Melanie Stecher

The European Programme for Intervention Epidemiology Training (EPIET), Cohort 2022
Norwegian Institute of Public Health (NIPH), Norway

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/2023/23 and ECDC/AD/2023/06 govern the EU-track and MS-track, respectively, of the ECDC Fellowship Programme, field epidemiology path (EPIET) and public health microbiology path (EUPHEM).

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

Melanie Stecher, a physiotherapist by training, has worked nationally and internationally in Australia and Curaçao before shifting to public health. She holds a Bachelor's degree in physiotherapy, followed by a Master's degree in public health and a PhD in health sciences. Her PhD focused on HIV epidemiology, identifying hotspots of HIV transmission in Germany and pre-treatment drug resistance in transmission clusters. She also focused on the safety and tolerability of treatment interruption in HIV-infected patients as a strategy for future HIV cure trials. Melanie's post-doctoral work at the Department of Infectious Diseases at the University Hospital Cologne focused on epidemiological studies of COVID-19. During the pandemic, she was involved in the development and implementation of the German National Pandemic Cohort Network (NAPKON) for COVID-19 and the Lean European Open Survey on SARS-CoV-2 (LEOSS). In both longitudinal cohort networks, she conducted national and international COVID-19 studies.

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 Manual[1].

[1] European Centre for Disease Prevention and Control (ECDC). European public health training programme. Stockholm: ECDC; 2020. Available from: https://www.ecdc.europa.eu/en/publications-data/ecdc-fellowship-programme-manual-cohort-2021

Stockholm, 2024

1. Epidemiological investigations

1.1. Outbreak investigations

Measles, malaria, cholera, dengue, cVDPV2 outbreaks in the Greater Horn of Africa, 2023/2024

Supervisor: Liesbeth Aelbrecht (World Health Organization, The Incident Management Support Team, Nairobi, Kenya)

Category: Vaccine-preventable diseases, Emerging and re-emerging diseases, Vector-borne diseases, Food- and waterborne diseases

Aim: To assess and describe the ongoing outbreaks in seven countries of the Greater Horn of Africa (GHoA) to implement and coordinate intervention and prevention efforts in the affected regions.

Methods: The Incident Management Support Team (IMST) collated and verified data on reported outbreaks or rumours received from various national sources. The data were collected in a line list and quality checked. Descriptive analyses were performed and visualised (epi-curves) by country and region. Results were summarised in reports (e.g. sitreps, snapshots) and presented to relevant stakeholders in weekly reports.

Results: Between January 2023 and January 2024. Ongoing measles and malaria outbreaks were reported in seven GHoA countries with the highest number of cases reported from Ethiopia (43,464) and Kenya (~11 million), respectively. Cholera and dengue outbreaks were ongoing in four countries, with the highest numbers reported from Ethiopia with 30,420 and 21,906 cases, respectively. Circulating vaccine-derived poliovirus (cVDPV2) was reported in two countries with 13 confirmed cases in Kenya and five cases in Somalia. In South Sudan, 20 yellow fever cases and five deaths were reported as of 12 January 2024.

Public health implications: Prolonged climate shocks in the Greater Horn of Africa have affected people's health and exacerbated the health crisis in the region. The number of reported disease outbreaks was at its highest level in the region and was still ongoing when Melanie completed her assignment. The team was able to provide support and help assess the current situation and challenges in each country to further plan and prioritise interventions.

Role: Melanie was part of an Incident Management Support Team (IMST) based in Nairobi, Kenya, established to support crisis response across the Greater Horn of Africa region. She was responsible for extracting data from various relevant sources, and creating and adapting existing R scripts to perform descriptive analysis. She produced figures (epi-curves) and tables, and contributed substantially to presenting results (time, place and person for the different outbreaks) in regular reports that were published and/or provided internally to the WHO leadership and relevant stakeholders. During that international deployment, Melanie contributed substantially to the following outputs: situation reports 11 and 12, three snapshots on the impact of El Niño flooding on health, four snapshots on food insecurity and health, three situation updates on flooding in the Horn of Africa, and weekly (seven in total) briefing notes (see example outputs: 'Other reports' 1–4, 'Other presentations' 3).See the 'International assignment' section 7 at the end of the report for more details.

