Harmonizing and supporting infection control training in Europe

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SUMMARY

Healthcare-associated infection (HCAI), patient safety, and the harmonization of related policies and programmes are the focus of increasing attention and activity in Europe. Infection control training for healthcare workers (HCWs) is a cornerstone of all patient safety and HCAI prevention and control programmes. In 2009 the European Centre for Disease Prevention and Control (ECDC) commissioned an assessment of needs for training in infection control in Europe (TRICE), which showed a substantial increase in commitment to HCAI prevention. On the other hand, it also identified obstacles to the harmonization and promotion of training in infection control and hospital hygiene (IC/HH), mostly due to differences between countries in: (i) the required qualifications of HCWs, particularly nurses; (ii) the available resources; and (iii) the sustainability of IC/HH programmes. In 2013, ECDC published core competencies for infection control and hospital hygiene professionals in the European Union and a new project was launched ['Implementation of a training strategy for infection control in the European Union' (TRICE-IS)] that aimed to: define an agreed methodology and standards for the evaluation of IC/HH courses and training programmes; develop a flexible IC/HH taxonomy; and implement an easily accessible web tool in 'Wiki' format for IC/HH professionals. This paper reviews several aspects of the TRICE and the TRICE-IS projects.

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Introduction

Training of healthcare workers (HCWs) in infection control and hospital hygiene (IC/HH) lies at the centre of all

programmes that aim to prevent and control healthcare-associated infection (HCAI) and, more broadly, to improve patient safety. In 2000, the Institute of Medicine gave fresh impetus to prevention of HCAI by publishing *To err is human*, a novel approach to patient safety in healthcare organizations (HCOs).[1] Patient safety is now an essential component of the standards of care required of both HCWs and HCOs worldwide. HCAI represents a major threat, being responsible for significant morbidity, mortality, and socio-economic burden to patients and their families.[2–4] According to the European Centre for Disease Prevention and Control (ECDC), an estimated 3.2 million patients (95% confidence interval: 1.9–5.2 million) acquire an HCAI in European acute hospitals every year, and ∼37,000 die as a direct consequence.[5,6] Furthermore, HCAI accounts for a substantial proportion of adverse events in hospitalized patients, and has been identified by the World Health Organization (WHO) as an essential component of their global patient safety challenge.[7–13] The study on efficacy of nosocomial infection control (SENIC) considered it essential for hospitals to have a continuous approach to HCAI that includes: surveillance; availability of properly trained, dedicated personnel; evidence-based policies; and monitoring to ensure that the recommended interventions are applied effectively.[14] But in spite of the available evidence, implementation is still a problem both for HCOs and HCWs.[15–17] It is therefore essential to promote competence-based training of specialists in IC/HH, as well as HCWs more generally, to make them aware of HCAI risks and capable of implementing appropriate recommendations.

Background to the TRICE (training in infection control in Europe) project

The European Union (EU) has for several years promoted policies and interventions that harmonize HCAI prevention and control in all member states. The overall policy is set out in the Council Recommendation of 9 June 2009 on patient safety, including the prevention and control of HCAI (2009/C 151/01).[18] The section on HCAI contains the following recommendations on training:

(d) foster education and training of healthcare workers by:
  (i) at national or regional level, defining and implementing specialised infection control training and/or education programmes for infection control staff and strengthening education on the prevention and control of healthcare associated infections for other healthcare workers.

In 2012, the European Commission's report on the implementation of 2009/C 151/01 stressed that member states should:[19]

- Ensure adequate numbers of specialized infection control staff with time set aside for this task in hospitals and other healthcare institutions.
- Improve training of specialized infection control staff and better aligned qualifications between Member States.

A European project known as 'Improving patient safety in Europe' (IPSE) was launched in 2005 by the Commission's Directorate General for Health and Consumers (DGSANCO).[20] It dealt with many aspects of HCAI prevention and control including: European standards and indicators for Public Health surveillance; event warning and rapid exchange of information on HCAI and antimicrobial resistance; surveillance and control of antibiotic resistance in intensive care units; and surveillance of HCAI in nursing homes. Moreover, it focused attention on training in infection control and HCAI epidemiology and, together with the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) and the Health Protection Agency (HPA), developed a 'core curriculum for infection control practitioners'.[21] In 2006, the project also explored existing IC/HH training courses in the EU member states, two candidate countries (Croatia and Turkey) and two other European countries (Norway and Switzerland).

