## Summary of work activities
### Maria Tseroni
### Intervention Epidemiology path (EPIET)
### Cohort 2015

# Background

The ECDC Fellowship Training Programme includes two distinct curricular pathways: Intervention Epidemiology Training (EPIET) and Public Health Microbiology Training (EUPHEM). After the two-year training EPIET and EUPHEM graduates are considered experts in applying epidemiological or microbiological methods to provide evidence to guide public health interventions for communicable disease prevention and control.

Both curriculum paths are part of the ECDC fellowship programme that provides competency based training and practical experience using the 'learning by doing' approach in acknowledged training sites across the European Union (EU) and European Economic Area (EEA) Member States.

## Intervention Epidemiology path (EPIET)

Field epidemiology aims to apply epidemiologic methods in day to day public health field conditions in order to generate new knowledge and scientific evidence for public health decision making. The context is often complex and difficult to control, which challenges study design and interpretation of study results. However, often in Public Health we lack the opportunity to perform controlled trials and we are faced with the need to design observational studies as best as we can. Field epidemiologists use epidemiology as a tool to design, evaluate or improve interventions to protect the health of a population.

The European Programme for Intervention Epidemiology Training (EPIET) was created in 1995. Its purpose is to create a network of highly trained field epidemiologists in the European Union, thereby strengthening the public health epidemiology workforce at Member State and EU/EEA level. Current EPIET alumni are providing expertise in response activities and strengthening capacity for communicable disease surveillance and control inside and beyond the EU. In 2006 EPIET was integrated into the core activities of ECDC.

The objectives of the ECDC Fellowship - EPIET path are:

- To strengthen the surveillance of infectious diseases and other public health issues in Member States and at EU level;
- To develop response capacity for effective field investigation and control at national and community level to meet public health threats;

- To develop a European network of public health epidemiologists who use standard methods and share common objectives;
- To contribute to the development of the community network for the surveillance and control of communicable diseases.

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

## Pre-fellowship short biography

Maria Tseroni graduated as a nurse in 1995 and she holds a Master degree in Health and Social Care Management from London Metropolitan University. She has worked in the Hellenic Center for Disease Control and Prevention (KEELPNO) since 2003. She participated in the response to various public health crises such as the response to the SARS outbreak, the preparedness for the Athens 2004 Olympic Games, the preparedness for H5N1 avian influenza, the H1N1 influenza pandemic in 2009, the preparedness for the Special Olympics Games in 2011, the response to malaria re-introduction in Greece and the preparedness for Ebola. She is also a PhD candidate in the Department of Nursing of Cyprus University of Technology.

## Fellowship assignment: Intervention Epidemiology path (EPIET)

On 14 September 2015, Maria started her EPIET fellowship at the Department of Epidemiological Surveillance and Intervention of KEELPNO, Athens, Greece, under the supervision of Dr Angeliki Lambrou. Her EPIET frontline coordinator was Dr. Kostas Danis. 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

### *Importance of active case detection for malaria cases in Evrotas, Lakonia, Greece, 2015*

Greece has been malaria-free since 1974. In October 2011, following an outbreak of 36 locally-acquired malaria cases in Evrotas, an Active Case Detection (ACD) surveillance system for malaria was implemented among migrants from malaria-endemic countries to support early diagnosis and treatment of cases. We evaluated the sensitivity of this system and timeliness of diagnosis for 2015.

From 30 July to 7 December 2015, we visited each migrant home every 10-15 days to screen for fever and other malaria symptoms. We performed Rapid Diagnostic Tests (RDTs) and blood sampling on symptomatic patients. We estimated i) the sensitivity of ACD using the number of malaria cases among migrants from endemic countries detected by ACD divided by the total number of reported malaria cases in the same period among the same population and ii) the timeliness as the time between onset of symptoms and diagnosis.

