

MediPIET Summary report of work activities

Milko Joksimović

Montenegro, 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 on the programme at: <https://www.ecdc.europa.eu/en/training-and-tools/training-programmes/fellowships/medi Piet>.

2. Pre-fellowship short biography

Dr Milko Joksimović graduated from the Faculty of Medicine at the University of Montenegro and completed a medical specialty in Epidemiology. Since 2014, he has worked in the public health system of Montenegro, primarily at the Institute of Public Health. His professional focus has consistently been on surveillance, prevention, and control of communicable diseases at both primary care and national levels. Over the years, he has gained extensive experience in vaccine-preventable diseases, respiratory pathogens, and the coordination of national immunisation programmes. Prior to entering the MediPIET programme, he was already engaged in the development of public health guidelines, surveillance systems, and response measures in Montenegro.

Fellowship

On 25 September 2023, Dr Milko Joksimović started his MediPIET fellowship at the Institute of Public Health of Montenegro, Podgorica, Montenegro. This report summarises the work performed during the fellowship.

National supervisor: Dr Aleksandar Obradović

Scientific coordinator: Katie Palmer.

Fellowship projects

3. Surveillance

Evaluation of the Measles Surveillance System in Montenegro, 2023–2025

Introduction: Measles surveillance is a core component of the national communicable disease control system in Montenegro. Following challenges in vaccination coverage and sporadic imported cases, an evaluation of the surveillance system was conducted to assess its functionality and identify areas for improvement.

Methods: We evaluated existing national surveillance data collected between 1 January 2023 and 31 October 2025, reviewed legal and procedural documents, and conducted consultations with key public health staff. Standard World Health Organization (WHO)/European Centre for Disease Prevention and Control (ECDC) surveillance evaluation criteria were used. Attributes assessed included completeness and timeliness of reporting, case investigation practices, laboratory confirmation processes, data flows, and communication pathways.

Results: The system demonstrated a stable reporting structure, with routine zero-reporting functioning in most municipalities. Timeliness of initial notification was generally adequate, however delays were observed in forwarding samples for laboratory confirmation. Documentation of case investigations improved over the evaluation period, but variability persisted across regions. Key gaps identified included incomplete classification fields, inconsistencies in zero-reporting by some healthcare providers, and reliance on manual processes in the absence of a fully integrated electronic reporting system.

Conclusions: Measles surveillance in Montenegro is operational and capable of early case detection, but several areas require strengthening — in particular timeliness monitoring, data standardisation, and improved feedback loops. The evaluation informed national discussions on system strengthening and preparedness for potential measles outbreaks.

Role and outputs: The fellow was the principal investigator. He conducted data review and extraction, analysed routine surveillance indicators, reviewed legislation and reporting processes, coordinated with surveillance units, prepared the full evaluation report, and developed recommendations in line with national priorities.

Supervisor: Dr Aleksandar Obradović

Status: Completed.

4. Outbreaks

Pertussis outbreak in Montenegro, September 2023 – October 2024

Introduction: Between September 2023 and October 2024, Montenegro experienced its largest pertussis outbreak in five decades, with transmission occurring nationwide. The aim of the investigation was to describe the epidemiological characteristics of the outbreak and identify factors contributing to the rapid spread.

Methods: The investigation used routine national surveillance data, laboratory confirmation reports, vaccination records from the electronic immunisation registry, and structured interviews conducted by epidemiological services. Cases were classified according to EU 2018/945 definitions. Descriptive analyses were performed by time, place, age group, vaccination status, and hospitalisation.

Results: A total of 1 010 pertussis cases were reported (crude incidence 162 per 100 000), with a peak in December 2023. Interviews were completed for 870 cases. School-aged children (6–19 years) constituted 59% of cases, with the highest count in those aged 11–14 years. Infants <1 year accounted for 8.3% of all cases but 62% of hospitalisations (71 in total). One death occurred in an 80-year-old adult. Vaccination data indicated that 31.5% of interviewed cases were unvaccinated, while 57.4% had received four doses, with a median of 11.5 years since the last dose, which may suggest waning immunity. Cases were reported in 21 of 25 municipalities, with Podgorica showing the highest incidence. Following the declaration of the outbreak in December 2023, national measures included enhanced surveillance, communication, macrolide treatment, prophylaxis for high-risk contacts, catch-up vaccination, adjustment of the infant schedule to 2–3–4 months, and introduction of Tdap recommendations for pregnant women and high-risk adults.

