



FELLOWSHIP REPORT

Summary of work activities

Cristina Valencia

Intervention Epidemiology path (EPIET)

Cohort 2014

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 EPIET scientific guide¹.

Pre-fellowship short biography

Cristina Valencia holds a Master of Public Health (MPH) as well as a Master of Science in Epidemiology. Prior to EPIET, she worked for 2 years as an epidemiologist at Novartis vaccines in Amsterdam in which she focused on vaccine preventable diseases (primarily Meningitis B, Group B Streptococcus and Influenza).

Having obtained a BSc. in Biology and Biostatistics at Boston College, she followed a two year research internship at Harvard Medical School where she focused on the effects of atrial fibrillation as a contributing factor to atrial arrhythmias.

Cristina's dedication to the field has taken her to countries such as Ecuador, Tanzania, and India, where she has undertaken different projects related to infectious disease epidemiology. She is an advocate for the development of a public and private partnership consortium within the healthcare industry, and has worked collaboratively with the Amsterdam Institute for Global Health and Development (AIGHD) and with PharmAccess.

Fellowship assignment: Intervention Epidemiology path (EPIET)

On the 15 September 2014, the EPIET selection committee placed Cristina Valencia at the Wetenschappelijk Instituut Volksgezondheid - l'Institut Scientifique de Santé Publique (WIV-ISP) in Brussels, Belgium. She was assigned to the department of healthcare associated infections and antibiotic resistance, and was directly supervised by Dr. Marie-Laurence Lambert and Dr. Naima Hammami.

This is the first year that this department hosts an EPIET fellow; previous fellows that have been assigned to this institute have worked under the supervision of Dr. Sophie Quoilin in the department of infectious diseases in the community.

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 European Centre for Disease Prevention and Control. European public health training programme. Stockholm: ECDC; 2013. Available from: http://ecdc.europa.eu/en/epiet/Documents/Scientific%20guides/EPIET%20Scientific%20Guide_C2016.pdf

1. Surveillance

Title: Surveillance of Clostridium Difficile infections (CDIs) in Belgian Hospitals

Background

Clostridium difficile infection (CDI) is a major cause of diarrhoea and pseudomembranous colitis in both acute and chronic healthcare institutions. An increase in incidence has been reported in many countries across the world over the last decade. This increase has been attributed to a number of factors: the rising use of certain antibiotics, an increase in the population at risk (older people) and the emergence of CDI hypervirulent strains

Methods

We analyzed the different sources of available data concerning the epidemiology of CDI in Belgium: national surveillance in hospitals (2008-2015), including data from the national reference laboratory (NRC), hospital stays (RHM/MZG 1999-2013) and death registration data (1998-2013).

Results

Hospital participation remained high, with 140 hospitals participating at least one semester and reporting a cumulative number of 2975 episodes. The median number of reported episodes per hospital, per semester was 9 (maximum 62, minimum 0). For 60% of these episodes, onset of symptoms was 2 days or more after admission in the reporting hospital (definition of hospital-associated CDI, HA CDI). Episodes of HA-CDI were mainly diagnosed in the geriatrics department (49%), intensive care unit (9%), and onco-haematology (9%) (these figures exclude 20% for whom department of diagnosis was not recorded). Patients were predominantly females (58%); median age was 80 (HA-CDI) and 73 (non HA-CDI); 3% died within 30 days with CDI being considered as directly or indirectly related to their death. These figures are comparable with previous years. The mean incidence of CDI in hospitals in 2015 - 1.87/1000 admissions - is the highest reported since 2009. There is a large variability in incidence between hospitals. In 2015, an increase in incidence of HA CDI was observed in all 3 regions. In an (yet unpublished) 2015 ECDC study comparing CDI rates in hospitalised patients across European countries, Belgium has the lowest CDI incidence; however differences in surveillance methods make comparisons difficult.

Conclusion

Participation of Belgian hospitals in CDI surveillance has remained high despite the fact that it was no longer compulsory. The mean incidence of CDI in Belgian hospitals (1.87/1000 admissions) is the highest reported since 2009. The severity of the disease has not changed in recent years. Belgium has the lowest incidence of CDI reported in European countries; however differences in surveillance methods make comparisons difficult.

