



MediPIET

Mediterranean and Black Sea Field
Epidemiology Training Programme Network



Funded by the EU

MediPIET Summary report of work activities

Oksana Artemchuk

Ukraine, Cohort 3 2019-2021

Background

About MediPIET

The Mediterranean and Black Sea field epidemiology training programme “MediPIET” is a CBRN CoE Project 74 – 2018/400-697. Within the framework of the EU CBRN Risk Mitigation Centres of Excellence (CoE) initiative, Europe-Aid-DEVCO funds MediPIET to increase security in the EU neighbourhood. Building on the success of the previous MediPIET phase 2014-2017, this project supports capacity building for prevention and control of natural and man-made health threats through a regional training program in intervention epidemiology.

Furthermore, the MediPIET project is aimed at consolidating a competent workforce with the necessary competence in intervention epidemiology to carry out essential public health functions for prevention and control of national and cross-border challenges posed by communicable diseases. In detail, expected results are as follows: (i) Enhanced field epidemiology training capacity in participating countries; (ii) Enhanced capacities in public health institutions to train their workforce and collaborate with regional networks; (iii) Increased capacity of exchange public health knowledge and methodologies between non-EU countries and EU partners; (iv) Sustainable country capacity and regional networking to deal with health security challenges.

The project is implemented by the Consortium Instituto de Salud Carlos III, Madrid, Spain (ISCIII) and the Fundación Estatal Salud, Infancia y Bienestar Social, Madrid, Spain (FCSAI) under the scientific leadership of ECDC in the two-year period 2019-2021. It extends over the non-EU countries covered by the EU Enlargement and European Neighbourhood policies: Albania, Algeria, Armenia, Bosnia and Herzegovina, Egypt, Georgia, Jordan, Kosovo¹, Lebanon, Libya, Moldova, Montenegro, Morocco, Palestine², Serbia, the Republic of North Macedonia, Tunisia, and Ukraine.

¹ This designation is without prejudice to positions on status and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

² This designation shall not be construed as recognition of a State of Palestine and is without prejudice to the individual positions of the Member States on this issue.

Pre-fellowship short biography

Oksana is a Ukrainian medical doctor and epidemiologist with a PhD in medical management. She has been working in communicable disease surveillance and public health since 2012 mainly with the Public Health Centre of the Ministry of Health of Ukraine, European Union funded projects and the World Health Organization. Her area of expertise is influenza and acute respiratory viral infections surveillance.

Training site

On July 2019, Oksana Artemchuk started her MediPIET fellowship at the State Institution "Public Health Centre of the Ministry of Health of Ukraine", Kyiv, Ukraine.

The State Institution "Public Health Centre of the Ministry of Health of Ukraine" (PHC) is a health care institution established in 2015. The PHC is responsible for maintaining and strengthening public health, social and hygienic monitoring of diseases, epidemiological surveillance and biosafety, group and population prevention of diseases, control of epidemics and strategic management in the field of public health.

The main task of the PHC is to work in the field of public health. The PHC performs treatment-and-prophylactic, scientific-practical and organizational-methodical functions in the field of health care in order to ensure the quality of treatment of patients with socially dangerous diseases, including HIV / AIDS, tuberculosis, drug addiction, viral hepatitis, etc., disease prevention in context of public health system development. PHC participates in the formation of regulatory policy and interacts with other ministries, research institutions, international and non-governmental organizations working in the field of public health and combating socially dangerous diseases.

National supervisor(s): Dr Roman Rodyna

Scientific coordinator: Dr Iro Evlampidou

Fellowship projects

Surveillance

Age-specific influenza burden using sentinel surveillance data, Ukraine, 2018 -2019

Background: Since 2016, severe acute respiratory infections (SARI) and influenza like illnesses (ILI) sentinel surveillance is implemented in six Ukrainian regions but age-specific influenza burden is unknown. We assessed data quality and estimated the influenza-associated SARI and ILI burden for years 2018/19 to identify the at-risk age-groups and guide programmatic decisions.

Methods: For 2018/19 separately and combined, we estimated age-specific medians and 95% confidence intervals (95%CI) for influenza-associated: SARI proportional contribution to all hospital admissions and in-hospital case fatality ratio (CFR) and ILI incidence rate using weekly sentinel surveillance data from 11 SARI and 7 ILI sites and WHO methodology.

