



## FELLOWSHIP REPORT

### Summary of work activities

Guido Benedetti

Intervention Epidemiology path (EPIET)

Cohort 2018

## Background

The ECDC Fellowship Training Programme includes two distinct curricular pathways: Intervention Epidemiology Training (EPIET) and Public Health Microbiology Training (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 are part of the ECDC fellowship programme that provides competency based training and practical experience using the 'learning by doing' approach in acknowledged training sites across the European Union (EU) and European Economic Area (EEA) Member States.

### Intervention Epidemiology path (EPIET)

Field epidemiology aims to apply epidemiologic methods in day to day public health field conditions in order to generate new knowledge and scientific evidence for public health decision making. The context is often complex and difficult to control, which challenges study design and interpretation of study results. However, often in Public Health we lack the opportunity to perform controlled trials and we are faced with the need to design observational studies as best as we can. Field epidemiologists use epidemiology as a tool to design, evaluate or improve interventions to protect the health of a population.

The European Programme for Intervention Epidemiology Training (EPIET) was created in 1995. Its purpose is to create a network of highly trained field epidemiologists in the European Union, thereby strengthening the public health epidemiology workforce at Member State and EU/EEA level. Current EPIET alumni are providing expertise in response activities and strengthening capacity for communicable disease surveillance and control inside and beyond the EU. In 2006 EPIET was integrated into the core activities of ECDC.

The objectives of the ECDC Fellowship - EPIET path are:

- To strengthen the surveillance of infectious diseases and other public health issues in Member States and at EU level;
- To develop response capacity for effective field investigation and control at national and community level to meet public health threats;
- To develop a European network of public health epidemiologists who use standard methods and share common objectives;

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*The views expressed in this publication do not necessarily reflect the views of the European Centre for Disease Prevention and Control (ECDC).*

*This portfolio does not represent a diploma. Fellows receive a certificate acknowledging the 2-year training and listing the theoretical modules attended. Additionally, if all training objectives have been met, they receive a diploma.*

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- To contribute to the development of the community network for the surveillance and control of communicable diseases.

Fellows develop core competencies in field epidemiology mainly through project or activity work, but also partly through participation in training modules. Outputs are presented in accordance with the EPIET competency domains, as set out in the ECDC Fellowship Programme Manual.

## Pre-fellowship short biography

Guido Benedetti graduated as a dentist (2003), and then obtained a PhD in preventive dentistry (Dottorato di Ricerca, Italian course, 2011) and a Master of Public Health (2017). After a few experiences with humanitarian organizations and international agencies, he served as a field epidemiologist with Médecins Sans Frontières from 2014 to 2018, before entering the EPIET programme.

## Fellowship assignment: Intervention Epidemiology path (EPIET)

On September 11<sup>th</sup>, 2018, Guido Benedetti started his EPIET Fellowship at the Statens Serum Institut, Copenhagen, Denmark, under the supervision of Steen Ethelberg. This report summarizes the work performed during the Fellowship.

## Fellowship portfolio

This portfolio presents a summary of all work activities (unless restricted due to confidentiality regulations) conducted by the fellow during the ECDC Fellowship, EPIET path. These activities include various projects, 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.

This portfolio also includes a reflection from the fellow on the field epidemiology competencies developed during the 2-year training, a reflection from the supervisor on the added value of engaging in the training of the fellow, as well as a reflection by the programme coordinator on the development of the fellow's competencies.

## Fellowship projects

### 1. Surveillance

**Title:** *Campylobacter surveillance in Denmark: making use of spatio-temporal information to flag potentially exceptional events*

Campylobacter is the most commonly reported cause of human bacterial enteritis in Denmark, with more than 4,500 microbiologically confirmed cases in 2018 (SSI n.d.). Transmission vehicles include contaminated food (e.g. poultry meat and raw milk), contact with animals and environmental sources (e.g. municipal drinking-water supply systems) (Kuhn et al. 2017). Campylobacter surveillance is ongoing in Denmark. It is known that Campylobacter is common in the country and that probably many relatively small outbreaks are missed. Next-generation sequencing showed how case clustering may be more common than previously assumed (Kuhn et al. 2018).

