MediPIET Report
Summary of work activities

DorinaToçi
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Training site: Institute of Public Health, Albania, Department of Epidemiology and Health Systems

National Supervisors: Dr. Eugena Tomini, Dr. Ervin Toçi

Scientific Coordinator: Dr. NikolettaMavroeidi (March 2016)

Pre-fellowship short biography

I am a medical doctor specialized in Public Health. I have attended an International Master of Public Health program at Braun School of Public Health and Community Medicine, Hebrew University, Jerusalem, Israel. I started to work at the Institute of Public Health since October 2004 at the department of Epidemiology and Health Systems. I am the national coordinator of congenital malformations surveillance system in Albania. I have completed the PhD programme at the Faculty of Public Health, University of Medicine on the "Epidemiology of Congenital Malformations in Albania". I have been engaged in several studies and projects with the main focus on non-communicable diseases and reproductive health.

Fellowship projects

Surveillance projects

Title: Congenital Malformations in Albania for the period 2011-2015, data from Congenital Malformations Surveillance System

Background:
The prevalence of congenital malformations (CMs) varies from 10-60 per 1000 live births and this figure increases significantly if the CMs detected later in life are included. Almost three million fetuses and infants are born each year with major CMs. Moreover, CMs contribute about 500,000 deaths worldwide each year. While 2-3% of infants are born with major CMs, they account for 500,000 deaths worldwide each year and for 20% of infant deaths in developed countries. CMSS in Albania covers all the districts - 36 and regions - 12. CMSS collected information from all public hospitals (maternity and pediatric wards/hospitals) and primary health care centers (PHCC) of Albania. All hospitals and PHCC of the country report CMs individual reporting forms.

In 2009, the Institute of Public Health (IPH) in collaboration with the Ministry of Health and UNFPA began implementing the congenital malformations surveillance system (CMSS) as a first step towards identifying the major CMs in Albania and exploring their genetic, socio-demographic, environment and nutrition factors that increase the risk for CMs. There is an individual mandatory reporting form; for all congenital malformations (CMs) diagnosed during pregnancy, induced abortion, live birth, stillbirth and + early neonatal death, children up to 2 years old. In our country up to now no study described the distribution and characteristics of CMs nationwide for the period 2011-2015, and this report isthe first to analyse the data for the whole period in order to enhance the prevention of CMs and adapt existing antenatal care programs.

Objectives:

1. To estimate the prevalence of congenital malformations for the period 2011-2015, by year of notification, by region and by specific type of CMs in Albania,
2. To describe the distribution of congenital malformations by different socio-demographic and birth related characteristics for the period 2011-2015,

Methods:

The data for this report were extracted from the CMSS at the Department of Epidemiology and Health System in IPH, Albania. Fetal deaths prior to 20 weeks of gestational age are not included. The frequencies of all variables (congenital malformations diagnosis, residence by region and urban/rural, infant birth weight, gestational age, infant's gender, mother's age, mother's level of education, mother's status of employment, mother's ethnicity and vital status of the baby) were calculated.Analysis was performed as follows: frequencies were run for all variables defined in the section of operational definitions to identify missing data and outlier values. The prevalencewas calculated using the numbers of CMs cases in the nominatorand the number of live births for each year in the denominator. Statistical significance was set to p-value 0,05."The Statistical Package for Social Science 15th Edition (SPSS Inc.) was used fort he analysis.

Results:

From 2011 to 2015 a total of 166093 live births occurred and 2384 babies were reported with CMs, with a calculated average prevalence of 14.4 per 1000 live births (95% CI: 13.79-14.94). The prevalence of CMs during 2011-2015 was 15.2, 14.3, 14.1, 11.6 and 16.9 per 1000 live births per each year respectively. The prevalence rate of total CMs in Albania increased by 11% from 2011 (15.2/1000 live births) to 2015 (16.9/1000 live births). From 2011 to 2015, the six main types of congenital malformations were hypospadias; polydactyly; down syndrome; ventricular septal defect; cleft palate and cleft lip; atresia and stenosis of large intestine, rectum and anal canal, with an average prevalence of 1.11; 0.89; 0.89; 0.76; 0.67 and 0.52 per 1000 live births, respectively. For the period 2011-2015 the total prevalence of CMs was higher among males than in females (16.0 and 10.8 per 1000 live births respectively). The prevalence of CMs in mothers ≥30 years old (19.4/1000 live births) was higher than that in mothers under age 30 (11.7/1000 live births). During the whole study period, 66.5% of mothers were unemployed. Around 48% of mothers had 8 years of education or less and 46% had higher education. Among all babies with CMs during the period 2011-2015, 89.2% were born alive, 4.9% were stillbirth, 4.2% were early neonatal deaths and 1.7% of cases were induced abortions. Around 74% of cases had a normal birth weight and 75% of cases were born on term. During 2011-2015, Tirana and Gjirokastra are the regions with the highest prevalence rates of CMs (28.1 and 22.4 per 1000 live births respectively); meanwhile there are a lot of variations in the prevalence rates of CMs in other regions of Albania.

Conclusions: The observed differences in the prevalence among regions could be partly explained by variations in diagnostic practice (inadequate training of medical staff and infrastructure in some districts), and reporting problems in some districts due to frequent turnover of staff in public health district directories.

Status: Completed / Oral presentation for MediPIET Annual Conference in Marrakesh, Morocco, 2016. Published in the Albanian Medical Journal, Vol. 4, 2016

Title: Evaluation of congenital malformations surveillance system for the year 2015 in Albania

Background:

Congenital malformations (CMs) represent a significant health problem worldwide. The prevalence of specific CMs is different in different populations and its assessment depends on the health care system, the use and coverage of preventive services, access to screening, diagnosis and termination of pregnancy in severe cases. Worldwide, the prevalence of CMs varies from 10-60 per 1000 live births and this figure increases significantly if the CMs detected later in life.In Albania, during 2011-2015 the prevalence of CMs was 14.4 per 1000 live births (95% CI: 13.79-14.94). The prevalence of CMs in Albania increased by 11% from 2011 to 2015.Since 2017 no evaluation of the surveillance system was done before. The aim of the study was to describe the prevalence of CMs in Albania during 2011-2015 in order to evaluate and adapt antenatal programs and to evaluate the performance of the surveillance system for the year 2015 in order to improve it.

