MediPIET Summary report of work activities

Nadejda Morărescu

Republic of Moldova, Cohort 5 (2022)

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 the prevention and control of natural or man-made threats to health posed by communicable diseases. It is a competency-based, **in-service**, **2-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. You can find more information about the programme on the ECDC website.

Pre-fellowship short biography

Nadejda obtained a medical degree and a Diploma in Epidemiology from the State University of Medicine and Pharmacy "Nicolae Testemițanu" of the Republic of Moldova in Chisinau in 2015. Since graduation, she has worked as an epidemiologist at the National Agency for Public Health in Moldova, in the Department of Prevention and Control of Communicable Diseases. Her main responsibilities included the national-level epidemiological surveillance of healthcare-associated infections (HAIs) and antimicrobial resistance (AMR). In this role, she contributed to the monitoring and surveillance of these infections and resistance patterns, the development and implementation of national regulations and legislative frameworks, and alignment with international regulations.

Fellowship

On 26 September 2022, Nadejda Morărescu started her MediPIET fellowship at the National Agency for Public Health, Moldova. This report summarises the work performed during the fellowship.

National supervisor: **Dr Alina Druc**

Scientific coordinator: **Dr Pawel Stefanoff**

Fellowship projects

Surveillance

Evaluation of the epidemiological surveillance system of antimicrobial resistance in the Republic of Moldova

Introduction: AMR is recognised by the World Health Organization (WHO) as one of the top 10 global public health threats. Effective surveillance systems are essential for informing policy, supporting antimicrobial stewardship, and guiding clinical and public health interventions. In Moldova, AMR surveillance was formally integrated into the national communicable disease surveillance system in 2018, and the country has contributed data to the Central Asian and Eastern European Surveillance of Antimicrobial Resistance (CAESAR) network since 2015. The objective of this evaluation was to assess the performance of Moldova's national AMR surveillance system and propose recommendations for its enhancement.

Methods: We evaluated the national AMR surveillance system using the United States Centers for Disease Control and Prevention (US CDC) and ECDC frameworks. We reviewed the national regulatory documents (Ministry of Health Orders No. 711/2018 and No. 128/2022) to define the system objectives and components. We considered the following attributes: simplicity, flexibility, acceptability, representativeness, timeliness, and data quality. We used data from reports submitted to the national reference laboratory (NAPH) between 2021 and 2023. In addition, we surveyed 45 laboratory professionals involved in AMR data collection and reporting. We analysed the data using Epi Info, IBM SPSS Statistics, and Excel.

Results: Moldova's AMR surveillance system demonstrated flexibility and simplicity. Most respondents (54%) reported no disruptions in reporting, and 67% found the forms easy to complete. Data quality was high, with 100% completeness in core variables, although inconsistent resistance testing (e.g. ESBL, CARBA) highlighted areas for improvement. Timeliness was a challenge, with an average delay of 9.44 days between patient admission and sample collection, influenced by clinical management. Voluntary participation led to potential underrepresentation of certain pathogens. The absence of address information recorded in the surveillance database limited our analysis of the system representativeness.

Conclusions: We found the system simple, flexible and acceptable. However, reliance on paper-based reporting, incomplete patient data, and limited resources affected data quality and efficiency. Inconsistencies in sample collection timing suggest the need for standardisation to improve timeliness and comparability. Although data flows were stable, representativeness remained limited due to voluntary participation and insufficient regional coverage. To strengthen Moldova's AMR surveillance system, we recommended implementing a centralised electronic reporting platform and expand training for laboratory personnel. Including variables to capture the timing of clinical suspicion and confirmation would improve timeliness. Enhanced regional participation and the addition of a geographical identifier in the database would allow for more accurate monitoring of coverage and representativeness nationwide.

Role and outputs: Nadejda served as Principal Investigator and initiated the evaluation of the antimicrobial resistance surveillance system in collaboration with the reference laboratory. She drafted a protocol, designed a questionnaire for data collection, analysed the surveillance data and drafted the final report. In relation to this project, Nadejda visited the AMR surveillance team at the Robert Koch Institute (RKI) in Germany and critically appraised the Moldovan AMR surveillance system with the input of German experts.

