



**Cohort 2
2015-2017**

MediPIET Report

Summary of work activities

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Pre-fellowship short biography

I graduated at the Faculty of Medicine, University of St "Kiril I Metodij", Skopje in 2013 and gained a diploma for a medical doctor. After graduation I worked as a voluntary for 2 years in the Institute of Public Health of the Republic of Macedonia.

I participated in the first five MediPIET Modules for Cohort 1 as an external participant.

Since 2015, I work as full-time researcher at the Sector for Prevention and Control of Communicable Diseases within the Institute for Public Health, R. Macedonia. Shortly before the start of the MediPIET fellowship I started with specialization in epidemiology. Currently my position is a researcher at the Department for tropical, quarantine diseases, HIV/ AIDS and sexually transmitted infections in the frame of the Sector for Prevention and Control of Communicable Diseases at IPH and I participate in activities connected with maintenance of the results achieved by the eradication of malaria through undertaking activities to prevent the introduction and spread of malaria in the country; implementation of measures and activities to prevent the introduction of cholera; program to protect the population in Republic Macedonia from HIV/AIDS; implementation of continuous epidemiological surveillance, monitoring and control of communicable diseases; monitoring of implementation of program activities in the public health centres in the country and participation in epidemiological researches.

Fellowship projects

Surveillance project

1. Brucellosis in the Republic of Macedonia, 2001-2015, before and after the introduction of vaccination in animals

Background:

Brucellosis is a zoonotic infection caused by the bacterial genus *Brucella*. The bacteria are transmitted from animals to humans by ingestion through infected food products, direct contact with an infected animal, or inhalation of aerosols. Brucellosis is a global zoonosis that presents severe public health challenge and major economic burden. Control strategies available to prevent human brucellosis are pasteurization of milk, livestock vaccination and elimination of infected animals, education of population with accent of population in risk. The Republic of Macedonia represents an endemic area where brucellosis prevails as a dominant zoonosis. Vaccine for the animals was introduced in 2008.

Objectives:

The aim of the study is to analyse the brucellosis surveillance system and the epidemiological patterns of human brucellosis in R. Macedonia, as well as to examine the influence of the vaccination of animals on the incidence of the disease among humans.

Methods:

This is a descriptive study which present the analysis of the official data for brucellosis in R. Macedonia for the period 2001-2015. The data related to human and animal brucellosis has been collected from the Institute of Public Health and the Food and veterinary Agency. For additional information related to this issue, the qualitative analysis of the official reports and published papers have been implemented.

Results:

During the 15-year period from 2001 to 2015, the public health system in R. Macedonia registered 3.728 cases (Mean=248,5; SD=153,8). The highest number of cases as well as highest incidence were registered in 2008 (490 cases; I=24,0/100.000) and the lowest number of cases and incidence were registered in 2015 (22 cases; I=1,1/100.000). During the entire observed period, the mean annual incidence rate in R. Macedonia was 12,2 per 100.000 inhabitants. The number of registered cases of brucellosis from 2001-2015, although variable, suggest a trend of significant decline. In the period 2001-2008, R. Macedonia registered an average of 374 infected people annually. In the period 2009-2015 there was an average of 104 registered infected people annually which represents a decline of 72,2% compared to the period 2001-2008. The largest number (669) and percentage of cases (17,9%) were at the age of 40-49 and over 60 years. The distribution of cases by gender during the period 2001-2015, the proportion of males is higher – 69,6%, compared to 30,4% of the female population, whereas the male-to-female ratio was calculated as 2,43:1. The epidemiological curve that shows the average of cases by months for the 15-year period, was typical for brucellosis, with pronounced seasonality of the disease from late winter to summer and peak in the period from May to July. If we analyse the last five years, given the small number of cases, the disease lost the seasonality and no specific increase is registered in the spring and summer months. Out of all registered cases for this period 71,1% lives in rural areas, while 28,9% of cases live in urban areas. According to the data, it was found that the highest percentage (56,9%) of infected persons had contact with animals - usually sheep and goat or cows or handled meat and meat products, participated in manipulation of goods/ lambing/ abortion. Interweaving of contact and alimentary route of transmission of brucellosis, especially among breeders is frequent – 29,8% (contact and consumption of raw or undercooked animal products (milk, cheese)), so it cannot be excluded or confirmed the correct way of acquiring the disease. There is a strong positive correlation between the number of infected animals and humans ($r=0,94$) after the implementation of vaccination.

