

# Summary of work activities

## Sofia Papanikou

### The ECDC Fellowship Programme Field Epidemiology path (EPIET), 2020 cohort

## Background

The ECDC Fellowship Programme is a two-year competency-based training with two paths: the field epidemiology path (EPIET) and the public health microbiology path (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 provide 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.

According to Articles 5 and 9 of ECDC's founding regulation (EC No 851/2004) 'the Centre shall, encourage cooperation between expert and reference laboratories, foster the development of sufficient capacity within the community for the diagnosis, detection, identification and characterisation of infectious agents which may threaten public health' and 'as appropriate, support and coordinate training programmes in order to assist Member States and the Commission to have sufficient numbers of trained specialists, in particular in epidemiological surveillance and field investigations, and to have a capability to define health measures to control disease outbreaks'.

Moreover, Article 47 of the Lisbon Treaty states that 'Member States shall, within the framework of a joint programme, encourage the exchange of young workers. Therefore, ECDC initiated the two-year EUPHEM training programme in 2008. EUPHEM is closely linked to the European Programme for Intervention Epidemiology Training (EPIET). Both EUPHEM and EPIET are considered 'specialist pathways' of the two-year ECDC fellowship programme for applied disease prevention and control.

This report summarises the work activities undertaken by Sofia Papanikou, cohort 2020 of the Intervention Epidemiology path (EPIET) at the Greek National Public Health Organization.

## Pre-fellowship short biography

Sofia Papanikou is a Dermatologist-Venereologist at Andreas Sygros Hospital in Athens, Greece. She obtained a Master of Science (MSc) in Public Health and a MSc in Environmental and Occupational Health from the National School of Public Health in Athens, a MSc in Health Care Management from the Hellenic Open University of Patras, Greece, and a MSc in Dermoscopy and Preventive Dermatocology from the Medical University of Graz, Austria. She also holds a Ph.D. in Medicine, and she is a Post Doctoral Researcher in topical immunotherapy, for Alopecia Areata, at the National and Kapodistrian University of Athens.

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From 2015-2020 she worked at the 1st Regional Unit of Attica at the Directorate of Planning and Development of Health Services and Social Solidarity Policies (Department of Primary Health Care) and the Directorate of Public Health. In September 2020, she started her EPIET Member State-track fellowship at the Hellenic National Public Health Organisation in Athens, Greece.

## Methods

This report accompanies a portfolio that demonstrates the competencies acquired during the EPIET fellowship 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 ECDC Fellowship Manual<sup>1</sup>.

### 1. Epidemiological investigations

#### Outbreak investigations

##### *1.1 A Clostridium perfringens outbreak in a Greek high school through catered lunches, North-Eastern Aegean Sea, May 2021.*

Supervisors: Dr Kassiani Mellou, MPH, PhD, National Public Health Organisation (NPHO); Theologia Sideroglou, RN, MSc (NPHO); Anthi Chrysostomou, RN, MSc (NPHO).

In May 2021, 20 gastroenteritis cases were reported among 126 students (12-18 years) and 48 employees in a Greek school. Lunches were delivered by a catering company and consumed in classrooms. An outbreak investigation was initiated to identify the source and implement control and preventive measures.

A retrospective cohort study with cases defined as students or school staff presenting with abdominal pain and/or diarrhoea during 27-29 May 2021 was conducted through a structured paper questionnaire. Food-specific attack rates (AR), odds ratios (OR), and 95% confidence intervals (95% CI) were calculated. School and catering company premises were inspected while stool and food samples were collected and microbiologically analysed. During the outbreak investigation it became apparent that some students and teachers from a co-located high school also received catered lunch boxes offered at the nearby school. Thirty symptomatic cases (26 students and four teachers) were identified among 129 respondents (AR:23%). Two of three collected stool samples from symptomatic cases were positive for *Clostridium perfringens*. Six food samples of the dish offered on 27 May, tested positive for *Clostridium perfringens*, and four were positive for *Bacillus cereus*. In multivariable analysis, spaghetti with minced meat consumed on 27 May was significantly associated with the onset of acute gastroenteritis. The environmental investigation revealed inadequate recording of procedures and temperature measurements.

