



EPIET REPORT

Summary of work activities

Aleksandra Polkowska

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

Background

Pre-fellowship short biography

Prior to EPIET, Aleksandra Polkowska worked at the National Institute of Public Health – National Institute of Hygiene Warsaw (NIZP-PZH) in the Unit for the Epidemiology of Vaccine-Preventable Diseases, where she coordinated two ECDC projects. After graduation from Warsaw Medical University and a specialisation in emergency medicine followed by a master's degree in public health, she obtained a master's degree in project management from the Warsaw School of Economics.

EPIET assignment

On 19 September 2011, Aleksandra Polkowska was assigned to the Epidemiologic Surveillance and Response Unit, Department of Infectious Disease Surveillance and Control, at the National Institute for Health and Welfare (THL), Helsinki, Finland. Her site supervisor was Outi Lyytikäinen.

Fellowship projects

Surveillance projects

Evaluation of an enhanced communicable disease surveillance system implemented for the European football championship EURO 2012 in Poland^{1,2,3,4}

From 8 June to 1 July 2012, Poland and Ukraine jointly hosted the final round of the European Football Association's (UEFA) European football championship EURO 2012. An enhanced surveillance system for infectious diseases was implemented in Poland for the duration of the tournament. Its aim was to early detect emerging disease outbreaks, unusual patterns of disease and other threats of public health relevance that may require rapid public health actions.

The objectives of the project and report were to describe and evaluate the enhanced surveillance system implemented for EURO 2012 in Poland. The enhanced surveillance system was evaluated in terms of its usability, flexibility, representativeness, timeliness, acceptability and usefulness. Moreover, we analysed data from the

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enhanced surveillance system in order to determine whether EURO 2012 had an impact on the epidemiological situation of infectious diseases in Poland.

The system was considered easy-to-use, flexible, representative, timely and well accepted by stakeholders. No relevant public health events were detected during the championship. Having compared the epidemiological data on 20 selected infectious diseases with data from the previous years, we detected an increase in the number of rotavirus and salmonellosis cases during the tournament. However, the cause of increase was difficult to determine. In conclusion, the enhanced surveillance system met its objectives and created a model that can be replicated for future mass gatherings in Poland.

Enhanced surveillance for infectious diseases should always be considered at mass gatherings. It contributes to the timely monitoring of public health events, the detection of outbreaks and offers public health authorities the option to respond with control measures. For mass gatherings at the international level, the involvement of international public health organisations such as ECDC and WHO should also be taken into consideration. Those organisations provide unique expertise in the surveillance of mass gatherings and can facilitate communication between countries or assist with the evaluation of the international epidemiological situation. Implementing enhanced surveillance during mass gatherings requires additional financial and human resources for operation, which should be addressed during the planning phase.

Status: Completed

Survey on the impact of travel advice for EURO 2012

We posted a survey on UEFA's EURO 2012 Facebook pages in order to evaluate whether public health travel advice, specifically on the importance of measles vaccination, reached spectators at the EURO 2012 championships. Responses suggested that these messages were missed by 77% of fans. Social networks could serve as innovative platforms to conduct surveys, enabling rapid access to target populations at low cost, and could be of use during upcoming mass gatherings such as the Olympics.

Status: Completed

Outbreaks

Outbreak of *Mycoplasma pneumoniae* infection in Finland, 2010–2011⁵

The number of cases of *Mycoplasma pneumoniae* infection detected by laboratory-based surveillance increased in Finland in late 2010. During 2011, the number of cases was four times higher than during the previous epidemic in 2005. The 2011 epidemic affected mostly school-age children. The increased number of cases was probably not due to changes in laboratory procedures, but public interest may have had an effect, since the number of Google queries closely followed the epidemic curve.

Status: Completed

Outbreak of gastroenteritis caused by norovirus GII.4 Sydney variant after a wedding reception at a resort, Finland, August 2012^{6,7,8}

On 20 August 2012, a municipality notified the National Institute for Health and Welfare (THL) of an outbreak of gastroenteritis among guests of a reception in a resort. We investigated the outbreak to identify the agent and source of the infection, and to recommend control measures.

We defined a case as a guest who developed at least one of the following symptoms: diarrhoea, vomiting, nausea or abdominal pain between 18–21 August 2012. We surveyed guests with email addresses in order to collect information on food and beverage consumption and symptoms. We described cases by time, place and person and compared exposed with unexposed in terms of incidence, using risk ratios with 95% confidence intervals. We collected stool specimens from guests, customer service employees and the environment to be tested for gastroenteritis-causing pathogens.

