MEETING REPORT

Expert consultation on healthcare-associated infection prevention and control

Stockholm, 25–26 February 2010

Executive summary

On 9 June 2009, the Council of the European Union issued a Recommendation on patient safety, prevention and control of healthcare associated infections (HAI). The Recommendation invited Member States (MS) to consider implementing standard and risk-based infection prevention and control measures in all healthcare settings, making guidelines and recommendations available and encouraging the adherence to the Council Recommendation by using structure and process indicators. To support this process, the European Centre for Disease Prevention and Control (ECDC) has a mandate to develop scientific guidance with international experts on evidence-based measures and appropriate practice for effective HAI prevention. This should aim at strengthening national HAI prevention strategies and encourage coordination where needed.

The purpose of this meeting, held from 25 to 26 February 2010, was to consult with a group of experts from across Europe and representatives of the World Health Organization (WHO) and European Commission to reach a consensus on the current needs and key priorities for developing evidence-based guidance on prevention of HAI at the European level. During the first day, the Council Recommendation and an overview of current activities of the ECDC Antimicrobial Resistance and Healthcare Associated Infection programme were presented. This was followed by round table discussions on the priorities and gap analyses of HAI prevention guidance and opportunities for collaboration and integration with national and international guidance, notably with the WHO. Thereafter, the experts were asked to rank priority guidance topics for the top five organisational elements of hospital infection control programmes and top five care-specific measures. The criteria for priority ranking were based on the perceived level of effectiveness of interventions and extent of potential benefit in reducing the burden of HAI disease across Europe.

The top five organisational elements of hospital infection control programmes to be further reviewed included structural arrangements, surveillance targets and methods, education and training of healthcare workers, behavioural change and quality of care interventions, and policy and resources for standard and transmission-based precautions. The top five care-specific measures included the following list: prevention of surgical site infection and perioperative prophylaxis; standard precautions, patient isolation and transmission-based precautions; ventilator-associated/hospital-acquired pneumonia; catheter-related bloodstream infection; and catheter-related urinary tract infection (in acute care and long-term care facilities). Draft outlines on methods of development and content of ECDC guidance were also reviewed and agreed upon.

Stockholm, June 2010

1 Background

On 9 June 2009, the Council of the European Union issued a Recommendation on patient safety, prevention and control of healthcare associated infections (HAI). The Recommendation invites Member States (MS), at the national or regional level, to consider and employ the following advisements:

- implementing standard and risk-based infection prevention and control measures in all healthcare settings;
- promoting consistency in, and communication of, infection prevention and control measures between healthcare providers;
- making guidelines and recommendations available at the national level; and
- encouraging the adherence to the Council Recommendation by using structure and process indicators, as well as the results of accreditation or certification processes in place.

The Recommendation also proposed that, at the healthcare institution level, MS implement an infection prevention and control programme addressing the following aspects:

- organisational and structural arrangements;
- diagnostic and therapeutic procedures;
- resource requirements;
- surveillance objectives;
- training and information to patients;
- appropriate organisational governance arrangements for the elaboration and the monitoring of the infection prevention and control programme; and
- appropriate organisational arrangements and qualified personnel with the task of implementing the infection prevention and control programme.

The European Centre for Disease Prevention and Control (ECDC) has a mandate to develop scientific guidance with international experts on evidence-based measures and appropriate practice for effective HAI prevention. This should aim at strengthening national HAI prevention strategies and encourage coordination where needed; notably, managing the risks associated with the cross-border spread of multi-drug resistant bacterial pathogens.

1.1 Objectives

The overall purpose of this meeting was to consult with a group of experts from across Europe and representatives of the World Health Organization (WHO) and European Commission to reach consensus on the following specific objectives:

- Identifying the current needs for prevention of HAI at the European level.
- Identifying the key priorities for prevention of HAI, with regards to the following:
  - range of healthcare settings;
  - national/regional level interventions versus local interventions.
- Providing an overview of available or planned international HAI prevention guidelines And EU maps of national policy and practices.
- Outlining a plan for producing evidence-based guidance on effective HAI prevention measures in support of the Council Recommendation on Patient Safety.
- Discussing methods and information sources for evidence assessment.
- Advising on target audience, scope and format of ECDC guidance.