Results: In 2018 and 2019, the highest median proportion of influenza-associated hospital admissions was observed in those aged 18-29 years: 2.2% (95%CI: 2.0-3.0, 6 sites) and 1.6% (95%CI: 1.0-2.0, 6 sites) respectively and in 2019, in the 65+ age-group: 1.4% (95%CI: 0.8-2.0, 6 sites). The median CFR in 2018 was 0% (95%CI: 0.0-0.0, 2 sites, 3 deaths) across all ages. In 2019 and 2018/19 the highest CFR was in those aged 30-64 years: 14% (95%CI: 7.0-27.0, 5 sites) and 8.0% (95%CI: 4.0-19.0, 6 sites) respectively. In 2018/19, for ILI, 479 tests were performed with 69 (29%) positive. The highest median influenza-associated ILI incidence was in the 18-29 age-group (per 100,000): in 2018: 127 (95%CI: 79-205, 5 sites), in 2019: 110 (95%CI: 41-292, 4 sites) and in 2018/19: 200 (95%CI: 109-367,

4 sites). For 2018-2019 season, among positives SARI and ILI 47% (196/93) were viruses A untyped, 28% (196/54) A(H1N1) pdm09 and 25% (196/49) A(H3N2).

Conclusions: SARI and ILI burden were highest among young adults and elderly and CFR among adults. ILI cases were underreported. We recommend improving sites' performance and undertake studies to confirm these findings.

Role and outputs: Principal investigator

Oksana developed the study protocol, data extraction forms and performed the data collection, cleaning management and analysis, and prepared a report.

Supervisor(s): Dr Roman Rodyna

Status: Completed

Outbreaks

1. Outbreak of acute gastroenteritis at a wedding party in a village in Chernivtsi region, Ukraine, September 2019

Background: Following a notification of a gastroenteritis outbreak after a wedding home-made buffet on 29-30 September 2019 in restaurant «XX», Putivlya, we carried out an epidemiological investigation in order to assess the extent of the outbreak, identify the vehicle of transmission and implement control measures.

Methods: We defined a case as an individual who attended the wedding buffet in 29-30 September 2019 at restaurant «XX » in Putivlya and developed at least one of the following symptoms between 29/09 and 03/10/2019: diarrhoea (≥ 3 loose stool for 24 hours), fever $\geq 38.0^{\circ}\text{C}$, chills, nausea, vomiting, abdominal pain or headache. We undertook a retrospective cohort study using a structured questionnaire and face-to-face interviews, visited the restaurant premises, conducted interviews with wedding organizers and collected biological and environmental specimens. We estimated Risk Ratios (RR) and 95% confidence intervals (95%CI) using binomial regression.

Results: Among 250 wedding guests, 166 (66%) completed the questionnaire among which 131 (79%) became a case (average incubation: 2 days, standard deviation: 0.6, maximum: 5). Among 131 cases, 75 (57%) were hospitalized and no one died. People who ate cheese containing food items had 5.1 times more risk of becoming a case (RR: 5.1, 95%CI: 2.6-9.7). Among 75 stool specimens, 58 (77%) were positive for pathogens; 57 (98%) for *Salmonella enteritidis* and 1 (1.7%) for *Enterobacter cloaci*. The buffet cooks were relatives of the wedding couple, not trained in proper food handling practices. Food was available during the 2-days party continuously outside of the fridge. Among 15 food specimens tested, 11 (73%) were positive for *S. enteritidis* (1, 9.0%), *Klebsiella pneumonia* (5, 45%), *Staphylococcus epidermidis* (1, 9.0%) and for *S. enteritidis* and *K. pneumonia* (4 36%).

Conclusions: The investigation findings suggest that cheese may have been the vehicle of transmission of this *Salmonella* outbreak. We recommend strengthening public awareness on hygiene measures and proper food handling techniques.

Role and outputs: Co-investigator

Oksana performed data cleaning and management, descriptive, bivariate, univariate and multivariate data analysis and prepared a final report with recommendations.

Supervisor(s): Dr Roman Rodyna

Status: Completed

2. Outbreak of Botulism in Chernihiv region, Ukraine, January-July 2019

Background: Botulism is a rare but serious illness that can be potentially fatal. In August 2019, following a notification of an increased number of botulism cases in Chernihiv region, the Public Health Center conducted a field investigation in order to identify the source, mode of transmission and possible risk factors for contracting botulism in order to implement control measures.

