Meeting report

ESCAIDE 2015: an operational scientific conference on infectious diseases for professionals from Europe and beyond

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The ninth annual 'European Scientific Conference on Applied Infectious Disease Epidemiology' (ESCAIDE), organised by the European Centre for Disease Prevention and Control (ECDC), took place between 11 and 13 November 2015 in Stockholm. One aim of ESCAIDE is to share applied scientific knowledge on infectious diseases surveillance, prevention and control in Europe and internationally. Other aims are (i) to build a multidisciplinary network of independent health professionals, (ii) to strengthen and expand the international response capacity against communicable disease, and (iii) the sharing of experiences on translating evidence from epidemiological and microbiological investigations into actions leading to public health protection.

In 2015, more than 600 public health specialists from 55 countries participated to share their knowledge and experiences on current challenges in the field of infectious diseases. Scientific work was presented in five plenaries, 21 parallel sessions and three moderated poster sessions composed of 24 different tracks. Oral presentations were shared online [1].

The global public health threat of antimicrobial resistance

The keynote speech of the conference was given by Jan Kluytmans (University Medical Center Utrecht, the Netherlands) presenting 'Antibiotic resistance: a tragedy of the commons'. He described the extensive use of antimicrobial drugs in humans and animals and the consequences on antimicrobial resistance (AMR) development. The underlying drivers for AMR are the lack of basic hygiene, a high uncontrolled consumption of antibiotics, and transfer of resistance-conferring molecular elements between animal species, including humans [2]. In spite of this, actions against AMR linked to contaminated food consumption remain infrequent and uncoordinated. He concluded that prudent use of antimicrobials should be advocated and the use of important antibiotics, at least for livestock, should be more tightly controlled.

The Antimicrobial Resistance and Causes of Non-prudent Use of Antibiotics project was presented by John Paget (the Netherlands Institute for Health Services Research, the Netherlands) in a parallel session entitled 'Antimicrobial Resistance'. Research to assess and define the key factors explaining the non-prudent use of antibiotics across seven selected European Union (EU) countries will end in June 2016. Research findings will be translated into policy actions for the more cautious use of antibiotics.

Social media for public health purposes

In this plenary session, the usefulness of social media as tools in communicable disease surveillance and control was discussed. In the last fifteen years many health web-based informal channels have fundamentally changed access to, and dissemination of, medical information, in the field of public health surveillance and outbreak detection and intervention. The integration of health data from official sources with Internet-based data can be an added value to public health surveillance systems in providing information for better risk assessments of communicable diseases.

John Brownstein (Boston Children's Hospital, the United States of America) showed the current sources in the use of non-traditional data sources for the purposes of infectious disease surveillance and epidemic intelligence gathering. 'HealthMap' utilises online informal sources for disease outbreak monitoring and real-time surveillance of emerging public health

threats. Food-borne illness surveillance efforts can be supplemented by the business review site 'Yelp.com', as described by Nsoesie et al. [3]. Other examples presented included 'Thermia', which is a decision support framework based on current clinical guidelines for fevers and associated febrile illnesses, and 'Flu Near You', which is an anonymous community health project in North America that reports and maps influenza-like symptoms weekly. 'UberHEALTH' is a new model of healthcare delivery, which includes the option to have influenza vaccination delivered at home, active in over 70 cities around the world.

Ingemar Cox (University College London, UK and the University of Copenhagen, Denmark) discussed how Internet-based health data sources could facilitate medical research evaluating analysis methods used in recent literature. Digital data offers the potential to access a massive volume of patient-reported outcomes and unfiltered real time, multi-dimensional information on patients' experience. On the other hand, e-data have the limitations of a wide variation in availability and costs to researchers, and storage ability for researchers to utilise data are limited by access to funds and software developers. Moreover, ethical challenges and privacy issues are unclear, and rules are needed to opportunely treat and de-identify e-data.

Epidemiological investigations for public health protection

The plenary session on the occasion of the 20th EPIET anniversary was dedicated to the recurrent food-borne Hepatitis A virus (HAV) outbreak that occurred in 13 EU and European Economic Area countries between 2012 and 2014 involving 1,589 cases. During these investigations, an EPIET and EUPHEM network of experts gave valuable support. Jane Richardson of the European Food Safety Authority and Johanna Takkinen (ECDC) summarised the food tracing activities and recommendations that followed the consecutive multi-country outbreaks. They emphasised the multidisciplinary approach and the good EPIET and EUPHEM collaboration as key factors for controlling the outbreak. Gaia Scavia (Istituto Superiore di Sanità, Italy) gave a national perspective of the investigation. The HAV outbreaks were caused by exposure to contaminated lots of mixed berries from various origins. Sequencing and centralised collection of the viral strains in the Hepatitis A Laboratory-Network database were essential for hypothesis generation. Tracing data were exchanged via the European Rapid Alert System for Food and Feed. A common sequencing protocol was prepared by a EUPHEM fellow at the Dutch National Institute for Public Health and the Environment. Compliance with good hygiene, manufacturing and agricultural practices were recommended in order to focus on preventive measures rather than trying to remove or inactivate the virus from contaminated food.