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[1] European Centre for Disease Prevention and Control. European public health training programme. Stockholm: ECDC; 2013. Available from:
http://ecdc.europa.eu/en/epiet/Documents/Scientific%20guides/EPIET%20Scientific%20Guide_C2016.pdf

During the study period, we undertook 2762 fever screenings, 169 RDTs and 133 blood samples among migrants (median monthly population size: 384, range: 348-453). In 2015, eight *Plasmodium vivax* cases were reported in Evrotas, seven of whom during the ACD period. Through ACD, we identified six imported cases in males from Pakistan (Sensitivity: 100%) and one locally-acquired case in a migrant from a non-endemic country was detected through the passive surveillance system. The median age of cases identified through ACD was 24 years (range: 19-30). Four of the six imported cases had fever as the main symptom, with a median temperature of 37.6$^{o}$C (range: 37.2$^{o}$C-40$^{o}$C). The median time between onset and diagnosis was 2.5 days (range 0-10).

ACD in Evrotas promptly identified most of the reported malaria cases, suggesting that it contributed to reduced disease transmission. ACD must be continued to prevent re-establishment of malaria in the area.

### Role and outputs:

Maria was the principal investigator of this surveillance project. She set up the Malaria Active Case Detection surveillance system at Evrotas municipality for 2015, performed data cleaning and analysis and presented the findings orally at ESCAIDE 2016 (1). She also presented this work orally at two national conferences, as an invited speaker and as a co-author, respectively (2, 3).

### Supervisor(s): Dr. Christos Hadjichristodoulou

## Malaria Active Case Detection surveillance system at Evrotas municipality for 2016, Lakonia, Southern Greece

In October 2011, following an outbreak of 36 locally-acquired malaria cases in Evrotas, an Active Case Detection (ACD) surveillance system for malaria was implemented targeting migrants from malaria-endemic countries to support early diagnosis and treatment of cases and interrupt disease transmission.

Between 18 May and 30 November 2016, field teams visited each migrant's household every 7-15 days to: i) screen for fever and other malaria symptoms, ii) perform Rapid Diagnostic Tests (RDTs) and blood sampling on symptomatic patients, iii) treat and investigate each confirmed case and iv) perform focus investigations. We estimated i) percentage of reported cases who were diagnosed through ACD (sensitivity) and ii) the time between first symptom (fever) and initiation of treatment.

During the surveillance period, we undertook 17,122 fever screenings, 560 RDTs and 300 blood samples among migrants residing in Evrotas (median monthly migrant population size: 712; range:523-914). During this period, 14 imported *Plasmodium vivax* malaria cases were reported among migrants in Evrotas (incidence 19.6 cases per 1,000 migrant population). Through ACD, we identified 12 malaria cases among newly incoming males (median time in Greece: 7 months; range 2-11) from the Punjab province of Pakistan, while during the same period two additional imported malaria cases were reported through the passive notification system (Sensitivity: 86%). The median age of all cases was 20 years (range: 16-40). The median time: between first symptom and first contact with health services was 1.5 days (range 0-10); between onset and diagnosis was 2 days (range 0-21) and from diagnosis to initiation of treatment was 0 days (range 0-0).

The high sensitivity of ACD and the appropriate timeliness of initiation of treatment indicated that the ACD system met the WHO standards in 2016. We recommend continuing ACD among migrants in the area to minimize malaria transmission.

### Role and outputs:

Maria was the principal investigator of this surveillance project. She coordinated the Malaria Active Case Detection Surveillance System at Evrotas municipality for 2016 and the investigations, performed data cleaning and analysis and prepared the final report (4). Maria presented her work orally as an invited speaker in two national conferences (5, 6). She also continued the project in 2017.

