EPIET REPORT

Summary of work activities

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

Background

Pre-fellowship short biography

Andrea Kološová graduated from Medical University in Bratislava in 1996. She has been working for the Regional Public Health Authority in Komárno, Slovakia, as an epidemiologist since January 2007.

EPIET assignment

In September 2011, Andrea Kološová was assigned as an EPIET Member State track fellow at the institute she was working at (Department of Epidemiology of the Regional Public Health Authority in Komárno, Slovakia). Since her supervisor was based at the Regional Public Health Authority in Banská Bystrica, Slovakia, she collaborated also with this institute and with the National Public Health Authority of the Slovak Republic in Bratislava.

Fellowship projects

Surveillance project

Surveillance of hospital-acquired infections in a regional hospital; estimation of the real burden of disease by using the capture–recapture method

The notification of hospital-acquired infections (HAIs) is mandatory in Slovakia. Despite this, the proportion of patients with identified HAIs among hospitalised patients is very low (from 0.3 to 0.7%) compared with the European average of 7.1%. We performed a study to estimate the real burden of HAIs in Komárno General Hospital in between 2008 and 2010. We decided to use capture–recapture method (two information sources). The first source was based on the notification data from the hospital. Only laboratory-confirmed cases caused by multidrug-resistant strains were included (104 cases). The second source was cases identified by positive MDR strain cultures as identified by a microbiological laboratory, with further active case finding performed by a local epidemiological team (60 cases). We estimated the actual burden of disease at 312 cases (2.2 % of all hospitalised patients). The sensitivity of the hospital's system was 33% (lab-based system: 19.2%). The study results indicate that the surveillance system for HAIs is weak and needs to be improved.

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Status: completed

Other activities: In her two years at the EPIET training site, the fellow was involved in the surveillance of infectious diseases, performed passive and active surveillance, carried out data collection, entered data into the national surveillance system EPIS-SK (web-based system), and performed analytical tasks. The results were published in 2011 and 2012 in the annual epidemiological report of Komárno district [2] [3].

Outbreak

***Salmonella* Enteritis outbreak associated with contaminated eggs in Slovakia, May 2012** [1]

Background: On 21 May 2012, the Regional Public Health Authority in Komárno was notified of an increase in the number of *Salmonella* cases. We investigated the outbreak to estimate its magnitude, identify the source of infection and implement control measures.

Methods: We conducted a retrospective cohort study among children and teachers from a school. We collected information on food consumption and symptoms. Probable cases were those attending the canteen who reported at least three watery diarrhoea or three loose stools and fever or vomiting between 10 and 21 May. Cases were confirmed by *Samonella* detection in rectal swabs. We calculated attack rates (AR) and risk ratios (RRs) with 95% confidence intervals (CIs) and by logistic regression, odds ratios (ORs) with 95% CIs for relevant items. We conducted an environmental investigation.

Results: Of 721 persons approached, 695 (616 children, 79 teachers) participated (96.3%). We identified 43 cases: 41 children (12 confirmed) and 2 teachers (none confirmed) for an AR of 6.4%. The median age for cases who were children was 9 (range: 3–15). Cases reported the following symptoms: diarrhoea (100%), vomiting (55.8%) and fever (23.3 %). Four children were hospitalised, no deaths were reported. Compared with others, those who consumed fried fish (66%) and spinach soup with scrambled eggs (55%) were 4.6 (95% CI: 1.7–13) and 2.4 times (95% CI: 1.2–4.7) more likely to become ill. In a multivariate analysis, only fried fish was associated with illness (OR=6.5; 95% CI 1.2–35). No fried fish was available for analysis. *Salmonella* enteritidis was isolated on the shells of the eggs that had been used for the batter. We detected non-compliance (e.g. undercooking, lack of surface differentiation with hazard analysis and critical contact points.) Swabs from kitchen staff were all negative. Eggs were traced back, a ban on the sale was declared, and *Salmonella* were confirmed at a farm.