Role and outputs: Principal investigator

Re-drafting of the 2015 surveillance protocol as well data collection tool (questionnaire) and variable line list. Analysed data of three different databases in Belgium. Participated in feedback to all hospitals and drafted the annual report which was sent to all participating hospitals in Belgium

Supervisor(s): Marie-Laurence Lambert

Competencies developed:

My involvement in this study strengthened my capacity to interlink and analyse different datasets (three in the case of this surveillance system). Moreover I learned how to deliver surveillance information to all of the actors involved in the public health realm of *Clostridium difficile* in Belgium.

Title: Establishing a surveillance system for Ebola virus disease in the prefecture of N'Zérékore, Guinea; investigation and confirmation of Ebola cases

Background

During the 2014-2015 Ebola Virus Disease (EVD) outbreak in N'Zérékore, Forested Guinea, modes of transmission remained unexamined for a number of new cases. We used network visualization to investigate Ebola Virus Disease (EVD) transmission chains (TC) in seven sub-prefectures of Nzérékore in order to adapt outbreak response.

Methods

Between August 2014 and February 2015, the EVD outbreak response team including the World Health Organization (WHO) and local health authorities routinely collected information among new cases regarding hospital visits, cases within a household, participation in burials, as well as dates of symptom onset, serial intervals (SI) and exposure to EVD. SI's were defined as the interval between symptom onset in an index case and symptom onset in a secondary case infected by that index case. Cases who reported hospital visits, contact with a case in the household or participating in burials were attributed to these exposures.

Results

We identified seven TC (one urban and six rural) gathering characteristics of 102 probable/confirmed cases. Overall, 61% (62 cases, SI range: 7-20 days) were household related, 32% (33 cases, SI range 8-30 days) were household or burial related and 7% (7 cases, SI range: 4-20 days) were hospital-related. In the urban chain (10 cases, SI range: 7-20 days), 4 cases were household related and 6 cases were hospital related, none were household or burial related. In the rural chains (92 cases, SI range: 7-30 days), 63% (58 cases) were household related, 1% (1 case) was hospital related and 36% (33 cases) were household or burial related. No cases reported multiple exposures.

Conclusions

Network visualization during field response is crucial in enhancing local control strategies, refining outbreak response and aiding rapid response teams. Urban settings need to focus on reducing hospital EVD transmission whereas rural settings should focus on raising awareness of transmission within a household and safeguarding EVD burials.

Role and outputs: Field Epidemiologist (surveillance activities)

Drafting of surveillance protocol and establishment of the prefectural surveillance system; Daily epidemiological reports were generated (named SITREP) which outlined the current case (probable, confirmed, undetermined, non-case) and contact load; generation of risk assessment; training for health personnel and community sensitization was established. Abstract was presented and a manuscript was accepted (first author)

Supervisor(s): Bertrand Sudre

Competencies developed:

Although both outbreak and surveillance competencies were put to test, I learned the difficulties of working with missing and incomplete datasets as well as the challenges behind establishing and operating a database in an outbreak setting. Moreover, I learned the politics behind working with different actors in the surveillance of Ebola and the need to build a stronger health care infrastructure. Finally, I understood the importance in the collaboration between epidemiologists and diagnostic laboratories to provide the most accurate information to the surveillance system.

2. Outbreak investigations

Title: Investigation of a collective food-poisoning (toxi-infections alimentaires collectives - TIAC) outbreak after the EuroDetachement conference in Brussels, January 2015

Background

In January 2015, organizers of an international conference in Brussels on 27-29 January reported an outbreak of gastroenteritis among its 130 attendees. Lunches and cocktails were offered during the conference by one catering company. We investigated the outbreak to estimate its magnitude and implement control measures.

Methods

On 10 February 2015 we emailed a standard questionnaire to all attendees to gather demographic, clinical and exposure information and laboratory results. We defined cases as attendees with vomiting, nausea, abdominal pain or diarrhoea between 27 January-2 February 2015. We interviewed food handlers and tested leftovers of the sandwiches served. Faecal specimens of five cases were tested for enteric pathogens. We computed relative risks with 95% confidence intervals (CIs).

