



MediPIET Report

Summary of work activities



Cohort 2
2015-2017

Zeina Farah
Lebanon

Training site: Ministry of Public Health, Lebanon

National Supervisor: Dr Nada Ghosn

Scientific Coordinator: Dr Adela Paez Jimenez

Pre-fellowship short biography

Since 2010, I have been working as an epidemiologist at the Bekaa office of the Epidemiological Surveillance Program, Lebanese Ministry of Public Health (MoPH). I am coordinating several surveillance systems in my area of activity such as communicable diseases surveillance, hospital-based mortality surveillance and surveillance in the context of the Syrian crisis and displaced population. I have participated in several outbreak investigations. I am also an instructor of Epidemiology, Biostatistics and research methodology.

Fellowship projects

Surveillance projects

Communicable Diseases Surveillance in Field Medical Units for Syrians in Great Bekaa, Lebanon, 2016

Background: The Syrian crisis has had a significant impact on Lebanon due to the large influx of refugees crossing the borders. The Great Bekaa region hosts the largest number of refugees. Refugees are integrated in the local community and 20% of them live in informal tented settlements¹ with low access to health services. International and national organizations established field medical units to provide health services to Syrian refugees in Lebanon.

Objectives: To include field medical units in the national communicable diseases surveillance in order to monitor communicable diseases among Syrians living in the Bekaa and to detect alerts and outbreaks.

¹ Norwegian Refugee Council. (2017). NON-FORMAL EDUCATION PROGRAMMING: An approach to increasing enrollment into the formal system. Retrieved October 30, 2017, from https://static1.squarespace.com/static/583af1fb414fb5b3977b6f89/t/59bdbb81cf81e06811307251/1505606531272/10_PromisingPractices_NRC_WEB.pdf

Methods: The regional surveillance system was expanded to include the field medical units. An aggregated weekly reporting form for two age groups (< 5 and ≥ 5) is used, targeting 14 diseases and syndromes. Data is collected from the medical units active in the Great Bekaa. Forms are sent from the field medical units to the peripheral levels at the Ministry of Health by hand or fax or email. Data entry and analysis are performed using Epidata and Epiinfo softwares. Weekly bulletins are prepared and disseminated.

Results: In 2016, 15 field medical units were active in the Bekaa region. The cumulative completeness of reporting was 81%. Respiratory infections accounted for 32% of the consultations, watery diarrhoea for 3% and scabies for 2%. One case of acute flaccid paralysis, 9 suspected cases of measles, 31 cases of mumps, 16 cases of jaundice and 5 cases of cutaneous leishmaniasis were reported. Specimens were collected from all the measles cases and from 45% of mumps cases.

Conclusion: Through this system, we were able to detect communicable diseases among Syrians in the Great-Bekaa and complement the national surveillance system. This highlights the importance of having a flexible surveillance system that can add new data sources when needed.

Recommendations: It is crucial to enhance reporting from field medical units by conducting regular training for the field units staff and improving coordination with the non-governmental organizations active in the field.

Status: Completed. Role: In charge of the implementation of the system and currently ensuring its proper running, including data analysis and feedback flow. Deliverables: Abstract accepted as oral presentation in MediPIET Annual Scientific Conference 2016.

Hospital mortality surveillance among Syrians in the Great Bekaa - Lebanon, 2014-2016

Background: Lebanon has been dramatically affected by the Syrian crisis. The Great Bekaa region hosts the largest number of Syrians. Almost a third of all Syrians in Lebanon are under 18 years old² and a fourth live in informal tented settlements¹, suffering from poor conditions and overcrowding. This increases the risk of communicable diseases transmission. Moreover, Syrian deaths are not registered in Lebanon. Thus, there is a need to collect data on mortality among Syrians in Lebanon. On the other hand, the hospital-based mortality surveillance system was established by the MoPH in 2006.

Objectives: To measure proportional mortality in hospital settings among Syrians in the Great Bekaa region between 2014 and 2016.