2 Outline of the agenda

The meeting was held over two half-days, from 25 to 26 February 2010 (see Annex 1 for the agenda). During the first day, the Council Recommendation and an overview of current activities of the ECDC Antimicrobial Resistance and Healthcare Associated Infection programme and HAI surveillance outputs—including development of structure and process indicators of HAI prevention—were presented. This was followed by round table discussions on the priorities and gap analyses of HAI prevention guidance and opportunities for collaboration and integration with national and international guidance, notably with the WHO. Thereafter, the experts were asked to rank priority guidance topics by casting a vote for the top five organisational elements of hospital infection control programmes and top five care-specific measures. The criteria for priority ranking were based on the perceived level of effectiveness of interventions and extent of potential benefit in reducing the burden of HAI disease across Europe. Draft outlines on methods of development and content of ECDC guidance outputs were also reviewed and agreed upon by the general consensus of the participants.

2.1 Participants

Experts in the field from the European Commission, WHO, ECDC and other European countries and organisations attended the meeting (see Annex 2). All discussions developed in a very constructive atmosphere and consensus was reached on key priorities for future guidance. Moreover, the discussions led to outlining new areas for future cooperation between WHO and ECDC regarding prevention and control of HAI.

3 Presentations

Marc Struelens of ECDC's Scientific Advice Unit presented ECDC's role in supporting implementation of the Council Recommendation on the prevention of HAI and explained the objectives of the meeting. He also suggested the outline of possible guidance topics as a basis for this consultation, possible elements of national and regional guidance on hospital infection control programmes, and possible targets of clinical prevention measures. In addition, his presentation included draft proposals of the scope and structure of ECDC's scientific and technical guidance documents.

Antoon Gijsens of the Health Threat Unit at DG Sanco highlighted the main features and legal significance of the Council Recommendation on prevention of HAI. Dr Gijsens also stated that the Commission will produce an implementation report to the Council by June 2012 based on progress reports received in 2011 from the Member States. The report will address the following issues:

- measuring the progress made;
- analysing whether the recommended measures work effectively; and
- identifying areas for further action.

Finally, Dr Gijsens clarified the respective roles of the Commission and ECDC in the light of the Council Recommendation.

Dominique L. Monnet of ECDC's Scientific Advice Unit presented the EU legislation and official documents concerning antimicrobial resistance (AMR) and HAI, including the Council Recommendations on the prudent use of antimicrobial agents in human medicine and on patient safety. Additionally, the documents contained information on the prevention and control of HAI, and Council Conclusions on antimicrobial agents in human medicine and on innovative incentives for effective antibiotics. He summarised ECDC's role in general and, regarding this health threat in particular, expounded on an organigram of ECDC strategies, activities and outputs of the Antimicrobial Resistance and Healthcare Associated Infection programme in the areas of surveillance, scientific advice, training and communication. Finally, he identified gaps and showed how development of guidance on HAI prevention will complement the current activities of the team.

Carl Suetens and Klaus Weist of ECDC's Surveillance Unit presented the networks and ongoing projects of surveillance of HAI in acute care coordinated by ECDC. They reported preliminary results of the healthcare-associated infections in long-term care facilities (HALT) project. They also presented the progress achieved by ECDC in supporting the Council Recommendation through case definitions and methodology for pan–EU surveillance of incidence and prevalence of HAI. Lastly, they summarised the recommendations made by the Improving Patient Safety in Europe (IPSE) project experts in collaboration with WHO EURO on structure and process indicators of infection control performance which could be useful to monitor implementation at local, national and EU levels. They provided further information on an ECDC analysis of the evidence base supporting these indicators.

