The development of a European surveillance system for healthcare-associated infections

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History of standardised surveillance of healthcare-associated infections in the EU

- HELICS (Hospitals in Europe Link for infection control through surveillance) = collaboration of national/regional surveillance networks: first initiative in 1994, funding discontinued
- 1998: Decision 2119/98 EC: epidemiological surveillance and control of communicable diseases in Europe -> HELICS II: assess needs
- 2000-2004: HELICS III-IV (EU funded): surveillance of Surgical Site Infections and ICU-acquired infections


- 2005-2008: Continued HELICS surveillance as workpackage of IPSE (Improving Patient Safety in Europe, EU funded)
- 1/7/2008: transition IPSE & HAI surveillance coordination to ECDC Stockholm
ICU: surveillance of HAIs in intensive care units; CDI: surveillance of *Clostridium difficile* infections; SSI: surveillance of surgical site infections; PPS: Point prevalence survey; LTCF: long-term care facilities
Why do we need standardised protocols?

- HAI surveillance = key component for HAI prevention, especially as part of surveillance network
  - Use of same methods ⇒ feedback of risk-adjusted indicators for inter-hospital comparisons as measure of own performance

- 2007: ECDC external evaluation of EU-funded IPSE (Improving Patient Safety in Europe) network
  - “The European HAI surveillance needs to cover other types of nosocomial infections besides surgical site infections and ICU-acquired infections in order to estimate and monitor the complete HAI disease burden.”
  
  “Develop common HAI point prevalence survey (PPS) protocol & strategy”

  “Define basic common indicators for evaluation of HAI control and prevention programmes”
EU Council Recommendation of 9 June 2009 on patient safety, incl. the prevention and control of HAIs (2009/C 151/01)

“Adopt and implement a strategy ... for the prevention and control of HAIs...:”

(c) establish or strengthen active surveillance systems by:

(i) at national or regional level:

⇒ organising prevalence surveys at regular intervals, as appropriate;

⇒ surveillance of targeted infection types to establish national reference data, accompanied by process and structure indicators to evaluate the strategy;

⇒ using, where appropriate, surveillance methods and indicators as recommended by ECDC and case definitions as agreed upon at Community level in accordance with the provisions of Decision No 2119/98/EC;

Development of a new HAI surveillance component: steps

1. Review of existing protocols, identify methodological differences
2. Meeting with Member States experts to discuss strategy
3. Meetings and teleconferences with Member States experts to discuss and agree on objectives, protocol, timeline
4. Development of data collection tools (protocol, forms, software)
5. Test the feasibility of the protocol and adapt it accordingly
6. Conduct (outsource) scientific studies for additional evidence
7. Develop training materials, train the trainers
8. Roll out the new protocol, provide helpdesk during national training and data collection
9. Feedback: hospital reports for participating hospitals, national results
10. European report
Example: ECDC PPS of HAIs and antimicrobial use in acute care hospitals

Structure and process indicators: percentage of single room beds

- Single-room beds (%)
  - <5
  - 5 to <10
  - 10 to <20
  - 20 to <30
  - >=30
  - Not included

Single room beds in participating hospitals (%): median = 11.1%

Step 1: review of point prevalence surveys of HAI in Europe, 2008

Mean HAI prevalence 7%

Mean HAI incidence 5%

4.1M patients with HAI, 37 000 direct deaths

Step 1. Review of methodological differences of national PPSs of HAI in EU countries, 2008

<table>
<thead>
<tr>
<th>Methodological difference</th>
<th>%</th>
<th>Countries (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case definitions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnostic related groups</td>
<td>12%</td>
<td>LV, SE</td>
</tr>
<tr>
<td>CDC, modified</td>
<td>12%</td>
<td>FR, NL, (UK)</td>
</tr>
<tr>
<td>CDC, unmodified</td>
<td>77%</td>
<td>Other</td>
</tr>
<tr>
<td>Imported HAI included</td>
<td>47%</td>
<td>DK, ES, FI, FR, IE, NL, SE, UK</td>
</tr>
<tr>
<td>Included infections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All infections</td>
<td>53%</td>
<td>BE, EL, IT, LT, LV, NL, PT, SE, SI</td>
</tr>
<tr>
<td>Only main infection types (2)</td>
<td>12%</td>
<td>NO, DK</td>
</tr>
<tr>
<td>Exclusion of secondary bloodstream infections</td>
<td>24%</td>
<td>UK, IE, FI, DE</td>
</tr>
<tr>
<td>Exclusion of asymptomatic bacteriuria</td>
<td>12%</td>
<td>ES, FR</td>
</tr>
<tr>
<td>Data collection type / workload</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggregated numerator and denominator</td>
<td>12%</td>
<td>NO, DK</td>
</tr>
<tr>
<td>Patient-based numerator, aggr. denominator</td>
<td>12%</td>
<td>SE, LV</td>
</tr>
<tr>
<td>Patient-based numerator and denominator</td>
<td>77%</td>
<td>Other</td>
</tr>
<tr>
<td>Exclusion of specific patients or specialties</td>
<td>18%</td>
<td>FR, NL</td>
</tr>
</tbody>
</table>