In light of the IPSE experience, in 2009 ECDC commissioned and launched a project named 'Infection control training needs assessment in the European Union' (TRICE), with the aim of strengthening IC/HH training in EU member states.

Available data on IC/HH training in Europe

The TRICE 2010 survey of 33 countries of the EU, other EEA countries and EU candidate countries suggested that there had been an increase in attention and commitment to HCAI in Europe in recent years, as manifest in the following:

— nearly all participating countries (88%, 29/33) had national recommendations for managing IC/HH;
— ratios for IC/HH doctors per bed or admission were as recommended in 54% of respondent countries (18/33), and ratios for IC/HH nurses were as recommended in 70% (23/33), even if not always monitored in their application;
— IC/HH programmes related to patient safety were present in 45% of countries (14/30);
— many training programmes provided a certificate of graduation, diploma, or other formal recognition that allows participants to be designated as IC/HH practitioners;
— basic IC/HH training was provided in medical and nursing schools of 70% (23/33) and 79% (26/33), respectively, of respondent countries;
— IC/HH link professionals were present in 39% (13/33) of countries for doctors and in 61% (20/33) for nurses.

Some critical issues remained, especially regarding IC/HH training programmes there being differences:

— between countries in qualifications required by HCWs, especially for nurses;
— in training opportunities across the disparate national models for providing healthcare;
— in the available resources and in the sustainability of IC/HH programmes.[22]

In 2013, in view of the TRICE results and of the importance of continued support for national IC/HH training programmes, ECDC launched a second project named 'Training in infection control in Europe — implementation strategy' (TRICE-IS) which aims to implement and harmonize IC/HH programmes and tools, according to 'Core competencies for infection control and hospital hygiene professionals in the European Union'.[23] The agreed list of core competencies, also known as 'European IC/HH core

competencies', was proposed for adoption by IC/HH professionals across Europe.

The challenge of course harmonization in Europe

The TRICE survey also showed that there are large differences between countries in IC/HH training programmes, related in many cases to the lack of harmonization of the training systems and programmes for HCWs in general. A future progressive harmonization and mutual recognition of IC/HH training programmes must consider the existing legal frameworks in higher education in Europe:

— the 'Convention on the Recognition of Qualifications concerning Higher Education in the European Region' (1997), emphasizing the principle of fair and transparent recognition procedures for higher educational qualifications and the acceptance of existing differences unless they are found to be substantial. Transparency regarding the criteria adopted and procedures followed for recognition are the backbone of the Convention;[24]
— the 'Directive 2005/36/EC of the European Parliament and Council of 7 September 2005 on the recognition of professional qualifications', setting out the rules for the mutual recognition of these qualifications;[25]
— the inter-governmental agreement called the 'Bologna Process', designed to establish a system of credits known as the 'European credit transfer and accumulation system' (ECTS) as a proper means of promoting student mobility.

The ECTS users' guide aims to assist learners, academic and administrative staff in higher education institutions.[26] Structuring IC/HH training programmes through ECTS and modelling them according to the European IC/HH core competencies are essential steps toward the standardization of IC/HH courses and training programmes in the EU.[23] The availability of the European IC/HH core competencies is one of the cornerstones of harmonization in IC/HH training programmes all over Europe. Comparison with the infection prevention core competencies established in 2010 by the Certification Board of Infection Control and Epidemiology (CBIC) shows that whereas CBIC core competencies are grouped into three levels of competencies (novice, proficient, and expert), the European core competencies are grouped into two (introductory and expert).[23,27] The CBIC core competencies are grouped into six areas (identification of infectious disease; surveillance and epidemiological investigation; preventing and controlling the transmission of infectious agents; employee/occupational health; management and communication; education and research) whereas the European IC/HH core competencies are grouped into four areas (programme management; quality improvement; surveillance and investigation of HCAI; infection control).