Objectives:

1. To evaluate the CMSS as a surveillance system for detecting congenital malformations by assessing its attributes.

Methods:

The evaluation followed the Centers for Disease Control and Prevention guidelines for evaluating public health surveillance systems (2001). The evaluation focused on 2015 data of the surveillance system.CMs cases reported are compared with the ones in the respective hospital. Health personnel (in 36 districts) involved in the surveillance system participated in the evaluation. We assessed the system's usefulness, simplicity, flexibility, data quality, acceptability, representativeness and timeliness. CMs forms (#) reported through CMSS were compared with CMs cases in the hospitals registers (percentage of reporting with CMs form was calculated for the analyzed year) in order to assess the representativeness. We have calculated the proportion of missing values for each variable on the reporting form (38 variables in total) in order to assess the data quality.

Results:

The evaluation is focused on 2015 data of the surveillance systemonly form public sector, because there was no report of CMs from private sector up to 2016. *Usefulness* –CMSS provides information for descriptive and etiologic studies of CMs. CMSS provides data to Maternal and Child Health programs, public health experts, health professionals, policy makers and the general public. CMSS is able to detect trend over years (time, person and place). A TAIEX workshop on the framework of the surveillance and prevention of CMs was organized in Tirana on October 2017.*Simplicity* - CMSS is a passive, paper based surveillance. In 2015, the participations of all (38) public hospitals of Albania was 100%. All (36) public health district directories and all (36) specialists of the surveillance in the districts reported (100%). There are two types of reporting sources [hospital registers (only the total number) and CMs individual form]. 100% of reported cases to CMSS met the case definition criteria. The reporting form is composed of two pages and contains 38 variables. The surveillance system operates within the existing budget and human resources.*Flexibility* - the reporting form can easily adapt to new CMs diagnosis, changes in the case definition, technology, introduction of ICD 10 (adding other options in different fields of the reporting form). CMSS was enhanced for *microcephaly* reporting in the framework of Zika virus transmission (according to WHO guidelines). *Data quality*–Overall completeness of the CMs forms was 83.2 % (for 38 variables),socio-demographic factors 100 %, risk factors 0%.*Acceptability* - 100% is the proportion of public health specialists involved in the surveillance activities. Overall the completeness of the form was 83.2% for all 38 variables. 100% participation from the hospitals (38).*Representativeness* - Cases notified by the CMSS represent 82% of all live birth cases with CMs as compared to the total number in hospital registers. CMSS is a nationwide, population based that covers

the whole population of births in Albania (29,000 births in 2015). Timeliness –all institutions (38) reportedmonthly in time, 100%.

Conclusions: CMSS is rather simple, flexible, and provides useful data. This is the first evaluation of CMSS in Albania. Main weaknesses of the surveillance that need to be improved are: lack of reported CMs among stillbirths and induced abortions, no reporting on risk factors data in the reporting form, missing data from private sector and lack of an ongoing system for evaluating the accuracy of reported diagnoses.

Recommendations:

- Improve reporting of risk factors among all cases through a specific law or regulation
- Improve reporting of CMs among stillbirths and induced abortions
- Conduct routine monitoring in order to ensure that the activities of the surveillance system maximize case ascertainment
- Implement regular trainings of the staff in Public Health District Directories regarding the surveillance system
- Continuously train the physicians about the importance of reporting CMs

Status: Completed / Accepted as oral presentation for MediPIET Annual Conference in Brussels, Belgium, 2017
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Outbreak Investigations:

Title: Food borne outbreak among a group of students travelling in North of Albania, 2017

Background:

Foodborne diseases due to known pathogens are estimated to cause 9.4 million illnesses each year in the United States. *Salmonella* is 1 of 4 key worldwide causes of diarrhoeal diseases. Most cases of salmonellosis are mild; however, sometimes it can be life-threatening. The severity of the disease depends on host factors and the serotype of *Salmonella*.
The cases were reported from the emergency unit of the main University hospital (Mother Theresa) in Tirana to the department of communicable diseases at IPH, on September 1st. There were 36 students and 1 driver traveling to the North of Albania (Valbona touristic village) and on August 31st they had lunch at a restaurant in Kukës district. In the same day, during the night, they were traveling back to Tirana, and only 9 of the persons started to have symptoms starting from 23:00 pm of August 31st. In this outbreak investigation are included all cases with symptoms who received medical care at the emergency unit of Mother Theresa Hospital in Tirana. The main symptoms were: abdominal cramps, fever, headache, diarrhea without blood and tremor. The case definition for was composed as follows: all the persons that went on North trip in Valbona touristic village, that consumed lunch at the specific (X) restaurant of Kukës district on August 31st and that had the following symptoms after 20 pm: diarrhea without blood and/or high fever, abdominal cramps, headache, tremor. The objective of the outbreak investigation was to identify the cause of the outbreak among 37 persons traveling to North of Albania.

Methods:

An outbreak investigation (OBI) team was created and an outbreak investigation plan was drawn up by IPH staff and in collaboration with the clinicians from the hospital, health inspectorate specialist of Kukës district and the public health directory of Kukës. The outbreak investigation team contacted all the 37 persons traveling to North of Albania and who had lunch at the restaurant. Rectal swab samples were taken from the cases and were analyzed at the Institute of Public Health in Tirana. Socio-

demographic characteristics (age, gender, place of residence) were registered for all the students (cases and non cases). The symptoms and the time of symptoms were registered for all the nine cases. The OBI team listed all the items of the lunch menu that students consumed, and all persons were interviewed about all food items and in case they had any symptom. Stool specimens for gastroenteritis cases were collected and were bacteriologically and virologically tested at the Institute of Public Health in Tirana. Food, water samples and stool specimens of the staff working in the restaurant were collected and tested by Health Inspectorate of Kukës.

Results:

The cohort of this outbreak is composed of 37 persons, 36 students and 1 male driver. 54% of persons were females. They all belonged to 20-25 age groups except the driver who was 49 years old. 100% of the cases had abdominal cramps. Around 67% of them had high fever and around 56% of them had diarrhoea without blood. 100% of the cases have consumed respectively chicken meat, fried potatoes and bottled water, and only 33.3% of them consumed energy drink. The total attack rate of illness was 24.3%, CI 95% 11.8 to 41.2. The highest attack rates were registered among persons that consumed chicken (39.1%) and bottled water (36%). Multivariable analysis was performed to control for potential and actual confounding effects. Although not statistically significant, persons who consumed chicken had 8 times a higher risk of getting ill than persons who didn't consume chicken. In univariate analysis it can be noted that all the associations are not significant. The situation is similar in multivariable analysis models, showing no significant confounding effects. For all cases, rectal samples were taken and tested at the microbiological laboratory. 6 out of 9 (66.7%) rectal samples resulted positive for *Salmonella gr. D serotypeEnteritidis*. Remained food items were tested at the microbiological laboratory at Health Inspectorate of Kukes district and only chicken meat and packaging paper of chicken meat resulted positive for *Salmonella Enteritidis*. One of the limitations of this investigation is the lack of information on previous meals, other than lunch on August 31st in Kukes district, consumed by the persons involved in the outbreak. The laboratory capacities in Albania are limited to diagnose only the serotype of *Salmonella gr. D Enteritidis*without performing DNA testing to further divide each serotype into more subtypes. The investigation team concluded that the source of this outbreak was chicken meat contaminated with *Salmonella Enteritidis*.
Recommendations were addressed to the restaurant staff to ensure that all sanitary requirements are meet in the process of food preparation and storage. Employees were advised for maintaining good sanitation and hygiene practices.