Emerging challenges to vaccine programmes

Nicole Guiso (Institut Pasteur, France) presented the impact of human immunization with different vaccines against Bordetella pertussis on the selection of escape mutants and the possibly consequent reduction in vaccine effectiveness [4] in a further plenary session. With the aim to better understand the impact of vaccination on B. pertussis populations or the role of Bordetella species evolution on pertussis vaccines effectiveness, the speaker suggested to consider not only the vaccine composition and strategies used, but also the biological surveillance of disease, the vaccine coverage and the characteristics of the circulating B. pertussis and B. parapertussis populations.

Annette Mankertz (Robert Koch-Institute, Germany) pointed out the slight increase in secondary vaccination failure regarding measles [5] and the frequent secondary vaccine failure related to mumps [6] occurring worldwide in recent years. She discussed the underlying causes, including antigen escape and waning immunity due to a lack of natural booster.

Nonspecific side effects of children vaccines in the world's poorest countries were discussed by Christine Stabell Benn (Statens Serum Institut and University of Southern Denmark, Denmark). The Bandim Health Project is a health and demographic surveillance platform to test real-life effects of health interventions in Guinea-Bissau. It has shown that vaccines' nonspecific effects involve cross-reactivity of the immune system with unrelated pathogens. Live attenuated vaccines seem to improve the immune system's ability to fight other pathogens, while inactivated vaccines might reduce it. Moreover, both positive and negative nonspecific effects seem strongest for females [7].

Public health events in 2015: Ebola virus and Middle East respiratory syndrome coronavirus

In the last plenary, Pierre Formenty from the World Health Organization (WHO) discussed the Ebola crisis in West Africa, highlighting the lessons learnt for prevention of future crises. Molecular evidence for sexual transmission of Ebola virus (EBOV) in Liberia was recently described [8] and viral persistence in human body fluids was assessed. The post Ebola survivor programme combines health essential services as well as non-health services.

Results from efficacy testing of the recombinant, replication-competent vesicular stomatitis virus-based vaccine expressing a surface glycoprotein of Zaire Ebolavirus in a ring vaccination trial [9] in Guinea, West Africa, was presented by Gunnstein Norheim (Norwegian Institute of Public Health, Norway). The study was performed towards the end of the epidemic and succeeded due to a novel study design, multi-partner international team and close collaboration with the national Ebola response team.

Stephan Günther (Bernhard-Nocht-Institute for Tropical Medicine, Germany) described the European Mobile Laboratory Project (2012—2015). Over 10,000 samples were tested in Guinea, Liberia, Sierra Leone and Nigeria from March 2014 to February 2015 by mobile laboratories, reducing the need to transport samples over long distances. Moreover, a MinION nanopore sequencing, coupled to a newly developed web-based pipeline for real-time bioinformatics analysis on a laptop, allowed the first complete EBOV sequence in Guinea to be obtained.

Maria Van Kerkhove (Institut Pasteur, France) discussed the extent of Middle East respiratory syndrome coronavirus (MERS-CoV) infection and its transmission to humans. Since 2012 the WHO reported over 1,611 cases from 26 countries, with more than 575 deaths. Genetic data supported multiple sporadic introductions into human populations by contact with dromedary camels and possibly other not yet identified animals. Some 0.15% of the general population were found to be seropositive for anti-MERS-CoV antibodies in Saudi Arabia [10]. The author suggested active surveillance in both animals and humans to stop camel-to-human and human-to-human transmission, and to develop a clear guidance for at risk populations.

Parallel and poster sessions

The core content of the conference consisted of parallel and poster sessions with work presented by qualified professionals and training fellows working in the field of infectious disease prevention and control. A wide range of topics were discussed covering areas related to infectious diseases through multidisciplinary efforts in a 'one-health' approach. The experience of many outbreak investigations including food, water and vector-borne diseases and zoonoses were shared. AMR and healthcare- associated infections, HIV and sexually transmitted infections, vaccine-preventable diseases, vaccine coverage, safety and effectiveness, tuberculosis, as well as influenza and other respiratory viruses were also addressed. Moreover, intervention and surveillance studies on communicable diseases, international health, challenges due to mass gatherings, novel methodological approaches and modelling offered up-to-date knowledge and insights to the participants.

ESCAIDE side events

A number of side events complemented the conference programme. The 'BarCamp' was a dynamic assembly where the audience generated the content. Three very topical subjects (herd immunity, translating outbreak results into food regulation, lessons learnt from migrants' health) generated fruitful discussions. 'Meet the expert' sessions allowed for a deeper exchange with some of the plenary speakers and at the fourth Eurosurveillance scientific lunchtime seminar, Maria Zambon (Public Health England, UK) and Jacob Moran-Gilad (Ministry of Health and Ben-Gurion University, Israel) elaborated on aspects of using new laboratory methods to support outbreak detection.

Conclusions

ESCAIDE is the leading conference on applied infectious disease epidemiology in Europe. Every year it connects hundreds of public health front-line professionals in the field of communicable diseases. This integrated laboratory-field epidemiology network for outbreak detection, investigation and response, strengthens Europe's defences against infectious disease threats by being open to multidisciplinary participants worldwide to foster knowledge exchange and professional discussions.

Early detection and response have proved to be key in preventing the spread of any communicable disease. Expertise diversity, pragmatism and close multidisciplinary collaborations as well as community engagement and local study teams were critical components in outbreak investigations. Moreover, a 'One Health' approach was also recommended as a successful strategy to fight against infectious diseases.

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Conflict of interest

None

Authors' contributions

MS wrote the manuscript. AJ critically reviewed the paper and gave input to the content, which was incorporated in the report. Both authors read and approved the final manuscript.

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