Supervisors: Pawel Stefanoff, Alina Druc, Livia Țapu and Olga Burduniuc

Status: Completed

Outbreak

Investigation of the foodborne outbreak at the Recreation Centre for Children

Introduction: An outbreak of *Salmonella enteritidis* occurred among 86 individuals attending the Recreation Centre in Chisinau on 3 July 2023. We investigated the outbreak to identify the vehicle and implement targeted control measures.

Methods: Cases were defined as persons who consumed food at the Recreation Centre on 3 July 2023 and confirmed by laboratory testing to have contracted *Salmonella enteritidis*, presenting at least one of the following symptoms within the subsequent 72 hours: diarrhoea, vomiting, fever, or abdominal pain. We interviewed and collected stool samples from all 86 individuals. The aetiologic agent was confirmed by bacterial culture. The Territorial Department for Food Safety (TDFS) conducted environmental investigations at the Recreation Centre and the catering firm, focusing on food hygiene and sanitation practices.

Results: Of 86 interviewed individuals, 48 (56%) were cases. Of them, all consulted a family doctor, 27 required hospitalisation and 21 received outpatient treatment. Stool cultures confirmed the presence of *Salmonella enteritidis* in the 48 symptomatic cases, while the remaining 38 samples tested negative. Chicken breast and egg noodles were identified as the most likely vehicles for the outbreak, with a 100% attack rate among those who consumed them, and no cases among those who did not consume them. *Salmonella enteritidis* was detected in both products, showing a pathogen count of 9.12 CFU per gram. Environmental investigations revealed significant food hygiene and sanitation deficiencies, including improper food storage and inadequate hygiene practices. A kitchen worker from the catering service was found to be a carrier of *Salmonella enteritidis*.

Conclusions: The outbreak was caused by contaminated meals with chicken and eggs. The contamination most likely occurred during food handling by the catering service. Factors that contributed to the contamination were serious deficiencies in food hygiene and sanitation at the catering firm, and the handling of food by an infected kitchen worker. We recommended closure of the incriminated kitchen and immediate corrective actions to address the identified structural and operational deficiencies. In the long term, we recommended enforcing exclusion of symptomatic food handlers from kitchen duties for at least 48 hours after their first normal stool. Additionally, food handlers and personnel should receive proper education on hygiene practices for food preparation and serving.

Role and outputs: As Co-investigator, Nadejda participated in the outbreak investigation team, conducted active case finding, interviewed cases, analysed the data and drafted the final report.

Supervisor: Pawel Stefanoff, Alina Druc

Status: Completed

Research

Knowledge and support for antimicrobial stewardship does not necessarily translate into good practice: survey of employees of the largest tertiary hospital in Moldova, May to June 2024

Introduction: AMR is an increasing problem globally, largely driven by the overuse and misuse of antibiotics. In Moldova, physicians are frequently not following recommendations regarding the use of antimicrobials. Despite the adoption of a national strategy to combat AMR, information on healthcare professionals' knowledge, attitudes, and practices related to antimicrobial stewardship (AMS) remains limited. This study aimed to assess the knowledge, attitudes, and practical implementation of AMS principles among staff at a tertiary hospital.

Methods: We surveyed employees of the Republican Clinical Hospital between 20 May and 30 June 2024. We interviewed doctors, nurses, pharmacists, clinical pharmacologists, and epidemiologists using a structured, self-administered questionnaire. The instrument assessed their knowledge, attitudes, and practices regarding antimicrobial stewardship. We analysed the collected data using descriptive statistics and tests of association.

Results: Among 138 participants, 65% were female and 54% were nurses. A high proportion demonstrated good knowledge (87%) and a positive attitude (80%) towards AMS. However, only 38% reported good stewardship-related practices. Significant associations were observed between knowledge and attitude ($p < 0.001$), and between knowledge and practice ($p = 0.013$). No significant association was found between attitude and practice ($p = 0.160$).

Conclusions: These findings reveal a disconnect between knowledge, attitudes, and practical implementation of AMS principles. While healthcare professionals were knowledgeable and well-intentioned, practice remained inconsistent. This suggests that effective AMS interventions must combine individual training with structural support at the institutional level. Tailored strategies should address both general awareness and hospital-specific factors contributing to AMR.

