Focus on Campylobacter

Surveillance of food- and waterborne diseases in the EU

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European Centre for Disease Prevention and Control
Uppsala, 5 October 2010
What is ECDC?

the European Centre for Disease Prevention and Control (Regulation 851/2004)

Mission

Identify, assess & communicate current & emerging health threats to human health from communicable diseases

- EU level surveillance of communicable diseases
- Epidemic intelligence
- Early Warning and Response System (EWRS)
- Technical assistance and training
- Scientific opinions and studies
- Communication to scientific community and to public
Surveillance mandate of ECDC

Search for, collect, collate, evaluate and disseminate relevant scientific and technical data of 49 diseases

- Support **strengthening the national surveillance systems**
- Develop **integrated data collection systems** covering all MS and all notifiable communicable diseases
- Establish EU-wide **standard case reporting**
- Monitor **trends of diseases** across Europe
- Disseminate the **results to stakeholders** for timely public health actions at EU and MS level
- **Coordinate** the integrated operations of the **Dedicated Surveillance Networks (DSNs)**
General developments

- Long term **surveillance strategy 2008-2013**

- Standard **EU case definition**
  - Published on 28 April 2008

- **The European Surveillance System (TESSy) since 2008**

- **Agreement on access to TESSy data in 2009**

- **Evaluation of 17 DSNs ended in May 2009**

- **Concept of integrating molecular typing data to EU level surveillance in 2008**
Scope of European FWD programme

20/49 diseases (41%)

Confirmed cases of 49 communicable diseases by ECDC disease specific programmes (excluding HCAI*), AER 2007, N = 1 030 898

- Anthrax
- Botulism
- Brucellosis
- Campylobacteriosis
- Cholera
- Variant Creutzfeldt-Jakob disease
- Cryptosporidiosis
- Echinococcosis
- Giardiasis
- Hepatitis A
- Listeriosis
- Leptospirosis
- Salmonellosis
- Shigellosis
- STEC/VTEC infection
- Toxoplasmosis
- Trichinosis
- Tularaemia
- Typhoid/paratyphoid fever
- Yersiniosis

*HCAI = health care associated infection
Reported human cases of FWD in 2007

- Campylobacteriosis
- Giardiasis
- Salmonellosis
- Hepatitis A
- Yersiniosis
- Shigellosis
- Cryptosporidiosis
- STEC/VTEC
- Listeriosis
- Toxoplasmosis
- Tularaemia
- Echinococcosis
- Leptospirosis
- Trichinellosis
- Brucellosis
- Typhoid/paratyphoid fever
- Botulism
- Cholera
- vCJD
- Anthrax
General FWD surveillance objectives

- **Monitor trends**

- **Enhance**
  - detection of international food-borne clusters and outbreaks through appropriate laboratory methods
  - rapid exchange of information on clusters and causative agents/strains

- **Strengthen**
  - integrated/linked surveillance in humans, food, feed and animals
  - collaboration between public health, food, feed and veterinary authorities
  - laboratory capacity in MSs
FWD surveillance network

- Building on former Enter-net network
  - Transfer of Enter-net to ECDC in 2007
  - New network of epidemiologists and microbiology experts
  - Nominated for six priority diseases
    - Salmonellosis
    - Campylobacteriosis
    - STEC/VTEC infection
    - Listeriosis
    - Shigellosis
    - Yersiniosis
  - **Coordination Group**: 5 epi + 5 lab + EFSA + CRL VTEC

- Annual discussions on surveillance objectives and methods, datasets, surveillance findings, outbreak investigations, laboratory capacity building

- Forms basis network for rapid detection of FWD clusters/outbreaks
Surveillance outputs

- **Annual Epidemiological Report** since 2005
  - Preparation of disease chapters for 20 diseases

- **Community Summary Report** on trends and sources of zoonoses and zoonotic agents in the EU (EFSA and ECDC)
  - Human chapters prepared since 2005

- **Enhanced surveillance report 2006-2009** under preparation
  - Six priority diseases (SALM, CAMP, VTEC, LIST, YERS, SHIG)
  - Monitoring surveillance indicators and unusual trends/changes

- **Quarterly overviews** of Salmonella and VTEC cases under preparation for the network

- **Query tool** for public use under preparation
Selected surveillance results
EU population

