

MediPIET Summary report of work activities

Ayah Tuffaha

Palestinian Authority, Cohort 5 (2022)

Background

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

2. Pre-fellowship short biography

Ayah Tuffaha obtained her MBBS (Bachelor of Medicine, Bachelor of Surgery) from An-Najah National University in 2017. She worked in field-based health programmes with the Palestinian Medical Relief Society and Health Work Committees until early 2020. In 2020, she joined the Palestinian Ministry of Health, where she began her work in the Preventive Medicine Department within the Hebron Directorate.

Fellowship

On 26 September 2022, Ayah Tuffaha started her MediPIET fellowship at the Palestinian Ministry of Health – Preventive Medicine Department in Hebron, Palestine. This report summarises the work performed during the fellowship.

National supervisor: Dr. Samer Assad

Scientific coordinator: Emily White Johansson, Katie Palmer.

Fellowship projects

3. Surveillance

Evaluation of the Measles Surveillance System in West Bank, Palestine

Introduction: Measles is a highly contagious viral disease. Despite being vaccine-preventable, it remains a major public health concern worldwide and in the West Bank. Measles outbreaks have resurged globally due to disruptions in vaccination programmes, particularly during the COVID-19 pandemic. This report evaluates the measles surveillance system in the West Bank from 2018 to 2024, focusing on key surveillance indicators to assess its effectiveness.

Methods: A retrospective descriptive analysis was conducted using surveillance data from the Ministry of Health records between 1 January 2018 and 26 September 2024. The evaluation focused on six World Health Organization (WHO)-recommended surveillance performance indicators. Data on measles vaccination coverage (MCV1 and MCV2) were also reviewed. Analytical methods included trend analysis and performance assessment using Microsoft Excel.

Results: The surveillance system in the West Bank is case based, combining passive and active surveillance. From 2018 to 2024, measles, mumps and rubella (MMR) coverage remained high ($\geq 95\%$), but the sensitivity of the system declined during the COVID-19 pandemic, with reporting rates for discarded non-measles, non-rubella cases dropping below the target in 2021 and only partially recovering by 2024. Timeliness of specimen transport decreased in recent years, although the timeliness and completeness of case investigations consistently exceeded targets.

Conclusions: While the measles surveillance system in the West Bank has strengths in terms of investigation timeliness and vaccination coverage, challenges remain with regard to sensitivity, specimen transport timeliness, and feedback to healthcare professionals. It is essential to address these gaps to achieve measles elimination and sustain high immunisation rates.

Role and outputs: The fellow was the principal investigator of the evaluation project. She developed the protocol and analysed the surveillance data. She also drafted the evaluation report and discussed findings with the Preventive Medicine Department.

Supervisor: Dr. Samer Assad

Status: Completed.

4. Outbreaks

Investigation of aseptic meningitis outbreak in Hebron district, West Bank, 2022

Introduction: On 15 September 2022, the Palestinian Ministry of Health was alerted by the Pediatric Department of Queen Alia Governmental Hospital of an increased number of admitted aseptic meningitis cases, resulting in the overcrowding of the paediatric ward. An outbreak investigation team was formed immediately to identify the cause, mode of transmission, and develop appropriate control measures. We report on the outbreak of aseptic meningitis which affected a total of 122 individuals in the Hebron district, the majority of whom were young children.

Methods: A suspected case was defined as fever and/or meningeal signs and symptoms in Hebron since 1 August 2022, with contact history and no other focus of infection. A confirmed case required cerebrospinal fluid pleocytosis and no laboratory evidence of fungal or bacterial meningitis. All hospitals in the district were notified. We carried out regular visits to hospitals, reviewed records, interviewed patients or their parents via a semi-structured questionnaire (demographics, immunisation, exposures and clinical/lab details), and maintained daily phone contact when in-person visits were not feasible. Field visits included home visits and door-to-door interviews. All data were recorded in the Ministry of Health's central database, then extracted as a line list and analysed in R. Microbiological analysis included cerebrospinal fluid (CSF) culture, blood culture, gram stain, and polymerase chain reaction for enterovirus, cytomegalovirus, and other viral and bacterial pathogens, as available.

