



EPIET REPORT

Summary of work activities

Indra Linina

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

Background

Pre-fellowship short biography

Indra Linina has a master degree in Public Health. Prior to EPIET, she worked in public health for eight years, starting with a position at the regional office of epidemiology in Latvia, where she worked on surveillance and outbreak investigation. In 2005, she moved to the national level and worked on emergency preparedness and response.

EPIET assignment

In September 2011, Indra became an EPIET fellow at the Scientific Institute of Public Health in Belgium. She was placed in the unit of Epidemiology of Infectious diseases, under the main supervision of Dr Sophie Quoilin (epidemiology) and Prof Dr Koen De Schrijver (outbreak investigation).

Fellowship projects

Surveillance project

Data analysis of hepatitis B cases, reported by the sentinel laboratory network, 2007–2011

Background: Between 2007 and 2011, a threefold increase in hepatitis B cases was reported by the Sentinel Laboratory Surveillance System in Belgium, contrary to an otherwise declining trend in Europe. We described the hepatitis B cases reported in Belgium from January 2007 to December 2011, and looked into potential changes in screening and reporting practices to explore reasons for the unexpected increase.

Methods: We used data on hepatitis B in Belgium from the sentinel laboratory surveillance system. We visited laboratories to explore their diagnostic methods. We calculated incidence using relevant 2009–2010 mid-year population estimates as denominators and risk ratios (RR) to compare incidences in different groups. We subsequently conducted subanalyses by geographical location and sentinel laboratory and described laboratory methods used for hepatitis B diagnosis.

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Results: The annual number of hepatitis B infections in Belgium gradually increased from 298 (2.7/100 000) in 2007 to 798 (7.4/100 000) in 2011. The largest increase of cases was observed in Brussels, with the incidence increasing from 7.5/100 000 in 2007 to 41/100 000 in 2011. The number of hepatitis B cases reported from one single laboratory in Brussels increased by 10% (2009) and 23% (2010). During 2007–2008, serological testing was most commonly used by all laboratories participating in the sentinel surveillance network. However, since 2009, there has been a 29% increase of reports of hepatitis B cases diagnosed using molecular methods from one laboratory in Brussels.

Conclusions: The apparent increase of hepatitis B incidence in Belgium between 2007 and 2011 was due to the introduction of molecular testing methods. The findings highlight the importance of validating surveillance data, investigating potential changes in reporting practices, and improving surveillance attributes.

Status: Almost completed

Output: Internal report, manuscript in progress [1]

Epidemic intelligences activities during the Euro 2012 in Poland and Ukraine

Introduction: Approximately two million people visited Poland and Ukraine during the UEFA European football championship (EURO 2012). To detect and assess potential health threats in this mass gathering setting, the European Centre for Disease Prevention and Control (ECDC) implemented tailored epidemic intelligence activities including event-based surveillance (EBS) of web information in collaboration with EpiNorth and the two hosting countries.

Methods: Based on previous experiences, we customised several web-based EBS systems (MedISys, HealthMap, PULS and GPHIN) for automatic selection of official and unofficial public health information relevant for EURO 2012; EpiNorth provided additional daily screening results from websites run by official authorities of the hosting, participating and bordering countries. We filtered information using pre-defined criteria, shared relevant events with the hosting countries, WHO and EpiNorth network for validation or further assessment, and included a daily summary in 24 ECDC bulletins.

Results: We filtered 114 events screened by the EBS web systems. Of these, 76 (67%) were related to hosting countries (58/76 to Ukraine), 30 (26%) to participating countries, and 8 (7%) to other bordering countries. Of the 76 events recorded in the hosting countries, we evaluated and validated 39 potential public health threats with implications for these countries and a further 11 events because of the public health threat they could pose to visitors/participants. Our analysis showed that none represented a major public health threat for the EURO 2012 tournament.

Conclusions: Continuous monitoring and assessment of an increased flow of media information by EBS web-systems or other public health information channels did not lead to the identification of any major public health threats. Web-based EBS activities provided real-time information on potential public health threats and countermeasures in place during the mass gathering. Based on our experiences with EURO 2012 and previous mass gatherings, we suggest that multiple ESB web-systems should be used in addition to standard disease surveillance.

Status: Completed

Output: Oral presentation at the International Meeting on Emerging Diseases and Surveillance, Vienna 2013 [2]

Building a surveillance system for congenital infectious diseases in Belgium

Surveillance of congenital infectious diseases among pregnant women in Belgium aims to describe the importance of diseases in order to formulate recommendations and to obtain good screening practices. We aim to estimate the frequency of seropositive pregnant women for syphilis, rubella, toxoplasmosis, CMV, Parvo virus 19 (and other listed diseases) to assess whether: (i) congenital infectious diseases constitute a public health problem in Belgium and (ii) the screening practices are adapted to the current epidemiological situation.

