

Summary of work activities

Anine Kongelf

The ECDC Fellowship Programme

Field Epidemiology path (EPIET), 2020 cohort

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.

Both curriculum paths provide training and practical experience using the 'learning by doing' approach in acknowledged training sites across European Union (EU) and European Economic Area (EEA) Member States.

According to Articles 5 and 9 of ECDC's founding regulation (EC No 851/2004) 'the Centre shall, encourage cooperation between expert and reference laboratories, foster the development of sufficient capacity within the community for the diagnosis, detection, identification and characterisation of infectious agents which may threaten public health' and 'as appropriate, support and coordinate training programmes in order to assist Member States and the Commission to have sufficient numbers of trained specialists, in particular in epidemiological surveillance and field investigations, and to have a capability to define health measures to control disease outbreaks'.

Moreover, Article 47 of the Lisbon Treaty states that 'Member States shall, within the framework of a joint programme, encourage the exchange of young workers'. Therefore, ECDC initiated the two-year EUPHEM training programme in 2008. EUPHEM is closely linked to the European Programme for Intervention Epidemiology Training (EPIET). Both EUPHEM and EPIET are considered 'specialist pathways' of the two-year ECDC fellowship programme for applied disease prevention and control.

This report summarises the work activities undertaken by Anine Kongelf, cohort 2020 of the Intervention Epidemiology path (EPIET) at the Public Health Agency of Sweden (PHAS).

Pre-fellowship short biography

Anine Kongelf graduated with an MSc in Reproductive and Sexual Health Research from the London School of Hygiene and Tropical Medicine in 2012. Her interest in HIV prevention and policy led Anine to work on HIV-prevention research in complex urban settings in India, before joining the Red Cross in 2014. Prior to starting the fellowship, Anine was working as a team leader at the Norwegian Red Cross to improve surveillance, outbreak detection capacity and community-based response in humanitarian contexts. She has worked in humanitarian contexts for infectious disease outbreak response including Ebola, cholera, plague, as well as supporting COVID-19 operations. Anine commenced the EPIET fellowship in September 2020 under the supervision of Moa Rehn (PHAS) and frontline coordination of Dr Guido Benedetti (ECDC/SSI) and Dr Barbara Schimmer (ECDC/RIVM).

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Methods

This report accompanies a portfolio that demonstrates the competencies acquired during the EPIET fellowship by working on various projects, activities and theoretical training modules.

Projects included epidemiological contributions to public health event detection and investigation (surveillance and outbreaks); applied epidemiology field research; teaching epidemiology; summarising and communicating scientific evidence and activities with a specific epidemiology focus.

The outcomes include publications, presentations, posters, reports and teaching materials prepared by the fellow. The portfolio presents a summary of all work activities conducted by the fellow, unless prohibited due to confidentiality regulations.

Results

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

1. Epidemiological investigations

Outbreak investigations

1.1 Outbreak of *Salmonella* Coeln linked to consumption of fresh sprouts in Sweden, 2021

Supervisors: Rikard Dryselius, Marie Jansson Mörk, Moa Rehn

In September 2021, an outbreak of *Salmonella* Coeln was detected as part of the routine microbial surveillance programme at the Public Health Agency of Sweden (PHAS), where whole genome sequencing of *Salmonella* isolates and SNP analysis revealed a cluster of *Salmonella* Coeln cases with national distribution. In total, 52 confirmed cases of *S. Coeln* were identified during the outbreak period of 15 August – 18 November 2021. As part of the national outbreak investigation, we conducted a case-case study to identify the vehicle of infection. Thirty-three outbreak cases and 93 control cases were included in the study. The case-case study showed a statistically significant association between *S. Coeln* infection and consumption of fresh sprouts (aOR 44, 95% CI 11 – 170, $p < 0.001$). Local investigations and traceback of products implicated fresh alfalfa sprouts from Producer X as the vehicle of infection. Environmental studies did not yield *Salmonella* Coeln from seeds, sprouts or rinsing water, and thus no microbiological link between the suspected alfalfa sprouts and the outbreak strain could be established. It is not clear at which stage the sprouts were contaminated. We hypothesised that a change in pasteurisation temperature may have caused a failure to eliminate all pathogens, given the limited time the seeds are exposed to heat. The sprout producer increased the pasteurisation temperature back to previous levels (from 74 to 78 degrees Celsius) upon notification of the outbreak. Fresh sprouts are known to have caused several *Salmonella* outbreaks previously and is a well-documented risk food item for salmonellosis and other bacterial gastroenteritis. This outbreak demonstrates again that fresh sprouts continue to be a food item with outbreak potential, despite pasteurisation and control mechanisms in place to avoid contamination.

