

Anna Ohlson

The European Programme for Intervention Epidemiology Training (EPIET), Cohort 2023
Public Health Agency of Sweden (PHAS), Sweden

Background

The ECDC Fellowship Programme is a two-year competency-based training with two paths: the field epidemiology path (EPIET) and the public health microbiology path (EUPHEM). After the two-year training, EPIET and EUPHEM graduates are considered experts in applying epidemiological or microbiological methods to provide evidence to guide public health interventions for communicable disease prevention and control. The Administrative Decisions ECDC/AD/2022/16 Rev.01 and ECDC/AD/2023/06 govern the European Union (EU)-track and Member State (MS)-track, respectively, of the ECDC Fellowship Programme, field epidemiology path (EPIET) and public health microbiology path (EUPHEM), Cohort 2023.

Both curriculum paths provide training and practical experience using the 'learning-by-doing' approach at acknowledged training sites across the European Union/European Economic Area (EU/EEA). This final report describes the experiences and competencies the fellow acquired by working on various projects, activities, theoretical fellowship training modules, other modules or trainings, and international assignments or exchanges during the fellowship.

Pre-fellowship short biography

Anna Ohlson is a veterinarian with a PhD in veterinary epidemiology and over 15 years of experience in infectious disease surveillance and control in livestock. She has held positions at the Swedish University of Agricultural Sciences (SLU), the National Veterinary Institute (NVI), and the Swedish Dairy Association. Her work has focused on the development and implementation of national control programmes for infectious diseases in cattle. She has played a key role in establishing a national biosecurity programme for livestock, in collaboration with the NVI and the Swedish Board of Agriculture. Since 2021, Anna has been working at the Public Health Agency of Sweden (PHAS) within the Unit for Coordination and Surveillance of Seasonal Viruses, with a specific focus on the surveillance of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and respiratory syncytial virus (RSV).

Results

The objectives of the core competency domains were achieved partly through project and activity work, and partly by participating in the training modules. Results are presented in accordance with the EPIET/EUPHEM core competencies, as set out in the ECDC Fellowship Manual¹.

¹ European Centre for Disease Prevention and Control (ECDC). Manual for the ECDC Fellowship Programme EPIET and EUPHEM paths. Stockholm: ECDC; 2025. Available at: <https://www.ecdc.europa.eu/en/publications-data/ecdc-fellowship-programme-manual>

1. Epidemiological investigations

1.1. Outbreak investigations

1.1.1. Outbreak of norovirus in a combined school and kindergarten, Örebro region, Sweden, 2023

Supervisors: Moa Rehn (PHAS), Sharon Kühlmann-Berenzon (PHAS)

Category: Food- and waterborne diseases

Aim: To assess the extent of a norovirus outbreak in a combined school and kindergarten, identify the source of infection, and suggest appropriate control measures.

Methods: A retrospective cohort study was conducted among school children aged 6–12 years (grades 1–6) and school staff using a web-based questionnaire, which was distributed via the school administration. A case was defined as displaying vomiting and/or diarrhoea and/or two other specified symptoms, starting from 6 November 2023 (Monday). Risk of illness was analysed by univariate, stratified, and multivariate analysis, using logistic regression. Clinical samples from cases, as well as food samples and environmental swabs from the school canteen were collected for laboratory testing (using polymerase chain reaction (PCR)).

Results: Of 106 respondents, 44 met the case definition. Risk of illness was significantly higher among children in school year 3 or lower (risk ratio (RR): 2.3; 95% confidence interval (CI): 1.16–4.57), and among those who had eaten lunch at the canteen on 6 November 2023 (Monday) (RR: 3.3; 95% CI: 0.90–12). No single food item was conclusively identified as the source, but milk consumption was associated with illness among children in school years 4 to 6 (RR: 8.5; 95% CI: 2–13.6, $p=0.0185$). Norovirus was confirmed in stool samples from cases, but was not detected in food or environmental samples.

Public health implications/Conclusions: Multiple transmission routes were likely, including person-to-person, contaminated surfaces, and beverage-/food-borne spread. This highlights the complexity in identifying a single source of infection in norovirus outbreaks and the importance of strict hygiene measures in canteens and schools in general.