Status: Completed

2. Evaluation of influenza ILI sentinel surveillance system in the Republic of Macedonia

Background:

Seasonal influenza is an acute respiratory infection caused by influenza viruses. Influenza is a notifiable disease in R. Macedonia more than 35 years. In 2014/2015 season, sentinel surveillance of Influenza like Illnesses (ILI) and Acute Respiratory Infection (ARI) was initiated. WHO recommends an evaluation to be performed every 1-2 years for the sentinel ILI surveillance system. This evaluation is the first for the sentinel ILI surveillance system in R. Macedonia.

Objectives:

To describe the ILI sentinel surveillance (epidemiological and virologic); to evaluate the extent to which attributes of the ILI sentinel surveillance system (epidemiological and virologic) are performing effectively; and to identify areas for strengthening or maintaining within the ILI sentinel surveillance system.

Methods:

The evaluation was conducted according to CDC guide. Data quality, completeness, timeliness and representativeness were analysed through existing epidemiological and laboratory databases for the seasons 2015/2016 and 2016/2017. Web-based questionnaire for ILI sites, to analyse simplicity, acceptability and stability was created and applied. Quantitative and qualitative indicators were scored in 3 grades: weak, moderate and good performance. The average of the scores assigned to each indicator for all indicators evaluated within each attribute was used to provide an overall score for each surveillance attribute assessed in this evaluation. The average of the attribute scores was used to calculate an overall score for the surveillance system.

Results:

The nine surveillance system attributes were analysed after the end of the 2016/2017 influenza season, using surveillance data collected started from 2015/2016 influenza season from 832 reported ILI patients in the epi database and 195 tested materials from the lab database.

In total, 38 indicators were analysed. Good performance was found in 24 indicators, moderate in 7 indicators and weak performance was found in 7 indicators.

From the evaluated attributes, we have found good performance in 3 attributes - Data quality and completeness; Representativeness; and Sustainability. Moderate performance was calculated in 6 attributes. The attributes for utility and stability showed moderate performance but on the upper limit, problems with transport were detected and MEM model was used in only one season. The attributes for flexibility, acceptability and simplicity also showed moderate performance but on the lower limit, changes of the distribution of sentinel sites and feedback were detected as problems. Regarding timeliness, the only weak performance is for proportion of samples received within 72 hours of collection but data for this indicator was limited. Weak performance was not found when analysing the attributes.

The overall score for the ILI sentinel surveillance system is calculated to be 79,2% which means moderate performance.

Based on the findings of this evaluation to make the sentinel ILI surveillance system work in better performance we recommended several recommendations such as implementation of an electronic system for data collection; manufacturing of more sophisticated lab and epi database which will be connected so data will be available all the time to the involved staff for analyses; training of the involved staff for filling in the databases; introduction of multiplex PCR for testing other respiratory pathogens to compare the circulation of other viruses to influenza viruses; in order to improve the performance of the courier we recommend a full-time hired courier who will collect the specimens immediately after they are taken from each ILI sentinel site; taking more than one specimens per week; training for the responsible staff at the ILI sites for timely sending of all needed data; implementation of a software that will immediately send the result of the lab testing to the doctor as well as better feedback with the weekly reports.

Status: Completed

Outbreak Investigations:

1. Report of acute enterocolitis outbreak in Gostivar, Republic of Macedonia (lead the OIT)

Background:

Vrapchishte is a small rural municipality located in the western part of the Republic of Macedonia with a population of 6.787. The municipality of Vrapchishte has a central community water supply system that distributes drinking water to three villages: Vrapchishte, Zubovce and Galate. According the National Program for Public Health, the water is microbiologically, chemically and physically tested every month by the local Public Health authorities. In the last 10 years, there have been 3.985 registered cases of acute enterocolitis in the LUCPH in Gostivar, with annual incidence rate ranging from 41,8 to 625,4/100.000 population. During this period, small proportion of all mentioned registered cases were from the municipality of Vrapchishte.

Objectives:

To describe the outbreak in order to provide recommendations for preventing future infections.

Methods:

An outbreak investigation team was consisted from epidemiologists from LUCPH and IPH, environmental specialists, microbiologists, representatives from SSHI and representatives from FVA. After reviewing the data, the OIT concluded that the number of observed cases clearly exceeded the expected number. A case was defined as any person living in Vrapchishte, Galate or Zubovce with an onset of diarrhoea and/or vomiting after 1st of June 2016. Active case finding was conducted through local GPs and regional hospital. Attempts were made to contact all reported cases from 1st until 22nd of June 2016. The OIT succeed to contact and interview all reported cases, using a structured questionnaire. Data from the filled questionnaires was entered into a database (Microsoft Excel 2016, SPSS v.22). Descriptive statistics analyses were calculated.

