



**Cohort 2
2015-2017**

MediPIET Report

Summary of work activities

Alexei CEBAN
Republic of Moldova



Training site: National Centre for Public Health, Chisinau, Republic of Moldova

National Supervisors: Dr. Stela Gheorghită and Dr. Natalia Caterinciuc

Scientific Coordinator: Dr. Ahmed Zaghloul

Pre-fellowship short biography

Before joining MediPIET fellowship, Alexei Ceban studied public health at Medical and Pharmaceutical University „Nicolae Testemitanu”. Dr. Alexei Ceban was employed since 5th year of faculty as epidemiologist assistant at the Monitoring of Public Health Events Department from National Centre for Public Health. After graduation of epidemiology residency, he was employed as epidemiologist in Vaccine Preventable Department. During that time, he gained experience in international collaboration with various NGOs (WHO, UNICEF, CDC Atlanta, etc.) on different communicable disease projects, mainly for IHR 2005 and vaccine preventable diseases.

Fellowship projects

Surveillance project

1. Epidemiological situation of measles elimination, Republic of Moldova, 2006 – 2015

Background: Vaccination against measles in Moldova started in 1962. In period of 1962-2005 the average annual incidence was 130/100000. Systematic immunization of children, initiated in the 1960s of the 20th century, allowed morbidity to be reduced by more than 99% and conditioned the modification of the epidemic process. However, in the context of the actual impact of the measles vaccine, the Republic of Moldova aims to achieve the goals of the "Strategic Global Plan for the Eradication of Measles 2012-2020", which incorporates accelerated control and measles elimination activities. In 2006, a National elimination strategy of measles was implemented, regarding to this, were registered only secondary cases linked to imported ones.

Objective: To describe epidemiological situation of measles and to recommend best actions for achieving goal of elimination of measles in Moldova.

Methods: We conducted an epidemiological descriptive study for the period 2006-2015 in order to describe measles epidemiological situation. We calculated annual measles incidence, stratified by age

groups and regions, rural and urban areas. We obtained incidence and vaccination coverage rates for each dose of measles, mumps, and rubella vaccine (MMR). Data was collected from annual surveillance reports from Public Health Centers.

Results: In period of 2006-2015, 84 cases were reported, with annual average incidence rate of 0.2/100,000 population. The highest rate was registered in 2006 with 34 cases (0.81/100,000) and the lowest in 2014 with 2 cases (0.05/100,000). All No cases were registered from 2008-2011 and in 2015. The national annual average coverage of 1-dose MMR was 93%, but, continuously decreasing from 96.6% in 2006 to 88.2% in 2015. The highest incidence among age groups was in 3-6 years old with 9 cases (1.3/100,000). Measles incidence ratio in urban area was 1.4 times higher than in rural. In studied period, from 37 administrative territories, 18 reported at least one case (48.6%), highest rate was registered in Calarași with 18 cases (3.2/100,000). The urban areas reported 0.24 cases per 100.000 population and for rural areas 0.17 cases per 100.000 population.

Conclusion: During the period of elimination in the Republic of Moldova it is obvious that there is no cycling of disease or seasonality. Measles gets a new look after strengthening national immunization programs and implementation strategies disposal which provides a strict epidemiological surveillance of the disease. Urban regions and specific territories prevails agglomeration of unvaccinated groups of people who have higher risk to get measles. Further studies are needed to identify vaccination gaps and potential risk groups, in order to develop a catch-up vaccination campaign and to implement specific immunization communication strategies.

Status: Completed

2. Increasing incidence of pertussis in Republic of Moldova, 2016

Background: In last years, at the global, regional level including and Republic of Moldova there is a tendency of increasing numbers of pertussis cases. In 2016 we detected an increasing number of pertussis outbreaks in different administrative territories from Republic of Moldova. A study was conducted in order to determine the nature and epidemiological situation of pertussis in Moldova.

Objective: To describe pertussis epidemiological situation from Republic of Moldova and to develop recommendations in order to improve surveillance and control of pertussis.