Role: Anine was part of the Swedish outbreak investigation team as a co-investigator for this outbreak, responsible for data management and analyses, designed and conducted the case-case study and wrote the outbreak investigation report (2).

1.2 Crossborder outbreak of *Salmonella* Braenderup – descriptive investigation of the Swedish outbreak, 2021

Supervisors: Rikard Dryselius, Moa Rehn

In April 2021 PHAS identified a cluster of *Salmonella* Braenderup by whole genome sequencing (WGS) through the national microbial surveillance programme. Initially, seven cases spanning five different regions had isolates belonging to the same genome cluster. A national outbreak investigation was initiated. On 3 May 2021, Denmark issued an urgent inquiry regarding 13 cases with clustering isolates of *S. Braenderup*, and during May, multiple European countries reported cases. In total, 348 outbreak cases of *S. Braenderup* were reported from 12 countries in the EU/EEA and the UK between 15 March and 6 July 2021, 46 of which were reported from Sweden. The national outbreak investigation consisted of descriptive analysis of case trawling questionnaires to identify the source.

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

A case study was designed but not carried out due to insufficient data. The Swedish outbreak investigation was not able to confirm the vehicle of infection independently based on epidemiological or environmental investigations.

However, as the Swedish outbreak cases clustered with the Danish outbreak strain, we concluded that the Swedish outbreak is part of a larger international outbreak. European case interviews (including Swedish cases) suggested small melons (potentially Galia melons) as the source of the outbreak. Analytical epidemiology (a case-control study) in the UK implicated melons as the suspected vehicle of infection. Eventually microbiological investigations confirmed isolation of *S. Braenderup* matching the outbreak strain from two Galia melons imported to the UK from one batch from a producer in Honduras, and in Austria from a pooled sample of melons (of unknown origin) including Galia melons. It is not known when in the production chain the melons were contaminated. By the time the investigation concluded, the melons from the implicated producer were no longer on the market.

Role: Anine was part of the Swedish outbreak investigation team, and supported the investigation by performing data management, processing and analysis, descriptive epidemiology, designing a case-case study, and supported data collection in the initial phases of the outbreak investigation. Anine wrote a short outbreak report (3).

1.3 Cross-border outbreak of EHEC O103 – investigation of the Swedish outbreak, 2021

Supervisors: Moa Rehn

In August 2021, PHAS noticed an increase in notified cases of EHEC serotype O103 reported from several regions in Sweden, with isolates belonging to the same genome cluster. Denmark and Finland subsequently reported seven and 57 cases of EHEC O103 respectively. A teleconference on the multi-country outbreak of EHEC was initiated by ECDC. Case interviews in Finland (n=25) and Denmark (n=1) implicated fresh, ready-to-eat salad as a potential vehicle of transmission, and traceback activities were initiated. ECDC conducted a cluster analysis of representative outbreak sequences within the multi-country outbreak, which revealed a tight cluster of EHEC O103:H2 spread across Finland, Denmark and Sweden.

In total, 10 cases (seven males, three females) of EHEC O103 were identified from eight regions in Sweden, with symptom onset ranging from 23 July – 31 July 2021. Age distribution ranged from 5 – 57 years and the median age was 30 years. Five cases responded to a trawling questionnaire. The outbreak was monitored, and PHAS contributed with epidemiological and sequence data from Sweden in the international outbreak investigation. Following the initial signal, no new cases were identified, and no further investigations were conducted by PHAS. The main hypothesis of the event under investigation was consumption of contaminated ready-to-eat fresh lettuce, which was reported by cases in all three countries. However, the source of infection was not confirmed. We concluded that the Swedish cluster was part of the Nordic outbreak and suggested that vehicle of infection was the same.

