



## EPIET REPORT

# Summary of work activities

Rita Szabó

European Programme for Intervention  
Epidemiology Training (EPIET), 2011 cohort

## Background

### Pre-fellowship short biography

Prior to EPIET, Rita Szabó worked for three years as a coordinator at the National Centre for Epidemiology (NCE) in Hungary in the Department of Hospital Epidemiology and Hygiene. Her responsibilities included surveillance of hospital-acquired bloodstream infections and healthcare-associated infections in long-term care facilities. She serves as the national contact point for the ECDC survey of healthcare-associated infections in long-term care facilities (HALT project). Her education includes a BSc and MSc in nursing from the University of Pecs.

### EPIET assignment

During her Member State-track fellowship, Rita Szabó was assigned to the NCE Department of Hospital Epidemiology and Hygiene, under the supervision of Dr Karolina Böröcz, Department Head of Hospital Epidemiology and Hygiene.

## Fellowship projects

### Surveillance project

#### **Point-prevalence of healthcare-associated infections and antimicrobial use in long-term care facilities, 2013**

**Background:** Healthcare-associated infections (HAI) and antimicrobial use are common among residents in long-term care facilities (LTCF). As part of the ECDC-funded HALT-project (healthcare-associated infections and antibiotic use in European long-term care facilities), we conducted a point-prevalence survey with voluntary participation to establish representative baseline rates and identify priorities for improvement.

**Methods:** All LTCFs with over 50 beds were invited to participate in the HALT project. Between April and May 2013, trained LTCF-staff completed: 1) an institutional questionnaire on infection control practices (ICP) and 2) a form on each resident with HAIs and/or on antimicrobial therapy on the day of the survey. We used the ECDC definitions and

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Stockholm, May 2014

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protocol. We calculated prevalence of infections and antimicrobial use, using the number of all residents as the denominator and 95% confidence intervals (95% CI).

Results: 98 (23%) LTCFs with approximately 11 700 beds participated in the study. The prevalence of HAI was 2.0% (95% CI: 1.8%–2.3%). Of 235 HAIs reported, the most common ones were respiratory (40%), skin/soft tissue (30%), and urinary infections (17%). Of all residents, 1.3 % (95% CI: 1.1%–2.0%) used antimicrobials. Of 154 antimicrobials reported, 87% were for systemic use.

Conclusions: The first baseline data indicate that HAIs and antimicrobial use constitute a relevant public health problem in LTCFs in Hungary. We recommend that a surveillance system be implemented which is specific for LTCFs and follows trends in HAIs and antimicrobial use and identifies priorities for national and local intervention measures. The focus should be on preventing infections and promoting the prudent use of antimicrobials in LTCF residents.

Status: Completed

Output: National Bulletin article<sup>1</sup>, poster and oral presentations at international conferences<sup>2-4</sup>.

### **Increasing incidence of hospital-acquired bloodstream infections in Hungary – results from the National Nosocomial Surveillance System, 2005–2012**

Background: The National Nosocomial Surveillance System (NNSR) was implemented in Hungarian hospitals in October 2004.

Methods: We described hospital-acquired bloodstream infections (BSI) notified during 2005–2012 through the NNSR.

Results: Annual incidence increased from 3 to 10 per 100 000 patient days. Of the 11 200 BSI notified cases, 60% were male; the median age was 62 years. More than 41% of reported BSI cases occurred in intensive care units. The most common causative microorganism was *Coagulase-negative staphylococci* (17.8%). The case fatality rate was 20.4%.

Conclusions: Results from NNSR emphasise the need to optimize infection prevention guidelines and train the hospital staff.

Status: Completed

Output: submitted manuscript to Journal of Hospital Infection<sup>5</sup>

### **Healthcare-associated infections due to carbapenemase-producing Enterobacteriaceae in Hungary**

Background: In Hungary, the National Center for Epidemiology recognized the first carbapenemase-producing *Enterobacteriaceae* (CPE) strains in 2009. According to the National Reference Laboratory (NRL), the proportion of CPE strains from hospitalised patients has been increasing. We investigated the epidemiology of CPE episodes.

Methods: We analysed CPE episodes recorded by the NRL and the National Nosocomial Surveillance System between September 2011 and September 2012. We defined an episode as a CPE-infected patient, regardless of clinical symptoms. Episodes were described in terms of demographic characteristics, CPE resistance mechanisms, clinical characteristics and outcomes.

