

MediPIET Summary report of work activities

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Georgia, 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. You can find more information about the programme [here](#).

2. Pre-fellowship short biography

Before starting the MediPIET fellowship, I worked as an epidemiologist in Tbilisi, Georgia, specialising in the surveillance of communicable diseases. I obtained a Master of Science in Public Health from the Georgian-Norwegian Master programme and have been employed at the National Center for Disease Control and Public Health in Georgia, where my primary role has involved monitoring and managing public health threats across the country.

3. Fellowship

On 26 September 2022, I started my MediPIET fellowship at the National Center for Disease Control and Public Health, in Tbilisi, Georgia. This report summarises the work performed during the fellowship.

National supervisor: Ekaterine Ruadze

Scientific coordinator: Natalie Girin

Fellowship projects

4. Surveillance

Positive Predictive Value, Quality, and Timeliness of Crimean-Congo Hemorrhagic Fever Surveillance in the republic of Georgia (2019–2023)

Introduction

Crimean-Congo haemorrhagic fever (CCHF) is a tick-borne viral disease endemic to Georgia. It has a high case fatality rate of up to 30%. Frequent outbreaks pose a threat to public health in the region, particularly in rural areas with agricultural activity. We evaluated the Georgian CCHF surveillance system to enhance the efficiency of outbreak detection and response.

Methods

We reviewed records from the Electronic Integrated Disease Surveillance System (EIDSS) from 2019–2023. We defined PPV as the proportion of notified cases meeting the confirmed case criteria and data quality as the proportion of duplicate notifications. We defined timeliness as the delay between the date of symptom onset until the notification date and the delay between the notification date and the date of final diagnosis.

Results

Between 2019 and 2023, 390 suspected CCHF cases were reported (incidence: 10.5 per 100 000 population), of which 118 were confirmed (incidence: 3.2 per 100 000 population). The PPV of CCHF notifications was 30% (95% Confidence Interval (CI): 25.7–34.8). A review of case records revealed frequent misapplication of the case classification criteria and a high number of suspected cases that did not meet the confirmation threshold. Of unconfirmed cases, 70% presented with similar symptoms to CCHF, including fever and haemorrhaging, but were attributed to other febrile illnesses endemic to the region. There were 43 (11%) duplicate records. Notification delay was 3.5 days (95% CI: 2.9–4.1). Final diagnosis delay was 0 days (95% CI: 0–0.3).

Conclusions

We found low PPV and data quality of the Georgian CCHF surveillance system. We recommend improving data collection, enhancing quality assurance measures, and providing user training. The low PPV may be partially due to the severe nature and especially dangerous profile of the disease, prompting specialists to overreport cases as a precaution. This underscores the need for interventions to enhance case identification accuracy through refined definitions, rigorous validation, and improved diagnostic capabilities.

Role and outputs: Principal investigator. Fellow wrote the protocol, analysed surveillance data, developed and analysed questionnaire and wrote the report.

Supervisor: Ekaterine Rudadze

5. Outbreaks

*Outbreak of *Staphylococcus aureus* among schoolchildren in Marneuli, Georgia, 25 December 2022*

Introduction

In December 2022, an outbreak of gastrointestinal illness was reported among children attending a dinner party at a restaurant in Marneuli, Georgia. Following this event, an investigation was conducted to identify the source and causative factors of the outbreak, aiming to inform future food safety practices.

Methods

We conducted a retrospective cohort study. A case was defined as a person who developed diarrhoea or vomiting within 30 minutes to eight hours after eating at the restaurant on 25 December 2022. Data was collected via telephone interviews, and descriptive and univariable analyses were followed by multivariable logistic regression to adjust for demographics and food items. Food samples and nasopharyngeal swabs from staff were tested for bacteria. This analytical study combined epidemiological and microbiological findings to determine the outbreak's potential cause.