Three parallel outbreaks of Salmonella *Typhimurium, between March and June 2024, in different regions of Norway*

Supervisors: Hilde Marie Lund, Lin Cathrine T Brandal

Category: Food- and waterborne diseases

Aim: To investigate the outbreak of *Salmonella* Typhimurium and identify the source, assess the age and sex distribution of the cases, describe the clusters, generate a hypothesis, and implement relevant preventive measures.

Methods: The outbreak response group at NIPH coordinated the investigation in collaboration with the municipal physicians, the Norwegian Food Safety Authority (NFSA) and the Norwegian Veterinary Institute (NVI) to identify the source of infection and prevent future cases. Cases were interviewed using trawling questionnaires, purchase receipts were collected, and microbiological analysis, product traceability and descriptive analysis were carried out.

Results: Three independent cluster outbreaks were identified, with cases occurring between March and June 2024. Cluster 1 (sequence type (ST) 19) included 11 confirmed cases, five women and four men, with a median age of 62 years (interquartile range (IQR) 28–89), living in seven different counties in Norway. Cluster 2 (ST 36) included 13 confirmed cases, 10 women and three men, median age 44 years (IQR 6–78), living in three different counties. Cluster 3 (ST 19) included 11 confirmed cases, three women and eight men, median age 3 years (IQR 0–69) with eight children ≤6 years, living in six different counties. For clusters 1 and 2, there is currently no clear hypothesis for the source of infection and investigations are ongoing. For cluster 3, cats and small birds have been identified as possible vehicles of infection.

Public health implications: Based on the findings for cluster 3, advice on how to prevent infection from small birds and cats was given to the public through the media and the institute's website (*Salmonella* infection in Norway after contact with small birds and cats - NIPH (fhi.no)). The outbreak report was published on The European surveillance

portal for infectious diseases (EpiPulse) and neighbouring countries were contacted. Investigations for clusters 1 and 2 are still ongoing.

Role: Melanie worked under the supervision of Hilde Marie Lund and Lin Cathrine T Brandal from the Outbreak Investigation Unit. She supported the documentation of interview questionnaires received from the Norwegian food safety authorities, created epidemic curves by symptom onset and date of first positive sample, and attended meetings.

1.2. Surveillance

COVID-19 vaccine effectiveness surveillance in Norway, January–May 2023

Supervisors: Hinta Meijerink, Jostein Starrfelt

Aim: With the emergence of new severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants, that may have an impact on transmission, disease severity, treatment, testing and vaccination (i.e. variants of concern, VOC), the continuous surveillance of COVID-19 vaccine effectiveness (VE) and waning immunity is more important. Therefore, we aimed to provide a monthly standardised surveillance report on estimates of COVID-19 vaccine effectiveness in Norway.

Methods: We used population data and linked data from the National Emergency Preparedness Register for COVID-19 (Beredt C19), which contains individual-level data from various registries in Norway. We performed stratified, descriptive analysis on the vaccine coverage and used Cox proportional hazards models to estimate the vaccine effectiveness on different outcome measures (severe illness/hospitalisation, intensive care admission, sick leave (COVID-19 listed), and mortality. Vaccination status was included as a time-varying covariate and models were adjusted for potential confounders. Results were stratified by different vaccine types/boosters and time since last dose. The emergence of new VOCs was also considered. We developed a R mark-down script to create automised monthly statistics and analyses on COVID-19 VE.

Results: The monthly report was used internally and parts of it were included in the publicly available report on respiratory diseases in Norway.

Public health implications: To generate new evidence on COVID-19 vaccine effectiveness on a regular basis to identify and consider changes in risk factors and new VOCs for public health decision making on COVID-19 vaccination campaigns in Norway, and to compare results with international data to see comparative trends and outcome measures.

Role: Melanie performed the statistical analyses and created an R mark-down to produce and automate the monthly report, including the graphs, tables and text on vaccine coverage, vaccine effectiveness stratified by different risk groups and a summary for each chapter (the specific reports on COVID-19 VE were created over a period of five months, see an example under 'Other reports' output 1). She was also responsible for providing relevant graphs and text for the respiratory infections report, which is published weekly in Norway. Melanie also attended the weekly surveillance meetings to present the status of vaccine uptake and changes in vaccine effectiveness in relation to different doses (See outputs 'Other reports' 5 and 6).

Evaluation of the surveillance system for non-cholera Vibrio *and* Shewanella *infections in Norway between 2019 and 2023*

Supervisors: Ettore Amato, Astrid Louise Løvlie

Aim: To evaluate the surveillance system for non-cholera *Vibrio* and *Shewanella* infections in Norway between 2019 and 2023.