Role: Anna co-led the investigation alongside other fellows at PHAS (Carmen Espinosa-Gongora and Hilde De Clerck). She contributed to all investigation steps, including questionnaire design, epidemiological analysis, stakeholder meetings, and the final report was written as a joint effort (see section 4.2, report 2). Furthermore, Anna presented the result of the outbreak investigation at a stakeholder meeting (see section 4.4, presentation 3).

1.1.2. Outbreak of *Cryptosporidium parvum* in multiple regions, Sweden, 2023

Supervisors: Moa Rehn (PHAS), Sharon Kühlmann-Berenzon (PHAS), Anette Hansen (PHAS)

Category: Food- and waterborne diseases

Aim: To describe the outbreak, identify its source, and apply mitigation measures.

Methods: The outbreak was identified through routine surveillance, with a rise over expected level in notified cases. A retrospective case–control study was conducted using a web-based questionnaire. Cases were identified through notification. Controls, frequency-matched by age and sex, were selected from a national random pool. We described distribution of cases and analysed exposure data by univariate, stratified and multivariate analysis, using logistic regression. In addition, clinical samples from a subset of cases were collected for laboratory analysis.

Results: In total, 60 cases from 13 out of 21 regions were identified between 15 December 2023 and 1 January 2024. Cases were more likely than controls to have consumed food from grocery-store salad bars (adjusted odds ratio (aOR): 58; 95% CI: 22–186). Among specific items, consumption of kale-mix salad was associated with being a case (aOR: 3.6; 95% CI: 1.2–12). A novel *Cryptosporidium parvum* subtype (IIyA11) was identified in stool samples of cases. Trace-back investigations identified kale producers in Sweden, Belgium and Spain, but no single source was confirmed. The absence of available food samples impacted microbiological confirmation and trace-back investigation.

Public health implications/Conclusions: The investigation findings suggested kale-mix salad from grocery-store salad bars as the likely vehicle for *Cryptosporidium* transmission in this outbreak. The findings underscore the importance of improved surveillance, hygiene, and preventive controls in the production and handling of pre-packaged products that are consumed raw.

Role: Anna co-led the epidemiological part of the outbreak investigation, alongside the EUPHEM fellow, Ioana Bujila. She contributed to all investigation phases, including questionnaire design, epidemiological analysis, and meetings with regional centres for disease control and prevention and the Swedish Food Agency. A manuscript with shared first authorship was published in a peer-reviewed journal (see section 4.1, paper 1).

Furthermore, Anna was the co-author of an abstract accepted for the European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2024 (presented by Ioana Bujila; see section 4.3, presentation 2).

1.1.3. Outbreak of *Salmonella typhimurium* in multiple regions, Sweden, 2024

Supervisors: Rikard Dryselius (PHAS), Ilias Galanis (PHAS)

Category: Food- and waterborne diseases

Aim: To describe the outbreak, identify its source, and suggest mitigation measures.

Methods: The outbreak was identified through routine surveillance, with a rise over expected level in notified cases. Descriptive analysis and a hypothesis-generating case–case study were conducted, based on national surveillance data and responses to the standardised *Salmonella* trawling questionnaire used by PHAS. Cases were compared with *Salmonella* cases of other subtypes, matched by time period and age group. Preliminary hypotheses were explored through univariate logistic regression.

Results: A total of 102 *Salmonella* Typhimurium cases were identified across 11 regions, including 35 confirmed cases (STm_13_2024). Analysis suggested associations with minced meat (odds ratio (OR): 3.5; 95% CI: 1.0–14.1) and a specific supermarket chain (OR: 5.7; 95% CI: 1.1–57.0). Although sprouts showed a strong association (OR 7.3; 95% CI: 1.8–34.2), the low exposure proportion (30% of cases) led to an initial decision not to consider them the likely source. As no additional cases were reported, the outbreak was initially declared over. However, following the subsequent detection of new cases both in Sweden and abroad, the investigation was later reopened. The renewed investigation, led by the EPIET fellow, Kate Lillepold, ultimately identified sprouts as the source of infection.