Status: Completed/ member of investigation team/data collection and analysis

Title: Acute gastroenteritis outbreak investigation in Tirana, March-May 2017

Background: Noroviruses are the most common cause of epidemic gastroenteritis, responsible for at least 50% of all gastroenteritis outbreaks worldwide often responsible for outbreaks in a wide spectrum of community and healthcare settings. Infection due to norovirus is extremely common in the community with as many as one in one hundred people becoming ill each year. Humans are the only known reservoir for human norovirus infections, and transmission occurs by three general routes: person-to-person, foodborne, and waterborne.

An increased number of gastroenteritis cases were reported at the Institute of Public Health (Department of Infectious Diseases) Tirana on April 4, 2017 from the two emergency units of the main hospital (Mother Theresa) in Tirana: communicable diseases emergency unit and pediatric emergency unit. The number of persons reported with gastroenteritis has increased significantly from April 1, onwards compare to the previous days and to the same period of the previous year.An outbreak control team was created and an outbreak plan was drawn up by IPH staff and in collaboration with the clinicians from the hospital. The team conducted descriptive epidemiological and microbiological investigations to determine the source and extent of the outbreak and to guide the appropriate control and preventive measures. The objective of the outbreak investigation was to identify the source and to

initiate proper control measures in order to stop the current outbreak and prevent future outbreaks.

Methods: Two emergency units were contacted for the retrospective identification of acute gastroenteritis cases since the beginning of April and possible new cases among patients every day. Gastrointestinal symptoms were more common among children and elderly people. Acute gastroenteritis cases that occurred after April 1, 2017 were recorded.
To identify the possible cases, the data were taken from the registers of two units in "Mother Theresa„ tertiary hospital of Tirana. Any patient that was presented in Pediatric and Infectious disease emergency hospital the emergency hospitals of University Hospital Center (UHC) from April 1, 2017 with the following symptoms: nausea, abdominal pain, vomiting and/or diarrhea and/or fever, was identified.
Descriptive epidemiology was performed on the collected cases of acute gastroenteritis with dates from March 29 to May 7 (outbreak period) and furthermore interviews were conducted with a subset of these cases, available family members and relatives, in order to collect the initial information on symptoms and possible exposures. Stool specimens were collected and were bacteriologically and virologically tested. Water samples at different points in the distribution system were collected and tested microbiologically for the presence of coli forms. Norovirus detection was performed by RT-PCR test.
Based on the results of the descriptive study, a waited case-control study (120 cases-120 controls), matched by place and residence was conducted during August 2017, using a questionnaire, in order to test the hypothesis that the tank water was the source of the outbreak. The case-control study was performed on 120 adult cases with gastroenteritis signs (phone numbers taken from the registers of the emergency units) and 120 controls of the same neighborhoods (controls were randomly selected from the same administrative units of cases by the GP registers) and they were telephone interviewed.

Results: *Descriptive*-The total number of AGE cases was 4910 and they were registered from March 29 to May7, 2017. The higher number of cases was observed between dates April 2 and April 18 (57.4% of the total cases). Units with higher attack rates for Tirana urban area were administrative unit no. 6 (AR=1.44 - 868 cases), administrative unit no. 9 (AR=0.92 - 476 cases) and administrative unit no.4 (AR=0.85 - 568 cases); and regarding rural area Farka (AR=3.08 - 358 cases) and Kamza (AR=0.58 - 427 cases) communes.
The patients were presented at the emergency units of "Mother Theresa„ hospital within the first 24 hours after the occurring of clinical signs. They have had mostly vomiting (94%) and abdominal cramps (84%), diarrhea (78%), nausea (74%) and few of them (9%) had fever. The majority of cases belonged to the pediatric age-group (less than 5 years old) (AR=3.0 and 33.2% of total cases) followed by the age-group 16-25 years old (AR=1.0 and 31.0% of total cases). Only 1.5% of patients presented in the Emergency Infectious Unit were hospitalized and among children presented in the Emergency Pediatric Unit only 5% were hospitalized. After some initial interviews with the cases it was concluded that they had not consumed common food items. The only risk factor related to this outbreak was found to be linked with the consuming of tank water.
Twenty eight out of the 57 faecal samples (49.1%) analyzed in the virology laboratory resulted positive for Norovirus and genotype II was identified. Microbiological testing of the drinking water (water supply system) resulted negative for coliforms at points in the distribution system.
According to the Water Supply System Enterprise the main water sources for Tirana Municipality are 4: Plant and hyrdo point Bovilla, Gravy source Dajti Basin which include Shen Meri source, Selita spring, Pump station and Dajti basin taks; Pumping stations I and II and Independent source. The water is processed using the normal physical treatment, chemical treatment and disinfection, e.g. pre-chlorination, coagulation, decantation, filtration and disinfection (final chlorination). During the treatment process the quality of drinking waters achieve the values required from the Albanian Standard for drinking water (STASH 3904:1997;VKM 145,1998). The quality of drinking water is regularly monitored by two chemical and microbiological laboratories in Tirana Water Supply Company and by the laboratories in the Public Health Directorate (Sanitary Inspectorate of Health). Both two laboratories make daily analysis of 16 samples taken in determined points in Tirana city network, for 7 physical-chemical parameters and 3 microbiological parameters (total coliform, E.coli and fecal Streptococci). The residual chlorine present in drinking water is constantly within the allowed norms at 0.5-0.8 mg/l. Nevertheless, Tirana water pipeline has a lot of amortized segments, hundreds of thousands of suction pumps installed in the network, thousands of deposits above and below the