Results

Of 107 attendees who responded, 57 were cases (AR=53%). Disease onset was between 6 hours after consuming lunch on 27 January and 18:00 on 29 January; 54 cases occurred 6-24 hours after the second lunch. 52 cases (91%) reported nausea, 41 (72%) abdominal pain, 38 (66%) vomiting and 27 (47%) diarrhoea. All participants attended both lunches. Participants who consumed salmon sandwiches were two times more likely to become ill

(RR= 2.1 95%CI: 1.55-4.70). One stool specimen was positive for *Salmonella* spp. Leftovers of de-frosted salmon used for sandwiches during lunch the first day were re-frozen then thawed for lunch on the second day. No food handlers reported ill. No salmon sandwich leftovers were available for testing. None of the other food items tested positive for enteric pathogens.

Conclusions

Epidemiological evidence points toward salmon sandwiches as the probable vehicle in this point source outbreak. Though not corroborated by microbiological evidence, de-freezing and re-freezing salmon leftovers may have contributed to contamination and increased pathogen concentration. Food Health authorities need to reinforce compliance with established recommendations and the education of food-handlers on proper handling and storage of leftovers

Role and outputs: Principal investigator

Drafting protocol, development and dissemination of data collection tool (questionnaire). Development and realization of analysis plan and epidemiological tables. Drafting of report that was shared with the health inspection agency for the city of Brussels. Author of abstract and manuscript

Supervisor(s): Javiera Rebolledo, Sophie Quoilin

Competencies developed:

The investigation of this outbreak strengthened my capacity to develop a protocol and questionnaire and use bioinformatics and statistical software to analyse the data collected. I learnt about the value of public health information for action and had the opportunity to work jointly with a group of public health actors. I had the opportunity to select the most appropriate study design (cohort) and analyse the data accordingly. Finally I got to understand the different limitations in solving an outbreak investigation primarily related to laboratory confirmation of cases

3. Applied epidemiology research

Title: Prevention of central-line associated bloodstream infections in intensive care units: an international online survey

Background

Central line-associated bloodstream infection (CLABSI), with an attributable mortality of 12%-25%, is largely preventable. Monitoring processes and outcomes and ensuring compliance with clinical practice guidelines are important components of any intervention aiming at prevention. We documented attitudes and practices in intensive care units in 2015 in order to assess compliance with CLABSI prevention guidelines.

Methods

Between June and October 2015, we disseminated an online questionnaire, available in 10 languages, to medical doctors and nurses working in ICUs through national and international ICU societies. We investigated clinical practices related to central line (CL) insertion, maintenance and measurement of CLABSI-related data. Countries were categorized as high, middle, or low income according to World Bank definitions. We computed weighted estimates (% and standard error, SE) for countries providing at least 10 complete responses.

Results

3407 complete responses were received from 95 countries. 14 middle income countries and 27 high income countries provided 10 or more responses and were used to compute weighted estimates as follows; full barrier precaution including use of sterile drapes was reported by 51% (SE=2.1) and 82% (SE= 0.9). Central line insertion via the femoral vein was reported by 15 % (SE= 1.6) and 10% (SE=0.9). Daily assessment for the need of a central line is reported by 60% (SE= 2.0) and 73% (SE=1.2). 78% (SE=1.8) and 70% (SE=1.2) count CLABSI routinely, yet 15% (SE=1.4) and 24% (SE=10.3) are able to report their data.

Conclusions

Adherence to international guidelines need to be reinforced at ICU level. Priorities in middle income countries should focus on improving 1) full barrier precautions and 2) using chlorhexidine >0.5% for skin preparation. Reduction of device exposure through daily assessment of CL need remains a priority in both settings. Almost all respondents consider measurement of CLABSI key to quality improvement, however less than a quarter actually report their CLABSI rate. Our study was limited by a non-random sample of ICU doctors and nurses.

Role and outputs: Principal investigator

Drafting and development of protocol and data collection tool (survey). Dissemination of the survey. Development of data analysis plan and dummy tables. Realization of report and dissemination to relevant stakeholders. Drafting and submission of abstract and first author (co-authorship) of manuscript.

Supervisor(s): Naima Hammami, Marie-Laurence Lambert

Competencies developed:

This applied epidemiology research guided me through the process of conducting a study from start to finish. My protocol writing skills were tested as well as the generation of an online data collection tool, the analysis of the data and the final dissemination to the stakeholders involved. I learned about the difficulties of generating a cohesive manuscript that pleases all authors and the challenges in the submission of such to a pertinent journal.