This project wished to enrich Campylobacter surveillance with a new alert tool to be tested on retrospective data and subsequently used in a prospective manner, measuring its performance in raising alerts. In order to identify such an alert tool, a preliminary analysis of the data from the current surveillance system was required.

The proposed approach considered pools of weekly observations measured at municipality level, regardless of historical occurrences. The tool was designed to identify "extreme" observations based on the skewness of the incidence distribution per municipality (stratified by population group) and week.

The tool showed good performance in flagging weeks with historically identified outbreaks and "extreme" Campylobacter incidences. The tool is currently applied in a prospective manner, as an additional instrument in the hands of the public health officer monitoring Campylobacter.

## Role and outputs

Role: principal investigator

Activities: wrote a research proposal and protocol; reviewed and analysed historical and routine surveillance data; provided interpretation of analysis outputs; wrote a research abstract for submission to ESCAIDE 2020 and an internal analysis report

**Supervisors:** Katrin Gaardbo Kuhn, Steen Ethelberg

## Title: Activities related to the COVID-19 response in Denmark

This activity was not defined around an ordinary Fellowship project. As the COVID-19 epidemic ignited, operations at Statens Serum Institut adapted to the evolving needs of the situation. In such a context, Guido participated in the COVID-19 Danish response. Specifically, his job contributed to monitoring the COVID-19 epidemic at the international level, with a focus on European regions. Starting in June 2020, he participated in the development and implementation of models necessary to support decision-making towards the reopening of borders. These activities implied a daily involvement in routine surveillance practices and as such became his primary tasks since March 2020.

## Role and outputs

Role: surveillance officer

Activities: participated daily in designing surveillance tools, retrieving sub-national data from 12 selected European countries, analysing surveillance data; wrote and maintained analysis codes; produced and delivered daily reports; participated in providing data interpretation and recommendations to stakeholders.

**Supervisor:** Steen Ethelberg

## Title: Bacteraemia after surgery in Denmark from 2014 to 2018: an incidence study

Currently, healthcare-associated infections (HAI) are a public health concern in Europe (Suetens et al. 2018; ECDC 2017). HAIs possibly account for a higher burden of disability and death than all other infectious diseases under surveillance in the region, and improved efforts are necessary to their control (Cassini et al. 2016). The causes of the increasing occurrence of HAIs in Europe are still not clearly understood, while the evolution of antibiotic resistant pathogens may play a role in it (de Kraker et al. 2013). In Denmark, more than [...] HAIs were reported from 2014 to 2018, including [...] bacteraemia, [...] urinary tract infections (UTIs), [...] infections with *Clostridium difficile* and [...] deep infections after hip/knee replacement (HAIBA n.d.). Out of a population of approximately 5,700,000 people, about 3 million surgical procedures were performed in Denmark from 2014 to 2018, including 1.4 million procedures of the heart or major vessels, the digestive system or spleen, the musculoskeletal system, the nervous system or obstetric surgeries, as available in the Danish patient register, Landspatientregisteret (eSundhed n.d.)

Bacteraemia is a condition with possibly severe consequences and high mortality rates (ECDC 2018). This study aimed to i) explore the incidence and the factors associated with bacteraemia after surgery in Denmark; ii) build an operational definition of the risk of bacteraemia after surgery, so contributing to its surveillance.

COVID-19 related activities impeded the completion of this project as initially intended. Nonetheless, it was possible to retrieve, consolidate and preliminarily analyse data about surgeries and bacteraemia events occurring in Denmark from 2014 to 2018. Findings will be internally reported and will possibly i) be baseline for developing further hypothesis of the relationship between surgery and bacteraemia; ii) have implications for practice (e.g. preventive measures) and case management (e.g. updating of related guidelines at facility level) through the involvement of relevant surgical scientific societies in Denmark.