buildings, which are generally not cleaned, with the addition of residential areas and many intersections in the water supply network, with no 24 hour water supply and generally with delayed interventions in repairing the defects. Still there are areas which present problems in the water chlorination, such as New Ring and Kashar commune, Farke commune, the construction site over the artificial lake, Kamez and Vore municipalities.
Analytical- In the case-control study, the mean age of cases and controls was 36.3 years old (SD=15.1) and 39.4 years old (SD=15.3) respectively. Among the 120 cases, 91.7% of them had diarrhea and vomiting symptoms during March 29 – May 9, 2017.
Illness was significantly associated with consumption of tank water (OR=22.2 P-value=0.000 and 95%CI=7.75–63.44) and tap water (OR=3.3 P-value=0.002 and 95%CI=1.58–6.90). Controls were 99,5% more likely to have consumed bottled water compared to cases OR=0.05 and P-value=0.000; 95%CI=0.03–0.10.
After stratification for the tank water consumption, both consumption of tank and tap water remained significantly associated with disease: OR1=0.42 p=0.2 and 95%CI=0.13–1.32 and OR2=7.54 p=0.000 and 95%CI=3.4 –16.38 respectively. Further, the consumption of tank water modifies the effect of tap water (tap water OR=3.3 without stratification, after the stratification OR=7.54).
Discussions/Limitations- In our study cases could be more likely to report drinking tank and tap water than controls, due to the delay between exposure and their telephone interview. Virological and microbiological samples were small, and we think that having more water samples from the affected areas would have benefited in the investigation.
Conclusions and Recommendations:In this report we have presented an outbreak of acute gastroenteritis which occurred in Tirana from March 29 to May 9, 2017. The outbreak has affected more than 4900 cases with the following symptoms: nausea, abdominal pain, vomiting and/or fever. The highest attach rate for rural area was observed in Farka (3.08) and for urban area in Tirana 6 (1.44), Tirana 9 (0.92) and Tirana 4 (0.85).Epidemiological and microbiological investigation suggested that the source of this outbreak was Norovirus genotype II (49.1% of samples). Microbiological testing of the drinking water (water supply system) at points in the distribution system resulted negative for coliforms; still in Tirana water pipeline has a lot of problems, a lot of amortized segments, a history of drop of water and problems with the water chlorination in Kamza and Farka communes.
In the case-control study, drinking tank water was significantly associated (22.2 times higher for cases) with gastroenteritis while drinking bottled water was protective. We also found an association with drinking tap water (3.3 times higher for cases) which can be linked with the problems of water supply system. After the stratification depending on the consumption of tank water we concluded that consuming tank water modifies the effect of tap water. Although the initial hypothesis only referred to tank water the analytical study identified that the source of outbreak is related with consumption of both tap and tank water.
In order to prevent possible outbreak in future it is recommended to monitor the source and final tap water quality, proper chlorination and adequate monitoring of water supply quality and give information to population to obtain drinking water form safe sources.

Status: Completed/member of investigation team/data collection and analysis

Research

Title: Assessing Laboratory Capacity for Infectious Meningoencephalitis at the Regional level, Albania 2010-2016

Background:

Meningitis is defined as the inflammation of the membranes (meninges) that surround the brain and spinal cord. Encephalitis is the inflammation of the brain. Both can be caused by bacteria, viruses, rarely fungi, and parasites or be noninfectious. The most common causes are of viral etiology. The most common symptoms of encephalitis and meningitis are headache and fever, stiff neck, confusion, or lethargy can also be present. The diagnosis is usually confirmed by the biochemical and

microbiological testing of cerebrospinal fluid (CSF). The incidence proportion and case-fatality for bacterial meningitis vary by region, country, pathogen, and age group. Without treatment, the case-fatality can be as high as 70 percent, and one in five survivors of bacterial meningitis may be left with permanent sequelae including hearing loss, neurologic disability, or loss of a limb. Antimicrobial chemoprophylaxis of close contacts of sporadic cases of meningococcal disease is the primary means for prevention of meningococcal disease worldwide.Meningoencephalitisis included in theMajor Disease-Based Surveillance System (MDBS). Meningoencephalitis cases are reported through the aggregated monthly form and through the individual forms. This form includes basic socio-demographic variables, signs and symptoms, epidemiological data and specific analysis performed. The notification is mandatory within 72 hours directly to the Institute of Public Health using an individual notification form. The epidemiologist in the district or region investigates and collects the notification forms from primary health care centers, district/regional hospitals and public/private laboratories. The meningococcal disease is reported within 24 hours by the district/regional epidemiologist; meanwhile other meningoencephalitis cases are reported within 72 hours to the IPH. The surveillance system is a paper based system. Fact that implies delays in the information flow and potentially in the secondary prevention of meningococcal disease.
Case definition

- Possible case: continues temperature (high fever >39ºC) for some days with meningitis irritation signs.
- Suspected case: possible case plus conscience alteration and changes of personality.
- Confirmed case: possible or suspected case with laboratory confirmation of cerebrospinal fluid testing results.

The aim of this study is to assess actual laboratory capacities regarding the diagnosis of meningoencephalitis in Albania in order to strengthen and improve the diagnostic capabilities and management of meningoencephalitis cases at national level.

Objectives:

1. To identify the high risk age-groups, regional distribution and trend over years of meningoencephalitis cases during period 2010-2016.
2. To identify the gaps in laboratory capacity (confirmation and diagnosis of meningoencephalitis cases) and accessibility to care, for different regions in Albania.

Methods:

This is a cross-sectional study.We analyzed all the data on suspected and confirmed meningoencephalitis cases reported in the IPH, with onset of illness during 2010-2016. We calculated the annual incidence by dividing the number of meningoencephalitis cases by the corresponding population at the end of a given year (incidence is calculated per 100,000 inhabitants). Regional, urban/rural, age and gender specific incidences by year and case fatality were calculated. A questionnaire designed for the purpose of the study was used to assess the laboratory capacity at the regional level. Data collected through the questionnaire were on human resources, laboratory security level, training of staff in sample collection and transportation, the presence of SOP and laboratory supplies, type of samples collected, time to transport the samples, tests performed for the diagnosis of meningoencephalitis and presence of reference laboratory. We calculated the frequency of laboratory capacities available.Data are presented in tables and maps. All data analysis was carried out in SPSS statistical software package.