Methods: We retrieved data on all *Vibrio* and *Shewanella* infections reported to the Norwegian Surveillance System for Communicable Diseases (MSIS) between 2019 and 2023. We selected relevant attributes for evaluation. Completeness and plausibility checks were performed for key variables, and the number and proportion of valid records were calculated. Timeliness was measured for steps in the surveillance system to assess its ability to enable timely action by calculating the median number of days between disease onset, diagnostic sampling, and reporting.

Results: A total of 408 cases of *Vibrio* and *Shewanella* were reported in MSIS during the observation period, of which 66% (279/408) were cases of *Vibrio* and 34% (138/408) *Shewanella*. Completeness for socio- demographic characteristics and laboratory information ranged from 99-100%. Completeness for clinical information and the place and route of transmission ranged from 53–99% and 39–69%, respectively. Internal completeness and internal validity were high (100%) for all key variables. The median time from sample collection to notification was six days (0–74 days). The results will now be presented and discussed with the stakeholders and specific recommendations will be formulated.

Public health implications: The first evaluation of this surveillance system will promote the best use of public health resources by ensuring that only important problems are monitored and that surveillance systems operate efficiently. Wherever possible, the evaluation of the surveillance system will include formulating recommendations for improving quality and efficiency of the system, for example, by eliminating unnecessary duplication.

Role: Melanie selected the variables used in the attribute analyses, planned regular meetings to discuss the methods and results of the project, performed the data analysis using R and prepared the final report and presentation (see outputs 'Other reports' 10' and 'Other presentations' 4).

Routine surveillance activities

Severe acute respiratory infections (SARI) and COVID-19 surveillance in Norway

During her fellowship, Melanie was involved in routine surveillance activities for Severe acute respiratory infections (SARI) and COVID-19 surveillance in Norway. The surveillance activities included supporting routine operations for the information system, updating the automatised data analyses and reports if needed in R, Stata, and R mark-down; regularly analysing surveillance data and producing health information products for diverse audiences (public, experts, decision makers) such as weekly reports, monitoring of epidemiological situation and presenting the results in the weekly meetings (See outputs 'Other reports' 6).

Epidemic Intelligence Rotation at the NIPH in Norway

During her fellowship, Melanie was involved in the rotation of the Epidemic Intelligence (EI) team at NIPH. The EI monitors national and international public health alerts from the Norwegian outbreak reporting system (VESUV), international surveillance network communication (EWRS/IHR) and media surveillance. The purpose is to monitor notifications of outbreaks or events reported worldwide and disseminate information of public health concerns. The activities included processing and distributing relevant information to the responsible officers at the NIPH, and preparing the weekly epidemic reports to be presented at epidemiological intelligence meetings at the NIPH. The reports were disseminated internally and to the Ministry of Health.

2. Applied public health research

Increasing number of resistance strains to quinolones among non-travel-associated Shigella *spp. in Norway between 2018 and 2023*

Supervisors: Umaer Naseer, João Pires, Lin Cathrine T Brandal

Aim: To analyse the epidemiological distribution and the antibiotic susceptibility of *Shigella* spp. and to characterise the antimicrobial resistance determinants in non-travel associated *Shigella* spp. strains in Norway isolated from 2018–2023.

Methods: Antibiotic susceptibility testing results for *Shigella* spp. isolates between 2018 and 2023 were collected from the National Reference Laboratory (NRL) for a panel of antibiotics. Multi-drug resistance (MDR) was defined as non-susceptibility to at least one agent in ≥3 antibiotic classes. Whole genome sequencing (WGS) was performed at the NRL using Illumina technology and antibiotic resistance genes (ARGs) were identified using AMRFinderPlus within SeqSphere. Descriptive statistics were used to characterise genotypic information by antibiotic class, year of isolation and recent travel history.

Results: Our results show that an increasing number of isolates harboured double or triple ARGs, which are conferring resistance to one or more first- and second-line antimicrobials simultaneously and which in turn lead to higher levels of MDRs. Although shigellosis cases in Norway are mostly acquired during international travel, we observed an increase in non-travel-associated cases and, consequently, an increase in clusters with non-travel-associated isolates from 2018 to 2023.