Role: Anine set up the data management for the outbreak, conducted descriptive analyses, participated in meetings with ECDC, Denmark and Finland, and wrote a short outbreak report (4).

Training modules related to assignment/projects

EPIET/EUPHEM Introductory Course – The EPIET/EUPHEM Introductory course provided fellows with a foundational understanding of systematic outbreak investigations, study design and analysis. Through lectures, case studies and practical exercises fellows became familiar with the 10 steps of an outbreak investigation, which interlinks surveillance, microbiology and outbreak investigations for public health action.

Outbreak Investigation Module – The Outbreak Investigation Module deep dived into the ten steps with a practical orientation towards data management and analysis. Following the introductory course, the module further prepared fellows for field investigations by practicing a multi-day outbreak investigation case study.

Multivariable Analysis Module – The Multivariable Analysis Module built on the Introductory Course and provided fellows with the skills needed to perform and interpret multivariable analysis and to communicate the results. The module deepened the fellow's technical skills in statistical methods used for analytical studies in outbreak investigations.

Educational outcome

Through the involvement in the outbreak investigations, the fellow was able to experience how theoretical frameworks are applied to outbreak investigations, using the 10 steps to guide practical action. The fellow gained insights into outbreak management at the local, national and international level, and learnt the importance of good structures to efficiently coordinate outbreak response. The fellow was able to build on learning from modules, and developed competencies and technical skills in analytical epidemiology, including study design, data management and statistical analysis through conducting a case-case study. Through her involvement in these outbreak investigations the fellow also gained insights into laboratory methods used in surveillance and outbreak investigations, as well as international coordination and collaboration in outbreak investigations.

2. Surveillance

2.1 Estimating disease severity from SARS CoV-2 variants of concern using surveillance data from the Skåne region, Sweden, December 2021 - January 2022: a rapid case-case analysis to inform risk assessment

Supervisors: Marie Mörk, Emmi Andersson, Moa Rehn

SARS-CoV-2 surveillance through PCR-based typing has been applied in Sweden to quickly detect occurrence and expansion of newly introduced variants of concern (VOCs). On 26/11/2021, ECDC classified the Omicron variant (B.1.1.529) as a VOC. Based on confirmed SARS-CoV-2 cases notified from the Skåne region (population: 1 378 000) from 1 December 2021 to 9 January 2022, we investigated the association between severe clinical outcomes by variant, to inform the risk assessment of Omicron transmission replacing Delta (B.1.617.2) since week 51, 2021 in Sweden. Data was extracted from national registries. We compared notified cases with severe clinical outcomes defined as hospitalisation, ICU-admission and death to cases with no severe outcomes. For each outcome we compared the odds of being infected with Omicron-variant or Delta-variant determined by PCR-based typing. We used logistic regression to calculate adjusted odds ratios (aOR) controlling for age, sex, previous notified SARS-CoV-2 infection, and expected vaccine effect (no/one dose, and time since last dose for fully vaccinated cases).

During the study period, 43 214 cases were notified in the Skåne region, of which 21 293 cases with available variant information were included in this case-case study. Of these cases, 10 007 (47%) were infected with Delta and 11 286 (53%) by Omicron. Cases with each severe outcome respectively were more likely to be infected with the Delta-variant compared to non-severe cases, with aOR 1.6 (95% CI 1.3-2.1) for hospitalisation; aOR 3.1 (95% CI 1.3-7.5) for ICU-admission and; aOR 2.4, (95% CI 1.2-4.6) for death. Risk of hospitalisation, ICU-admission or death were lower among cases infected with SARS-CoV-2 Omicron-variant compared to the Delta-variant. These findings correspond with other international studies. We concluded that PCR-based typing has the potential to enable rapid, in-depth comparison of disease characteristics and outcomes of different variants of SARS-CoV-2 to inform risk assessment at times of introduction of new VOCs. PCR-based typing should be implemented systematically to enable such analyses.

