# MediPIET Summary report of work activities

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Egypt, Cohort 6 (2023)

# 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 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/medipiet

## 2. Pre-fellowship short biography

Salma Ali Mohasseb is a public health and community medicine specialist with a medical background. She works at the national hepatology and tropical medicine research institute affiliated to the Egyptian Ministry of Health. Her work focuses on analysing health data and improving data quality to support evidence-based public health decision-making. Further, her role focuses on raising public health awareness regarding health issues. She has contributed to national-level public health projects and has a strong interest in translating research findings into practical policy and action. She is currently a PhD candidate in public health.

## 3. Fellowship

On September 2023, Salma started her MediPIET fellowship at the Ministry of Health and Population, Cairo, Egypt. This report summarises the work performed during the fellowship.

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# Fellowship projects

## 4. Surveillance

### *Evaluation of Brucellosis National Electronic Disease Surveillance System*

**Background:** Brucellosis is an endemic zoonotic disease in Egypt, requiring effective surveillance systems to guide timely prevention and control measures. The National Electronic Disease Surveillance System (NEDSS) is the primary platform for monitoring notifiable diseases, including brucellosis. However, systematic evaluations of its performance at subnational levels are limited. This study aimed to evaluate the performance of the brucellosis component of NEDSS in Menoufia Governorate, an endemic area in the Nile Delta, to identify strengths, gaps, and opportunities for improvement.

**Methods:** We conducted an evaluation of the brucellosis surveillance system using the Centre for Disease Prevention and Control (CDC) guidelines for surveillance system evaluation. Human brucellosis surveillance data reported to NEDSS in Menoufia Governorate from 1 January to 31 December 2023 were extracted and analysed. Field visits were conducted at primary health units, district offices, and the governorate directorate. A structured face-to-face questionnaire was administered to 27 surveillance officers across all levels to assess system attributes, including simplicity, flexibility, sustainability, representativeness, and usefulness. Data quality was assessed through completeness of selected non-mandatory variables, and timeliness was measured using key reporting intervals.

**Results:** The surveillance system demonstrated strong performance in simplicity, flexibility, and usefulness, with composite scores of 74.1%, 100%, and 88.9%, respectively. All respondents reported ease of data entry, clear reporting pathways, and the system's utility for outbreak detection and decision-making. Data completeness was high, with 100% completeness for disease outcome and over 89% for key sociodemographic variables. Timeliness was generally satisfactory, with notification occurring within two to four days of diagnosis. However, sustainability showed weak performance (29.6%), reflecting challenges related to inconsistent financial support, internet connectivity, and system interruptions. Representativeness was moderate (66.7%), due to limited inclusion of private and university healthcare sectors. Lack of direct laboratory integration into NEDSS was identified as a source of avoidable reporting delays.

**Conclusions:** The brucellosis surveillance component of NEDSS in Menoufia Governorate is a functional and valuable public health tool, characterized by strong usability, flexibility, and perceived usefulness. However, limitations in sustainability, representativeness, and laboratory integration may affect long-term performance and accuracy of disease burden estimates. Strengthening financial and infrastructural support, expanding reporting to non-governmental sectors, enhancing analytical capacity at peripheral levels, and integrating laboratory reporting are critical to improving surveillance effectiveness. These improvements would enhance the system's contribution to evidence-based brucellosis control within a One Health framework.

**Role and outputs:** The fellow was the principal investigator for this project. She led the evaluation of the surveillance system (NEDSS) in Menoufia Governorate. She designed the evaluation questionnaire and conducted field visits across primary health units, district offices, and the governorate directorate. She extracted, cleaned, and analysed surveillance data, assessed system attributes in line with CDC evaluation guidelines, and interpreted findings. Finally, she drafted a report and highlighted some recommendations based on the evaluation results to strengthen system performance.

**Supervisor:** Sherif Shams El Dien

## 5. Outbreaks

### *Chickenpox outbreak investigation*

**Background:** Chickenpox (varicella) is a highly contagious viral disease that can cause outbreaks in school settings, particularly where immunity gaps exist. In October 2025, a suspected chickenpox outbreak was reported in a primary school in Fayoum Governorate, Egypt. An epidemiological investigation was conducted to confirm the outbreak, describe its magnitude, identify risk factors, and implement control measures.