Public health implications: We therefore recommend raising awareness among physicians and public health professionals to consider at-risk populations, travel-associated diarrhoea, and the risk of *Shigella* through sexual transmission. The recent developments in 2023 highlight that it will also be important to increase susceptibility testing in cases of non-travel-associated diarrhoea, and the results should be used to guide antibiotic therapy whenever possible.

Role: Melanie performed data cleaning and analyses, submitted abstracts for two conferences (ESCAIDE 2023 and ECCMID 2024), and prepared the e-poster and gave an oral presentation. She drafted a chapter/text box for the NORM 2023 report (This report presents data of occurrence of antimicrobial resistance and usage of antimicrobial agents in Norway in humans and animals) and drafted a manuscript [Under Preparation] (See outputs 'Other reports' 7, 'Conference presentations' 1 and 2).

Effectiveness and durability of a second COVID-19 booster against severe outcomes among older people in Norway: a population-based cohort study comparing mono- and bivalent booster doses

Supervisors: Hinta Meijerink, Jostein Starrfelt

Aim: To provide evidence on the protection of a fourth dose of a monovalent or bivalent mRNA vaccine against COVID-19 among older people during the Omicron period.

Methods: We performed a population-based cohort study and linked data from the National Emergency Preparedness Register for COVID-19 (Beredt C19), which contains individual-level data from various registries in Norway, covering the period from 1 July 2022 to 15 January 2023. We included individuals aged 75+ who had received at least a third COVID-19 vaccine dose. Using Cox proportional hazard models, we estimated the vaccine effectiveness of mono- and bivalent vaccines, comparing fourth- to third-dose recipients (>24 weeks ago). Vaccination status was used as time-varying covariate, and models were adjusted for potential confounders.

Results: We included 408,073 individuals. A fourth dose with either monovalent or bivalent mRNA vaccine showed increased protection against COVID-19-associated mortality relative to a third dose in individuals ≥75 years. The bivalent BA.1 vaccine showed the highest protection (adjusted hazard ratio (aHR) 0.08, 95% CI 0.02–0.32) compared to the bivalent BA.4–5 (aHR 0.27, 95% CI 0.14–0.56) and monovalent dose (aHR 0.34, 95% CI 0.26–0.45) 2–9 weeks after vaccination. The increased protection waned over time, with no added protection from the monovalent vaccine after 33 weeks compared to a third dose.

Public health implications: Our results indicate an increased protective effect of a fourth dose against severe outcomes compared with a third dose, with a decreasing effect over time. These findings have informed updates to COVID-19 vaccine recommendations in Norway in 2023.

Role: Melanie wrote the study protocol, performed the analysis using R, planned meetings with the study group to discuss the results, wrote and submitted the manuscript as a first author to a peer-reviewed journal. She submitted an abstract for ESCAIDE 2023 and presented the work in an oral presentation on this conference (See outputs 'Manuscripts' 1, 'Conference presentations' 3, 'Other presentations' 1 and 2).

Psychological and sociodemographic factors influencing vaccine readiness in Norwegian adults: a representative survey using the 7C-Model

Supervisors: Bo Lars Thorvald Terning Hansen, Anja Bråthen Kristoffersen

Aim: Vaccine decision support requires a tailored approach considering psychological component of vaccine acceptance. Therefore, we aim to assess the general attitude towards vaccination among adults in Norway.

Methods: Following a tender process, we conducted a web-based survey among individuals ≥18 years of age in Norway who are part of a representative population panel. We used the 7C measure of vaccine readiness and collected variables on socio-demographic factors, COVID-19 and influenza vaccination intention and history. Descriptive analyses and a multivariable binomial regression, adjusted for sociodemographic factors, on the binary 7C outcome were performed. Analyses were weighted for sex, geographical region and education and results presented as adjusted Odds Ratio (aOR) with 95% confidence interval (95% CI).

Results: The survey was sent out to a total of 8,188 individuals, of which 4,137 (50.5%) completed the questionnaire. The results of the overall 7C score indicated that the study population was willing to be vaccinated (mean: 4.92). Negative associations with vaccine readiness were found for people living alone compared with people living with a partner and/or children (aOR 0.74, 95% CI 0.56–0.97), living in eastern Norway compared with living in the Oslo area (aOR 0.56, 95%CI 0.31–0.99), and immigrant status compared with having Norwegian-born parents (aOR 0.69, 95% CI 0.57–0.84).