Of 54 guests, 72% responded. Of those, we identified 23 cases (attack rate: 43%, 65% females, median age: 34, 9% hospitalised), with the highest attack rate among persons 20–30 years of age (71%). Cases started to occur on 19 August, peaked on 20 August and ended on 21 August. No food items or beverage served was associated with disease. Two of the five stool specimens and 10 of the 36 specimens from surfaces yielded norovirus GII.4. Genotyping of norovirus RNA from 5 norovirus-(NoV)-positive samples revealed the new norovirus GII.4 Sydney variant.

Epidemiological, laboratory and environmental investigation suggested that this outbreak occurred in the context of environmental contamination with NoV. After cleaning, disinfection with hypochlorite solution in accordance with THL guidelines and one week of closure, the resort reported no new cases.

Status: Completed

Research

Impact of *Mycoplasma pneumoniae* epidemics on pneumonia-associated hospitalisations and macrolide consumption, Finland, 1996–2011^{9,10}

Mycoplasma pneumoniae (MP) is a common cause of community-acquired pneumonia. The epidemics in Nordic countries were consistent with 3–5-year interval cycles. To evaluate the burden of the 2010–2011 wave of MP infections, we measured the impact of MP epidemics on pneumonia-associated hospitalisations and macrolide/doxycycline consumption.

We analysed time-series data using (1) laboratory-confirmed cases of respiratory pathogens reported to the National Infectious Diseases Register (1995–2011), (2) ICD-10 code-defined weekly pneumonia-associated hospitalisations by age group from the National Hospital Discharge Registry (1996–2010), and (3) monthly consumption of macrolides/doxycycline from the Finnish Medicines Agency (defined daily dose/1 000/day, 1997–2011). To examine the association between MP cases and pneumonia-associated hospitalisations, we modelled data using negative binomial regression. To examine the association between the logarithm of antimicrobial consumption and MP cases, we built a linear regression model with Newey-West standard error estimates. We adjusted both models using linear trend (quadratic), sinusoidal long-term cycles, monthly indicator, and incidence of other respiratory pathogens.

In 1995–2011, the overall mean reported rate was 26 cases per 100 000; it was highest among 5–14-years-olds (69 per 100 000). Pneumonia-associated hospitalisations among those aged 5–14 (incidence rate ratio (IRR) 1.009; p-value (P)=0.01) and 15–64 (IRR 1.003; P=0.02) years old were associated with MP cases. However, rates of pneumonia-associated hospitalisations were not higher during epidemics. The mean macrolides/doxycycline consumption increased from 4.7 DDD/1 000/day in 1997–2010 to 5.04 in 2011, with a marginal overall impact of epidemics on consumption (IRR 1.02; confidence interval 1.01–1.03).

M. pneumoniae caused mainly mild disease and the results of our analysis suggest that the recent epidemics were well managed, without overuse of antibiotics and excess in hospitalisation. We recommend time series analyses and the use of a combined surveillance database for public health impact assessment.

Status: Completed

Epidemiology of meningitis in Finland, 1995–2011¹¹

Finland introduced *Haemophilus influenzae* type b (Hib) conjugate vaccine to the national childhood vaccination programme in 1993; pneumococcal conjugate vaccine (PCV) was added in 2010. We described the epidemiology and trends in incidence of bacterial meningitis in Finland (1995–2012).

We defined bacterial meningitis as the presence of *Streptococcus pneumoniae*, *Neisseria meningitidis*, *Streptococcus agalactiae*, *Listeria monocytogenes* or *Haemophilus influenzae* in cerebrospinal fluid (CSF). We analysed laboratory-based surveillance data from the National Infectious Disease Register (NIDR, 1995–2012) and data on isolates from the reference laboratory (2002–2012). To evaluate trends, we calculated pathogen- and age-specific annual rates. We estimated case fatality proportions within 30 days of sampling date using data from NIDR (2004–2012). We tested possible changes in rates (Poisson regression), case fatality (chi-square) and age distribution of cases (Wilcoxon rank-sum). We calculated proportion of bacterial meningitis caused by vaccine-preventable serotypes (10-valent PCV, 4-valent meningococcal vaccine, Hib vaccine).