4. Communication

Manuscripts submitted to peer- reviewed journals (accepted)

- 2 manuscripts accepted in a peer-reviewed journal (1,2)

Conference presentations

- 1 oral presentation at an international conference (3)
- 3 poster presentations at international conferences (4,5,6)
- 1 poster presentation at national conference (7)

Other presentations

- 1 oral presentation at European Commission congress on health (8)
- 1 oral presentation at Health & The city: global health syndrome (9)
- 1 oral presentation at WIV-ISP Scientific Seminar (Ebola virus disease) (10)
- 1 oral presentation at WIV-ISP Scientific Seminar (CLABSI: international survey) (11)
- 1 oral presentation at WIV-ISP Scientific Group Meeting (CDIFF annual report) (12)
- 1 oral presentation at Iranian-German summer school (Scientific communication) (13)

Reports

- 1 outbreak report (14)
- 1 surveillance report (15)
- 4 mission reports (16,17,18,19)
- 1 unit report (20)

Other (press releases)

- 2 press releases (21,22)

5. Teaching activities

Title: *World Health Organization (WHO) Ebola Virus Disease preparedness- Mauritania*

The WHO set in motion a preparedness strategy to support 15 countries develop the necessary capacity to manage the importation EVD (Ebola virus disease). One element of this strategy was the deployment of international

Preparedness Strengthening Teams (PST) to assess countries current level of preparedness and to set specific plans for strengthening health measures to manage EVD.

Lectures given:

- Case finding and case reporting
- Data collection
- Analysis of data
- Reporting of surveillance data

Supervisor(s): Sebastian Cognat

Educational outcome:

Training on epidemiological surveillance and contact tracing at field level. Moreover, I learned about the importance of providing proper and thorough training to outbreak response teams in order to prepare them for the possible occurrence of an outbreak. I gained insight into working with people from different background and cultures.

Title: *World Health Organization (WHO) Ebola Virus Disease preparedness- Burkina Faso*

The WHO set in motion a preparedness strategy to support 15 countries develop the necessary capacity to manage the importation EVD. One element of this strategy was the deployment of international Preparedness Strengthening Teams (PST) to assess countries current level of preparedness and to set specific plans for strengthening health measures to manage EVD.

Lectures given:

- Case finding and case reporting
- Data collection
- Analysis of data
- Reporting of surveillance data

Supervisor(s): Nicolas Isla

Educational outcome:

Training on epidemiological surveillance and contact tracing at field level. Moreover, I learned about the importance of providing proper and thorough training to outbreak response teams in order to prepare them for the possible occurrence of an outbreak. I gained insight into working with people from different background and cultures.

Title: *WIV-ISP Epidemiology week course*

Annual epidemiology teaching week organized by the head of the department Surveillance and Public Health. The course motivates the staff to engage in teaching activities in the field of epidemiology and public health. There are different modules being offered to audience (members /staff of the institute)

Lectures given:

- Implementation of surveillance systems
- Outbreak investigations
- Study design
- Sampling
- Effect modification and confounding
- 5 different case studies

Supervisor(s): Herman Van Oyen

Educational outcome:

Training on different areas of epidemiology and public health. Prepare and deliver the material for the teaching courses. I gained experience in keeping up an active discussion in a case study and motivating participants to get involved and ask questions.

Title: Iranian-German School on Field Epidemiology (IGSFE)

The Bernhard Nocht Institute for Tropical Medicine (BNITM) in Hamburg has asked for 1-2 fellows to organize and teach in the "Introduction to (Field) Epidemiology" course in Teheran, Iran in September 2016. Overall aim of the summer school; Introduction to Intervention epidemiology: At the end of the course the participants shall be able to investigate outbreaks and implement measures against the spread of infectious diseases.