Public health implications: The results will be used as a baseline to monitor the evolution of vaccine uptake in the Norwegian population over time. They will also be important to show what type of intervention can improve vaccine uptake and thus coverage.

Role: Melanie performed the analysis and prepared graphs and tables for the manuscript. Throughout the period she planned regular meetings with the study group to discuss the analyses and results. She wrote the methods and results and parts of the discussion of the manuscript and submitted it to a peer-reviewed journal (See outputs 'Manuscript' 4).

3. Teaching and pedagogy

Outbreak Analysis Training at the Norwegian Institute of Public Health (NIPH)

Melanie and Beatriz Valcarcel Salamanca (MS EPIET Fellow) designed and delivered a three half-day (3.5 hours each) outbreak investigation training course focusing on data analysis and interpretation using presentations and case studies. The target audience was NIPH staff in Oslo with: i) extensive data analysis skills but limited outbreak investigation experience, or ii) some outbreak investigation experience but needing further data analysis skills or a refresher. Pre- and post-evaluations were conducted to address the heterogeneous group. The course aimed to build capacity at NIPH (See 'Other presentations' 3). The project was guided by Hilde Kløvstad and Emily Ann Macdonald).

SHARP Joint Action Workshop Lisbon, Portugal

The Strengthened International Health Regulations & Preparedness in the European Union (SHARP) Joint Action aims to strengthen preparedness and support for the International Health Regulations (IHR). A two-day face-to-face course with public health experts from across Europe was held in Lisbon, Portugal, in July 2023. Monika Falk and Melanie Stecher (NIPH) developed a case study (guided by Bjørn Gunnar Iversen and Emily Ann Macdonald) and supported and facilitated the session in Lisbon. The training focused on improving epidemic intelligence knowledge and practice in the context of new integrated surveillance for public health emergencies, drawing on the experience of COVID-19.

Supervision of a master's-degree student – Tuberculosis contact tracing in Norway

Melanie supervised Othelie Ree Harangen's statistical analyses for her master's thesis in Global Health: 'Is tuberculosis contact tracing working as intended in Norway? A retrospective register-based cohort study of TB patients and contact tracing data from 2016 to 2021'. Melanie and Othelie met regularly to discuss the methodological approach and results. Melanie also provided feedback on the graphical presentation of results and the method and results section of the thesis (See outputs 'Other reports' 8).

Developing training material for the Training of Trainers in Applied Molecular Epidemiology of Infectious Diseases, Noguchi Memorial Institute for Medical Research, Accra, Ghana

The NIPH is part of the Building Stronger Public Health Institutions and Systems (BIS) programme. A part of this programme is the delivery of a short course that aims to contribute to strengthening the current and future disease control workforce in Ghana and neighbouring countries by equipping participants with sufficient skills and knowledge to apply molecular data in disease response, surveillance, and policy activities. Melanie was part of a multidisciplinary team which was responsible for the development of content and lecture materials for the course in Ghana. Due to overlapping international assignments with WHO in Nairobi, Kenya, Melanie could not attend the on-site training in Ghana, but was involved in preparing and reviewing the teaching materials.

4. Communications related to the EPIET fellowship

Manuscripts published in peer-reviewed journals

1. **Stecher M**, Kristoffersen AB, Lie K, Andersen SR, Meijerink H, Starrfelt J. Effectiveness and durability of a second COVID-19 booster against severe outcomes among older people in Norway: a population-based cohort study comparing mono- and bivalent booster doses. Int J Epidemiol. 2023;52(6):1716-24

2. Meijerink H, Veneti L, Kristoffersen AB, Danielsen AS, **Stecher M**, Starrfelt J. Estimating vaccine effectiveness against COVID-19 using cause-specific sick leave as an indicator: a nationwide population-based cohort study, Norway, July 2021 - December 2022. BMC Public Health. 2024 Jul 11;24(1):1861. doi: 10.1186/s12889-024-19374-0. PMID: 38992631; PMCID: PMC11241785

3. Seppälä EM, Bøås H, Dahl J, Stålcrantz J, **Stecher M**, Tønnessen R, Isaksson Rø GØ, Kløvstad H, Paulsen TH. Registry-based surveillance of severe acute respiratory infections (SARI) in Norway during 2021-2024. Preprint published: Registry-based surveillance of severe acute respiratory infections in Norway during 2021-2024 (authorea.com)