### Supervisor(s): Dr. Christos Hadjichristodoulou

### Competencies developed:

Setting up an enhanced ACD surveillance system for malaria at Evrotas municipality was an exciting project to work on, as prevention of re-introduction of malaria is an important public health target in Greece. Also, interruption of indigenous malaria transmission is one of the targets of the WHO European region. Before setting up the ACD surveillance system, I performed a literature review including reviewing epidemiological reports of other similar systems.  Approaching and mapping the migrant population was challenging, as the majority of this population is undocumented and mobile within and outside of the area of Evrotas. It was also challenging to

efficiently communicate health messages to people from foreign countries with variable educational level. Due to the fact that the majority of imported malaria cases at Evrotas had mild symptoms, it was necessary to develop procedures and communication skills to find as many cases as possible.

I improved my educational and leadership skills by training other healthcare professionals on malaria and ACD procedures as well as coordinating different partners for the logistics and technical issues of the surveillance system, including collaboration with the laboratories. I contributed to the improvement of the database and performed regular data cleaning and analysis. This helped me to consolidate my technical skills on the management of big data sets (i.e. data cleaning and recoding). Additionally, I monitored the progress of the project and prepared activity reports.

# 2. Outbreak investigations

## *A gastroenteritis outbreak investigation following a wedding reception, Athens, January 2016*

On 24 January 2016, an outbreak of gastroenteritis symptoms was reported among 204 persons attending a wedding reception in a hotel in Athens. We performed a retrospective cohort study to identify the vehicle of transmission.

We defined as case any person who participated in the wedding reception and presented ≥3 episodes of diarrhoea within three days after having eaten at the reception. We interviewed wedding participants using a structured questionnaire on food consumption. We calculated adjusted risk ratios (aRR) using multivariable binomial regression.

Of 183 interviewed guests, 87 (48%) met the case definition. Forty-eight (55%) cases presented symptoms between 10 and 16 hours after the meal. The main symptoms of cases were diarrhoea (100%) and abdominal pain (81%). The median duration of symptoms was 21 (range: 1-91) hours. The epidemic curve was indicative of a common point source. The risk of infection was higher (aRR=3.9; 95%CI=2.3-6.5) among those who consumed the beef scaloppini with mushrooms cream dish compared with those who did not. Only one case submitted a stool sample, which was culture negative for *Salmonella* spp., *Shigella* spp. and *Yersinia,* but the quantity was inadequate for virus and toxin culture. *Bacillus cereus (*2000 cfu/gr) was identified in one eggplant salad sample. Environmental investigations at the facilities indicated structural and operational deficiencies.

Epidemiological evidence suggested that beef scaloppini with mushrooms cream dish was the most likely vehicle of transmission. However, it was not possible to identify the contaminated ingredient in this dish. The short incubation period, the duration of symptoms and the type of symptoms were consistent with toxin contamination. We recommended addressing the structural and operational deficiencies in the hotel food premises and reinforcing good hygiene practices to prevent future outbreaks.

### *Role and outputs:*

Maria was the primary investigator of this outbreak. She adapted the questionnaire for the interviews, collected the data using telephone interviews, developed the data entry mask, performed data entry, analysed data and composed an epidemiological report for the stakeholders (7).

### *Supervisor(s):* Dr. Angeliki Lambrou, Dr. Kassiani Mellou

### *Competencies developed:*

By working on the gastroenteritis outbreak, I got familiarized with the steps of an outbreak investigation. By performing the cohort study, I developed different technical skills, including multivariable data analysis. I gained experience in the management of a foodborne outbreak and especially in collaboration with regional health authorities. Also, I learned to manage the limitations in the absence of a definitive microbiological diagnosis.

# 3. Applied epidemiology research

## *Knowledge, attitude and practices regarding malaria among local and migrant population, Sofades, Central Greece, 2014*

In 2012-2013, a cluster of 12 malaria cases was reported in Sofades municipality, Central Greece, an agricultural area with migrants from malaria endemic countries. In June-July 2014, we conducted communication campaigns

targeting locals and migrants and periodic house-to-house fever screening of migrants. We conducted two knowledge, attitude and practice (KAP) surveys before (June 2014) and after (September 2014) the interventions to evaluate their effectiveness.