**Methods:** An outbreak investigation followed by a retrospective cohort study was conducted among the entire school population (N=540). Active case finding was performed through school record review and parental interviews. A case was defined as any student with fever followed by vesicular rash within a two-week period before or after notification. Laboratory confirmation was performed using Polymerase Chain Reaction (PCR) testing for varicella-zoster virus (VZV) in selected cases. Data on demographics, classroom attendance, and vaccination status were collected. Attack rates were calculated, and an epidemic curve was constructed to characterize transmission dynamics.

**Results:** A total of 56 cases were identified, all confined to second-grade students (n=81). The overall school attack rate was 10.4%, while the attack rate within the second grade reached 69.1%. Vaccination coverage in the second grade was critically low (2.5%), with all cases occurring among unvaccinated students. The epidemic curve suggested an initial point-source exposure from an index case, followed by propagated transmission. Overcrowding, poor classroom ventilation, and delayed isolation facilitated rapid spread.

**Conclusions:** This outbreak was directly attributable to the introduction of varicella into a densely populated classroom with minimal vaccination coverage, resulting in rapid and extensive transmission. The findings highlight the importance of adequate vaccination coverage, prompt case detection and isolation, and adherence to classroom capacity and ventilation standards. Strengthening school-based surveillance and outbreak response mechanisms is essential to prevent similar outbreaks in the future.

**Role and outputs:** The fellow responded to the first call with the preventive medicine department team by visiting the school. she reviewed the medical record for vaccination status and contacted the parents via phone calls to check for the symptoms of the cases and to ask for vaccination status. She communicated public health messages to the families by phone calls about how to isolate the case and how to prevent the spread of the infection. Finally, she developed an outbreak report with suggestions for a long-term preventive strategy to prevent future outbreaks.

**Supervisor:** Sherif Shams El Dien

# 6. Research

## *Epidemiology of Human Brucellosis in Egypt: A Retrospective Analysis of Seasonal Variation and High-Risk Populations from the National Electronic Disease Surveillance System for the years 2021–2023*

**Objective:** Human brucellosis remains endemic in Egypt, posing public health and economic challenges. We aimed to assess the seasonal, demographic, and geographic distribution of reported human brucellosis cases using the National Electronic Disease Surveillance System.

**Methods**: A retrospective analysis was conducted on surveillance data from 1 January 2021 to 30 December 2023. Cases were classified according to the World Health Organization's case definitions, and seasonal variations were evaluated with Chi-Square.

**Results**: We included 15 649 cases. Males (57%) and individuals aged 15–35 (45.5%) years represented the largest affected population, with farmers and agricultural workers accounting for nearly one quarter of cases (24.4%, 3 818/15 649). Seasonality was present, showing lowest cases in winter (16.4%). Geographically, higher case counts were concentrated in the Upper Egypt governorates e.g.: Minya (3 117/15 649) and the Nile Delta, e.g.: Monufia (1 560/15 649) regions characterised by intensive livestock production. Mortality was rare (0.1%).

**Conclusions:** The seasonal and occupational patterns of human brucellosis in Egypt suggest it is closely linked to livestock management practices, highlighting areas where One Health interventions such as targeted vaccination, enhanced dairy safety, and pre-season public health campaigns can be strategically intensified to reduce transmission in high-risk communities in Egypt.

**Role and outputs:** The fellow was the principal investigator. She led the study using National Electronic Disease Surveillance System (NEDSS) data. She developed the study protocol and designed the data extraction framework. she extracted, cleaned, and analysed national surveillance data from 2021–2023, conducted statistical analyses of seasonal, demographic, occupational, and geographic patterns, and interpreted the findings. She drafted a manuscript and prepared it for submission. Based on the study results, she suggested evidence-based public health recommendations.

**Supervisor:** Sherif Shams El Dien

# 7. Scientific communication

## Conference presentations

Mohasseb S, Shamseldein S, Palmer K, Hassany M. Variations and reported rates of human brucellosis in Egypt: a three-year study (2021–2023). In: European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE); 21 November 2025; Warsaw, Poland. Poster presentation.