## Role and outputs

Role: principal investigator

Activities: wrote a research proposal and protocol; reviewed and analysed historical surveillance data; provided interpretation of analysis outputs; wrote an internal analysis report [under writing as per September 2020]

**Supervisors:** Brian Kristensen, Sophie Gubbels, Steen Ethelberg, Katrin Gaardbo Kuhn

## Competencies developed

The 3 aforementioned surveillance projects related to the gathering, analysis, interpretation and reporting of surveillance data. Although they did not involve designing a new surveillance system or evaluating an existing one, they allowed Guido to contribute and answer several questions of public health relevance (i.e. the nature of *Campylobacter* exceedances and bacteraemia incidence) and real-time public health needs (i.e. the COVID-19 epidemic).

Reviewing, understanding and planning the use of different data sources (from both public and internal repositories) required structured planning skills e.g. matching data availability, timeliness and completeness with operational needs.

Working with large data-frames, from multiple sources, then allowed Guido to push his data-handling skills forward. This entailed studying and working on 2 aspects: building upon previous knowledge of biostatistics and learning about new analysis software environments.

These activities allowed Guido reasoning about the relevance and the use of surveillance data. By strengthening his capacities in analysis and interpreting disease-related data, Guido could apply epidemiological evidence to inform operational decisions, and expand his knowledge of reporting of communicable diseases. Being passionate about field-applied methods, Guido enjoyed exploring public health problems, and their relevance to the public, speculating on operationally sound approaches to transform multi-source evidence into practice.

## 2. Outbreak investigations

### Title: A gastroenteritis outbreak occurring in a Danish school, February 2019

On February 27<sup>th</sup> 2019, the Danish Veterinary and Food Administration (DVFA) and Statens Serum Institut (SSI) learnt from Danish media about the evacuation and closure of a graduate school following an “extremely contagious, airborne viral infection”. Seemingly, more than 100 people had fallen ill. Consequently, DVFA and SSI investigated the outbreak. We describe the communication flow behind the school closure and the investigation findings to capitalize on lessons learnt. We uncovered the communication flow by interviewing school representatives and public health authorities. We then compared it with the routine roles of involved parties during local foodborne outbreaks. We conducted a cohort study among people present at school on February 24<sup>th</sup>-27<sup>th</sup>, using an online questionnaire. Cases were defined as having diarrhoea and/or vomiting on February 26<sup>th</sup>-27<sup>th</sup>. We calculated risk ratios (RR) for exposures to food from the school canteen using Quasi-Poisson regression. Stool samples were collected. The school ricocheted through a web of authorities who failed to provide clear guidance. This rushed the school to evacuation and closure and generated panic. The outbreak was arbitrarily considered non-foodborne, and DVFA was involved too late to collect food samples. Our study included 169 people, 46 were cases, 40 occurring over 18 hours. People consuming a vegetarian sandwich had six times higher risk of illness (RR=5.9, 95%CI 3.5-10). Norovirus GII.P7-GII.14 was confirmed in seven stool samples. Communication pitfalls among authorities led to questionable control measures and hampered a thorough investigation. Field investigation, epidemiological and laboratory findings suggested that this was a point source foodborne norovirus outbreak. To avoid similar scenarios, we recommend strengthening the communication flow and clarifying responsibilities between food and health authorities at local and national level.

### Role and outputs

Role: principal investigator

Activities: investigated the outbreak using the 10-classic steps of outbreak investigations; produced a final outbreak report; submitted and presented (as poster) an abstract to ESCAIDE 2019.