In both surveys, we randomly selected households using spatial sampling and included one randomly selected individual in each household. In the second survey, we also selected a simple random sample of migrants, only present after June. We interviewed participants using a structured questionnaire. We defined knowledgeable about malaria if >1 correct answer regarding transmission, symptoms and/or prevention were provided and sufficiently protected if >1 mosquito protection practices (MPPs) (repellents, insecticides, window-nets) were used. We calculated prevalence differences adjusted for socioeconomic factors (aPD) using binomial regression.

In the first survey 101 local residents participated while 153 locals and 137 migrants participated in the second survey. Among locals, 45% (45/101) knew about malaria before the intervention and 77% (118/153) after (aPD=34%; 95%CI=22%-45%); 87% (88/101) were sufficiently protected before and 79% (121/153) after (aPD=-10%; 95%CI=-19% to-0.5%); 60% (56/93) would seek healthcare within 48 hours before versus 55% (83/151) after (aPD=-6%; 95%CI=-19% to-6.8%). After the intervention, 72% (98/137) of migrants knew about malaria; 99%(130/131) of migrants would seek healthcare within 48 hours versus 55% (83/151) of locals (aPD=35%; 95%CI=22%-47%). None of migrants used >1 MPPs.

Despite the interventions and an increase in malaria knowledge among locals, use of MPPs did not increase. Systematic education is needed to ensure better compliance with malaria preventive practices.

### Role and outputs:

Maria was the joint primary investigator in this study. She conducted the communication campaigns in local residents and migrants; set up the periodic house-to-house fever screening of migrants; performed data cleaning and analysis and submitted an abstract for ESCAIDE 2017 that was accepted as a poster presentation (8). She submitted a manuscript to a peer reviewed journal (9).

### Supervisor(s): Dr. Angeliki Lambrou, Dr. Kostas Danis


### Adherence of tuberculosis patients to tuberculosis treatment and determinants in Greece: study protocol

Patients' adherence to TB treatment is crucial for cure of individual patients, preventing spread of infection, and eliminating the development of drug resistance. Various studies have highlighted poor adherence to TB treatment with 20 to 50% of patients failing to complete therapy. In Greece, no such study has been undertaken. We designed a cross-sectional study to estimate the adherence of tuberculosis patients to TB treatment and to identify factors associated with non-adherence in order to propose effective solutions to improve compliance.

We included all TB patients diagnosed from 1 June 2015 to 30 June 2016, who received TB treatment and were under follow up by the Outpatient Clinic of the Anti-TB Department of "Sotiria" General Chest Diseases Hospital of Athens (GCDHA), covering about 40% of the total TB cases in Greece. We excluded patients treated for Rifampicin-Resistant TB or Multi-Drug-Resistant TB and those admitted to psychiatric hospitals or in prisons. We used the WHO TB treatment outcome definitions classifying as "adherent" those who were either "Cured" or whose "Treatment was completed". We will collect data from i) patients' records and ii) telephone interviews with patients using a structured questionnaire. To examine associations between independent variables and the outcome, we will calculate adjusted Prevalence Ratios with 95% confidence intervals using Poisson regression.

Data collection is ongoing.

### Role and outputs:

Maria was the lead investigator. She designed the study, developed the questionnaire, wrote the protocol and submitted the protocol to the Ethics Committee of the "Sotiria" GCDHA. The protocol was approved by the Ethics Committee (10).

### Supervisor(s): Dr. Angeliki Lambrou, Dr Katerina Manika (Aristotle University of Thessaloniki)

## *Rapid needs assessment of the refugee migrant population in the three camps of Elliniko, June 2016, Athens, Greece*

In early 2016, MSF launched support activities in the three refugee camps of Elliniko (3,612 individuals) in Athens. MSF planned to conduct a vaccination campaign in the camps. We aimed to assess the health and sanitary needs of refugees and to estimate baseline measles/measles-mumps-rubella (MMR) vaccination coverage among <15 year-olds.

