



FELLOWSHIP REPORT

Summary of work activities

Alexandra Brazinova

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;

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 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.

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

I graduated from general medicine and specialised in public health. Prior to the EPIET fellowship I worked at the Institute of Epidemiology, Faculty of Medicine in Bratislava, Comenius University in the Slovak Republic and I also had a part-time position at the Department of Epidemiology of Regional Public Health Authority in the Slovak Republic (RPHA). At RPHA I participated in field epidemiology tasks – outbreak investigation, data processing and analysis. Prior to the fellowship I assisted in several community outbreak investigations; I conducted interviews, assisted in data entry and analysis and presented the findings in annual congresses.

For more than 15 years I have been involved in research on the epidemiology of communicable and non-communicable diseases, health events and health determinants. I worked extensively in the area of epidemiology of mental health disorders, where I described the incidence and prevalence of the most common mental health disorders and suicide rate in the Slovak Republic and estimated the treatment gap. I also did research on risk factors of cardiovascular diseases in the Slovak Republic. For a decade I was involved in traumatic brain injury epidemiology in Austria and Slovakia, where I was responsible for data collection and analysis.

I have published the results of my research in scientific papers that are included in Web of Science database.

Fellowship assignment: Intervention Epidemiology path (EPIET)

On 1 Sept.2018, Alexandra Brazinova started her EPIET fellowship at the Regional Public Health Authority Banska Bystrica, Banska Bystrica, Slovak Republic, under the supervision of Maria Avdicova. 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: *Invasive pneumococcal disease surveillance system in the Slovak Republic. Evaluation of the surveillance system*

Pneumococcal infections and invasive pneumococcal disease (IPD) are major causes of communicable disease morbidity and mortality in Europe and globally, with the highest burden of disease found in young children and the elderly. The surveillance system for invasive pneumococcal disease (IPD) in the Slovak Republic was established in 2004. It includes cases of pneumococcal sepsis, meningitis and pneumonia, information on hospitalization, vaccination status, and since 2011, when the National Reference Center (NRC) for invasive pneumococcal disease was created, also on serotype.

The aim of the project was to evaluate the IPD surveillance system in the Slovak Republic,, to describe the individual characteristics of the surveillance system.

The monitoring of IPD incidence and vaccine uptake is well established in the Slovak Republic. Reported incidence of IPD is increasing in the Slovak Republic. Case reporting can be improved by enhanced communication by the public health authority with treatment centres.

Role and outputs: *Principal investigator*

I developed protocols, interviewed stakeholders, processed and analysed the surveillance data and wrote the report. I have presented the results at 3 national congresses.

Public health output: based on the surveillance system evaluation suggestions for an improvement were presented to Slovak society of infectious diseases.

Supervisor(s): *Maria Avdicova*

Competencies developed:

I learned the skills necessary for describing the system and for the evaluation of individual characteristics of the surveillance system.

Title: *Impact of vaccination on invasive pneumococcal disease in the Slovak Republic.*

The invasive pneumococcal disease (IPD) vaccination was introduced as a mandatory vaccination in children in 2009 in the Slovak Republic. The vaccines currently available are a 10-valent pneumococcal conjugate vaccine (PCV10), fully covered by health insurance, and a 13-valent vaccine (PCV13) that was introduced in 2010 and required co-payment until 2019.

The project evaluated the impact of the vaccination on IPD incidence and on the circulation of serotypes in the population.

As of 2009, when mandatory IPD vaccination started in the Slovak Republic, 89% of reported IPD cases were not vaccinated. Approximately one third of vaccinated IPD cases had pneumococcal serotypes 19A and 3, the majority were vaccinated with the 10-valent vaccine that did not include these serotypes. Over time both serotypes 3 and 19A have formed an increasing proportion of the serotypes reported. As a result of this analysis, in early 2019 full coverage of PCV13 (that contains serotypes 19A and 3) by health insurance was introduced in Slovakia.

The surveillance system enables evaluation of IPD cases and circulating serotypes. It will enable future evaluation of impact of change in the health insurance coverage of vaccine on the circulating serotypes and disease incidence.

Role and outputs: *Principal investigator*

I consulted with microbiologists regarding the serotyping and distribution of case serotypes, processed and analysed the surveillance data and wrote the report. I have presented the results at 3 national congresses.

