Assessment of infection control, hospital hygiene capacity and training needs in the European Union

2014

ECDC TECHNICAL REPORT

Assessment of infection control, hospital hygiene capacity and training needs in the European Union, 2014

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Abbreviations

AMR	Antimicrobial resistance
EEA	European Economic Area
EU	European Union
IC	Infection control
HAI	Healthcare-associated infection
HCW	Healthcare worker
HH	Hospital hygiene
IPSE	Improving Patient Safety in Europe project
LTCF	Long-term care facility
TRICE	Training in Infection Control in Europe project
TRICE-IS	Training in Infection Control in Europe - Implementation Strategy project

Executive summary

Background

The prevention and control of healthcare-associated infections requires coordinated efforts at all levels of healthcare organisations. The 'Council recommendation 2009/C of 9 June 2009 on patient safety, including the prevention and control of healthcare associated infections' [1] and the European Commission's related implementation reports [2, 3], stressed the need for fostering education and improving the training of healthcare personnel at all levels, ensuring adequate numbers of trained infection control and hospital hygiene (IC/HH) staff.

Understanding the current trends in Europe in IC/HH training for healthcare workers (HCWs) is an essential pre-requisite for the definition and implementation of policies and programmes aimed at increasing and harmonising capacity and training in IC/HH all over Europe. The 'Improving Patient Safety in Europe' (IPSE) project (2006) and the ECDC-commissioned project 'Training in Infection Control in Europe' (TRICE) (2010) conducted surveys of the status of IC/HH training in Europe and developed a document called 'Core competencies for IC/HH professionals in the European Union' [4].

In 2012, ECDC launched the 'Training in Infection Control in Europe - Implementation Strategy' (TRICE-IS) project, which included a third survey to assess IC/HH training capacity in Europe.

Aims

This technical report describes the results of the 2014 survey on the evolution of the IC/HH capacity and training in Europe, comparing 2014 data with those from the two previous surveys conducted in 2006 (IPSE) and 2010 (TRICE).

Methods

The 2014 TRICE-IS survey was conducted with a 45-item questionnaire based on the questionnaires used for the surveys in 2006 and 2010. The questionnaire was administered by e-mail to invited designated experts from thirty participating countries.

Results

IC/HH policies and resources

The 2014 TRICE-IS survey showed that IC/HH and patient safety activities were organised and managed at a regional or local level in about one third of European countries. When both professionals in charge of IC/HH and those dealing with patient safety existed, their responsibilities tended to completely or partially overlap.

National recommendations for the management of IC/HH activities were reported by all but one country; 45% of countries even imposed penalties for non-compliance.

The proportion of countries which had made available a specific definition of an IC team increased from 66% in 2006 to 93% in 2014 (p<0.05).

The reported presence of a legal or recommended staffing level ratio for IC/HH doctors in acute care hospitals increased from 48% in 2006 to 55% in 2010, but decreased to 45% in 2014. There was a similar pattern for the reported presence of a staffing level ratio for IC/HH nurses: 62% (2006), 72% (2010) and 59% (2014).

Professional roles of IC/HH doctors and IC/HH nurses

In 2014, 19 (63%) and 23 (77%) of 30 EU/EEA Member States reported having a professional profile for IC/HH doctors and IC/HH nurses, respectively.

The proportion of countries with an officially defined role for IC/HH link[1] doctors increased from 26% in 2006 to 45% in 2014, and from 55% in 2006 to 73% in 2014 for IC/HH link nurses.

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[1]"Link professionals (mostly nurses) act as a link between their own clinical area and the infection control team. Their role is to increase awareness of infection control issues in their ward and motivate staff to improve practice" [10].

IC/HH professional training

In 2014, an official recognition of IC/HH professional degrees was present for doctors in 18 (60%) countries and for nurses, in 23(77%) countries. The number of universities and professional bodies that provided IC/HH professional training also significantly increased (p<0.05).

The proportion of countries with a curriculum or training programme forIC/HH professionals increased from 35% in 2006 to 59% in 2014 for IC/HH doctors, and from 55% in 2006 to 66% in 2014 for IC/HH nurses.

The proportion of countries with recommendations for training IC/HH link professionals increased from 14% in 2006 to 31% in 2014 for IC/HH link doctors, and from 21% in 2006 to 45% in 2014 for IC/HH link nurses.

The proportion of countries with basic IC/HH training increased from 62% (2006) to 93% (2014) in medical schools, and from 72% (2006) to 93% (2014) in nursing schools.

Sixty per cent of the countries reported that the 'Core competencies for IC/HH professionals in the European Union' document [4] had an impact on designing their national IC/HH training.

Conclusions

The results of this 2014 survey showed that investment in IC/HH professional capacity and training in Europe has improved. Nevertheless, the situation apparently did not change or even reversed in some areas, thus stressing the need for further monitoring and support at European and country level. When asked about the nature of possible EU-level support, 57% of Member State experts considered 'European Union level courses' as very suitable. The main obstacles for implementing training activities at the national level were the 'lack of funding dedicated to IC/HH practice' and the 'lack of valuing the IC/HH specialty'.

Further consultation with IC/HH training stakeholders is crucial to design the best way in which the EU can promote and support training initiatives. As part of this effort, periodic surveys such as this one may be used as a monitoring tool to document and stimulate improvement of IC/HH training activities in EU Member States.

Introduction

In 2013, ECDC estimated the impact of healthcare-associated infections (HAIs) as a major threat for patient safety in Europe: the prevalence of patients with at least one HAI in European acute care hospitals was estimated at 5.7%, with 81 089 (95% CI: 64 624–105 895) patients with at least one HAI on any given day [5]. Furthermore antimicrobial resistance (AMR), specifically related to HAIs, represents a significant challenge to public health. The continuous increase in HAIs caused by antimicrobial-resistant (especially multidrug-resistant) microorganisms that are difficult to treat, contributes to the morbidity and mortality of HAIs and healthcare costs [6]. In another survey in European long-term care facilities (LTCFs), the crude prevalence of residents with at least one HAI was 3.4%, with 116 416 residents with at least one HAI on any given day. LTCFs are becoming relevant for prevention and control of HAIs considering the increasing delivery of healthcare in the community and aging populations in Europe [7].

The Council recommendation of 9 June 2009 on patient safety, including the prevention and control of healthcare associated infections (2009/C 151/01) [1], and the two reports from the European Commission on its implementation in Member States [2,3], stressed the need for coordinated efforts at all levels to prevent and control HAIs and the central role played by healthcare professionals.

Understanding the current trends in capacity and training needs of IC/HH professionals is an essential pre-requisite for the definition and implementation of policies and programmes aimed to increase and harmonise IC/HH capacity and training, as well as improvements in patient safety across Europe.

The European Commission-funded 'Improving Patient Safety in Europe' (IPSE) project (2006), and the ECDC-funded 'Training in Infection Control in Europe' (TRICE) project (2010), provided an initial and a follow-up assessment of IC/HH training in Europe, in terms of management, human resources and training initiatives.

The TRICE survey showed an increased commitment to IC/HH training in Europe between 2006 and 2010, but also described the many challenges that existed due to the differences between European countries in the qualifications of IC/HH professionals and in the sustainability of IC/HH training initiatives [8], thus highlighting a need for continued support to national IC/HH training programmes.

In 2012, ECDC initiated a new project to further support national IC/HH training initiatives in European countries which reflected on previous initiatives, was in line with Council recommendation 2009/C 151/01 and subsequent European Commission reports on its implementation [1,2], and which drew from the document 'Core competencies for IC/HH professionals in the European Union' [4], Following an open call for tender, the contract was awarded to the University of Udine and the project adopted the name 'Training in Infection Control in Europe - Implementation Strategy' (TRICE-IS). The project focused on providing an updated assessment on the state of the art of capacity and training in IC/HH in Europe; developing a catalogue of IC/HH courses in European countries that are conducted according to the European IC/HH Core Competencies [9]; and developing an IC/HH wiki which will support the harmonisation in Europe of IC/HH training initiatives.

On 1 December 2014, the 'Council conclusions on patient safety and quality of care, including the prevention and control of healthcare associated infections and antimicrobial resistance' [10], confirmed the importance of topics such as infection control, prevention of AMR, and training of professionals to ensure quality and safety for European citizens.

Council recommendation 2009/C 151/01 [1] recognises the importance of HAIs and AMR as issues that affect the quality and safety of patient care. Nevertheless, its implementation is still a challenge and there is a continuous need to improve and sustain patient safety and the prevention and control of HAIs in European healthcare facilities [2,3]. This technical report describes the state of IC/HH capacity and training in Europe in 2014, and provides a comparison with the results of two previous similar surveys in 2006 (IPSE) and 2010 (TRICE).These surveys complement the reports from the European Commission on the evaluation of the implementation of Council recommendation 2009/C 151/01 [2,3].

Methods

Timetable

The TRICE-IS survey was organised as follows:

- designation of Member State experts by each country in January 2013 according to the ECDC profile (see below);
- obtaining the agreement of Member State experts on the survey methodology during a meeting in Venice, June 2013;
- coordination with the other ECDC project 'Feasibility study for the development of European Union-level training in infection control and hospital hygiene';
- finalisation of the questionnaire structure and pilot testing in five countries (August 2014);
- questionnaire administered to all Member State experts (September-October 2014);
- contacts with Member State experts to clarify where there were any incomplete or unclear answers (November– December 2014);
- preliminary report sent to all Member State experts for comments and data verification;
- discussion of the report with the Member State experts at the TRICE-IS meeting held in Madrid, September 2015.

Profile of Member State experts

Member State experts were either doctors or nurses nominated by the National Coordinators of the ECDC Coordinating Competent Bodies, according to a profile defined by ECDC. This profile described the role of Member State experts, which was to contribute to the survey methodology and to reply to the questionnaire, interacting also with the Ministry/Department of Health, infection control leads and other professionals in their country as appropriate; 77% (23/30) of the Member State Experts reported having collaborated with at least one other professional to complete the questionnaire.

Structure of the questionnaire

The 2014 TRICE-IS questionnaire was based on similar questionnaires used in the previous two surveys (IPSE project in 2006 and TRICE project in 2010). This approach allowed for comparison of results and gaining a better understanding of the trends in IC/HH training in Europe. However, whilst the majority of the questions were repeated, new questions were added, as identified and agreed by the TRICE-IS core staff and Member State experts.

The new questions mainly focused on:

- the role and influence of decentralisation to the regions/provinces in addressing and managing IC/HH activities
- the relationship between patient safety and IC/HH activities (organisational aspects and possible overlapping of responsibilities and activities)
- IC/HH training initiatives in non-acute care hospitals and LTCFs as defined at the national level
- the assessment of each country's priorities in IC/HH training needs in accordance with the areas and domains of the European IC/HH Core Competencies [4]
- the need for EU cooperation/support in accordance with the areas and domains of European IC/HH Core Competencies [6]
- future perspectives for IC/HH training in Europe by asking for descriptions of relevant current initiatives
- recommendations for future investments in IC/HH training in Europe.

The TRICE-IS questionnaire (Annex 1) included a total of 45 questions - many of them allowing more than one answer – and was structured into the following sections and chapters:

- A. Section 1 - Human resources for IC/HH.
  Chapter 1. National context;
  Chapter 2. IC/HH doctors;
  Chapter 3. IC/HH nurses;
  Chapter 4. Status of IC/HH doctors;
  Chapter 5. Status of IC/HH nurses;

- B. Section 2 - Training.
  Chapter 1. National framework (profile) or programme for training (initial, continuing);
  Chapter 2. IC/HH training programmes;
  Chapter 3. Evaluation of IC/HH core competencies;
  Chapter 4. Basic training of healthcare workers (HCWs) and "link" practitioners;
  Annex A. IC/HH professional competencies;

- C. Section 3 - The future.
  Chapter 1. Plans for further organisation of IC/HH in each country;
  Chapter 2. EU-level training.