Results

Contact information was available for all 35 attendees, and 12 met the case definition, yielding an attack rate of 25%. The epidemic curve suggested a point-source outbreak with a median incubation of four hours. Univariable analysis identified a strong association between illness and mushroom and cheese pizza consumption (risk ratio (RR): 10.4; 95% CI: 8.5–12.3). Among the 12 symptomatic cases, 11 (92%) had consumed this item. Coliforms were found in food samples, and a nasopharyngeal swab from a kitchen employee tested positive for *Staphylococcus aureus*.

Conclusions

This study linked cheese consumption with illness, with *Staphylococcus aureus* as the likely pathogen. Findings led to specific food safety recommendations, emphasising temperature control and food handler hygiene. The investigation highlights the value of studying small-scale outbreaks, as they can lead to targeted public health actions and improved food safety regulations.

Role and outputs: Principal Investigator. I was involved in every stage of the outbreak investigation, adapting the official outbreak investigation questionnaire, performing data entry, analysing the data, drafting the final report, and sharing the findings with interdisciplinary teams, including the National Food Agency (NFA).

Supervisor: Ekaterine Rudadze

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6. Research

Child lead (Pb) exposure and source identification in Poti region in Georgia

Introduction

Lead exposure remains a public health concern, particularly for young children in Georgia. The 2018 National Multiple Indicator Cluster Survey (MICS-2018) reported that 41% of children aged two to seven years had blood lead concentrations (BLC) above the action level of 5 µg/dL. This finding led to interventions by the National Center for Disease Control and Public Health (NCDC), including family communication and a state-funded follow-up program in 2019. Supported by organisations such as UNICEF, the UK Health Security Agency, and Pure Earth, additional public health initiatives targeted sources like spices, dust, soil, and paint. In 2023, NCDC launched a pilot project in Poti, a city in the Samegrelo region with high BLC rates, focusing on lead source identification and building capacity for lead isotope ratio analysis.

Methods

In 2023, we measured BLC in 63 randomly selected children aged two to seven years in Poti using inductively coupled plasma-mass spectrometry (ICP-MS). Statistical analysis was conducted in STATA 18, calculating the mean, standard deviation, and 95% confidence interval for BLC. A two-sample t-test compared these findings with MICS-2018 results.

Results

The 2023 study revealed a mean BLC of 2.49 µg/dL (95% CI: 1.96–3.02), significantly lower than the 9.21 µg/dL mean from 2018 ($p < 0.001$). Only two children had BLC above the action level. Additionally, lead levels in spices showed improvement, with only 2.3% of samples exceeding the permitted 5 µg/kg threshold.

Conclusions

These findings indicate a reduction in BLC among children in Poti. A more extensive, nationwide study is needed to assess the impact of public health interventions on BLC levels. Continued research, targeted actions, and collaboration across national and international agencies are essential to reduce lead exposure and safeguard the health of children in Georgia.

Role and outputs: Co-investigator. I was involved in all the steps of the study, from initial data entry and thorough data analysis to drafting and submitting the manuscript for publication in a peer-reviewed journal.

Supervisor: Ekaterine Ruadze

7. Scientific communication

Conference presentations

Bainduri Milena. Blood lead concentration and exposure changes in parallel of public health interventions in Georgian children. Presented at: 19th Annual International Symposium on Environment; 2024 Jul 15–18; Athens, Greece.

Publications and outputs

Bainduri M, Ruadze E, et al. Assessment of Blood Lead Levels in 2–7-Year-Old Children in Poti, Georgia, 2023: A Pilot Study of Environmental Lead Exposure Sources. [Submitted to 'Environmental Research']

8. Teaching activities

I led a full-day, face-to-face training session on 'Safety of COVID-19 Vaccines and Adverse Events Following Immunisation' in Tbilisi for the Georgia Red Cross Society on 13 November 2022. My role involved the comprehensive development of training materials, including presentations following World Health Organization guidelines, pre- and post-tests, and instructional posters. The session began with an icebreaker and pre-tests to assess baseline knowledge, followed by detailed presentations on the safety and common side effects of COVID-19 vaccines, including Pfizer, AstraZeneca, Sinopharm, and Sinovac. Key materials included Georgia-specific statistics on vaccine safety and a study guide based on WHO's Adverse Events Following Immunization (AEFI) guidelines.