This investigation highlights the risk of foodborne outbreaks in school settings. It led to implemented changes of food temperature control, distribution of meals by the catering company, direct consumption inside the school within two hours after delivery and a ban on giving lunch meals to out-of-school persons. General recommendations were issued, such as detailed recording of the procedures (reception and distribution of meals in the school), possession of the appropriate food temperature control thermometer, storage of food samples under specific conditions, the reassurance of their laboratory control whenever necessary, and the selection of qualified staff with special training in kitchen hygiene and food handling rules. Also, recommendations to the catering establishment focusing on adequate personnel training and HACCP issues, especially regarding temperature/time controls during all production, handling, and distribution phases.

<sup>1</sup> European Centre for Disease Prevention and Control. European public health training programme. Stockholm: ECDC; 2020. Available from: <https://www.ecdc.europa.eu/en/publications-data/ecdc-fellowship-programme-manual-cohort-2021>

**Role:** Sofia was the principal investigator in this outbreak. She participated in the communication with the competent Public Health Services and the design of the analytical epidemiological study, developed the questionnaire, collected data, developed the database in EpiData, performed the data entry, and conducted the analysis. Additionally, she wrote an internal report and a final report for EPIET. Moreover, Sofia submitted an abstract to ESCAIDE 2021, which was presented as a poster. She also submitted a manuscript on this outbreak as a first author to the journal *Foodborne Pathogens and Disease*.

### ***1.2 An acute gastroenteritis outbreak in a Social Welfare Center for elderly and disabled persons in Lesvos, Greece, 2021.***

Supervisors: Dr. Kassiani Mellou, MPH, Ph.D., National Public Health Organisation (NPHO); Theologia Sideroglou, RN, MSc (NPHO); Anthi Chrysostomou, RN, MSc (NPHO).

In June 2021, a cluster of gastroenteritis cases was reported among elderly and disabled residents of a Social Welfare Center (WC) in Lesvos island, Greece. A mainly descriptive outbreak investigation was conducted.

A case was defined as a person living or working at the WC presenting with diarrhea between 6-7 June 2021. The local food safety authority inspected the (kitchen) premises and the water supply of the center.

Five stool samples were collected from symptomatic residents and tested for enteropathogens (bacteria, viruses and parasites) but all were negative. Three water samples (from the water tank, drilling water, and the kitchen tap), were collected for microbiological testing and one sample for physicochemical analysis. Additionally, samples of frozen raw pork and beef (five samples each) were tested for food microbiological analysis.

Forty residents and staff members completed the questionnaire and 54 residents the form with the assistance of a staff member (response rate: 66.7%). Thirty-five resident cases, of which one died, were identified (attack rate: 37.2%). There were no cases reported among staff.

It became clear that food items and tap water consumption could not be accurately recalled by the residents and could not be reliably derived or recorded by other means. All food samples of raw pork meat were positive for coliform bacteria. Water samples were negative for enteropathogens and the physicochemical analysis was normal.

The environmental investigation identified deficiencies, such as the absence of a Hazard Analysis and Critical Control Points (HACCP) study, tap water supply from unlicensed sources and a lack of staff food training certificates. The investigation indicated that an acute gastroenteritis outbreak probably occurred from a foodborne point source, however the exact transmission route and the etiological agent remained unknown. Recommendations were made to avoid future outbreaks by improving the kitchen equipment, chlorination of the tank water and train staff on food handling in order to protect this vulnerable patient population.

**Role:** Sofia participated in the outbreak investigation team and communicated with the competent Public Health Services. Collaborating with her experienced colleagues at the NPHO, she designed the questionnaire and collected the information. She created the database in EpiData and performed the data entry. Additionally, she analysed the data and prepared the intermediate and final reports in Greek and English.

### ***Training modules related to assignment/projects***

**EPIET/EUPHEM Introductory Course** -This course introduced Sofia to the field epidemiology of infectious diseases. She learned about public health microbiology techniques, epidemiological and laboratory data analysis, associations between exposures and outcomes, public health control measures and recommendations, and communication of public health information to stakeholders.

**Outbreak Investigation Module** - Sofia learned the ten steps of an outbreak investigation, how to construct and interpret an epidemic curve, design appropriate data collection instruments, and understand the importance of formulating public health recommendations. She also learned how to apply univariate analysis for the outbreak investigation.

**Multivariable Analysis Module** – During this module, the fellow learned the principles of multivariable analysis, how to select the multivariable analysis adapted to a study objective/design, identify the relevant variables, build an optimal regression model, and to interpret the results of a regression model.