Results:

In Albania, a total of 326 meningoencephalitis cases were reported during the period 2010-2016.During 2010-2016, incidence proportion ranged from 0.9 to 2.1 per 100,000. Among all meningoencephalitis cases only 23 (7%) of them were laboratory confirmed; 15 were positive for *West Nile* virus, 4 for echo virus (3 echovirus 6 and 1 echovirus 30), and 4 for meningococcal. All the cases (possible, suspected and confirmed) were reported as meningoencephalitis cases. Case fatality was 0 (zero) for all years except for 2013 case fatality 2.2% (1 death from meningococcal disease). During the whole period

there were variations on the incidence proportion of meningoencephalitis in all regions of Albania. During 2010-2016, the lowest incidence proportion was registered in Gjirokastraand Beratregion, 0.6and 0.9/100,000 respectively. The highest incidence proportion was registered in Vloraand Lezharegion, 3.2 and 3.1/100,000 respectively. During 2010-2016, the incidence proportion in Tirana region was registered 2.1/100,000.Vlora is one of the regions with the highest incidence proportion, and from 2010 to 2016 the incidence in this region increased by 50%. In 2016, 66% of regions had an incidence proportion varying from 1.0 to 3.0 per 100,000 population. In most of the years under study, the most affected areas were the lacunars regions. The highest number of cases occurred during August till October for the whole period 2010-2016 (147 cases or 45% of the total cases). During August - October, in 2010 and in 2016 occurred 3.8% and 57.4% of cases per each respective year. During 2010-2015 the highest incidence was registered in urban areas of Albania, while in 2016 the highest incidence was registered in rural areas, 2.2 versus 2.0 per 100,000. During 2010-2016 the highest incidence was registered among males. In 2010, the incidence among males is 60% higher than among females. In 2011, 2012, 2013, 2014, 2015 and 2016 the incidence among males was 1.6, 2.4, 1.5, 1.6, 1.7 and 1.2 times higher than among females. During the whole period the incidence was the highest among 1-4 and 60+ agegroups.In each year under study, the most common sign was temperature and headache. White collar occupation accounted for the majority of new cases of meningoencephalitis in all years except for 2013 and 2016. During the whole period, cerebrospinal fluid testing was performed in 35% of the cases.

Case investigation and reporting, contact tracing and sample transport is done by the epidemiologist. CSF sample collection is done by the infectologist physician, and the diagnosis of meningoencephalitis is established by the microbiologist. In Tirana region, there are 10 epidemiologists, 6 at IPH and 4 at PHD epidemiologists respectively. Other regions of Albania have 1 epidemiologist each. 25% of regions do not have microbiologists at microbiological laboratory. In the regions of Diber, Kukes and Shkoder there is lack of microbiologists. Tirana has the highest number of microbiologists in the country, they account for 50% of microbiologists in the country. 100% of regions have laboratory technicians. Tirana has the highest number of laboratory technicians, accounting for 34.3% of all laboratory technicians in the country. 16.7% of regions do not have infectologist physician. Tirana has the highest number of infectologist physicians, accounting for 55.3% of infectologists in the country. In 92% of regions (11 regions), the laboratory security level is unclassified. In Tirana region, only at IPH the security level of virology laboratory is level 3. In 33.3% of regions, the epidemiologists were not trained for sample transportation. None of the regions (100%) had SOP for establishing the diagnosis of meningoencephalitis in Albania. 92% of regions reported to not regularly have all the reagents and supplies needed to establish the diagnosis of meningoencephalitis. In Tirana region, only IPH reported to regularly have all the reagents and supplies for establishing this diagnosis. 33.3% of the regions collect CSF sample. 58.3% of regions collect feces and blood samples respectively. 75% of regions collect only blood samples for establishing the diagnosis of meningoencephalitis. Kukes, Diber and Gjirokastra regions (16.7%) didn't collect any of the following samples: CSF, serum, blood and feces. Only four regions (Tirana, Fier, Korca and Vlora) collect all the samples for establishing the diagnosis of meningoencephalitis, accounting for 33.3% of all regions in the country. Among all 12 regions, 3 (25%) of them do not transport samples to the laboratory. Among the 9 (nine) regions that transport samples to the laboratory, 33.3% of them transport the sample within 24 hours, and also 55.6% of them transport the sample in the range of 24-48 hours.Among those that perform a diagnostic test (8 regions), 87.5% perform only blood culture (hemoculture). Although the regions of Fier, Vlore and Korce collect CSF sample, they only perform the biochemical examination of CSF. Tirana is the only region performing all the diagnostic tests for establishing the diagnosis of meningoencephalitis in Albania. IPH in Tirana is the only institution performing all the diagnostic tests as follows: culture (blood and CSF), serology, virology, molecular (PCR) and microscopic examination. UH center in Tirana performs only blood, CSF culture and microscopic examination. All the regional microbiological laboratories were asked for testing about specific causes of meningoencephalitis, as follows: meningococcus, pneumococcus, haemophilus influenzae, west Nile virus and other organisms. 92% of the regions (except for Tirana) didn't test for these specific causes of meningoencephalitis. In Tirana region, IPH was the only institution testing for all four specific causes mentioned above. The tests performed for diagnosis of meningococcus, pneumococcus and haemophilus influenza are as follows: blood and CSF culture, microscopic examination and latex agglutination test. The tests performed for the diagnosis of west Nile virus are Elisa and PCR. UH center tests only for meningococcus diagnosis,

and the test performed are blood, CSF culture and microscopic examination. During 2015-2016, except for Tirana region, all the regions sent the collected samples to UH center in Tirana and none of them resulted positive for a casual agent of meningoencephalitis diagnosis.UH center in Tirana received 8 and 22 samples for the years 2015 and 2016 respectively, but none of them resulted positive for the diagnosis of meningoencepahlitis. During 2015-2016, IPH in Tirana had the highest number of received samples; in 2015 none of them resulted positive but in 2016 out of 30 samples received only one of them resulted positive for *Neisseria meningitides* and CSF culture was the test performed to confirm the casual agent. 11 regional microbiological laboratories of the country except for Tirana region do not send the samples to a reference laboratory. In Tirana region, in 2011, IPH sent the samples at the reference laboratory of Instituto Superiore Di Sanita, Rome for confirmation of west Nile virus.