Methods: We conducted a descriptive study. We reviewed and analyzed pertussis surveillance records, conducted active case finding and described the pertussis cases from 2016. Case definition applied was from national surveillance system. Clinical confirmed case was defined as a person with cough lasting at least two weeks with at least one of the following symptoms: paroxysms of coughing, inspiratory whooping, post-cough vomiting; Lab confirmed case: isolation of *Bordetella pertussis*, ELISA or PCR and Epidemiologically confirmed: a case that meets the clinical case definition and is linked to a laboratory-confirmed case. Specific IgM antibodies of patients were investigated by the method of enzyme immunoassay.

Results: A total of 210 from 280 cases of pertussis reported in 2016 were analyzed. The incidence rate in 2016 was 7 per 100000 population, from which 68.1% of cases were aged from 0 to 6 years, 27.1% were school age children (7-17 years) and 4.8% were adults. Vaccination coverage decreased in 2008 to 2015, from 95.4 to 89.7%. We registered a late uptake of medical care, with an average of 10.5 days after onset of the disease. At the same time, in distribution among age groups of late uptake of medical care of children <1 year was 9.6 days, in the group of 1-6 years - 11 days and more than 7 years - 13.2 days. Also we established a late diagnosis after addressing for medical care, in 42.9%, the diagnosis was established after the second week. The bases of the diagnosis of pertussis in 73.1% of cases was laboratory data, for 16.2% was epidemiological data and in 10.7% clinical data. Specific IgM antibodies were detected in 77.0% of patients. Among patients <1 year, 14.9% were under the age of vaccination (<2 months), 34% received 1-3 doses of vaccine, 46% were not vaccinated, and 5.1% had

no data. From children patients who received a full course of vaccination against pertussis, 25% had been vaccinated 1-2 years ago and other 25% became ill after 3-4 years after immunization.

Conclusion: Children <6 years were mainly affected, but also school age children and adults are involved more often in pertussis transmission. Late diagnosis and uptake of medical care could contribute to the spread of pertussis. Training of medical staff is needed for increasing vigilance and uptake public health measures. A case-control study is recommended in order to identify the risk factors for pertussis infection.

Status: Completed

3. Evaluation of measles and rubella surveillance system in Republic of Moldova, 2010 -2016

Background: To achieve elimination of measles and rubella and to maintain interruption of indigenous transmission, proper vaccination coverage only is not sufficient, but also an efficient surveillance system must be in place. We performed an evaluation of measles and rubella surveillance system in Republic of Moldova to ensure that data collected meets the proposed objectives of surveillance system.

Objectives: To describe the measles and rubella surveillance system and to evaluate the key system attributes. To assess performance and determine how well the system operates to meet its stated purpose and objectives with recommendation of best actions in order to improve measles and rubella surveillance system.

Methods: The performance of surveillance was evaluated according to European Centre for Disease Prevention and Control guidelines. The information was sourced from national register of diseases, national statistic form for vaccine coverage, and national register of reference laboratory. We described the system and assessed sensitivity, predictive positive value, completeness, representativeness, and timeliness using data from surveillance system and reference documents. For simplicity, flexibility and acceptability we used a standardized questionnaire for healthcare and Public Health Centers personal from local, intermediate and national level. For evaluation of chosen qualitative attributes were standardized 29 questions with Likert scale.