We conducted a survey among a random sample of refugees residing in the camps. The number of participants by camp was proportional to camp size. In two camps, we used systematic sampling to select tents and in the third, we used simple random sampling. We interviewed one randomly selected individual above 15 years-old from each selected tent. We calculated weighted proportions using the number of people per tent as weights and adjusted for clustering for the vaccination coverage estimate; a cluster was defined as a single shelter.

We included 214 individuals in the analysis. 44 (23%) reported having at least one chronic disease; of which 12 (30%) reported having high blood pressure, 12 (30%) heart and 11 (28%) kidney diseases. Among those with these pathologies, 50%, 68% and 83% reported not taking the appropriate treatment, respectively. 106 (51%) respondents reported not having adequate access to soap and 157 (59%) to clothe-washing. 90 (43%) respondents did not feel safe within the camp. Vaccination against measles was known for 220 of the 348 (63%) <15 year olds. Among those, 15 (6.8%) were vaccinated based on vaccination records and 168 (76%) based on parental/guardian recall.

This assessment indicated low access to proper care for chronic diseases with the majority of respondents reporting not taking appropriate treatment. It also indicated insufficient hygiene conditions in the camps, with limited access to basic hygiene material. Refugees in Elliniko camps need to be provided with sufficient access to chronic disease and sufficient hygiene material.

### *Role and outputs:*

Co-investigator. Maria contributed to the survey and the design of the sampling strategy, piloted the questionnaire, conducted interviews with refugees and revised the study report (11).

### *Supervisor(s):* Dr. Kostas Danis

### *Competencies developed:*

With the KAP on malaria project, I gained more experience in data analysis particularly in multivariable analysis. I became more familiar with scientific writing. Furthermore, I had my first experience on creating a poster.

By working in the TB treatment adherence project, I had the opportunity to get involved in all the initial stages/steps of an applied epidemiological research. From the literature review, I gained more knowledge on the public health burden of TB. Also, I learnt a lot about sampling techniques and I developed further my skills to design a questionnaire and plan the analysis.

With the rapid needs assessment of the refugee migrant population project, I became more familiar with random sampling techniques. I also gained insight on Epi-Collect mobile data collection tool.

# 4. Communication

## *Publications in peer reviewed journals*

None to date

## *Manuscripts submitted to peer reviewed journals (in review process)*

One manuscript submitted to a peer reviewed journal (9).

## *Conference presentations*

- One oral presentation at ESCAIDE 2016 (1).
- One abstract accepted for poster presentation ESCAIDE 2017 (8).
- Five presentations (as an invited speaker) at national conferences [8th Conference of the Greek Society for Infection Control (2), 11th Panhellenic Conference on Public Health and Health Services (12), One day

Conference on "Malaria in Greece today" organised by the Hellenic Center for Diseases Control and Prevention and the National School of Public Health (5), 1st Panhellenic Forum for the Study and Prevention of Vectorborne Diseases (6), 4th Panhellenic Conference on Crisis Management in Health Sector (13)].

### Other presentations

Three oral presentations as co-author at 11th Panhellenic Conference on Public Health and Health Services, 21-23 March 2016, Athens, Greece (14, 15, 16).

### Reports

One outbreak report (7), one surveillance report (4) and one protocol/application to the Research Ethics Committee (9)

### Other

One manuscript as first author published in Plos Negleted Tropical Diseases from work before EPIET: Tseroni M, Baka A, Kapizioni C, Snounou G, Tsiodras S, Charvalakou M, Georgitsou M, Panoutsakou M, Psinaki I, Tsoromokou M, Karakitsos G, Pervanidou D, Vakali A, Mouchtouri V, Georgakopoulou T, Mamuris Z, Papadopoulos N, Koliopoulos G, Badieritakis E, Diamantopoulos V, Tsakris A, Kremastinou J, Hadjichristodoulou C; MALWEST Project. 2015. Prevention of Malaria Resurgence in Greece through the Association of Mass Drug Administration (MDA) to Immigrants from Malaria-Endemic Regions and Standard Control Measures. *PLoS Negl Trop Dis. 9(11):e0004215*.