Conclusions:
This is the first report detailing the incidence proportion of meningoencephalitis and assessing the laboratory capacity in Albania during 2010-2016. The aim of this study was to assess actual laboratory capacity regarding diagnosis of meningoencephalitis in Albania in order to strengthen and improve the diagnostic capabilities and management of meningoencephalitis cases at national level. In Albania, during 2010-2016 a total of 326 meningoencephalitis cases (incidence 11.2/100,000 population) were reported. Case-fatality of meningoencephalitis in Albania is virtually zero, with only 1 attributable death during 2010-2016. Examination of CSF was carried out in 32% of reported cases and in only 7% of meningoencephalitis reported cases the etiologic factor was detected via laboratory procedures. However, viral etiology is suspected in about 78% of cases regardless of laboratory testing. Incidence proportion of meningoencephalitis in Albania varies by year, mainly due to lack of complete reporting. No consistent seasonality pattern of meningoencephalitis cases was detected during 2010-2016 although the majority (45%) of all cases has occurred in August-October. Incidence of meningoencephalitis in Albania is higher among males and in urban areas. In Albania during 2010-2016, the most affected age-groups were 1-4 and 60+ years old. One quarter of regions lack microbiologists, about one-fifth of regions lack infectiologists, but all regions have laboratory technicians. The highest number of such professionals is concentrated in Tirana. The laboratory security level is unclassified for all regions of Albania, except for Tirana. In Tirana, only the virology laboratory in the premises of IPH is classified as level 3 security level laboratory. In half of regions infectiologists are not trained to perform CSF sample collection whereas in Tirana two-thirds of them are not trained either. In one-third of regions epidemiologists (newly appointed ones) were not trained for sample transportation procedures and there is lack of SOP for the diagnosis of meningoencephalitis in all regions of the country. CSF sample collection is done in only one-third of regions, feces and blood samples are collected in about 60% of regions and exclusively blood samples are collected by three-quarters of regions. In one-quarter of regions no samples are taken for meningoencephalitis cases whereas in one-third of regions all types of samples are collected. Among sample collecting regions, sample transportation is done within 24 hours in 44.4% of them whereas the remaining 55.6% send the collected samples between 24-48 hours. One-third of regions do not perform any test for the diagnosis of meningoencephalitis and among those that carry out some kind of tests, about 90% of them perform only blood test. CSF in tested only for biochemical compounds in 3 regions. In Tirana, IPH collects all kinds of samples and performs the tests for meningoencephalitis suspected cases included in our survey.

Recommendations:
There is need to further strengthen the existing surveillance system through enhancing the collaboration among clinicians for timely and complete reporting of cases and there is also need for guidelines for the management of cases from individual and public health perspectives.

There is need to improve the case definition of meningoencephalitis cases in order to set specific diagnoses for meningitis, encephalitis cases and meningoencephalitis.

There is need to increase CSF sampling for biochemical and microbiological testing and other relevant tests in order to be able to detect the causative agent and treat accordingly.

We recommend to study and assess the distribution of meningoencephalitis risk factors, as a step to explain yearly and regional variations of the disease.

There is need to develop and strengthen regional clinical and laboratory infrastructure capacity for the diagnosis of meningoencephalitis.

In regions with shortage of staff we recommend the appointment of skilled staff in order to improve sample collection and meningoencephalitis diagnosis rates. Also there is need to train and educate existing in-service professionals regarding these issues.

We recommend the training of all infectiologists to perform CSF sample collection as a very important step for assessment of etiology of meningoencephalitis.

There is need to train the newly appointed regional epidemiologists about the procedures of sample transportation and to develop standard operating procedures for the diagnosis and management of meningoencephalitis.

We recommend that the security level of all microbiologic laboratories of Albania should be assessed and classified in line with USA CDC recommendations.

There is need for a microbiological reference laboratory in Tirana, the capital of Albania.

Status: Completed

International Assignments:

Title: Tularemia Surveillance in Kosovo

Background: Tularemia is bacterial zoonotic infectious disease affecting animals and humans caused by the bacterium *Francisellatularensis*. The bacterium (*Francisellatularensis*) is highly virulent for humans and a range of animals such as rodents, hares and rabbits. Although this disease can be life threatening, tularemia can be treated successfully with antibiotics. In Albania, in 1999 was reported only one suspected case of Tularemia in Has district, and since then there were no cases of tularemia in humans and animals. Kosovo is a neighbor country to Albania and in 2015 there was a large outbreak of Tularemia in Kosovo. As there is an uncontrolled movement of animals through borders, there is need for collaboration with the National Institute of Public Health of Kosovo (NIPH)in order to take preventive measures and to learn from their experience. Taking into consideration that the surveillance system of infectious diseases in Kosovo is electronic, it will be a good opportunity to learn from their experience, share experiences from both countries and help IPH of Albania improve and strengthen their surveillance system.

Objectives:

The main objectives of the IA in Kosovo were:

1. To get acquainted with following:
    - the surveillance system of communicable diseases in general
    - the electronic Tularemia surveillance system
    - the collection, analyze, interpretation and dissemination of data on Tularemia
    - preparation of the weekly/monthly bulletin, and
    - to compare the surveillance systems between two countries

Results: Since 1999, Kosovo has become an endemic country for tularemia. For the last five years, 2011-2016, the incidence proportion of Tularemia in Kosovo was 0.4, 0.5, 1.2, 5.8, 20.6, 1.4 per 100,000 population respectively. Up to now, in Albania there are no suspected cases among humans and animals.Both countries use the same case definition for tularemia, according to WHO and CDC guidelines. In both countries there is a good inter-sectorial collaboration towards detecting, reporting and control measures of communicable diseases. In both countries, a tularemia suspected or confirmed case is reported immediately within 24 hours.In Kosovo the surveillance system for communicable diseases is electronic at the national and regional level. In Kosovo, laboratory results are checked immediately through an online program MedLis, in which the epidemiologists had a unique username

and password in order to check laboratory results of a specific disease. A confirmed tularemia case is compatible with a positive laboratory test for *F. tularensis*on serological results and an agglutination titer greater than 1:160. This way, the electronic system is helpful for an immediate reporting, and therefore leading to timely and fast response. In Albania, the reporting system is paper based, regional epidemiologists report by phone or by mail to the Institute of Public Health. Institute of Public Health in Albania has the laboratory capacities for the diagnosis of Tularemia. As Kosovo is a neighbor country to Albania, there is a possibility of uncontrolled movement of animals through the border. There is a strong collaboration between the veterinary sector and National Institute of Public Health in Kosovo. The veterinary agency in Kosovo recommends the general public to minimize the rodent and rabbit populations near the home by keeping woodpiles off the ground and in sunny areas, by fencing off any garden areas, by never leaving pet food outside after a pet has eaten, and by securing all garbage in rodent-proof containers. Tularemia kills the animals. There are no data from the veterinary sector in Kosovo on animals control towards Tularemia prevention. Therefore there is need for a strong collaboration between two countries, and more specific between NIPH of Kosovo and IPH of Albania regarding exchanging of experiences towards prevention of Tularemia disease in Albania.

There is need for implementing the electronic surveillance system of communicable diseases in Albania also, as an efficient tool for reporting a communicable disease quickly and therefore to a better and prompt public health action towards prevention and control measures regarding tularemia.