Results: Last reported cases of measles were in 2014 and for rubella last recorded case in 2012. Surveillance system covered the entire domestic population and visitors. Sensitivity of measles surveillance system for the studied period was very high, 95.2 [CI 85.15-99.19]. From 2010 to 2016, 40 measles cases were registered, from which 2 cases were not reported as measles cases. For rubella surveillance system, sensitivity was also very high, 100% [CI 36.84-100.00], only 3 cases were reported and all of them were classified correctly according to the case definition. In Moldova were reported 40 cases of measles and 300 suspected cases, calculated PPV was 11.8 [CI: 8.65-15.52]. The completeness of the surveillance measles and rubella system with no missing reporting data fields constituted 97.4%. Timeliness was 71.2% and represented the reports which were transmitted to the upper level in 24 hours. Were questioned 172 personal from all levels for qualitative variables. Overall flexibility was 49%, only 22% of the staff has willingness and can be flexible to introduce additional changes or update the system and 34% will have positive attitude if the case definition or surveillance indicators will support some changes. In case of introducing a new diagnostic methodology or a new tool - 83% of personal will agree on that, 81% of staff could allocate more time in communications activities and advocacy with population. System is accepted of its users in 71%, acceptability for aim and objectives of the system – 85%. Recognize the measures of the surveillance system like efficient and want to continue activities for maintaining elimination of measles and rubella - 83%. Agreed 69% on that surveillance data of measles and rubella reflects the true situation. General simplicity of the system was assessed to 71%, case definition and collection of data are simple for 81%. Almost 80% of staff mentioned that managing the data is simple, including time spent on transferring, entering, and backing up data. From total, 54% were agreeing with doubled activities and working on reporting. Timeline for reporting in 24 hours were viewed simple for 87% of the staff.

Additional comments of the staff in the questionnaire was summarized as receiving of feedback from national stakeholders on annually/monthly results of the system and to conduct more trainings for medical health care workers. Also to be mentioned, some medical workers had suggestions on introducing of an electronic information system.

Conclusion: A national distributed passive case-based surveillance system is in place, with clear and comprehensive objectives, generally well accepted by both healthcare and public health staff with generally good compliance with reporting. The reporting of cases in the measles and rubella surveillance system is complete, timely and lab results are available. Feedback to the reporting bodies should likewise be disseminated in a timely manner at all levels thereby encouraging participation and involvement for detection improvement with proper public health response and intervention.

Status: Completed

Outbreak Investigations:

Gastroenteritis in a rest camp in Stefan-Voda district, Republic of Moldova

Background: On 4th of August 2017, Public Health Center from Stefan-Voda district was noticed about 9 suspected cases of gastroenteritis in a rest camp from the district. All 9 suspected cases had diarrhea, abdominal pain and fever. In next few hours another six cases were reported. From all 15 cases, 7 persons were hospitalized in the district hospital with gastroenteritis diagnosis. Physician from the camp reported that on 3rd of August in the afternoon, a group of 58 children came to camp for holidays, and other 55 children were already in the camp for 4 days. In total, the camp had 113 children and 10 administrative personal. At 3pm they gathered all together for the lunch. After 2 hours first 2 children from different groups had gastrointestinal symptoms.

An outbreak investigation team was set up on 5th of August and consisted from 2 epidemiologists, one hygienist, one infectious physician and one veterinary from food safety agency.

Objective: To identify the possible source of the outbreak and implement relevant actions in order to stop the outbreak.

Methods: We conducted a retrospective cohort study in order to identify the source of the outbreak. We conducted active case finding in the camp and for those who left the camp. A case was defined as person who attended the lunch from 3rd August in the camp and developed at least one of following symptoms: diarrhea, abdominal pain and fever. Data were collected with face to face interviews using structured questionnaire including basic socio-demographic data, time and type of symptoms, and complete list of food items served during the lunch. For descriptive and analytical methods we used Epi Info v.7. Food specific Attack Rates and Relative Risk were calculated in order to assess effect of exposure to each food item. Patients, kitchen personnel and environmental investigations were collected, specimens were analyzed in local Centre for Public Health.

Results: We interview only 85 (69%) from 123 persons were interviewed. From total number of participants 27 met the case definition with the attack rate of 32%. The mean age was 13 years with the range from 4 years to 41 years. The main affected age group was from 11-18 years with 77 % (21 cases). Males were slightly more affected 55%. The epidemic curve indicated a point source outbreak with most cases peaking on the 4th of August. The index case was on 3rd August, which was identified as employee from the kitchen who didn't seek medical care or report to the medical worker. The incubation period ranged from 12 to 48 hours, and last case was registered on 5th of August. At the lunch were served soup with meatballs, pickles of millet, vegetable salad with eggs, cabbage rolls, chicken breast, spaghetti with milk and boiled eggs. The highest attack rate was observed at people who ate vegetable salad with eggs, 75% (RR 13, CI 4.25-39.70) and for boiled eggs 76% (RR 8.34, CI 3.52-19.73). For other food items was no evidence that they could contribute to the developing of disease.