Results: From 1 August to 31 December 2022, 122 cases of aseptic meningitis were identified. Among these, 47% ($n=57$) were under one year of age, and 37% ($n=45$) were aged 1–4 years. In total, 93% ($n=114$) of cases required hospitalisation. Common symptoms included fever (98%, $n=120$), vomiting (45%, $n=55$), and headaches (31%, $n=31$). No exposure to contacts with meningitis, mumps, or measles were reported. Five cases tested positive for enterovirus and one for cytomegalovirus, while the remainder were negative for common viral pathogens. Poliovirus testing was unavailable.

Conclusions: The outbreak mainly affected young children with typical viral meningitis symptoms, but negative PCR results suggest a possible new or mutated pathogen. The peak during late summer/autumn coincided with social gatherings, indicating person-to-person spread. Hospitals were strained by high patient numbers and limited resources. Key recommendations included the expansion of lab testing, improvement of infection control, preparation of hospitals for surges, education of the public on hygiene and early care-seeking, and strengthening of surveillance and healthcare worker training for earlier outbreak detection.

Role and outputs: The fellow was the principal investigator. She wrote the protocol, developed the outbreak hypothesis with the help of the outbreak investigation team, conducted interviews and data collection, and followed up with the laboratory results. Furthermore, she obtained the dataset from the Palestinian Ministry of Health, analysed the data, and wrote the outbreak report. She presented this report in a fireside oral presentation session at ESCAIDE in 2023.

Supervisor: Dr. Samer Assad

Status: Completed.

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5. Research

Barriers to disease notification among primary healthcare physicians in West Bank, Palestine: A cross-sectional survey

Introduction: Strong public health surveillance systems are critical to the early detection of and effective responses to outbreaks. Primary healthcare center (PHC) physicians are the frontline healthcare workers for disease notification within the Palestinian Ministry of Health surveillance system. However, there is limited understanding of the barriers that PHC physicians face in notifying diseases in the West Bank. We aimed to assess the knowledge, attitudes, and practices (KAP) of PHC physicians in disease notification and to identify barriers encountered during the notification process.

Methods: We conducted a cross-sectional survey of PHC physicians working in the Palestinian Ministry of Health PHC centres during the period 5 August 2024 to 24 May 2025. A total of 269 physicians were randomly sampled for inclusion and 223 responded (83%) to the online self-administered English questionnaire. We used logistic regression to examine associations between KAP scores, physician characteristics, and recent notification practices.

Results: Among 223 respondents, 30.9% (n=69) demonstrated good knowledge of the notification process, and most (93.3%, n=208) had a positive attitude towards the system. Common misconceptions included beliefs that laboratory confirmation is required for reporting (61%, n=136) and that case definitions must always include laboratory criteria (65.5%, n=146). Over 80% (n=63) of respondents reported notification of their last encountered measles, mumps, or chickenpox case, but only 52.4% (n=33) of measles cases were notified immediately. Most commonly reported barriers to notifying cases were lack of time (60.5%, n=135), and uncertainty about which diseases to report (38.1%, n=85) and when (32.3%, n=72). After adjustment, higher knowledge was associated with lower likelihood of incorrect practices, such as waiting for lab confirmation before notification (OR: 0.85, 95% CI: 0.75-0.97, p=0.015).

Conclusions

While PHC physicians in the West Bank demonstrated a willingness to notify diseases, this is undermined by significant knowledge gaps and systemic barriers. Findings highlight the need to disseminate clear guidance, provide training, modernise the notification system, and implement a feedback mechanism to strengthen the disease notification system.

Role and outputs: As principle investigator, the fellow developed the research idea, designed the study, developed the research protocol, formulated the methodology, and applied for ethics committee and Ministry of Health approval. She designed the questionnaire, programmed it into KoboToolbox, prepared it for deployment for field data collection, and oversaw the entire data collection process. She performed all statistical analyses using R, prepared and submitted the manuscript for peer-reviewed publication and coordinated with co-authors throughout the revision process.

Supervisor: Dr. Samer Assad

Status: Completed.

