EUPHEM

EUPHEM REPORT

Summary of work activities

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European Public Health Microbiology Training Programme (EUPHEM), third cohort

Background

According to the European Centre for Disease Prevention and Control's (ECDC) advisory group on public health microbiology ('national microbiology focal points'), public health microbiology (PHM) is a cross-cutting area that spans the fields of human, animal, food, water, and environmental microbiology, with a focus on human population health and disease. The primary work function is to use microbiology to improve the health of populations in collaboration with other public health disciplines, in particular epidemiology. PHM laboratories play a central role in the detection, monitoring, outbreak response, and provision of scientific evidence to prevent and control infectious diseases.

European preparedness for responding to new infectious disease threats requires a sustainable infrastructure capable of detecting, diagnosing, and controlling infectious disease problems, including the design of control strategies for the prevention and treatment of infections. A broad range of expertise, particularly in the fields of epidemiology and public health microbiology, is necessary to fulfil these requirements. PHM is required to provide access to experts with expertise and experience in all relevant communicable diseases at the regional, national and international level in order to mount rapid responses to emerging health threats, plan appropriate prevention strategies, assess existing prevention disciplines, develop or assist in the development of microbiological guidelines, evaluate/develop new diagnostic tools, arbitrate on risks from microbes or their products, and provide pertinent information to policy makers related to the above issues from a microbiology perspective.

According to articles 5 and 9 of ECDC's founding regulation (EC No 851/2004) 'the Centre shall, encourage cooperation between expert and reference laboratories, foster the development of sufficient capacity within the community for the diagnosis, detection, identification and characterisation of infectious agents which may threaten public health' and 'as appropriate, support and coordinate training programmes in order to assist Member States and the Commission to have sufficient numbers of trained specialists, in particular in epidemiological surveillance and field investigations, and to have a capability to define health measures to control disease outbreaks'. Therefore, ECDC has initiated the two-year EUPHEM training programme in 2008. EUPHEM is closely linked to the European Programme for Intervention Epidemiology Training (EPIET). Both EUPHEM and EPIET are considered 'specialist pathways' of the two-year ECDC fellowship programme for applied disease prevention and control.

Stockholm, August 2012

This report summarises the work activities undertaken by Giovanna Jaramillo-Gutierrez, fellow of the third cohort of the European Public Health Microbiology Training Programme (EUPHEM) at the Laboratory for Infectious Diseases at the National Institute of Health and the Environment (RIVM), Netherlands.

All EUPHEM activities aim to address different aspects of public health microbiology and underline the various roles of public health laboratory scientists within public health systems.

Material and methods

This report accompanies a portfolio of the outcome of different activities conducted during the EUPHEM fellowship. Activities were comprised of specific projects and theoretical training modules (not summarised in this report). Specific projects included laboratory surveillance, risk assessments, outbreak investigations, quality management, research, summarising and communicating scientific evidence, and activities with a specific microbiological focus, such as biosafety or different laboratory techniques. The outcome included publications, presentations, posters, reports, and teaching materials prepared by the fellow. The portfolio presents a summary of all work activities conducted by the fellow, unless prohibited due to confidentiality regulations.

Results

Multi-centre study in the Netherlands on the laboratory capability to detect Human Enterovirus 68, an emerging respiratory pathogen

In September and October 2010, an increase in the number of detections of enterovirus 68 in sentinel community surveillance of acute respiratory infections was observed across the Netherlands. Concurrently, clinical laboratories reported increased detections of human rhinovirus and enterovirus (EV) although they did not identify enterovirus 68. Enterovirus 68 shares phenotypic and genetic features with human rhinovirus. The aim of this study was to assess the capability of clinical laboratories to detect and identify human enterovirus 68 virus, provide recommendations and raise awareness among clinicians and microbiology laboratories especially in case of unexplained severe respiratory illness. Our results showed that laboratories misidentified enterovirus 68 as human rhinoviruses and thus might have missed EV68 cases because they usually do not test patients with respiratory disease for enterovirus infection.