Zoonotic diseases need:

- Multi-dimensional approach (as global public health is repositioned in international agendas, it is imperative for disease emergence not be looked at in isolation, but must now be systematically viewed alongside dynamic changes in farming landscapes, animal agriculture intensifications, natural resource depletions, land utilisation patterns, trade globalization, human behaviours, food consumption, and evolving trends in agricultural production, distribution and marketing systems).

- Inter-sectorial collaboration (increasing the collaboration between human and animal medicine, closer intersectorial collaboration using existing tools can defeat zoonoses affecting humans. In that respect, we need to highlight the necessity of intersectorial collaboration between Human Public Health and Veterinary Public Health, including a spectrum of distinct disciplines such as internal and infectious diseases medicine, human public health, microbiology, environmental epidemiology, epidemiology, veterinary medicine, veterinary public health, entomology and wildlife biology).

- Cross border collaboration (there is need for actions to be taken and country level and between two countries, in order to identify common criteria for ensuring cross-border alerts, risk assessment procedures and concerted response).

- Exchange of experience and information in region(national and regional public health sectors should give priority to surveillance systems and enhanced diagnostics regarding emerging pathogens. A broad collaboration among clinicians, public health workers, veterinary medicine and veterinary public health officials is necessary for prompt response strategies ensuring the prevention and management of Tularemia. Moreover, developed countries should invest in the establishment and strengthening of surveillance systems in resource-limited countries, considering the international significance of emerging zoonoses).

- Commitment of the community (informing of the population about personal preventive measures and actively involving the community regarding educational activities for prevention of Tularemia).

Status: Completed

Title: Syndromic Surveillance in the Netherlands

Background:
Syndromic surveillance (SS)complemnets traditional surveillance systems by providing clinically nonspecific but (close to) real-time information on the occurence of events, of potential public health impact, gained from existing and if possible automatically generated data that were originally. Syndromic surveillance systems rely on data collection and analysis from various information sources including general practitioners, emergency departments, pharmacy sales, telephone help lines, web queries, and veterinary data. These systems monitor the spread, the trend and impact, or absence of impact, of known or unknown events in the population on the basis of the presentation of signs and symptoms, confirmed cases / syndromes.
This customized international assignment was organized in the Care and Public Health Research Institute (CAPHRI) and International Health Department in the Netherlands, Maastricht University. CAPHRI implements high quality multidisciplinary research and teaching aiming at the improvement of the individual's quality of life and the population's health through responsible innovation in public health and health care.International Health Department of CAPHRI was the leading partner on conceptualization, development, implementation / testing and evaluating the Emergency Data-based System for Information on, Detection and Analysis of Risks and Threats to Health (SIDARTHa). The Netherlands are not using SIDARTHa syndromic surveillance, although this country was the leading one in implementing this program to other European countries. In this report is studied the Netherlands syndromic surveillance system.
Syndromic surveillance in Netherland and worldwide is still a relatively new approach and there is still much doubt about its added value. Timeliness in terms of earlier case detection and/or reporting results is considered the main strength of the approach. The provision of information at times when no information is available from other surveillance systems can be considered another advantage. Also the flexible application for different health threats is a strength of syndromic surveillance. The major weakness is seen in the lack of specificity of the output of syndromic surveillance systems.

Syndromic surveillance in Albania
In Albania there are only two syndromic surveillances, ALERT syndrome-based surveillance systemand sexually transmitted diseases syndrome based system. ALERT meaning "alarm", representing in meantime the acronyms of Albanian Epidemiological Reporting Tool. Data flow structure of the Alert System implies the weekly mandatory notification from the basic level (GP's at the primary healthcare centers, secondary and tertiary hospitals, public and private laboratories) tosurveillance system of Department of Communicable Diseases at Institute of Public Health, through the local level (district epidemiological service). There are 9 syndromes under ALERT system, namely diarrhea without blood, diarrhea with blood, upper respiratory infection, rash with fever, jaundice, hemorrhage with fever, suspected meningitis, and unexplained fever. Alert data reports are send to the IPH through email post weekly every Wednesday of the consecutive week. In the sexually transmitted diseases syndrome-based surveillance system, are included the following syndromes: lower abdominal pain, vaginal discharge, urethral discharge, vesicular genital ulcerations, non-vesicular genital ulcerations, warts, bubon inguinal and scrotal edema. Dermatologists, obstetrician-gynecologist and infectionist doctors working in public and private sector report to this syndromic surveillance system through an individual reporting form. The forms are collected by the epidemiologist of the public health district directory every month. These forms are reported every month to the Institute of Public Health by regular mail.There are delays in reporting syndroms in SS in Albania. These delays can contribute in delayed control and preventive actions.It is paper based and not an electronic system contributing in delaying in reporting of the weekly syndromes. For the last five years, the new appointed general practitioners are not trained in reporting the syndromes of SS in Albania.

Objectives:

1. To get familiar with the Syndromic Surveillance System in Netherland and study the Netherland experience in order to improvethe syndromic surveillance system in Albania

Results:
Syndromic data registries included in the syndromic surveillance in the Netherlands are as follow: work absenteeism (national absenteeism registry), general practitioners consultations (network of general practice and Netherlands institute for health services research), pharmacy prescriptions (foundation for pharmaceutical statistics) hospitalizations (Dutch national medical register, hospital data), laboratory submissions / negative and positive results (national infectious diseases information system), mortality (cause of death and crude mortality registry by statistics Netherlands). The reporting units are as follows: general practitioner's health centers, hospital emergency units, hospital statistical unit, laboratory units, foundation for pharmaceutical statistics, national statistical office in Netherlands. The reported syndromes are as follows: respiratory tract infections syndromes;HIV, viral hepatitis and sexually transmitted infections syndromes, gastrointestinal syndromes, antimicrobial resistance – associated infections, emerging and vector borne diseases syndromes. Respiratory tract infections syndromes and gastrointestinal syndromes are electronically reported within 24 hours, whereas other syndromes are electronically weekly reported to the National Institute for Public Health and Environment.This electronic system is helpful for an immediate reporting, and therefore leading to timely and fast response.
Wijngaard and colleagues state that "syndromic surveillance can enhance traditional surveillance systems by spotting uncommon outbreaks independently of laboratory tests. Also, SS can be useful in monitoring of disease burden and virulence shifts of common pathogens" (Wijngaard CC et al. 2011). In addition, SS data can be used to plan the expanded diagnostic capacity in response to an emerging health event to counsel clinicians to limit use of antiviral medications early in 2009 influenza pandemic to decrease the risk of medication shortages and viral resistance later in the pandemic. The value provided by the Dutch registries for SS resulted from their high population coverage (>90%), good data quality which included sufficient patient characteristics and laboratory information to identify possible causes of trends and verify signals generated by SS. Studies that report the operating costs associated with real-time syndromic surveillance found annual operating costs ranging from US$ 130,000–150,000 to US$ 280,000. Kaufmann *et al*. 1997, reported that the economic damage caused by a bioterrorist attack can amount to millions or even billions of dollars. The SARS epidemic in 2003 and the influenza pandemic in 2009 showed that the economic damage caused by naturally occurring outbreaks can be similarly high.
If SS could detect and control outbreaks earlier, through using specific space-time algorithms, then it is possible that its benefits will outweight its costs, as evidenced by earlier reports where SS was able to detect outbreaks of Legionnaires' disease in syndromic hospital data (Wijngaard CC et al. 2010).
As regards the usefulness of syndromic surveillance to improve the monitoring of disease burden and detection of virulence shifts of common pathogens, a clear association was found between norovirus laboratory surveillance with morbidity and mortality among elderlies and also an association was detected between influenza shifts in the antigenicity of circulating viruses with number of hospitalizations and deaths (Wijngaard CC et al. 2010).
The biggest advantage of SS is the opportunity of real-time reporting of electronic emergency data that can offer timelier and more frequent information compared to established traditional surveillance systems. Syndromic surveillance systems can serve a variety of public health purposes.

