European surveillance systems HAIICU, HAISSI and CDI and provided annual files for TESSy upload to ECDC.

Competencies developed:
Andreea learned how to assess the need to improve the surveillance system by identifying the gaps in the existing surveillance system, to develop and implement a sentinel surveillance system and gained experience with the analysis and interpretation of national surveillance data.

2. Outbreak investigations

Title: *Q-fever outbreak in a veterinary university in Romania, 2019*

Background: In May 2019, a district public health authority notified nine Q-fever cases to the National Institute of Public Health (NIPH), all linked to a veterinary university with 1342 students and 179 staff. We investigated this outbreak to identify the source and implement control measures.

Methods: A case-control study was carried out to investigate this outbreak. We defined cases as students or university staff, with symptom onset (fever ± headache, chills) between 01/04/2019 and 15/07/2019, with or without laboratory confirmation. To elicit cases, university community members were advised, via email, to seek healthcare if they experienced symptoms compatible with Q-fever. We recruited asymptomatic controls via an online questionnaire, and compared them with cases to assess potential risk factors. Campus dust samples were tested. PCR testing of animals from the stables was performed.

Results: Of 50 cases (36 students and 14 faculty), 18 (36%) were confirmed. The epidemic curve suggested ongoing source exposure. All confirmed cases reported fever; 38 (76%) headache and 20 (40%) chills.

The case-control study included 30 cases and 151 controls. Cases were more likely to have been in contact with sheeps (OR 2.5, 95%CI: 1.0-6.2) than controls and less likely exposed to dogs (OR 0.2, 95% CI 0.1-0.7). No other exposure was significantly associated with illness.

PCR testing of animal blood was negative for *Coxiella burnettii* DNA. Genotyping was not available to assess the relatedness of strains from human and environmental samples. *Coxiella burnettii* was detected in all dust samples; the protocol for cleaning the stables involved using a high pressure water jet on previously moistened dust.

Conclusion: Our investigation suggested that the outbreak might have been caused by contaminated dust aerosolized by the high pressure water jet. The NIPH recommended training for staff members responsible for cleaning on the importance of dampening the dust before using the high pressure water jet.

Role and outputs: *Andreea was principal investigator.*

Andreea wrote the protocol and submitted to the ethical committee, analysed the outbreak data, submitted a manuscript to a peer-reviewed journal (1), conducted telephone interviews, developed an online questionnaire, performed a case-control study. She wrote the outbreak investigation report (9) and presented the results and recommendations at a national conference (3).

Supervisor(s): Adriana Pistol

Title: *Hepatitis E outbreak in a small town in Romania, 2019*

Background: Viral hepatitis E is transmitted via contaminated water and food. Pigs are a common source of infection of hepatitis E. Symptoms occur in 8-50% of infections. Hepatitis E is not under surveillance in Romania. In February 2019, 11 hospitalized cases from Medias, Sibiu County were reported to the National Institute of Public Health. We investigated outbreak to identify a common exposure and implement control measures.

Methods: We interviewed lab-confirmed cases using a hepatitis E-specific trawling questionnaire and descriptively analysed the data.

Results: Eleven cases were hospitalized between 26/01-26/02/2019, median age 72 years (range 50-87 years), 55% female. Symptoms were jaundice (100%), fatigue (82%) and dark-coloured urine (73%). All cases were positive for hepatitis E rapid test, eight (73%) were confirmed with Elisa EIA IgM anti-HEV. Nine cases (82%) lived in five neighbourhoods in Medias and two cases (18%) in neighbouring villages. No particular meat products were identified as common exposure. House water for the nine Medias cases was supplied from a main pipeline extracting water from the Tarnava Mare River, which has several pig farms located along its shores. Water bacteriological examinations between November 2018 and January 2019 recorded no coliform counts, yet 53 pipeline repair interventions were recorded in the same period in that area. The other two cases used water from privately-owned wells.

Conclusion: Although we could not identify the source of infection, our investigation showed the need of a national hepatitis E surveillance system with a one-health approach, built on collaboration between human, veterinary and environmental sectors. This surveillance system would enable us to better understand the epidemiology of hepatitis E in Romania and allow targeted interventions.