Conclusion: Cooking with contaminated eggs and a breach of hygiene regulations caused this outbreak; fried fish was the vehicle. Strict adherence to good manufacturing practises is necessary to prevent the spread of infections.

Status: completed

Research projects

Main factors leading to vaccine refusal among parents and future parents in Slovakia

Study protocol

Background and justification. Vaccination is one of the most important measures to prevent the spread of infections in children and adults. Regular vaccination schedules were established in the 1940s in Slovakia. Since then, vaccines have become safer and vaccination schedules are more effective. Vaccination against pertussis, diphtheria, tetanus, hepatitis B, poliomyelitis, invasive pneumococcal diseases, invasive diseases caused by *Hemophilus influenzae B*, measles, mumps, and rubella is mandatory. Thanks to this system, vaccine coverage is more than 95% for each type of vaccine included in the mandatory system in Slovakia. Over the last years, the number of parents who refuse to vaccinate their children has increased. These parents usually consider vaccinations as unnecessary or even harmful. This could endanger herd immunity.

Objectives:

- Identify the major factors leading to parental vaccine refusal and maintain the high vaccination coverage in Slovakia.
- Find the best methods of intervention to maintain the high vaccine coverage in Slovakia.

Methods: We will investigate 2 groups of respondents: group 1 – future parents (female students of secondary schools) and group 2 – current parents (attending paediatricians' offices).

We will use a self-administrated questionnaire distributed by public health workers.

Outcome: Attitude to vaccination and decision about vaccination in case of voluntary vaccination

Sample: We decided to perform the investigation among two groups: a group of future parents (students of secondary schools) and a group of current parents (interviewed in paediatricians' offices). We decided to have 95% CI, precision 5, design effect 2. Each group consisted of 1000 respondents.

Group 1 – future parents: Cluster sampling. During stage one, the national coordinator will randomly choose schools from the national registry; selection of schools will be representative of the size of the district. During the second stage, regional investigators will randomly select one grade from one of the schools selected during the first stage (there is no national register, so selection will have to be done at the regional level). During the third stage, 10 female respondents will be selected form each target grade through simple random sampling. If a selected grade has fewer than 10 girls, another grade will be chosen. A cluster will then consist of two grades.

Group 2 – current parents (parents attending paediatricians' offices). The national coordinator will preselect a number of paediatricians' offices for each district and in proportion to the size of the districts. The final selection of paediatricians' offices for each district will be done by staff performing the investigation because the national registry of paediatricians' offices cannot be accessed by the coordinators. Investigations should be conducted within one day. The first five mothers attending the paediatrician's office on that day will be interviewed.

Study design – prevalence study (cross sectional), two groups of population

Data analysis plan

Outcome 1: attitude to vaccination: positive/negative

Outcome 2: decision whether to vaccinate (if decision was voluntary)

Description: Univariate and multivariable analysis will be used to examine the association between outcomes and variables. We will compare attitudes among different groups, using weighted logistic regression, weighted binomial regression.

Limitations: Mothers who refuse vaccination most often lean towards alternative medicine and rarely see a physician.

Status: completed, communication

Abstract

Attitudes toward vaccination of current and future parents in Slovakia

Background: Slovakia introduced regular vaccination schedules in the 1940s. The vaccination against 10 infectious diseases (pertussis, diphtheria, tetanus, hepatitis B, poliomyelitis, invasive pneumococcal diseases, invasive diseases caused by *Hemophilus influenzae B*, measles, mumps and rubella) is mandatory. This system ensured that vaccine coverage was high in Slovakia. Over the last years, the number of parents who refuse to vaccinate their children has increased.

Methods: We interviewed two groups of respondents selected by cluster sampling, future parents (female secondary school students) and current parents (attending paediatricians´ offices) by using a self-administrated questionnaire. We were looking for the weighted proportion of respondents with a negative attitude toward vaccination and main factors contributing to their attitude using univariate and multivariate analyses (logistic regression).