Results: During the study period, 27 episodes were identified [median age 66.5 years, range 0–92 years, 59 (60%) males]. Reported CPEs were mainly *Klebsiella pneumoniae* (24), *Enterobacter cloacae* (1), *Serratia marcescens* (1) and *Klebsiella oxytoca* (1). The carbapenemases involved in *Klebsiella pneumoniae* episodes were Verona integron-encoded metallo-β-lactamase (VIM) (24) and *Klebsiella pneumoniae* carbapenemase 2 (KPC-2) (1). The carbapenemases involved in the three other CPE episodes were VIM. Among 27 reported episodes, at least one site was affected: urinary tract (11), bloodstream (6), surgical site (6), respiratory tract (4), gastrointestinal tract (1) and gynaecological tract (1). Eight episodes had a fatal outcome (case fatality 30%).

Conclusion: Although our results demonstrate that CPE remains rare in Hungary, we strongly emphasise that the healthcare facilities should have an important role in preventing the spread of CPE and curbing the development of widespread resistance by implementing adequate control measures (e.g. reinforcement of standard and contact precautions, contact tracing).

Status: Completed

Output: Poster presentation at international conference<sup>6</sup>

## **Outbreak**

### **Gastroenteritis outbreak in a long-term care facility, February–March 2013, Budapest, Hungary**

Background: On 2 March 2013, the Subregional Public Health Institute Service of District III of Budapest (SPHIS) was informed about a clustering of gastroenteritis (GE) among residents in a long-term care facility (LTCF). SPHIS launched an investigation in collaboration with the National Center for Epidemiology (NCE).

**Methods:** On 3 March 2013, the investigation team visited the LTCF to confirm the existence of the outbreak and assess initial cases, as well as to obtain general information on the facility and common residential areas used by ill residents.

**Results:** Twenty-three (24%) residents and three (12%) healthcare workers (HCWs) met the case definition. Of the affected residents, 21 (91%) were female. All affected HCWs (n=3) were female. 57% of residents were between 80 and 89 years of age. All residents reported diarrhoea and 8 (31%) reported vomiting. The duration of GE ranged from 24 to 96 hours (median 72 hours). Out of 11 stool samples submitted to the NCE laboratory, one resident had a stool sample positive for norovirus, and three residents had a stool sample positive for *C. difficile*. One resident who tested positive for *C. difficile* was hospitalised. All residents who tested positive for *C. difficile* were treated with antibiotics onsite.

**Conclusion:** We presumed that this GE outbreak was caused by norovirus transmitted by person-to-person spread. We recommended that LTCFs should submit stool specimens as early as possible during a suspected gastroenteritis outbreak, ideally from individuals during the acute phase of illness (within 2–3 days of onset).

**Status:** Completed

**Output:** Internal report

## Research

### **Incidence, outcomes and risk factors of acquired bloodstream infections in a neurosurgical intensive care unit in Hungary, 2011–2012**

**Background:** Healthcare-associated bloodstream infection (BSI) is a serious illness with high associated mortality, increased antibiotic use and extra costs. Critically ill patients receiving neurosurgical intensive care are vulnerable to BSIs. In Europe, the largest prevalence study performed in this area was the European Prevalence of Infection Intensive Care (EPIC) study in 2007, but it did not include Neurosurgical Intensive Care Units (NSICUs). In August 2012, the National Centre for Epidemiology received a request for assistance by the National Institute of Neurosciences (NIN). The infection control practitioner of NIN presumed a high burden of BSIs at the institute's NSICU and needed epidemiological evidence to demonstrate the importance of infection prevention and control for the local medical staff and stakeholders. Although laboratory and medical records have been produced over the years (from 2009), no analysis of these data has been performed since the launch of the local surveillance in this institute. We aim at estimating the incidence of BSIs, risk factors and case-fatality ratio among patient admissions to the NSICU of the NIN in Budapest, Hungary.