We calculate Relative Risk for eating boiled eggs and vegetable salad as egg food and comparing with chicken food which were in soup of meatballs (RR 1.6, CI 0.93-03.26) and chicken breast (RR 1.2, CI 0.78-6.34), we performed univariate analysis. For the person who ate food which contains chicken RR was 1.47, CI 0.76-2.83, but for those who ate food which contained eggs, RR was 7.14, CI=3.88-13.14 ($p=0,00006$). Laboratory results were negative from environmental investigations and stool specimens were positive.

Conclusion: Was not possible to obtain microbiological proof of the source of infection because, by the time the outbreak was identified, none of the food items. Eggs food was a significant associated with the illness with a 7.14 higher risk for those who ate eggs in comparison with those who didn't ate eggs, but for those who ate vegetable salad with eggs had 13 times higher risk of developing illness. At the end of investigation, were performed several training for food handlers in rest camps. Through the mass media were raised awareness on foodborne diseases and its prevention.

Status: Completed

Research

Case-control study: Risk factors for increasing transmission of pertussis in Republic of Moldova, 2017

Background: Pertussis is a respiratory disease caused by *Bordetella pertussis*, and is highly contagious, with an attack rate of about 90-100% in non-immunized individuals, especially in young children. Although prevented by vaccination, pertussis remains a cause of substantial morbidity worldwide, being endemic in all countries. In last years, in the Republic of Moldova there is a tendency of increasing numbers of pertussis cases and several outbreaks were registered in some districts. In order to identify risk factors for pertussis in relation with vaccination history, a case control study was conducted for confirmed pertussis cases from Chisinau that occurred between 1st January 2017 and 31st July 2017.

Objective: To identify risk factors for pertussis in Republic of Moldova and to develop recommendations in order to improve surveillance and control of pertussis.

Methods: We conducted a 1:1 case-control study in order to identify the risk factors for spreading pertussis and to analyze vaccination history with whole cell pertussis vaccine (DTwP) among cases in comparison with controls. We defined cases according to national case definition for pertussis during the study period 1st January 2017 and 31st July 2017 from Chisinau municipality. The control group consisted of persons who were selected randomized from the same medical immunization registry as cases by matching variables: to live in the same administrative sectors of Chisinau municipality, same type of vaccine (DTwP) and the age with the difference not more than 6 months. Hospital medical records were requested for all cases and controls. A standardized medical record tool was used to collect data on symptoms, diagnostic testing, hospitalization, and vaccination status. As part of routine surveillance, were made face to face or telephone interviews with pertussis cases and controls to confirm vaccination status as a selection control and determine 2 or more children in the house, and strong contact with persons with prolonged cough more than 1 week. As this was undertaken as part of a national outbreak response, ethical approval was not required. Epidemiological descriptive methods were used to describe and analyze morbidity and vaccination coverage. We first estimated the odds ratio without adjustment for covariates. Then we calculated the adjusted odds ratio and used logistic regression by conditioning on calendar time, number of doses of pertussis vaccines received, strong contact with a person coughing more than 1 week, presence of more than 2 children in the house. Logistic regression was used to describe data and to explain the relationship between risk factors and outcome.

Results: From total amount of 134 cases, we selected 54 cases and 54 controls as response rate was very low for controls (40%). In the first 6 months of 2017, 204 cases were registered from which 134 were notified in Chisinau municipality. We analyzed 54 pertussis cases from studied period from which

males represented 54% from total cases. The most affected age group was children aged between 0-2 years with 29 cases (54%), in school age group defined from 7-17 years were registered 13 cases (24%) and in age group from 3-6 years were registered 11 cases (20%) and one case in adults.

Vaccination data were obtained for all cases and controls. From total number, 39 (58%) controls and 15 (28%) cases were vaccinated with at least one dose of DTwP. After matched pair case-control in vaccination with 4 dose we obtained, OR, 0.2 (CI= 0.04-0.91). The results demonstrated that even a dose received can protect significant from being affected by pertussis (OR, 0.09; CI=0.02 – 0.31).