Instructions on how to complete the questionnaire, a glossary (definitions of terms) and relevant references were included in an introductory text (see Annex 1).

Structure of data

This report presents the results of the 2014 TRICE-IS survey with replies for certain the questions compared with those reported in the 2006 and 2010 surveys. For 2014, replies were received from 30 EU/EEA Member States: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Comparison of results between the 2006, 2010 and 2014 surveys only included the 26 Member States that participated in all three surveys: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Data for the United Kingdom were collected via one questionnaire plus separately for the four UK administrations (UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales), to allow for comparison of 2014 replies with those from the previous surveys, when data were only reported separately. For simplicity, the term 'country' is used for each of the four UK administrations throughout the report. For the denominator, we used the term EU/EEA 'Member States' when the United Kingdom was considered as a single entity and 'European countries' when the UK was separated in four separate units.

When maps were used for comparing results across surveys, the replies from all countries participating in each survey were taken into account, i.e. 31 countries in 2006, 33 countries in 2010 and 33 countries in 2014. When tables were used for similar comparisons, only the replies of the 29 countries that participated in the three surveys were taken into account.

The replies from all the surveys were entered into a database and analysed with SPSS version 20 (IBM SPSS Statistics, New York, NY, USA). Results were compared using the Chi-square test accepting a value of $p<0.05$ as statistically significant.

Response rate

All contacted Member State Experts provided the requested answers for 2014. Thirteen (45%) of the 29 countries included in the comparisons had the same Member State expert completing the questionnaire as in 2010, while for the 2010 questionnaire, the Member State expert was the same as in 2006 for only eight (28%) of the 29 countries.

Results

Healthcare context in participating EU/EEA Member States

Twenty EU/EEA Member States reported that their healthcare systems are centralised, seven as decentralised and three as mixed centralised/decentralised (Figure 1). Decentralisation of healthcare systems was more likely in more populous EU/EEA Member States: eight (62%) out of 13 EU/EEA Member States with 10 million or more inhabitants had a decentralised or mixed centralised/decentralised healthcare system which is significantly (p<0.05) higher as compared with less populous countries (12%, 2/17).

At the national level, 20 (67%) of 30 EU/EEA Member States reported the presence of a nominated/legal responsible lead for IC/HH and 18 (60%) of them, for patient safety. However, the functions of IC/HH and patient safety completely or partially overlapped in 17 (85%) of 20 EU/EEA Member States that reported such functions.

At the regional level, 16 (53%) of 30 EU/EEA Member States reported having a nominated/legal responsible lead for IC/HH and 13 (43%) of them, for patient safety. Their functions completely or partially overlapped in 10 (77%) of 13 EU/EEA Member States reporting such functions at the regional level.

At the local level, hospital and/or healthcare organisations had a nominated/legal responsible lead for IC/HH and/or patient safety in 83% (25/30) and 73% (22/30) of the 30 EU/EEA Member States, respectively. In 15 (75%) of 20 EU/EEA Member States there was a complete or partial overlap of these functions.

Figure 1. Reported organisational structure of healthcare systems by Ministry/Department of Health in 30 EU/EEA Member States, 2014
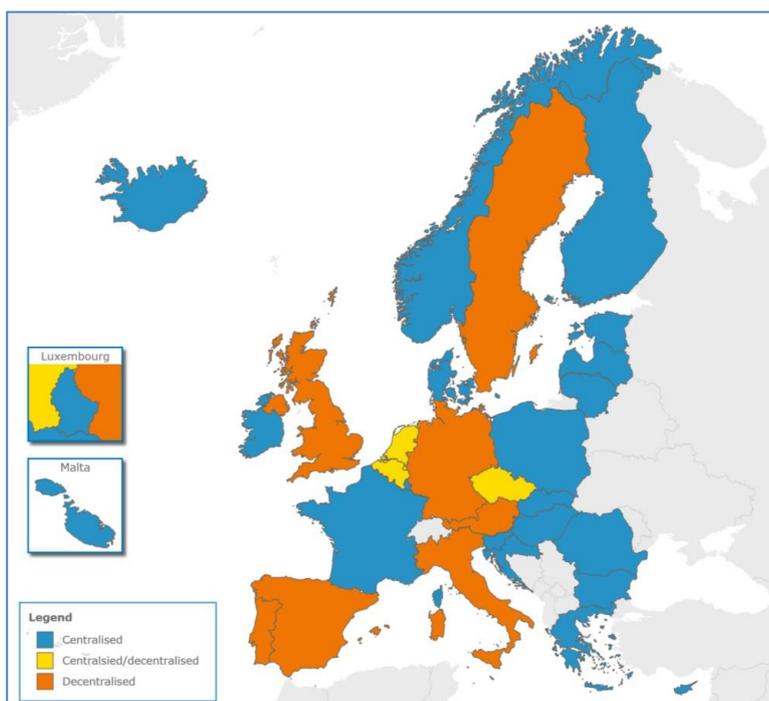
IC/HH policies and resources

In 2014, national recommendations for the management of IC/HH activities were present in all but one (97%, 29 countries) of 30 EU/EEA Member States. In the majority of EU/EEA Member States, they were defined by law (73%, 22 countries) and/or government recommendations (80%, 24 countries). In 13 (45%) of these 29 EU/EEA Member States, there were also penalties for non-compliance.

In 2014, a specific definition of an IC Team within country national programmes or regulations was reported by 27 (90%) of 30 EU/EEA Member States (Figure 2).

Figure 2. EU/EEA Member States with a specific definition of an IC Team, 2014
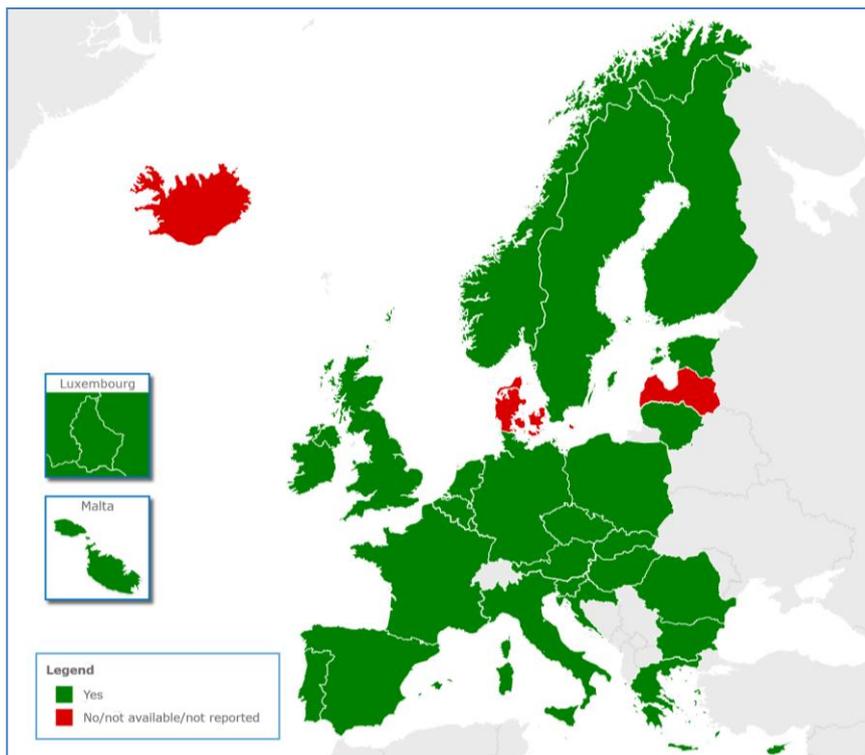
Between 2006 and 2014, there was a significant increase ($p < 0.05$) in the number of countries which had made available a specific definition of an IC team (Table 1).

In 2014, among the 27 EU/EEA Member States where the definition of an IC team existed, its activities were described as mandatory in 25 (93%) EU/EEA Member States for acute hospitals, in 19 (70%) EU/EEA Member States for LTCFs and in 22 (81%) EU/EEA Member States for other hospitals. In 59% (16/27) of EU/EEA Member States, the description of the activities of the IC Team was mandatory for all three settings.

Furthermore in 2014, a mandatory requirement for a plan that formally defined IC/HH activities on a yearly basis existed in 23 (77%) of 30 EU/EEA Member States for acute hospitals, in 20 (67%) EU/EEA Member States for other hospitals and in 10 (33%) EU/EEA Member States for LTCFs.

Table 1. Reported presence of a specific definition of an IC Team, 29 European countries†, 2006, 2010 and 2014

Presence of a specific definition of an IC Team	2006 %	2010 %	2014 %
Yes, any	66	79	93
Yes, by an ordinance of the Ministry of Healthcare/Department of Health*	58	61	78
Yes, it's part of government recommendations*	32	39	56
Yes, it's part of professional bodies' recommendations*	32	22	30
No/not available/not reported	34	21	7

*multiple answers were allowed. The values are percentages on 'Yes' answers.
†29 (including UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales) countries participated in the three surveys in 2006, 2010 and 2014.

In 2014, provision of resources for IC/HH activities (including staff) was reported in 27 (90%) of 30 EU/EEA Member States as funded by 'general revenue of the healthcare organisation itself'. Other answers were (multiple answers were allowed):

- four (13%) of 30 EU/EEA Member States reported 'a specific budget decided according to law or official recommendation'
- two (7%) EU/EEA Member States reported 'a specific funding provided by an external body'
- two (7%) EU/EEA Member States reported 'other funding mechanisms'.

The professionals in charge of IC/HH were reported as being employed by their healthcare organisations in various positions as presented in Figure 3. The percentage of countries where the professional in charge of IC/HH was running an 'autonomous service on IC/HH' increased from 17% in 2010 to 55% in 2014. There was also an increase in the number of countries with departments of management of quality and safety: 45% in 2010 to 72% in 2014. Multiple answers were possible because of possible sub-national, in-country differences.

Between 2010 and 2014, there was a statistically significant ($p<0.05$) increase in the number of European countries reporting that professionals 'run IC/HH as an autonomous service'.

Figure 3. **Positions held in their organisation by the professionals in charge of IC/HH, 29 European countries, 2010 and 2014[†]**
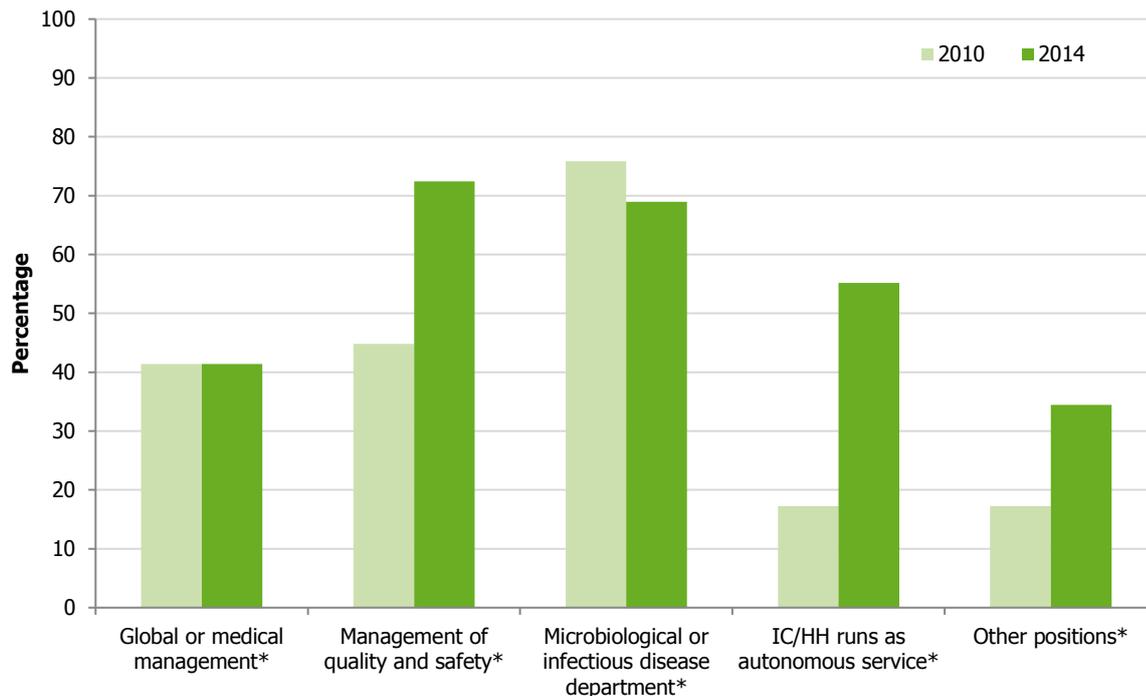
* multiple answers were allowed; † 29 (including UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales) countries participated in the three surveys in 2010 and 2014. This question was not asked in 2006.