Role: Anine extracted data and performed data analysis, wrote a Swedish preliminary report (5) and English report (6), submitted a scientific abstract and presented the study as an oral presentation at ESCAIDE 2022 (13).

2.2 COVID-19 Surveillance in Sweden December 2020 – January 2022

Supervisor: Moa Rehn

COVID-19 was classified a notifiable disease according to the Communicable Diseases Act (2004:168) 1 February 2020. Confirmed cases are notified in the Swedish notification system for notifiable diseases (SmiNet). PHAS manages SmiNet and aggregates, analyses and reports incoming case data on the national level. A team of epidemiologists within the Unit for Coordination and Surveillance COVID-19 was responsible for the running of the Swedish COVID-19 epidemiological surveillance at PHAS. The objective of the epidemiological surveillance of COVID-19 during the pandemic was to provide evidence for public health action to minimise mortality, morbidity and negative societal effect; to monitor and evaluate effects of public health action; and to enable monitoring and to certain extent prediction of the pandemic developments. The fellow contributed to this objective by participating in the ongoing epidemiological surveillance for COVID-19.

Outputs from this project included: production of daily epidemiological surveillance reports on aggregated COVID-19 cases, hospitalisation and deaths in time, place, person to provide PHAS staff and management with an up-to-date situation report; PHAS public dashboard was updated daily (national level) and weekly (regional level); and data were reported to the European Surveillance System (TESSy). A weekly public surveillance report described the trends in testing, notified cases, severe outcomes and in-depth analyses on specific topics of interest. The agency also communicated surveillance data and their interpretation to the public through weekly press conferences. The epidemiological surveillance team was responsible for providing the figures and graphs and contributing their interpretation and COVID-19 situation analyses.

Role: Anine participated in all activities mentioned above, including data processing, analysis and interpretation of surveillance data. Anine produced daily surveillance reports (7); co-authored weekly surveillance reports (8), created slides for national weekly press conferences.

2.3 Planned evaluation of the data quality and timeliness of the COVID-19 epidemiological surveillance system in Sweden

Supervisors: Moa Rehn, Emma Löf

The Swedish COVID-19 epidemiological surveillance system was established in early 2020 in the midst of the ongoing pandemic and was built on components and adapted from the routine surveillance system for notifiable diseases. The surveillance system was under extensive demands from all stakeholders as a key source to understanding the epidemic development in Sweden, and the system grew organically to cope with ever increasing demands for insight. No evaluation had been undertaken on the COVID-19 surveillance systems performance, although seroprevalence studies and an upgrade of the notification system provided valuable insight to some of the system's components.

The objective of the project was to evaluate the data quality and timeliness attributes of the Swedish COVID-19 epidemiological surveillance system, in order to understand, document and communicate its strengths, limitations and reasons for such; and to guide prioritisation of further developments/improvements of the system. The evaluation was to provide evidence as to whether the data quality and timeliness achieved the stated objectives of the surveillance system, and/or if adaptations or improvements were needed for more efficient and useful epidemiological surveillance of COVID-19.

The evaluation was not carried out due to a change in operational needs and priorities of PHAS and the fellow.

Role: Anine planned the evaluation, conducted background research, wrote the project proposal and presented the project at the Nordic Mini Project Review Module (15).

Training modules related to assignment/projects

EPIET/EUPHEM Introductory Course – The EPIET/EUPHEM Introductory course built on Anine's knowledge of surveillance systems, focusing on the key components of surveillance systems, analysis of surveillance data, and the systematic evaluation of these. The course was specifically useful to guide the evaluation project. Phylogeny and whole genome sequencing provided a useful introduction to which the fellow could build upon in the surveillance data analysis project.

Rapid Assessment and Survey Methods module - Rapid Assessment and Survey Methods module built on concepts introduced in the introductory course, and further deepened fellows' knowledge of setting up surveillance systems, risk assessment methods and spatial analysis.