### ***Educational outcome***

Sofia developed her competencies and became confident in conducting outbreak investigations using the classic 10-steps in an outbreak investigation. She actively contributed to all steps of the two foodborne outbreaks investigation. She learned to communicate successfully and collaborate with all the stakeholders and other disciplines involved. She especially learned to describe a foodborne outbreak in terms of person, place, and time, set up a case definition, design questionnaires, perform data entry using EpiData Manager, analyse cohort data using STATA, apply univariate and multivariate logistic regression analysis and significance tests. She also learned how to recommend appropriate evidence-based measures to control an outbreak and how to report and present the results of her work.

## 2. Surveillance

### 2.1 Designing a new surveillance system for Borreliosis and Rickettsiosis in Greece

Supervisors: Dr Kassiani Mellou, MPH, PhD, (NPHO); Pervanidou Danai, MD, MPH, (NPHO).

Borreliosis, also called Lyme disease, is a tick-transmitted infection caused by spirochetes of the *Borrelia burgdorferi sensu lato* (s.l.) species complex and one of the most prevalent vector-borne diseases in Europe. Rickettsioses are zoonoses caused by bacteria (Genera *Rickettsia* and *Orientia*) belonging to  $\alpha$ -proteobacteria. They are transmitted by ticks, lice, fleas, and mites. There were references/evidence that these vector-borne diseases exist/may exist in Greece but were underdiagnosed and not recorded as they did not belong to the national mandatory notifiable communicable diseases. This surveillance project aimed to design and set up a new national passive surveillance system for Borreliosis and Rickettsiae in Greece. Our objectives were to design a prospective surveillance system to monitor the incidence of both vector-borne diseases, identify high-risk groups and to detect geographical areas for targeted interventions to guide preventive and control measures.

Hospital physicians, GPs, and microbiologists electronically notify individual cases through a specific developed data collection tool system (a dedicated notification form), with case-based data stored in a central database. Reporting is carried out by health professionals weekly. Data sources are private and public hospitals, health centres, and laboratories. The NPHO has enhanced diagnosis capacity by supporting a specialised laboratory. Information material (letters for health professionals) was developed and published on the NPHO website. Annual analysis of the surveillance data will be performed by epidemiologists at the NPHO and reports overall (calculation of notification rates of the diseases, age, and gender specific, geographical and seasonal distribution of the diseases, and estimation of the proportions of patients with specific exposures such as occupation, outdoor activities, tick bites). From April 2022 onwards, Borreliosis and Rickettsioses have been included in the restructured list of mandatory notifiable diseases in Greece. The above-mentioned information material and the notification form were distributed to all hospitals, medical associations, and healthcare professionals throughout the country and published on the NPHO website ([https://eody.gov.gr/wp-content/uploads/2022/04/epidimiologiki\\_epit\\_lyme-rik-anap-erlix-2022.pdf](https://eody.gov.gr/wp-content/uploads/2022/04/epidimiologiki_epit_lyme-rik-anap-erlix-2022.pdf)). The surveillance of these diseases started on April 2022, and so far, no cases have been confirmed. So, the first analysis and an annual report are planned for 2023 and will be published on the NPHO's website.

**Role:** Sofia was involved in the process of setting up the new surveillance system at the national level. She performed a literature search regarding the two vector-borne diseases and communicated with the laboratory directors of the seven university public hospitals to obtain information on the local laboratory diagnosis capacity. She wrote the surveillance project proposal and participated in designing the notification form specifically dedicated to Borreliosis and Rickettsioses in Greece. In addition, she participated in writing part of the informative material for the health professionals about these two vector-borne diseases.

### *Routine surveillance activities at NPHO*

During the EPIET fellowship at the NPHO, Sofia participated in the Department for Airborne Diseases activities at the Directorate of Epidemiological Surveillance and Intervention for Communicable diseases.

She was involved in the COVID-19 Active Surveillance System for severe cases, where she collected data for hospitalised patients of COVID-19 through the active surveillance system for severe COVID-19 infection. This surveillance system covers the whole country, including all private and public hospitals in Greece. She performed case-to-case follow-ups for every hospitalised severe COVID-19 patient at the intensive care unit of 14 public hospitals around the country and updated the database for all new admissions and the number of deaths. She communicated daily, by telephone with doctors and nurses of the COVID-19 intensive care units to obtain information about patients' demographics (age, ethnicity, address, id number), medical status (medical health history, comorbidities, complications), respiratory status (ARDS, Acute lung injury, incubation), and their outcome (recovery, complications, death). The fellow realised the necessity for daily and weekly reports to stakeholders regarding the COVID-19 infection in the country.