Public health implications/Conclusions: The outbreak underscored the importance of maintaining situational awareness even after an outbreak appears to be over, as new information may emerge that justifies reopening the investigation. The identification of a multi-country food-borne source further highlighted the critical role of international collaboration in outbreak detection and response.

Role: Anna led the epidemiological part of the initial investigation, including statistical analysis and development of an R-script for daily updates, and participated in coordination meetings with regional centres for disease control and prevention. She wrote an activity report (see section 4.2, report five), and a manuscript has been submitted to a peer-reviewed journal with her as a co-author (see section 4.1, paper 2). Anna also contributed to an abstract submitted by Kate Lillepold for ESCAIDE 2025, which got accepted for poster presentation (see section 4.3, presentation 3).

1.2. Surveillance

1.2.1. Assessment of wastewater SARS-CoV-2 quantification as a potential surveillance indicator for COVID-19 in Sweden, 2023–2024

Supervisors: Moa Rehn (PHAS), Ilias Galanis (PHAS), Erik Sturegård (PHAS), Sharon Kühlmann-Berenzon (PHAS)

Type of project: Evaluating a surveillance system

Aim: To evaluate the potential of wastewater surveillance (WWS) as an early warning indicator for COVID-19 in Sweden, based on its correlation with reported case data.

Methods: The study analysed data over a 72-week period from 19 wastewater treatment plants (WWTPs) across 14 regions, covering 43% of the national population. Cross-correlation analyses were performed at regional and national levels, assessing the relationship between SARS-CoV-2 levels in wastewater and reported COVID-19 cases. Weekly data and three-week trends were examined. Cross correlation coefficients, sensitivity, specificity, positive and negative predictive value (PPV/NPV) were calculated for different time lags (1–3 weeks shift). Poisson regression models were used to evaluate the predictive power of wastewater levels on reported cases.

Results: Wastewater SARS-CoV-2 levels showed high correlation with reported COVID-19 cases (national $r=87$). PPV was moderate to low (63–74%), i.e. wastewater signals were not optimally reflected in notifications. The highest estimates for correlation, sensitivity, specificity, PPV and NPV were at lag 0 (no shift in time). Poisson regression models showed limited predictive power for WWS.

Public health implications/Conclusions: While WWS reflected COVID-19 case trends, it did not provide early warning for the rise in COVID-19 cases. While its added value was limited in Sweden's COVID-19 surveillance system, WWS remains a potentially useful preparedness tool for emerging diseases or in settings with limited case data. Continued evaluation of surveillance indicators for COVID-19 WWS is essential for efficient resource allocation.

Role: Anna participated actively in planning the study, collated data, performed data analysis, interpreted results, and formulated conclusions. She wrote the study protocol (see section 4.2, report 10) of the evaluation, and a manuscript has been submitted to a peer-reviewed journal with her as first author (see section 4.1, paper 3). Her abstract on the project was accepted for ESCAIDE 2024 as an oral presentation (see section 4.3, presentation 1). Furthermore, Anna presented the results at the Nordic Mini Project Review Module, at the Day of Seasonal Virus Conference (Säsongsvirusdagen), and at PHAS Forum for Wastewater (see section 4.4, presentations 1, 2 and 4).

1.2.2. Surveillance support for global cholera outbreaks, GOARN/WHO Geneva headquarters (remote), 2025

Supervisors: Global outbreak alert and response network (GOARN) and World Health Organization (WHO) Geneva Cholera Global Cholera Incident Management System Team (IMST)

Type of project: Surveillance support and data analysis (see also section 7, 'International assignments')

Aim: To support WHO's Global Cholera Incident Management System Team (IMST) in coordinating surveillance efforts for ongoing global cholera outbreaks, with a focus on data collection, analysis, risk assessment and reporting.

Methods: The mission was conducted remotely from Sweden (January–March 2025), supporting GOARN/WHO headquarters' (HQ) Health Information Pillar. Activities included consolidation of national and subnational cholera data from situation reports, dashboards, and coordination meetings. Data were entered into a centralised database, validated, and analysed using R scripts to produce weekly figures, maps, and visualisations. Outputs were integrated into internal briefings, the global cholera dashboard, and situation updates for partners.