We also analyzed strong contact with a person who is coughing more than one week and revealed as a significant risk factor for developing of whooping cough, (OR, 21.00; CI=2.82-156.12). A strong contact with a person who received 4 doses of DTwP and a person who is coughing more than a week, the risk decreased from 21 odds to 7.6 (CI =2.62-22.56, $p=0.0002$), but in the same time odds for of 4 doses were high (OR, 0.55; CI=0.19 – 1.60). Also, we obtained that to have 2 or more children in a household is a possible risk factor to develop pertussis, OR, 2.5 (CI 0.97-6.4). In case of vaccine refusal the persons have a 5 times higher risk to develop pertussis than those who accepted it (OR, 5.26; CI=1.62-17.02). We analyzed how affects false contraindication as a delay in vaccination as a risk factor, and obtained that persons with contraindications are highly receptive to get pertussis (OR, 3.75; CI=1.41-9.92; $p=0.005$).

Our study limitations were, small sample size with 1:1 case control study, when is recommended for vaccine preventable diseases study 1:2. Lack of association between some risk factors had not been studied from literature.

Conclusion: The results demonstrated that, incomplete pertussis vaccination due to contraindications or refusals was a significant risk factor for developing pertussis. Receiving the 4th dose was associated with a significantly higher protective factor than those with 3 doses. Strong contact with a person with prolonged cough was demonstrated as important risk factor, but also that being fully immunized the risk is reducing 3 times, from 21 times to 7 times more likely. Also an increased number of children in the house can possible increase the risk with 2.5 times more to get pertussis.

This research study should continue in order to identify risk factors with strong association for spreading of pertussis bacteria, but still should be taken in account and maturation of infection and to analyze more school age groups and adults. To increase awareness of population about the risk of the disease and vaccination benefits in order to raise vaccination coverage to an optimal level.

International Assignments:

1. ECDC expert meeting on Immunisation Information Systems (IIS)

ECDC gathered on 26-27 November 2015 a technical expert meeting bringing together experts with experience of designing, developing and implementing electronic immunization information systems. The objectives were to review the benefits of IIS towards vaccination programme management and monitoring, to review the steps needed towards the development of a technical guideline that would support Member States in establishing IIS at national or subnational level and to set-up a technical expert group that could allow for continuation of mutual support across countries within and beyond the EU. Designing, developing and implementing a national IIS is a substantial undertaking and its objectives need to be clearly established. Today, only a small number of EU Member States have national electronic IIS. Through the experience shared by experts at the meeting it became apparent that setting up such systems require long-term planning, political support, IT development, legislation for data protection, and financial investments. I was actively involved in the process of producing the draft report.

Second ECDC expert meeting on Immunisation Information Systems was held on 16-17 June 2016. I was part of this meeting with task to make meeting report. In addition to the report I was involved in data cleaning/analysis and presentation from the survey on IIS conducted by ECDC among Member States. Once reviewed and approved by ECDC, the meeting report was available for internal distribution for supervisors and Scientific Coordinator.

Final goal for ECDC Vaccine Preventable Department is to develop and publish IIS guidelines to be used by those who want to implement IIS or those who want to improve/change existing IIS. This is ongoing process.

At both workshops of the international assignments I participated and completed the tasks with Vladimir Mickikj, graduated MediPIET fellow from 1st cohort.

Impact of IA: After attending the IA, we initiate to develop a concept of national electronic IIS with implementation from beginning in 5 pilot sites in the Republic of Moldova. The concept of the IIS was to develop an electronic application that facilitates to collect structured & standardized data on each administered doses of vaccine. The old database from National Immunization paper based system was transferred on new platform and computerized database allows "in real time" to collect and analyze vaccine coverage data, Adverse Events Following Immunization (AEFIs) and also vaccine-stock management. The system was integrated in the national primary health care electronic (pilot) system with WHO and ECDC recommendations. IIS collects evidences for local and national decision-making process which ensuring appropriate intervention.

MediPIET International assignment offered chance to learn from international (ECDC) experience and allowed further harmonization of national IIS.