**Supervisors:** Laura Espenhain, Luise Müller, Katrin Gaardbo Kuhn, Steen Ethelberg

### Competencies developed

Prior to EPIET, Guido’s experience in outbreak response encompassed measles, cholera and Ebola in low-resource settings. Desiring to work in the European public health arena, he highly valued the opportunity to be exposed to the work of the Section for Zoonotic, Food and Waterborne Infections of the Department of Infectious Disease Epidemiology & Prevention at Statens Serum Institut. There, Guido had the opportunity to respond to the aforementioned outbreak as per the 10-classic steps of outbreak investigations. Also, he could participate in the response to a few other outbreaks during the Fellowship. Especially, he benefitted from routine meetings with colleagues from the microbiology and the communication department. Specifically about communication, Guido has an interest about going beyond the sole epidemiological aspect and relate them to the society we live in. As such, he had the opportunity to witness how public health problems and the related evidence are actually translated into the public debate, and how this is necessarily more complex than the mere analysis of epidemiological facts.

### 3. Applied epidemiology research

#### **Title:** Introduction of influenza Point-Of-Care testing and impact on disease surveillance in Denmark

In Denmark, influenza surveillance is ensured by data capturing from existing population-based registers. Since 2017, Point-Of-Care (POC) testing has been implemented outside the regional Clinical Microbiology Departments (CMD). This research aimed to explore the implementation of influenza POC testing and its impact on influenza surveillance. We retrospectively observed routine surveillance data on national influenza tests before and after the introduction of POC testing as available in the Danish Microbiological Database. Also, we conducted a questionnaire study among Danish CMDs about influenza diagnostics. [Results & Conclusions].

#### **Role and outputs**

Role: principal investigator

Activities: wrote a project proposal around the original idea of the study; designed the study, retrieved and analysed data; interpreted findings and wrote the manuscript; submitted the manuscript for publication (Eurosurveillance).

**Supervisors:** Hanne-Dorthe Emborg, Tyra Grove Krause

#### **Title:** What is behind the geographical difference of the influenza vaccination coverage among the elderly in Denmark?

The elderly (aged  $\geq 65$  years) are at risk of influenza and its consequences. Currently, the influenza vaccination coverage (VC) in Europe misses the recommended 75% target. In Denmark, 50% of elderly were vaccinated during the 2017/2018 season, with higher VCs in urban municipalities. Literature suggests that wide-ranging health determinants (HDs) impact influenza VC. We explored the relationship between elderly influenza VC in 2017/2018 and HD-related indicators across the 98 Danish municipalities. We extracted influenza VCs among elderly and geography- and HD-related indicators from publicly available databases. HDs covered demographic (e.g. resident elderly/kilometer<sup>2</sup> ratio), societal (e.g. family wealth, proportional education attainment) and health system indicators (e.g. medical practices/elderly ratio, per-capita health care expenditure). We estimated median [interquartile range] VCs (overall, and stratified by urban and rural municipalities). We explored relationships between VCs and HDs using Quasi-Poisson regression models for rates. Median VC in Danish municipalities was 48% [46%-51%]. Stratified by urban and rural municipalities it was 51% [48%-55%] and 46% [44%-48%], respectively. Municipalities with higher per-capita health care expenditures ( $p=0.01$ ), family wealth ( $p<0.01$ ) and education attainments ( $p<0.01$ ) were associated with higher VCs. In urban municipalities, higher medical practices/elderly ratios ( $p=0.03$ ), family wealth ( $p<0.01$ ) and education attainments ( $p<0.01$ ) were associated with higher VCs. In rural municipalities, higher resident elderly/kilometer<sup>2</sup> ratios were associated with higher VCs ( $p<0.01$ ). As shown elsewhere, we found that wider society- and health system-related factors (e.g. health care expenditure and the availability of medical practices) contribute to the influenza VC and the related urban-rural gradient among the elderly in Denmark. We recommend such evidence to contribute tailoring future campaigns e.g. by prioritising less served areas. Further individual-level analysis will contribute to identifying vulnerable groups.

#### **Role and outputs**

Role: principal investigator

Activities: wrote a research proposal and protocol; designed the study, retrieved and analysed data, and interpreted findings; submitted and presented (as poster) an abstract at ESCAIDE 2019; wrote a manuscript for publication [under writing as per September 2020].