Multivariable Analysis Module - The Multivariable Analysis Module deepened the fellow's understanding and practical application of statistical analysis and the use of R. Training on the various regression models, choosing the optimal regression model, controlling for confounding and effect modification, and interpreting the results of the model were particularly useful for the surveillance data analysis project.

Educational outcome

Through participating in routine national surveillance for COVID-19, Anine learned about structures, stakeholders and systems in place for surveillance in Sweden, and gained valuable insights and experience in conducting epidemiological surveillance at the national level. The fellow was able to utilise the skills acquired from modules, primarily through performing quantitative analysis in STATA. The rapid analysis of surveillance data on SARS CoV-2 variants deepened the fellow's understanding of microbiological surveillance and its application and value in public health surveillance.

3. Applied public health research

3.1 Risk of SARS-CoV-2 infection among members of a fitness centre chain in Stockholm, Sweden 2020: a retrospective matched case-control study

Supervisors: Julius Collin, Maria Axelsson, Lilian Van Leest, Anders Wallensten, Moa Rehn.

COVID-19 outbreaks have been reported in fitness centres. It is unknown if attending fitness centres carry a higher risk of transmission on a population level than other indoor environments. Friskis and Sveltis (F&S) is the largest fitness centre chain in Sweden and was open all year in 2020, and operated under specific Swedish regulations to prevent transmission. We estimated and compared the risk of SARS-CoV-2 infection among active and inactive F&S-members in Stockholm, 2020. In a retrospective, register-based, matched case-control study we measured the association between fitness centre exposure and SARS-CoV-2 infection. Cases were F&S-members with laboratory confirmed SARS-CoV-2 infection in the national COVID-19 registry during the study period. Controls were F&S-members susceptible to infection at cases' selection date, matched on age and sex, based on an incidence density design. Exposure to fitness centres was measured through member's attendance activity. 'Active members' were those attending F&S seven days before infection of the case (exposure period). Attendance was grouped into type (Outdoor/Gym/Low-intensity/High-intensity) and frequency (no. of sessions) of attendance during the exposure-period. We estimated incidence rate ratios (IRR) of infection among active and inactive F&S-members, using conditional logistic regression.

Among 81 276 members, 8 049 participated in the study. We identified 505 cases and generated 40 077 matched controls (median: 86; range: 6-163) from the study population. We found no significant association between active members and the risk of infection compared to inactive members (IRR: 0.91, 95% CI: 0.80-1.03). The study is based on available register data without the possibility to assess risk of behaviours and exposures outside the context of F&S. Despite the study limitations, the results suggests that fitness centres may not constitute an increased risk for transmission, in an otherwise 'open' society where prevention measures are implemented. Keeping fitness centres open under authorities' regulations seems appropriate, considering the health benefits exercise provides.

Role: Anine was the lead investigator of the study and project managed the research. She wrote the protocol (10), applied for ethical approval, collected data, performed data analysis, wrote the Swedish (11) and English reports (12), submitted the abstract and presented the study as an oral presentation (13) at ESCAIDE 2022, and submitted a manuscript to a peer-reviewed journal (1)

Training modules related to assignment/projects

EPIET/EUPHEM Introductory Course – The EPIET/EUPHEM Introductory course provided fellows with a thorough understanding of the core concepts of operational and applied research. The operational research inject days allowed fellows to identify research priorities, define public health objectives and research questions, develop a study protocol, in addition to plan data analysis and presentation of results. This was particularly useful as the project was selected for review which helped guide the research at an early stage. Furthermore, fellows discussed ethical and governance considerations, and practiced formulating recommendations for public health action.

Multivariable Analysis Module - The Multivariable Analysis Module builds on the EPIET/EUPHEM Introductory Course and further developed the fellows' statistical analysis skills. The case-based module worked through a variety of statistical regression methods which enabled fellows to plan their own data analyses.

Rapid Assessment and Survey methods (RAS) module – The RAS module built on the Introductory Course to enhance fellows' skills in risk assessments, sampling and survey methods. Furthermore, risk communication and communicating public health recommendations were taught. This was particularly useful for the interpretation and communication of research findings, and preparing public health recommendations.