### **Monkeypox infection**

Since the start of the monkeypox outbreak in Greece and as of 29 September 2022, 80 confirmed cases of monkeypox (MPX) have been reported. Sofia realised the importance of capturing the proportion of MPX cases in Greece and describing the disease's epidemiological trends. She communicated with doctors and nurses in Greek public and private hospitals about the reported cases of MPX and their characteristics and recorded cases in the database. She also performed the investigation and the contact tracing of fifteen cases (by phone communication) to fill in the relevant questionnaire concerning the cases of MPX infection.

### **Influenza**

Regarding influenza surveillance, Sofia contacted (by phone) doctors and nurses in seven public and private hospitals, asking for information about the influenza cases reported in the country lately (laboratory confirmation, demographics, and vaccination status).

**Competencies developed:** Sofia's involvement in the daily surveillance of these three diseases was an exciting experience. She realised the importance of active surveillance and investigation for mandatory diseases like COVID-19, influenza, and MPX. The investigation and the contact tracing of the monkeypox cases were challenging as sensitive personal data were collected. She also understood the importance of communication skills and data management using different tools/databases. Additionally, she had the chance to work in multi-disciplinary teams and adapt already standard operating procedures of the Directorate, such as time framework, etc.

### *Training modules related to assignment/projects*

**EPIET/EUPHEM introductory course** - The introductory course familiarised Sofia with the main concepts in epidemiological surveillance. She obtained knowledge on how to develop or evaluate a surveillance system. She also learned the main aspects of the analysis of the surveillance data and how to draw conclusions and make public recommendations based on the results.

**Rapid Assessment and Survey Methods module** - During this module, the fellow deepened her knowledge in surveillance and communication of the findings in an emergency setting.

**Time Series Analysis module** - This module offered the fellow the adequate knowledge to comprehend how to use time series analysis to examine surveillance data for the detection of trends.

**Multivariable Analysis Module** - This module built on the Introductory Course helped Sofia to develop her statistical skills further. She had the opportunity to learn about the regression methods that can be used for the surveillance data analysis.

### *Educational outcome*

For Sofia, this surveillance project was a great learning experience. It assisted her in understanding the surveillance system structure and how to collect, analyse, interpret and report surveillance data. She learned how to design and implement a new surveillance system.

## 3. Applied public health research

### *3.1 A retrospective study of Sexually Transmitted Infections (STIs) among HIV-positive Men who have Sex with Men (MSM), at the HIV/AIDS Unit of Andreas Sygros Hospital, Athens, Greece, 2018-2020.*

Supervisors: Dr Kassiani Mellou, MPH, PhD, (NPHO); Dr. Raftopoulos Vasilis, RN, PhD, (NPHO).

In Greece, intercourse between MSM remains the predominant mode of transmission of human immunodeficiency virus (HIV). Published data on the frequency of STIs among HIV-positive MSM in Greece is limited. We conducted a retrospective study among older (diagnosed before 2018) and newly diagnosed HIV-positive MSM (diagnosed from 2018-2020) who were followed or examined for new STIs at the HIV/AIDS Unit of Andreas Sygros Hospital, a major reference center for STIs, in Athens during 2018-2020. Cohort data included patient demographics and performed clinical and laboratory STI diagnostic test results (syphilis, gonorrhoea, herpes, HAV, HBV, HCV, HPV infection) during 2018-2020 retrieved from medical records.

We described this cohort by age, occupational status, reasons for STI screening, and new acquisition of gonorrhoea, syphilis or herpes during the study period. A descriptive analysis of new STI occurrence stratified by age group and new STI occurrence was performed using Stata version 16.

The cohort consisted of 1 082 HIV positive MSM with median age of 48 years (range: 18-87 years), 36.3% of who were screened for STIs because they had STI symptoms, 33.8% were asymptomatic and routinely screened, 15.5% were screened as they had a sexual partner with an STI and 14.4% were referred for screening. 197 MSM were diagnosed with syphilis, 57 with gonorrhoea, and 309 with herpes. The most common STI co-infection was syphilis and herpes (8.6%), followed by syphilis and human papillomavirus infection (2.7%).

One or more STIs were identified among HIV-positive MSM, during the study period. Specific STI prevention programs focused on syphilis, gonorrhoea, and herpes should be targeted for HIV-positive MSM.