As a preliminary to the TRICE-IS project, the European IC/HH core competencies document was compared with the training documentation of the IC/HH-related disciplines (medical microbiology, infectious disease, public health and epidemiology). This revealed that European documents addressing the training of specialties related to IC/HH cover many areas corresponding to the European IC/HH core competencies, but they seldom cover all the topics covered by the latter.

Towards a catalogue of European IC/HH training courses and programmes

One of the main goals of the TRICE-IS project is the revision of IC/HH courses in the EU in agreement with European IC/HH core competencies, with a view to achieving the mutual recognition of IC/HH training courses within European countries in the medium to long term. In order to achieve this, a methodology and criteria for the evaluation of IC/HH courses and training programmes, and standards for their inclusion in a possible future European Catalogue, were developed. Certain inclusion and exclusion criteria have to be met before the course can be evaluated. If the course fails to satisfy these criteria it is returned without further evaluation (Table I). There are also 'evaluation' criteria: 'essential', that have to be fulfilled completely for it to pass the review process; and 'desirable', which do not preclude passing this evaluation (Table I). In addition, compatibility with the competencies of at least one of the four areas of European IC/HH core competencies is a basic prerequisite for submission of an IC/HH course. The evaluation process, which is in progress, allows the provision of advice to course submitters in the event of deficiencies, to help them improve their course and eventually to succeed with a resubmission. The goal is a European catalogue of evaluated IC/HH courses, available online. A standard system for evaluation of IC/HH courses represents a point of reference for European countries without a national curriculum for developing new training programmes for IC/HH professionals, according to ECDC standards. It may offer an opportunity for some countries to reorient and restructure the available IC/HH courses, to promote European standardized training programmes and to improve the quality of their performance.

IC/HH Wiki and IC/HH taxonomy

To face the challenge of promotion and harmonization of IC/HH training programmes in Europe, TRICE-IS is developing a shared and flexible IC/HH taxonomy, easily accessible to all IC/HH professionals (both trainers and practitioners) specifically those interested in training programmes in a 'Wiki' format.

A Wiki tool specific for IC/HH is an e-learning platform for trainers in IC/HH that aims to store, share, exchange, and — last, but not least — to optimize the knowledge on IC/HH in a collaborative way among European countries. It could represent:

— a tool for supporting training in the field of IC/HH;
— a repository for IC/HH training materials;
— an opportunity to compare multiple, evidence-based, points of view concerning contemporary IC/HH issues to stimulate future research and additions to the evidence base;
— a place to lodge discussions concerning the focus of IC/HH field training, competencies and other aspects of IC/HH practice;
— a place to share new developments in IC/HH methods.

For the development of IC/HH Wiki, the first necessary step is the creation of an IC/HH taxonomy coherent with the four areas of European IC/HH core competencies. A shared IC/HH taxonomy aims to promote integration and awareness of the

Table I

Evaluation of European infection control/hospital hygiene courses: exclusion, inclusion and evaluation criteria (version for pilot evaluation)

Exclusion criteria (the course is excluded from further evaluation if the answer to one of the following questions is 'yes').
    Is the proposed course organized by industries?
    Is the proposed course sponsored by industry?

Inclusion criteria (the course undergoes further evaluation if the answer to all these questions is 'yes')
    Is the proposed course developed at the postgraduate level only?
    Is the proposed course designed following the Bologna Process?
    Has the proposed course been run and/or done at least once in the last three years (including the case of an ongoing course)?
    Is the proposed course based on methods of active teaching/learning?
    Is the proposed course organized by one or more of the following categories: educational institution, medical school, nursing school, university, member state ministry of health, public health institute, regional health authority, healthcare organization, professional/scientific society, private hospitals?
    Does the proposed course have a minimum number of European Credit Transfer and Accumulation System (ECTS)/hours (2 ECTS or 30 hours direct teaching courses with final examination) following the Bologna Process (http://ec.europa.eu/education/higher-education/bologna_en.htm)?
    Does the proposed course cover domains and competencies of at least one area, that can be identified as common or similar to those reflected in the ECDC technical document 'Core competencies for infection control and hospital hygiene professionals in the European Union'?[23]