Public health output: based on the surveillance system analysis the 13-valent pneumococcal conjugate vaccine was approved for full coverage by health insurance.

Supervisor(s): *Maria Avdicova*

Competencies developed:

I learned the skills necessary for describing the system, for the evaluation of individual characteristics of the surveillance system, improved data analysis skills in STATA for presenting long term trend data. I also learned the skills of applying the surveillance system evaluation results on current health and vaccination status of the population.

Title: HIV surveillance

The HIV/AIDS surveillance monitors the current epidemiology of HIV disease in the Slovak Republic. The surveillance system was established in the country in 1985. The Slovak Republic belongs among countries with a low incidence of HIV/AIDS, although the trend of incidence has been increasing in recent years.

Role and outputs: Principal investigator

As of 1 January 2020 I was given the task of country coordinator of HIV/AIDS surveillance system. This task was granted to me thanks to my EPIET training.

I am responsible for regional and national data collection, entry and analysis, communication with regional HIV/AIDS coordinators at regional public health authorities. I am responsible for annual and 6-month report development and submission to governmental institution.

Supervisor(s): Maria Avdicova**Competencies developed:**

I gained knowledge on HIV/AIDS disease, diagnostics and treatment. I developed competencies in data collection from treatment centres, data input into HIV database and report development.

2. Outbreak investigations

Title: Scabies outbreak

On the 2nd September 2019 an outbreak of scabies was reported in clients of a Nursing Care Home in city X in Trnava region (one of 8 regions of the Slovak Republic). Epidemiological investigation lead to the finding that out of 25 exposed persons (16 clients and 9 personnel) 8 clients and 5 personnel got sick. First cases were noticed by a primary care dermatologist on the 22nd August 2019 with symptoms of all-body exanthema. The rest of the cases were diagnosed over the course of the next 2 weeks.

This was the first outbreak of scabies in the facility. Interviews of the cases suggest that the suspected source of the infection was an infected person and the suspected transmission factor was an immediate contact with a sick person. It was not possible to identify the index case.

All personnel and clients were treated with anti-scabies medication. 4 clients were hospitalized in Infectious diseases department at Teaching hospital Y. All other clients were transferred to another facility or home care within the family. The facility was closed for one month. Appropriate outbreak-control measures were requested and performed in the facility.

Role and outputs: Principal investigator

I was the principal investigator of the outbreak. I developed the questionnaire, developed a data entry mask, performed data entry and did all the data analysis. I communicated with the facility management and personnel. I attended outbreak control team meetings, communicated results of the meeting. I wrote the outbreak report.

Supervisor(s): Maria Avdicova**Competencies developed:**

I learned the outbreak investigation skills, mainly the communication with the facility management, personnel and clients. I also learned information about scabies itself as this was the first scabies outbreak I was involved in. I trained putting 10 steps of outbreak investigation into practice.

Title: COVID-19 pandemic

COVID-19 is a respiratory disease that has been declared a pandemic by the WHO; it is caused by the new coronavirus SARS-CoV-2.

The COVID-19 outbreak started in the Slovak Republic on 6th March 2020, when the first case in the country was laboratory diagnosed. The country had the first wave of the outbreak in March-June and the second one started in September 2020.

Role and outputs: Co-investigator

I participated in Covid-19 outbreak investigation since its start in Slovakia (March 2020) as a field epidemiologist at Regional Public Health Authority (RPHA) Bratislava. This is one of 36 RHPA in the Slovak Republic and it is responsible for the capital Bratislava and the largest geographical region.

Since the start of my involvement until present (November 2020) I have been responsible for the following tasks: to interview the cases and complete the epidemiologic investigation questionnaire ; to trace and interview the contacts and complete epidemiologic investigation; to enter the data into epidemiologic information system; to serve on the information 24/7 hotline; to coordinate groups of medical students-volunteers on the information hotline.

As of June 2020 I have served on 2 ministerial work groups – Ministry of Health and Ministry of Education – that developed an alert system to prepare the country for further development of the COVID-19 pandemic. In the Ministry of Health work group, I am responsible for the development of alert system indicators that consist of three domains – Epidemiologic (Rt number, daily new cases, 14 day incidence, daily hospitalization, daily deaths); Public Health (testing & contact tracing capacities of regional public health authorities etc.) and Health Care System capacities (number of hospital beds, ICU beds, ventilators etc.). In the Ministry of Education work group, I participated in the development of a manual for educational facilities (preschool, elementary schools, high schools, universities, dormitories, special schools) that will guide them in the upcoming epidemiologic situation.