President of the Scientific Committee of the 9th Conference of the Greek Society for Infection Control, 02-04 November, Athens.

## 5. Teaching activities

### Management of a hospital outbreak. Case study: Outbreak Investigation in a Neonatal Intensive Care Unit.

Maria developed, presented and facilitated the above case study (duration 50' minutes) during a 5-day seminar of the Greek Society for Infection Control on Infection Control Specialization delivered in Athens, Greece, on 18-22 April 2016. The 120 attendees of the seminar were Infection Control healthcare professionals from all over Greece.

She also facilitated an updated version of this case study during a 5-day seminar of the Greek Society for Infection Control on Infection Control Specialization at the Henry Dunant Hospital, Athens, Greece, on 20-24 February 2017. The audience was 70 healthcare professionals from all over Greece with experience or interest in Infection Control.

### Lecture on Malaria Active Case Detection Methodology and Best Practices.

Maria developed and delivered a one–hour interactive lecture at the Public Health Directorate of West Greece, Patra, Greece, on 19 August 2016, to 20 public health professionals. The aim of the lecture was for participants to implement the Malaria Active Case Detection system in the Regional Units of Achaia and Ilia.

### Field Training of two MediPIET fellows from FYROM on Malaria Active Case Detection in Evrotas Municipality, Southern Greece.

Maria developed and delivered 20 hours of training. The training took place during 12-16 September 2016, at Evrotas Municipality, Lakonia, Southern Greece. The training included: i) preparation for the visits to migrants' residencies (such as schedule of visits, data entry, preparation of the required equipment/material for the Active Case Detection) and ii) visits to the houses of migrants from malaria endemic countries for fever screening.

### Lecture on Malaria in Greece

Maria developed and gave a forty-minute lecture on malaria in Greece, at the National School of Public Health, Athens, Greece, on 11 October 2016. The lecture focused on the national epidemiological data of malaria and on focus investigation of malaria cases in Greece. The target audience was 100 postgraduate students in Public Health and Health Services Management.

### Lecture on Malaria in Greece

Maria developed and gave a 2-hour lecture at the Department of Nursing, University of Peloponnese, Sparta, Greece, on 27 October 2016. The lecture focused on the national epidemiological data of malaria and on malaria active case detection methodology and best practices. The audience was 35 undergraduate students of Nursing, who after the training participated as observers in the Active Case Detection of Malaria Cases Program at Evrotas municipality, Southern Greece.

### Case study: Outbreak Investigation in a Neonatal Intensive Care Unit.

Maria developed, presented and facilitated the above case study (duration 90' minutes) during the 9th Conference of the Greek Society for Infection Control which took place from 2 to 4 November 2016, in Athens, Greece. The 37 participants of the case study were Infection Control healthcare professionals from all over Greece. Participants completed an evaluation form.

### Workshop: How effective is our teaching

Maria in collaboration with a colleague developed, presented and facilitated the above workshop (duration 105' minutes) during the 9th Conference of the Greek Society for Infection Control which took place from 2 to 4 November 2016 in Athens, Greece. The 50 participants of the workshop were Infection Control healthcare professionals from all over Greece.

### Lecture: Public Health Organizations at International, European and National level. Functions and aims.

Maria developed and delivered the above lecture (duration 50 minutes) during a 5-day seminar of the Greek Society for Infection Control on Infection Control Specialization delivered at Henry Dunant Hospital, Athens, Greece, on 20-24 February 2017.The 70 participants of the course were Infection Control healthcare professionals from all over Greece. The seminar was delivered the week

She also delivered an updated version of the lecture (duration 50 minutes) at the National and Kapodistrian University of Athens, Faculty of Nursing, on 10 March 2017. The audience was 20 postgraduate students in Disaster Medicine and Crisis Management.