Results: From January to March 2025, 98 500 cholera cases and 1 300 deaths were reported globally. Five countries were classified as having acute cholera crises: Angola, Democratic Republic of the Congo (DRC), Myanmar/Burma, South Sudan and Sudan; 24 others reported ongoing outbreaks. Data analysis over this time period showed seasonal declines in cases, though interpretation was challenged by delayed or inconsistent reporting. The case fatality exceeded WHO targets in several countries. Despite gaps in raw data and reliance on manual processes, validated outputs supported real-time response coordination.

Public health implications/Conclusions: The mission highlighted the importance of sustained technical capacity and standardised data collection in global outbreak response. While short-term improvements in reporting workflows were achieved, long-term enhancements – such as automation and harmonisation across countries – are critical for strengthening global cholera surveillance.

Role: Anna contributed to data management, validation, analysis, and visualisation of results. She supported weekly reporting and helped produce global situation updates shared internally and with partners. She also wrote an end-of-mission report (see section 4.2, report 6). Furthermore, Anna presented the result of the mission at PHAS (see section 4.4, presentation 6).

2. Applied public health research

2.1. Temporal trends and testing patterns in gonorrhoea: a population-based study in Västra Götaland and Stockholm regions, Sweden, 2015–2024

Supervisors: Inga Velicko (PHAS), Erik Sturegård (PHAS), Ilias Galanis (PHAS), Anna Nielsen (PHAS), Moa Rehn (PHAS)

Aim: To investigate trends in gonorrhoea incidence, testing patterns, and individual-level risk factors for positivity in Västra Götaland and Stockholm regions, Sweden, 2015–2024.

Methods: We analysed 1 257 282 individual-level gonorrhoea test records (positive and negative) with personal identity number for the above regions. Descriptive analyses were performed for repeated testing, reinfections, and multi-site sampling (genital, rectal, oral). Incidence was modelled using sex- and region-stratified negative binomial regression, adjusting for year, age, testing coverage, multi-site testing, and the COVID-19 pandemic period (2020–2022). Logistic regression examined predictors of test positivity.

Results: Incidence increased across all groups, most sharply among females in Stockholm (+13% annually). In 2024, incidence was highest in Stockholm among males aged 25–34 (350/100 000) and among females aged 20–24 (170/100 000). Reinfections were rare but clustered in a small group of men. Multi-site testing strongly predicted positivity, which increased over time. Individuals tested at >1 anatomical site had over sixfold higher odds of a positive test result (Stockholm: 6.2, 95% CI: 5.74–6.70; Västra Götaland: 7.06, 95% CI: 5.93–8.40). Among males tested at all three sites, 77% of infections were only detected extra-genitally. Among females, 36% were detected only extra-genitally.

Public health implications/Conclusions: Gonorrhoea incidence is rising, particularly among young females and older males, which signals a need to target prevention measures towards these groups. While increased testing partly explains the rise of incidence in men, trends in women suggest a true increase in transmission. Expanding multi-site testing, especially in high-risk groups, is essential to improve detection.

Role: Anna designed the study, secured ethical approval, coordinated data collection, and carried out the data analysis. Furthermore, she presented the results at the Nordic Mini Project Review Module (see section 4.4, presentation 5). She also authored the study protocol (see section 4.2, report 9) and research report (see section 4.2, report 8).

2.2. Gonorrhoea and chlamydia transmission risk factors in Sweden: a focus on young adults, 2025–2026

Supervisors: Inga Velicko (PHAS), Erik Sturegård (PHAS), Ilias Galanis (PHAS), Anna Nielsen (PHAS), Moa Rehn (PHAS)

Aim: To investigate behavioural and lifestyle-related risk factors for gonorrhoea and chlamydia infections among young adults aged 18–29 in Sweden, in order to inform prevention and control strategies.