Educational outcome:

As the lead investigator for a large research project Anine greatly advanced her competencies in epidemiological research, statistics, data management, ethics and scientific communication, as well as project management and collaboration with external actors. She was able to deepen her understanding of quantitative data analysis in R, and benefitted from input from colleagues, fellows and supervisor through ongoing collaboration at PHAS, as well as through the operational research inject days and the Project Review Modules.

4. Teaching and pedagogy

4.1 Introduction to surveillance, microbiology and outbreak investigations, MSc Infectious Disease Control, Södertörn University

The EPIET and EUPHEM fellow delivered a one-day module on surveillance, microbiology and outbreak investigations for Master students enrolled in an Infectious disease control course at Södertörn University. Anine adapted training materials used in previous years and delivered lectures on surveillance and outbreak investigations and facilitated a case study on an outbreak of gastrointestinal illness in Sweden. The students evaluated the teaching through an online, anonymous questionnaire developed by the fellows.

Anine also supported the case study facilitation in 2021, when the lectures were delivered by the EPIET fellow of C2021.

4.2 Case study facilitation: 'An epidemic of trichinosis in France', Veterinary Medicine, Swedish University of Agricultural Sciences

Anine facilitated a case study of 'An epidemic of trichinosis in France' for two groups of fifth-year veterinary medicine students. Through the case study, the fellow guided participants through the ten steps of an outbreak investigation and explained more in-depth concepts of analytical study designs such as case-control studies, before summarising and concluding the outbreak investigation to the group.

Training modules related to assignment/projects

EPIET/EUPHEM Introductory Course - The EPIET/EUPHEM Introductory Course provided introduction to training in adult education; formulating training objectives, and people's different learning styles and sensory preferences, which was useful in the preparation of the teaching assignments.

Outbreak Investigation Module – The Outbreak Investigation Module was useful in familiarising the fellow with the use of case studies in teaching of outbreak investigations.

Educational outcome:

Anine further developed her teaching skills in field epidemiology, gaining confidence in delivering technical lectures and teaching analytical epidemiology during case study facilitation. She was also able to strengthen her own skills in the subject matter, by teaching others.

5. Communication

5.1 Publications related to the EPIET fellowship

1. **Kongelf A.**, Collins J., Axelsson M., Van Leest L., Wallensten A., Rehn M. No association between SARS-CoV-2 infection and fitness centre attendance in Stockholm, Sweden 2020: a retrospective matched case-control study (*Manuscript submitted for publication*)

5.2 Reports

2. **Kongelf A.**, Salmonella Coeln Outbreak Investigation Report, Sweden 2021. Internal outbreak investigation report. PHAS, Stockholm, Sweden.
3. **Kongelf A.**, Salmonella Braenderup outbreak, Sweden 2021. Internal outbreak activity report. PHAS, Stockholm, Sweden.
4. **Kongelf A.**, EHEC outbreak, Sweden, August – September 2021. Internal outbreak activity report. PHAS, Stockholm, Sweden.
5. **Kongelf A.**, Mörk M., Jämförelse av PCR-typade fall av SARS CoV-2 variant delta (B.1.617.2) och SARS CoV-2 variant omikron (B.1.1.529, inkl. sublineages BA.1 and BA.2). Internal report. April 2022. PHAS, Stockholm, Sweden.
6. **Kongelf A.**, Andersson E., Rehn M., Mörk M.J., Disease severity and outcomes of COVID-19 in cases infected with SARS-CoV-2 Delta and Omicron variants, Skåne region, Sweden, December 2021 - January 2022: A rapid analysis of surveillance data. Internal report. December 2022 PHAS, Stockholm, Sweden.
7. Contribution to Dagens Epiläge 14 April 2021. Internal epidemiological situation report for COVID-19.
8. Contribution to Veckorapport om covid-19, vecka 13 2021. Weekly surveillance report COVID-19. [in Swedish]. PHAS, Stockholm, Sweden. Available from <https://www.folkhalsomyndigheten.se/globalassets/statistik-uppfoljning/smittsamma-sjukdomar/veckorapporter-covid-19/2021/covid-19-veckorapport-2021-vecka-31-final.pdf>
9. **Kongelf A.**, Covid-19 Surveillance in Sweden. Internal activity report. PHAS, Stockholm, Sweden.