Role and outputs: As Principal Investigator, Nadejda developed the research protocol and questionnaire, and submitted the application to the ethics committee and the Ministry of Health. She interviewed respondents, analysed the data and drafted a manuscript for a peer-reviewed journal. The preliminary results were presented at a national conference.

Supervisor: Pawel Stefanoff

Status: Completed

Scientific communication

Conference presentations

Morărescu N. Preliminary results of the study on knowledge, attitudes, and practices of healthcare professionals towards antimicrobial stewardship at the Republican Clinical Hospital in Moldova. International Conference on the Prevention and Control of Healthcare-Associated Infections at national level; 19–20 September 2024, Chișinău, Moldova (oral presentation).

Morarescu N, Anton M, Tapu L, Colac S, Burduniuc O, Stefanoff P. Carbapenem resistance in gram-negative bacteria in the Republic of Moldova, 2019–2023. European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE); 20–22 November 2024, Stockholm, Sweden (poster presentation). Available at: https://www.escaide.eu/sites/default/files/documents/ESCAIDE-2024-Detailed-Programme_2.pdf

Publications and outputs

Morărescu N, Stefanoff P. Knowledge and support for antimicrobial stewardship does not necessarily translate into good practice: survey of employees of the largest tertiary hospital in Moldova, May–June 2024. Manuscript submitted to Antimicrobial Resistance & Infection Control in August 2025.

Teaching activities

Antimicrobial resistance: mechanisms, impact, preventive measures, contributing factors and effective interventions

Nadejda led a one-day training session for employees of the Municipal Clinical Children's Hospital in Chisinau on 3 July 2024. The audience were healthcare workers, including hospital management, paediatricians, nurses, students, and residents. She was responsible for organising the training session and developed training materials, delivered presentations, led discussions, and collected feedback. First, Nadejda introduced antibiotic resistance frameworks and recent government decisions in Moldova. She facilitated a case study on antimicrobial resistance in intensive care units to promote application of theoretical knowledge and engaged participants in discussions about practical problems encountered in patient care. At the end of the session, she collected feedback and administered a quiz to assess knowledge retention. Most participants were very engaged in the teaching activity and showed a clear understanding of key concepts. Participants were overall satisfied and expressed a desire for more frequent training sessions on similar topics.

International assignments

Improving the Moldovan antimicrobial resistance surveillance system based on examples of good practices and solutions used in Germany

Nadejda evaluated Moldova's AMR surveillance system, established in 2015 under international frameworks such as Central Asian and European Surveillance of Antimicrobial Resistance (CAESAR) and Global Antimicrobial Resistance and Use Surveillance System (GLASS). From 27 to 31 May 2024, she visited the Robert Koch Institute (RKI) in Berlin, Germany, to learn about the German AMR surveillance system and to identify good practices relevant for Moldova. The programme included expert presentations, in-depth discussions, and the analysis of strengths, weaknesses, opportunities and threats (SWOT) of the Moldovan system. In addition, Nadejda participated in practical sessions on surveillance of antimicrobial consumption, healthcare-associated infections, outbreak investigation strategies, and electronic data management systems. The visit resulted in recommendations on improvement of the Moldovan approach, including introducing electronic reporting, expanding AMR training, strengthening cross-sector collaboration through a One Health approach, and seeking international funding for AMR awareness initiatives.

Hosting country and institute: Robert Koch Institute (RKI), Berlin, Germany

Supervisor: Imke Wieters, Tim Eckmanns

Status: Completed

Other activities

- Participation in the workshop 'Biological Terrorism Detection for Prevention and Response' organised by the United States Embassy Chisinau, Export Control and Related Border Security Program (EXBS) and Louisiana State University from 3 to 5 April 2023 in Chisinau, Moldova. In this workshop, several aspects related to bioterrorism were discussed, as well as some simulation exercises (methods, phases, types of decontamination, personal protective measures, etc.).