Status: Completed

2. WHO GOARN Outbreak Response Training Course, Global Outbreak Alert and Response Network, July 9-14, 2017, Lisbon and Évora, Portugal

In period of 9-14 July 2017, international training on controlling and responding to a public health event organized by the Global Alert and Response Network (GOARN) took place. In total were selected and trained 24 participants from all regions of the world in order to enhance response capabilities and control major public health events.

The objectives of this training were to: train public health experts of GOARN partner institutions on pre-deployment procedures for international outbreak response; build and assess the vital soft skills for future GOARN deployees, according to the GOARN Competency Model for GOARN team members; orient participants on WHO and GOARN's codes of conduct, ethics and guiding principles, and security procedures to be upheld by deployees working in the field in to response to public health crisis situations.

The GOARN training provided a unique chance to explore technical, operational and logistical challenges of a coordinated response to an outbreak of unknown origin. To provide an extremely realistic set of land, the course used a scenario-based simulation exercise that took place in different locations, including Lisbon and other remote locations in Portugal.

All participants were divided into groups and worked in teams throughout the training. During the training, we have gradually received information and instructions to undertake rapid action in extremely challenging and time-consuming environments. It should be noted that this was intense training with a rather busy schedule. Comprehensive reports were made and submitted every day with detailed epidemiological analysis to date, measures taken, risk assessment and specific recommendations. At the end of the training, the final report of the mission was presented by each group. As part of a team of eight public health professionals, I strengthened my ability to work as an effective team member during challenging operational and technical circumstances, in preparation for deployment for international missions with WHO GOARN.

Terms of reference have been met successfully, namely, confirmation and identification of the cause of the outbreak, risk assessment, recommending appropriate and feasible control measures in the scenario context and identifying the additional support that could be provided by the WHO for the control of the outbreak.

Impact of IA: It should be mentioned that, following training, Republic of Moldova has the opportunity to become a GOARN partner and to contribute to the strengthening of international capacities to respond to major public health events. Currently it was initiate the process to include National Centre for Public Health as part of the WHO GOARN.

Status: Completed

Scientific communication

- MediPIET Annual Scientific Conference 2016, Marrakech, Maroc. Oral presentation: Epidemiological situation of measles elimination, Republic of Moldova, 2006 – 2015
- MediPIET Annual Scientific Conference 2017, Brussels, Belgium. Rapport: Evaluation of measles and rubella surveillance system in Republic of Moldova, 2010 -2016
- MediPIET Annual Scientific Conference 2017, Marrakech, Maroc. Rapport: Increasing incidence of pertussis in Republic of Moldova, 2016
- **Ceban Alexei**. New aspects and challenges in prevention and control of pertussis. Bulletin of the Academy of Sciences of Moldova Medical Sciences, 1(53) 2017, p. 172-176. ISSN 1857-0011
- **Ceban Alexei**, Nicolae Furtuna, Victoria Bucov, Anatolie Melnic. National Guidelines for health care workers on vaccination against Human Papillomavirus Infections.
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- Josanu Cristina, Spinu Constantin, Sajen Octavian, Isac Maria, Suveica Luminita, **Ceban Alexei**. Hepatitis B to healthcare workers in the Republic of Moldova. . Bulletin of the Academy of Sciences of Moldova Medical Sciences, 1(53) 2017, p. 91-97. ISSN 1857-0011

Teaching experience

1. Lecture and case-study on epidemiological surveillance and outbreak investigation

In collaboration with Norwegian Public Health Institute, we adjusted for country context 3 MediPIET presentations from 1st module on "Introduction to Intervention Epidemiology" and 2nd module on "Food and water borne diseases and outbreak investigation".

On May 27th 2016, was organized one day training on Principles of Epidemiological Surveillance and Outbreak Investigation – 10 steps. The training included a half day lecture and the practical part with a case study on Outbreak Investigation of Gastroenteritis. Bernardo Guzmán Herrador – EPIET graduated fellow (cohort 2010), Natalia Caterinciuc – MediPIET supervisor, Dumitru Capmari – MediPIET fellow and me facilitated the training for Residents Epidemiologists of the 1st and 2nd year from State Medical University and young epidemiologists and microbiologists from National Centre of Public Health and Chisinau Municipal Centre of Public Health.

