



FELLOWSHIP REPORT

Summary of work activities

Sanja Vuzem

Intervention Epidemiology path (EPIET)

Cohort 2016

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 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;

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This portfolio does not represent a diploma. Fellows receive a certificate listing the theoretical modules attended and the 23-month training. Additionally, if all training objectives have been met, they receive a diploma.

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- To develop a European network of public health epidemiologists who use standard methods and share common objectives;
- To contribute to the development of the community network for the surveillance and control of communicable diseases.

Pre-fellowship short biography

Sanja Vuzem is a medical doctor with a specialisation in Public Health Medicine. Throughout her residency, and following completion in 2016, she has been working as a field epidemiologist at the National Institute of Public Health (NIJZ) Slovenia. She is based in the regional unit Maribor of the NIJZ and contributes at an operational level within the region, as well as on the national level. Her main fields of interest are epidemiology of the communicable diseases, vaccinology and risk communication in epidemiology. Sanja rounds out her public health career by following her passion for music.

Fellowship assignment: Intervention Epidemiology path (EPIET)

On 14 September 2016, Sanja Vuzem started her EPIET fellowship at the Communicable Diseases Centre at the NIJZ, under the supervision of Irena Klavs and co-supervisors Veronika Učakar and Mario Fafangel. This report summarizes the work performed during this fellowship.

Methods

This portfolio demonstrates the competencies acquired during the ECDC Fellowship, EPIET path, 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 EPIET scientific guide¹.

Fellowship projects

1. Surveillance

Supervisor(s): Veronika Učakar

Evaluation of the Slovenian national pertussis surveillance system 2006-2015: assessing the impact of the additional vaccine booster dose in 2009/10

Childhood vaccination has significantly reduced pertussis morbidity and mortality. Despite high vaccination coverage, pertussis has re-emerged as a public health problem in the last decade in many countries, including Slovenia, leading to the introduction of booster vaccinations. In the 2009/10 school year, the Slovenian national immunisation programme implemented a booster dose of pertussis vaccine among children aged 8 (grade 3 of elementary school).

¹ European Centre for Disease Prevention and Control. European public health training programme. Stockholm: ECDC; 2013. Available from: <http://ecdc.europa.eu/en/publications/Publications/.pdf>

We described and evaluated selected attributes (timeliness, completeness, usefulness) of the Slovenian pertussis surveillance system and analysed its results from the period 2006-2015 in order to provide information to consider the impact of the additional pertussis booster dose on the disease incidence, to inform current national vaccination policy.

Evaluation of the pertussis surveillance system highlighted the need for timely local reporting to enable rapid response which enables execution of preventive measures when they can still have a significant effect in the community. It also provided additional evidence for the implementation of the national electronic vaccination registry, which would enable better completeness of the vaccination status.

In order to accurately assess changes in the epidemiology over time and optimise disease control, it is important that we continue to improve the surveillance of pertussis, from clinical recognition to laboratory diagnosis and timely reporting and regular analysis of the surveillance data.

Role: Principal investigator

Sanja wrote the protocol (7), extracted, cleaned and analysed data from the surveillance system, conducted the surveillance system evaluation and wrote the report (2).

2. Outbreak investigations

Supervisor(s): Veronika Učakar

An outbreak of adenoviral keratoconjunctivitis in a hospital setting, Slovenia, August-October 2017

This was the first reported outbreak of adenoviral keratoconjunctivitis in a hospital setting in Slovenia.

On 30th August, the National Laboratory informed the Maribor region of the National Institute of Public Health (NIJZ) about a possible adenoviral keratoconjunctivitis outbreak in the ophthalmology department (OD) of the University Medical Centre Maribor. We initiated an investigation to determine the scope of the possible outbreak, identify the source and vehicle of infection and implement appropriate infection control measures.

We defined primary and secondary cases and reviewed available medical records for patients with a diagnosis of acute keratoconjunctivitis from 1st August until 9th October. Hand swabs from healthcare workers and environmental swabs from surfaces in the OD were obtained.

We identified 50 primary and 13 secondary cases. 41/43 conjunctival swabs from primary and secondary cases tested positive for adenovirus. Further typing of selected positive cases showed the HAdV-8 subtype.

The OD restricted visitation for hospitalised patients and cancelled all non-urgent elective procedures, changed the disinfectant and switching to the use of single-use eye drop vials. Additional preventive measures were implemented after the regional epidemiological team joined the outbreak investigation and management team. An available examination room was brought into use, thorough cleaning and disinfection of the entire OD was carried out on two occasions and hand hygiene training was implemented for every healthcare worker in the department.

Containment of the outbreak proved to be very difficult and required strong collaboration with the OD, the National laboratory, infection control team of the University Medical Centre Maribor and NIJZ's epidemiological team. A comprehensive outbreak investigation and management of the outbreak provided suggestions for additional preventive measures and emphasized the importance of raising awareness among healthcare workers on hand hygiene and their role as well as responsibility in prevention of communicable diseases transmission.