Results:

The total number of reported cases in this outbreak was 86. Fifteen percent of cases (n=13) had onset of symptoms on the same date - 02.06.2016, 16% (n=14) had onset on 06.06.2016, while 12% (n=11) had onset on 10.06.2016. These three days were also identified as peaks of the outbreak. According to the results from the descriptive analyses, out of 86 registered cases, 55,8% (n=48) were female while 44,2% (n=38) were male. The age distribution of the cases ranged from 2 to 71 years with median age of 27 years. The most affected age group was 20-29 years - 18% (n=16). Three villages were affected: Vrapchishte, Galate and Zubovce. The highest number of cases were registered in the village Vrapchishte – 87,2% (n=75; AR=0,015). Five (5,8%) of the cases had more severe symptoms and had to be hospitalized. No death cases were reported. After the investigation, the OIT confirmed that the community water supply system had no residual chlorine in the water and was positive on Escherichia coli. Because no samples of vomit or faeces were taken, it was not possible to make a link between the cases and the causative agent. Because of the previous history of small outbreaks in this region, the local epidemiologist was alarming the relevant stakeholders continuously that an intervention is needed for repairing the water supply system. Even they have been educated during the continuous education process, the local GP's do not practice to take samples of vomit or faeces from the cases. Based on the findings we recommended several recommendations such as to remove the deficiencies from the community water supply in order to prevent future outbreaks; to establish a Protocol for outbreak investigation of waterborne diseases, which should be practical tool for improvement of field investigation; to train the local epidemiologists for timely recognitions and investigation of a potential waterborne disease outbreak; in regions with a potential risk for a waterborne diseases outbreak, intensive health education should be provided and adapted to the local population.

Status: Completed

2. Report from an outbreak investigation of acute food poisoning outbreak in the employees of the Lear Factory in Tetovo on March 31, 2017 (part of the OIT)

Background:

On 31.03.2017, at 5.15 am, the local epidemiologist from CPH Tetovo received a telephone notification for mass food poisoning reported by the infectious diseases specialist at the Clinical Hospital in Tetovo. All sick persons provided data that they are employed in the "Lear" factory in Tetovo. The epidemiologist from CPH Tetovo immediately informed the State Sanitary and Health Inspectorate (SSHI) from Tetovo, the inspectors from the Food and Veterinary Agency (FVA) - Tetovo and the Sector for Control and Prevention of Infectious Diseases from the Public Health Institute (IPH).

Objectives:

To describe and analyse the outbreak in order to provide recommendations for preventing future infections.

Methods:

After the received information from the competent physicians and the survey of some of the patients in the Clinical Hospital Tetovo on the morning of March 31, 2017, a case is defined as any person who: works in the factory "Lear", Tetovo; was at work in II or III shift on March 30, 2017; ate in the canteen of food served in II and III shift at the 30th and early morning on March 31st; and has developed symptoms of food poisoning with nausea and vomiting for the period from March 30 to March 31, 2017. After obtaining the information from the initial investigation at the Tetovo Hospital and in consultation with the epidemiologist from CPH Tetovo, the team prepared a structured questionnaire with basic sociodemographic data, questions about the symptoms that they developed and the time of the symptoms, as well as what foods they consumed in the canteen. In the period from March 31 to April 3, the IPH team conducted a cohort study in order to investigate the causes of the outbreak. As the cohort, all employees from the II and III shifts were defined on March 30 in the factory "Lear" Tetovo. The employees are contacted by phone according to the list received from the person for human resources from the factory "Lear" Tetovo. The completed questionnaires were entered in the MS Excel database. EpiInfo v.7 was used for descriptive analysis and for determining association measures (risk).

