Making One Health Work – experiences with food- and waterborne diseases in EU/EEA

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European Centre for Disease Prevention and Control, ECDC

Mandate to act on its own initiative if origin of outbreaks is unknown until source is known

• **An agency** of the European Union, located in Stockholm, Sweden
• **Founded in 2004**; nearly 300 employees in 2017
• **Mission** to ‘identify, assess and communicate current and emerging threats to human health from communicable diseases’ (Reg. 851/2004)
• **Mandate**: epidemiological surveillance, Early Warning and Response System (EWRS), public health risk assessment, preparedness and response planning (EC/1082/2013)
EU key collaborators for foodborne diseases

Food - and Waterborne Diseases and zoonoses network (FWD-Net):
epidemiologist and microbiologists in EU/EEA

- EURL for Campylobacter, Sweden
- EURL for Listeria monocytogenes, France
- EURL for Salmonella, The Netherlands
- EURL for VTEC**, Italy

EURL = European Union Reference Laboratory
**RASFF = Rapid Alert System for Food and Feed
**EURL for VTEC=European Union Reference Laboratory for verotoxigenic E. coli
**Epidemic Intelligence and Surveillance Framework - FWD focus**

### Indicator-based surveillance

- "Standard surveillance" systems
- Short-, medium-, long term objectives
- Mandatory/voluntary notification
- Laboratory-based surveillance
- Detecting (re)-emerging threats
- Trend monitoring
- Severity monitoring

*Collect*  
*Validate*  
*Analyse*  
*Interpret*

### Event-based monitoring 24/7

- Data
- Events
- Any data source / real-time

*Screen*  
*Filter*  
*Validate*  
*Analyse*

- Immediate threats
- Media review
- Info scanning tools
- Distribution lists
- International agencies
- EWRS
- EPIS*

### Signal

- Assess public health risk

### Communication

- Public health Alert

### Control measures (RESPONSE)

*EPIS = Epidemic Intelligence Information System*
Trends in priority foodborne diseases, 2015

Salmonellosis

Listeriosis

ShigaToxin-producing *E. coli* (STEC)

Campylobacteriosis

STEC O104:H4

Standard operating procedures for EU level MLVA* typing

MLVA S. Typhimurium

2011

MLVA S. Enteritidis

2016

Peters at al. 2017. Multi-laboratory validation study of MLVA:
http://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2017.22.9.30477

*Multi-Locus Variable number tandem repeat Analysis
Strengthening surveillance through molecular typing - objectives

- Early detection and delineation of multi-country FWD outbreaks and/or dispersed clusters to trigger outbreak investigations and contribute to trace back and forward investigations
- Detection of (re-)emergence and monitoring the spread of virulent/resistant strains
- Identification of persistent FWD strains causing human infections in EU and likely originating from continuous sources
- Identification of transmission chains, and new risk factors for infection and severity of disease
One Health - development of joint molecular typing-enhanced surveillance

- STEC O104:H4 outbreak
- EC vision on molecular typing support for outbreak preparedness
- EC request to ECDC and EFSA on establishment of molecular typing databases
- Joint ECDC-EFSA Steering Committee for a joint molecular typing database
- Collaboration agreement: ECDC-EFSA- EURLs for *Listeria monocytogenes*, *Salmonella* and VTEC => PFGE\(^1\) and MLVA\(^2\)
- EC request to ECDC and EFSA to upgrade joint molecular typing database with WGS
- First non-human isolate submitted to the joint database (PFGE)
- 1st WGS support to multi-country outbreak investigation

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\(^1\)PFGE=Pulsed-field gel electrophoresis
\(^2\)MLVA=Multi-Locus Variable number tandem repeat Analysis
Improved signal detection and response to multi-country foodborne outbreaks

MLVA\(^1\) + PFGE\(^2\)

Weekly cluster reports

Joint ECDC-EFSA Rapid Outbreak Assessments

Urgent Inquiry: unusual increase of cases at national level

Whole genome sequencing (WGS) support since 2015

\(^1\)MLVA=Multi-Locus Variable number tandem repeat Analysis
\(^2\)PFGE=Pulsed-field gel electrophoresis
Collaboration between EU agencies on surveillance of AMR and AMC

Surveillance of AMR and antimicrobial consumption in humans (EARS-Net, ESAC-Net, HAI-Net, FWD-Net)

Surveillance of antimicrobial consumption in animals (ESVAC)

Surveillance of antimicrobial resistance in animals and foods

Joint Interagency Antimicrobial Consumption and Resistance Analysis report (JIACRA)
First report published in January 2015
Second report published in July 2017
Critical success factors

- High level political support

- Communication; agreed messages on joint actions

- Networking => learn to know each other in peace time

- Development of WGS in Member States and good collaboration in investigations
Challenges

- Do we have a common understanding?
  - Different objectives: outbreak response – source attribution
  - Cultural differences:
    - Slow => political influence
    - Rapid => responding to ongoing threat
  - Risk assessment concept

- Respecting each others mandates
  - Risk assessment/risk management
Moving forward step by step

- 3rd joint ECDC-EFSA networks meeting next week

- Joint ECDC-EFSA working group for EC mandate to upgrade joint molecular typing database with WGS

- Joint surveillance reports / Scientific opinions / Risk assessments

- Improving communication of threats to policy makers and general public in mutual cross-sectoral understanding

- Look for win-win approaches

- Cross-fertilization => open-mindness: learn about other disciplines
ECDC experts

- Celine Gossner
- Daniel Palm
- Ettore Severi
- Frances Drugan
- Ivo van Walle
- Joana Revez
- Karin Johansson
- Laura Espinosa
- Marc Struelens
- Margot Einöder-Moreno
- Milka Docheva
- Saara Kotila
- Taina Niskanen
- Teija Korhonen
- Therese Westrell

Epidemiologists and microbiologists in the FWD network

- Valentina Rizzi
- Frank Boelaert
- Beatriz Guerra
- Ernesto Liebana
- Marta Hugas
- EFSA