Methods: Data was obtained from the hospital-based mortality surveillance system targeting all deaths occurring at the hospital level in public and private sectors. Data was collected through an anonymous weekly form. Forms were received from hospitals at peripheral levels through fax or email. Causes of death were coded and underlying causes of death were selected using ICD-10 guidelines. Data was entered and analyzed using Epidatav3.1, EpiInfov6.04 and SPSSv18. Data on Syrian deaths occurring between 2014 and 2016 in the Great Bekaa was analyzed.

Results: The participation rate of hospitals was 100% with a completeness of reporting of 85%. A total of 1443 hospital Syrian deaths were between 2014 and 2016 in the Bekaa. This represents 23% of total hospital deaths reported during this period. Seventy four percent of them were in-hospital deaths (N=1072). Fifty one percent of in-hospital deaths were less than one year old. The main underlying causes of death were conditions originated in the perinatal period (37%), external causes and circulatory diseases. For infants (less than one year old), the main causes of death were conditions originated in the perinatal period (mainly respiratory distress and prematurity). For the age group 1-14yrs the main cause of death was external causes (mainly transport accidents). For those 15yrs and

² United Nations High Commissioner for Refugees (UNHCR). (n.d.). Syria Regional Refugee Response Inter-agency Information Sharing Portal. Retrieved October 30, 2017, from <http://data.unhcr.org/syrianrefugees/country.php?id=122>

above, the main causes of death were circulatory diseases, external causes and neoplasms. As alerts, 4 meningitis cases, 5 maternal mortalities and 13 intestinal infections were reported.

Conclusion: During the study period, the proportionate mortality of perinatal conditions among Syrians in the Bekaa region was 37% compared to 4% among Lebanese. Among infants (less than one year old), the proportionate mortality of perinatal conditions was 73% among Syrians compared to 52% among Lebanese.

Recommendations: These findings highlight the importance of enhancing maternal and perinatal care among Syrians in Lebanon and improving quality of health care services. It is also crucial to look for alternative methods to collect data on deaths occurring outside the hospital to be able to compute mortality rates.

Status: Completed. *Role:* In charge of the implementation and running of the mortality surveillance, including data analysis. *Deliverables:* Abstract accepted as oral presentation in MediPIET Annual Scientific Conference 2017.

Outbreak Investigation

First Highly Pathogenic Avian Influenza H5N1 incursion in domestic poultry in Lebanon, April 2016

Background: In April 2016, H5N1 foci in poultry were detected in two farms in the Bekaa region adjacent to Lebanon's borders with Syria. Subsequently, the H5N1 multi-sectorial preparedness plan was activated.

Objectives: The objectives of the MoPH plan were to identify exposed persons and to provide them with prophylaxis in addition to early detect human cases.

Methods: An exposed person was defined as anyone living in the affected area and having contact with poultry. Exposed persons were identified by field teams or designated medical centers. Then, they were monitored through daily phone calls to ascertain their clinical status and detect any suspected H5N1 case. Antiviral (Oseltamivir) was used as 10-day prophylaxis after the last exposure.

Oropharyngeal swabs were collected from those showing symptoms and tested in the National Influenza Center. Sensitization sessions for health professionals were also conducted. Data was collected using specific forms, entered in Epidata, and analyzed via Epidatastat.

Results: A total of 187 exposed persons were identified. With a mean age of 31 years-old, 75% were males and 48% were Syrians. Also, 83% had contact with poultry in farms or near their households and 17% were members of the intervention team. Regarding treatment and follow-up, 184 exposed persons received oseltamivir and 97% of them were monitored for at least 7 days. Among 41 persons with symptoms, coryza, cough and sore throat were the most common. Specimens collected from 39 persons were all PCR negative. Two hospitalized suspected cases were also identified.

Conclusion: This was the first foci of influenza A(H5N1) in Lebanon. A total of 35 000 poultry were affected and 49 000 were culled. The MOPH identified 185 exposed persons and no human cases were detected. The containment was declared in June 2016. The outbreak was reported to both WHO and OIE within 24 hours of confirmation.

Recommendations: It is crucial to update the preparedness plan based on lessons learned and to maintain and improve the coordination between different sectors. It is also important to adopt the One Health approach.