The main recommendations to improve the syndromic surveillance in Albania are as follows:

- As in Albania the syndromes are reported once a week (ALERT syndromes) or once a month (sexually transmitted diseases syndromes), there is need to improve the frequency of reporting for specific syndromes by encouraging maternity hospitals, general hospitals, primary health care centers and emergency care units for a better and in time reporting of syndromic surveillance systems in Albania.
- Increasing the number of syndromes reported in the syndromic surveillance of Albania through taking into consideration the Netherlands experience, by adding work absenteeism, antimicrobial resistance associated infections, emerging and vector borne diseases syndromes.
- Setting up an electronic reporting will contribute in the improvement of timely reporting, early outbreak detection and in taking effective prevention measures.

- Continuous training of physicians and especially of new appointed ones in all the districts of Albania regarding syndromic surveillance reporting and its importance.

Status: Completed

Scientific communication

One manuscript as first author published in the Albanian Medical journal, vol. 4 2016. Congenital malformations in Albania for the period 2011-2015 (1)

One manuscript as first author published in the Albanian Medical journal, vol. 2 2017. Evaluation of congenital malformations surveillance system in Albania during 2015 (2)

Participation in the second national congress "Care during Pregnancy and Childbirth" in Tirana.Oral presentation 4-6 March 2016.Factors associated with congenital malformations in Tirana during 2012-2014(3)

Participation with an oral presentation in the International Public Health Conference, Tirana, Albania, (Congenital heart malformations in Albania during 2012-2015). May 2016 (4)

Participation in the Annual Scientific Conference of MediPIET, Protecting Public Health Across Borders, Marrakesh, Morocco. Oral scientific presentation.Title" Congenital malformations in Albania, results from Congenital Malformations Surveillance System, 2011-2015. (5)

Participation with a poster presentation 5th International Public health Conference, Albania, 9th May 2017.Behavioural Determinants of Health and Disease in Countries of the European region. The burden of birth defects in Albania during 2011-2015. (6)

Second author in one manuscript published in the Albanian Medical Journal, vol. 4 2016.Monitoring trends of abortion rates in Albania for the period 2010-2015. (7)

Second author in one manuscript published in the Albanian Medical Journal, vol. 1 2017. Evaluation of Abortion Surveillance System in Albania for the period 2014-2015 (8)

Last author in one manuscript published in the Albanian Medical Journal, vol. 1 2017. Trends of smoking prevalence among Albanian adolescents during 2011-2015: Results of ESPAD surveys. (9)

Abstract accepted as oral presentation in the Annual Scientific Conference of MediPIET, Regional contribution and synergies for Global Health Security, Brussels, Belgium, 27 November – 1st December 2017.

Teaching experience

Teaching Geriatrics to post graduate studentsin the Master of Public Health, Public Health Faculty, University of Medicine. (2016-2017)

Taiex workshop: Congenital Malformations Surveillance System and preventing congenital malformations.(5-6 October 2017), as a facilitator and presenter.

Training publich health specialist working in the Public Health District Directories and giving oral presentations on the "Birth defects world day" 3 March 2017, Tirana. "Surveillance's importance for preventing congenital malformations".

Miscellaneous (additional activities)

Training: EPIHACK Analytics Albania "& "Time to Detect, Time to Respond, April 2016, in collaboration with the communicable diseases department of IPH. The aim was to assess the timeliness from the diagnosis to case report.

Training on ICD-10, as trainer of trainers, in order to implement ICD-10 in Albanian health system. 24-27 July 2017

Next steps

Dorina will continue to work at the Institute of Public Health at the department of Epidemiology and Health Systems. She will continue to be the national coordinator of congenital malformations surveillance system in Albania.

In the framework of congenital malformations surveillance system, Dorina will continue to collaborate with department of non-communicable diseases and department of environmental health towards identification of congenital malformations of risk factors in Albania. Dorina will use the skills acquired in order to provide information for public health action

Dorina is keen and willing to participate in outbreak investigations.

In the framework of epidemiology field training of public health specialists and epidemiologists in all the districts of Albania, Dorina will collaborate and get involved in cascade trainings for increasing the local and national capacities.

Supervisor's conclusion

During the two-year MediPIET fellowship, Dorina Toci has successfully leaded a variety of scientific assignments from evaluation surveillance system to outbreak investigation and a research project. Dorina being a follower from Non - Communicable Disease Department, but during this period had an intersectorial and correct cooperation with the Communicable Disease Department.
She worked in a systematic way, correct and very committed in terms of tasks.
The activities she has worked with during the fellowship time shows how much she has used the trainings and new skills as a way to improve her work and achieve more. Her projects all led to excellent outcomes.
I am confident that her work will continue to give benefits for the institution and for the country.

Scientific Coordinator's conclusion

Dorina was already an experienced PH professional with sound PH perception and commitment before her MedipIET fellowship. Nevertheless, we jointly concluded that Dorina successfully developed new skills and knowledge with regard to data analysis and interpretation, to the design and implementation of research protocols and with regard to investigating outbreaks using analytical methods. Although working outside the Dpt of Communicable Diseases Epidemiology Dorina has manifested an increased sense and ability for intersectioral collaboration that supported the successful accomplishment of her assignments. Working with Dorina was sharing scientific constructive feedback and mutual commitment.

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