- Participation in the US CDC/Council of State and Territorial Epidemiologists (CSTE) Scientific Writing Workshop (24–28 April 2023, Zagreb-Croatia). This workshop aimed to build participants' skills in scientific writing for peer-reviewed journals. The goal was to allow respiratory surveillance professionals to convert the results of influenza and other respiratory disease surveillance and research projects into manuscripts, which can be submitted for publication. During the workshop, participants worked on a manuscript that was submitted to a peer-reviewed journal.
- Participation in data collection for the 'Post-Introduction Evaluation of the Influenza Vaccine (iPIE)' study, conducted in the Republic of Moldova from 4 to 13 December 2023, under the order of the Ministry of Health. The study, based on the WHO iPIE methodology, was organised by the National Agency for Public Health (ANSP) in collaboration with international experts and The Task Force for Global Health (TFGH).
- Acting in 2024 as the national focal point for Infection Prevention and Control (IPC), with responsibility for completing the 2024 Global IPC Survey (IPCAT/IPCAF data) conducted by the World Health Organization (WHO).
- Participation in the national team submitting national data to the CAESAR and GLASS platforms (2022–2024). Contributing to the development of the Guidelines for Infection Prevention and Control in Healthcare Facilities, which were approved by Order No. 672/2024 of the Ministry of Health of the Republic of Moldova and the Expert Council of the Ministry of Health of the Republic of Moldova. Available at: https://ms.gov.md/wp-content/uploads/2024/11/Ghid-pentru-prevenirea-%C8%99i-controlul-infec%C8%9Biilor-%C3%AEn-institu%C8%9Bia-medico-sanitar%C4%83-spitaliceasc%C4%83.pdf

MediPIET modules attended

1. Introductory Course, 26 September to 14 October 2022, Spetses, Greece, face to face
2. Inject days on Operational Research, 8–10 November 2022, virtual
3. Outbreak Investigation module, 5–9 December 2022, Berlin, Germany, face to face
5. Vaccinology inject day, 29 March 2023, virtual
6. Chemical, Biological, Radiological, and Nuclear (CBRN) Awareness and Mitigation module, 13–17 March 2023, Petrovac, Montenegro, face to face
7. Multivariable Analysis module, 22–26 May 2023, Frankfurt, Germany, face to face
8. Rapid Risk Assessment module, 19–23 June 2023, Stockholm, Sweden, face to face
9. Project Review module, 28 August to 1 September 2023, Lisbon, Portugal, face to face
10. Time Series Analysis and GIS module, 11–15 December 2023, Rome, Italy, face to face
11. One Health module, 3–7 June 2024, Belgrade, Serbia, face to face
12. Project Review module, 26–30 August 2024, Lisbon, Portugal, face to face

Personal conclusions of fellow

The MediPIET fellowship has been a meaningful chapter in my career, helping me build skills and expand my knowledge in public health and epidemiology. This programme provided a mix of essential learning areas, such as tracking disease outbreaks, monitoring infectious diseases, and conducting field investigations. A major benefit was strengthening my understanding of data analysis through statistical tools, which I now find essential in my work. The programme also placed strong emphasis on ethical practice and effective teaching methods, which has prepared me to contribute thoughtfully and responsibly to public health. Working alongside peers from different countries broadened my perspective, as I could see how various regions tackle public health issues. These professional connections now serve as a great resource for ongoing collaborations. Reflecting on this experience, I feel ready to bring these skills into practice. The foundation I gained from MediPIET, along with support throughout, has set a solid path for my future in public health, and I'm very grateful for all the opportunities this fellowship provided.

Acknowledgements

I would like to sincerely thank everyone who provided their support and assistance in helping me complete the MediPIET programme, despite the many challenges we faced. I am especially grateful to my scientific coordinator, ECDC Coordinator Pawel Stefanoff, whose guidance played a crucial role in the successful completion of my projects, as well as to my colleagues for their collaboration and support. I also thank my national supervisor, Alina Druc, who has consistently sought to help me find solutions and opportunities for success, fostering a positive collaboration. I would also like to acknowledge the National Agency for Public Health and the Reference Laboratory team: Olga Burduniuc and Livia Țapu, for their invaluable contributions to this work. Their expertise and encouragement were invaluable throughout this journey.