Professional roles of IC/HH doctors and IC/HH nurses

In 2014, 19 (63%) and 23 (77%) of 30 EU/EEA Member States reported having a professional profile for IC/HH doctors and nurses, respectively. Among EU/EEA Member States where such a professional profile existed, a related job description for doctors was reported in 14 (74%) of 19 EU/EEA Member States and for nurses in 20 (87%) of 23 EU/EEA Member States (Figures 4 and 5).

Figure 4. EU/EEA Member States with a professional profile for IC/HH doctors and related job description, 2014
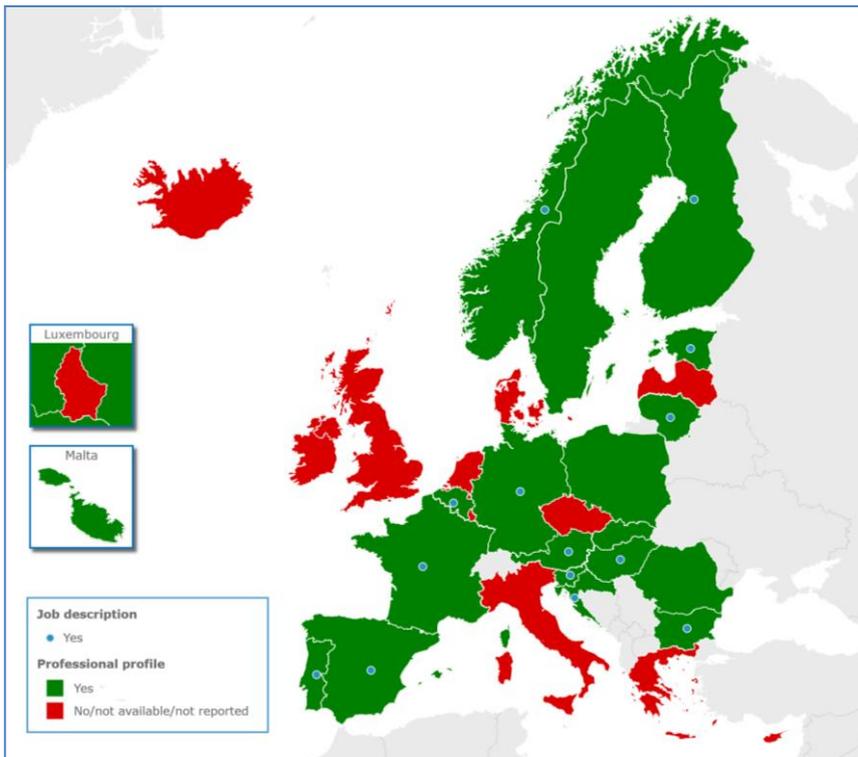
Figure 5. EU/EEA Member States with a professional profile for IC/HH nurses and related job description, 2014
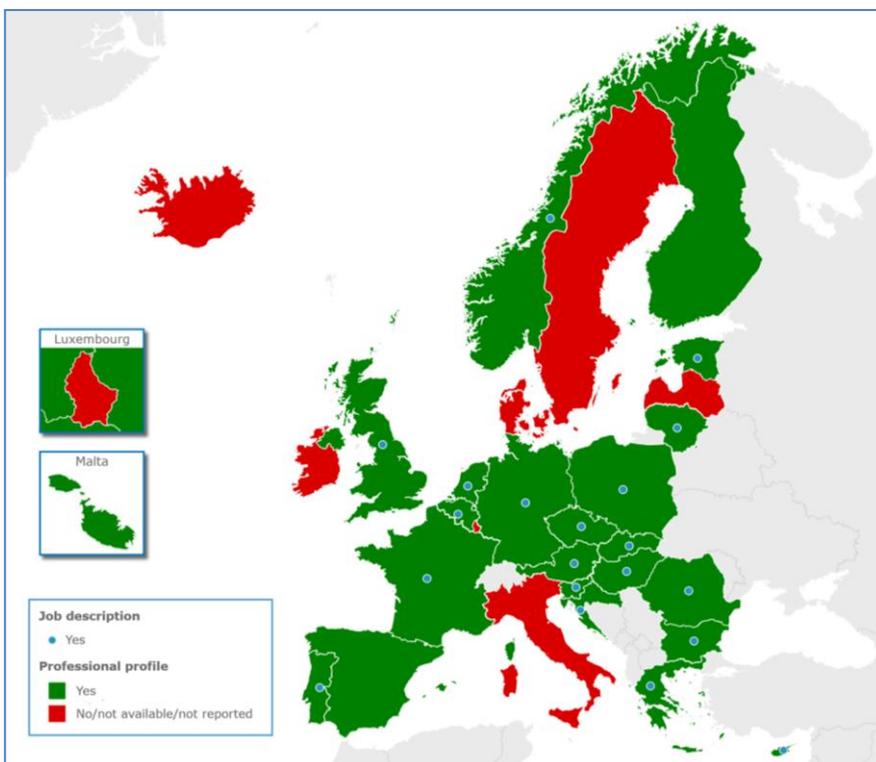
The presence of officially recognised degrees for IC/HH was higher in 2014 than in previous years for both for doctors and nurses, yet not statistically significant. Universities and professional bodies significantly increased their role as providers (p<0.05; Table 2).

In 2014, 18 (60%) and 23 (77%) of 30 EU/EEA Member States recognised an IC/HH degree for doctors and nurses, respectively.

Table 2. **Presence of an officially recognised degree in IC/HH, 29 European countries[†], 2006, 2010 and 2014**

	Doctors			Nurses		
	2006 %	2010 %	2014 %	2006 %	2010 %	2014 %
Yes, by any organisation	45	45	62	66	62	79
Yes, by healthcare authorities*	77	69	33	95	72	39
Yes, by universities*	15	31	61	16	29	48
Yes, by professional bodies*	23	54	50	32	44	61
No/not available/not reported	55	55	38	34	38	21

*multiple answers were allowed. The values are percentages on 'Yes' answers.
†29 countries (including UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales) participated in the three surveys in 2006, 2010 and 2014.

The evolution of the usual background for IC/HH professionals between 2006 and 2014 is shown in Figure 6. Microbiology and Infectious diseases were the most prevalent specialties among IC/HH doctors throughout the three surveys. For IC/HH nurses, specialisation was more common in 2014 than in the previous surveys, even though no significant trend was identified.

In 2014, a legal or recommended ratio for IC/HH doctors was reported by 15 (50%) of 30 EU/EEA Member States for acute hospitals, by eight (27%) EU/EEA Member States for other hospitals and by three (10%) EU/EEA Member States for LTCFs. Data about other hospitals and LTCFs were requested for the first time in 2014.

The percentage of countries reporting a legal or recommended ratio per beds for IC/HH doctors for acute hospitals increased from 48% (14/29) in 2006 to 55% (16/29) in 2010, but decreased to 45% (13/29) in 2014.

For IC/HH nurses, a legal or recommended ratio per beds was reported in 2014 in 19 (63%) of 30 EU/EEA Member States for acute hospitals, 11 (37%) EU/EEA Member States for other hospitals and in six (20%) EU/EEA Member States for LTCFs. Over time, the presence of a ratio for IC/HH nurses increased for acute hospitals from 62% (18/29) in 2006 to 72% (21/29) in 2010, but decreased back to 59% (17/29) in 2014.

Figure 6. IC/HH professionals (doctors/nurses) by background, 29 European countries[†], 2006, 2010 and 2014
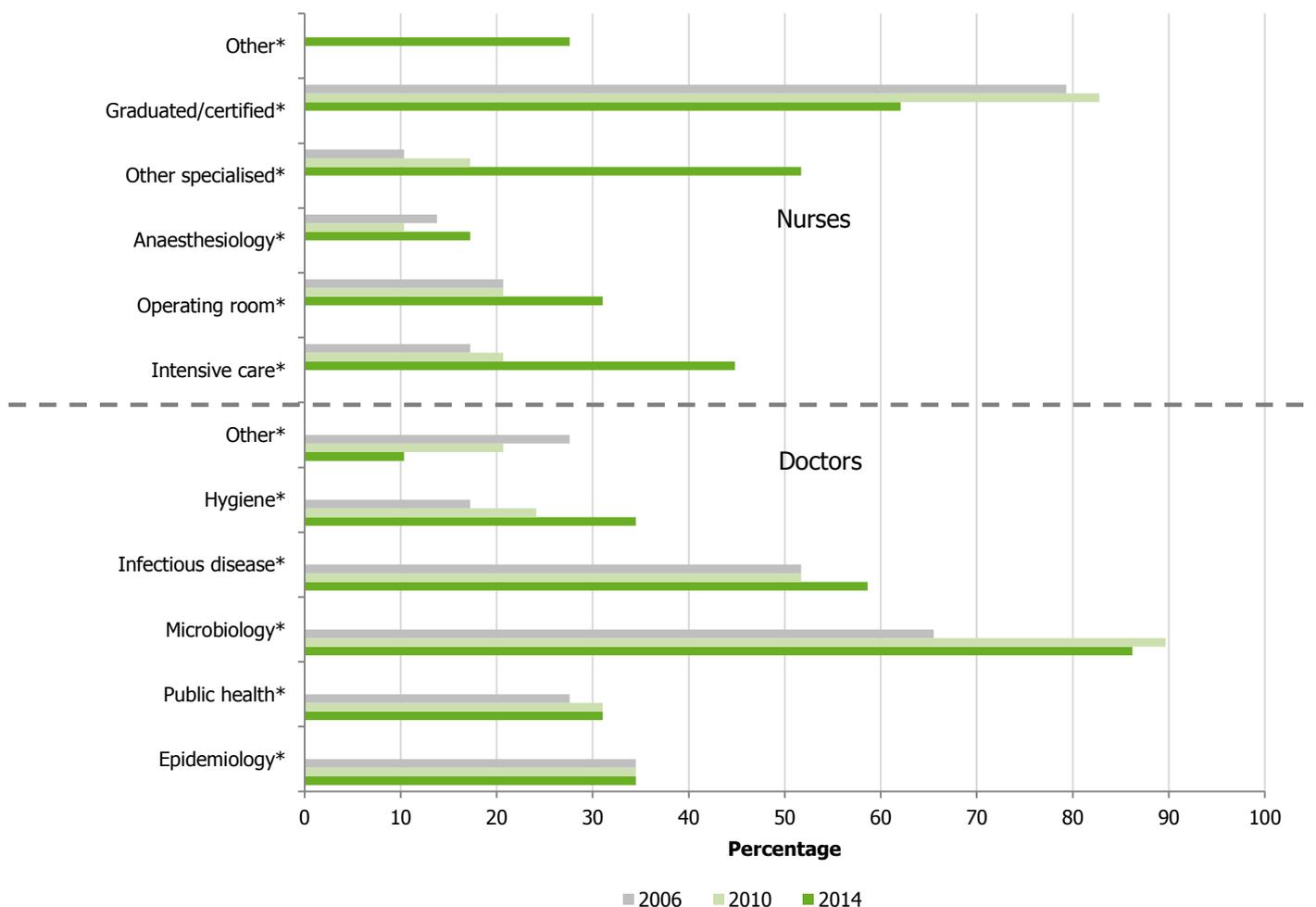
*multiple answers were allowed
†29 countries (including UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales) participated in the three surveys in 2006, 2010 and 2014.