Methods: We defined a case as an individual diagnosed with botulism clinically or via laboratory testing in Chernihiv region between 01/01-15/07/2019 and was reported to the PHC. We undertook a descriptive study using structured questionnaires and telephone interviews with the patients. We visited two city fish markets, reviewed medical records of hospitalized cases and performed descriptive analysis.

Results: From 1 January to 15 July 2019, nine cases of botulism were reported in Chernihiv region, all living close to rivers and not linked to each other. Of the nine cases, 6 (67%) were male. The average age was 40.8 (SD: 7.2) years. The most common symptoms were dry mouth (8/9, 89%), visual impairment (7/7, 100%), muscle weakness (6/6, 100%), diplopia (4/5, 80%) and vomiting (4/4, 100%). All cases were hospitalized and no death occurred. All cases reported consumption of dried salted homemade river fish, which was uncut. No other common source of exposure was identified. Eight of 9 cases were tested and four were positive for botulinum toxin type E. The remaining cases were clinically diagnosed.

Conclusions: The clinical presentation, microbiological results and epidemiological findings suggest *C. Botulinum* was the causative agent and the homemade dried salted fish could be the vehicle of transmission. We recommend raising public awareness on the appropriate cooking techniques of salting and drying fish at home in order to prevent the accumulation of the toxin and the appearance of further cases of botulism.

Role and outputs: Co-investigator

Oksana was a team member in the field investigation, reviewed medical records, performed telephone interviews, market visit, analysed the data, prepared a map and a final report with recommendations.

Supervisor(s): Dr Roman Rodyna

Status: Completed

Research

Knowledge, attitudes and practices survey towards pneumococcal disease and vaccination among primary healthcare doctors, Ukraine, 2021

Background: The Ukrainian Ministerial Order (UMO) recommends pneumococcal vaccine (PCV) in risk groups but not free-of-charge resulting in coverage <5% (crude estimation). In 2022, the vaccination calendar will include PCV for children <5years. Doctors' pneumococcal knowledge, attitudes and practices (KAP) are paramount to successful roll-out but unexplored. We surveyed doctors aiming to assess their KAP to address gaps and misconceptions and support PCV implementation.

Methods: In March 2019, we selected and surveyed primary care doctors using simple random sampling and structured self-administered online questionnaire. We measured attitudes and practices using 5-point Likert-type questions. We defined pneumococcal disease (PD) knowledge as low/moderate (<80%), high ($\geq 80\%$), PCV and overall knowledge as low ($\leq 50\%$), moderate/high (51-100%) and PCV attitudes and practices as negative/neutral (1.0-3.4), positive (3.5-5.0). We calculated prevalence ratios (PRs) and 95% confidence intervals (95%CI) using Poisson regression.

Results: The response rate was 46% (286/628). Females represented 85% (243/285); median age was 47 (interquartile range: 33-59) years (N=281). Twenty-six percent (72/277) had high PD

knowledge associated with age (>47 years: PR=0.52, 95%CI: 0.30-0.90) and child-related UMO awareness (PR=1.78, 95%CI: 1.04-3.08); 57% (159/279) had moderate/high PCV knowledge associated with positive attitudes toward PCV effectiveness (PR=2.30, 95%CI: 1.24-4.24). Overall knowledge was moderate/high in 65% (178/272); 83% (220/265) had positive PCV attitudes; 52% (135/258) had positive practices associated with female sex (PR=2.10, 95%CI: 1.08-4.08), positive attitudes (PR=3.29, 95%CI: 1.19-9.11) and perception of vaccine supply as medium/big barrier (PR=1.66, 95%CI: 1.28-2.72).

Conclusion: We observed moderate pneumococcal knowledge, especially in older doctors, positive PCV attitudes and neutral practices. Females and doctors with positive attitudes recommended PCV more. For successful PCV implementation, we recommend prior educational activities targeting primary care doctors, especially older males, to improve knowledge, introduce PCV and address concerns while ensuring uninterrupted vaccine supply.