4. **Stecher M**, Bråthen Kristoffersen AB, Thorvald Terning Hansen BL. Psychological and sociodemographic factors influencing vaccine readiness in Norwegian adults: A representative survey using the 7C-Model. [Under Preparation]

5. **Stecher M**, Pires J, Brandal L, Naseer U. Increasing number of resistance strains to quinolones among non-travel-associated Shigella spp. in Norway between 2018 and 2023 [Under Preparation]

4.1. Other reports

1. World Health Organization (WHO). SITUATION REPORT 12: 01 November - 31 December 2023 Greater Horn of Africa Food Insecurity and Health Grade 3 Emergency. Nairobi, Kenya. Available at: https://cdn.who.int/media/docs/default-source/documents/emergencies/ghoa-food-insecurity-and-health-sitrep-n12-(nov-dec-2023).pdf?sfvrsn=f860e4ec_1&download=true

2. World Health Organization (WHO). Greater Horn of Africa, Food Insecurity and Health Snapshot. Nairobi, Kenya. Available at: https://reliefweb.int/report/ethiopia/greater-horn-africa-food-insecurity-and-health-snapshot-31-january-2024

3. World Health Organization (WHO). Briefing note Great Horn of Africa. Weekly internal report. Not publicly available [Example Report]

4. World Health Organization (WHO). Situation Update on flooding the Horn of Africa. Weekly internal report. Not publicly available [Example Report]

5. COVID-19 Vaccine Effectiveness Surveillance Report Norwegian Institute of Public Health – NIPH 2/3/23

6. Weekly report on COVID-19, influence, and other respiratory infections. Ukerapporter om covid-19, influensa og andre luftveisinfeksjoner https://www.fhi.no/publ/statusrapporter/luftveisinfeksjoner/#alle-ukerapporter-2020-2024. [Example Report]

7. NORM og NORM-VET: Usage of Antimicrobial Agents and Occurrence of Antimicrobial Resistance in Norway 2023. Increasing number of resistance strains to quinolones among non-travel-associated Shigella spp. in Norway between 2018 and 2023. page 110 – 11. Available at: https://www.fhi.no/contentassets/4e24fb63a3754577a94c42b6c8cc89c4/norm-norm-vet-2023-komplett.pdf

8. Does tuberculosis contact tracing work as intended in Norway? A retrospective register-based cohort study of tuberculosis patients and contact tracing data from 2016 to 2021. Master thesis. (Available at: NTNU Open: Does tuberculosis contact tracing work as intended in Norway? A retrospective register-based cohort study of tuberculosis patients and contact tracing data from 2016 to 2021)

9. Nordstrand K, Arnesen TM, Mengshoel AT, Wikman Strand, ÅM, Ingebrigtsen, Heldal E, **Stecher M**. Årsrapport Tuberkulose i Norge 2022 - med behandlingsresultater for 2021. Oslo Norwegian Institute for Public Health 2023. Available at: https://www.fhi.no/contentassets/1a18d78701514f199d7bdc19ee14fa3f/arsrapport-for-tuberkulose-i-norge-2022_endelig.pdf

10. **Stecher M**, Amato E, Løvlie AL. Report on the evaluation of the surveillance system on Vibrio and Shewanella in Norway [Internal report]

4.2. Conference presentations

1. **Stecher M**, Pires J, Brandal L, Naseer U. Increasing number of resistance strains to quinolones among non-travel-associated Shigella spp. in Norway between 2018 and 2022 (oral presentation). Presented at: European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), 27–30 April 2024, Barcelona, Spain. [Oral Presentation]

2. **Stecher M**, Pires J, Brandal L, Naseer U. Increase of multidrug resistance in Shigella spp. among travel acquired cases in Norway, 2012-2022 (e-poster presentation). Presented at: European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE), 22–24 November 2023, Barcelona, Spain. [Poster Presentation]

3. **Stecher M**, Kristoffersen AB, Lie K, Andersen SR, Meijerink H, Starrfelt J. Effectiveness and durability of a fourth COVID-19 vaccine dose against severe outcomes among older individuals in Norway: a population-based cohort study (oral presentation). Presented at: European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE), 22–24 November 2023, Barcelona, Spain. [Oral Presentation]