4 Discussion and priority setting

During the discussion session, the scope of HAI prevention guidance and links to patient safety initiatives were reviewed. Marc Struelens clarified that ECDC resources would allow the development of guidance on up to five topics in the next two years. It was therefore essential to identify the top priorities accordingly.

As the Council Recommendation remains very general in its definition of HAI as well as institutional prevention measures, the participants first debated on the level of care settings that should first be addressed by ECDC guidance, including the following:

- acute secondary and tertiary care hospitals;
- long-term care facilities, care for the elderly and handicapped;
- primary care and home care practice;
- inter-sectoral procedures & patient care pathways; and
- regional & inter-regional (including cross-border) infection control coordination.

A clear majority of participants (9 out of 13) advised ECDC to focus first on acute inpatient care, with special consideration to high risk patient groups like the critically ill and immunocompromised. Other experts considered it important to encompass the whole range of settings because outpatient care is fast developing and transmural care requires a consistent approach. It was agreed that it would be realistic, given resource limitations, to begin with guidance for infection prevention in hospital care where the largest preventable burden is likely to occur. Participants nevertheless recommended considering where and how acute care interventions may be broadly applicable to chronic and/or primary care to ensure continuity of patient safety.

Discussion participants provided their personal view on the priority topics and type of guidance needed at the EU level. The main issue centred around getting healthcare professionals to utilise appropriate practices. The need for promoting implementation through the education and training of healthcare workers to enable behaviour change toward appropriate practice was also universally acknowledged by the participants. To meet this need, it was considered useful to go beyond reviewing or updating existing scientific evidence and highlight the most effective, evidence-based measures that can be bundled together in quality improvement interventions. To facilitate this, it was further suggested that ECDC should recommend process indicators and propose technical support, such as training materials and checklists (implementation tool-kits). The methodology and documents developed by the WHO First Patient Safety Challenge were suggested as a successful model to emulate. Likewise, useful web-based improvement tools have been developed at the national level; e.g., in the UK's Clean Safe Care website (www.clean-safe-care.nhs.uk).

Participants cited the prevention of device or procedure related infections, standard and transmission-based precautions and general activities and resources for infection control programmes as priority topics.

The discussion then examined the scope of guidance on key structural and organisational components of effective HAI prevention programmes at the hospital level. This topic was considered important by ECDC in order to support MS in ensuring that the core components of such prevention programmes are put into place enabling hospitals to carry out the implementation and monitoring of specific interventions. This guidance should also inform the selection of valid and useful structure indicators for comparing prevention programmes at hospital, national and possibly international levels. During the group discussion, potential components of such institutional programmes were re-formulated and re-organised into the following nine categories:

- Organisation & structural arrangements:
  - management, prevention objectives and action plan;
  - multi-disciplinary advisory committees (infection control, safety, quality, etc).
- Human resources:
  - general healthcare worker staffing;
  - infection control professionals (nurses, physicians and other); and
  - qualitative rather than quantitative assessments.
- Education and training of healthcare workers.
- Patient information & integration into patient safety environment.
- Infection control procedures, including standard precautions and transmission based isolation precautions.
- Behavioural changes and quality of care interventions; care bundles for specific invasive processes; self-evaluation & improvement.
- Technical resources:
  - laboratory diagnostic procedures, IT support, disinfection and sterilisation, construction, ventilation, isolation rooms, water and food safety.
- Surveillance:
  - targets, methods, feedback; outbreak detection & management.
- Antimicrobial stewardship programme.

All experts were invited to vote for their top five most important and potentially effective components to be further reviewed for supporting evidence and broad applicability across Europe. Based on the voting results, a shortlist of priority components was defined (List 1).

List 1: Priority topics for guidance: organisational components of hospital infection control programmes

1. **Organisation and structural arrangements for developing and implementing an infection control (IC) programme, including the following:**
   - **management support, prevention objectives and action plan**
   - **multi-disciplinary advisory committees (infection control, safety, quality, etc…)**
2. **Surveillance: targets, methods, feedback, outbreak detection and management.**
3. **Programme for education and training of healthcare workers.**
4. **Behavioural change and quality of care interventions, and invasive care bundles.**
5. **Local policy and provision of resources for standard precautions and transmission-based isolation precautions.**

In addition, ECDC was strongly advised to refer to a recent WHO document providing expert opinion on the core components for infection prevention and control programmes. (Click here for the report). It was also suggested to link the guidance to the legal framework of the International Health Regulation.