IC/HH professional training

In 2014, 14 (47%) of 30 EU/EEA Member States reported the presence of a curriculum or programme for training IC/HH doctors and 16 (53%) EU/EEA Member States reported such curriculum or programmes for training IC/HH nurses.

Table 3 shows the increase in the presence of curricula or programmes for training doctors and nurses as IC/HH professionals. Professional bodies and universities increased their importance as providers of both IC/HH doctors and nurses. Figure 7 shows the changes in the availability of such curricula and programmes by country from 2006 to 2010 and 2014.

Table 3. Availability of a curriculum or programme for training doctors and nurses as IC/HH professionals, 29 European countries[†], 2006, 2010 and 2014

Availability of a curriculum or programme for training doctors and nurses as IC/HH professionals	Doctors			Nurses		
	2006 (%)	2010 (%)	2014 (%)	2006 (%)	2010 (%)	2014 (%)
Yes, at any level	35	55	59	55	62	66
Type of degree/learning leading to IC/HH qualification						
IC/HH specialty*	14	14	17	34	34	31
IC/HH sub-specialty*	7	10	21	3	-	10
Continuous training (government)*	10	14	10	10	7	17
Continuous training (professional bodies)*	34	31	59	31	34	66
Board certification*	10	10	14	7	10	17
University degree*	21	27	45	17	21	48
Other*	-	17	14	-	3	21

*multiple answers were allowed
†29 countries (including UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales) participated in the three surveys in 2006, 2010 and 2014.

In 2014, IC/HH continuing professional education was reported by 17 (57%) of 30 EU/EEA Member States for IC/HH doctors and in 18 (60%) EU/EEA Member States for IC/HH nurses, although continuing professional education programmes was only optional in 14 (82%) of 17 EU/EEA Member States for IC/HH doctors and in 14 (78%) of 18 EU/EEA Member States for IC/HH nurses.

Professional bodies delivered this continuing professional education through:

- specific training in 16 (94%) of 17 EU/EEA Member States for IC/HH doctors and in 16 (89%) of 18 EU/EEA Member States for IC/HH nurses
- national meetings in 14 (82%) of 17 EU/EEA Member States for IC/HH doctors and in 15 (83%) of 18 EU/EEA Member States for nurses.

Figure 7. Availability of a curriculum or programme for training doctors and nurses as IC/HH professionals by country, 2006, 2010 and 2014

Doctors

| 2006 (31 countries) | 2010 (33 countries) | 2014 (33 countries) |

Nurses

| 2006 (31 countries) | 2010 (33 countries) | 2014 (33 countries) |

Legend
- Yes
- No/not available/not reported
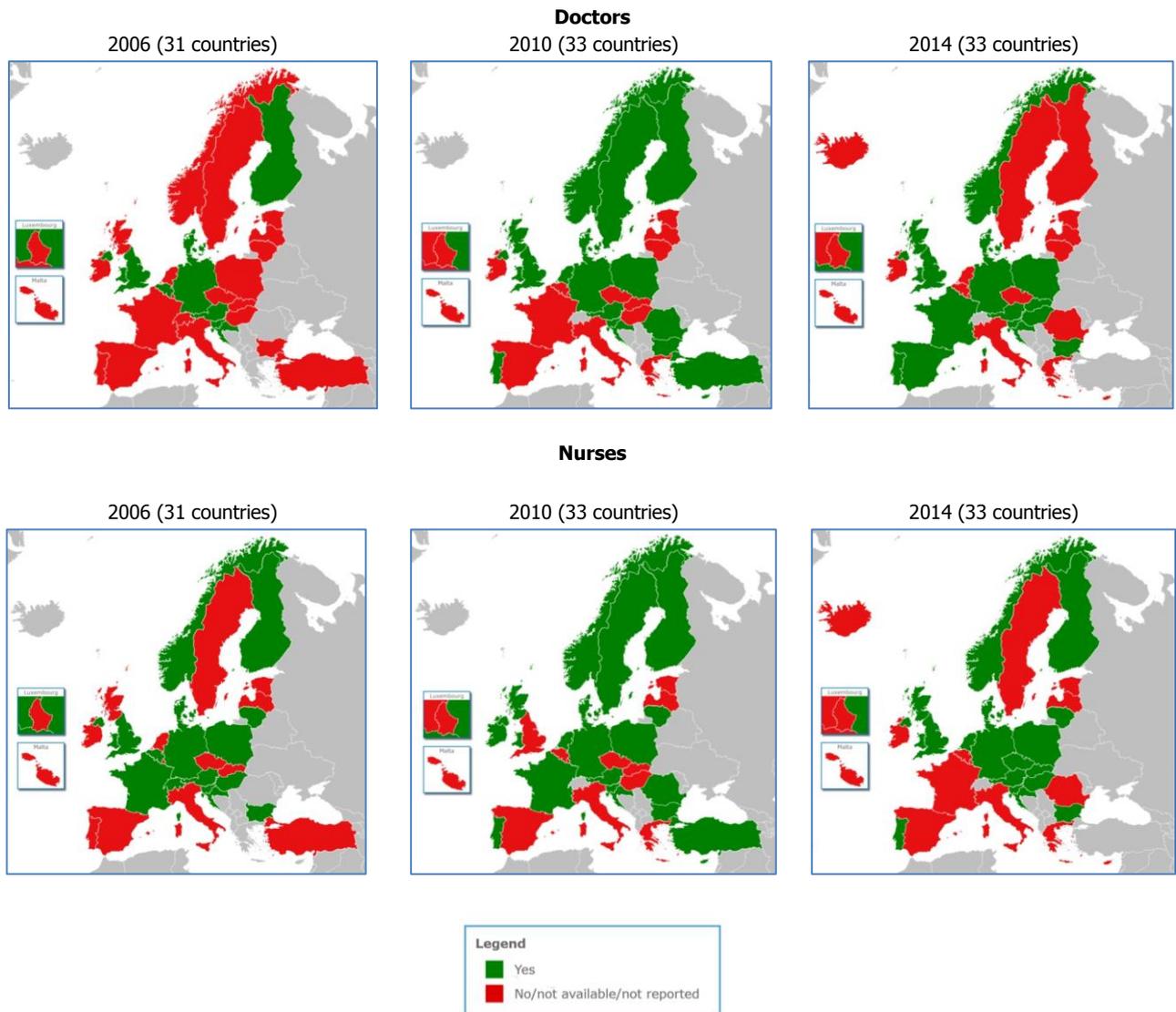
The number of countries providing continuing education for IC/HH professionals is shown in Figure 8. The number increased from 12 to 18 countries for IC/HH doctors and from 12 to 19 for IC/HH nurses, but these increases were not statistically significant.

Figure 8. Presence of mandatory and optional continuing education for IC/HH professionals (doctors and nurses), 29 European countries†, 2006, 2010 and 2014
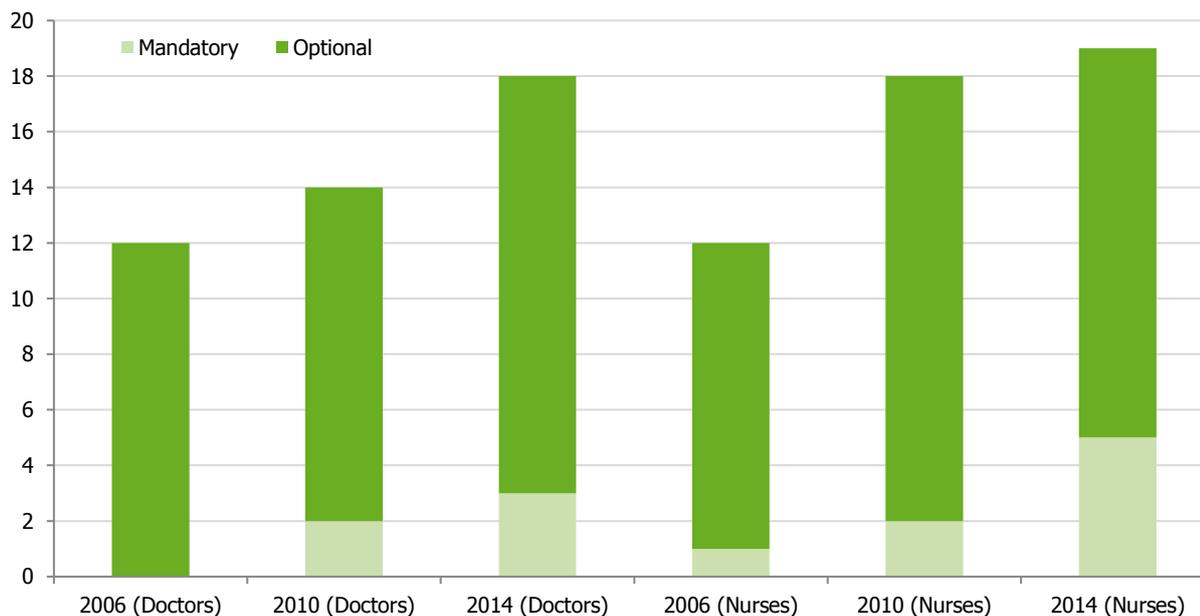
*Only 29 countries (including UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales) participated in the three surveys in 2006, 2010 and 2014.*

IC/HH link professionals and basic IC/HH training of healthcare professionals

In 2014, the role of link professionals[2] was increasingly recognised as relevant in IC/HH activities. IC/HH link doctors were reported in 18 (60%) of 30 EU/EEA countries and, in most of these (61%, 11/18), their role was officially defined. There were even more EU/EEA countries reporting the presence of IC/HH link nurses (83%, 25/30) and their role was also officially defined in most countries (60%, 15/25). Figure 9 shows the changes in the presence of IC/HH link doctors and nurses by country from 2006 to 2010 and 2014.

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[2]"Link professionals (mostly nurses) act as a link between their own clinical area and the infection control team. Their role is to increase awareness of infection control issues in their ward and motivate staff to improve practice" [11].