4.3. Other presentations

1. **Stecher M**, Kristoffersen AB, Lie K, Andersen SR, Meijerink H, Starrfelt J. Effectiveness and durability of a fourth COVID-19 vaccine dose against severe outcomes among older individuals in Norway: a population-based cohort study (oral presentation). Presented at: Nordic mini module held at the Danish Institute of Public Health, 13–14 March 2023, Copenhagen, Denmark

2. **Stecher M**, Kristoffersen AB, Lie K, Andersen SR, Meijerink H, Starrfelt J. Effectiveness and durability of a fourth COVID-19 vaccine dose against severe outcomes among older individuals in Norway: a population-based cohort study (oral presentation). Presented at: Seminar on Vaccine Effectiveness Studies at the NIPH 23 March 2023, Oslo, Norway

3. **Stecher M**, Valcarcel Salamanca B. Hands-on outbreak analyses using outbreak scenarios on Cryptosoiridium and Gastroenteritis. Presented at: Outbreak Analysis Seminar, 9–12 October 2023 NIPH Oslo, Norway

4. **Stecher M**. WHO Deployment in Nairobi, Kenya. Presented at: Section meeting at the NIPH, February 2024, Oslo, Norway

5. **Stecher M**, Amato E, Louise Løvlie A. Evaluation of the surveillance system for non-cholera Vibrio and Shewanella infections in Norway between 2019 and 2023 (oral presentation). Presented at: Nordic mini module held at the Finish Institute of Public Health, 29 February–1 March 2024, Helsinki, Finland

5. EPIET/EUPHEM modules attended

- Introductory Course, 26 September–14 October 2022, Spetses, Greece
- Outbreak Investigation, 5–9 December 2022, Berlin, Germany
- European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2022, 23–25 November 2022, Stockholm, Sweden
- Multivariable Analysis, 22–26 May 2023, Frankfurt, Germany
- Rapid Assessment and Survey Methods, 19–23 June 2023, Stockholm, Sweden
- Project Review Module 2023, 28 August–1 September 2023, Lisbon, Portugal
- European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2023, 22–24 November 2023, Barcelona, Spain
- Vaccinology, 4–8 March 2024, virtual
- European Congress of Clinical Microbiology and Infectious Diseases (ECCMID) 2024, 27–30 April 2024, Barcelona, Spain
- Management, Leadership and Communication in Public Health, 24–28 June 2024, Stockholm, Sweden
- Project Review Module 2024, 26–30 August 2024, Lisbon, Portugal
- European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2024, 20–22 November 2024, Stockholm, Sweden

6. Other training

- Workshop in outbreak investigation, 3 November 2022, Norwegian Institute for Public Health, Oslo, Norway
- Introduction to R for applied epidemiology, 28 November–1 December 2022, online course
- Nordic mini module, 13–14 March 2023, Kopenhagen, Denmark
- Nordic mini module, 29 February–1 March 2024, Helsinki, Finland
- Word Health Organization, United to Respect: Preventing sexual harassment and other prohibited conduct, 26 November 2023
- World Health Organization, Introduction on the Prevention of and Response to Sexual Exploitation, Abuse, and Harassment (PRSEAH), 24 November 2023
- World Health Organization, Prevention of sexual exploitation and abuse (PSEA), 25 November 2023
- World Health Organization, Ethics Empowerment, 27 November 2023
- World Health Organization, BSAFE, 15 June 2023

7. International assignment - Greater Horn of Africa Drought, Food Insecurity, and Health Response, Nairobi, Kenya, 30 November–20 January 2024

Remark: Due to Melanie's international assignment, she was not able to take part in the EPIET module on time series analysis on 11–15 December, Rome, Italy.

Melanie was deployed for eight weeks to support the routine activities of the Health Information Management (HIM) team of the Incident Management Support Team (IMST) in Nairobi. The deployment was based at the WHO emergency hub in Nairobi, Kenya.

The drought, food insecurity, and health crisis in the Greater Horn of Africa (GHoA) was declared a Grade 3 emergency in May 2022, following five failed seasons of rain leading to the worst drought in the region in recent history. Since early November 2023; Somalia, Ethiopia and Kenya experienced excessive rainfall resulting in flooding and overflow of rivers. These floods caused hundreds and thousands of people to be displaced, hundreds injured, and dozens of fatalities. The prolonged climate shocks in the region have severely impacted people's

health and deepened the region's health crisis. As the region continues to experience one of the worst food insecurity and malnutrition situation in decades, the number of reported disease outbreaks also reached its highest ever level this century. Moreover, conflict continues, particularly in Ethiopia, parts of South Sudan, Sudan, and Somalia, compounding the severity of the food insecurity and health crisis, and resulting in millions being displaced across the region. After the declaration of the Grade 3 emergency, WHO established an incident management support team (IMST) based in the WHO emergency hub in Nairobi, Kenya, with five strategic objectives to support the crisis response across the GHoA region. (1) coordination and leadership, (2) surveillance and health information management, (3) outbreak prevention and control interventions, (4) essential nutrition actions and (5) essential health services.