In September 2020 I was appointed as a member of COVID-19 crisis management committee of the Comenius University (CU) and a leader of the COVID-19 crisis management committee of the Faculty of Medicine of CU.

Between March and September 2020 I have published numerous articles and given interviews related to the COVID-19 pandemic in national and international newspapers and journals and on national and international television and radio stations (Including The Lancet, The Wall Street Journal, BBC, LeFigaro).

Supervisor(s): Maria Avdicova, Zuzana Kristufkova**Competencies developed:**

I learned the skills necessary for COVID-19 outbreak investigation and analysis. I was involved in development of the case definition, epidemiologic investigation of the cases, contact tracing, distribution of information to the public – on the phone and in written form in local and national media, data analysis, alert system development on regional and national level for two sectors – health and education.

I really had an opportunity to develop my field epidemiology skills. I learned to work in a high pressure environment with very short deadlines, also multi-agency working in these working groups. I learned to understand the point of view of other agencies and develop a way forward.

3. Applied epidemiology research

Title: Metabolic syndrome in clients of health counselling offices in the Slovak Republic in 1993-2017

Metabolic syndrome (MetS) is a constellation of closely related cardiovascular risk factors.

In this study we aimed to estimate the prevalence of MetS in clients of health-counselling offices in the Slovak republic that were established in the country in 1993, describe the clients with MetS and investigate the association between MetS and demographic, socioeconomic and personal and family history factors.

This was an observational cross-sectional study based on the records of health-counselling offices in the Slovak Republic in the period 1993-2017

121663 client records were available for analysis. Overall 26.74% of the study group had MetS.

More women with MetS were identified than men, but the prevalence was significantly higher amongst male than female clients (28.88%: and 25.67% respectively, prevalence ratio =1.13 (95%CI 1.10-1.15), $p < 0.001$)

Higher risk of metabolic syndrome was associated with being male, smoking, lower level of physical activity, a higher amount of perceived stress, lower level of education, being widowed or divorced. Both men and women with MetS had highest odds to be in age categories 65+ (OR 11.08 [95%CI 9.77-12.57] for men, (OR 37.24 [95%CI 9.77-12.57] for women). With respect to education, women with MetS had highest odds to have incomplete primary level (OR 3.71 [95%CI 2.49-5.52]) , followed by completed primary level (OR 2.77 [95%CI 2,61-2,95]) and high school level at the third place (OR 2.36 [95%CI 2.22-2.51]) , with university education being the reference category. Men with MetS had increased odds only for high school level education (OR 1.5 [95%CI 1.39-1.60]).

In family status, widowed clients had the highest odds of MetS in both men and women (OR 9.55 [95%CI 8.81-10.35] for women; OR 5.28 [95%CI 4.45-6.26] for men). This was followed by married and divorced categories.

Public health impact of the project is in estimating the metabolic syndrome prevalence in the Slovak republic, which had not previously been done before. Whilst in line with estimates from other countries, this study highlights that in this group at least in the Slovak Republic, MetS is a major issue. Another important outcome is increasing the awareness of the existence of health-counselling offices, which provide free-of-charge evaluation of the cardiovascular risk factors and health promotion advice to the public.

Role and outputs: *Principal investigator*

I wrote the research protocol, processed and analysed the data, developed a manuscript for the submission to a peer-reviewed journal. I have also presented the results of the research project at several national and international conferences.

Supervisor(s): *Maria Avdicova*

Competencies developed:

I learned skills for management of large data sets (300 thousand+ entries), data processing, description and analysis. I also learned the competencies in the interpretation of the data for various aspects of health – mainly cardiovascular and metabolic. I improved my STATA skills and used what I learned in the MVA module to undertake logistic regression.

4. Communication

Publications in peer reviewed journals

I have co-authored the following articles within my EPIET engagement:

Fulová M, Kotrbancová M, **Bražinová A**, Boledovičová J, Trnková K, Špaleková M. Legionnaires' Disease in Pediatric Patients, Control Measures and 5-Year Follow-Up. *Pediatr Infect Dis J.* 2020 May 28.