Figure 9. Presence of IC/HH link professionals (doctors and nurses) by country, 2006, 2010 and 2014

Doctors

| 2006 (31 countries) | 2010 (33 countries) | 2014 (33 countries) |

Nurses

| 2006 (31 countries) | 2010 (33 countries) | 2014 (33 countries) |

Legend
- Yes (green)
- No/not available/not reported (red)
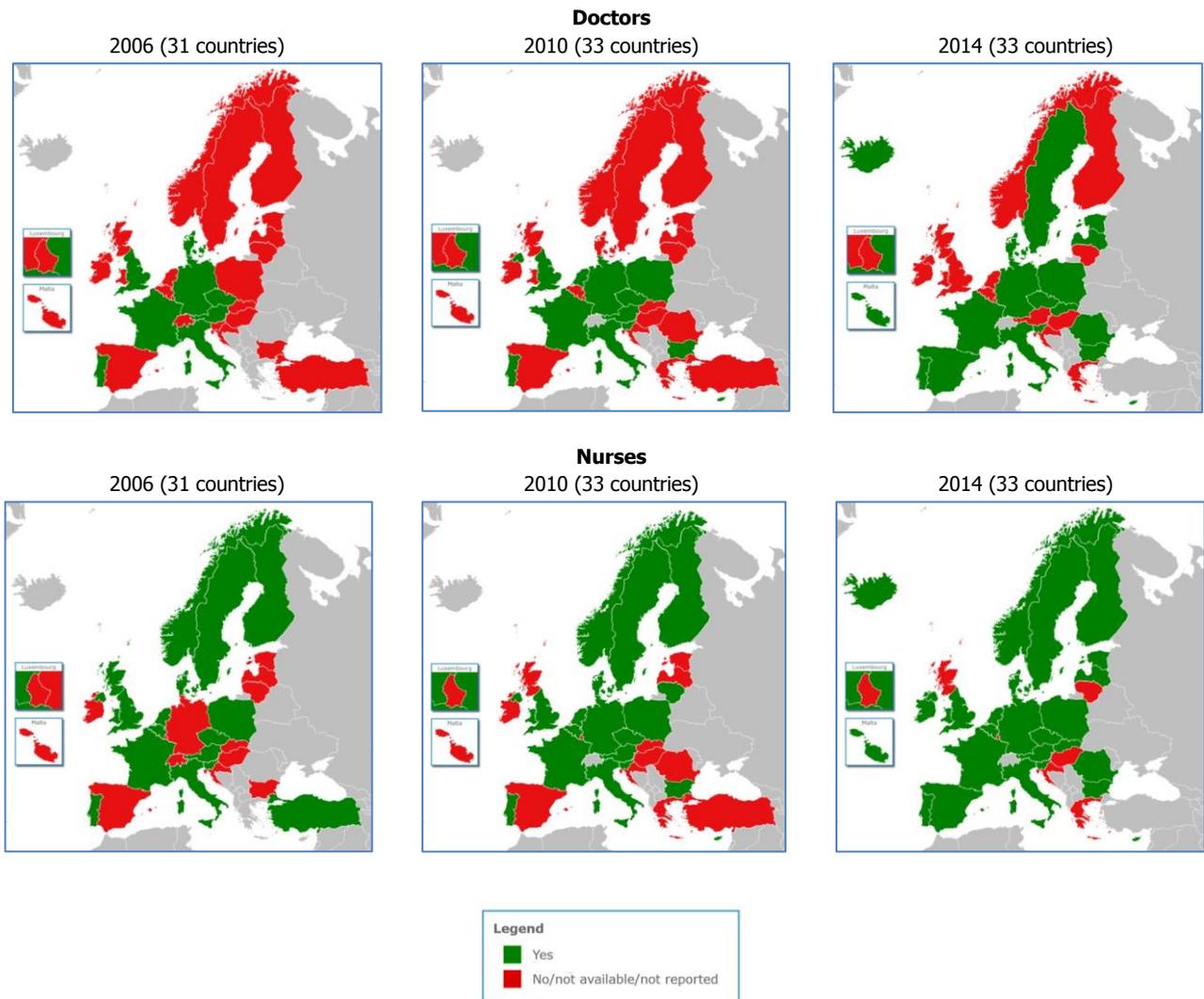
In 2014, recommendations for training these IC/HH link professionals existed in 11 (37%) of 30 EU/EEA Member States for doctors and in 15 (50%) EU/EEA Member States for nurses.

Between 2006 and 2014, there was an increase in both the presence of doctors and nurses as IC/HH link professionals and the existence of recommendations for their training (Figure 10). The number of countries with IC/HH link professionals in place increased from 28% (8/29) in 2006 to 52% (15/29) in 2014 for IC/HH link doctors, and from 59% (17/29) in 2006 to 83% (24/29) in 2014 for IC/HH link nurses.

Figure 10. Presence of IC/HH link professionals (doctors and nurses) and existence of recommendations for their training in 29 European countries[†], 2006, 2010 and 2014
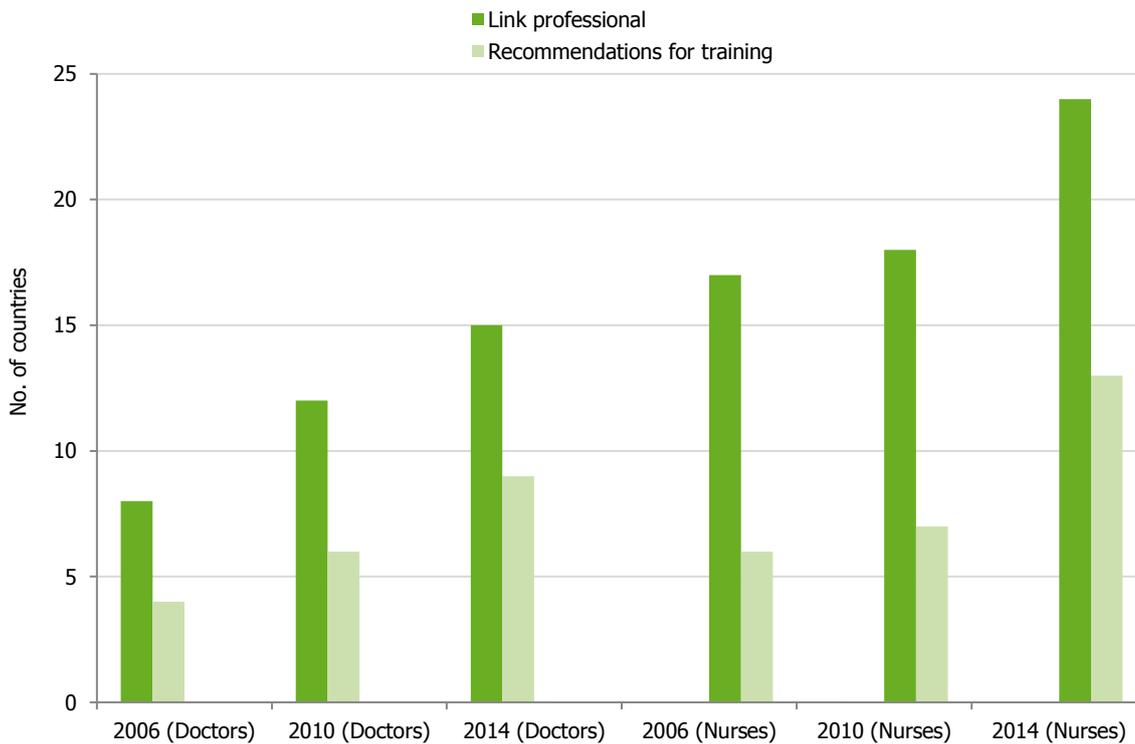

†Only 29 countries (including UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales) participated in the three surveys in 2006, 2010 and 2014.

In 2014, 25 (83%) of 30 EU/EEA Member States reported having basic IC/HH training in medical schools and 26 (87%) EU/EEA Member States reported having it for nursing schools. Among the 25 EU/EEA Member States with basic IC/HH training in medical schools, 17 (68%) reported that it was mandatory. Among the 26 EU/EEA Member States with basic IC/HH training in nursing schools, 19 (73%) reported it as mandatory.

The percentage of countries with basic IC/HH training in medical schools increased from 62% in 2006 to 93% in 2014, and for nursing schools from 72% in 2006 to 93% in 2014, but these increases were not statistically significant (Figure 11).

Figure 11. Presence of mandatory and optional basic training in IC/HH in medical and nursing schools in 29 European countries[†], 2006, 2010 and 2014
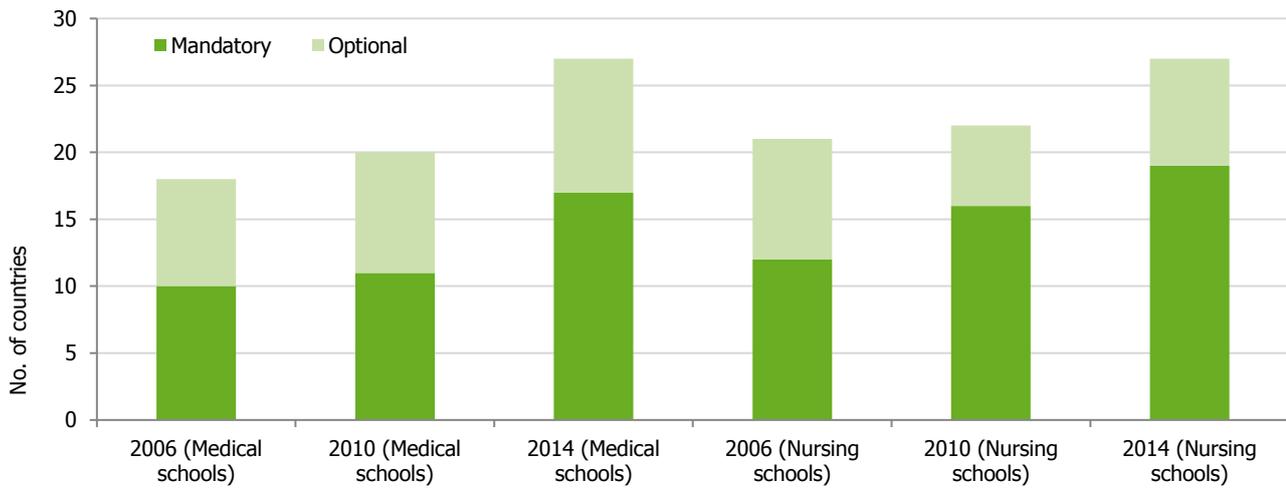

[†]29 countries (including UK-England, UK-Northern Ireland, UK-Scotland and UK-Wales) participated in the three surveys in 2006, 2010 and 2014.

Figure 12 shows the changes in the availability of basic training in IC/HH in medical and nursing schools by country from 2006 to 2010 and 2014.

Figure 12. Presence of basic training in IC/HH in medical and nursing schools by country, 2006, 2010 and 2014