(1) More recent PPSs available from the following countries: SE, DK, PT, NL, NO, ES, LT, PL.
(2) Pneumonia, bloodstream infection, urinary tract infection, surgical site infection.

Step 2 and 3. ECDC PPS of healthcare-associated infections and antibiotic use in acute care hospitals: meetings

**Step 2.** Strategic joint IPSE/EARSS/ESAC meeting Jan 2009: Integration protocol of former ESAC hospital PPS for antimicrobial use, Study EU vs CDC HAI case definitions

**Step 3.** Meetings and teleconferences with experts:
- PPS I protocol: 7 meetings, PPS II protocol: 5 meetings, 7 teleconferences
- Total 229 experts from 27 EU Member States, 2 EEA/EFTA countries, 7 EU (potential) candidate and 8 neighbourhood countries, CDC Atlanta, WHO regional office Europe, European Commission, ESICM, ESCMID, ESAC project, ECDC

EARSS: European antimicrobial resistance surveillance project; ESAC: European antimicrobial consumption project; CDC: Centres for disease control and prevention, Atlanta, United States; ESICM: European Society of Intensive Care Medicine; ESCMID: European Society of Clinical Microbiology and Infectious Diseases
Step 3. Decision process during meetings

- Collect comments by email prior to meeting
- Objectives, timeline (4 waves, every 5 years), options (light, standard): consensus
- Variables, definitions...: discussion, voting if needed

**Objectives of ECDC PPS 2016-2017**

1. To **estimate** the total burden (prevalence) of HAI & antimicrobial use
2. To **describe** patients, **invasive procedures, infections** (sites, micro-organisms including markers of antimicrobial resistance) and **antimicrobials** prescribed (compounds, indications)
   - By type of patients, specialties or healthcare facilities
   - By EU-country, adjusted or stratified
3. To describe key **structures and processes for the prevention of HAI**s and **antimicrobial resistance** at the hospital and ward level in EU hospitals
Step 4. Development of ECDC PPS tools: protocol, forms, free software for hospitals

ECDC Point prevalence survey of healthcare-associated infections and antimicrobial use in acute care hospitals
Forms V4.2

Step 5. Test the feasibility of the protocol. ECDC Pilot PPS, June-October 2010

Pilot ECDC PPS support contract outsourced to University of Antwerp, InVS Paris, IPH Brussels (2010)

- 23 countries, 66 hospitals, 19,888 patients
- HAI: 7.1%, Antimicrobial use: 34.6%
- Protocol workload/100 patients (data collection and data entry)
  - **Light** (unit-based) option (16 hospitals): **2.5 days** (20 hours)
  - **Standard** (patient-based) option (50 hospitals): **4 days** (32 hours)

Step 6. Outsource studies for additional evidence

- Concordance study EU vs CDC HAI case definitions (2009 - Charité University Medicine, Berlin)
  

- PPS validation pilot study (Glasgow Caledonian University, 2011)
  

- Systematic review on organisation of hospital infection control programmes (SIGHT study, HUG, 2010)
  
Step 6/2. Outsource national validation contracts

→ AF33 (Feb 2013): “Include national validation surveys in PPSs”

Step 7. Training

- Training curriculum developed in 2010 (outsourced, coordinated by HPA, London)
- Train-the-trainer course: London, March 2011 (2 participants from each country)
- On average: 3 courses of 7.25 hours organised per country
- 104 participants/country (median 78, range 5-436)
- Estimated number of hospital staff trained in PPS methodology: **2800** people

Step 8. Roll out final protocol, helpdesk

- National PPS coordination: median 4 experts, 59 expert-days

  - ECDC Questions and answers forum
  - Data from 1149 hospitals/30 EU/EEA countries submitted to ECDC (TESSy)

Step 9. Data analysis, feedback results at hospital and national level

- Hospital feedback reports (24 pp) sent by ECDC to national coordinator within 1-2 weeks after data submission to ECDC
- Detailed hospital results versus national and EU results, incl. standardisation
- Possible in local language

