



MediPIET Summary report of work activities

Lina Chaito

Lebanon, Cohort 4 (2021)

Background

About MediPIET

The Mediterranean and Black Sea Programme for Intervention Epidemiology Training (MediPIET) aims to enhance health security in the Mediterranean and the Black Sea region by supporting capacity building for prevention and control of natural or man-made threats to health posed by communicable diseases. It is a competency-based **in-service two-year fellowship** during which selected fellows conduct projects and field investigations at a MediPIET Training Site in their home country and attend MediPIET modules.

Since mid-2021, MediPIET is implemented by ECDC as a part of the [EU Initiative on Health Security](#). You can find more information about the programme at: <https://www.ecdc.europa.eu/en/training-and-tools/training-programmes/fellowships/medi Piet>

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Pre-fellowship short biography

Lina is an epidemiologist and holder of a Bachelor degree in Biology and a Master in Public Health (Epidemiology and Biostatistics). Since 2012, Lina has been working at the Epidemiological Surveillance Unit of the Lebanese Ministry of Public Health. Her main tasks included: conducting surveillance of vaccine-preventable diseases with special attention to measles surveillance, analysing surveillance data, investigating outbreaks, preparing reports for results communication and training public health professionals on surveillance and reporting. In addition, she is a lecturer in public health at nursing schools.

Fellowship

Lina started her MediPIET fellowship in September 2021 at the Epidemiological surveillance program/Ministry of Public Health, Lebanon, Beirut. This report summarises the work performed during the fellowship.

National supervisor(s): Dr Nada Ghosn

Scientific coordinator: Dr Pawel Stefanoff

Fellowship projects

1. Surveillance

Enhancing epidemic intelligence activities in Lebanon

Background: The International Health Regulations (IHR) 2005, emphasise the need to strengthen countries capacities in epidemic intelligence for early detection and response to outbreaks. We aimed to enhance epidemic intelligence activities in Lebanon, by employing tools and solutions used by the European Centre for Disease Prevention and Control (ECDC).

Methods: We reviewed the epidemic intelligence activities in Lebanon and explored solutions used at the emergency operating centre (ECDC-EOC). We listed tools used for general screening. We described internal procedures at ECDC-EOC, the progress of the round table meeting and explored how lessons learned can be used to enhance epidemic intelligence activities in Lebanon.

Results: In 2009-2023, the epidemic intelligence activities in Lebanon included school-based surveillance, hotline and media scanning. ECDC organised detection and communication on emerging threats 24 hours, seven days per week, using various automated screening tools. Detected events were presented and discussed during the round table meeting. Identified relevant events and discussions were documented in daily reports disseminated to a broad range of stakeholders.

Conclusion: Epidemic intelligence at ECDC was structured and systematic, based on internal procedures and sustainable resources. Lebanon could benefit from ECDC experience in epidemic intelligence and adopt various automated customised tools according to available resources, its own needs and the situation. We recommend to the Lebanese Ministry of Public Health extending information sources, standardising work by developing internal procedures, reviewing the progress of the round table meeting and its related outputs, strengthening information management by including tools for risk assessment as well as reinforcing the communication part.

Role and outputs: Principal investigator, conducted Desk Review, visited the EOC at ECDC, suggested recommendations, wrote a summary report.

Supervisor: Dr Nada Ghosn

Status: Completed

Progress towards measles elimination: Review of measles surveillance performance indicators in Lebanon, 2013-2022

Background: Lebanon adopted the World Health Organization (WHO) regional strategic plan (2012-2020) to achieve measles elimination. However, the country still experiences periodic outbreaks every four to five years. We aimed to analyse the WHO measles surveillance performance indicators to identify areas of improvement.

Methods: We reviewed cases suspected of measles and/or rubella notified to the epidemiological surveillance programme between January 2013 and December 2022. A suspected case was defined as any patient presenting febrile maculopapular rash or considered by a physician as clinically compatible. We assessed the notification rate of non-measles/rubella rash cases in the population (WHO target: discarding at least two non-measles/rubella cases per 100 000 population). We also assessed the proportion of rash cases investigated within 48 hours of notification, the proportion of cases adequately investigated including demographic and vaccination information, and the proportion of cases tested for measles and/or rubella (target: $\geq 80\%$ of notified cases). We calculated the mean proportions and standard deviations to summarise the annual surveillance performance indicators.

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Results: We reviewed 5 626 suspected cases in 2013-2022, notified mostly from hospitals (66%). Outbreaks occurred in 2013 (n=1 760) and 2018-2019 (n=1 984). Except for outbreak years, the non-measles/rubella notification rate ranged from 0.1/100 000 to 1.8/100 000 population. The proportion of cases adequately investigated and in a timely way were 47% ($\pm 19\%$) and 83% ($\pm 16\%$) respectively. The proportion of tested cases was 59% ($\pm 16\%$) during the study period.