Doctors

| 2006 (31 countries) | 2010 (33 countries) | 2014 (33 countries) |

Nurses

| 2006 (31 countries) | 2010 (33 countries) | 2014 (33 countries) |

Legend
- Yes
- No/not available/not reported
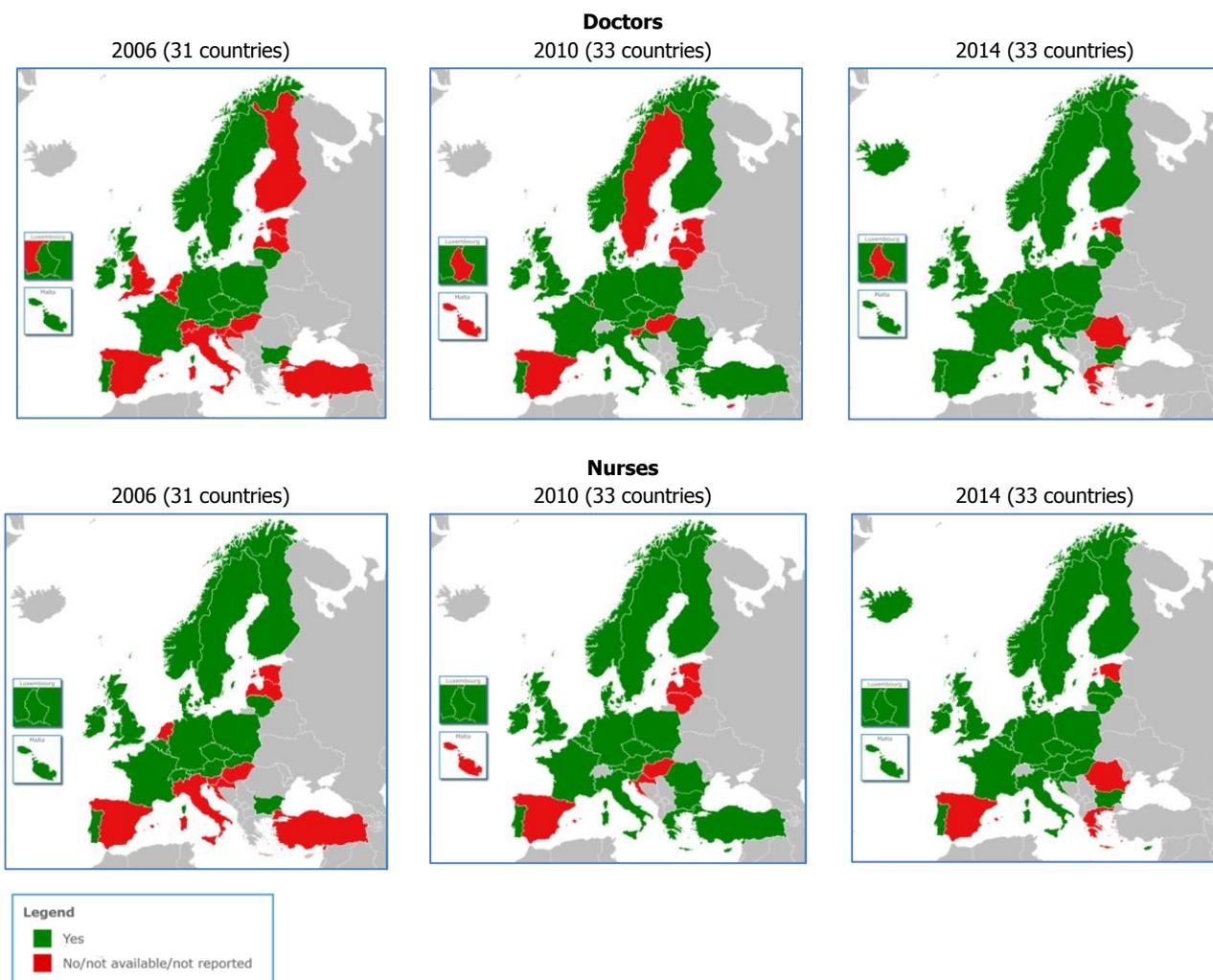
IC/HH training and EU cooperation/support needs

The domains of European IC/HH core competencies that were reported by EU/EEA Member States as having the highest priorities regarding the 'need for IC/HH training in own country' and 'need for EU cooperation/support' are shown in Table 4.

Table 4. Reported priorities for 'need for IC/HH training in own country' and 'need for EU cooperation/support' according to European IC/HH core competencies in 30 EU/EEA Member States, 2014

Perceived priorities		Countries %
Area*	Domain*	
Need for IC/HH training in own country		
Quality improvement	Performing audits of professional practices and evaluating performance	63
Infection control activities	Contributing to reducing antimicrobial resistance (AMR)	63
Programme management	Management of an infection control programme, work plan and project	57
Programme management	Elaborating and advocating an infection control programme	53
Quality improvement	Contributing to quality management	53
Surveillance and investigation of HAIs	Managing (implementation, follow up, evaluation) a surveillance system	53

Infection control activities	Implementing infection control healthcare procedures	53
Need for EU cooperation/support		
Quality improvement	Contributing to research	40
Quality improvement	Contributing to risk management	37
Quality improvement	Performing audits of professional practices and evaluating performance	37
Surveillance and investigation of HAIs	Managing (implementation, follow up, evaluation) a surveillance system	37
Surveillance and investigation of HAIs	Identifying, investigating and managing outbreaks	37
Infection control activities	Contributing to reducing antimicrobial resistance (AMR)	37
Programme management	Management of an infection control programme, work plan and project	33

According to the European IC/HH Core Competencies [6].

Impact of the European IC/HH core competencies and perspectives for IC/HH training in Europe

Eighteen (60%) of 30 EU/EEA Member States reported that European IC/HH Competencies had had some impact on IC/HH training in their country.

The most frequent categories of obstacles for improving IC/HH professional training identified by EU/EEA Member States are listed in Table 5.

Table 5. Perceived main obstacles for improving IC/HH professional training in 30 EU/EEA Member States, 2014

Perceived obstacles	Countries (%)
Lack of funding dedicated to IC/HH practice	27
Lack of interest (i.e. lack valuing and appreciation of the IC/HH specialty)	23
Lack of IC/HH professionals	17
Lack of educated trainers in IC/HH	17
Lack of training programmes in IC/HH	13
National curriculum for infection control	13
Barriers and poor collaborations among institutions, scientific societies and professional bodies	10
Other	10
Not reported	13

Furthermore, 20 (67%) of 30 EU/EEA Member States reported that they had plans for future IC/HH training organisation. EU/EEA Member States were also asked about the suitability of different training formats in their professional context. The results are reported in Table 6.

Table 6. Perceived suitability of IC/HH training formats, 30 EU/EEA Member States, 2014

Perceived suitability	Distance learning (%)	Exchange of professionals (%)	Toolkit based learning (%)	EU-level courses (%)
Very suitable	30	37	27	57
Somewhat suitable	37	33	50	20
Neutral	13	17	17	10
Not very suitable	10	3	-	3
Not at all suitable	3	-	-	3
Not reported	7	10	7	7

'EU-level courses' were the leading format for IC/HH training, considered as 'very suitable' by 57% of EU/EEA Member States. Distance learning, exchange of professionals and toolkit-based learning were also commonly perceived as very suitable or somewhat suitable.

IC/HH doctors and/or nurses were identified as the 'best target for EU-level courses' by 17 (63%) of the 27 EU/EEA Member States that answered this question, followed by trainers (18%, 3 EU/EEA Member States).

Fourteen EU/EEA Member States mentioned facilitating and limiting factors to enhance EU-level IC/HH courses. The most important facilitating factors were: recognition of IC/HH specialty (29%), funding courses at EU-level (21%), e-learning tools (14%), enhancing the importance of IC/HH (14%) and audits/case discussion (14%). The limiting factors were: language barriers (21%), cost to attend EU-level courses (14%), difference in healthcare systems (14%) and time commitment (14%).

Discussion

Prevention and control of HAIs and AMR are recognised as a major patient safety determinant and a priority for European healthcare systems in the Council recommendation 2009/C 151/01 [1], but their implementation still showed room for improvement [1, 2, 3, 12]. IC/HH training is crucial to build capacity for IC/HH and effectively address the challenge of safer patient care in European healthcare.

The TRICE-IS survey provides a picture of the situation of the European IC/HH capacity and training needs in 2014 and their evolution since 2006. Although improvement was observed in several areas, other indicators showed worsening results in 2014 e.g. the ratio of IC/HH doctors and of IC/HH nurses per hospital beds, where the progress observed between 2006 and 2010 has now been reversed.

In 2014, decentralisation of the Ministry/Department of Health was reported by 33% of EU/EEA Member States and was mostly seen in countries with a larger population. While decentralised healthcare management offers opportunities for providing closer support to healthcare organisations and professionals in line with their needs, it may also hamper consistency with the core competencies n of the training programmes. Future similar surveys could also assess training needs at sub-national levels.

The impact of Council recommendation 2009/C151/01 [3] was evident since almost all countries reported national recommendations for the management of IC/HH activities. Indeed, 13 EU/EEA Member States had set penalties for non-compliance with their recommendations. In 2014, a mandatory plan defining annual IC/HH activities was formally present in most EU/EEA Member States for acute care and for 'other' hospitals, but few EU/EEA Member States reported having such a plan for LTCFs. It is clear that there is less focus on IC/HH in LTCFs and therefore it is considered a priority that progress in building IC/HH capacity is monitored.

The role of IC/HH professionals has evolved since 2006, showing a closer relationship with the professionals in charge of patient safety, with their activities and responsibilities partially or completely overlapping in the majority of countries. This, no doubt, reflects the increased understanding of the threat posed by HAIs and AMR. These results could also be considered a consequence of Council recommendation 2009/C 151/01 [1] that addressed both patient safety and prevention and control of HAIs in one single document.

The percentage of countries with a specific definition for an IC Team has increased significantly since 2006. While in 2014 this was mandatory for acute care hospitals in 93% of the countries, there was still room for improvement for 'other' hospitals and LTCFs, for which it was mandatory in only 81% and 70% of the EU/EEA Member States, respectively.

The professionals in charge of IC/HH activities had different positions within their organisation (infectious diseases and/or microbiological department, management to quality and safety, etc.) but, interestingly, the number of countries reporting that 'IC/HH runs as autonomous service' significantly increased between 2010 and 2014. This again might be interpreted as a response to Council recommendation 2009/C 151/01, but would need to be further explored.

The results of the three surveys highlighted some progress towards a better definition of the role and profile of IC/HH professionals, as shown by an increased presence of a defined job description. Between 2010 and 2014, there was an increase in the reported availability of officially recognised degrees both for IC/HH doctors and nurses, and in the presence of specialised background (i.e. intensive care, operating room, and anaesthesiology) for IC/HH nurses. All these could be viewed as good signs towards the generalised presence of IC/HH professionals in European healthcare systems.

Finally, it is important to stress the increase in the presence of IC/HH link practitioners[3] (both doctors and nurses) and the availability of recommendations for the training of such IC/HH link professionals.

IC/HH training for healthcare professionals engaged in IC/HH at different levels increased between 2006 and 2014. Training of both IC/HH professionals and of medical and nursing students increased during 2006–2014 and was often reported as compulsory (in 2014, 68% and 73%, respectively). In addition, professional bodies and universities had also increased their role as providers of IC/HH qualification since 2006. A small increase in the number of European countries with available programmes for continuing education and/or curricula for IC/HH training was also observed.

Despite these encouraging developments, approximately half of EU/EEA Member States still did not have a programme or curriculum for training doctors and nurses as IC/HH professionals, and 40% of them had no continuing education for either IC/HH doctors or nurses.

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[3] "Link professionals (mostly nurses) act as a link between their own clinical area and the infection control team. Their role is to increase awareness of infection control issues in their ward and motivate staff to improve practice" [11].

Use of IC/HH staff/beds ratio for acute hospitals as a target for IC/HH capacity did not show any increase, stressing the need to find the best way to guarantee sufficient human resources specialised in IC/HH for hospitals and for LTCFs.

The 2014 survey revealed that 60% of the EU/EEA Member States also reported that the European IC/HH core competencies [4] had had a significant impact on IC/HH training in their country.

Several areas based on European IC/HH Core Competencies [4] were reported as priorities for training in countries and for EU cooperation/support. The most reported included 'contributing to reducing antimicrobial resistance', 'performing audits of professional practices and evaluating performances', 'management of an infection control programme, work plan and project' and 'managing a surveillance system'. These topics could be considered as a reference point for future European IC/HH training initiatives, since many countries reported that EU-level courses for IC/HH professional training were very desirable. The majority of countries also considered a European programme with an exchange component, among other formats, as suitable for training.

Lack of specific resources (both funding and professionals) and lack of interest in IC/HH training programmes were perceived as the main constraints, followed by language barriers and the time commitment required. Conversely, recognition of IC/HH as a specialty and funding for courses at EU level were perceived as facilitating factors for the success of IC/HH training initiatives. These factors should be considered and addressed when planning future actions and investments at European, national, regional and local level since they could help EU/EEA Member States reach better standards of patient care in the medium to long term.

Some limitations regarding the data should be mentioned. For 2014, we requested re-examination of the returned data by the corresponding Member State expert where issues of reporting accuracy were identified. All Member State experts were asked to approve the results of data analyses and comparisons before finalising the report. However, two-thirds of the Member State experts that replied in 2014 were not the same as in the two previous surveys in 2006 and 2010. Member State experts were invited to discuss the accuracy of the reported data for 2006, 2010 and 2014 with authorities, organisations and other experts in their country (e.g. with the Department of Health, the IC/HH professional societies and leaders of IC/HH courses), but the fact that, for some countries, different experts replied to the three surveys remains a factor that might have affected the results.