Results: We included 1021 students and 1070 parents. The proportion of students who refuse vaccination was 8.4% (95% CI=6.6–10.6), and 10.9% (95% CI=8.6–13.7) in current parents. The main factor leading to a negative attitude in both groups was a personal belief about the adverse effects of immunisation, for example fever or allergic reactions (parents OR: 18.4, 95% CI= 6–57, students OR: 3.7 95% CI=1.8–7.7). The second most important factor was related to personally communicating with people who find vaccination harmful (lectures: OR 5.2, 95% CI 2.5–10.9 for parents, negative opinion of a friend or relative: OR 2.9, 95% CI 1.5–5.5 for students). The knowledge of infectious diseases was generally weak; only 25% (95% CI 21.4–29.9) of students and 39% (95% CI 35–43.3) of parents knew that measles carries a risk in terms of possible harmful consequences or death.

Conclusion and recommendation: Poor knowledge of infectious diseases and vaccination in conjunction with personal experience with negative views can endanger vaccination goals. Further education, thorough meetings and discussions, is essential in order to ensure high vaccine coverage.

Point prevalence study of hospital-acquired infections (HAIs) in Komárno General Hospital

The aim of the study was to estimate the real burden of HAIs in hospitals and collect data on the prescription practices for antibiotics. The investigation was conducted in accordance with the study protocol provided by ECDC; HAI definitions were taken from the standard definitions included in the ECDC protocol. 165 patient documents were investigated to identify potential HAIs. Only three HAIs were confirmed (1.81% of hospitalised patients), most likely because of the very strict standard case definition. Forty-two (25.45%) patients were using antibiotics. The majority of patients with antibiotics were hospitalised at a surgical ward, and the most common antibiotic was ciprofloxacin.

Scientific communication

Oral [1]; one manuscript submitted [2]

Teaching experience

- Vaccination: course for nurses, September 2012,
- Crisis communication guidelines and crisis plan: teaching the staff of Regional Public Health Authority
- Outbreak investigation: strong evidence, Slovak Medical University, February 2013, young epidemiologist, students
- PROHIBIT: introduction to the project, study protocol, FAQs, meeting of Slovakian working group members, October 2011

Supervisor's conclusions

During her two-year fellowship, Andrea Kološová was involved in a many public health activities in Slovakia, both at the local and national level. She worked on an important research project at the national level entitled 'The value of vaccination: The main risk factors leading to vaccine refusal among parents and future parents in Slovakia'. The fellow co-operated with epidemiologists from 35 regional public health authorities in Slovakia. Results from the study were used to support the National Immunisation Programme in Slovakia. Andrea has developed both personally and professionally during the fellowship. She has solved many outbreaks, two of which were very serious (salmonellosis, viral hepatitis B and C). Experiences from her fellowship have increased her skills, abilities and knowledge, which helped her to solve many other public health problems.

Next steps

Andrea Kološová will remain an employee of the Regional Public Health Authority in Komárno. She would like to continue her work at this institute and collaborate with the National Public Health Authority and Slovak Medical University.

List of publications and communications

1. Kološova A, Avdičová M. *Salmonella* enteritis outbreak associated with contaminated eggs. In: ESCAIDE 2012 abstract book, 2012, p. 25.
2. Kološova A. Outbreak of gastroenteritis caused by *Salmonella* enteritis associated with contaminated eggs in one school canteen in Slovakia 2012 [submitted to Eurosurveillance].
3. Kološová A, Tóthová R, Uríčková H, Masárová D, Kičková M. Annual report of the Regional Public Health Authority in Komárno 2011, Epidemiology, 2012, p. 2-102.
4. Kološová A, Tóthová R, Kičková M. Annual report of the Regional Public Health Authority in Komárno district 2012, Epidemiology, 2013, p. 2-112.