Role and outputs: *Andreea was principal investigator.*

Andreea wrote the outbreak investigation plan, analysed the outbreak data, conducted telephone interviews, developed the questionnaire, data analysis and interpretation and wrote the outbreak investigation report (8).

Supervisor(s): Adriana Pistol

Competencies developed:

Andreea developed the plan of the outbreak investigation using the classic 10-step field epidemiology approach and conducted most of the investigation.

3. Applied epidemiology research

Title: *Factors affecting influenza vaccination uptake among health care workers in Romanian hospitals, 2020*

Influenza is an acute respiratory infection and is a leading cause of global morbidity and mortality. Annually, up to 0.3% of the Romanian population is reported with influenza like illness (ILI), and 0.01% hospitalized with severe acute respiratory infections (SARI), of which around one-third could be explained by influenza. Vaccination of Healthcare workers (HCWs) is recommended due to the risk of HCW acquiring influenza from infected patients, as well as to lower the risk of HCW being exposed to community contacts and exposing fragile patients to influenza. In Romania, vaccine coverage rates of HCWs have seen a significant decrease from 64% (2010-2011) to 34% (2017-2018).

This study aims to provide additional and up-to-date information on the factors affecting influenza vaccination uptake among HCWs in Romanian hospitals. We performed a cross-sectional study using an anonymous, self-administered online questionnaire. Information on vaccination, knowledge and attitudes about the influenza vaccine was collected. HCWs with medical conditions that made vaccination contraindicated were excluded.

The questionnaire was sent to 13,409 doctors and nurses from 38 hospitals. The response rate was 1.5% (203 responses). Two people who reported conditions for which vaccination is contraindicated were excluded from the analysis.

Mean age of responders was 45 years (range 23-68 years), 63% females and 72% were nurses.

Overall vaccination coverage was 65% for the two influenza seasons (2018-2019, 2019-2020), of which 62% declared they were vaccinated in both seasons, 12% only in the season 2018-2019 and 26% only in the season 2019-2020. As reasons for vaccination, 90% consider themselves to belong to a risk group, followed by a belief that the vaccination is a very effective way to protect them against influenza (73%). Most common reason for refusing vaccination was the doubts about vaccine effectiveness (31%).

Variables associated with vaccination were positive responses to questions about whether vaccination is a very effective way to protect HCWs against influenza (OR 32, 95%CI 7.5-290) and that the benefits are greater than the risk and inconvenience (OR 21.43, 95%CI 9.38-49).

The very low response rate, mainly due to the current situation regarding COVID-19 pandemic, associated with the possible selection bias, as vaccinated HCWs are more likely to answer the questionnaire, does not allow us to extrapolate the results of this study in order to improve the strategy to increase influenza vaccine coverage among HCWs. We consider it necessary to perform this study again when the COVID-19 pandemic situation improves.

Role and outputs: *Andreea was principal investigator.*

Andreea wrote the protocol, developed the online questionnaire, did the data analysis, submitted the protocol to ethical committee and wrote a report of the project (11).

Supervisor(s): Adriana Pistol

Competencies developed:

During this project Andreea was able to gain more insight into how to conduct cross-sectional studies and to write a study protocol. She was able to develop an online questionnaire, perform data analysis, interpret the results of the study and assess how they can be used to improve the strategy to increase influenza vaccine coverage among HCWs.

4. Communication

Publications in peer reviewed journals

Not applicable.

Manuscripts submitted to peer reviewed journals (in review process)

1. Niculcea A.S., Pistol A., Zaharia A.D., Lessons learned from a Q-fever outbreak in a veterinary university, Cluj, Romania, 2019. Submitted to Europe's journal on infectious disease surveillance, epidemiology, prevention and control - Eurosurveillance (submitted on 06th July 2020).

Conference presentations

2. Niculcea A.S., November 2018, "The evolution of reported cases of CDI in Romania, 2014-2017", presented at the National Conference of Microbiology and Epidemiology 2018, Sibiu, Romania. Oral presentation (15 minutes).
3. Niculcea A.S., November 2019, " Lessons learned from a Q-fever outbreak in a veterinary university, Cluj, Romania, 2019", presented at the National Conference of Microbiology and Epidemiology 2019., Bucharest, Romania Oral presentation (15 minutes).