Educational outcome: understanding the strengths and weaknesses of surveillance systems; the use and limitation of diagnostic and typing methods and their interpretation in outbreak investigations and surveillance; to recognise specific issues when investigating rare and emerging diseases through laboratory and epidemiological methods.

Awareness, knowledge, behaviour and attitude towards norovirus transmission by food handlers in the Netherlands 2008–2011

The role of food handlers in the transmission of norovirus through the food chain is difficult to ascertain, but has been illustrated in numerous outbreak studies. The aim of this study was to assess the level of awareness on norovirus among food handlers working in different settings (catering companies versus healthcare institutions). Our results showed that although food handlers from healthcare institutions have more knowledge on the existence of norovirus as a cause of gastroenteritis than those from catering companies, no significant difference was found in terms of their knowledge of norovirus control measures.

Educational outcome: understanding the roles and responsibilities of partners from the Food Safety Authority and the National Institute for Public Health; to take part in a multidisciplinary teamwork combining microbiology and epidemiology.

Retrospective evaluation of the case definition of acute Q fever in the Netherlands, 2009–2011

The south of the Netherlands experienced large scale outbreaks of Q fever in 2007 and 2009. In the notification case definition of acute Q fever in the Netherlands, one of the laboratory criteria was the presence of IgM phase II antibodies in serum. Subsequent comparative diagnostic evaluations showed that these antibodies persisted up to 12 months, making them poor markers of acute cases. The aim of this study was to evaluate the usefulness of the case definition over time in different phases of the epidemic by reviewing the number of cases associated with a positive laboratory test taken between 2009 and 2011 and assessing these new serological findings in the light of the case definition. Our results showed that the case definition that included presence of solitary IgM phase II antibodies lead to overreporting of laboratory notifications to the MHS in 2010 and 2011 due to the persistence of IgM phase II antibodies in the population of the affected region of Noord-Brabant.

Educational outcome: to understand the role of laboratories in surveillance and (post-)epidemic surveillance; ability to communicate effectively with persons from a multidisciplinary background and identify common goals.

Laboratory rotations: Identification and characterisation of pathogens in bacteriology and virology

The aim of this rotation was to introduce the fellow to different methods of identification and characterisation of pathogens. The visits to the different laboratories took place during the first three weeks of the fellowship.

Educational outcome: understanding the basic concepts of virology, bacteriology, parasitology and immunology in relation to different diagnostic tests.

Facilitator during an infectious disease outbreak simulation exercise, Master of Infectious Immunology programme, Erasmus University of Rotterdam, January 2011

This simulation exercise was designed to introduce master's students without previous PH knowledge to the complexities of a public health response. This included strategies when dealing with unexpected public health aspects of infectious disease outbreaks and understanding the roles of different organisations in response to outbreaks. Participants were divided in groups representing different institutions, i.e. local municipal health services, national public health institutes, ECDC, WHO, and the media. The aim was to let the students experience the specific roles and processes of public health decision-making.

Educational outcome: planning and organising a course, defining learning objectives, developing the ability to communicate effectively with persons from a multidisciplinary background.

Lecturer inLab4Epi module for EPIET and UK FETP fellows, Health Protection Agency, Colindale, November 2011

This module was addressed to epidemiologists (EPIET and UK FETP fellows and external participants) at the HPA. The fellow prepared and taught three lectures: 'Diagnostics for public health decision-making', 'Laboratory terminology' and 'Specificity and sensitivity'.

Educational outcome: teaching laboratory and microbiology concepts relevant to epidemiologists.

Lecturer and facilitator for the epidemiology module of the master's programme in vaccinology and clinical development, University of Siena, organised jointly with the Novartis Vaccines Institute for Global Health, November 2011

The fellow taught a one-week epidemiology module for a group of 15 students from low-income countries together with Georgia Ladbury, EPIET fellow Cohort 16. Gave lectures on laboratory-based surveillance, specificity and sensitivity, cohort and case-control studies, and facilitated case studies.