Status: Study protocol drafted

Outbreaks

Increase of hantavirus cases hospitalised in Dinant hospital, 2011–2012

In July 2012, the hospital in Dinant alerted the health inspectorate of the French community about an increase of hantavirus cases hospitalised with severe disease. Based on data from the sentinel laboratory network, the number of cases observed in the region of Dinant was higher than in previous years, while the total number of cases for the country did not indicate any epidemiological changes. We planned to describe hantavirus cases hospitalised in Dinant hospital between 2011–2012 by time, place, person and clinical picture and identify potential risk factors of infection.

Status: Study protocol drafted; study was not approved by the hospital committee.

Gastrointestinal infection outbreak after a community dining event in Lier, 22–23 September 2012

Background: On 28 September 2012, the Food Agency of Antwerp reported an outbreak of gastroenteritis among people who attended a community dining event in Lier. We conducted a case-control study to identify the source of infection.

Methods: We defined a case as a person who attended the community dining event between 22–23 September 2012 and developed diarrhoea, nausea or vomiting. We selected controls among persons who attended the same event during the same period and did not develop symptoms of gastrointestinal infection. We conducted telephone interviews using a standardised questionnaire to obtain information on symptoms and food consumption. We calculated odds ratios (ORs) and 95% confidence intervals (95% CI).

Results: Of the 35 participants, 22 met the case definition. Seven (32%) cases visited a medical doctor; microbiological investigations were performed in one case. Cases were more likely to have eaten mayonnaise (OR=3.6; 95% CI 0.50–28) than controls. Laboratory tests of one case and the four persons involved in food preparation and service were negative for bacteria.

Conclusions: It was not possible to identify the source and vehicle of infection in this outbreak. Because of the small sample size and the poor power of study, results should be interpreted with caution. We recommended that high hygienic standards should be set during food preparation for private events.

Status: Completed

Output: Outbreak investigation report, report published at the regional epidemiological bulletin [3]

Outbreak of gastroenteritis after family dinner in restaurant 'X' on 30 September 2012

Background: On 8 October 2012, the Antwerp Food Agency reported an outbreak of gastroenteritis among members of one family who participated in a family dinner in restaurant 'X' on 30 September 2012. We investigated the outbreak to estimate the extent and identify the mode and vehicle of transmission in order to stop the transmission and recommend appropriate control measures.

Methods: We conducted a retrospective cohort study. We defined a case as a person who participated in the family dinner in the specific restaurant on 30 September 2012 and developed symptoms of gastrointestinal infection (vomiting or nausea or diarrhoea) between 1 and 7 October 2012.

Results: We interviewed 10 (77%) of the 13 family members that attended the dinner. The risk of the disease among those who consumed a kiwi drink served as aperitif and made by staff members of the restaurant was higher (RR 2.00; 95% CI 0.33–11). Other food items including sushi with raw salmon (RR 1.50, 95% CI 0.47–7.4), smoked salmon (RR 1.2, 95% CI 0.37–3.7) and baked salmon (RR 1.4, 95% CI: 0.45–4.2) did not significantly increase the risk of infection. All microbiological testing of food items was negative. The general hygiene conditions in the kitchen were evaluated as insufficient.

Conclusions: Neither the epidemiological nor the microbiological information indicated a clear vehicle of infection in this small family outbreak. We recommended reinforcing good hygienic practices for the staff of the restaurant and the use of hazard analysis and critical control point (HACCP) principles in food preparation.

Status: Completed

Output: Outbreak report

Research

Mumps outbreak among university students, Flanders 2012–2013: evidence of poor vaccine effectiveness in this cohort

Introduction: The current increase in mumps notifications in Belgium is mainly affecting young adults; 68% of this affected received two doses of measles-mumps-rubella (MMR) vaccine. We conducted a retrospective cohort study at one of the most affected universities, the Catholic University of Leuven, to estimate incidence, calculate MMR vaccine effectiveness, and detect potential risk factors.

Methods: We defined a case as anyone with self-reported parotitis between September 2012 and March 2013. We distributed web-based questionnaires to a random sample of students. We calculated the two-dose vaccine effectiveness by comparing the risk for measles in students who were vaccinated twice with those who were vaccinated only once (based on vaccination records). We estimated risk ratios (RR) to identify risk factors. Information on circulating genotypes was collected from the National Reference Centre.

Results: Of the 765 participants, 47 (6%; 95% CI 4%–8%) met the case-definition; all reported being vaccinated with at least one MMR dose. The two-dose vaccine effectiveness was 69% (95% CI -24%–92%). Students vaccinated within the last 10 years were less likely (RR 0.33; 95% CI 0.11–1.0) to develop mumps. The risk of mumps was higher (RR 3.6, 95% CI 1.8–7.0) among the nine cases working in a bar. All 16 samples collected at the Catholic University of Leuven were genotype G5.