Melanie supported the ongoing activities as part of the HIM team in the GHoA IMST by:

- Monitoring the health and nutrition situation in the seven countries affected by extreme weather conditions in the Greater Horn of Africa due to El Niño (including the monitoring of outbreaks in these countries).
- Providing technical support as well as epidemiological and information management support to the HIM team
- Participating in the production of different information products for the ongoing response activities and overall objectives of the mission.

8. Other activities

Reviewer of a manuscript for International Journal of Epidemiology

Melanie reviewed a manuscript for the *International Journal of Epidemiology* on "COVID-19 vaccine effectiveness under a risk-age-based mass vaccination program: a comparison of the cohort, test-negative and syndrome-negative designs".

Annual surveillance report on tuberculosis in Norway 2022

For the annual surveillance report on tuberculosis in Norway, Melanie adapted the SATA script and extracted relevant data, created figures and graphs on the prevalence of tuberculosis over time by different age groups, sex and region. (See outputs 'Other reports' 9).

Survey on latent tuberculosis infection in the Nordic countries

The aim of this project is to collect and disseminate knowledge about screening, diagnosis and treatment of LTBI (latent tuberculosis infection) in the Nordic countries. The survey consists of a questionnaire covering both TB (tuberculosis) epidemiology and clinical management of LTBI. It will be sent to national experts in each of the collaborating countries. In addition, country-specific interviews covering challenges and good clinical practices will be conducted before the end of 2024. The survey was sent out in June 2024. Melanie supported the development of the content and structure of the electronic survey, carried out the analysis, produced graphs and tables and contributed to the report/manuscript of the project which will be submitted after the fellowship.

Acknowledgements

I would like to thank and acknowledge the support and guidance of several people over the last two years of the fellowship.

Firstly, I would like to thank my main supervisor, Hinta Meijerink. Her continuous support and guidance has been important throughout this time. Her expertise and feedback have greatly influenced the direction and quality of the research projects on vaccine effectiveness. To Ettore Amato for his amazing and patient guidance and continuous support over the two years. For the great time we shared, both professionally and privately.

I would also like to thank the ECDC – Frontline Coordinators Katie Palmer and Nadine Zeitlmann for their great guidance over the two years. Thank you to all the supervisors and collaborators of the various projects I have worked on over the past two years: Anja Bråthen Kristoffersen, Astrid Louise Løvlie, Bjørn Gunnar Iversen, Bo Lars Thorvald Terning Hansen, Elina Marjukka Seppälä, Emily Ann Macdonald, Ettore Amato, Hilde Kløvstad, Hilde Marie Lund, Jostein Starrfelt, Karine Nordstrand, Liesbeth Aelbrecht, Lin Cathrine T. Brandal, Liz Ertzeid Ødeskaug, Monika Falk, Othelie Ree Harangen, Svein Rune Anersen, Trine Hessevik Paulsen, Trude Marie Lyngstad, Trude Margrete Anersen, and Umaer Naseer. Thank you for your constructive feedback and fruitful discussions, which have greatly enhanced the depth of my projects. I am very happy to have had the opportunity to learn from you and I appreciate the time and effort you have put into guiding me through the challenges.

To my co-fellows at NIPH, Joao Pedro Do Couto Pires, Lea Franconeri, Arne Michael Taxt and Beatriz Valcarcel Salamanca, I am very grateful for the opportunity to get to know you through this experience, sharing fun and challenging moments while supporting each other. Thank you for a great and fun time, both professionally and privately. Our shared experiences and good times have enriched this journey and made these two years immensely enjoyable.

To my Cohort 2022 fellows, I am grateful to have been part of such an amazing, energetic, supportive, professional and dedicated cohort and I look forward to sharing many more experiences and challenges with you in the future.

I would also like to thank my friends and family for their unwavering support. Thank you for always being there to listen, support and encourage me from different parts of the world.