Status: Completed

2. Immunization in practice training courses for medical family doctors

In period of 4-30th May 2017, 9 regional workshops were carried out, based on WHO guidelines „Immunization in practice“. Main goal of the training was to increase knowledge in surveillance of vaccine preventable diseases of main stakeholders from local level. Beneficiaries of the trainings were family doctors representing all administrative territories from Republic of Moldova. The epidemiologist from the host territory also attended the workshop. I was appointed to be part of facilitator’s team of the training workshops, which was consisted from 4 immunization specialists from the National Center for Public Health.

The duration of each training workshop was 2 days and covered the main immunization compartments, focusing on immunization monitoring and surveillance, vaccine and cold chain management, injection safety, contraindications to immunization, surveillance of adverse events following

immunization (investigation, analysis and reporting), social mobilization and communication with parents on immunization aspects. As a result of the training workshops, 243 family doctors were trained.
Status: Completed

Miscellaneous (additional activities)

- Member of working group on development of National Communication strategy for behaviour change and increase of vaccination demand approved and implemented by MoH for 2017-2020 order nr. 651 from 11 August 2017.
- Secretary of the national working group of experts in communication and advocacy in immunizations.
- Developed and maintaining national facebook page for immunization "Vaccinarea: DA sau BA".
<https://www.facebook.com/vaccinare1/>
- Developed and maintaining national website for immunization
<http://cnspl.md/index.php/vaccinarea/>
- Developing a pilot electronic informational immunization system

Web articles and information for public:

- <https://www.europalibera.org/a/interviu-alexei-ceban-campanie-imunizare-populatie/28827761.html>
- <http://cnspl.md/index.php/succes-remarcabil-pentru-republica-moldova-tara-a-obtinut-statutul-de-eliminare-a-rujeolei-si-rubeolei-indigene/>

Next steps

I am grateful for the lessons learned from my MediPIET colleagues, scientific coordinators, facilitators, supervisors and external participants, which worth it's every minute and second. With acquired competencies from the project I will try to do my best to share experience not only in my institution but and beyond to local level and to the young epidemiologists. I am planning to stay in my country, to finish which I only started, to implement new electronic systems, to establish a national field epidemiology program and to strengthen external collaboration in the region.

Due to MediPIET, I improved my analysis skills, outbreak investigation, time series analysis, effective communication and I got a more complex vision on public health and its importance.

I would like to acknowledge my MediPIET scientific coordinator, Dr. Ahmed Zaghoul for his commitment to work with us and support during our fellowship. Also I am grateful for my national supervisors Dr. Stela Gheorghita and Natalia Caterinciuc, who encouraged us and helped when it was needed. Acknowledgements and best wishes to all MediPIET family.

Supervisor's conclusion

Alexei Ceban had a successful 2 year Fellowship MediPIET. He is a highly motivated person and has worked hard and efficiently to completed many projects that have important significance for public health in the Republic of Moldova. In this fellowship work time, he achieved a good level of competence in all required domains. In his research project related to situation of pertussis in the Republic of Moldova he has made a valuable contribution and an excellent work to identify the gaps in the surveillance and vaccine coverage as well as establish risk factors and develop a package of intervention to decrease the number of cases. Alexei has developed good managerial skills and he led the epidemiological investigation

of a gastroenteritis outbreak in a rest camp. Based on his knowledge and skills he coordinated field work related to outbreak investigation and proposed inter-sectoral measures to stop spreading of the diseases and prevent in future such outbreaks. He was able to work effectively and independently and delivered quality work on 3 surveillance projects. He had an important contribution in developing a pilot national immunization electronic system, guidelines for communicable diseases and SOPs. He is well organized, with highly implication and big responsibility for his work with excellent communication skills. He is always focused on achieving the goals of the projects and I am sure that he will contribute to further strengthening and improving of the public health system in the Republic of Moldova and at the regional level.

Scientific Coordinator's conclusion

Text

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