Janoušková M, Formánek T, **Bražinová A**, Mílek P, Alexová A, Winkler P, Motlová LB. Attitudes towards People with Mental Illness and Low Interest in Psychiatry among Medical Students in Central and Eastern Europe *Psychiatr Q.* 2020 Aug 11.

Stehlik M, Kiselak , Dinamarca A, Alvarado E, Plaza F, Felipe A, Medina Marin, Stehlikova S, Venegas B, Gajdos A, Li Y, Katuscak S, **Brazinova A**, Lu Y. REDACS: Regional emergency driven adaptive cluster sampling for effective COVID-19 prevalence (LSAA-2020-0246). Submitted 2020 Nov 4, *Stochastic Analysis and Applications Journal.*

Manuscripts submitted to peer reviewed journals (in review process)

I have developed the following manuscript as an outcome of my research project:

Brazinova A, Klocova Adamcakova Z, Avdicova M: Metabolic Syndrome In Clients Of Health Counselling Offices In The Slovak Republic In 1993-2017. Submitted to the *International Journal of Public Health.*

Conference presentations

National vaccinology congress 2020: 6-8 September 2020, Tatranska Lomnica, Slovak Republic
Brazinova et al: What can we do about vaccine hesitancy?

National vaccinology congress 2019: 11-13 April 2019, Tatranska Lomnica, Slovak Republic
Brazinova et al: Excess cardiovascular mortality related to influenza in the Slovak Republic in 2007-2017.
Brazinova et al.: Evaluation of invasive pneumococcal disease surveillance system in the Slovak Republic.

National vaccinology congress 2018: 26-28 April 2018, Tatranska Lomnica, Slovak Republic
Brazinova et al: Excess all-cause mortality related to influenza in the Slovak Republic in 2007-2017
Brazinova et al: Viral Hepatitis A outbreak in Bratislava Region – challenges for public health authority.

International conference on chronic diseases: 24-25 October 2019, Kosice, Slovak Republic
Brazinova A: Cardiovascular disease risk factors prevalence in clients of health counselling centers in the Slovak Republic - 25 years of monitoring

National conference on Pharmaco-economics 2020: 3 June 2020, Bratislava, Slovak Republic
Brazinova A: Presentation on Lessons learned from management of the Covid-19 pandemic

National conference of obesity and metabolic syndrome: 16-18 July 2020, Demanovska dolina, Slovak Republic

Brazinova A: Cardiovascular risk factors and metabolic syndrome prevalence in clients of health counselling offices in the Slovak Republic in 1993-2017

Other presentations

Between March and November 2020 I have published numerous articles and given interviews related to the COVID-19 pandemic in national and international newspapers and journals and on national and international television and radio stations (Including The Lancet, The Wall Street Journal, BBC, LeFigaro).

References (the list is not complete):

The Lancet: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)32261-3/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32261-3/fulltext)

The Wall Street Journal: <https://www.wsj.com/articles/as-covid-sweeps-europe-one-country-tries-a-new-tactic-test-the-entire-population-11603462995>

Major Slovak daily Dennik N: <https://dennikn.sk/autor/alexandra-brazinova/>

National TV Station TA3: <https://www.ta3.com/clanok/1188697/epidemiologicka-a-brazinova-o-cestovani-pocas-pandemie.html>

National TV Station TA3: <https://www.ta3.com/clanok/1190065/epidemiologicka-a-brazinova-o-druhej-vlne-koronavirusu.html>

National TV Station TA3: <https://www.ta3.com/clanok/1189532/koronavirus-ako-sucast-nasho-zivota.html>

National radio station Slovak radio: <https://www.rtv.slovakia.sk/radio/archiv/11436/1424411>

Reports

Report on epidemiology of HIV/AIDS in Bratislava region and in the Slovak Republic in 2019 – National Report of Public Health Authority Network

Other

Book chapter:

Brazinova et al: Scientific evidence and its power. In: Propedeutics in Epidemiology (In Slovak). Textbook. Trnava, Slovak Republic 2020. ISBN 978-80-568-0148-2

