EPIET and EUPHEM; Building capacity in the EU

Arnold Bosman, head of public health training, ECDC
EFSA Annual Conference 2015, Milan, Italy
Programme objectives of EPIET path/ EUPHEM path

Key elements:

• Strengthen surveillance in EU Member States & EU level
• Develop PH response capacity in and beyond the EU
  – address disease threats / outbreaks through field investigation and control
• Develop a European Network of Field Epidemiologists / Public Health Microbiologists
  – using best practise and sharing common objectives;
• Support outbreak detection, investigation and response nationally and internationally
• Foster future leaders in PH Microbiology in EU
Training Objectives & Methods  
2 year EPIET Fellowship

Objectives

• Surveillance
• Outbreak Investigation
• Population based studies
• Teaching
• Communication (including scientific)

Methods:

• Learning by doing “through service” (80%)
• Supervised ‘apprenticeship’ (10%)
• Specialist courses (10%)
Pathways

- Epidemiology (EPIET) since 1995
  - Core Competencies Intervention Epidemiology (2007)
- Public Health Microbiology (EUPHEM) since 2008
  - Core Competencies PH Microbiology (2011)
- Two distinct specialist profiles
- Same 5 public health functions in training objectives
- Part of communicable disease risk management cycle
- Other disciplines may fit this model
Outputs & outcomes 1995-2015
Modest Numbers

• EPIET & EUPHEM: 462 Fellows
  – 70 Cohorts 2014-2015
  – 39 Graduating cohort (2013)
  – 324 Graduated successfully (diploma)

• International Deployments: 233
  – 123 Outbreak
  – 39 Surveillance
  – 45 Survey
  – 15 Teaching
  – 11 Others
EPIET / EUPHEM and EU-capacity

- EPIET in ECDC (2006)
- EUPHEM (2008)
- MS-track (2011)
- EPIET & EUPHEM: 2 complementary curricula
- EAP, EU- & MS-tracks share same curriculum
Improving surveillance

• ECDC Disease Networks: (2006-2007) fellows in each evaluation team
• National surveillance: fellows evaluate & operate systems (reporting to TESSy)
• Setting up molecular typing platforms for FWD surveillance (as part of TESSy)

Some examples
• Borrelia (in Norway, Finland)
• Lab based CCHF (in Spain, Hungary, Romania, Germany)
• STI in Germany, Hungary, Romania, Finland
• Entroviruses (Denmark, Finland, Norway, UK)
• Tuberculosis (in Finland)
• Molecular typing platforms for FWD (Spain, Ireland, Denmark, Germany, Finland)
Response capacity in & beyond EU

- Initially via MSF & GOARN
- Increasingly directed from ECDC
- Complex Emergency Situations Course (1 week)

Some examples
- Mortality surveys (e.g. Darfur 2004)
- Tsunami (2004)
- Earthquakes (Pakistan 2005, Haiti 2010)
- Pandemic H1N1 (2009)
- Vaccine coverage surveys
Supporting International Response

• Fellow & Supervisors
• Not included: alumni

• Mission Controls:
  – WHO 97
  – ECDC 30
  – MSF 26
  – Other 27
H1N1 pandemic response fellows 2009

<table>
<thead>
<tr>
<th>Type of involvement</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance (data management and analysis)</td>
<td>11</td>
<td>23.4%</td>
</tr>
<tr>
<td>EOC support, on call duty</td>
<td>13</td>
<td>27.7%</td>
</tr>
<tr>
<td>Research (leading and support)</td>
<td>14</td>
<td>29.8%</td>
</tr>
<tr>
<td>Contact tracing</td>
<td>4</td>
<td>8.5%</td>
</tr>
<tr>
<td>Outbreak investigation</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>No involvement</td>
<td>2</td>
<td>4.3%</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

* More than one answer was possible

Figure: Number of influenza outbreak, research and surveillance activities performed by EPIET-trained fellows by host country

Numbers of activities:
- Outbreak investigation
- Surveillance
- Research
- EOC, on call duty

- Ebola Control Teams: Guinea, Sierra Leone, Liberia
- Ebola Preparedness: Mauretania & Burkina Faso
- Total missions: 40
  - 4 Coordinator/Director
  - 12 EPIET Associated FETP
  - 20 EU-track (4 EUPHEM)
  - 4 MS-track (1 EUPHEM)

Main tasks performed
- Field coordinator
- Field epidemiology
- Public Health Microbiology
- Mortality survey
- Preparedness / training
Food & Waterborne Diseases;
Services provided by fellows