Lectures given:

- Scientific communication
- Scientific writing
- Case study: Salmonella in the Caribbean
- Case study: Tampon toxic shock syndrome
- Case study: Outbreak of gastroenteritis

Supervisor(s): Norbert Schwarz

Educational outcome:

This teaching experienced strengthened my capacity of case study facilitation. I also learned to plan ahead and produce all of the necessary teaching material (both facilitator and participant guides) under one standard template. I also lead the communication with the Iranian partners in all case study related questions

6. International Missions

World Health Organization (WHO) Ebola Virus Disease preparedness- Mauritania

Please refer to teaching activity 1

World Health Organization (WHO) Ebola Virus Disease preparedness- Burkina Faso

Please refer to teaching activity 2

ECDC/GOARN EBOLA outbreak response mission- Guinea

Please refer to surveillance activity 2

Iranian-German School on Field Epidemiology (IGSFE)

Please refer to teaching activity 4

7. EPIET/EUPHEM modules attended

- Introductory course Spetses, Greece (29.9-17.10.2014)
- ESCAIDE 2014, Stockholm (5-7.11.2014)
- Outbreak Module, Berlin (08-12.12.2014)
- MVA Module, Vienna (23-27.03.2015)
- Project Review Module 2015, Lisbon (24-28.08.2015)
- ESCAIDE 2015, Stockholm (11-13.11.2015)
- Time Series Analysis module, Utrecht (23-27.11.2015)
- Vaccinology Module, Paris (16-20.04.2016)
- Rapid assessment & survey methods module, Athens (20-25.06.2016)
- Project Review Module 2016, Lisbon (24-28.08.2016)

Other training than EPIET/EUPHEM modules:

- UNDSS Basic Security in the Field course, 10 Oct 2014, online;
- UNDSS Advanced Security in the Field course, 10 Oct 2014, online;

Supervisor's conclusions

Under my supervision, Cristina worked on 2 main projects:

1) A survey of prevention practices for central-line associated blood stream infections (CLABSI) in intensive care units. CLABSI is one of the more severe health-care associated infections. The survey has documented low adherence to prevention practices. Country specific detailed results will be published, allowing targeted interventions to improve CLABSI prevention.

2) Annual report on the epidemiology of *Clostridium difficile* infections in Belgium. This detailed report compiles data from different sources and provides an assessment of the trends and situation of *C. difficile* in Belgium. This year's report included for the first time the use of funnel plots for benchmarking of hospital's surveillance data.

She also worked to other projects (which I did not supervise, so I feel less confident in providing comments on their public health impact): outbreak investigation in Belgium (foodborne) - this led to the identification of the reasons for the outbreak and practical recommendations for prevention. She also worked overseas in collecting data during the Ebola outbreak.

Coordinator's conclusions

Cristina has impressed me in her ability to network and engage other colleagues in her projects. She is an excellent social and professional mobilizer, an exceptionally convincing networker, and very fast and hard working. Outputs are rapidly delivered.

Cristina can work as well in a team as on her own. She likes to work independently, yet is open to guidance in scientific activities.

Cristina loves the field work and took every opportunity she could to participate in international missions. She was very engaged during the Ebola crisis in West Africa and participated in assessment missions as well as supported in control measures to contain the outbreak in the affected countries.

Cristina is genuinely interested in people and wants to help others to have a better life. She is interested in disease and the extent to which it affects the human condition and I believe she sees epidemiology and public health as a way to influence disease outcomes and the health of populations.

I see Cristina working in the international arena, with links to key public health and epidemiology professionals around the globe, given her excellent networking skills. I wish her all the best in the pursuit of her professional career.

Personal conclusions of fellow

The last two years spent as an EPIET fellow at the Wetenschappelijk Instituut Volksgezondheid - l'Institut Scientifique de Santé Publique (WIV-ISP) in Brussels have been nothing but educational. I have had the capacity to grow as a field epidemiologist and learn from the different branches that comprise European public health. Through my work both at the institute and in the field I have acquired the necessary tools and knowledge to continue working in the field of epidemiology and strengthen the capacity of the European epidemiology network.

Upon completion of my fellowship I would like to continue an international career as a communicable disease epidemiologist in Europe. My areas of interest remain in response to international outbreaks emergency preparedness, international networks and capacity building, project management and public health policy

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5. Bertrand Sudre
6. Tarik Derrough
7. Josep Jansa