Conclusions: The outbreak revealed immunity gaps driven by declining childhood coverage, waning post-vaccination immunity, and the absence of maternal immunisation. Key priorities for prevention include strengthening routine and catch-up vaccination, implementing maternal Tdap immunisation, and evaluating the need for adolescent boosters.

Role and outputs: The fellow was the principal investigator for the outbreak. He extracted and reviewed surveillance, laboratory, vaccination and interview data, prepared descriptive epidemiological analyses, and contributed to recommendations. He gave a poster presentation on the outbreak at the ESCAIDE 2024 conference and was the first author on the outbreak manuscript, which was submitted for publication.

Supervisor: Dr Aleksandar Obradović

Status: Completed.

5. Research

Knowledge, attitudes and practices regarding influenza vaccination among primary healthcare workers in Montenegro

Introduction: Influenza vaccination coverage among primary healthcare workers in Montenegro remains low, despite longstanding national recommendations. Understanding knowledge, attitudes and practices (KAP) is essential to inform targeted interventions and improve uptake. This study aimed to assess baseline KAP related to influenza vaccination among primary healthcare workers across all regions.

Methods: A cross-sectional survey using a structured KAP questionnaire was implemented in all primary healthcare centres. Sampling followed a probability-proportional-to-size approach to ensure adequate representation of facilities and professional groups. The questionnaire assessed socio-demographics, knowledge of influenza, attitudes toward vaccination, and self-reported vaccination practices. Data were analysed descriptively, with results stratified by professional category.

Results: Participation in the survey exceeded the planned sample size (n=501) and included physicians and medical technicians (nurses, and other primary healthcare workers). General knowledge of influenza was good, but there were misconceptions regarding vaccine effectiveness and side effects. Physicians showed more favourable attitudes towards vaccination than medical technicians. The most frequently reported barriers included concerns about adverse effects, insufficient time during clinical duties, and limited encouragement from employers. Self-reported vaccination uptake remained low across all categories, despite familiarity with national recommendations.

Conclusions: This baseline KAP assessment identified attitudinal, informational and organisational barriers to influenza vaccination among primary healthcare workers. Recommendations include tailored communication strategies, improved availability of workplace vaccination, and targeted interventions for professional groups with lower acceptance. The findings will inform future national strategies and serve as a reference point for monitoring trends in primary healthcare worker vaccination behaviour.

Role and outputs: The fellow was principal investigator for the study. He designed the protocol, sampling framework and all appendices, developed the questionnaire, coordinated implementation with all primary healthcare centres, validated and analysed data, and prepared the full research report.

Supervisor: Dr Aleksandar Obradović

Status: Completed.

6. Scientific communication

Conference presentations

Joksimović M, Obradović A, Palmer K, et al. Pertussis outbreak in Montenegro, 2023–2024. Poster presentation at ESCAIDE 2024; Stockholm, Sweden.

Publications and outputs

Joksimović M, Palmer K, Raičević M, Obradović A. Pertussis Outbreak in Montenegro, September 2023 – October 2024. Eurosurveillance. [Submitted for publication].

The fellow is a co-author of two scientific papers published in 'Vaccines'. His contributions included participation in study design, data interpretation, drafting and revising manuscript sections, and preparation of data for publication.

1. Štrbac M, Joksimović M, Vuković V, Ristić M, Lončarević G, Kanazir M, et al. Overview of the implementation of the first year of immunization against human papillomavirus across different administrative units in Serbia and Montenegro. *Vaccines*. 2024;12(7):803. doi:10.3390/vaccines12070803
2. Obradović A, Raičević M, Joksimović M. The Impact of Limited Vaccine Access on COVID-19 Mortality—Descriptive Study of COVID-19 Vaccination and Mortality Due to COVID-19 in Montenegro, July 2020–February 2022. *Vaccines*. 2025; 13(3):278. doi:10.3390/vaccines13030278.