Status: Completed. *Role:* Part of an outbreak investigation team according to the preparedness plan, involving MoPH and Ministry of Agriculture, in charge of identification and follow-up of exposed persons as well as data collection and analysis. *Deliverables:* Abstract accepted as oral presentation in MediPIET Annual Scientific Conference 2016 and manuscript accepted at Emerging Infectious Diseases.

Research projects

Time series analysis of human brucellosis in Lebanon, 1995-2017

Background: Brucellosis is a zoonotic disease that affects cattle, goats, sheep and swine. It is transmitted to humans by consuming unpasteurized dairy products from infected animals, contact with infected animal tissues or inhaling airborne agents. Human brucellosis is endemic in Lebanon. Between 1995 and 2016, the national incidence rate ranged between 3.1 and 8.1 per 100,000 inhabitants.

Objectives: The purpose of this study was to short-term forecast the incidence of human brucellosis in Lebanon with a prediction model.

Methods: Brucellosis cases reported weekly to the ministry of public health between 1995 and 2017 were included in the analysis, performed using Stata v13. Trends and periodicity were described for data between 1995 and 2016. Weekly prediction for 2017 was generated and compared to reported data.

Results: Preliminary results show stable trends of brucellosis incidence between 1995 and 2016 with a slight increase in the past few years. TSA models show also a seasonal fluctuation of the national incidence rates. The forecasted incidences for 2017 are consistent with the real incidence except for few weeks.

Conclusions: Our findings illustrate the usefulness of time series analysis to define brucellosis thresholds for early detection of outbreaks. Since animal vaccination is the most efficient strategy to control human brucellosis, data on cattle brucellosis cases have been requested from the Ministry of Agriculture to study the correlation between the two series.

Status: in progress. *Role:* principal investigator.

Protocol for ESBL colonization in poultry farmers in Lebanon: an exposure versus non exposure study

Background: Antibiotic resistance is one of the most important threats to public health today. The Extended-spectrum β -lactamases (ESBL) are enzymes found in the Enterobacteriaceae, and confer resistance to a variety of β -lactam antibiotics³. Cross resistance can occur when animals are given an antibiotic that is closely related to an antibiotic used in human medicine. Several studies conducted in Lebanon have shown that ESBL production rate in *E. coli* and *K. pneumoniae* isolates is increasing⁴ but no data was found on ESBL prevalence among poultry farmers in Lebanon. In addition, poultry production is an important component of the Lebanese Agricultural sector⁵ and there is no control on the use of growth promoters and antibiotics in poultry during the pre-market stages⁶.

Objectives: The principal objective of the study is to evaluate the faecal carriage of ESBL enterobacteria (E-ESBL) of poultry farmers in comparison with subjects not exposed to poultry farming. The secondary objective is to evaluate if specific practices in the use of antibiotics or in farming are associated with an increased risk of carriage of E-ESBL.

Methods: It is a paired exposed-non exposed cross-sectional study. Data for the study will be collected using specially developed and tested questionnaire. Subjects will be interviewed in person by trained interviewers. They will also be asked to submit one fresh faecal to be tested in the laboratory. Prevalence of carriage of E-ESBL will be determined in farmers in contact with poultry and compared to

³ EFSA. (2011). Scientific Opinion on the public health risks of bacterial strains producing extended-spectrum β -lactamases and/or AmpC β -lactamases in food and food-producing animals. EFSA Journal, 1-95.

⁴ Salem, S., Dahdouh, E. & Daoud, Z. (2013). Resistance of Gram-Negative Bacilli in Lebanon. ISRN Infectious Diseases,1-6.

⁵ Darwish, A. H. (2003). Analysis and Assessment of the Poultry Sector in Lebanon . Beirut: Ministry of Agriculture/Food and Agriculture.

⁶ Asmar, F. (2011). Lebanon; country pasture forage resource profile. Retrieved December 21, 2015, from <http://www.fao.org/ag/agp/agpc/doc/counprof/lebanon/lebanon.html>

that of a non-exposed group. Associations between colonization and specific farming activities and antibiotic practices will also be tested.