Methods: A case–control study including individuals aged 18–29 years who are tested for gonorrhoea and chlamydia at selected youth and sexually transmitted infections (STI) clinics in four regions will be invited to participate during a defined study period. Participants will complete a web-based questionnaire covering sexual behaviour, alcohol and substance use, and other potential risk factors. Their responses will be linked to their laboratory test results for gonorrhoea and chlamydia (positives=cases, negatives=controls). Statistical analysis will include univariate and multivariate logistic regression to assess associations between exposures (risk factors) and test positivity.

Results: Data collection has not yet started. The study was successfully prepared, with internal approval from PHAS and ethical approval obtained. Regional centres for disease control and prevention in four Swedish regions with high STI incidence were engaged. The study is ready for implementation.

Public health implications/Conclusions: Understanding behavioural and lifestyle-related risk factors for gonorrhoea and chlamydia among young adults is essential to design targeted prevention strategies. This study will provide evidence to support tailored public health interventions in Sweden.

Role: Anna led the preparation of the research study, including writing the project proposal and the study protocol, developing and piloting the questionnaire, conducting the sample size calculation, and preparing data management and protection plans. Anna successfully coordinated the full ethical approval process with the PHAS Legal Office and the Swedish Ethical Review Authority. The study has been prepared for implementation at clinics in four Swedish regions with high STI incidence. She also authored the study protocol (see section 4.2, report 9) and activity report (see section 4.2, report 7).

3. Teaching and pedagogy

Lectures on surveillance and outbreak investigation for medical doctors, Karolinska Institutet, 2023

Anna co-led a virtual three-hour training session on outbreak investigation for medical doctors in the public health/clinical microbiology residency programme at Karolinska Institutet. Together with the EUPHEM fellow, Ioana Bujila, they delivered theoretical teaching on outbreak investigation methods, including statistical concepts, study designs, and the 10-steps approach to outbreak investigation. They also facilitated a practical case study on a *Cryptosporidium* outbreak. Anna focused on the epidemiological methods, while Ioana covered microbiological and laboratory aspects. Anna wrote a reflective note (see section 4.2, report 1).

Lectures on surveillance and outbreak investigation for master's degree students, Södertörn University, 2024

A full-day training session covering key topics in field epidemiology and outbreak response was organised for students enrolled in the international master's degree programme, 'Infectious Disease Control' at Södertörn University. Anna co-led the training with the EUPHEM fellow, Ioana Bujila. She presented surveillance basics, while Ioana focused on microbiological surveillance. They covered outbreak investigation theory and methods, including a case study on a *Cryptosporidium* outbreak. Here, Anna emphasised epidemiological methods, while Ioana covered laboratory aspects. She also wrote a reflective note (see section 4.2, report 3).

Lecture on quantitative wastewater-based epidemiology for medical doctors, PHAS, 2024

Anna held a lecture on quantitative wastewater-based epidemiology at PHAS. The lecture provided an overview of wastewater-based surveillance and included the evaluation of surveillance of SARS-CoV-2 in wastewater, interpretation of quantitative data, and discussion of public health applications. The session was part of the training for medical doctors in the public health and clinical microbiology residency programme at Karolinska Institutet. She also wrote a reflective note (see section 4.2, report 4).

4. Communications related to the EPIET/EUPHEM fellowship

4.1. Manuscripts published in peer-reviewed journals

- Bujila I, **Ohlson A**, Hansen A, Agudelo L, Kühlmann-Berenzon S, Galanis I, et al. Outbreak of the novel *Cryptosporidium parvum* IIyA11 linked to salad bars in Sweden, December 2023. *Epidemiol Infect.* 2024;152:39552133. Available at: <https://pubmed.ncbi.nlm.nih.gov/39552133/> (Paper 1, shared first authorship).
- Lillepold K, Karamehmedovic N, Bujila I, **Ohlson A**, Nederby Öhd J, Hall I, et al. Multi-cluster outbreak of *Salmonella* Typhimurium sequence type 36 linked to alfalfa sprouts, Sweden, August–November 2024. *Epidemiol Infect.* 2025;153: 40916032. Available at: <https://pubmed.ncbi.nlm.nih.gov/40916032/> (Paper 2).
- **Ohlson A**, Rehn M, Sturegård E, Kühlmann-Berenzon S, Brodin R, Székely A, et al. Evaluation of wastewater SARS-CoV-2 quantification as a surveillance indicator for COVID-19 in Sweden. *Eurosurveillance.* (Paper 3). [Submitted for publication].