It was recommended that current collected data stored in medical charts should be enriched with a standardised short questionnaire to collect information on behavioral risk factors in order to identify potential or changing risk profile patterns among HIV-positive MSM in Greece.

**Role:** Sofia wrote the project proposal and the research protocol, designed the data extraction form, developed the data entry mask, and performed data entry and statistical analysis. In addition, she wrote the final research report.

### ***3.2 A retrospective study of STIs among HIV-negative MSM at the STI Clinic of Andreas Sygros Hospital, Athens, Greece, 2018-2020.***

Supervisors: Dr Kassiani Mellou, MPH, PhD, (NPHO); Dr. Raftopoulos Vasilis, RN, PhD, (NPHO).

A retrospective study was conducted at a large STI clinic (the STIs Clinic of Andreas Sygros Hospital) in Athens for the study period 2018-2020. The main aim was to estimate the occurrence of new STIs among HIV-negative MSM, describe the demographic characteristics of this client population and identify possible risk factors for STI acquisition to inform interventions for preventing STIs among this population group.

Data were retrieved from hospital medical records, included patients' demographics, reasons for STI screening, performed clinical and laboratory STI diagnostics for syphilis, gonorrhoea, hepatitis A (HAV), hepatitis B (HBV), hepatitis C (HCV), human papillomavirus (HPV), sexual identity, and the number of sexual partners during the last six months. Descriptive and stratified analyses were done using Stata version 16.

888 HIV-negative MSM with median age of 31 years (range 18-89 years) were evaluated for STIs during 2018-2020. Of these, 83% were Greek. 3% had an MSc or Ph.D., 35.8% had a university diploma, 17.1% had a certificate from Technological Educational Institutes or colleges (2-3 years of studies), 14.9% finished the basic education (elementary and high school) and for 29.2% we had no information.

From the 886 participants for whom the information was known, 637 (72%) identified as homosexual, and 249 (28%) had a bi-sexual orientation. Of these, 607 MSM (68.4%) were tested for STIs as they experienced STI symptoms, 165 (18.6%) were referred for screening because their partner had a confirmed STI while 109 (12.3%) were asymptomatic, and 5 (0.7%) were tested for other reasons. Most MSM (37.2%) were diagnosed with syphilis, followed by HPV (21.3%) and gonorrhoea (14.3%). Bisexual MSM had a 1.4 times greater probability of being diagnosed with HPV than homosexual MSM.

Specific STI prevention programs focused on syphilis, gonorrhoea, and HPV infection should be targeted for HIV-negative MSM. The existing data on medical charts should be enriched with risk behavior information to identify potential risk factors and behaviors among HIV-negative MSM in Greece.

**Role:** Sofia wrote the project proposal and the research protocol, designed the data extraction form and data entry mask, and performed data entry and analysis. In addition, she wrote the final research report.

## **Training modules related to assignment/projects**

**EPIET/EUPHEM Introductory Course** - This module initiated the basic concepts of study design. It familiarised the fellow with framing research questions and planning and writing study protocols. All this knowledge was applied to the design of these two studies.

**Outbreak Investigation Module** - During this module, Sofia broadened her knowledge of study design and further analyses based on the descriptive findings of the outbreak. Furthermore, it improved her experience in developing relevant aims and objectives and how to present the results.

**Multivariable Analysis Module** - This module increased the analytical and statistical skills needed for the detailed analysis of data.

**Rapid Assessment and Survey methods (RAS) module** - Through this module, the fellow obtained knowledge in the communication of findings in cases of an emergency setting.

### ***Educational outcome***

This project was beneficial and interesting for Sofia. She further enhanced her skills in planning and conducting a public health epidemiology study by preparing a study protocol, setting a research question, and presenting the study's aim and objectives. Additionally, she became more confident in creating a research project from the beginning to the end. Moreover, she prepared abstracts to communicate the study results to the scientific community.

## **4. Teaching and pedagogy**

### ***4.1 Outbreak investigation. Case study: Investigation of a gastroenteritis outbreak in a school setting, Mytilene, May 2021.***

This two-hour training was given on 1 December 2021. The audience consisted of 17 nurses specialised in Public Health and Community Nursing with no previous theoretical or practical experience in outbreak investigation. This case study was developed based on Sofia's outbreak investigation. No similar case study had ever been presented to them. An anonymous questionnaire was given to participants at the end of the lecture. According to the participants' answers, the presentation and case study were easy to follow and useful for the postgraduate course.