Special acknowledgment to all the protocol authors: Antoine Andremont, Ghassan M. Matar and Nada Ghosn. Status: implementation is stand-by pending of resource mobilization.

International Assignments

Ebola Virus Disease GOARN Mission, Guinea, March 5-April 5, 2015

Background: During the Ebola outbreak in Guinea in 2015, an online reporting system was used to collect daily information about Ebola related events from the different Guinean prefectures. Collected data was analysed and presented in the daily and weekly situation reports. A guideline for the reporting application was available. Given the importance of swabbing dead bodies for contact tracing, data on community deaths were collected through the online reporting system. During the mission, two main problems were identified: underreporting of community deaths and low rate of swabbing of dead bodies.

Objectives: The objectives of the mission were to support the different activities of the Surveillance Commission, especially those related to the daily online reporting system and the weekly situation reports. Another objective agreed onsite was to improve reporting of community deaths and swabbing of dead bodies.

Methods: During the mission, I worked on four weekly situation reports. This included data cleaning, verification, analysis and data presentation. In addition, I worked daily on summarizing the key points ("points saillants") of the daily reports to be presented at the surveillance meeting.

On the other hand, field visits to the 3 morgues of Conakry and to some *Direction Communale de la Sante* (DCS) were conducted. During the visits, physicians responsible for the morgues, WHO consultants and directors at the DCSs were interviewed. Mortality data for years 2013, 2014 and 2015 were collected and compared with the reported data.

Results: Some problems were detected in the online system. Questions were added and others were modified. An updated guideline was developed and disseminated to the concerning parties. On the other hand, the field visits highlighted the issues of underreporting and low swabbing rate. Findings were discussed with members of the surveillance commission. A plan of action for mortality surveillance was developed and disseminated to the relevant parties. Some activities of the action plan were implemented.

Conclusion: Further joint efforts were crucial to end the transmission of ebola in Guinea. Swabbing all community deaths in the active prefectures was crucial for contact tracing. Swabbing all dead bodies present in hospital morgues, big hospitals and big mosques was a priority. Efforts also targeted deaths in the community, in collaboration with the municipal authorities, civil protection and religious authorities. Organising the reporting of community deaths in Guinea will also have long term benefits to the country.

Status: Completed. Most short- and mid-term recommendations regarding surveillance of community deaths were implemented; mission report timely shared with GOARN upon return.

International assignment, KEELPNO, Greece, June 27-July 8, 2016

Background: Greece used to be a transit country for refugees going to destination countries in Western Europe through the Western Balkan corridor. On March 2016, the Balkan route was closed to

all migrants and refugees had to stay in Greece⁷. Up to 14 July 2016, the number of people of concern in Greece was estimated as 56 853 persons. Refugees arrive to Greece primary through the sea borders. The top three nationalities of Mediterranean Sea arrivals during 2016 were Syrians (48%), Afghans (25%) and Iraqis (15%)⁸.

Objectives: The aim of this assignment was to support Greek authorities in planning public health programs and vaccination activities for refugees and migrants coming to Greece. My main task were to document the epidemiological profile of migrants coming to Greece, vaccination practices in their countries of origin and the response of Middle East countries to refugee crisis practices.

Methods: A desk review was conducted to get data on the epidemiological profile of refugees coming from Syria, Afghanistan and Iraq. Data about the vaccination activities conducted in Lebanon and Jordan were obtained directly from the vaccination departments in the two countries. Data available in Arabic was translated to English.

Results: Activities of the Expanded Program of Immunization in Lebanon targeting Syrians between 2013 and 2016 were presented in the report in addition to the vaccination activities of the Jordanian ministry of health between 2012 and 2015. The report includes also the epidemiological profile of Syrians before and during the crisis in addition to the epidemiological profile of Afghans and Iraqis. A short report on the risk of cutaneous leishmaniasis in Greece was also prepared. Moreover, recommendations to improve the syndromic surveillance system at points of entry in Greece were included in the report.