The experts discussed the content and structure of the ECDC guidance and how this should be developed (Annex 3). There was agreement that it was necessary to base the guidance on the best available scientific evidence through a transparent process based on current standards of systematic review and appraisal of published studies. The European Centre for Disease Prevention and control is currently reviewing its methodological guidelines in this area.

It was, however, advised to avoid duplication of efforts and to first appraise the existing national and international guidelines before undertaking yet another full scale systematic literature review. The adaptation of existing guidelines to meet a broader range of contexts may be the most efficient approach (see ADAPTE statement, www.adapte.org). An overview of well-known, US clinical guidelines—which cover most topics—and international guidance documents was presented (Annex 4). However, many Healthcare Infection Control Practices Advisory Committee-Centers for Disease Control and Prevention (HICPAC-CDC) documents are already over five years old and do not, except for the latest guideline on prevention of urinary tract infections (UTI), provide summary of evidence tables to build upon. The Society for Healthcare Epidemiology of America (SHEA) guidelines are more focused on key strategies, but these are based on ad hoc rather than systematic evidence appraisal. World Health Organization guidance documents on hand hygiene are very complete and comprise training, education, audit and communication tools to enable multimodal implementation. World Health Organization guidance on safe surgery is more general and so far provides only a limited range of infection prevention measures. Further work in this area, as well as on prevention of catheter-related bloodstream infections, is underway at WHO.

Experts pointed out that in several EU MS—including the UK, Germany, France and the Netherlands—national expert centres have developed a range of evidence-based HAI prevention guidance documents, many of which are published in English. For instance, several evidence-based guidelines are publicly available from the UK (Annexes 4 and 5). A project funded under the Seventh Framework Programme of research of the European Commission, coordinated by the University of Geneva under the acronym PROHIBIT, will perform a systematic survey and analysis of all national HAI prevention guidelines in 2010 as well as an in-depth survey of hospital policies and practices across the EU over 2011-12.This will clearly provide important new data that should inform the ECDC guidance. To this end, good communication with the PROHIBIT project leaders has been established.

It was also agreed that reviewing data on the economic impact and intervention costs of HAI, with to the idea of ranking interventions based on cost-effectiveness, would be impractical as part of any ECDC guidance due to the many differences in the way healthcare systems are organised and funded. Studies showing local cost-effectiveness of interventions in terms of shorter duration of hospital stay would, however, be worth mentioning where available.

Next, the participants discussed and reformulated the following list of prevention measures at the clinical care level to be further considered for ECDC guidance:

- Standard prevention measures, including:
  - standard precautions, including hand hygiene procedures and personal protective equipment;
  - environmental controls; i.e., single bed rooms, sanitary facilities.
- Risk-based prevention measures by procedure, including:
  - surgery: surgical site infection (SSI) and perioperative prophylaxis;
  - endoscopy; and
  - dialysis.
- Risk-based prevention measures by device, including:
  - IV catheter related BSI;
  - urinary catheter-related UTI; and
  - mechanical ventilator-associated pneumonia (VAP).
- Risk-based prevention measures by type of care/pathology, including:
  - oncology and haematology;
  - critical care;
  - neonatal care; and
  - transmission-based precautions and isolation measures.
- Risk-based prevention measures by organism/disease, including:
  - multi-drug resistant organisms;
  - *C.difficile*, Legionella, Aspergillus.
- Healthcare worker protection:
  - immunization; and
  - personal protective equipment.