Other presentations

4. Niculcea A.S., August 2020, "Lessons learned from a Q-fever outbreak in a veterinary university, Cluj, Romania, 2019", Project Review Module. Oral presentation (10 minutes).

Reports

5. Niculcea A.S., *Clostridium difficile* infections in Romanian hospitals in 2017 report, 23 May 2019. Available from: https://www.cnscbt.ro/index.php/analiza-date-supraveghere/infectii-nosocomiale-1/1224-analiza-evolutiei-infectiei-cu-clostridium-difficile-in-spitalele-din-romania-2017/file

6. Niculcea A.S., *Clostridium difficile* infections in Romanian hospitals in 2018 report, 09 August 2019. Available from: https://www.cnscbt.ro/index.php/analiza-date-supraveghere/infectii-nosocomiale-1/1225-analiza-evolutiei-infectiei-cu-clostridium-difficile-in-spitalele-din-romania-2018/file

7. Niculcea A.S., Serban S., Popescu G., Antibiotic consumption, antimicrobial resistance and healthcare associated infections in Romania –2017 annual report, 16 December 2019. Available from: https://www.cnscbt.ro/index.php/analiza-date-supraveghere/infectii-nosocomiale-1/1309-consumul-de-antibiotice-rezistenta-microbiana-si-infectii-asociate-asistentei-medicale-nosocomiale-in-romania-2017/file

8. Niculcea A.S., Hepatitis E outbreak in a small town in Romania, 2019, internal report, 30 April 2019

9. Niculcea A.S., Q-fever outbreak in a veterinary university in Romania, 2019, internal report, 18 October 2019

10. Niculcea A.S., Salmonellosis surveillance in Romania, 2020, quarterly report, 19 July 2020, internal report.

11. Niculcea A.S., Factors affecting influenza vaccination uptake among health care workers in Romanian hospitals, 2020, internal report, September 2020

Other

12. Romanian *Clostridium difficile* infections surveillance protocol, 04 November 2019. Available from: https://www.cnscbt.ro/index.php/metodologii/infectii-nosocomiale/1281-metodologie-icd-2019/file
13. Romanian salmonellosis surveillance protocol, 19 December 2019. Available from: https://www.cnscbt.ro/index.php/metodologii/salmoneloze/1311-metodologia-de-supraveghere-a-salmonelozei/file
14. Recommendations for emergency medical services crew during COVID 19 Pandemic, 28 January 2020. Available from: https://www.cnscbt.ro/index.php/info-medical/1355-recomandari-pentru-personalul-de-pe-ambulanta/file
15. Infection prevention and control measures for healthcare settings involved in providing medical assistance to COVID 19 suspected/confirmed cases, 28 January 2020. Available from:

https://www.cnscbt.ro/index.php/info-medical/1345-2-prevenirea-si-controlul-infectiilor-suspecte-cu-noul-coronavirus-in-unitatile-sanitare-23-01-2020/file

16. How to correctly wear mask during COVID 19 Pandemic, 05 February 2020. Available from: https://www.cnscbt.ro/index.php/info-populatie/1381-sfaturi-privind-utilizarea-mastilor/file

17. Performing dialysis for asymptomatic COVID 19 suspected/confirmed cases protocol, 03 March 2020. Available from: https://www.cnscbt.ro/index.php/info-medical/1452-procedura-privind-efectuarea-dializei-la-persoanele-asimptomatice-aflate-in-izolare-la-domiciliu-sau-carantinati/file

18. Rational use of PPE in the context of COVID-19, 08 March 2020. Available from: https://www.cnscbt.ro/index.php/info-medical/1476-utilizarea-rationala-a-ppe-in-contextul-covid-19/file

19. Recommendations for people infected with the new coronavirus (COVID-19) during home quarantine, 26 June 2020. Available from: https://www.cnscbt.ro/index.php/info-populatie/1829-recomandari-privind-izolarea-la-domiciliu-a-persoanelor-cu-covid/file

5. Teaching activities

Title Workshop for hospital doctors, GPs, resident doctors and NIPH personnel for COVID-19 HelpLine

In order to provide accurate information about COVID-19 to the general public on themes such as: the pathogen, ways of transmission, preventive measures, and travel related information, the Ministry of Health established a COVID HelpLine starting 28th of February 2020.