Brazinova et al: Use of evidence in practice. In: Propedeutics in Epidemiology (In Slovak). Textbook. Trnava, Slovak Republic 2020. ISBN 978-80-568-0148-2

Textbook:

Epidemiologic methods and their use in epidemiology of selected diseases (In Slovak). Bratislava, Slovak Republic 2020. ISBN 978-80-223-4982-6

Available

at:

https://www.fmed.uniba.sk/fileadmin/lf/sluzby/akademicka_kniznica/PDF/Elektronicke_knihy_LF_UK/Epidemiologic_ke_metody_a_ich_uplatnenie_v_epidemiologii_vybranych_ochoreni.pdf

5. Teaching activities

Title *New design of Epidemiology course for medical students*

Development and implementation of a new curriculum of and a textbook for the practical sessions of Epidemiology course for 5th year medical students, Faculty of Medicine, Comenius University, Bratislava, Slovakia. This course is delivered by the Institute of Epidemiology. The aim of the development and implementation of a new curriculum of and a textbook for the practical sessions of Epidemiology course is to provide the students of general medicine and dentistry with the most up-to-date epidemiologic knowledge and skills.

The duration is September 2019 – February 2021. As for the learning material we have used ECDC/WHO/CDC/national guidelines, information sheets, reviews, scientific papers, EPIET training materials.

Supervisor(s): *Maria Avdicova*

Educational outcome:

I am the author and the leader of this activity. I wrote a project proposal and received a grant from the national educational agency in the spring 2019 to implement this activity (Grant KEGA no.044UK-4/2019). As of January 2020, the project team has drafted the new curriculum and an outline of the sessions (textbook chapters). First set of new sessions will be pilot tested in the fall 2020.

6. Other activities

No other activities

7. EPIET/EUPHEM modules attended

All modules completed

1. *Introductory course, 24Sep-12Oct 2018, Spetses, Greece*
2. *Outbreak investigation, 3-7Dec 2018, Berlin, Germany*
3. *Multivariable analysis, 25-29March 2019, Madrid, Spain*
4. *Rapid Assessment and Survey Methods, 13-18May 2019, Zagreb, Croatia*
5. *Project review 2019, 26-30 Aug 2019, Prague, Czech Republic*
6. *Time Series Analysis, 4-8 Nov 2019, Bilthoven, Netherlands*
7. *Vaccinology, 11-15 May, online*
8. *Project Review 2020, 24-27 Aug 2020, online*

Supervisor's conclusions

Alexandra Brazinova was very active during her EPIET studies. She worked independently and creatively on her tasks, she utilized relevant scientific literature.

Alexandra Brazinova presented her work at several national meetings and on the national and international platform.

She successfully presented her highly appraised results at numerous conferences with positive feedback.

She is using all gained knowledge in her field epidemiology practice within COVID-19 pandemic, as well as in her work as university professor at the School of Medicine of Comenius University. It was my pleasure to work with Alexandra Brazinova as her supervisor. I am certain all her EPIET knowledge will be put to use and all her work will be beneficial for the enrichment of epidemiology in the Slovak Republic.

Coordinator's conclusions

I have only been Alexandra's frontline co-ordinator for the final few months of her fellowship. This coincided with the height of the COVID-19 pandemic in Europe. Alexandra was heavily involved in her country's response to the pandemic. This prevented her from undertaking some of the projects she was intending, but has been a huge learning experience for her in true field epidemiology. Because of her role in medical education, I am sure she will be passing on that learning to future generations of medics in the Slovak Republic. Despite her local workload and responsibilities, she has worked hard to ensure that she could demonstrate that she had achieved the competencies required for her EPIET diploma. I wish her all the best in the future and hope that she will be able to put the skills she has learned to good use in the future.

Personal conclusions of fellow

Prior to EPIET training, I was mainly an academic epidemiologist engaged in non-communicable disease epidemiology. Thanks to EPIET and due to my COVID-19 outbreak investigation involvement I became a field epidemiologist. I am very grateful for this opportunity and I will do my best to put my knowledge and training in use in my country.

Acknowledgements

I would like to acknowledge my supervisor Maria Avdicova, my co-supervisor Zuzana Kristufkova, my first frontline coordinator Alicia Barrasa and second frontline coordinator Mari Morgan, all of them for their guidance, support and friendly approach that made my training successful.