Results:

The IPH team telephoned 462 employees of II and III shifts, or 82,6% out of 557 people who worked in these two shifts, according to a list from the Lear factory. Of the interviewed persons, 129 (28,0%) are male, and 331 (72,0%) are female. The age of the respondents ranges from 19 to 57 years (middle age 35,3 years). After consuming food in the canteen, the symptoms of stomach pain occurred in 184 (40,0%) of the subjects in both shifts, symptoms with nausea and vomiting occurred in 136 (29,8%), 34 people complained for fever (7,4%) and diarrhoea 132 (28,7%). Of the respondents, 136 or 29,6% meet the criteria for the case in the outbreak. Of the cases, 30 (22,1%) are males, and 106 (77,9%) are females. The age of the cases ranges from 19 to 57 years (mean age 36,5 years). Of the total of 243 exposed employees in the II shift, 15 people developed symptoms (AR = 6,2%), while in III shift symptoms were developed in 121 out of 217 exposed (AR = 55,8%). The risk of Disease in the III shift is 9 times higher (95% CI = 5,5-14,9) compared to the II shift. In most of the respondents (n=50) symptoms occurred in the period from 03.00am to 03.45am on March 31, 2017. Of the total number of patients, 119 were hospitalized, and 100 of them received infusion therapy in a daily hospital. During the analysis, we found that the greatest risk is associated with the consumption of macaroni, i.e those who ate macaroni have a 31,5 ($p < 0.00000$) higher risk of disease than those who did not eat. The risk of disease is associated with the consumption of Bolognese sauce which is 2,7 times ($p < 0.00000$) more than those who did not eat from this sauce. Consumption of yogurt is associated with a 1,7-fold ($p < 0.0018$) greater risk of disease compared to those who did not drink yogurt. The stratified analysis for concurrent exposure to both sauce and macaroni shows that the risk of 2,7 times in univariate analysis is reduced to 1,07 times (95% CI = 0,7-1,6) and is not significant, i.e the sauce is not a risk factor for the disease. Stratified analysis for concomitant exposure to both yogurt and macaroni shows that the risk of 1,7 times in univariate analysis is reduced to 0,9 times (95% CI = 0,7-1,3) and is not significant, that is, yogurt is not a risk for the disease.

Status: Completed

3. Report from an increased number of cases of acute enterocolitis in Bogovinje, Republic of Macedonia (part of the OIT)

Background:

Bogovinje is a village located in the western part in R. Macedonia with a population of 1.650 (2002 census) although significant number of the population emigrated to European countries. From 2006-2015, there have been in average 41,5 cases of acute enterocolitis in the Centre for Public Health (CPH) in Tetovo, with annual incidence rate ranging from 5 to 56,1 /100.000 population. During this period, small proportion of all registered cases was from the municipality of Bogovinje. Drinking water supply is secured through local water supply system that is maintained by the local authorities.

Objectives:

To identify the risk factor, to implement control measures and to provide recommendations for preventing future infections.

Methods:

An Outbreak investigation team (OIT) was consisted from epidemiologists from CPH Tetovo and IPH, environmental specialists, microbiologists and representatives from the local authorities. After reviewing the current data and comparing to the previous period for the same time and place, we concluded that the number of observed cases clearly exceeded the expected number. We defined case as any person living in Bogovinje, with an onset of diarrhoea and nausea or vomiting after 27th May 2016. We interviewed patients at the GPs office as part of a formative research for the risk factors to be investigated in an analytical study. We conducted a retrospective cohort study. All the cases who reported any gastrointestinal symptoms three days before and/or after the incident were interviewed. We used a structured questionnaire by telephone interviews to collect the data for the study. We entered data from the filled questionnaires into a database (Microsoft Excel 2016). We performed descriptive statistics and we analysed measures of association in Epi_Info v 7.0. We took water samples from different sites of the water supply system for chemical, physical and microbiological analyses. Faeces samples from suspected cases were taken for microbiological analyses on Salmonella types, Staphylococcus aureus-coagulase positive, Enterobacteriaceae, E. Coli 0157, listeria monocytogenes.

Results:

The total number of interviewed people that met the case definition was 29, registered from the 27th May to 01th June 2016. Of all registered cases 44,8% (n=13) had onset of symptoms on the same date, 31.05.2016. This was identified as the peak of the outbreak. There were no more registered cases after the 01th June 2016. Out of 29 detected cases, 69,0% (n=20) were male, while 31,0% (n=9) were female with a male-to-female ratio of 2,2. The age distribution of the detected cases ranged from 5 to 78 years with mean age of 27,9 years (SD=±22,4). The most affected age group was 0-14 years – 37,9% (n=11), followed by 15-29 – 31,0% (n=9). The main symptoms of the 29 detected cases were diarrhoea (100,0%), vomiting (86,2%) and nausea (82,7%) but abdominal cramps (65,5%) and fever (3,5%) were also detected. We calculated food specific attack rates in order to calculate effect of exposure to each food item and water. We used Chi-square uncorrected / Fisher exact test for assessing significance level. We observed highest attack rate of 75,0 for cabbage and iceberg salad (AR=57,1%), but the RR was highest for water from local supply and cabbage. We found statistical significance for water from local supply (RR=9,8; CI=1,23-40,42; and p=0.003). All samples of the drinking water taken from different sites of the water supply system were negative for common bacterial pathogens, usually investigated in the laboratory (E. coli and other coliform bacteria). Chemical and physical characteristics of the water were also met. All faeces samples were negative on bacterial pathogenic flora.