In order to prepare the COVID HelpLine operators, the National Institute of Public Health (NIPH) organised six workshops of 2 hours and 20 minutes each, at the NIPH site.

The target audience were doctors (hospital and GPs), resident doctors and NIPH personnel.

Learning needs of participants were discussed between the instructors based on experience with COVID-19 as part of the national surveillance team, and based on the experience of the first two days of running the COVID HelpLine.

Together with a colleague, I developed the teaching materials and the handouts, which contained:

- general information about SARS-COV2 and COVID-19, such as what was known on the pathogen, transmission routes, symptoms and incubation period;

- information regarding the national guidelines, such as case definition according to the national surveillance methodology, close contact definition, quarantine definition and what it implies, and travel restrictions;

- instructions on how to talk to the general public (greeting formula, tone of voice used, specific word to avoid), possible answers to the most common questions, how to deal with angry or frustrated callers, what to do when you don't know the answer, what to do when there is no answer to the specific question;

- a Map Chart of the European countries affected by COVID-19.

The lecture was an interactive oral presentation, with possibility to ask questions at any moment. As part of the Q&A, we did role-play, where one of the lecturers was the telephone operator, and the participants asked questions as the general public, then one of the participants was the telephone operator and one of the lecturers was asking questions.

Upon completion of this workshop, participants should be able to:

- provide general information regarding SARS-COV2 and COVID-19 (pathogen, transmission route, symptoms and incubation period);

- explain the terms used in the national guidelines (case definition, close contact, quarantine);

- provide useful information regarding the prevention measures that everyone needs to implement (hand washing, how and when to wear a mask, social distancing, etc.);

- provide travel recommendations and information regarding the measures that will be taken at the border entry point in Romania.

- deal with angry or frustrated callers and with questions that have no answers.

At the end of each session we had direct feedback that was taken into account for the next session.

We also did a follow-up at the site of the COVID HelpLine each morning, to receive additional feedback on how well the training had prepared the personnel and what more information was needed.

Supervisor(s): Adriana Pistol

Educational outcome:

This activity taught Andreea how to adapt and react quickly to any changes in the format of the lecture and to provide the same information for different types of audience (different backgrounds and professional category), how to use previous experience in giving practical examples. It also provided the opportunity to use role-play as a teaching method, which was extremely useful in preparing participant on how to react in different situations, especially when they didn't know the answers or if the caller was angry and/or verbally aggressive.

Andreea learned how to receive feedback and use it to improve her delivery of the lecture in order to address the needs of the audience.

6. Other activities

Epidemic intelligence for COVID-19

An outbreak of acute respiratory illness, coronavirus disease 2019 (COVID-19), emerged in late December in Wuhan, China, and spread worldwide in the following months. As Romania has a large number of emigrants that work in COVID-19 affected countries and travel frequently between countries, a national surveillance protocol has been developed in Romania and been implemented at national level since January 27th 2020. The epidemic intelligence team was responsible for delivering all materials related to preventive and control measures for the general population, the medical personnel, the public health authorities and any other entities that were affected. These materials were updated frequently, based on the information and recommendations provided by ECDC and WHO, and posted on the National Institute of Public Health and the Ministry of Health sites. In order to provide accurate information to the general public, a COVID Helpline was established by the Ministry of Health. The epidemic intelligence team was responsible for providing materials and training the HelpLine operators.

At first the surveillance was focused on monitoring travellers from affected countries, contact tracing and implementation of control measures. The first confirmed case was reported on February 26th 2020.

In March 2020, community transmission was recorded and the Government declared a state of emergency that lasted till May, followed by a state of alert that is still in place.

As of March, the epidemic intelligence team was responsible for 24/7 on-call duties and provided epidemiological assistance to the National Centre of Control and Coordination of Intervention (under the Ministry of Defence), in the form of 7 days on-site missions at the Centre of Command.