**Methods:** We will conduct a retrospective cohort study among patients admitted to the NSICU of the National Institute of Neurosciences between 1 January 2011 and 31 December 2012. Data will be obtained from the medical records and the laboratory results of included patients by trained and experienced infection control practitioners using a standard datasheet. Incidence rate will be calculated as the number of BSIs per 100 patients. T-tests and Mann-Whitney tests will be used for the comparison of continuous variables in all groups (e.g. age, type of BSI). Chi-square tests or Fisher's exact test will be performed in case of categorical variables (e.g. diagnosis at admission, Simplified Acute Physiology Score II, presence of invasive medical devices). Univariate relationship between BSI and outcome will be tested using relative risk (RR). Logistic regression will be used for multivariable analysis of associations between BSI occurrence and exposures.

**Status:** Study protocol prepared and submitted to the Ethics Review Board of National Institute of Neurosciences. Study will be implemented after the end of fellowship.

**Output:** Study protocol

## Scientific communication

One National Bulletin article<sup>1</sup>, one submitted manuscript<sup>5</sup>, one oral presentation<sup>4</sup>, three poster presentations<sup>2,3,6</sup>

## Teaching experience

### **Epidemiological methods for point prevalence surveys of healthcare-associated infection**

The courses (16–17, 18–19 and 26–26 April 2012) were designed for infection control personnel participating in the European point prevalence survey of healthcare associated infections (PPS-HAI). This course taught data collection tools and practices, and introduced the PPS-HAI protocol. Rita delivered two presentations and facilitated case studies and computer training sessions.

### **Course on epidemiology and statistical methods for epidemiology**

The course (1–21 June 2012) was designed for professional staff at NCE. The aims of course were to present the principles of infectious disease epidemiology and practice statistical methods. Rita delivered lectures on types of

variables and measures in epidemiology; statistical inference on rates, risks, odds, contingency tables and continuous variables; principles of infectious diseases epidemiology and outbreak investigation. She also facilitated case studies.

### **One-day accredited course on surveillance of healthcare-associated bloodstream infections**

The course (22 January 2013) was designed for hospital infection control personnel (e.g. epidemiologists, microbiologists, nurses). This course aimed to provide up-to-date information on recognition and prevention of bloodstream infections. Rita delivered lectures on the prevention of, and surveillance protocol for, healthcare-associated bloodstream infections. She also facilitated case studies and computer training sessions.

## Miscellaneous

Member of Hungarian Society of Infection Control

## Supervisor's conclusions

During her two-year fellowship at the National Center for Epidemiology, Rita Szabó was involved in numerous activities, e.g. a European-wide surveillance project, outbreak investigations, epidemiological research and teaching. In addition, Rita performed a huge amount of daily operational routine work at the department of hospital epidemiology. Despite this heavy workload, she has succeeded in performing all her EPIET tasks to a very high quality and with a professional attitude.

Rita is a very active, hard-working and constructive colleague, and she also has developed both personally and professionally. A positive attitude to challenges and an open mind towards colleagues make Rita a very qualified team member.

## Next steps

Rita plans to start a PhD fellowship (healthcare associated infections, antimicrobial use and infection control in long-term care facilities).

## References

- <sup>1</sup> Szabó R. Infection prevention and control practices in long-term care facilities – online Bulletin of National Centre for Epidemiology (March 2012). Available from: <http://www.oek.hu/oek.web?nid=1068&pid=1>
- <sup>2</sup> Szabó R, K. Böröcz. The HALT-project in Hungary – Lessons learned and moving forward. Twelfth Congress of the International Federation of Infection Control, Zagreb, Croatia, 10–13 October 2012)
- <sup>3</sup> Szabó R, K. Böröcz. Time for awareness: healthcare associated infections and antimicrobial use in long-term care facilities – Hungary, 2013. European Scientific Conference on Applied Infectious Disease Epidemiology, Stockholm, Sweden, 5–7 November 2013.
- <sup>4</sup> Szabó R, K. Böröcz. After HALT-1: Establishment of surveillance system for LTCFs in Hungary. Joint Annual Meeting of the Antimicrobial Resistance and Healthcare-Associated Infections, Warsaw, Poland, 23–25 November 2011.
- <sup>5</sup> Szabó R, K. Böröcz. Increasing incidence of hospital-acquired bloodstream infections in Hungary – Results from the National Nosocomial Surveillance System, 2005–2012. [Manuscript submitted to Journal of Hospital Infection]
- <sup>6</sup> Szabó R, K. Böröcz, A. Szőnyiné. Healthcare-associated infections due to carbapenemase-producing Enterobacteriaceae in Hungary. Meeting on Emerging Diseases, Vienna, Austria, 15–18 February 2013.