**Supervisors:** Palle Valentiner-Branth, Lasse Vestergaard, Steen Ethelberg

#### **Competencies developed**

Guido has been passionate about applied operational research since the time he was working with humanitarian organizations in low-resource settings. Through these projects, he had the chance to practice identifying problems of public health concern that can be translated into questions for scientific research, and defining the specific methods for its conduction. On the other hand, he also valued the complementary work of retrieving, appraising and interpreting scientific evidence from the literature in order to put research, its methods and findings into perspective. Working on projects with a relevance for surveillance and public health strategies, he could also resonate on the

appropriateness of public health interventions. Furthermore, he could reflect on specific target groups for recommendations, as well as consolidate, analyse and interpret surveillance data through multiple sources.

## 4. Communication

### Publications in peer reviewed journals

*Provide here the list of manuscripts already published or accepted for publication*

No manuscript resulting from projects undertaken during the Fellowship was published or accepted for publication, so far.

### Manuscripts submitted to peer reviewed journals (in review process)

Introduction of influenza Point-Of-Care testing and impact on disease surveillance in Denmark. G Benedetti, et al. Submitted to EuroSurveillance

### Conference presentations

"Skewed to the centre": what is behind the geographical imbalance of the influenza vaccination coverage among the elderly in Denmark? G Benedetti, L Skaftø Vestergaard, P Valentiner-Branth. Presented (as poster) at ESCAIDE 2019

Panic can spread faster than pathogens: communication pitfalls during a foodborne outbreak in Denmark in 2019. G Benedetti, N Haaning, L Espenhain, L Müller, K Gaardbo Kuhn, S Ethelberg. Presented (as poster) at ESCAIDE 2019

### Other presentations

Not applicable

### Reports

A gastroenteritis outbreak occurring at [school name], Denmark in February 2019. Outbreak investigation report. June 6, 2019. Outbreak: FUD1745. G Benedetti, L Espenhain, L Müller [internal report]

### Other

What is behind the geographical difference of the influenza vaccination coverage among the elderly in Denmark? [manuscript under writing]

A Campylobacter outbreak detection tool in Denmark: (less) time, (more) place and person, G Benedetti, S Ethelberg, K Gaardbo Kuhn [abstract submitted for ESCAIDE 2020]

Bacteraemia after surgery in Denmark from 2014 to 2018: an incidence study. G Benedetti. Presentation for the 2019 EPIET/EUPHEM Nordic Mini Module, March 5<sup>th</sup>, 2020, Helsinki, Finland

Campylobacter surveillance in Denmark: making use of information to flag potentially exceptional events. G Benedetti. Presentation for the 2018 EPIET/EUPHEM Nordic Mini Module, March 11<sup>th</sup>, 2019, Copenhagen, Denmark

## 5. Teaching activities

### The practicalities of conducting a survey for the 2019 EPIET/EUPHEM Rapid Assessment & Survey Methods (RAS) module

This assignment included the following activities: i) a lecture about the practical implementation of a survey (90 min); ii) an exercise about the use of KoBo Toolbox for mobile data collection; iii) participating in the facilitation of 2 case studies and the field exercise of the 2019 RAS Module.

Target audience were the participants in the 2019 EPIET/EUPHEM Rapid Assessment & Survey Methods module.

Learning materials were; i) a presentation to be utilized as support for plenary discussion; ii) a package made of a presentation, tools for practice and references.

Learning objectives for this training activities were: i) to be aware and knowledgeable of the practical aspects related to the design and implementation of a survey in a remote, low-resource setting, under logistical and time constraints but with a demand for operational input; to be aware of the opportunities and limitations of mobile data collection tools; to be aware of the basic functioning of KoBo Toolkit for mobile data collection.