Evaluation criteria

E	Is the course denomination (title) present?
D	Does the course include the possibility of distance learning?
E	Does the course have specifications about the professionals allowed to participate?
D	Does the course specify educational background of the students allowed to attend according to different countries?
D	Does the course specify competencies of the students allowed to attend according to different countries?
D	Is it specified in the course whether the attendees need to be employed in a job that gives access to sufficient IC/HH experience and are required to pass the course?
E	Is the duration of the course defined?
D	Is the frequency of running of the course defined?
D	Is the number of attendees per course/initiative defined?
E	Are the faculty name and qualification present?
E	Does an official recognition of the course/programme exist?
D	Are professional development points available?
E	Is the number of hours of formal lectures (including preparation) and of practical experience present? Please enclose a scheme if available.
D	Do the students have access to a library?
D	Do the students have access to study rooms?
E	Is the number of hours for each topic of each module defined (ECTS for each topic if available)?
D	Does the course require a pre-course assessment (knowledge and expectation)?
E	Is the course evaluated?
D	Are the students' assessments needed for accreditation present in the course?
D	Are the responses to the students' assessments reviewed?
D	Does the course include a questionnaire, sent a few months after the course, so that students can reflect on the course's impact in their work?
D	Is funding, availability of fellowships or grants specified in the course?
D	Is dedicated time for training given to students by their healthcare organizations presented?
D	Does the course define the methods adopted to achieve learning goals?
D	Are learning goals within knowledge, skill and competencies formulated?
D	How are the students examined? Please specify.

ECDC, European Centre for Disease Prevention and Control; IC/HH, infection control/hospital hygiene; ECTS, 'European credit transfer and accumulation system'.
E, essential.
D, desirable.

different tools and activities on HCAI developed by ECDC. It is necessary both to identify the main topics that need to be developed in the IC/HH Wiki and to link terms with those already present in the Field Epidemiology Manual (FEM) Wiki (an open information sharing platform for public health experts hosted and funded by ECDC).[28] The development of IC/HH taxonomy is a continuous process integrating new terms, definitions and contents. The first step was the development, in the IC/HH Wiki tool, of two modules of the IC/HH taxonomy: HCAI surveillance and hand hygiene. This is an essential step for testing methodology and identifying standards for the future IC/HH Wiki development.

Conclusions

HCAI prevention and control and IC/HH training have been identified as major targets for HCOs in Europe for the foreseeable future. The EU has in place some essential foundations for IC/HH training, including:

— policies addressing these issues;
— continued support by ECDC for different aspects of prevention and control of HCAI;
— readily available reference documents such as the European IC/HH core competencies;
— projects aiming at progressive harmonization of action throughout Europe;
— periodic reviews of progress.

Nevertheless there are still opportunities for improvement in:

— the investment of resources in HCAI prevention and control;
— the harmonization of IC/HH training programmes through engagement of professionals and training organizations;
— the mutual recognition of competencies acquired through courses that comply with the Bologna process standards and the criteria proposed under TRICE-IS;
— the use of tools such as IC/HH Wiki for providing access to knowledge and sharing the experience of interested professionals.

Further investment is needed in the training of IC/HH practitioners and of IC/HH link professionals to ensure proper awareness of HCAI, and the competence to prevent and control it in Europe. It is hoped that the spread of the standards for IC/HH course evaluations and of the European IC/HH core competencies, together with the need to guarantee the safety of patients and HCWs, will improve IC/HH training in Europe.

Acknowledgements

Glossary

CBIC	Certification Board of Infection Control and Epidemiology
DGSANCO	Directorate General for Health and Consumers (of the European Commission)
ECDC	European Centre for Disease Prevention and Control
ECTS	European Credit Transfer and Accumulation System
EEA	European Economic Area
ESCMID	European Society of Clinical Microbiology and Infectious Diseases
EU	European Union
HCAI	Healthcare-associated infection
HCO	Healthcare organization
HCW	Healthcare worker
HPA	Health Protection Agency (England)
IC/HH	Infection control/hospital hygiene
IPSE	Improving patient safety in Europe
SENIC	Study on efficacy of nosocomial infection control
TRICE	Training in infection control in Europe (or 'Infection control training needs assessment in the European Union')
TRICE-IS	Training in infection control in the European Union implementation strategy
WHO	World Health Organization

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