4.2. Other reports

- **Ohlson A**. Lectures on surveillance and outbreak investigation for medical doctors, 2023. Reflective note, 2023.
- De Clerck H, **Ohlson A**, Espinosa-Gongora C. Norovirus school outbreak, autumn 2023, Örebro region, Sweden. Outbreak report, 2024.
- **Ohlson A**. Lectures on surveillance and outbreak investigation for master's students, 2024. Reflective note, 2024.
- **Ohlson A**. Lecture on quantitative wastewater-based epidemiology for medical doctors, 2024. Reflective note, 2024.
- **Ohlson A**. *Salmonella* Typhimurium outbreak, Sweden, 2024. Activity report, 2024.
- **Ohlson A**. End-of-mission report: Remote support: Global cholera surveillance. International mission report (GOARN/WHO), 2025.
- **Ohlson A**. Gonorrhoea and chlamydia transmission risk factors in Sweden: a focus on young adults. Activity report, 2025.
- **Ohlson A**, Velicko I, Sturegård E, Nielsen A, Rehn M, Galanis I. Temporal trends and testing patterns in gonorrhoea: a population-based study in Västra Götaland and Stockholm regions, Sweden, 2015–2024. Research report, 2025.
- **Ohlson A**. Exploring gonorrhoea and chlamydia trends and transmission risk factors in Sweden: a focus on young adults aged 16–29 years, 2015–2024. Study protocol, 2024. [Note: This protocol describes both the studies under 2.1 and 2.2, they are sub-studies in the same protocol.]
- **Ohlson A**. Evaluation of wastewater SARS-CoV-2 quantification as an early warning surveillance indicator for COVID-19 in Sweden, 2023–2024. Study protocol, 2024.

4.3. Conference presentations

- **Ohlson A**, Rehn M, Galanis I, Sturegård E, Kühlmann-Berenzon S. Wastewater-based surveillance of SARS-CoV-2 has limited potential to predict the number of COVID-19 cases in Sweden (oral presentation). Presented at: European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE); 21 November 2024; Stockholm, Sweden.
- Bujila I, **Ohlson A**, Hansen A, Agudelo L, Kühlmann-Berenzon S, Galanis I, et al. Outbreak of the novel *Cryptosporidium parvum* IIyA11 linked to salad bars in Sweden, December 2023 (poster presentation). Presented by Ioana Bujila at: European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE); 22 November 2024; Stockholm, Sweden.
- Lillepold K, Karamehmedovic N, Bujila I, **Ohlson A**, Nederby Öhd J, Hall I, et al. Multi-cluster outbreak of *Salmonella* Typhimurium sequence type 36 linked to alfalfa sprouts, Sweden, August–November 2024 (poster presentation). Presented by Kate Lillepold at: European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE); 19–21 November 2025; Warsaw, Poland.

4.4. Other presentations

- **Ohlson A**. Wastewater surveillance of SARS-CoV-2. Presented at: Nordic Mini Project Review Module; 29 February 2024; Helsinki, Finland.
- **Ohlson A**, Rehn M, Sturegård E, Kühlmann-Berenzon S, Galanis I. Evaluation of SARS-CoV-2 levels in wastewater as an indicator for COVID-19 surveillance (*Utvärdering av SARS-CoV-2 nivåer i avlopp som indikator för övervakning av covid-19*). Presented at: PHAS Forum for Wastewater; 29 May 2024; Stockholm, Sweden.
- **Ohlson A**. Norovirus school outbreak, autumn 2023, Örebro region. Presented at: Stakeholder meeting; 10 June 2024; Stockholm, Sweden.
- **Ohlson A**, Rehn M, Sturegård E, Kühlmann-Berenzon S, Galanis I. Evaluation of SARS-CoV-2 levels in wastewater as an indicator for COVID-19 surveillance (*Utvärdering av SARS-CoV-2 nivåer i avlopp som indikator för övervakning av covid-19*). Presented at: Day of Seasonal Virus Conference (Säsongsvirusdagen); 9 September 2024; Stockholm, Sweden.