This activity took place during the 2019 EPIET/EUPHEM Rapid Assessment & Survey Methods module in Zagreb, Croatia (week 20)

**Supervisor:** Steen Ethelberg

### Training assignment in the framework of a Médecins Sans Frontières, Operational Centre Brussels, Luxembourg Operational Research Unit (MSF OCB LuxOR) – SORT-IT training, Luxembourg 2019

This teaching assignment included the following activities: i) participating as facilitator in Module 2 of the MSF OCB LuxOR – SORT-IT training (data management and data analysis – September 30-October 5, 2019, Luxembourg) – see: <https://www.theunion.org/what-we-do/courses/online-and-multimedia-training/sort-it>; ii) facilitating 2 operational research projects about the effective provision of emergency obstetric and neonatal care to MSF beneficiaries; one project to be held in the Central African Republic; the other to be held in Nigeria; facilitation included: designing/writing the research protocol and analysis plan (in-class activities during the module) + distant support throughout the final submission of a manuscript for a peer-reviewed publication; iii) providing 2 lectures to course participants about summary statistics & significance tests.

Target audience were MSF field health staff (midwives and MDs), as per the requirements of the SORT-IT training.

**Supervisor:** Steen Ethelberg

### Educational outcome

Designing and conducting vaccination surveys in remote, low-resource settings was at the core of my work with Médecins Sans Frontières for a few years. Primarily, I have a strong passion for these kind of activities, because I believe surveys represent an excellent platform for the epidemiologist to learn thinking (theory) and acting (practice), managing and communicating, stepping out of any comfort zone and engaging with approaching new scenarios and environments. Therefore, the first aforementioned training was for me an opportunity to refresh memories and experiences from the past, but also to study further on a topic that fascinates me. For example I utilized materials from my field work but also reviewed reports from a range of other surveys in order to prepare for this activity. It was the first time I talked about such a topic outside the field and it required me to efficiently interact with an audience not necessarily exposed to certain settings yet.

Having completed the 4th African SORT-IT in Addis-Ababa in 2014 and having been involved in three more SORT-IT trainings after that (both as facilitator and/or organizer, during my working experience with Médecins Sans Frontières, 2014-2018), I was already familiar with this training initiative. Participating in this MSF training, now during my EPIET Fellowship, was for me a valuable opportunity to re-join a team of former colleagues (being today a member of the international MSF Association and still sharing its principles and values). Being in this MSF training gave me the opportunity: i) to participate in a lively and fresh, continuous peer-review process, which I highly rank among the valuable activities that a researcher (and specifically an epidemiologist) can have in her/his professional daily life; ii) to brush-up my skills in basics statistics i.e. summary statistics and significance tests (which is never enough); iii) to maintain a closer link to field experiences from domains I no longer deal with and to refresh my understanding of MSF projects and strategy.

## 6. Other activities

Routinely participated in the Department of Infectious Disease Epidemiology & Prevention (Statens Serum Institut) operational response to the COVID-19 epidemic.

Routinely participated in the activities of the Section for Zoonotic, Food and Waterborne Infections of the Department of Infectious Disease Epidemiology & Prevention (Statens Serum Institut) – focus on Campylobacter exceedances.

## 7. EPIET/EUPHEM modules attended

1. Introductory Course, 24 September - 12 October 2018, Spetses, Greece
2. Outbreak Investigation, 3-7 December 2018, Berlin, Germany
3. Multivariable Analysis, 25-29 March 2019, Madrid, Spain
4. Rapid Assessment and Survey Methods, 13-18 May, Zagreb, Croatia
5. Project Review 2019, 26-30 August 2019, Prague, Czech Republic
6. Time Series Analysis, 4-8 November 2019, Utrecht, the Netherlands
7. Vaccinology Module, 4 May - 24 June, 2020, online
  - Institute Pasteur, SPOC (Small Private Open Course), 4 May - 12 June 2020, online
  - Rijksinstituut voor Volksgezondheid en Milieu (RIVM), 22-24 June 2020, webinar
8. Project Review 2020 [excused from attendance]