References

1. Valencia, C. *et al.* (2016, November 10). Network visualization for outbreak response: Mapping the Ebola Virus Disease (EVD) chains of transmission in N'Zérékoré, Guinea. *Journal of Infection*.
2. Valencia, C. Hammami, N. Agodi, A. Lepape, A. Palencia, E. Blot, S. Vincent, JL. Lambert, ML. Poor adherence to guidelines for preventing central line-associated bloodstream Infections (CLABSI). *Antimicrobial resistance and infection control*.
3. Valencia, C. Bah, H. Fatoumata, B. Perea, W. Diallo, B. Kone, M. Giese, C. Conde, L. Malano, E. Mollet, T. Jansa, J. Coulombier, D. Sudre, B. Network visualization for outbreak response; mapping the Ebola Virus Disease (EVD) chains of transmission in Nzerekore, Guinea. *ESCAIDE*, 9-1/11/2015, Stockholm.
4. Valencia, C. Hammami, N. Agodi, A. Lepape, A. Palencia, E. Blot, S. Vincent, JL. Lambert, ML. Poor adherence to guidelines for preventing central line-associated bloodstream Infections (CLABSI). *International symposium on intensive care and emergency medicine (ISICEM)*. 5-8/3/2016
5. Valencia, C. Hammami, N. Agodi, A. Lepape, A. Palencia, E. Blot, S. Vincent, JL. Lambert, ML. Poor adherence to guidelines for preventing central line-associated bloodstream Infections (CLABSI). *ESCAIDE*, 22-25/11/2016
6. Valencia, C. Rebolledo, J. Quoilin, S. Tremerie, JM. An International outbreak of gastroenteritis following a conference in Brussels, January 2015. *ESCAIDE*, 9-1/11/2015, Stockholm .
7. Valencia, C. Rebolledo, J. Quoilin, S. Tremerie, JM. An International outbreak of gastroenteritis following a conference in Brussels, January 2015. *Methods in epidemiology conference*, 10-12/10/2015, Leuven .
8. Valencia, C. The Global Health Syndrome, September 2015. *Health policy and reform conference*, 19-21/09/2015, Odessa.
9. Valencia, C. The importance of public health, August 2015. *Health & The city: take 2*, 5-7/08/2015, Amsterdam.
10. Valencia, C. A message from the field. *WIV-ISP Scientific seminar: Ebola virus disease*, 10/12/2014, Brussels.
11. Valencia, C. Hammami, N. Agodi, A. Lepape, A. Palencia, E. Blot, S. Vincent, JL. Lambert, ML. Poor adherence to guidelines for preventing central line-associated bloodstream Infections (CLABSI). *WIV-ISP Scientific Seminar*, 02/04/2016, Brussels.
12. Valencia, C., Lambert, ML. *Epidemiology Of Clostridium Difficile Infection In Belgium*, WIV-ISP Scientific Group Meeting, 05/06/2016, Brussels.
13. Valencia, C., Scientific Communication, Iranian-German summer school, 17-28/08/2016, Tehran.
14. Institute Scientifique de Sante Publique (WIV-ISP),. *Outbreak of gastroenteritis at an international conference*. Brussels: WIV-ISP, 2016. Print.
15. Institute Scientifique de Sante Publique (WIV-ISP),. *Epidemiology Of Clostridium Difficile Infection In Belgium*. Brussels: WIV-ISP, 2016. Print.
16. European Center for Disease Prevention and Control, *Ebola Virus Disease Field Report, Nzerekore, Guinea 2015*. Stockholm: ECDC, 2015. Print. Field Report.
17. Global Outbreak Alert and Response Network, *Ebola Virus Disease Field Report, Nzerekore, Guinea*. Geneva: GOARN, 2015. Print. Field Report.
18. World Health Organization,. *Ebola Virus Disease Preparedness- Mauritania*. Geneva: World Health Organization, 2014. Print. Mission Report.
19. World Health Organization,. *Ebola Virus Disease Preparedness- Burkina Faso*. Geneva: WHO, 2014. Print. Mission Report.
20. Institute Scientifique de sante publique, *Healthcare Associated Infections In Belgian Hospitals*. Brussels: WIV-ISP, 2016. Print. Unit Report.
21. One world Magazine- 'Ebola, Obesitas En Andere Wereldwijde Killers | Oneworld.Nl'
<https://www.oneworld.nl/research/wereldwijde-vraagstukken/ebola-obesitas-en-andere-wereldwijde-killers>
22. ECDC 'Towards An Ebola-Free N'Zerekore: A Postcard From The Field By Cristina Valencia, EPIET Fellow, Cohort 2015'
<http://ecdc.europa.eu/en/epiet/postcards/Pages/towards-an-ebola-free-N-Zerekore.aspx>