The discussion raised some important questions about which criteria to apply in selecting the priorities. It was agreed that the perceived quality of scientific evidence supporting the assumed effectiveness should not be factored into the selection criteria. There was consensus to prioritise intervention targets most likely to reap maximal prevention benefit from demonstrated effectiveness and current burden of disease. Based on EU surveillance data, ECDC was advised to quantitatively check how many cases of HAI or attributable deaths may be averted by European-wide implementation of these measures. The future EU point prevalence surveys to be coordinated by ECDC in the coming years will facilitate the enumeration of these data.

Based on extrapolation from national prevalence data, ECDC estimated in its 2007 Annual Epidemiological Report that 3 000 000 patients acquired a nosocomial infection in the EU25 every year resulting in approximately 50 000 deaths. The most frequent infections were UTI (on average 28%), followed by respiratory tract infections (25%), SSI (17%), bacteraemia (10%) and others.

The top five most important and potentially effective targets for intervention were identified based on the votes of participants (List 2).

List 2: Priority topics for guidance: prevention measures at clinical practice level (to be developed in collaboration with WHO Patient Safety Challenges)

1. Prevention of surgical site infection and perioperative prophylaxis.
2. Standard precautions, patient isolation and transmission-based precautions.
3. Ventilator-associated/hospital-acquired pneumonia (VAP/HAP).
4. Catheter-related bloodstream infection.
5. Catheter-related UTI (acute care and long-term care facilities).

5 Conclusions and recommendations

The participants' main points are summarised in the following conclusions and recommendations:

- The European Centre for Disease Prevention and Control should focus its HAI prevention guidance in support of the Council Recommendation on Patient Safety on the highest impact topics, where most effective resources or specific practice implementation is likely to produce maximum reduction of disease burden across Europe. Although the initial focus should be on acute care, attention should be given to the continuum of care whenever applicable.
- Beyond the five top components of hospital prevention programmes and five priority clinical practice interventions identified by experts for future guidance, ECDC should perform further quantitative analysis on the potential benefit of interventions as new data become available on HAI prevalence, national guidance and quality gaps in hospital practice in the EU.
- Systematic reviews should aim at complementing the available high quality, evidence-based guidance developed by national agencies and the WHO. Adaptation and expert advice with input from all MS on cross-contextual applicability should be one of the preferred approaches. This should be informed by the forthcoming results of a systematic review of national HAI prevention guidelines in the EU MS (PROHIBIT project).
- Addressing the main challenges of getting healthcare professionals to utilise appropriate practice, ECDC guidance documents should focus on the three to five most effective measures and provide a clear description of the supporting evidence and success factors for their implementation.
- Practice-level ECDC guidance documents should be supported by an implementation tool-kit with training, communication, process indicators, audit and quality improvement materials.
- European Centre for Disease Prevention and Control scientific advice on HAI should be developed in close collaboration with WHO EURO and the WHO Global Patient Safety Challenges teams to ensure consistent advice and, where possible, share tasks.

Annex 1: Meeting programme

25 February 2010 — Day 1

13:00–13:15	**Welcome and introduction of participants and objectives of the meeting** *Marc Struelens*
13:15–13:25	**The Council Recommendation on patient safety and prevention of HAI** *Antoon Gijsens*
13:25–13:40	**ECDC HAI / AMR programme update** *Dominique L. Monnet*
13:40–14:10	**EU Surveillance of HAI** *Carl Suetens* **Structure and process indicators** *Klaus Weist*
14:10–15:00	**What are the needs? Discussion on scope of HAI prevention guidance & links to patient safety initiatives** *Marc Struelens*
15:00–15:30	***break***
15:30–17:30	**What are the needs? Gap analysis of HAI prevention guidance & discussion on EU needs and priorities** *Marc Struelens*

26 February 2010 — Day 2

08:30–09:00	**Guidance: scope and structure**
09:00–10:00	**Identifying key structural and organisational components of HAI prevention programmes**
10:00–10:15	***break***
10:15–11:45	**Ranking priorities for guidance on standard & specific process of care HAI prevention measures**
11:45–12:15	**General discussion, conclusions and next steps** *Marc Struelens*