### Educational outcome:

Developing and delivering these teaching assignments, I deepened my knowledge in epidemiological concepts and methods.

## 6. Other activities

Surveillance

- Maria was actively involved in the routine on-call activities of the Department that involved checking data completeness and quality, and performing case investigations for the Mandatory Notifiable Diseases System reports. Since January 2016 to July 2017, she investigated 327 cases of communicable diseases.
- Maria was involved in daily on call/telephone help-line duties for:

- o   notification of malaria-like symptoms and related health issues among the target population of migrants in Evrotas municipality

- o   notification of the laboratory results of blood samples taken from suspected malaria cases in the Evrotas municipality by the local hospital laboratories and the National Reference Laboratory for malaria

- o   problem-solving for issues related to the malaria active detection process notified by the field team

- She organised and conducted the following investigations for locally acquired malaria cases:

    - o   Focus investigation – reactive case detection (RACD) in the focus of a reported introduced locally acquired malaria case in Metohi, Regional Unit of Ahaia, Peloponnese, 14 to 15 July 2016.

    - o   Focus investigation – reactive case detection (RACD) in the focus of a reported introduced locally acquired malaria case, Evaggelismos, Regional Unit of Larisa, Thessalia, 15 to 16 December 2016.

    - o   Focus investigation – reactive case detection (RACD) in the focus of a reported introduced locally acquired malaria case, Nea Manolada, Regional Unit of Ilia, West Greece, 25 to 28 June 2017.

    - o   Malaria case investigation in General Hospital of Nafplio,  Regional Unit of Argos, Peloponnese, 23 December 2016

## Research

**Building a model to estimate the incidence rate of malaria in Evrotas Municipality**

Following an outbreak of 36 locally-acquired malaria cases in Evrotas in October 2011, the number of diagnosed cases were 27 in 2012, 0 in 2013 and 2014, and 8 in 2015. We aimed to build a model for estimating the incidence of malaria in Evrotas municipality, to prioritize malaria control activities.

We collected data on the weekly number of migrants, duration of stay in Greece, and case status in the context of the Malaria Active Case Detection Surveillance System in Evrotas. The 2012 and 2015 data will be used to build a person-time model to estimate malaria incidence.

The project is ongoing.

Role: Maria is a member of the research team.

## Additional training

- Completed the MSF course "Preparation for Primary Departure", 26 to 31 May 2016, Bonn, Germany.
- Completed ECDC on line course on Influenza vaccination of healthcare workers, 10 November 2016