- **Ohlson A**, Velicko I, Sturegård E, Nielsen A, Rehn M, Galanis I. Exploring gonorrhoea trends and test patterns in Sweden, 2015–2024. Presented at: Nordic Mini Project Review Module; 2025 Mar 14; Stockholm, Sweden.
- **Ohlson A**. GOARN deployment with WHO HQ global cholera IMST – Experiences from a remote assignment. Presented at: PHAS; 22 March 2025; Stockholm, Sweden.

5. EPIET/EUPHEM modules attended

- Introductory Course, 25 September–13 October 2023, Spetses, Greece.
- Study Protocol and Scientific Writing, 26–27 October and 7–8 November 2023, virtual.
- European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2023, 22–24 November 2023, Barcelona, Spain.
- Multivariable Analysis, 19–23 February 2024, Berlin, Germany.
- Vaccinology, 4–8 March 2024, virtual.
- Writing Abstracts for Scientific Conferences, 20 March 2024, virtual.
- Qualitative Research, 19 and 22 March 2024, virtual.
- Rapid Assessment and Survey Methods, 15–19 April 2024, Dublin, Ireland.
- Public Health Microbiology I – Basic phylogeny, 17–18 June 2024, virtual.
- Project Review Module, 26–30 August 2024, Lisbon, Portugal.
- European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2024, 20–22 November 2024, Stockholm, Sweden.
- Time Series Analysis, 9–13 December 2024, Utrecht, the Netherlands.
- One-Health, 12–15 May 2025, virtual.
- Project Review Module, 25–29 August 2025, Lisbon, Portugal.
- Public Health Leadership, 1–3 September 2025, Lisbon, Portugal.

6. Other training

- Introduction to R, 19–22 September 2023, Virtual.
- Theoretical and practical aspects of analysing SARS-CoV-2 in wastewater workshop, Genetic Epidemiology and Bioinformatics Training Programme (GenEpi-BioTrain), 24 and 31 January 2024, Virtual.
- Nordic Mini Project Review Module 2024, 29 February–1 March 2024, Helsinki, Finland.
- MOonitoring Outbreaks for Disease surveillance in a data science context (MOOD), mini module, EPIET Alumni Network, 18–19 November 2024, Stockholm, Sweden.
- Nordic Mini Project Review Module 2025, 13–14 March 2025, Stockholm, Sweden (see also section 8, 'Other activities').

7. International assignments

- Ten-week remote deployment (January–March 2025) through GOARN to support the Health Information Management team of the WHO Incident Management Support Team (IMST) at WHO headquarters in Geneva. The assignment focused on global cholera surveillance and coordination as part of the IMST response to ongoing cholera outbreaks (see sections 1.2 'Surveillance' and 4.2 'Other reports' for the end of mission report).

8. Other activities

- Planned, organised, and conducted the Nordic Mini Project Review Module in Stockholm, 13–14 March 2025, together with PHAS-co-fellows, Ioana Bujila and Kate Lillepold (see also section 6, 'Other training').
- Attended the weekly infectious disease coordination meetings between PHAS and regional centres for disease control and prevention, for information exchange and situation updates.

Acknowledgements

I would like to express my sincere thanks to everyone who made my EPIET fellowship such a memorable experience. To my main supervisor, Moa Rehn – your guidance, sharp feedback, and encouragement were invaluable; you have been an exceptional mentor, and I am truly grateful. My co-supervisor, Erik Sturegård, for invaluable support and clinical insights that meant a great deal. Ilias Galanis and Sharon Kuhlmann Berenzon, for your excellent statistical guidance. To my frontline coordinators, Esther Kukielka-Zunzunegui and Tanja Charles, for your support and availability. Ioana Bujila, my co-EUPHEM fellow – an outstanding teammate in outbreaks and beyond – whose good humour made the experience all the better. To the EPIET/EUPHEM team at PHAS for weekly discussions and great support. And to Cohort 2023 – it has been a privilege to share this experience with you. Finally, heartfelt thanks to my family, who made all the travel possible.