## Publications and outputs

Mohasseb S, Shamseldein S, Palmer K, Hassany M. Epidemiology of human brucellosis in Egypt: a retrospective analysis of seasonal variation and high-risk populations using national surveillance data, 2021–2023. Submitted.

# 8. Teaching activities

The fellow designed and delivered a focused three-hour public health training session on 'Hepatitis B in Egypt: A Focus on Healthcare Workers' for 29 gastroenterology and hepatology residents at the National Hepatology and Tropical Medicine Research Institute in Egypt on 18 February 2025. Her role was the lead trainer and training designer. She conducted a needs assessment through senior physician consultations, which identified specific knowledge gaps in HBV epidemiology, safe injection practices, and post-exposure prophylaxis. She developed all training materials, including a structured presentation and a real-world case study on needlestick injury management. The training method was interactive, combining a lecture format with active learning components and facilitated group discussions and a group case scenario exercise to outline post-exposure prophylaxis (PEP) steps. She also incorporated an educational video on safe injection practices. To evaluate impact, she administered a pre- and post-test with 18 multiple-choice questions. Results showed significant knowledge improvement, with the number of residents correctly scoring 75% or higher increasing from 15 (pre-test) to 28 (post-test). The session ended with a feedback discussion and an offer for free Hepatitis B vaccination for participants supported by the MOHP.

# 9. Other activities

The fellow was the Cohort Representative for MediPIET Cohort 6. She attended more than 10 meetings as a representative.

## 10. MediPIET modules attended

1. Introductory Course and outbreak investigation, 25 September – 13 October 2023, Spetses, Greece, in person.
2. Study Protocol and Scientific Writing, 26–27 October and 7–8 November 2023, online.
3. ESCAIDE Scientific Conference, 22–24 November 2023, Barcelona, Spain, in person.
4. Multivariable Analysis (MVA), 19–23 February 2024, Berlin, Germany, in person.
5. Qualitative Research, 19–22 March 2024, online.
6. Vaccinology Inject Day, 2 April 2024, online.
7. Rapid Assessment and Survey Methods and Mass Gatherings (RAS), 15–19 April 2024, Dublin, Ireland, in person.
8. One Health and Vector-borne Diseases module, 3–7 June 2024, online.
9. Ethics, 6 November 2024, online.
10. Chemical, Biological, Radiological and Nuclear (CBRN) Awareness and Mitigation Module, 7–11 April 2025, Budva, Montenegro, in person.
11. Project Review Module (PRM), 25–29 August 2025, Lisbon, Portugal, in person.
12. Time Series Analysis (TSA), 1–5 December 2025, Brussels, Belgium, in person.

## 11. Personal conclusions of fellow

My journey as a MediPIET fellow has been transformative both professionally and personally. Over the past two years, I enhanced my skills in outbreak investigation, surveillance, data analysis, and applied epidemiology, while also strengthening my abilities in scientific communication, writing, and cross-border collaboration. Being part of the 2023 cohort and connecting with fellows across Europe and Middle Eastern countries provided a vibrant network for learning, professional exchange, and lasting friendships. Beyond technical expertise, the fellowship enhanced my resilience, adaptability, and creative problem-solving, preparing me for the dynamic challenges of public health practice. Having completed the fellowship, I feel better equipped, confident, and connected to make a meaningful impact in public health both nationally and internationally.

## 12. Acknowledgements

I sincerely thank my MediPIET supervisor, Dr. Sherif Shams El Dien, for his invaluable guidance, and my scientific coordinator, Dr. Katie Palmer, for her mentorship and constructive feedback, which greatly contributed to my professional growth. I am also grateful to the Egyptian Ministry of Health and Population and to Dr. Mohamed Hassani the Assistant Minister for Public health presidential initiatives for creating opportunities that strengthen public health expertise in Egypt. Finally, I thank my colleagues from Cohort 6, EPIET, EUPHEM, and PAE, as well as the ECDC and the MediPIET programme, for making this fellowship a truly rewarding experience.