Role: Principal investigator

Sanja led the epidemiological investigation, developed case definitions, collected and analysed data, recommended control measures, and wrote an outbreak report (2). She communicated findings with the responsible local health authorities and the OD, wrote and submitted an abstract for a poster (5) to be presented at ESCAIDE 2018.

Supervisor(s): Veronika Učakar

A cluster of epidemiologically linked measles cases in the Maribor region, with transmission to healthcare workers, May-June 2018

Several European countries have been recently affected by measles outbreaks. Thanks to high vaccination coverage, Slovenia has reported a small number of mostly sporadic, imported cases with limited transmission in recent years. Only one measles case was confirmed in the Maribor region from 2008 to 2017. On 14 May 2018, an infectious disease specialist from the University Medical Centre informed the Regional Unit Maribor of the NIJZ about a laboratory-confirmed measles case. In the following month, five more cases occurred with possible epidemiological links to the index case.

We investigated a cluster of six measles cases with secondary transmission in a healthcare setting and to healthcare workers. No fatal outcomes were recorded. We performed extensive contact tracing of 687 identified contacts. We were able to trace 92% of all contacts, of whom 478 had proof of immunity. We performed ring vaccination for 146 contacts; eight contacts received intravenous immune globulin prophylaxis.

This urgent public health reaction presented a great workload for a small regional epidemiological team. However, a comprehensive epidemiological investigation remains important even in an environment with a high vaccination coverage.

Role: Principal investigator

Sanja undertook an epidemiological investigation, advised control measures, interviewed cases, performed contact tracing, provided ring vaccinations, collected and analysed case and contact data, wrote an outbreak report, and communicated regularly with the local and national media. She wrote and submitted a manuscript (1).

3. Applied epidemiology research

Supervisor(s): Mario Fafangel, Irena Klavs

***Title:* Estimating the annual burden of chlamydia, gonorrhoea, hepatitis B and syphilis to advise prioritisation of prevention and control strategies in Slovenia, 2011-2015**

Promoting sexual and reproductive health is a public health priority in Slovenia. Allocation of limited resources to the prevention and control of different sexually transmitted infections (STIs) has been traditionally informed by surveillance data, based on reported incidence. However, since reported incidence underestimates the true number of cases, and does not take into account the impact of disease sequelae, evidence-based prioritisation of public health interventions to ensure case management and preventing long-term sequelae according to the International Union against Sexually Transmitted Infections (IUSTI) guidelines proves challenging.

We used surveillance notifications to estimate the 2011-2015 age- and sex-specific mean annual incidence of selected acute symptomatic STI per 100.000 population. Multiplication factors were derived from published literature and Slovenian estimates for chlamydia and applied to account for underestimation of cases. We estimated DALYs with 95% uncertainty intervals (UI), using the Burden of Communicable Diseases in Europe (BCoDE) toolkit from ECDC.

Chlamydia had the highest estimated burden at 9.81 DALYs per 100.000 population per year (95% UI: 5.53-16.87). Hepatitis B accounted for 1.09 DALYs per 100.000 population (95% UI: 0.77-1.52) while the estimated burden of both gonorrhoea and syphilis was 0.05 (95% UI: 0.04-0.06) DALYs per 100.000 per year. For all STI, sequelae were the main component of the overall burden. The burden of chlamydia was higher in women <34 years old (37.52 DALYs per 100.000 stratum-specific population (UI: 16.41-73.06)) compared to all other women (4.77 DALYs per 100.000 stratum-specific population (UI: 2.07-9.82)).

STIs, particularly chlamydia, and their sequelae represent a substantial health burden in Slovenia. Both primary prevention measures and treatment of diagnosed cases are critical in reducing the burden of all STI. Universal chlamydia testing for sexually active women <34 years old could be a step forward in a limited resource setting, where prioritisation of public health interventions remains crucial. The BCoDE toolkit provides important information for establishing such intervention.

Role: Principal investigator

Sanja wrote the protocol (6), extracted data from surveillance system, performed data entry, contributed to data analysis, wrote and submitted an abstract. The abstract was presented as an oral presentation at ESCAIDE 2017 (4).

4. Communication

Publications

1. Vuzem S, Simonović Z, Turk K, Hudopisk N, Hansen L, Učakar V. Extensive contact tracing and management of a cluster of measles in the Maribor region, Slovenia, May-June 2018. (Submitted to *Epidemiology & Infection*)

Reports

2. An outbreak of adenoviral keratoconjunctivitis in a hospital setting, Slovenia, August-October 2017
3. Evaluation of the Slovenian national pertussis surveillance system 2006-2015: assessing the impact of additional vaccine booster dose in 2009/10

Conference presentations

4. Vuzem S, Fafangel M, Klavs I. Estimating the annual burden of chlamydia, gonorrhoea, hepatitis B and syphilis to advise prioritisation of prevention and control strategies, Slovenia, 2001-2015. Oral presentation. ESCAIDE 6-8 November 2017, Stockholm, Sweden.
5. Vuzem S, Učakar V, Klavs I. An outbreak of adenoviral keratoconjunctivitis in a hospital setting, Slovenia, August-October 2017. Poster presentation. ESCAIDE 21-23 November 2018, Valletta, Malta.