6. Scientific communication

Conference presentations

Tuffaha A, Assad S. Investigation of an aseptic meningitis outbreak in Hebron district, West Bank, 2022. In: European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE); 2023 Nov 22-24; Barcelona, Spain. Abstract FIRESIDE SESSION 9b. ESCAIDE 2023 Abstract Book.

Publications and outputs

Ayah Tuffaha, Emily White Johannson, Sobhi Alshaer, Samer Assad. 'Barriers to disease notification among primary health care physicians in West Bank, Palestine: A cross-sectional survey.' [Manuscript submitted].

7. Teaching activities

On 15 December 2022, the fellow delivered training on Acute Flaccid Paralysis (AFP) Surveillance to physicians, nurses, and physiotherapists from all the public, private, and NGO hospitals in the Hebron district at the Ministry of Health's Hebron Directorate. She began by revisiting fundamental concepts of public health surveillance before diving into AFP-specific content including case definitions, notification timing and procedures, contact tracing, and environmental surveillance in accordance with the Palestinian Preventive Medicine guidelines. To engage a diverse audience unfamiliar with epidemiology, She incorporated storytelling examples from the COVID-19 pandemic and continually emphasised and clarified each participant's critical role in timely notification. At the end of the one hour session she collected feedback from participants through active discussions.

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8. Other activities

- ESCAIDE, 2022, Stockholm, Sweden in person.
- ESCAIDE, 2023, Barcelona, Spain, in person.
- ESCAIDE, 2024, Stockholm, Sweden, in person.

9. MediPIET modules attended

1. ECDC Fellowship Introductory Course, 26 September–7 October 2022, Spetses, Greece, in person.
2. Introductory Course – Operational research Inject Days, 8–10 November 2022, online.
3. Introduction to R for Applied Epidemiology (40 hours), 28 November–2 December 2022, online.
4. Outbreak Investigation Module, 5–9 December 2022, Berlin, Germany, online.
5. Qualitative Research Inject Days, 31 January and 3 February 2023, online.
6. MediPIET Chemical, Biological, Radiological and Nuclear (CBRN) Module, 13–17 March 2023, Petrovac, Montenegro, in person.
7. Inject day on Vaccinology, 29 March 2023, online.
8. Multivariable Analysis Module, 22–26 May 2023, Frankfurt, Germany, in person.
9. Rapid Assessment and Survey Methods (RAS) Module, 19–23 June 2023, Stockholm, Sweden, in person.
10. Project Review Module, 28 August–1 September 2023, Lisbon, Portugal, in person.
11. Time Series Analysis Module, 11–15 December 2023, Istituto Superiore di Sanita (ISS), Rome, Italy, in person.
12. One Health approaches to field epidemiology practice in MediPIET countries, 3–7 June 2024, Belgrade, Serbia, in person.
13. Project Review Module, 26–30 August 2024 Lisbon, Portugal, in person.

10. Personal conclusions of fellow

This was one of the most life changing experiences yet. Meeting professionals and experts from different countries, training with them, and exchanging experiences and views was invaluable. Our field of work encompasses the world, and this fellowship programme embodies and substantiates this concept for many fellows like me, who were granted this opportunity. I have met some of the most amazing people through this fellowship and it was great to discover that I was definitely not alone. Epidemiologists and public health professionals everywhere face their own unique challenges and difficulties, yet we are all working towards the same goal: better health for our communities and the world.

11. Acknowledgements

I would like to express my sincere gratitude to my international coordinators, Katie Palmer and Emily White Johansson, for their continued guidance, support, and constructive feedback throughout this journey which has been instrumental in helping me meet the objectives of the MediPIET programme. My sincere appreciation goes to my supervisor, Dr. Samer Assad, for his consistent support and guidance at every stage of the fellowship, and for his commitment to my professional development. I would also like to thank Dr. Ayham Sawalmeh, my colleague and MediPIET alumnus, for generously sharing his experiences and advice and giving valuable insight and encouragement throughout the programme. Finally, I would like to thank the MediPIET team and ECDC coordinators for their continued efforts in making this programme possible and for providing a supportive learning environment that enabled the successful completion of the programme objectives. My particular appreciation goes to Rosinah Ismail-Clark for her role in coordination and support of the fellows throughout the fellowship.