## 4.2 Skin diseases and public health

This three-hour training was offered on 24 March 2022. The audience consisted of 29 students from the Department of Public and Community Health of the University of West Attica, Athens, Greece.

The lecture took place as part of their undergraduate studies. Sofia emphasised the importance of early diagnosis of infectious skin diseases (such as COVID 19).

## 4.3 Rare hair disorders and early detection by health workers in the community

Sofia gave an online, one-hour lecture on 3 April 2022. The audience consisted of health workers, patients from rare diseases associations, and representatives from the Ministry of Health.

This teaching activity was organised by the Hellenic Federation of Associations - Rare Diseases, representing patients' associations with rare diseases. Sofia highlighted the importance of early diagnosis of rare skin diseases (especially hair infectious diseases) in the community.

## Training modules related to assignment/projects

**EPIET/EUPHEM Introductory Course** - During the Introductory Course, the principles of adult education were presented. Sofia had the opportunity to comprehend tips and tools like 'the 3 As' that were valuable to design, facilitate and evaluate her training.

### Educational outcome

Although Sofia has an extensive background in teaching at the university level for her medical speciality, she found this teaching project very interesting and helpful. She had the opportunity to prepare and adapt her lectures according to the different backgrounds of the target audience, considering the participants' prior knowledge. Sofia also learned how to make the teaching materials more attractive to increase the knowledge gained.

## 5. Communication

### Publications related to the EPIET fellowship

#### Submitted

Papanikou S., Sideroglou T., Chrysostomou A., Kyritsi MA., Spaniolas S., Bouboulis D., Mouchtouri VA., Mellou K. A point source outbreak of *Clostridium perfringens* in a High School: Timely investigation is everything. Submitted to the journal *Foodborne Pathogens and Disease* on 27 July 2022.

#### Guidelines and information material for notifiable diseases

Sofia participated in designing the notification form specifically dedicated to Borreliosis and Rickettsioses in Greece. In addition, she participated in writing part of the informative material, in Greek, for health professionals about these two vector-borne diseases, and the new surveillance system ([https://eody.gov.gr/wp-content/uploads/2022/04/epidimiologiki\\_epit\\_lyme-rik-anap-erlix-2022.pdf](https://eody.gov.gr/wp-content/uploads/2022/04/epidimiologiki_epit_lyme-rik-anap-erlix-2022.pdf)).

## Reports

### Conference presentations

1. ESCAIDE 2021: Foodborne outbreak in a Greek high school through catered lunches, May 2021. 16 November 2021; late-breaker poster presentation.

### Other training modules

1. ECDC. Essentials of Writing and Reviewing Scientific Abstracts: a field epidemiology focus. 26 October 2021.
2. ECDC. Contact tracing in the context of COVID-19 response. Certificate authenticity code: inEgJuchE.
3. National and Kapodistrian University of Athens. Scientific Writing in Health Sciences. HYGIEIA Scientific Research and Educational Cluster. Online. November 2020-February 2021.

## 6. Other activities

1. Participation in sensitization for influenza vaccination (several activities)
2. COVID-19 Vaccination at Andreas Sygros Vaccination Center

## 7. EPIET/EUPHEM modules attended

1. Introductory Course part 1 (28/09/2020-16/10/2022), virtual.
2. Intro Course part 2-Inject Days-Operational Research, (9-10/11/2020), virtual.
3. Outbreak investigation Module, (7-11/12/2020), virtual.
4. Multivariate Analysis Module, (15-19/02/2021), virtual.
5. Introductory Course part 3 (26/04/2021-7/05/2021, except May 3), virtual.
6. Rapid Assessment and Survey Methods Module (5-6/05/2021), virtual.
7. Project Review 2021 Module, (23-27/08/2021), virtual.
8. Biorisk and Quality Management, (17-18/01/2022), virtual.
9. Vaccinology Module, (14-18/02/2022), virtual.
10. Time Series Analysis Module, 4-8/04/2022, Hybrid in ISS, Rome.
11. Management, Leadership and Communication in Public Health Module, (13-17/06/2022), ECDC, Stockholm.
12. Project Review 2022 Module, (29/08/2022-2/09/2022), Lisbon.