10. **Kongelf A.**, Collins J., Axelsson M., Van Leest L., Wallensten A., Rehn M. Study protocol: Risk of SARS CoV-2 infection among fitness centre members in Stockholm, Sweden
11. Folkhälsomyndigheten. Risk för covid-19 bland Friskis och Svettis medlemmar i Stockholm, Sverige 2020 [in Swedish]. PHAS, Stockholm, Sweden. 2021-10-05. Available from: <https://www.folkhalsomyndigheten.se/publikationer-och-material/publikationsarkiv/r/risk-for-covid-19-bland-friskis-och-svettis-medlemmar-i-stockholm-sverige-2020/>
12. **Kongelf A.**, Collins J., Axelsson M., Van Leest L., Wallensten A., Rehn M. Risk of SARS CoV-2 infection among members of a fitness centre chain in Stockholm, Sweden 2020. Internal Study report. PHAS, Stockholm, Sweden. 2021-08-19.

Conference presentations

13. **Kongelf A.**, Collins J., Axelsson M., Van Leest L., Wallensten A., Rehn M. Risk of SARS-CoV-2 infection among members of a fitness centre chain in Stockholm, Sweden 2020: Is going to the gym risky? ESCAIDE 2022. Stockholm, Sweden. Oral presentation.
14. **Kongelf A.**, Andersson E., Rehn M., Mörk M.J., Disease severity and outcomes of COVID-19 in cases infected with SARSCoV-2 Delta and Omicron variants, Skåne region, Sweden, December 2021 - January 2022. ESCAIDE 2022. Stockholm, Sweden. Oral presentation.

Other presentations

15. **Kongelf A.**, Evaluation of the Swedish COVID-19 Epidemiological Surveillance System: A project proposal. Nordic Mini Project Review Module 24.03.2021. Online
16. **Kongelf A.**, Collins J., Axelsson M., Van Leest L., Wallensten A., Rehn M. Risk of SARS CoV-2 infection among fitness centre members in Stockholm, Sweden 2020. Project presentation and preliminary results June 2021. Project Review Module 21.08.2021. Online
17. **Kongelf A.**, Collins J., Axelsson M., Van Leest L., Wallensten A., Rehn M. Risk of SARS-CoV-2 infection among members of a fitness centre chain in Stockholm, Sweden 2020: Is going to the gym risky? Project Review Module 22.08.2022. Online

7. EPIET/EUPHEM modules attended

1. Introductory Course part 1, (28.09-16.10.2020), virtual
2. Introductory Course part 2 - Operational Research inject days, (09-10.11.2020), virtual
3. Outbreak Investigation, (07.12-11.12.2020), virtual
4. Multivariable analysis, (15.02-19.02.2021), virtual
5. Multivariable analysis – Cox regression inject day (18.03.2021), virtual
6. Introductory Course part 3, (26.04.-07.05.2021), virtual
7. Rapid Assessment and Survey Methods, (05.05-06.05.2021), virtual
8. Project Review Module 2021, (23.08-27.08.2021), virtual
9. Vaccinology, (14.02-18.02.2022), virtual
10. Project Review Module 2022, (29.08-02.09.2022), virtual
11. Time series analysis, (07.11-11.11.2022), RIVM, The Netherlands