Conclusions: Incidence of self-reported mumps was high in this vaccinated population. The lower risk of mumps in students that were more recently vaccinated suggests that vaccine effectiveness may be waning over time. Ensuring a high two-dose vaccination coverage remains important, although reasons for low vaccine effectiveness should be further explored. As the risk of mumps was higher in students working in a bar, we recommend that advice should be given to cases on avoiding social activities whilst infectious.

Status: Completed

Outputs: Poster presentation at ESCAIDE 2013 [4]; article submitted [5]

Can climatic factors explain hantavirus incidence variation in Belgium?

Introduction: Hantavirus infection is endemic in Belgium, with annual case reporting through a sentinel laboratory surveillance network since the 1995–96 outbreak. We conducted a study to describe the epidemiology of the disease and explore the potential impact of climatic conditions on the incidence of hantavirus infection.

Methods: We analysed time-series data of laboratory-confirmed hantavirus cases and data on temperature and humidity in Belgium between 1996 and 2012. We calculated incidence using mid-year population estimates as denominators. We estimated correlation coefficients to examine the association between hantavirus cases and climatic factors.

Results: In 1996–2012, the overall mean reported incidence was two cases/100 000, with a mean annual rate of 3.9/100 000 in the Walloon Region and 0.4/100 000 and 1.4/100 000 in the Flanders and Brussels Regions, respectively. Incidence in males was 2.4 (95% CI 2.2–2.6) times higher than that in females. 34% of cases occurred from May to September. Incidence of hantavirus was positively correlated ($r=0.71$) with the summer temperatures measured two years before the occurrence of the cases.

Conclusions: The incidence of hantavirus in Belgium may be affected by climatic factors. Variations in climatic conditions could be used in surveillance of hantavirus infection as an early warning indicator to predict high-epidemic years.

Status: completed

Output: Oral communication at an international conference: 'Environment and health – bridging south, north, east and west', 2013 [6]

Scientific communication

- One outbreak report published at the regional epidemiological bulletin (first author) [3].
- One oral presentation at an international conference: 'Environment and health – bridging south, north, east and west', Basel, 19–23 August 2013 (first author) [6].
- One oral communication at the International Meeting on Emerging Diseases and Surveillance, Vienna, 15–18 February 2013 (second author) [2]
- One poster presentation at ESCAIDE 2013 (first author) [4]
- Two manuscripts in progress [1, 5]

Teaching experience

Outbreak investigation course

I organised a course on outbreak investigation, delivered a lecture on the same topic (150 min) and facilitated one case-study (three groups, 2.5 hrs per group) for Master of Science students (infectious disease epidemiology) at Riga Stradins University, Faculty of Public Health, 13–15 November 2012.

Status: Completed

Output: Evaluation report

Course in epidemiology

I facilitated two case-studies ('Gastroenteritis outbreak in Sweden' and 'Tampons and toxic shock syndrome') during an epidemiology course at the Scientific Institute of Public Health, Brussels, 17–24 September 2013.

Status: Completed

International missions

ECDC, Sweden, surveillance activities during EURO 2012, 4–29 June 2012

Surveillance project (see above)

Supervisor's conclusions

During her two-year fellowship at the Scientific Institute of Public Health, Indra Linina was involved in the daily activities of the unit for the Epidemiology of Infectious Diseases where she worked with various types of infectious diseases, ranging from rodent-borne to vaccine-preventable diseases, conducting epidemiological research. In order to experience all aspects of public health activities, she worked together with a health inspector at the regional level, carrying out field work in infection control. Indra was always keen to participate in, and learn from, all activities of the unit and shared with the team what she learned at EPIET. Indra benefited greatly from her fellowship and will certainly contribute to the development of the European public health community both nationally when back in Latvia and internationally through her many contacts to international networks.

Next steps

Indra will return to Latvia and work at the Emergency Preparedness and Emergency Medical Service in Riga on the coordination and preparedness for health crises; she will also be involved in work related to the International Health Regulations.

References

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3. Linina I, Broos B, De Schrijver K, Gastro-enteritis uitbraak na een parochiediner in Lier, provincie Antwerpen, 2012. Available from: <http://www.zorg-en-gezondheid.be/Publicaties/Publicaties-ziektes/#Infectieziekten>
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6. Linina I, Berger N. Can climatic factors explain hantavirus incidence variation in Belgium? Oral presentation at the international conference on 'Environment and health – bridging south, north, east and west'. Basel, 19–23 August 2013, first author.