Conclusion

Healthcare-associated infections and AMR affect the quality of healthcare delivery and patient safety. This survey conducted in 30 EU/EEA Member States as part of the TRICE-IS project showed some improvement in their capacity for IC/HH training of healthcare professionals between 2010 and 2014.

Changes in the situation, with apparent lack of progress or even regression in some areas stress the need for further monitoring and support at European and country level. For example, Nordic countries are working on establishing a new multidisciplinary programme, to replace the Training Programme on infection prevention and control that had been coordinated by the Nordic School of Public Health. The programme was discontinued in 2014 [9]. Therefore if a new survey is organised in the future, results on Member State capacity for training of infection control training may be more promising.

Since IC/HH and patient safety activities are organised and managed at regional or local level in about one third of European countries, future surveys should explore both subnational and local contexts in EU/EEA Member States.

IC/HH training has been identified as a crucial step in improving patient safety in EU/EEA Member States. It is therefore important to identify the best way in which the EU can promote and support such training initiatives. This is evident from the reported impact of the European IC/HH core competencies [6] and by the expressed suitability for country needs of European initiatives such as courses, toolkits and professional exchange programmes. Indeed, there are recent examples with the ECDC point prevalence surveys of HAIs and antimicrobial use in European acute-care hospitals and LTCFs [7,13], for which surveillance activities greatly benefited from train-the-trainer courses organised at the European level.

Furthermore, the fact that in many EU/EEA Member States, professionals nominated as responsible/legal leads for IC/HH and patient safety programmes are the same person, gives a new insight into the interactions between these two areas and about training needs for these professionals.

The survey also showed the emerging role of IC/HH link professionals, both doctors and nurses, and the need for promoting their specific training.

Regarding basic IC/HH training in medical and nursing schools, while its presence was relatively high in 2014, it was not always mandatory.

Although IC/HH in LTCFs was only partially explored in this survey, LTCFs emerged as a weak point for IC/HH in healthcare systems, i.e. low presence of mandatory requirement for a plan that formally defined IC/HH activities on a yearly basis, which again emphasises that more work is needed to improve the IC/HH situation in this setting [7,14].

The results of this and previous similar surveys shed some light on the evolution of the European healthcare systems with respect to IC/HH activities and training between 2006 and 2014. Periodic surveys may be used as a monitoring tool to guide further improvements of IC/HH training programmes.

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Annex 1. Questionnaire

Core Staff: Brusaferro S, Cookson B, Gallagher R, Hartemann P, Holt J, Kalenic S, Popp W, Privitera G.

Supporting Staff: Arnoldo L, Cattani G, Fabbro E.

ECDC: Suetens C, Varela Santos C, Van Kranendonk L, Prikazsky V, Bosman A.

Introduction

This questionnaire is part of a periodical monitoring of Infection Control/Hospital Hygiene (IC/HH) training needs assessment in Europe and is based on questions proposed in 2006 (Improving Patient Safety in Europe -IPSE project) and 2010 (Training Infection Control in Europe -TRICE project). Your answers are very important to better understand the progresses in IC/HH training and to assess present and future needs.

The information you provide will become part of an ECDC report including country profile and at least one scientific publication.

After the data collection you will be contacted to review the draft of the report to validate the country profile. You could be contacted in case of a need for clarification about data, too.

The questionnaire is structured in 3 Sections and 45 questions.

- Human Resources for Infection Control/Hospital Hygiene;
- Training;
- The Future;

The time to answer all the questions is estimated to 60 minutes, if all the necessary information is available or easily accessible. Nevertheless, some of the questions require data that could not be immediately available. For this reason, we kindly suggest you to ask for support (at regional/national level and or by scientific and professional training institutions) to help you with responses.

The deadline for returning your national data is the **20 October 2014.**

Preliminary instructions

- We provide a specific glossary and the list of acronyms: please read them before starting the questionnaire; if you do not agree or there are issues with any definition please report them in the free comments area below the glossary;
- for some questions we provide a free text field for references, comments and specifications, when appropriate; web links to retrieve documents and file attached will be appreciated;
- Section 3 is focused on the future perspectives for IC/HH training in Europe so you are asked to report official scenarios where these exist along with references/www.links. If they do not exist your opinion as a national expert in IC/HH training would be appreciated. Please consider that this section will contribute to draft the future investments in IC/HH training in Europe and to investigate training needs in your country;
- looking at the previous questionnaire, the role of regions/provinces within countries in addressing and managing IC/HH activities emerged as an important issue: for this reason the questionnaire includes the specification national and/or regional for some questions;
- please fill in this Word file and use the red fields to add your specifications and comments.

GLOSSARY

Acute Hospital: an inpatient facility providing acute care.

Infection Control: in some countries it may be known as Infection Prevention or Hospital Hygiene.

Infection Control Committee: should include wide representation from: management, physicians, other healthcare workers, clinical microbiology, pharmacy, central supply, maintenance, housekeeping, training services, etc. The committee must provide multidisciplinary input and cooperation and information sharing and have a reporting relationship directly to either administration or the medical staff to promote programmes visibility and effectiveness. (Prevention of hospital-acquired infections. Malta: World Health Organization; 2002. Available from: http://www.who.int/csr/resources/publications/whocdscsreph200212.pdf, last access 8th August 2014).

Infection Control Link Practitioner: doctors/nurses who act as a link between their own clinical area and the Infection Control Team (ICT). Their role is to increase awareness of IC/HH issues in their ward and motivate staff to improve practices.

Infection Control Professionals (doctors, nurses, pharmacists, etc.): doctors, nurses, other health care professionals formally involved in the ICT and in infection control activities in their healthcare organization both as responsible, team member, expert.

Infection Control Programme: a programme aimed at controlling HAI, through surveillance and/or adoption of evidence-based infection control policies and procedures.

Infection Control Team (ICT): Infection Control Professionals responsible for oversight and for coordination of all infection control activities to ensure an effective programme. (Prevention of hospital-acquired infections. Malta: World Health Organization; 2002. Available from: http://www.who.int/csr/resources/publications/whocdscsreph200212.pdf, last access 8th August 2014).

Infection Control Hospital Hygiene Training Programme: a programme leading to an IC/HH qualification.

Job-description: an employment position including duties, responsibilities and conditions required to perform the job. (Joint Commission International, Accreditation Standards for Hospitals, 5th Edition).

Long Term Care Facilities (LTCF): a facility that provides rehabilitative, restorative, and/or ongoing skilled nursing care to patients or residents in need of assistance with activities of daily living. LCTF include nursing homes, rehabilitation facilities, inpatient behavioural health facilities, and long-term chronic care hospitals.

Other Hospitals: a hospital that, according with the national definition, is not an acute care hospital.

Patient Safety: freedom, for a patient, from unnecessary harm or potential harm associated with healthcare. (Council recommendation of 9 June 2009 on patient safety, including the prevention and control of healthcare associated infections (2009/C 151/01). Available at: http://ec.europa.eu/health/patient_safety/docs/council_2009_en.pdf, last access 8th August 2014).

Medical Specialty: a nationally or internationally recognized area of medical specialization for which a structured postgraduate training programme exists. (Charter on Training of Medical Specialists in the European Community, Charter adopted by the Management Council of the UEMS, October 1993. Available from: http://www.uems.eu/__data/assets/pdf_file/0017/1484/906.pdf, last access 19th September 2014).

Acronyms

AMR	Antimicrobial Resistance
CS	Core Staff
ECTS	European Credit Transfer and Accumulation System
EU	European Union
IC/HH	Infection Control/Hospital Hygiene
ICT	Infection Control Team
ICLP	Infection Control Link Practitioner
ICU	Intensive Care Unit
HAI	Healthcare-associated Infection
HCW	Health Care Workers
LTCF	Long Term Care Facilities
MSE	Member States Expert
SS	Supporting Staff
TRICE	Training in Infection Control In Europe (also known as infection control training needs assessment in the European Union)
TRICE-IS	Training in Infection Control In Europe - Implementing Strategy

Country

Country	
Member State Expert	

Details of main person completing the questionnaire

First name	
Last name	
Institution	
Professional address	
Phone	
Fax	
Email	
Are other people involved in completing this questionnaire? Please fill in the boxes below:	

1	First name	
	Last name	
	Institution	
2	First name	
	Last name	
	Institution	
3	First name	
	Last name	
	Institution	
Date of Submission dd/mm/yy		

Section 1. Human resources for infection control/healthcare hygiene.

Chapter 1. National context

Question 1
The healthcare system in your country has the ministry of health/department of health:

☐ Centralised

☐ Decentralised (i.e. at regional/provincial level)

☐ Other

If there are different "models" in place please specify here:

Question 2
If decentralised:

How many regions/provinces have healthcare decentralised functions?	(n°)	
Are they responsible for commissioning/accreditation?	☐ Yes	
	☐ No	
	☐ Other, specify:	
Are they autonomous upon the use of the healthcare budget?	☐ Yes	
	☐ No	
	☐ Other, specify:	

Question 3
Who sets the following (tick all that apply):

	IC/HH	Patient Safety	Authority
Setting rules and standards	☐ National ☐ Regional	☐ National ☐ Regional	☐ Completely overlapped ☐ Partially overlapped ☐ Independent
Running programmes	☐ National ☐ Regional	☐ National ☐ Regional	☐ Completely overlapped ☐ Partially overlapped ☐ Independent

Monitoring the results	☐National ☐Regional	☐National ☐Regional	☐Completely overlapped ☐Partially overlapped ☐Independent
Adopting penalties and rewards	☐National ☐Regional	☐National ☐Regional	☐Completely overlapped ☐Partially overlapped ☐Independent
Training Professionals	☐National ☐Regional	☐National ☐Regional	☐Completely overlapped ☐Partially overlapped ☐Independent

Question 4

Is there a nominated/legal responsible for IC/HH and/or Patient Safety in healthcare institutions?

	IC/HH	Patient Safety	Are IC/HH and Patient Safety responsibilities and activities overlapped?
National level	☐Yes ☐ No ☐NA* If Yes, who** is?	☐Yes ☐ No ☐NA* If Yes, who** is?	☐ Completely overlapped ☐ Partially overlapped ☐ Independent
Regional/ provinciallevel	☐Yes ☐ No ☐NA* If Yes, who** is?	☐Yes ☐ No ☐NA* If Yes, who** is?	☐ Completely overlapped ☐ Partially overlapped ☐ Independent
Local level	☐Yes ☐ No ☐NA*	☐Yes ☐ No ☐NA* If Yes, who** is?	☐ Completely overlapped ☐ Partially overlapped ☐ Independent

*NA=not applicable or not available
**please mention the function identified.

Question 5

Does your country have recommendations for managing IC/HH?(multiple answers are allowed)

Yes, by an ordinance of the Ministry	☐National level ☐Regional level ☐Other, please specify:	
Yes, it is part of government recommendations	☐National level ☐Regional level ☐Other, please specify:	
Yes, it is part of professional bodies' recommendations	☐	
No	☐	
Unknown/not available	☐	
Not applicable	☐	
Specify:		

If yes, is there a penalty in case of no compliance with them?

| ☐Yes, please specify: | |
| ☐ No | |

Question 6

Within your national programme or regulations, do you have a specific definition of "Infection Control Team" (ICT)? (multiple answers are allowed)

Yes, by an ordinance of the Ministry of Healthcare/Department of Health	☐National level ☐Regional level ☐Other, please specify:	
Yes, it is part of government recommendations	☐National level ☐Regional level ☐Other, please specify:	
Yes, it is part of professional bodies' recommendations	☐	
No	☐	
Unknown/not available	☐	
Not applicable	☐	
If there are variations in place, please specify here:		

Question 7

If yes to question 6, does this definition include the following professionals?