Educational outcome: Lead, plan, organise, teach and facilitate a one-week course in epidemiology for master's level students; prepared exam questions (MCQ).

EUPHEM international mission (two months): 'Strengthening of national public health laboratory capacity and networks for the diagnosis and control of emerging infectious diseases in Lao People's Democratic Republic', World Health Organization, Laos

The aim of the mission was to support the implementation of activities to strengthen the national public health laboratory capacity and networks for the diagnosis and control of emerging infectious diseases in Laos, in line with the national Emerging Infectious Diseases workplan, the Asia Pacific Strategy for Emerging Diseases (2010), and the International Health Regulations (2005). As part of the WHO's emerging disease surveillance and response team, the fellow was involved in the following activities in collaboration with NCLE and IQLS: participation in several laboratory assessments in the south of Laos, organisation of the first meeting of the national laboratory network, technical input to the national laboratory policy document, and daily outbreak meetings on laboratory diagnostics.

Educational outcome: familiarisation with the Laotian public health system and political context; first-hand experiences in public health microbiology in an international context.

Promotion of the EUPHEM fellowship programme

The aim was to promote the EUPHEM programme through presentations of EUPHEM activities for different audiences. The following meetings and conferences were attended: ENIVD annual meeting in Antalya, Turkey (May 2011); virology monthly meeting, RIVM Laboratory for Infectious Diseases, Bilthoven, Netherlands (July 2011); Postdoctoral Development Initiative conference, Eindhoven University, Netherlands (March 2012). In addition, the fellow acted as EUPHEM representative during the year 2012 and as liaison for the EPIET representatives, EAN,

EUPHEM alumni, and ECDC staff (regular teleconferences with cohort representatives for EPIET and EUPHEM in order to address the concerns and suggestions of EUPHEM fellows), and provide feedback to ECDC.

Educational outcome: oral, written communications, advocacy.

Publications

1. Meijer A, van der Sanden S, Snijders BEP, Jaramillo-Gutierrez G, Bont L, van der Ent CK, Overduin P, Jenny SL, Jusic1 E, GAM, van der Avoort HGAM, Donker GA,Koopmans MPG. Emergence and epidemic occurrence of enterovirus 68 respiratory infections in the Netherlands in 2010. Virology. 2012 Feb 5;423(1):49-57.
2. Jaramillo-Gutierrez G, Benschop K, Claas E, de Jong A, van Loon A, Pas S, Pontesilli O, Rossen J, Swanink C, Thijsen S, van der Zanden A, van der Avoort H, Koopmans M, Meijer A. Multi-centre study in the Netherlands for the laboratory capability to detect human enterovirus 68, an emerging pathogen in the Netherlands (in preparation).
3. Verhoef L, Jaramillo-Gutierrez G, Koopmans M, Boxman I. Awareness, knowledge, behavior and attitude towards the potential for norovirus transmission by food handlers in the Netherlands 2008–2011 (in submission).
4. Jaramillo-Gutierrez G, ter Schegget R, Bijlmer H, Jansz A, Koopmans M, Wegdam-Blans M. Retrospective evaluation of acute Q fever laboratory case definition during and after a Q fever epidemic (2009–2011), Noord-Brabant, Netherlands (in preparation).

Reports

1. Jaramillo-Gutierrez G. WHO/ECDC report: 'National laboratory strengthening to prevent and control trans-boundary emerging infectious diseases in Lao PDR', Feb 2012

RIVM internal reports on national mumps surveillance:

1. Jaramillo-Gutierrez G, Ladbury G, Whelan J, Hahné S. 2-wekelijks overzicht bof epidemie, 26-07-2011.
2. Ladbury G, Whelan J, Jaramillo-Gutierrez G, Hahné S. 2-wekelijks overzicht bof epidemie, 12-07-2011.
3. Jaramillo-Gutierrez G, Whelan J, Hahné S. 2-wekelijks overzicht bof epidemie, 14-06- 2011.