Role and outputs: Principal investigator

Oksana developed the study protocol, questionnaire and cover and invitation letter for study participants and submitted them to the PGC Ethical Committee. She executed the study and performed data collection, cleaning, management and analysis. Oksana prepared the final study tables and a draft manuscript that will be submitted to Plos One medical journal.

Supervisor(s): Dr Roman Rodyna

Status: Completed

Scientific communication

1. Artemchuk O, Evlampidou I, Dykhanovska T, Dyachenko O, Rodyna R. "Age-specific influenza burden using sentinel surveillance data, Ukraine, 2018 -2019". Poster presentation at the Seventh European Scientific Working Group on Influenza (ESWI) Influenza Conference, 6-9 December 2020, virtual. Available from: <https://influenzaconference.org/mega-programme?view=list>
2. Artemchuk O, Evlampidou I, Rodyna R. Knowledge, attitudes and practices survey towards pneumococcal disease and vaccination among primary healthcare doctors, Ukraine, 2021 (manuscript under preparation to be submitted to Plos One).

Teaching experience

1. Pandemic Influenza Preparedness Framework Annual Meeting and Sentinel Surveillance Coordinators Meeting, October 2-4, 2019, Armenia

Oksana attended and delivered a lecture at the Pandemic Influenza Preparedness Framework Annual Meeting and Sentinel Surveillance Coordinators Meeting, organised by World Health Organization, Yerevan, Armenia, 2-4 October 2019. The lecture "Calculating and applying epidemic thresholds in influenza surveillance using the moving epidemic method" developed by World Health Organization was delivered to international public health specialists.

2. Training on outbreak investigation, 18 October 2019, Ukraine

Oksana attended and facilitated a case study at the training on outbreak investigation organised by the Public Health Center of the Ministry of Health of Ukraine, Kiev, Ukraine, 18 October 2019 on "Identifying the source of an anthrax outbreak" for regional public health personnel.

3. Two-days training "Training on influenza surveillance strengthening in Ukraine", October 24-25, 2019, Ukraine

The training aimed to update the sentinel Ukrainian staff on global and regional influenza surveillance situation, refresh the knowledge on changes in legislative base and electronic surveillance data management for the new epidemic season 2019-2020. Oksana delivered lectures for two days, conducted an simulation exercise and also moderated the entire training and group

discussions. The training was evaluated by participants and the main conclusions were: the trainers were knowledgeable, and good practice examples were used. Presentations contained relevant information and were presented in the right way. The structure of the training was well planned and allowed participants to be led from beginning to end without jumping from topic to topic.

4. Training series on "Vaccine preventable diseases (VPD) surveillance and immunization for primary health care staff, November-December 2019, Ukraine"

Oksana took part in this event organised jointly by World Health Organization Country Office for Ukraine (WHO/COa) and the Public Health Centre (PHC) of the Ministry of Health as lecturer and facilitator of practical exercise. The training's aim was to implement a capacity-building program for regional and community level authorities, health managers, public health and primary health care staff. Participating in a WHO series of trainings as a lecturer helped Oksana improve her knowledge of how work is being done in district hospitals and small rural outpatient clinics to alert the regional Public Health Centre on infectious diseases. This activity has also contributed to the development of her teaching skills and public speaking.

Miscellaneous

Organisation of public health events

- Oksana organized a roundtable "Vaccination against influenza - the best method of prevention» in Kiev, Ukraine, 30 July 2019. The event was attended by the Minister of Health, representatives of the State Expert Centre of Ukraine, manufacturers, vaccine distributors, non-governmental organisations and other interested parties.

Communication with media

- Oksana conducted 2 TV interviews: 1) "Influenza incidence forecast for the epidemic season 2019-2020", 15 October 2019 and 2) "The increase of number of pneumonia cases in Ternopol, 02-week 2020", 17 January 2020 and 2 talk shows 1) "Main Topic", 19 November 2019 and 2) "Medical expert", 12 November 2019 as an expert.