7. Teaching activities

The fellow developed and delivered a national training programme titled 'Overview of the Vaccination Programme in Montenegro' for directors of pre-school and school institutions. The training consisted of six 60-minute sessions held at the Ministry of Education. Activities included the development of comprehensive presentation materials, preparation of pre- and post-tests, creation of evaluation tools, and compilation of results into a summary report. Teaching methods included lectures, guided discussion, and case-based examples related to immunisation programme implementation. The fellow coordinated with institutional partners to ensure high participation and quality delivery. More than 250 participants attended the training sessions.

Other activities

- Coordination of national COVID-19, influenza, and Respiratory Syncytial Virus (RSV) surveillance reporting, including preparation of weekly epidemiological summaries and interpretation of trends for public health authorities.
- Continuous coordination with the Ministry of Health on communicable disease control, outbreak response, vaccination programmes, and implementation of national surveillance activities.
- Participation in national expert committees related to immunisation, infectious disease surveillance, outbreak response, and public health preparedness.
- Organisation and delivery of professional lectures and seminars for healthcare workers, including national training courses for directors of preschool and school institutions.
- Contribution to the development and implementation of the electronic Integrated Health Information System (IZIS) immunisation module and digital tools for surveillance strengthening.
- Participation in drafting national legislation and bylaws related to communicable diseases, immunisation, and public health preparedness.
- Active involvement in PIVI (Partnership for Influenza Vaccine Introduction) projects, including planning, reporting, and evaluation of influenza vaccination activities.
- Completion of Epidemic Intelligence training (ECDC), with practical application of daily data validation, signal detection and event-based surveillance.
- Participation in international study visits to Croatia and Slovenia in 2023 to review human papillomavirus (HPV) vaccination programmes and best practices.
- Multiple communication activities, including public speaking, TV and radio appearances, press statements, and contributions to public health campaigns on HPV vaccination, measles, mumps, rubella (MMR), pertussis, influenza, and general immunisation.
- Representation of the Institute of Public Health of Montenegro at various national and international meetings, workshops, and collaborative technical discussions.
- Member of the National Expert Committee for Protection of the Population from Communicable Diseases of the Ministry of Health, and member of the National Immunisation Technical Advisory Group (NITAG).

8. MediPIET modules attended

- Introductory Course – MediPIET Fellowship, 25 September – 13 October 2023, Spetses, Greece, attended in person.
- Study Protocol and Scientific Writing, 26–27 October and 7–8 November 2023, Online, attended online.
- Multivariable Analysis, 19–23 February 2024, Berlin, Germany, attended in person.
- Rapid Assessment and Survey Methods, 15–19 April 2024, Dublin, Ireland, attended in person.
- One Health Approaches in MediPIET Countries, 3–7 June 2024, Belgrade, Serbia, attended in person.
- Vaccinology Inject Day, 2 April 2024, (ECDC/MediPIET), attended online.
- Project Review Module, 26–30 August 2024, Lisbon, Portugal, attended in person.
- Chemical, Biological, Radiological and Nuclear Preparedness (CBRN), 7–11 April 2025, Budva, Montenegro, attended in person.

9. Conferences attended

- ESCAIDE 2023, 22–24 November 2023, Barcelona, Spain, attended in person.
- ESCAIDE 2024, 20–22 November 2024, Stockholm, Sweden, attended in person.
- ESCAIDE 2025, 19 to 21 November 2025., Warsaw, Poland, attended in person.

10. Personal conclusions of fellow

The MediPIET fellowship has been an exceptionally valuable professional and personal experience, despite the demanding circumstances under which I completed the programme. During the fellowship, I was promoted to Director of the Centre for Control and Prevention of Communicable Diseases at national level, which substantially increased my responsibilities and made balancing MediPIET activities challenging at times. Nevertheless, the programme significantly strengthened my applied epidemiology skills, particularly in outbreak investigation, surveillance evaluation, research design, scientific communication, and teaching. The modules, supervision, and field assignments directly improved the quality and depth of my work in Montenegro, and many competencies gained through MediPIET have already been integrated into national public health practice. Although some activities could not be completed to the extent I originally intended due to competing public health priorities, the fellowship has had a profound and lasting impact on my professional development, leadership capacity, and contribution to communicable disease control at the national level.

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