Conclusion: Findings indicated a high proportion of hospitalised cases, sub-optimal sensitivity and incomplete investigations. We recommend enhancing reporting of suspected cases from outpatient settings, training staff on adequate investigation with special attention on collecting biological specimens for laboratory testing. We recommend regular monitoring for measles surveillance indicators at national and provincial levels.

Role and outputs: Principal investigator. Lina wrote the protocol, analysed national surveillance data, submitted an abstract for Escaide 2023.

Supervisor: Dr Nada Ghosn

Status: Completed. Peer-reviewed manuscript in preparation.

2. Outbreaks

Food poisoning outbreak following a wedding ceremony in west Beqaa, Lebanon, September 2022

Background: On 14 September 2022, the epidemiological surveillance unit in Beqaa province received an alert on a food poisoning outbreak following a wedding ceremony. We investigated the outbreak to identify the potential source.

Methods: We conducted a retrospective cohort study among persons invited to the ceremony and members of neighbouring households who were offered the leftover food. A case was defined as any person who had consumed the food offered during the ceremony and developed at least one of the following symptoms: vomiting, diarrhoea or abdominal cramps during 11-18 September 2022. We systematically searched for cases by visiting all healthcare facilities and households in the wedding guests' residence location. We inspected the incriminated shops and collected food samples.

Results: Out of 150 invitees and neighbouring households, 91 were interviewed (60%) and of these 38 (42%) met the case definition. The highest attack rates were observed among males (55%) and persons aged between 21 and 40 years old (53%). The median time (range) between the main meal and onset of illness in cases was 18 (10-72) hours. Univariate analysis suggested that several food items were associated with illness. After adjusting for confounders, we identified coffee (RR 4.12, CI [2.58-6.58]) and meat pie (RR 1.62, CI [1.23-2.13]) as the main vehicles. Environmental investigations indicated that food was left outdoor for hours and coffee was served in large copper container. No human samples were collected. Microbiological tests were found positive for one type of raw meat (*E. coli*).

Conclusion: The causative agent of the outbreak was not determined. Several microorganisms could be implicated due to a poor food handling, storage and serving. We recommend raising awareness in the local community on safe food handling practices and proper storage.

Role and outputs: Principal investigator. Lina wrote the protocol, prepared the analysis plan, developed the questionnaire, led the investigation team, communicate with different stakeholders, analysed outbreak data, wrote a summary report.

Supervisor: Dr Nada Ghosn

Status: Completed

Trichinellosis outbreak in Koura district, Lebanon, March-April 2022

Background: Only sporadic Trichinellosis cases were reported in previous years in Lebanon, related to consumption of wild boar meat. We investigated a Trichinellosis outbreak in Koura district in March-April 2022, possibly linked with the consumption of raw goat meat.

Methodology: On the 29 April 2022, local clinicians notified several linked cases compatible with Trichinellosis to the Ministry of Public Health. We defined suspected cases as any person living or visiting Koura from 1 March to 30 April, 2022, and developing fever, myalgia and periorbital oedema. We searched for cases in local hospitals, medical centres, as well as by establishing a hotline for local communities. We collected information on demographics, symptoms and potential source of exposure. We inspected incriminated butcheries and sent meat samples for testing to the Lebanese Agriculture Research Laboratory.

Results: As on 9 May 2022, 17 suspected cases (59% females) were identified, of which one case was confirmed by IgG antibody test. Cases were residing in five different villages in Koura district. Two were hospitalised. We identified three families who shared a traditional meal of raw goat meat delivered from the same local butcher shop in March 2022. The laboratory detected *Trichinella* spp. larvae in one meat specimen.

Conclusion: The preliminary investigation points to goat meat. The trace-back investigation is carried out jointly with the Ministry of Agriculture. Our investigation may point to gaps in food safety procedures that will require review of existing protocol for screening meat specimens in Lebanon.

Role and outputs: Principal investigator. Lina interviewed the affected persons, communicated with different stakeholders in the affected area, implemented activities to enhance reporting of cases, communicated with food safety team to ensure adequate response, conducted descriptive analysis of reported cases, wrote a summary report.

Supervisor: Dr Nada Ghosn

Status: Completed

3. Research

Pfizer-BioNTech(BNT162b2) vaccine effectiveness against symptomatic laboratory confirmed COVID-19 among sentinel outpatients in Lebanon, July-December 2021

Background: In June 2021, Lebanon experienced a resurgence of COVID-19 cases and deaths, dominated by the Delta (B.1.617.2) variant. The new variant could impact the effectiveness of available vaccines. We estimated the effectiveness of BNT162b2 vaccine in preventing symptomatic laboratory confirmed COVID-19 disease.