Streptococcus pneumoniae and *Neisseria meningitidis* accounted for 80% of 1 249 bacterial meningitis cases. In 1995–2012, annual rates ranged from 1.8 to 0.7/100 000, with a relative annual decrease in trend overall (4%; 95% confidence interval (CI) 3–5%) and for *Neisseria meningitidis* (9%; 95% CI: 7–11%), *Listeria monocytogenes* (4%; 95% CI: 1–8%), *Streptococcus pneumoniae* (2%; 95% CI: 1–3%). The mean age of cases rose from 33 years in 1995–2003 to 37 years in 2004–2012 (p<0.05). In 2004–2012, estimated case fatality ranged from 7 to 16% (overall: 12%), without trend. In 2012, vaccine-preventable serotypes of *Haemophilus influenzae*, pneumococcus and meningococcus accounted for 0%, 46% and 17% of cases, respectively.

Rates of bacterial meningitis decreased over time and affected older people, while the case fatality rate remained unchanged. Vaccination already prevented many cases, but meningococcal vaccine could further reduce the burden of bacterial meningitis in the future

Status: Data analysis completed

Scientific communication

- Two oral presentations at ESCAIDE 2012, Edinburgh, Scotland⁸, one at TEPHINET 2012, Amman, Jordan⁹, and one at ESCAIDE 2013, Stockholm, Sweden²
- Two manuscripts published^{3,5} and one additional manuscript submitted.
- Third author of a poster, ESCAIDE 2012⁴

- Conducted reviews for peer review journals under the supervision of training site supervisor/EPIET coordinator:
 - Epidemiology and Infection (n=1)
 - Journal of Tropical Pediatrics (n=1)
 - Transactions of the Royal Society of Tropical Medicine and Hygiene (n=1)
 - Eurosurveillance (n=2)

Teaching experience

Essentials of infectious disease epidemiology, School of Public Health, University of Tampere

From 13 to 17 February 2012, Aleksandra taught an introductory course on the principles of infectious disease for students of epidemiology at the postgraduate and master's levels at the University of Tampere. The lectures provided both theoretical background and practical examples (studies). She also lectured on cohort and case-control studies and facilitated five case studies (in English).

International mission

Evaluation of an enhanced communicable diseases surveillance system implemented for the European Championship EURO 2012 in Poland

See section 'Surveillance projects' ^{1,2,3,4}

Status: Completed

Miscellaneous

Organization of the 'Nordic mini project review' in Helsinki

Status: Completed

International assignment

Hantavirus: Prevention measures and communication strategies in Europe^{12,13}

Between 2000 and 2012, the annual number of reported human hantavirus infections increased in Europe. We described preventive measures for hantavirus transmission, including communication strategies and impact assessment studies.

We first reviewed the literature to gather evidence on published preventive measures and communication strategies related to hantavirus infections in Europe between 2000 and 2012. We then used structured questionnaires to interview over the phone laboratory experts from the European Network for Diagnostics of Imported Viral Diseases and public health officers from 29 European countries who notified at least one case of hantavirus infection since 2005.

The literature review identified eight articles focusing on preventive measures, one of which reported on communication strategies. No publication studied effectiveness or acceptability of preventive measures.

The telephone survey indicated that 26 of 29 countries (90%) provided institutional information on preventive measures that focused on the animal reservoir (rodent control) and/or human/environmental aspects (e.g. how to avoid exposure to rodents, how to clean up utility rooms). Twenty-seven countries (93%) had a policy to communicate preventive measures through a variety of media in case of an outbreak; eight of these countries (28%) also provided information on a regular basis before outbreaks. Three countries (10%) assessed the impact of preventive measures, communication strategies, or studied awareness/knowledge about hantavirus infections.

Although most European countries inform the public on preventive measures, the recommended preventive measures are not based on evidence and their impact on the incidence of hantavirus infection has not been assessed. Evidence-based practices may improve the control of hantavirus infections in Europe.

There is a clear need for impact assessment studies on the currently recommended preventive measures and communication strategies for hantavirus transmission in Europe.

Status: Report drafted, abstract for a conference accepted as an oral presentation

Supervisor's conclusion

During the two-year fellowship at THL Aleksandra Polkowska was involved in a large variety of public health activities, e.g. outbreak investigations, surveillance, descriptive and analytical epidemiology and research, as described in the list of core competencies of the EPIET programme. Her projects all led to excellent outcomes. Aleksandra developed both personally and professionally during the fellowship; she solved given tasks in a highly competent way, with an increasing degree of independence, but at the same time seeking assistance as appropriate. A positive attitude to challenges and an open mind towards the ideas of her colleagues made Aleksandra an excellent team player. Based on her personal and professional skills, we can highly recommend Aleksandra Polkowska for any kind of public health work.

Next steps

After graduation, Aleksandra Polkowska plans to go back to Poland and apply for a PhD and a grant.

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