- 27 Member States
- 500 million
- Largest age group 25-44 yrs
- Female:male ratio 1,05
Surveillance of foodborne infections in humans is mainly based on reporting of laboratory-confirmed infections.
Trend of salmonellosis (25 MSs) and campylobacteriosis (20 MSs) in humans, TESSy data
Most commonly reported species (%) in 2009 (TESSy data)

- **C. jejuni**: 36.90%
- **C. coli**: 2.45%
- **C. lari**: 0.18%
- **C. uppsaliensis**: 0.01%
- **Other C. spp.**: 9.74%
- **Unknown**: 50.72%
Trend of *C. jejuni* and *C. coli*, 2007-2009 (TESSy data, 14 MSs)
Seasonality of *C. jejuni* by age groups, TESSy data for 2009 (18 MSs, 85% of EU population)
FWD (Urgent Inquiry) network

EPIS platform

Index country

Monthly summaries

FWD network

Country replies ECDC comments

Urgent inquiry

Multinational outbreak investigations
Organisms associated with UI’s, 2008-2009

<table>
<thead>
<tr>
<th>Organism</th>
<th>2008</th>
<th>2009</th>
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<tbody>
<tr>
<td><em>Salmonella spp.</em></td>
<td>31</td>
<td>17</td>
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<td><em>Shigella spp.</em></td>
<td>1</td>
<td>3</td>
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<tr>
<td>STEC/VTEC (shigatoxin-verotoxin producing <em>E. coli</em>)</td>
<td>1</td>
<td>6</td>
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<td>Hepatitis A</td>
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<td><em>Cyclospora</em></td>
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Surveillance supportive activities
Strengthening capacity

- **Survey** in national reference laboratories in 2009
  - *Salmonella, VTEC, Campylobacter, Listeria, Yersinia* and *Shigella*
  - Method harmonisation needs, planning for new EQAs and training needs

- Selected results:
  - Response from 25 MSs reference laboratories for Campylobacter
  - 11 laboratories process food samples and 8 animal samples
  - 23 laboratories support in outbreak investigations
  - 22 maintain a strain collection
  - 21 perform antimicrobial susceptibility testing
  - 20 are active in research and produce scientific publications
What are the training needs in your laboratory for the following areas? (only in relation to *Campylobacter spp.*)

<table>
<thead>
<tr>
<th>Identification/Confirmation</th>
<th>Typing methods</th>
<th>AST methods</th>
<th>Bio-safety</th>
<th>Quality Control/QA Assurance</th>
<th>Accreditation</th>
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*Rank_1, Rank_2, Rank_3, Rank_4, Rank_5*
Which molecular typing methods for *Campylobacter spp.* do you think would be most suitable for epidemiological surveillance purposes at the EU level?
Towards minimum pathogen specific objectives for NRLs – network collaboration

• **Example: VTEC**
  - 5 Most Common O Groups
    ( O157, O26, O103, O111, O145)
  - Capacity to detect vtx1, vtx2 and eae
  - IMS/SMAC/CT-SMAC available on request
  - Ampicillin, Streptomycin, Tetracycline, Chloramphenicol, Nalidixic Acid, Ciprofloxacin (FQ)
  - III Gen Cef (CTX/CPD), Trimethoprim, Sulphonamide
Multinational studies

- Project: “Seroepidemiology as a tool to assess incidence of *Salmonella* and *Campylobacter* infections”; 2009-2013
  - Antibody response in infected but asymptomatic cases
  - Protocol for countries to perform seroepidemiological studies to assess burden of *Salmonella* and *Campylobacter* infections
  - Multinational seroepidemiological study

- Joint *Listeria* typing study with EFSA planned 2010-2011
  - pilot a joint molecular typing exercise between ECDC and EFSA
  - support the development of molecular typing surveillance system for listeriosis at the EU level
  - provide useful information for food safety and public health authorities on potential links between identified high risk food types and human infections.
Support for outbreak investigations

- Project: "Practical toolbox for investigations of FWD threats that have an EU dimension"; 2010-2011
  - Case definitions
  - EU trawling questionnaire
  - Database with questions
  - Automated data analysis
  - Guidance for microbiology and environmental investigations
  - Guidance for analytical investigations
Thank you!

On behalf of ECDC FWD team:
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