Status: Completed. As mentioned above, recommendations shared with Greek authorities allowed for the inclusion of cutaneous leishmaniasis, quite frequent in the countries of origin of the new arrives, among the conditions under syndromic surveillance.

Scientific communication

Oral presentation: *Communicable diseases surveillance in field medical units for Syrians in Great Bekaa, Lebanon, 2016*, 2nd MEDIPIET Annual Scientific Conference 6-8 December 2016, Marrakesh-Morocco.

Oral presentation: *First highly pathogenic avian influenza H5N1 incursion in domestic poultry in Lebanon, April 2016*, 2nd MEDIPIET Annual Scientific Conference 6-8 December 2016, Marrakesh-Morocco.

Oral presentation: *Hospital mortality surveillance among Syrians in the Great Bekaa- Lebanon, 2014-2016*, to be presented at the 3rd MEDIPIET Annual Scientific Conference 28-30 November 2017, Brussels-Belgium.

Manuscript: *A successful approach to contain the H5N1 Highly Pathogenic Avian Influenza incursions in domestic poultry and prevent human cases in Lebanon, 2016* accepted for publication on 3/11/2017 in the *Emerging Infectious Diseases* journal-CDC.

⁷ Acaps/MapAction. (2016, March 26). Refugee/Migrant crisis in Europe: Scenarios - Possible developments in transit countries over the next 6 months. Retrieved July 21, 2016, from <http://reliefweb.int/report/world/refugeemigrant-crisis-europe-scenarios-possible-developments-transit-countries-over>

⁸ UNHCR, UNHCR Refugees/Migrants Emergency Response - Mediterranean. (2016, July 14). Retrieved July 17, 2016, from <http://data.unhcr.org/mediterranean/country.php?id=83>

Teaching experience

Since 2013, I have been teaching at the Lebanese International University. I am teaching "statistics for health sciences" and "research methodology" for sciences and pharmacy students. In February 2016, I delivered a workshop titled "research methods and study designs" for pharmacy instructors at the Lebanese International University.

Additional activities

I have participated in several training sessions for healthcare workers in hospitals and health centers at peripheral levels.

Next steps

My experience with MediPIET was a fruitful experience at the professional and personal levels. The skills I acquired during these two years will be very beneficial for our surveillance activities at the ministry of health. In addition, maintaining the connections built through the MediPIET network will be a priority for me in order to keep the exchange of knowledge and experience with fellows and supervisors. My long term goal is to pursue my education and complete a PhD in epidemiology and biostatistics.

Supervisor's conclusion

Zeina Farah is an example of acting locally equals to acting globally. Placed at the epidemiological surveillance program at Bekaa province, she has proved her knowledge, attitudes and skills to operate various surveillance systems, to investigate outbreaks, to conduct training sessions and build the capacity of locals, to contribute to humanitarian actions related to Syrian crisis and to coordinate with various partners, and to participate in international assignments.

During the 2-year fellowship, she has completed needed assignments with high professionalism. Zeina Farah has proved to be a valuable and experienced field epidemiologist.

Scientific Coordinator's conclusion

During the two-year MediPIET fellowship, Zeina Farah has shown creative leadership in a variety of surveillance, outbreak investigation and research projects. Based at the Bekaa office (peripheral level), she has managed to incorporate the scientific approach to their daily tasks and therefore developed innovative projects, as the implementation of morbidity and mortality surveillance among refugees in the Bekaa. Zeina has demonstrated strong commitment to respond to cross-border threats and participated in the global ebola response; she has also showed great interest for EU-wide health concerns and joined the ECDC mission to support Greek authorities to respond to the large influx of refugees in 2016. Zeina is very proactive, a quick learner and always compliant with deadlines. She has taken full advantage of the fellowship, which she joined as an epidemiologist with already 5-years of experience, to improve her knowledge and skills.

MediPIET Scientific Coordination concludes Zeina has succeeded in performing all her assignments to the highest standard and with a professional attitude. She has also demonstrated very good interpersonal and soft skills, being at ease working in multidisciplinary teams and excellent communication skills. It has been our pleasure to work with her.

References

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