- 21 International Deployments 1995-2015 (N=233)
  - Outbreaks (cholera, amebiasis, cryptosporidiosis, leptospirosis, salmonellosis)
  - Surveillance (Caribbean; hotel industry)
  - Survey, teaching

- 21 Submitted Abstracts ESCAIDE 2015 (N=105)
  - Salmonella 8
  - E.coli (incl. HUS) 5
  - Legionnella 2
  - Gastroenteritis 2
  - C.perfringens 1
  - Cryptosporidium 1
  - Norovirus 1
  - Shigella 1
Submitted Abstracts ESCAIDE 2015
Foodborne pathogens (n=19)

• 12 outbreaks
  – 9 ‘classic’ investigations
  – 2 ‘new methods’ (online and WGS)
  – 1 ‘review’
• 2 surveillance
• 5 ‘diverse’ study questions
  – Yet none linked to food risk assessment
# Hepatitis A virus (HAV) outbreaks in 2013-2015

<table>
<thead>
<tr>
<th>Hep A outbreak</th>
<th>Declared / closed</th>
<th>Countries affected</th>
<th>Genotype</th>
<th>Associated cases</th>
<th>Vehicle of infection</th>
<th>EPIET involvement</th>
<th>Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nordic Countries</td>
<td>Mar / Sep 2013</td>
<td>DK,FI,NO, SE</td>
<td>IB</td>
<td>77 conf 40 prob</td>
<td>Frozen strawberries</td>
<td>All fellows at national level involved in the investigations</td>
<td>Eurosurv1 (alumna) Eurosurv2 (fellow) ECDC/EFSA RRA</td>
</tr>
<tr>
<td>Ex-Egypt</td>
<td>Apr / Aug 2013</td>
<td>DK,EE,FI, FR,DE,IE, LV,LT,NL, NO,SK,SE, UK</td>
<td>IB</td>
<td>21 conf 86 prob</td>
<td>Fresh strawberries</td>
<td>Jussi Sane (EPIET) in ECDC for case control study. Fellows at national level collaborating at the questionnaire and interviewing cases and controls</td>
<td>Eurosurv1 (fellow) Eurosurv2 (fellow) RRA</td>
</tr>
<tr>
<td>Multi-state Europe</td>
<td>May 2013 / Jan 2015</td>
<td>AU,BG,FI, FR,DE,DK, IE,IT,NL, NO, PO, SE,UK</td>
<td>IA</td>
<td>361 conf 1228 prob</td>
<td>Frozen mixed berries</td>
<td>Rita da Sousa (EUPHEM) prepared the sequencing protocol – currently proposed at EU level</td>
<td>EFSA report Eurosurv1 Eurosurv2 (fellow) Eurosurv3 (alumnus) ECDC/EFSA RRA</td>
</tr>
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Courtesy of Ettore Severi, ECDC 2015
Strawberry pickers and Leptospirosis


- Seasonal workers from Poland, Romania
- Among 153 workers; 24 cases
- Risk factors proximity to rodents, yet also eating unwashed strawberries
- Recommendations made, yet not implemented
- In 2014 similar outbreak, detected in Germany among Polish seasonal strawberry pickers; n=44 (abstract ESCAIDE Nov 2015)
  - -→ same risk factors identified
Complex distribution chains


- 10-fold increase S.tm DT104 Sept-Nov 2005 in NL (N=169)
- Case Control: pre-processed raw beef product possible vehicle
- PFGE pattern & MLVA identical to previous Danish outbreak strain
- The same batch of beef was involved

"Could the outbreak in NL have been averted by the recognition of the outbreak in DK? Against this notion is the complexity of the product tracing which stretched the investigation into weeks, thus rendering a rapid intervention as a response to the RASFF alert impossible."
Fig. 2. Distribution routes uncovered by the product tracing, showing the shipment of incriminated beef from the European country of origin to The Netherlands and from there further internationally, May–November 2005.
Risk Management Cycle

- Event detection
- Risk assessment (rapid and formal)
- Control & preventive measures
- Evaluation and monitoring

Epidemic Intelligence
Risk Management Cycle & EPIET

- Field Research
- Program Evaluation
- Surveillance

- Event Detection
- Prevention & Control Measures
- Outbreak Investigation
- Field Research

- Support through Communicating results of Assessments
- Targeted recommendations
Summary and future needs

• EPIET Fellowship trains 40 specialists / year
  – Modest numbers, yet:
  – Covering most EU Member States; network
  – Joint operations epi & lab = asset
  – Surge capacity during international health crises
  – Strengthening PHE detection, threat assessment

• Link to risk management needs strengthening

• Collaboration with Food Safety Risk Assessment?
Cohort 2014