Status: Completed

Research

Bio behavioural study among people who inject drugs in R. Macedonia, 2017

Background:

The HIV/AIDS/STI surveillance system, as well as the surveillance systems for other communicable diseases in the Republic of Macedonia is regulated by laws and programs. The epidemiological surveillance is obligatory for all Regional Institutions for Health Protection – on regional level, for their Organization Units – on local level, as well as for the Institute for Public Health – on national level. The current system is relying on passive surveillance of HIV/AIDS/STI incidence and prevalence and therefore could not reflect the real situation, especially concerning surveillance among groups of special interests (vulnerable subpopulations). There are no procedures for routine, systematic HIV/AIDS testing among populations most at risk. However, starting from 2005 with the funds from Global Found to fight AIDS, Tuberculosis and Malaria, five cross-sectional bio-behavioural studies have been conducted among most at risk population. These studies were beginning of the implementation of the Second-Generation Surveillance for HIV/AIDS in R. Macedonia.

Objectives:

To determine HIV prevalence among IDUs in the capital city – Skopje in 2017; To determine the prevalence of other STIs (HCV, HBV and Syphilis); To assess knowledge, attitude, behavior and practices of IDUs in the year 2017; To link biological and behavioral data; To plan targeted intervention based on the results; and To use information obtained for advocacy and resource mobilisation.

Methods:

The "Respondent Driven Sample" method represents a system combining long referral chains and a statistical theory of the sampling process which controls errors (biases) including the selection of the initial participants – "seeds", and the various sizes of the social networks.

Results:

In this RDS study, 251 IDUs participated, including seven initial participants (seeds). According to the study, 88,8% of the IDUs were male, whereas female IDUs were 11,2%. The mean age of participants was 37,9 years (18 to 56 years). Most participants were aged 35-39 (36,7%). Participants of the Macedonian nationality accounts for 59,8%, Albanian 20,3% and Roma 13,5%. A proportion of 57,8% of IDUs have secondary education completed. Out of the examined samples, no positive HIV cases were found, whereas HCV positive cases were found in 179 respondents, respectively 84,8% of prevalence in the sample, or estimated proportion of 83,3% in the population. Out of 225 samples examined, 13 were positive on HBV, which represents a prevalence of 5,8% in the sample, while the estimated prevalence in the whole IDU population was 5,6%. One positive syphilis result was received. A proportion of 80,5% IDUs reported to have heard of HIV/AIDS, 56,2% about Syphilis, 25,9% about Gonorrhoea and 10,0% about Trichomoniasis. 80,1% of IDUs correctly replied to the suggestion that HIV can be transmitted through sharing injecting equipment. Only 37,8% of respondents stated that Hepatitis C can be transmitted through injection. Almost all (94,4%) responded that regular condom use can reduce the risk from HIV infection. 67,3% of IDUs consider that there is a successful treatment for AIDS and 21,5% stated that there is a vaccine against HIV. In the past 12 months, 68,1% of IDUs have received free condoms from outreach workers or in the "drop-in" centres. Additionally, in the last 12 months, 92,8% received free injecting equipment through the needle and syringe exchange programs. Average age at first injection stands at 20.4 years (range 9-38 years). According to the data of the 2017 study, IDUs most commonly have injected methadone in combination with diazepam (74,9%). The number of IDUs who inject daily is reduced and it stands at 12,7%. The majority, 66,8% of IDUs reported having sex in the last month prior to the study; of those, less than half (40,1%) had used a condom during their last sexual intercourse. 27,1% of IDUs have always used condoms in the last month prior to the study. In the 12 months prior to the study, 40,6% of IDUs had an HIV test done. Of the IDUs who have had an HIV test done, 93,1% knew the results.