Methods: We conducted a test-negative case-control (TND) study among adults aged 50 years and older who presented to surveillance sentinel sites between 1 July and 31 December 2021 and met the COVID-19 clinical case definition. Unvaccinated participants did not receive any vaccine dose before symptom onset. Partially and fully vaccinated received respectively one or two vaccine doses, if the last dose was administered more than 14 days before symptoms onset. We measured the association between the vaccination status and COVID-19 positivity, adjusted for demographic, behavioural factors using multivariable logistic regression. We calculated vaccine effectiveness (1-OR) and 95% confidence intervals.

Results: Out of 457 respondents, 150 (33%) tested positive and 307 (67%) were negative. The mean age of participating cases and controls was 61 (\pm 8.3) and 60 (\pm 7.8) years, respectively. Controls were more likely to be vaccinated than cases with at least one dose of BNT162b2 vaccine (162 controls; 53% and 64 cases; 43%). The estimated vaccine effectiveness was 22% (95%CI: -70% to 65%) among partially vaccinated and 44% (95%CI: 6% to 67%) among fully vaccinated.

Conclusion: Vaccination with two doses of BNT162b2 was moderately effective in preventing COVID-19 symptoms in adult population. The vaccine was less effective among partially vaccinated individuals. We recommend using these results for health education to stress the role of vaccination and for periodic assessment of vaccine effectiveness as a public health surveillance tool.

Role and outputs: Principal investigator. Lina wrote the protocol, analysed research data, developed questionnaire, led the investigation team, analysed data, wrote a manuscript, communicated results in scientific events and international conferences.

Supervisor: Dr Nada Ghosn

Status: Completed

4. Scientific communication

Poster presentation: ME'NA- ISN Influenza Day2022 & EMARIS 2023

Chaito L, Stefanoff P, Farah Z, Albuaini M, Ghosn N. Pfizer-BioNTech(BNT162b2) vaccine effectiveness against symptomatic laboratory confirmed COVID-19 among sentinel outpatients in Lebanon, July-December 2021. ME'NA- ISN Influenza Day.2022 Oct 7-8;Istanbul.

Chaito L, Stefanoff P, Farah Z, Albuaini M, Ghosn N. Pfizer-BioNTech(BNT162b2) vaccine effectiveness against symptomatic laboratory confirmed COVID-19 among sentinel outpatients in Lebanon, July-December 2021.EMARIS.2023 March 13-15;Muscat,Oman.

Oral presentation: Eight EMPHNET Regional Conference 2023

Chaito L, Stefanoff P, Albuaini M, Ghosn N. Progress towards measles elimination: Review of measles surveillance performance indicators in Lebanon, 2013-2022.Eight EMPHNET Regional Conference.2023 Oct 22-25; Amman, Jordan "Abstract accepted for oral presentation. However the conference was postponed due to security concerns"

Publications and outputs

Chaito L, Stefanoff P, Farah Z, Albuaini M, Ghosn N. Pfizer-BioNTech(BNT162b2) vaccine effectiveness against symptomatic laboratory confirmed COVID-19 among sentinel outpatients in Lebanon, July-December 2021. "in press"

Chaito L, Stefanoff P, Albuaini M, Ghosn N. Progress towards measles elimination: Review of measles surveillance performance indicators in Lebanon, 2013-2022. "in preparation"

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5. Teaching activities

Teaching activity 1: Performing COVID-19 rapid antigen test in school settings.

This training was organised as a collaboration between the Ministry of Public Health and the Ministry of Education and Higher Education in Lebanon after school opened. On 11 and 18 December 2021, two sessions were held at the syndicate of nurses in Beirut for three hours. It aimed to train nurses in public and private schools on COVID-19 rapid antigen test use with appropriate PPE and adequate documentation. The training was divided into two parts. The first part consisted of lectures and discussions to consolidate learning of participants. The second part was practical. Participants worked in groups of two (patients and swabbers) to train on nasopharyngeal swabbing, rapid antigen test and documentation forms. Lina's role was to facilitate the training. Learning materials consisted of lectures, rapid antigen test kits, PPE and documentation forms.

Teaching activity 2: Basic concepts on public health surveillance

On 17 February 2023, the Lebanese FETP organised a face-to-face workshop that consisted of lectures and exercises in an interactive learning environment. Before the workshop, fellows were asked to complete two pre-course lectures posted on the online FETP platform (LMS). The workshop was held at the Ministry of Public Health in Beirut. Lina facilitated the first wrap-up session of the workshop by rehearsing the contents of pre-course lectures. The allocated time for this wrap-up session was one hour. The learning materials consisted of pre-course lectures that were posted on FETP platform (LMS) and an exercise that Lina adapted from an EPIET case study on describing a public health surveillance system. Fellows were split in five groups (two persons each) to answer the questions of the exercise. Each group discussed the presented questions and then shared their answers with other groups. Also, in addition to the exercise, pre-course lectures were displayed and an interactive discussion (questions and answers) was initiated.