8. Other training

13. Nordic Mini Project Review Module, (23.03.–24.03.2021), virtual

Discussion

Coordinator's conclusions

Barbara Schimmer

One of the main goals of the EPIET programme is for fellows to develop core competencies in field epidemiology mainly through project or activity work, but also partly through participation in training modules and apply epidemiological methods to provide evidence to guide public health interventions for communicable disease prevention and control. This report summarises all activities and projects conducted by Anine Kongelf during her two-year EPIET fellowship (cohort 2020) as an EU-track fellow at the Public Health Agency of Sweden in Stockholm, Sweden. Anine started her fellowship with a solid theoretical background of epidemiologic concepts and extensive field experience in community surveillance in different humanitarian settings. She likes to work at the interface of both epidemiological and social dimensions of public health. Anine is a gentle, very structured, reliable and hardworking fellow and she managed to produce high-quality outputs on diverse topics during her fellowship. Anine was involved in three foodborne outbreak investigations with some international component and contributed extensively to multiple COVID-19 routine surveillance activities at PHAS. She managed to complete a large, applied research project on SARS-CoV-2 risk in fitness centres focusing on the design, implementation and analysis phases of this project. Anine recognises when it is important to apply more rapid methods for epidemiological comparison as she did in a case-case study comparing disease severity indicators of omicron and delta SARS-CoV-2 variants in one Swedish region using existing molecular surveillance data. Anine is a fast learner and diligently expanded her competencies into new areas and research methodologies during the COVID-19 pandemic. Anine is conscious to the context she is working in and motivated to make solid public health recommendations in each setting while carefully outweighing health benefits against possible adverse risks. Besides her strong organisational and analytical skills and joyful team spirit, she is a professional and fluent communicator capable of explaining complex study designs in a comprehensive manner. Anine showed strong motivation and perseverance through the two-year period marked by COVID-19 restrictions, remote working, and disruptions to in-person training and networking opportunities. She received excellent supervision at PHAS that also drove her fellowship towards success. I hope Anine will stay engaged with EPIET as her strong competencies, ability to work independently and within teams, combined with her personal characteristics, make her a great field epidemiologist in many different work settings.

Supervisor's conclusions

Anine started the fellowship with experience from field work in a humanitarian setting and with theoretical background in several epidemiological methods. This turned out to be a great starting point to successfully gain advanced and relevant technical skills in field epidemiology. The EPIET learning objectives were all completed through several projects covering a wide range of methods with varying level of complexity.

A large part of her fellowship was dedicated to the response of the COVID-19 pandemic. She participated and contributed to routine surveillance activities, planned an evaluation of the Swedish COVID-19 surveillance system and performed an in-depth analysis of microbiological surveillance data assessing its usability in risk assessments. Anine was the lead investigator in a unique register-based research project among fitness centre members, the findings gave valuable conclusions for future pandemic recommendations and insights around the risk for COVID-19 transmission in fitness centres. She was also involved in several foodborne outbreak investigations and made central contributions in descriptive and analytical epidemiology, data management and interpretation of findings. Through all these activities she gained an understanding of the Swedish infectious disease surveillance system, Swedish health registries and the role of different regional and national agencies in the surveillance and response of infectious disease threats in Sweden.

Through her activities at the Public Health Agency of Sweden, Anine has demonstrated that she is a fast learner, always making sure to fully understand the methodology and the logic behind the decisions in order to make relevant conclusions for her work. Anine has terrific organisational skills and along with her systematic approach this has been one of the corner stones in successfully delivering outputs. With these qualities along with her positive and flexible attitude, she makes a great team player.

Completing the EPIET fellowship during the COVID-19 pandemic gave opportunities to work with unique projects but also came with challenges, being forced to adapt to virtual offices and courses, lack of time from supervisors and co-workers and at the same time not having the expected network with co-fellows in other countries. Nevertheless, thanks to Anine's flexibility and determination, her fellowship was a great success in meeting the objectives of the program and the contributions she made to the agency and the field of public health.

Personal conclusions of fellow

The fellowship programme has, as I was hoping for, enabled me to build on my operational background and develop a technical skillset as a field epidemiologist. Most importantly, the fellowship allowed me to gain practical experience and to put the theories - often learnt through modules - into practice, through my daily work at PHAS. Undertaking the fellowship during the COVID-19 pandemic has made the fellowship a very different experience, but also allowed for unique insights and contribution to pandemic management and response at the national level in Sweden. After two years of training I can conclude that despite its challenges, it has been a great learning experience, both on a personal and professional level.

Acknowledgements of fellow

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