Status: Completed

International Assignments:

1. Surveillance of vector borne diseases, Greece

Background:

The global economic turmoil, emerging energy trends and the increasingly worrying situation of climate change - global warming, leads to the opportunity for intensive distribution of vectors of infectious diseases in the geographic areas where until now have not been registered, also to shift of seasonality and appearance throughout the year. All of this is an attack on human life and reclaiming already eradicated, eliminated diseases (tropical and subtropical).

Objectives:

Given the situation with vector-borne diseases, as well as the situation of migrants in transit in the Balkan route, including the Republic of Macedonia, there is a need to recreate momentum for control of vectors through basic facilities, including personnel with technical expertise, stronger surveillance systems and better laboratory infrastructure. Higher priority of vector control activities could save many lives. It is especially important for diseases for which no vaccine nor effective treatment. Therefore, by using the participation in MediPIET, Republic of Macedonia requested sending of 2 fellows on International assignment for surveillance of vector-borne diseases. The purpose of this International assignment is to update the knowledge for these diseases, to review the experiences of a country which deals with them, as well as new gaining knowledge for new techniques for monitoring and control of vectors and then - practical application of the gained experience in Republic of Macedonia.

Methods:

Theoretical and practical lessons. Meetings with relevant stakeholders and institutions from the public and private sector. Field work in the Evrotas municipality in the malaria project.

Results and conclusions:

During the International assignment in Greece, we visited several institutions. First of all, we visited Vector-borne disease Office within the Department of Epidemiological Surveillance and Intervention in HCDCP, institution responsible for the surveillance system of vector-borne disease in Greece. Also, there was the Benaki Phytopathological Institute who conducts vector surveillance and has close contact and collaboration with HCDCP. And lastly, Department of Parasitology, Entomology and Tropical diseases within the National School for Public Health with special emphasis on work in Medical Entomology Laboratory and Molecular Parasitology Laboratory. We met a representative of a private vector control company (Ecodevelopment) in order to inform us for vector surveillance and vector control activities which are performed on the field. A trip was organized by the Office for Environmental Health in HCDCP to "Marathon", nationally protected park with an environment which needs special requirements for vector control activities. The second week was assigned for active malaria case detection in Evrotas municipality in Laconia region of Peloponnese. We were a part of a team which is included in the program for interruption of local transmission of *Pl. vivax* and prevention of malaria re-establishment in malaria affected areas and with that team and we participated in on-field activities. We will apply the experience that we acquired through these International assignment activities to improve the system for surveillance of vector-borne disease. That will be achieved by strengthening the surveillance of vector-borne diseases; surveillance of vectors; and enhanced vector-control activities. We will develop a Protocol for multisectoral approach for monitoring, case/ outbreak investigation and reporting.

Status: Completed

2. Implementation of case definitions in Republic of Macedonia, Berlin

Background:

Surveillance is the ongoing systematic collection, analysis, and interpretation of outcome-specific data for use in planning, implementing and evaluating public health policies and practices. A communicable disease surveillance system serves two key functions; early warning of potential threats to public health and program monitoring functions which may be disease-specific or multi-disease in nature. Case definitions are recognized to be key elements of public health surveillance systems. They are to assure comparability and consistency of surveillance data and have crucial impact on the sensitivity and the positive predictive value of a surveillance system. Republic of Macedonia has adopted EU case definitions since 2011, but is facing problems with implementation of them.

Objectives:

The objective of this IA is to analyze the Macedonian surveillance system, especially the current implementation process of the case definition, to detect and discuss the challenges and to compare the implementation process in an EU country in order to make recommendations for improvements.

Methods:

Meetings with relevant stakeholders and institutions from all levels of the public health.

Results and conclusions:

Analyzing and discussing the Macedonian surveillance system based on legislation showed that there is an incoordination between Law and sub-law regulations. Changes in the law were not proceeded by changes of the Manual for reporting and the Notification form. The Notification form is outdated and used for all 64 diseases which may pose a problem when reporting STDs. It also does not give an opportunity to address the issue of the process of the implementation of case definitions. Republic of Macedonia need to implement case definitions primarily to assure consistency and sensitivity of the surveillance data but also as an EU enlargement country must implement them in order to report and to be comparable to EU countries. Case definitions that are published in Macedonian law are mix of 2002 EU case definitions and additional case definitions for other diseases. The additional case definitions are unclear, the clinical part is more descriptive then criteria and classification of the cases is rather unusable. The newest 2012 EU case definitions are not adopted. The current legislation suggests the use of the published case definitions but in practice they are not used as such as a result of different reasons. One of the biggest obstacle is that according to law, physicians whose primary role is to diagnose and treat a patient are those who should implement them. In order to do that, the physician need to have all the relevant data, the clinical symptoms and the lab data but also to be aware of the case definitions, , to decide whether the clinical and lab criteria are met and to classify cases. Compared to the German surveillance system and their implementation of case definitions, physicians only provide notification forms for a small number of diseases based on clinical symptoms and the implementation of case definitions is on a Local public health level where all information is collected and entered in an electronic database. Physicians in R. Macedonia are responsible for reporting of all notifiable diseases, while in Germany the system is lab based as a result of a very strong network of laboratories. The roles of the regional and national level are described in the law. Local units although present in the surveillance system, are not mentioned in the law as such and their role is unclear. Reporting is paper based, which lead to delays, one report is entered several times on different level in different software which are not connected. So numbers often does not match, which again lead to delays. In Germany, the report is entered only on a local level and directly goes to the database while state and national level only check for inconsistencies and if found, than contact the local level for clearance, so the delay is minimal. The current surveillance system is set in two parts, one for the mandatory notifiable diseases reported by physicians and the other for the mandatory notifiable pathogens reported by the labs. These two systems are not connected, they work in parallel. Local and regional public health authorities in R. Macedonia are understaffed, many LU does not have epidemiologist and/or a technician. Furthermore, lab capacities differ from one region to another, different kind of microbiological tests are used and cannot satisfy the need of the surveillance system.

Status: Completed

Scientific communication

- Tularemia Outbreak in the Republic of Macedonia, December 2014 – April 2015 - oral scientific presentation, First Annual MediPIET Scientific Conference, Skopje, 2015 (main author)
- Brucellosis in Human Population in R. Macedonia Before and After the Introduction of Vaccination in Animals 2001-2015 - oral scientific presentation, Second Annual MediPIET Scientific Conference, Marrakesh, 2016 (main author)
- Evaluation of influenza ILI sentinel surveillance system in the Republic of Macedonia - oral scientific presentation, Third Annual MediPIET Scientific Conference, Brussels, 2017 (main author)
- Measles Outbreak in Skopje, Republic of Macedonia, 2014, First Annual MediPIET Scientific Conference, Skopje, 2015 (co-author)
- Viral hepatitis A in the Republic of Macedonia, (2006-2015), Second Annual MediPIET Scientific Conference, Marrakesh, 2016 (co-author)
- Mass food poisoning outbreak in a factory in Tetovo, Macedonia, March 2017, Third Annual MediPIET Scientific Conference, Brussels, 2017 (co-author)
- First clusters of Hantavirus haemorrhagic fever with renal syndrome in Macedonia, Third Annual MediPIET Scientific Conference, Brussels, 2017 (co-author)
- A retrospective study of brucellosis in Macedonia, First international scientific conference of Faculty of Medical Science - ISCFMS2016 (co-author)
- Distribution of methicillin resistant Staphylococcus aureus in the Republic of Macedonia in the period 2013-2015, Annual meeting of association of medical doctors, Struga (co-author)
- Surveillance of influenza like illness in primary care, 5th Conference of the Association of general practice/ family medicine of South-East Europe, Budva, Montenegro (co-author)
- Haemorrhagic fever with renal syndrome in Macedonia in 2017, Days of preventive medicine, Ohrid, R. Macedonia (co-author)
- Characteristics of the 2016/2017 influenza season in the Republic of Macedonia, Days of preventive medicine, Ohrid, R. Macedonia (co-author)
- WHO European operational framework on climate change, health and vector-borne diseases, Days of preventive medicine, Ohrid, R. Macedonia (main author)

Teaching experience

- Training for health professionals for brucellosis - Continuous training of health professionals for controlling and preventing of brucellosis
- Workshops on implementation of the Program for elimination of measles, rubella and congenital rubella syndrome in different regions in the country
- Training of medical students at the Medical Faculty on Biostatistics
- Training of medical students at the Medical Faculty on Epidemiology of communicable diseases
- Training of colleague students (nurses, physiotherapist, radiologist, speech therapist students) at the Medical Faculty on Biostatistics and on Epidemiology of communicable diseases

Miscellaneous (additional activities)

Additional training activities:

- ECDC TESSy training sessions for new users from EU enlargement countries;
- Euro-GASP and STI Network Meeting;
- Multi Country - Workshop on the implementation of mosquito vectors surveillance in the EU and enlargement countries;
- TAIEX Workshop on Foodborne Disease Outbreaks;
- Training in biostatistics and medical informatics, Institute of epidemiology and Biostatistics, Medical faculty "St Kiril and Metodij", Skopje, R. Macedonia;
- Training in epidemiology of communicable diseases, Institute of epidemiology and Biostatistics, Medical faculty "St Kiril and Metodij", Skopje, R. Macedonia;
- Training in epidemiology on non-communicable diseases, Institute of epidemiology and Biostatistics, Medical faculty "St Kiril and Metodij", Skopje, R. Macedonia;
- Multi-country workshop on national AMR surveillance for data managers and epidemiologists from CAESAR countries;
- Workshop for revision of the protocols of the International Health Regulations 2005 and finalizing the operational part of the plan for preparation and response of the health system in emergency and crisis situations and disasters;
- Training in microbiology at the Institute of Microbiology and parasitology at the Medical Faculty University "St Kiril and Metodij", Skopje, R. Macedonia
- Workshop on Monitoring & Evaluation of Surveillance Systems with Emphasis on Influenza Sentinel Surveillance, Sarajevo, BiH
- Important steps in developing the research paper, Institute of epidemiology and Biostatistics, Medical faculty "St Kiril and Metodij", Skopje, R. Macedonia
- Annual Influenza Meeting 20-22 June, Stockholm, Sweden

List of media communications during fellowship:

<http://iph.mk/multimedija/mesecni-bilteni/>
<http://iph.mk/mali-sipanic-i-kako-da-se-zastitite/>
<http://iph.mk/kongo-krimiska-hemoragicna-treska-informacii-za-naselenieto/>
<http://iph.mk/hemoragicna-treska-so-bubrezen-sindrom-informacii-za-javnosta/>
<http://iph.mk/sostojba-so-grip-vo-republika-makedonija-sezona-20162017-zavrсна-informacija/>
<http://iph.mk/edukativen-materijal-za-tularemija/>
<http://iph.mk/informacija-za-sostojbata-na-pojava-na-tularemija-vo-republika-makedonija/>
<http://iph.mk/informacii-za-mers-cov/>
<http://iph.mk/ebola-virusna-bolest-procenka-na-rizik-pri-patuvanje-i-transport-2/>
<http://iph.mk/informacii-za-vakcinacija-protiv-sezonski-grip/>

Next steps

Organizing cascade training on regional and local level for epidemiologists in order to improve their skill and to strengthen capacities.

Organizing cascade training on regional and local level for epidemiologists for outbreak control and prevention as well as outbreak descriptive and analytical analyses.

Strengthening of vector-borne disease surveillance and control by establishing and implementation of a Protocol/Program for surveillance and control of vector-borne diseases.

Initiating measures for adopting EU2012 case definitions and their proper use in R. Macedonia.

Following the recommendations from the Evaluation of influenza ILI sentinel surveillance system in the Republic of Macedonia to improve and strengthen the system.

Supervisor's conclusion

During the two-year MediPIET fellowship Dragan Kochinski was involved in many activities like evaluation of sentinel influenza surveillance system, outbreak investigations, HIV research among injecting drug users and others as required by the MediPIET programme and guide.

He has conducted and finished all appointed activities timely and successfully. His reports were timely prepared, concise with findings and recommendations clearly identified. He was able to conduct his work as a team player with appropriate supervision required, accepting suggestions and ideas. His MediPIET assignments led to successful outcomes, including implementation of recommendations and scientific publications.

During the fellowship, he developed his skills for intervention epidemiology and especially for analytical epi methods in outbreak investigation, use of GIS and basic knowledge in RDS methodology and analyses.

Based on his personal and professional skills, we can highly recommend Dragan Kochinski for any kind of public health work.

Scientific Coordinator's conclusion

Text

References

- Tularemia Outbreak in the Republic of Macedonia, December 2014 – April 2015; http://medi Piet.eu/wp-content/uploads/2016/10/Abstract-Book-ASC-2015_FINAL.pdf; p.64
- Brucellosis in Human Population in R. Macedonia Before and After the Introduction of Vaccination in Animals 2001-2015; http://medi Piet.eu/wp-content/uploads/2016/10/abstract_book_2016_.pdf; p.91