Annex 2: Participants

Name	Organisation	Country
Benedetta Allegranzi	**1st Global Patient Safety Challenge, WHO**	Switzerland
Jean Bacou	**Haute Autorité de Santé & EUNetPaS**	France
Barry Cookson	**Centre for Infections, Health Protection Agency**	UK
Ana Paula Coutinho	**Communicable Diseases Unit, WHO Euro**	Denmark
Helen Crombie	**HCAI and Cleanliness, Department of Health**	UK
Uga Dumpis	**University of Latvia**	Latvia
Carole Fry	**Infectious Diseases and Blood Policy, Department of Health**	UK
Antoon Gijsens	**Health Threat Unit, DG SanCo, European Commission**	Luxembourg
Piotr Heczko	**Microbiology & infection control, The Jagiellonian Medical College**	Poland
Jette Holt	**Statens Serum Institut**	Denmark
Flora Kontopidou	**National School of Public Health**	Greece
Maria-Luisa Moro	**Agenzia Sanitaria Regionale**	Italy
Johan Struwe	**Swedish Centre for Disease Control**	Sweden

ECDC participants

Anna-Pelagia Magiorakos, Scientific Advice Unit

Dominique L. Monnet, Scientific Advice Unit

Marc Struelens, Scientific Advice Unit

Adoración Navarro Torné, Scientific Advice Unit

Carl Suetens, Surveillance Unit

Klaus Weist, Surveillance Unit

Annex 3: Scope & structure of ECDC guidance on healthcare-associated infection prevention

1 Definition of topic of HAI prevention measures

- Rationale/problem statement.
- Type of intervention/resources.
- Population at risk.
- Target audience & end users.

2 Systematic review of effectiveness and safety of measures

- PICO question.
- Search strategy & databases.
- Summary of findings.
- Grading of evidence.
- External validity, context modifiers.

3 Expert consensus guidance

- Expert panel composition.
- Consensus building methods.
- Recommended options, strength of advice and grade of evidence.
- Context determinants, bottlenecks and resources requirements.
- Considerations of data on cost-effectiveness.

4 Implementation tool kit

- Business case template for hospital management.
- Implementation methods and quality improvement models.
- Educational and training materials.
- Process of care quality indicators and checklist templates.
- Audit of compliance and outcome surveillance methods.
- Communication tools and patient education.

Annex 4: Overview of infection control practice surveys and clinical practice guidance

Topic of European survey	Timeline	Coordinator
Hospital Prevalence of HAI & antimicrobial drug use	2011–2012	ECDC (EU-PPS)
National IC guidelines	2010	University of Geneva (PROHIBIT project)
National structure & process indicators for IC programme	2010	ECDC (HAI national contact point survey)
Hospital IC policies & practices	2012	University of Geneva (PROHIBIT project)
Long term care IC policies & practices	2010	ECDC (HALT project)
Hospital IC training & staffing levels	2010	ECDC (TRICE project)
Clinical & PH laboratory capacity	2012	ECDC (EU survey)

Topic of prevention guidance	HICPAC	SHEA / IDSA	WHO	ECDC
Hand hygiene	2002		2005	
Surgery	1999	2008	2007	
IV catheter care	2002	2008		
Urinary catheter care	2009	2008		
Mechanical ventilation	2003	2008		
***C. difficile* infection**		2008		2009

Annex 5: UK guidance on the prevention of healthcare-associated infection

Topic of prevention guidance	Year	Website reference
Standard precautions, includes hand hygiene, insertion and care of short term urinary catheters, insertion and care of CVCs	2007	http://www.epic.tvu.ac.uk/Downloads/
Prevention and control of HAP, including VAP	2007	http://jac.oxfordjournals.org/cgi/content/abstract/62/1/5
Surgical site infections	2008	http://guidance.nice.org.uk/CG74
Antibiotic prophylaxis in surgery	2008	http://www.sign.ac.uk/guidelines/fulltext/104/index.html
Antibiotic stewardship	2007	http://jac.oxfordjournals.org/cgi/content/full/60/suppl_1/i87