Presentations

1. Jaramillo-Gutierrez G. RIVM Maandelijkse EPIET/EUPHEM bespreking, Mar 2011: 'Molecular surveillance of multidrug- and extensively drug-resistant tuberculosis in the European Union'
2. Jaramillo-Gutierrez G. ENIVD annual meeting in Antalya, Turkey, May 2011: 'EUPHEM activities'
3. Jaramillo-Gutierrez G. RIVM Laboratory for infectious Diseases, virology, Dutch laboratories capability to detect enterovirus 68 across the Netherlands, July 2011
4. Jaramillo-Gutierrez G. World Health organization Lao PDR, Lao PDR laboratory capacity building under the Asia Pacific Strategy for Emerging Diseases, Jan 2012.
5. Jaramillo-Gutierrez G. World Health Organization, Lao PDR, Non malarial febrile illness study in Laos 2010–2011, Jan 2012.
6. Jaramillo-Gutierrez G. Evaluation of acute Q fever case definition during and after a Q fever epidemic in Noord-Brabant, 2009–2011'. RIVM Maandelijkse EPIET/EUPHEM bespreking, Mar 2012.
7. Jaramillo-Gutierrez G. Scientific teleconference for EPIET and EUPHEM fellows, 'Lao PDR laboratory capacity building under the Asia Pacific Strategy for Emerging Diseases', May 2012.
8. Jaramillo-Gutierrez G. ECDC, Lao PDR laboratory capacity building under the Asia Pacific Strategy for Emerging Diseases, June 2012.
9. Jaramillo-Gutierrez G. ESCAIDE conference, Multi-centre study in the Netherlands for the laboratory capability to detect enterovirus 68, Nov 2011, Poster presentation.
10. Jaramillo-Gutierrez G. Retrospective evaluation of the case definition of acute Q fever in the Netherlands, 2009–2011.

Modules

1. Introductory course (20 days)
2. Computer tools in outbreak investigations (five days)
3. Vaccinology (five days)
4. Rapid assessment of complex emergencies (five days)
5. Biosafety and Quality Management (five days)
6. Public Health Microbiology Management (five days)
7. Project review (2x) (five days)
8. ECDC stay module (three days)

Discussion

One of the main goals of the EUPHEM programme is to expose the fellows to different public health experiences and activities, thus enabling them to work across various disciplines in the field of public health. This report summarises the different activities and projects conducted by Giovanna Jaramillo-Gutierrez, EUPHEM fellow (cohort 3), the second fellow placed at the National Institute of Public Health and the Environment (RIVM), Netherlands. The activities were in line with the 'learning by doing' approach of the EUPHEM programme; all projects had a clear educational outcome contributing into the development of a wide range of experiences and expertise. The activities provided the fellow with a variety of skills required in the field of public health microbiology and strengthened her ability to work in a multidisciplinary team.

Personal conclusions

Lab people are from Mars, epidemiologists are from Venus

The aim of the EUPHEM fellowship is to develop a European network of public health microbiologists in order to strengthen communicable disease surveillance and control through an integrated laboratory-field epidemiology network for outbreak detection, investigation and response. During the past years, the emergence of diseases (e.g. SARS, H5N1, pandemic H1N1) due to new pathogens has stressed that surveillance systems and outbreak investigations depend on functional public health laboratory systems. Therefore close collaboration between epidemiologists and laboratory scientists (clinical microbiologists, molecular biologists, environmental microbiologists, bacteriologists, virologists, etc.) is required to produce timely and reliable laboratory-confirmed disease data to support evidence-based decision making. Both epidemiologists and laboratory scientists need to understand each other's jargon and work culture to be able to work together efficiently and define common goals.

The EUPHEM fellowship provided me with a unique opportunity to interact a wide range of different key players in public health thanks to the interdisciplinary nature of the projects undertaken over the course of two years. It allowed me to develop approaches to tackle diverse health problems from a laboratory perspective, in a European (Netherlands) or international context (Laos). As a result, EUPHEM achieved to provide me with the skills to develop laboratory algorithms at the population level, depending on the type of setting (e.g. endemic or not).

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