Other

6. Protocol: Estimating the annual burden of chlamydia, gonorrhoea, hepatitis B and syphilis to advise prioritisation of prevention and control strategies, Slovenia, 2001-2015.
 7. Protocol: Evaluation of the Slovenian national pertussis surveillance system 2006-2015: assessing the impact of additional vaccine booster dose in 2009/10
- Multiple public communication activities for the national television and radio stations
 - Epidemic intelligence activities on the regional level – daily monitoring of communicable diseases notifications, epidemiological investigations of sporadically reported diseases, checking media for outbreaks/alerts

5. Teaching and pedagogy

Title: Outbreak investigation (September 2017, February 2018)

I carried out a teaching activity on outbreak investigation for medical interns and dental interns. The aim of the teaching was to illustrate the basics of an outbreak investigation using EPIET learning material ("Gastroenteritis in Kalundborg" case study). The session consisted of a short theoretical lecture on the 10 steps of outbreak investigation, following which participants were divided into smaller groups to discuss different steps, and then present their conclusions and answers in the plenary.

Reflection

The "workshop" approach worked very well because it gave the participants a glimpse of an epidemiologist's every day work on the field. It also showed them the importance of multi-disciplinary approach in an outbreak investigation. I encouraged as much communication in the groups as I could, and engaged a facilitator, so we could circle between the groups. If more time had been available, I would have included some basic attack rate and relative risk calculations to provide learners with a more in-depth approach to an outbreak investigation.

Title: Migrant health with emphasis on communicable diseases: collaboration with the International Organisation for Migration

I delivered multiple lectures on migrant health with emphasis on communicable diseases as a part of a project in collaboration with the International Organisation for Migration. The aim of the project was to develop materials for trainers in European countries who would then educate first line responders working with migrants. The target audience were healthcare and social workers who work with migrants in asylum centres and migrant centres. The objectives of the teaching were to pilot the training materials, developed by various European organisations, and peer reviewed by countries included in the project. The teaching consisted mostly of lectures, but I ensured active participation by putting the topics into actual working environment of the participants and actively asking them about their experience in their workplace.

Reflection

Working with a small group proved to be very practical as I was able to quickly adjust to the needs of participants, minding the flow of the lectures and staying on track with them and with time. Promoting active participation and sharing different experiences were the highlights of this teaching experience. To improve the training in the future, I would recommend structuring it in the form of workshops or problem-based learning.

6. EPIET/EUPHEM modules attended

1. Introductory course, Spetses, Greece, 29 September – 14 October 2016
2. Outbreak investigation module, Berlin, Germany, 5-9 December 2016
3. Multivariable analysis module, Zagreb, Croatia, 13-17 March 2017
4. Rapid risk assessment module, Athens, Greece, 8-13 May 2017
5. Project review module, Lisbon, Portugal, 28 August – 1 September 2017
6. Time series analysis module, Bristol, UK, 20-24 November 2017
7. Vaccinology module, Cardiff, Wales, 11-15 June 2018

7. Other training

1. Training of trainers in collaboration with the International Organisation for Migration.

Discussion

Supervisor's conclusions

Sanja has been a dedicated fellow, very positive about receiving feedback on her work and taking on new challenges. She successfully managed to fulfil all her EPIET objectives in the area of disease burden, evaluation of surveillance system and outbreak investigation. She strengthened her epidemiologic competencies and analytical skills during her two years of the fellowship. Sanja has demonstrated her commitment to public health in Slovenia, and will continue to add expertise to relevant areas within NIJZ's mandate.

Coordinator's conclusions

Sanja is enthusiastic, open-minded and reflective, and has been a pleasure to work with during her fellowship. She entered the programme as a motivated and experienced public health professional, and has been able to broaden her epidemiological skills and further refine her capacity for public and professional communication and teaching. She has taken on a diverse range of projects while maintaining her key function within the regional unit Maribor, and has demonstrated her talent for managing multiple competing demands and deadlines. As an MS-track fellow, Sanja will continue to contribute to public health in Slovenia and is poised to assume a leadership role.

Personal conclusions of fellow

Over the last two years, the programme has broadened my knowledge and opened opportunities to upgrade my epidemiological skills on a local and national level. It also gave me a chance to present my project in an international environment and exchange opinions with epidemiological experts. I gained new skills which I hope to implement in my future career and continue to contribute to public health on regional, national and international levels.

It was a precious experience personally and professionally. I would highly recommend it for colleagues who wish to obtain more knowledge in communicable diseases.

Acknowledgements of fellow

I would like to thank all my local project supervisors (Irena Klavs, Veronika Učakar and Mario Fafangel), who helped me with my projects and gave me useful advice.

I am immensely grateful to my frontline coordinator, Lisa Hansen, for all the guidance, motivation, positivity and patience in crucial times of the fellowship. I will forever cherish her help.