Weekly risk assessments were conducted to measure the risk of community transmission and implementation of preventive measures, such as quarantine of closed communities, towns, cities or counties.

Role and outputs: Contributor

Andreea was involved in the national COVID-19 pandemic response in Romania and participated in all the activities mention above. She was responsible for developing all materials related to prevention measures for the general public (16, 19), infection prevention and control measures for healthcare settings involved in providing medical assistance to COVID-19 suspected/confirmed cases (hospitals, dialysis centres, and emergency medical services crew) (14, 15, 17), rational use of personal protective equipment (PPE) in healthcare settings (18), training of Covid HelpLine operators. She has also done one mission the National Centre of Control and Coordination of Intervention in June and on-call duties twice per month since May and three times per month starting August.

Supervisor: Adriana Pistol

7. EPIET/EUPHEM modules attended

1. *Introductory Course, 24 September - 12 October 2018, Spetses, Greece*

2. *Outbreak Investigation module, 03 - 07 December 2018, Berlin, Germany*

3. *Multivariable Analysis module, 25 - 29 March 2019, Madrid, Spain*

4. *Rapid Assessment and Survey Methods module, 13 - 18 May 2019, Zagreb, Croatia*

5. *Project Review 2019 module, 26 - 30 August 2019, Prague, Czech Republic*

6.   *Time Series Analysis module, 4 - 8 Nov 2019, Bilthoven, Netherlands*

7.   *Vaccinology module, 22-24 June 2020, online*

8.   *Project Review 2020 module, 24-28 August 2020, online.*

8. Other training

1.   *Multicountry cross sectorial simulation exercises, 12-13 December 2018, Rome, Italy*
2.   *United Nations Security in the field BSAFE online course, 30 April 2019*
3.   *PRECEPT online course on EVA-ECDC, 06-07 May 2019*
4.   *Implementation of EU Colorectal Cancer Screening Guidelines within the Screening Programmes in Italy, Romania and Slovakia, 27-29 May 2019, Bucharest, Romania.*
5.   *Cross-border sharing of public health data online course on EVA-ECDC, 23-25 July 2019*
6.   *Social Media (SoMe) for public health professionals (#SoMe4epis), 01-02 September 2019, Prague, Czech Republic*
7.   *Influenza vaccination campaigns targeting health care workers online course on EVA-ECDC, 20 September 2019*

Supervisor's conclusions

Andreea started the fellowship with a strong background in surveillance, mainly in the area of healthcare associated infections, and a real drive to learn both new skills and methods, and new subject areas in which to apply this learning. During her two-year fellowship at the National Institute of Public Health (NIPH) as Member-State-track fellow, she was involved–in addition to her routine duties as an employee of NIPH–in all EPIET-required curriculum activities. Andreea considerably developed her skills during these two years, particularly in outbreak investigation and research, and has benefitted from the team experiences provided by EPIET. I would like to congratulate Andreea on her tremendous efforts to make the big step from a trainee to a capable field epidemiologist.

Coordinator's conclusions

Andreea has worked effectively and enthusiastically throughout her fellowship to balance the demands of the fellowship and the requirements of her role within the Public Health Institute particularly in the unprecedented circumstances of the COVID-19 Pandemic. She has been involved in all aspects of response including frontline advice and support as well as epidemiological analysis and policy development. Her projects have included the investigation of an interesting Q fever outbreak and a study on healthcare worker beliefs and behaviours related to flu vaccination which may also have implications for a future COVID-19 vaccine. Andreea has a very clear passion and commitment to public health and infectious disease epidemiology and a determination to succeed in this field and make a difference. Throughout her fellowship she has been able to gain experience and insight into a range of surveillance systems, epidemiological methods and ways of working in public health both within Romania and across Europe which I know she will be able to internalise and make great use of in the future as an agent for strengthening epidemiological and public health practice and capacity.

Personal conclusions of fellow

I started the fellowship as a way to broaden my knowledge and skills in field epidemiology, and also to gain exposure to the wider public health community and network within Europe. The past two years have helped me develop the areas I knew and fill gaps in my competencies, as well as work on a wider range of diseases. It has been a great journey both professionally and personally and the skills I acquired will help me be a better epidemiologist.

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