## Discussion

### Coordinator's conclusions

One of the main goals of the EPIET programme is for fellows to develop core competencies in field epidemiology mainly through project or activity work, but also partly through participation in training modules and apply epidemiological methods to provide evidence to guide public health interventions for communicable disease prevention and control. This report summarises all activities and projects conducted by Sofia Papanikou during her two-year EPIET fellowship (cohort 2020) as an MS-track fellow at NPHO in Athens, Greece.

Sofia is a dedicated and experienced medical specialist (Dermatologist-Venereologist) with a warm heart for her patients. At start of the fellowship, she wanted to broaden her world in the hospital towards the public health arena. She had a slow and challenging start to her fellowship as she was working a lot in the hospital to support during the COVID-19 pandemic. She had to balance conflicting demands in an often challenging work environment. At the end of her first year of the fellowship, she got more dedicated time and caught up with her EPIET projects.

She managed to investigate two foodborne outbreaks on Greek islands. She started up a new surveillance system on two important endemic vector-borne diseases (Lyme disease and rickettsiosis) that were not notifiable on national level. Using her existing network and previous medical knowledge helped her to play an important role to set this system up.

Her operational research project on HIV-positive and HIV-negative MSM diagnosed with one or more STI's during the study period was so close to her heart as she worked in this setting. However, this project was also the most challenging as after a long process of data entry not all research questions could be answered as demographic variables were not systematically collected in both MSM populations. Also, the diagnostic work and follow-up was done differently in the two MSM populations, so they could not be compared and were not representative as data collection was limited to one large STI clinic in Athens. As a scientific coordinator, I have found her to be a positive fellow and a very kind person who is in the process of and working to broaden her well-grounded clinical perspective towards a more population perspective needed for a field epidemiologist.

After EPIET, she will use her newly acquired skills during the fellowship in her specialty, by strengthening the research team capacity of medical specialists and using her new network with the public health field in Greece. More importantly, Sofia also foresees a part-time public health career on community level next to her specialist work in dermatology and venerology in the hospital. This dual interest and role will make her a stronger and more diverse professional and make sure she will be involve continuous learning on infectious disease epidemiology and keep making use of the network of field epidemiologists she is now acquainted with. (Barbara Schimmer).

## Supervisor's conclusions

During her two-year EPIET fellowship (cohort 2021) Sofia worked at the Directorate for Infectious Diseases Epidemiological Surveillance and Intervention of NPHO in Athens as an MS-track fellow. She participated in the investigation of two foodborne outbreaks, one in a school setting and one in a long health care facility. In addition, Sofia made an important contribution in the establishment of a new surveillance system for borreliosis and rickettsiosis in Greece, by preparing the respective protocol and setting up the system.

Finally, Sofia wrote the protocol for the research project on HIV-positive and HIV-negative MSM diagnosed with one or more STI's during the study period, analysed the collected data and prepared the report of the results.

Overall, Sofia was cooperative and willing to work on her projects, however due to the pandemic she had a low start as she had also to work at the hospital for the first six months.

Hopefully, EPIET would be the start of her new career in public health. The competencies she acquired during the program can be the basis for further development and acquisition of new knowledge and skills.

I believe that COVID-19 pandemic significantly affected her fellowship but I believe that Sofia made a sincere effort to complete the objectives of the program (Kassiani Mellou).

## Personal conclusions of fellow

EPIET was an incredibly inspirational experience. My main goal during this journey was to obtain knowledge and experience in different public health issues. My expectations were fully met. I had the unique chance to grow as a public health professional and personality.

In a learning-by-doing way, through the diverse variety of projects, I gained valuable knowledge and experience in the surveillance and control of human diseases and extended my previous experience with sexually transmitted infections. I had the opportunity to refresh my basic knowledge in statistics and practice and develop new data analysis skills using STATA.

Additionally, I gained the adequate knowledge and skills to communicate efficiently with public health experts of different specialities. I learned how to manage time, negotiate, write project protocols and address attitude public health issues in a more organised way.

As a person, I am very thankful for meeting and networking with all my co-fellows and all the modules' facilitators, who are a great group of talented and motivated public health professionals. In the future, I look forward to using all this experience from the fellowship to work as a medical doctor and as an epidemiologist.

## Acknowledgements of fellow

I am incredibly grateful to my supervisor Dr. Kassiani Mellou for her outstanding supervision and mentoring during my fellowship and her unlimited motivation, guidance, and patience. She was always there for me with constructive advice and helpful feedback to increase my knowledge and skills in epidemiology. I will never forget her emotional support at some difficult moments during this journey.

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