# 7. EPIET/EUPHEM modules attended

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

2.   EPIET/EUPHEM Outbreak Investigation Module, 7 to 11 December 2015, Berlin, Germany

3.   EPIET/EUPHEM Multivariable Analysis Module, 14 to 18 March 2016, Vienna, Austria

4.   EPIET/EUPHEM Risk Assessment Sampling Module, 20 to 25 June 2016, Athens, Greece

5.   EPIET/EUPHEM Project Review Module, 22 to 26 August 2016, Lisbon, Portugal

6.   EPIET Time Series Analysis Module, 7 to 11 November 2016, Bucharest, Romania

7.   EPIET Vaccinology Module,12 to 16 June 2017, Stockholm, Sweden

## Supervisor's conclusions (Angeliki Lambrou)

During her two-year EPIET fellowship in the Department of Epidemiological Surveillance and Intervention at the Hellenic Center for Disease Control and Prevention (HCDCP), Maria Tseroni has successfully achieved all her objectives. She assumed a leading role in preventing malaria outbreaks in the country and especially in Evrotas municipality where malaria had been re-introduced in 2011. She successfully set up, re-assessed and maintained an active case detection surveillance system under extremely challenging conditions, developing her leadership, communication, analytical and teaching skills. Her work has been used by HCDCP as a role-model for setting up similar systems elsewhere in the country as well as informing the public health professional and scientific community about malaria in Greece. Further, as public health prevention activities and campaigns in Greece need to be strictly prioritized and efficiently organized now more than ever, Maria's research results of the Knowledge, Attitude and Practices studies on malaria disease and mosquito prevention in affected areas will be of a great value for HCDCP. Maria led the epidemiological investigation of a foodborne outbreak which helped her further advance her analytical skills. Her original research idea on adherence of tuberculosis patients to tuberculosis treatment and determinants in Greece excited all relevant stakeholders and got translated into a research protocol and successful ethics application. Her work can be further developed by herself and HCDCP in order to increase our sparse country-specific scientific knowledge on TB treatment adherence. Another area where I have had the privilege to see Maria's great development was in teaching of which she had plenty of opportunities to practice during her fellowship. Every time she very knowledgeably and creatively prepared her teaching material, style and approach, targeting different audiences. At the same time, Maria has been actively involved in the department's on-call duties as well as meetings and other surveillance and investigation activities.

Both individually and as a team member, Maria rose to each work occasion. She was always receptive of constructive criticism and scientific review. It was an absolute pleasure to work with her as she is not only very hard working and highly dedicated to field epidemiology but also a positive and a kind person. I strongly believe that the EPIET fellowship gave Maria the opportunity to improve her field epidemiology competencies and skills and will allow her to successfully pursue her future professional aspirations.

## Coordinator's conclusions (Kostas Danis)

Maria Tseroni was trained as an MS-track fellow in the surveillance unit of the Greek CDC. During her fellowship, she worked hard on a diverse range of topics (such as active case finding activities in areas with malaria transmission in Greece, knowledge attitudes and practice surveys, TB treatment adherence study) and using a variety of methods. She was highly motivated and passionate with her work. She always focused on achieving the goals of the projects she was involved in. She demonstrated a positive attitude towards scientific review and she was always ready to accept constructive criticism. Despite having a lot of routine work as a MS-track fellow, she managed to achieve all her EPIET objectives. Through her projects and the EPIET training, Maria managed to develop her competencies in epidemiology and public health, and improved her epidemiological skills.

## Personal conclusions of fellow

EPIET has been a very enriching experience professionally and personally. I have learned many new skills through the modules, which were re-enforced by applying them subsequently to projects. I had opportunities to broaden my understanding of the epidemiology of a wider range of infectious diseases, and of study designs and methods.

Also, through EPIET, I had the opportunity to meet healthcare professionals (especially epidemiologists) from all over Europe and cooperate with them on different occasions. EPIET programme gave me knowledge and skills which I believe I will develop further in the future.

## Acknowledgements

I am immensely grateful to my supervisor Dr. Angeliki Lambrou who is a great mentor, has a precise yet pragmatic approach to epidemiological study design and implementation, and encouraged my efforts during EPIET fellowship.

I am also grateful to my EPIET front line co-ordinator Kostas Danis, who was constantly available for advice and provided excellent support, who has amazing skills and patience in explaining difficult epidemiological concepts, and who consistently encouraged me to strive for improvement in my epidemiological skills.

I would also like to acknowledge Apostolos Papavasileiou, MD, Director of Anti-TB Department of "Sotiria" General Chest Diseases Hospital of Athens and Assistant Professor Katerina Manika, who supported me during the preparation of the research protocol regarding the adherence to TB treatment in Greece; Professor Christos Hadjichristodoulou for the cooperation during my Surveillance project; Danai Pervanidou for the cooperation on malaria prevention activities; Dr Kassiani Mellou, Eleni Triantafillou, Anthi Chrisostomou and Aggeliki Giakoumi for their support during my gastroenteritis outbreak investigation; Ioanna Kokali for the administrative support for the

attendance of EPIET modules; and Dr Theano Georgakopoulou as Head of Department of Epidemiological Surveillance and Intervention, Hellenic Center for Disease Control and Prevention. Furthermore I would like to thank Valentinos Silvestros (EPIET Cohort 2013) for the cooperation on KAP Malaria Project; and Agoritsa Baka for her continuing support and encouragement.

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