6. International Assignments

Orientation on Epidemic Intelligence activities at ECDC

As recommended by the International Health Regulations (IHR-2005), Lebanon started implementing Epidemic intelligence (EI) activities in various phases by using Global Public Health Intelligence Network (GPHIN) and other online screening sources. However, there were many interruptions due to the lack of sustained resources. In 2021-2022, two workshops were conducted in collaboration with WHO-EMRO. Epidemic Surveillance unit (ESU) and call centre (CC) staff are responsible for conducting epidemic intelligence activities using the Epidemic Intelligence from Open Sources (EIOS) platform. The Lebanese Ministry of Public Health decided to enhance the epidemic intelligence activities in Lebanon and make them more systematic and sustainable. The aim of this visit was to get an overview of ECDC epidemic intelligence activities and discuss their relevance for future enhancement of EI in Lebanon. EI activities at ECDC were explored through close observation, documents review and meeting with EI staff at ECDC. This visit resulted in getting familiar with EI tools used at ECDC, overview of EI procedures, participating in the round table meeting, review of ECDC internal round table reports (RTR) and Communicable Disease Threat Reports (CDTR), and exploring the use of Epiwatch in Lebanon. Close observations of EI work at ECDC was important to come up with suggestions that may improve EI in Lebanon and make it more systematic and sustainable.

Hosting country and institute: European Centre for Disease Prevention and Control (ECDC), Sweden

Supervisor: Grazina Mirinaviciute

7. Other activities

- Refresher training on Epidemic Intelligence from Open Source (EIOS), WHO/EMRO, Jan 25-27, 2022, online
- Scientific Manuscript Writing and Publication Regional Workshop, EMPHNET, Aug14-18, 2022, Jordan
- Training workshop in Risk Communication, ECDC, 13-14 September, 2022, Stockholm
- Exchange of Experts programme: Greece/Lebanon on Legionella, ECDC, 29-30 May 2023, Athens
- Mentoring Lebanese FETP fellows cohort 1 & 2 & 3
- Conducting workshops on reporting and surveillance in Lebanon for different target audience including staff from hospitals, medical centres and municipalities.

8. MediPIET modules attended

- Introductory course – Part 1, 20 September – 8 October 2021, online
- Inject day Phylogeny, 20 October 2021, online
- Inject day operational research, 26 - 27 October 2021, online
- Inject days data collection, 10-11 November 2021, online
- Outbreak investigation, 6-10 December 2021, online

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- Multivariable analysis, 14-18 March, 2022,online
- Multivariable analysis inject day, 30 March 2022, online
- Project Review Module & Introductory Course -Part 2, 20-29 April 2022, Spetses, Greece
- Rapid Assessment and Survey Methods + Mass Gatherings, 6-10 June,2022, Stockholm, Sweden
- Project Review Module II, 29 August - 2 September, 2022, Lisbon, Portugal
- Times Series Analysis, 7-11 November, 2022, Utrecht, Netherlands
- Qualitative research inject days, 31 January and 3 February, 2023, online
- CBRN module, 13-17 February 2023, Petrovac, Montenegro
- Vaccinology inject day, 29 March 2023, online
- One Health & VBD, 2-4 May and 15-17 May 2023, online
- Project Review module, 28 August - 1 September 2023, Lisbon, Portugal

Supervisor conclusion

Lina has demonstrated during the two-year FETP a commitment to attend the modules and participate actively, to conduct needed projects and complete them, to undergo the international assignment, and to improve her epidemiological knowledge and skills. Her perseverance was remarkable in getting the projects completed despite various challenges. She contributed to the National FETP and was important resource for the quality of national FETP.

Scientific coordinator conclusion

Lina was a hard-working and result-oriented fellow. Thanks to her prior experience in public health surveillance and research, she fully benefited from the training courses and interactions with fellows and supervisors from MediPIET and other programmes. Her fellowship work not only contributed to the public health field in Lebanon, but also involved junior colleagues, and helped building the national FETP and various international collaborations.

Personal conclusions of fellow

MediPIET programme was a valuable experience that will definitely impact my career in the future. The modules had a very rich content that added to my knowledge and improved my skills. The learning by doing approach was a very useful method to apply the gained knowledge under the guidance and mentorship of experienced professors. In addition, it was a great opportunity to meet experts in the field from different countries and initiate ways for communication and exchange of expertise. The programme introduced new insights and perspective and made me more confident in applying epidemiological methods.

Acknowledgements

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ESU investigation team

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