III. IPC Programmes

III.1. IPC team

<table>
<thead>
<tr>
<th></th>
<th>Hospital H</th>
<th>EU mean/%</th>
<th>P25</th>
<th>P50</th>
<th>P75</th>
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<tbody>
<tr>
<td>Number of FTE infection control nurses</td>
<td>4</td>
<td>271</td>
<td>1.5</td>
<td>0.75</td>
<td>1</td>
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<tr>
<td>N FTE infection control nurses/250 beds</td>
<td>1.06</td>
<td>271</td>
<td>1.9</td>
<td>0.86</td>
<td>1.62</td>
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<tr>
<td>N FTE infection control doctors</td>
<td>0.5</td>
<td>265</td>
<td>0.5</td>
<td>0.1</td>
<td>0.25</td>
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<tr>
<td>N FTE infection control doctors/250 beds</td>
<td>0.13</td>
<td>265</td>
<td>0.8</td>
<td>0.1</td>
<td>0.32</td>
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III.2. IPC plan and report

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<th>EU mean/%</th>
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<tbody>
<tr>
<td>Annual IPC plan approved by CEO</td>
<td>1</td>
<td>269</td>
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<td>Annual IPC report approved by CEO</td>
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<td>265</td>
<td>80.4</td>
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III.3. Microbiology/diagnostic performance

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<th>Hospital H</th>
<th>EU mean/%</th>
<th>P25</th>
<th>P50</th>
<th>P75</th>
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<tbody>
<tr>
<td>Number of blood culture sets/year</td>
<td>5970</td>
<td>258</td>
<td>2111.0</td>
<td>86</td>
<td>727</td>
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<tr>
<td>Number of blood culture sets/1000 pt-days</td>
<td>28.7</td>
<td>257</td>
<td>19.7</td>
<td>4</td>
<td>12.6</td>
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<tr>
<td>Number of stool tests for CDI/year</td>
<td>707</td>
<td>249</td>
<td>381</td>
<td>8</td>
<td>110</td>
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<tr>
<td>Number of stool tests for CDI/1000 pt-days</td>
<td>3.4</td>
<td>248</td>
<td>3.6</td>
<td>0.3</td>
<td>1.6</td>
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Microbiology support during weekends

<table>
<thead>
<tr>
<th></th>
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<th>EU mean/%</th>
<th>P25</th>
<th>P50</th>
<th>P75</th>
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</thead>
<tbody>
<tr>
<td>Microbiology on Saturdays, clinical tests</td>
<td>1</td>
<td>259</td>
<td>90.0</td>
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<td>244</td>
<td>77.9</td>
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<td>Microbiology on Sundays, screening tests</td>
<td>1</td>
<td>233</td>
<td>69.5</td>
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</table>
Step 10. ECDC PPS report

ECDC point prevalence survey: healthcare-associated infections still a major public health problem, one in 18 patients in European hospitals affected

04 Jul 2013

The first Europe-wide point prevalence survey on healthcare-associated infections and antimicrobial use estimates that on any given day, about 80 000 patients – or one in 18 patients – in European hospitals have at least one healthcare-associated infection.

Conducted in more than 1 000 hospitals in 30 European countries, the survey provides the most comprehensive database on healthcare-associated infections and antimicrobial use in European acute care hospitals to date. The data are published as a report and also available online as an interactive database.
Development of a new HAI surveillance component: 10 steps

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Process 11: recruitment of countries, 2nd ECDC PPS

- Interest for participating countries and hospitals: compare HAI and antimicrobial use, WHO core IPC components, TATFAR antimicrobial stewardship indicators, identify priorities e.g. for surveillance

- Strong recommendation (EU Commission and ECDC Advisory Forum)

- EU legislation:
  - Decision 1082/2013/EU of European Parliament and the Council
  - Council Recommendation 2009/C 151/01 (Patient safety incl. HAIs)

- Currently: 28 EU/EEA countries, 5 EU (potential) candidate countries

*Norway: partial participation with structure and process indicators, national PPS protocol
Acknowledgments

Pilot PPS support
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Pilot PPS validation
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PPS helpdesk
S Hopkins, P Zarb, O Lyytikainen, B Coignard, ML Moro, J Kolman, J Reilly, A Muller, ECDC colleagues

HelicsWin.Net development
K Mertens, X Pretlot (IPH Brussels)
S Ostafiev, A Pedrini (ECDC)


- 200+ experts from EU/EEA Member States, WHO/Europe, ESICM, ESCMID, ESAC, CDC, ...
- National PPS coordination teams and participating hospitals!!!
Thank you!

EUROPEAN ANTIBIOTIC AWARENESS DAY
A EUROPEAN HEALTH INITIATIVE

18 November 2017

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