## Supervisor's conclusions

During the two-year Fellowship at the SSI in Copenhagen, Guido Benedetti has been part of the staff at the Department of Infectious Disease Epidemiology & Prevention, where he was placed in the Section for Zoonotic, Food and Waterborne Infections. Guido fulfilled all his EPIET obligations, working on quite varied projects and doing so with many different members of staff throughout the SSI. In addition to teaching and doing outbreak investigations, they concerned the impact for influenza surveillance of using rapid tests; a register based algorithm to pinpoint surgery-associated bacteraemia; analysing indicators for differences throughout Denmark in influenza vaccination rates; and a geo-based surveillance system for *Campylobacter* outbreaks, which is now being put into routine use at the department.

Guido arrived at the SSI already very skilled and with many years of experience mainly through global health work. Nevertheless, he has clearly developed a number of new competencies during the Fellowship, in part based on the wise decision not to repeat what he already knew but to focus his work on what he was not yet an expert in when choosing projects. Overall, he approaches projects in a seemingly easy-going manner but is in fact always extremely well prepared and very thorough with his outputs. During the COVID-19 crisis, which dominated the last quarter of Guido's Fellowship, he seemingly happily put in a huge amount of extra work for the SSI, working on monitoring the international COVID-19 situation; something we are very grateful for.

Guido also has proven to be a very good colleague, always considerate, always ready to help others and simply being the kind of person that just always seem to make people around him feel at ease. He also has artistic skills beyond epidemiology. His Italian cooking has performed small miracles at social gatherings involving the department. And as a talented visual artist he could, just before the corona-lock-down, invite the entire department to a public art exhibition of a selection of his paintings. Guido also seems to have grown to really like and appreciate the Danish life and work forms – and we are happy that he is now transforming from fellow to full-blown colleague as member of the staff at the epi department at the SSI.

Working with Guido, it is clear that he did not enter the epi world out of an interest only in models and theory but because of the actual human beings that may sometimes be a bit forgotten in our work on cohorts and populations. Guido's heart beats for changing the social inequalities, the injustice in our health systems and to make a difference for the most vulnerable people in our societies. That, I think, is a very good driver for the work we do.

## Coordinator's conclusions

Guido's Fellowship was remarkably successful. Guido was already experienced and skilled when he became an EPIET fellow. Nevertheless, he found projects and activities at his training site to further improve his competencies during his Fellowship. This development took place in all areas covered by the programme and was especially notable in the areas of public health surveillance (in a European setting), outbreak investigation and risk assessment and communication. Furthermore, he acquired/improved practical skills such as programming in R, mapping and spatial analyses and new biostatistical methods and modelling. Lastly, he improved his understanding of public health agencies and institutions in Europe and of data registers relevant for public health in Denmark.



## Personal conclusions of fellow

I initially sought from the EPIET programme the opportunity to access, witness and experience the European public health arena, after years of practice in humanitarian development and cooperation, a major part of it from low- and middle-income countries. I eventually found what I was looking for in first place.

I am grateful to the EPIET programme, because it allowed me to expand and polish my skills and it provided me with extra tools to build upon my competencies. In a nutshell, the EPIET programme made me more independent, confident and structured to keep on my professional journey through public health and epidemiology.

## Acknowledgements

Too many are the names that I should list here in order to sincerely and comprehensively acknowledge the friends and professionals who supported and guided me throughout this process, among the many fantastic colleagues at the Department of Infectious Disease Epidemiology & Prevention and other Departments of Statens Serum Institut, the project supervisors, the EPIET coordinators, co-fellows, and fellows from previous and subsequent cohorts. I simply say: thank you all.

However, there are two that I want to mention and warmly thank: Katrin Gaardbo Kuhn and Steen Ethelberg, for having selected and accepted me into their working team. Indeed, you became substantial contributors to my professional growth.

Special thoughts also go to all the EPIET Front Line Coordinators that generously supported and patiently guided me throughout this journey. Thank you, guys! You were also too many to be listed here.