Participation in trainings/events

1. "Advanced Excel and Power BI", Kiev, Ukraine, 25-26 June 2020, organized by non-governmental organization «Public Health Alliance». The main goal of training was to refresh knowledge and practical skills when working with Excel.
2. "Advanced Excel", Kiev, Ukraine, 8-9 August 2019, organized by non-governmental organization «Public Health Alliance». The main goal of training was to refresh knowledge and practical skills when working with Excel.
3. "The Basics of Public Speaking and the Basic Rules of Working with the Media", Kyiv, Ukraine, 14-19 August 2019. The event was organised by Public Health Centre of Ukraine. The purpose of the training was to develop the skills of public speaking and working with the media.
4. "Basic Mediation Skills Training", Kiev, Ukraine, 21 August 2019. The event was organised by Public Health Centre of Ukraine. The purpose of the training was to form the basic skills of conducting the mediation process.
5. Oksana prepared and delivered a presentation "EuroMOMO project in Ukraine" in Annual meeting for the European monitoring of excess mortality for public health action (EuroMOMO project), 4-6 September 2019, Copenhagen, Denmark. The event was organised by World Health Organization. The audience was epidemiologists, statisticians from WHO European Region countries, representatives from the Danish Statens Serum Institute.

Next steps

After graduation, Oksana will continue working in the field of public health in Ukraine and apply the acquired skills and abilities in her daily work. She plans to disseminate the knowledge and skills she received during the fellowship among public health professionals in Ukraine through trainings and

webinars. Oksana plans to disseminate the influenza burden estimates and the research findings of her KAP survey to relevant regional public health institutions and sentinel sites.

Supervisor conclusion

During fellow`s work, Oksana Artemchuk demonstrated gradually increasing skills in epidemiological analysis, outbreak investigation, scientific writing, research and especially in use of statistical software. She is the only epidemiologist in the country with skills in use of STATA software.

Thanks to these skills Oksana conducted a very useful for Ukraine KAP survey among medical workers on pneumococcal vaccine to be introduced in the National vaccination schedule, and this survey can help decision makers to overcome possible gaps and challenges during the vaccine introduction. Also, first in Ukraine, Oksana performed an influenza burden estimates study and the results of this work have to be used by practical epidemiologists and clinicians to develop the decisions on flu prevention in the country.

During her fellowship, Oksana demonstrated the ability to work under pressure and under multitasking conditions.

As a result of the fellowship, Oksana became a dedicated specialist able to work in national and international organizations in epidemiology and public health.

Scientific coordinator conclusion

Oksana Artemchuk is a Ukrainian medical epidemiologist with a PhD in medical management, working in the field of communicable diseases and influenza epidemiology and surveillance. During the fellowship, Oksana demonstrated her ability to work hard under difficult conditions with professionalism, politeness and humility. She was a committed fellow, eager to learn and gain new competencies. The projects Oksana has conducted were in the areas of food-borne outbreak investigations like Salmonellosis and Botulism, influenza surveillance and burden of disease, a project that estimated for the first time the burden of influenza in specific age groups, and in pneumococcal vaccine knowledge, attitudes and practices of Ukrainian doctors, a nationwide study that aims to inform the upcoming introduction of the pneumococcal vaccine in the Ukrainian national calendar. Oksana also taught public health professionals in various occasions and in collaboration with WHO and presented her work and other topics in a scientific conference and meetings. Through completing these assignments, Oksana has improved her skills and competencies in surveillance, outbreak investigation and research methods as well as in in statistical analysis, the use of statistical software and scientific communication. Oksana is dedicated to working in public health and epidemiology and in improving and protecting the health of the Ukrainian and global population.

Personal conclusions of fellow

During the last two years, my public health skills and knowledge have improved, especially in the area of outbreak investigation and research. I am able to independently conduct an outbreak investigation using epidemiological analytical methods and write a well-structured report with recommendations. I can independently choose a research design for a specific scientific problem and create a questionnaire. Additionally, I gained statistical analysis skills and I am able to work independently with statistical software such as STATA and EpiInfo. Finally, I consider training activities to be my strengths and I can present the topic to a large audience and achieve the learning objectives. MediPIET has provided me with networking opportunities while the knowledge and skills I have acquired in field epidemiology will help me to further work and collaborate with colleagues and institutions within and outside my country.

References

1. Artemchuk O, Evlampidou I, Dykhanovska T, Dyachenko O, Rodyna R. "Age-specific influenza burden using sentinel surveillance data, Ukraine, 2018 -2019". Poster presentation at the Seventh European Scientific Working Group on Influenza (ESWI) Influenza Conference, 6-9 December 2020, virtual. Available from: <https://influenzaconference.org/mega-programme?view=list>