I employed various interactive teaching methods, such as group discussions and personal experience sharing, to encourage active participation. The day concluded with a post-test to measure knowledge gains and a feedback session, which indicated high participant satisfaction and a request for extended training time. This session enhanced the readiness of Georgia Red Cross representatives to address public concerns about vaccine safety across urban and rural areas.

9. Other activities

- EIOS System Training Workshop, 7–9 March 2023, WHO, Tbilisi, Georgia
- Training on Using Simulation Exercises (SimEx) to enhance Emergency Preparedness & Response plans / Invitation / 31 May to 1 June, 2023, ECDC, Stockholm, Sweden
- Response Preparedness to Zoonotic Disease Outbreaks Workshop, WHO, 19–21 April, 2023
- Presenter at WHO EPI-WIN webinar: 'Strengthening One Health operations in countries to improve preparedness for emerging zoonotic diseases', 5 July 2023
- Public Health Emergency Management Fellowship at CDC, 14 February to 15 May 2024, Atlanta, United States
- WHO Sub-regional workshop on public health and animal health surveillance and control of zoonotic pathogens with epidemic potential at the human-animal-environment interface, Nov 21–24, 2024, Almaty, Kazakhstan

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10. 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, virtual module;
3. ESCAIDE Conference, 23–25 November/2022, Stockholm, Sweden, in person;
4. Introduction to R for Applied Epidemiology (40 hours), 28 November–2 December 2022, virtual course;
5. Outbreak Investigation Module, 5–9 December 2022, Berlin, Germany, in person;
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, one-day virtual session;
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 to 1 September 2023, Lisbon, Portugal, in person;
11. ESCAIDE Conference, 22–24 November 2023, MediPIET Scientific Event (23 November), MediPIET Alumni Network Meeting (23 November), Barcelona, Spain, in person.
12. Time Series Analysis Module, 11–15 December 2023, Istituto Superiore di Sanita (ISS), Rome, Italy
13. One Health approaches to field epidemiology practice in MediPIET countries, 3–7 June 2024, Belgrade, Serbia;
14. Project Review Module, 26–30 August 2024 Lisbon, Portugal, in person;
15. ESCAIDE Conference, 20–22 November 2024, Stockholm, Sweden, in person.

11. Personal conclusions of fellow

Reflecting on my journey with the MediPIET fellowship, I am immensely grateful for the skills and insights gained in field epidemiology. The programme's comprehensive training, which included modules, case studies, and hands-on learning, exceeded my expectations and strengthened my expertise in outbreak investigation, communicable disease surveillance, and epidemiological studies. The fellowship equipped me with essential skills and tools that will be instrumental as I advance in my career and respond to future public health challenges.

One of the most enriching aspects of the program was the chance to share experiences with colleagues from different countries, which broadened my perspective on the diverse challenges faced in public health today. The friendships and strong sense of community within MediPIET, EPIET, EUPHEM and PAE have been invaluable, making this journey not only educational but profoundly rewarding.

Acknowledgements

I would like to express my sincere gratitude to my MediPIET supervisor, Ekaterine Ruadze, and my country focal point, Dr. Paata Imnadze, for their invaluable guidance and support throughout my fellowship. Their insights in epidemiology and public health have been instrumental in my professional growth, offering me both the knowledge and opportunities to develop meaningful projects. I am especially grateful to my scientific coordinator, Natalie Girin, whose constant support, expertise, and mentorship have been a cornerstone of my journey. Finally, I extend my heartfelt thanks to my colleagues from Cohort 5 and the team at ECDC for sharing their experiences and creating memorable moments over the past two years.