☐IC/HH doctors

☐IC/HH nurses

☐Laboratory technicians

☐Environmental technicians

☐Data managers

☐Administrative support

☐Other

Please specify the composition of ICT if different from above mentioned professionals are included:

Question 8

If yes to question 6, please specify in which setting ICT activities are mandatory.

☐Acute hospitals	☐ Public ☐Private ☐ Not specified
☐ Other hospitals	☐Public ☐ Private ☐ Not specified
☐LTCF	☐Public ☐ Private ☐ Not specified

If mandatory, what are the consequences in case of absence? Please specify:

If not applicable why? Please specify:

Question 9

In healthcare organisations in your country, the professional in charge of IC/HH is usually involved in one or more of the following jobs? (multiple answers are allowed)

☐Global or medical management	
☐Management of quality and safety	
☐ Microbiological or infectious diseases department	
☐ IC/HH runs as an autonomous service	
☐ Other positions (please specify)	
☐ Unknown/not available	
☐ Not applicable	

If not applicable why?

Question 10

Is it mandatory to have a plan that formally defines IC/HH activities on yearly basis? (it could be also part of the general annual plan but with a section for IC/HH) (multiple answers are allowed)

☐ Acute hospitals		☐Yes ☐No ☐Unknown
☐ Other hospitals		☐ Yes ☐ No ☐ Unknown
☐LTCF		☐ Yes ☐ No ☐ Unknown
Comments:		

*If yes please make some comments about the compliance:

Question 11

In your country, the provision of resources for IC/HH activities (including staff) is usually founded by: (multiple answers are allowed)

☐ The general revenue of the healthcare organisation itself	
☐ A specific budget decided according to law or official recommendation	
☐ A specific funding provided by an external body (agency, insurance, etc.)	
☐ Other funding mechanisms, please specify:	
☐ Unknown/not available	

Question 12

If the previous questions are not sufficient to explain your country situations, would you like to comment what is happening in practice?Please write your comments below:

Chapter 2. Infection control/hospital hygiene doctors

Question 13
Within your national programme or regulations, is a professional profile for IC/HH doctors defined?
☐ Yes, by law
☐ Yes, it is part of government recommendations
☐ Yes, it is part of professional bodies' recommendations
☐ No
☐ Unknown/not available
☐ Not applicable

Question 14
If a professional profile exists, is there a detailed job description for IC/HH doctors?
☐ Yes
☐ No
☐ Unknown/not available
☐ Not applicable

Question 15

If a professional profile exists, is there a legal or recommended ratio for IC/HH doctors?

	Acute Hospitals	LTCF	Other Hospitals
Yes	☐	☐	☐
No	☐	☐	☐
Unknown/not available	☐	☐	☐
Not applicable	☐	☐	☐

If no, would you like to comment upon what is happening in practice?
If not applicable why?

Question 16

If yes to question 15, please give the doctors ratio per bed and per admission:

	Acute Hospitals	LTCF	Other Hospitals
Ratio per bed (n° of IC/HH doctors/n° beds)			
Ratio per admission (n° of IC/HH doctors/n° admissions)			
Other ratio, please specify:			
Unknown/not available	☐	☐	☐

Question 17	
At what level is the job description defined?	
☐ National level	
☐ Regional level	
☐ Local level	
☐ It isn't defined	
☐ Unknown/not available or applicable. Please explain:	

Chapter 3. Infection control/hospital hygiene nurses

Question 18
Within your national programme or regulations, is a professional profile for IC/HH nurses defined?
☐ Yes, by law
☐ Yes, it is part of government recommendations
☐ Yes, it is part of professional bodies' recommendations
☐ No
☐ Unknown/not available
☐ Not applicable

Question 19

If a professional profile exists, is there a detailed job description for IC/HH nurses?

☐ Yes

Question 20

If a professional profile exists, is there a legal or recommended ratio for IC/HH nurses?

	Acute Hospitals	LTCF	Other Hospitals
Yes	☐	☐	☐
No	☐	☐	☐
Unknown/not available	☐	☐	☐
Not applicable	☐	☐	☐

If no, would you like to comment what is happening in practice?

If not applicable why?

☐ No
☐ Unknown/not available
☐ Not applicable

Question 21

If yes to question 20, please give the nurses ratio per bed and per admission:

	Acute Hospitals	LTCF	Other Hospitals
Ratio per bed (n° of IC/HH nurses/n° beds)			
Ratio per admission (n° of IC/HH nurses/n° admissions)			
Other ratio, please specify:			
Unknown/not available	☐	☐	☐

Question 22

At what level is the job description defined?

☐ National level	
☐ Regional level	
☐ Local level	
☐ It isn't defined	
☐ Unknown/not available or applicable. Please explain:	

Chapter 4. Status of infection control/hospital hygiene doctors

Question 23

Do you have in your country official recognition of the degree (any kind) of IC/HH for doctors? (multiple answers are allowed)

☐ Yes, by healthcare authorities
☐ Yes, by universities
☐ Yes, by professional bodies
☐ No
☐ Unknown/not available
☐ Not applicable

Would you like to comment what is happening in practice?

Question 24

What are the most usual backgrounds for IC/HH doctors?

☐ Epidemiology	
☐ Public Health	
☐ Microbiology	
☐ Infectious Diseases	
☐ Hygiene	
☐ Other clinical specialty, please specify:	

Chapter 5. Status of infection control/hospital hygiene nurses

Question 25 Do you have in your country official recognition of the degree (any kind) of IC/HH for nurses? (multiple answers are allowed)
☐ Yes, by healthcare authorities
☐ Yes, by universities
☐ Yes, by professional bodies
☐ No
☐ Unknown/not available
☐ Not applicable
Question 26 What is the usual seniority for IC/HH nurses?
☐ Senior head nurses
☐ Qualified nurses (minimum 3 years experience)
☐ Newly qualified nurses
☐ Unknown/not available
Question 27 What are the most usual backgrounds for IC/HH nurses? (multiple answers are allowed)
☐ Intensive Care Unit (ICU) nurse
☐ Operating room nurse
☐ Anaesthesiology nurse
☐ Other specialised nurse
☐ Graduated/certified nurses
☐ Unknown/not available
☐ Other. Please specify:

Section 2 – Training

Chapter 1. National framework (profile) or programme for training (initial, continuing)

Question 28
Is there any curriculum or programme for IC/HH training for doctors and nurses?
(multiple answers are allowed)

	Doctors	Nurses
Yes, at national level	☐	☐
Yes, at regional level	☐	☐
Yes, at professional level	☐	☐
No, the training is organised by local institutions and societies	☐	☐
Unknown/not available	☐	☐
Not applicable	☐	☐

Question 29
What type of degree or learning leads to IC/HH qualification for doctors and nurses?
(multiple answers are allowed)

		Doctors	Nurses
IC/HH specialty		☐	☐
IC/HH sub-specialty. Please specify the main specialty:		☐	☐
Continuous training (government)		☐	☐
Continuous training (professional bodies)		☐	☐
Board certification		☐	☐
University degree		☐	☐
Other. Please specify:		☐	☐
Unknown/not available		☐	☐
Not applicable		☐	☐

Chapter 2. Infection control/hospital hygiene training programmes

Question 30
Are there training programmes followed by IC/HH professionals (doctors, nurses, etc.) in your country?

☐ Yes. Please specify the level:	☐ National level
	☐ Regional level
	☐ Local level
☐ No	
☐ Unknown/not available	
☐ Not applicable. Please specify:	

Question 31
If yes to question 30, please describe them filling in the following scheme:

	Title of IC/HH training programme	Organizational Level (national/regional /local)	Responsible organisation (contact details)	Language	Is the course considering the European IC/HH Core Competencies? (Yes/No)	Number of ECTS* (or hours) per IC/HH training programme	Link	Attendees (Nurses/Doctors/ Other)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

*ECTS: *European Credit Transfer and Accumulation System; 2 ECTS correspond to 30 hours courses*

Chapter 3. Evaluation of infection control/hospital hygiene competencies

Question 32		
Do you have a continuous education for IC/HH doctors and nurses in your country?		
	Doctors	Nurses
Yes, this is a mandatory training programme	☐	☐
Yes, this is an optional training programme	☐	☐
No, this training is not available	☐	☐
Unknown/not available	☐	☐
Not applicable	☐	☐
Question 33		
If yes to question 32, how is this training delivered? (multiple answers are allowed)		
	Doctors	Nurses
Through specific training delivered by professional bodies	☐	☐
Through national events of professional bodies	☐	☐
Not applicable (no continuous training programme available)	☐	☐
Unknown/not available	☐	☐

Chapter 4. Basic training of healthcare workers (HCW) and "link" practitioners

Question 34				
Are IC/HH link practitioners common in your country? (multiple answers are allowed)				
			Doctors	Nurses
Yes:				
	- officially defined role:			
		- national/regional level	☐	☐
		- professional level	☐	☐
	- not officially defined		☐	☐
No			☐	☐
Unknown/not available			☐	☐
Not applicable			☐	☐
Comments:				
Question 35				
Do you have recommendations for training IC/HH link doctors and nurses in your country? (multiple answers are allowed)				
			IC/HH link doctors	IC/HH link nurses
Yes, at national level			☐	☐
Yes, at regional level			☐	☐
Yes, at professional level			☐	☐
Other. Please specify:			☐	☐
No			☐	☐
Unknown/not available			☐	☐
Not applicable			☐	☐
Comments:				
Question 36				
Is there basic training in IC/HH in medical and nurse schools of your country?				
			Doctors	Nurses
Yes, this training is mandatory:			☐	☐
- how many ECTS* credits it provides?				
Yes, this training is optional:			☐	☐
- how many ECTS* credits it provides?				
No, this training is not available			☐	☐
Unknown/not available			☐	☐
*ECTS: European Credit Transfer and Accumulation System; 2 ECTS correspond to 30 hours courses				
Comments:				
Question 37				
Are IC/HH issues part of the examination or evaluation in basic training for doctors and nurses?				
			Doctors	Nurses
Yes			☐	☐
No			☐	☐
Unknown/not available			☐	☐

Not applicable	☐	☐
If there are variations in place, please specify here:		

Chapter 4. Annex A: infection control/hospital hygiene professional competencies

Instructions

In the Annex you can find the Area and Domains of European Infection Control/Hospital Hygiene Core Competencies (European IC/HH Core Competencies) as indicated in the whole document "Core competencies for infection control and hospital hygiene professionals in the European Union" published by ECDC in March 2013 as a Technical Document*. Some examples are added to each domain to clarify its meaning.

Please, choose with a tick ("**X**") the **five** domains in each column which you consider with a higher priority in your country regarding:

- need for IC/HH training: we would like to assess the IC/HH training needs (specifying the topic) you consider as a priority in your country (e.g. controlling environmental source of infection);
- need for EU cooperation/support: in your opinion we'd like to investigate for which IC/HH training needs an EU cooperation/support is more useful in your country (e.g. designing an HAI surveillance system; reducing antimicrobial resistance).Domains can be different from those identified in the previous column.

Moreover, please use open field below the Annex for any comments or specifications.

*Available at: http://www.ecdc.europa.eu/en/publications/publications/infection-control-core-competencies.pdf (last access September 10th 2014).

Area	Domain	Need for IC/HH training in your country	Need for EU Cooperation/Support
1. Programme management	**Elaborating and advocating an infection control programme.** e.g. developing the IC/HH programme, identifying needs for the protection of HCWs, leading the team.	☐	☐
	Management of an infection control programme, work plan and project. e.g. managing an IC/HH programme; disseminating information; appropriately reporting IC/HH findings to the IC committee.	☐	☐
2. Quality improvement	**Contributing to quality management.** e.g. contributing to the ongoing accreditation, certification; conducting and coordinating audits of professional practices related to IC/HH in clinical areas.	☐	☐
	Contributing to risk management. e.g. integrating risk management concepts.	☐	☐
	Performing audits of professional practices and evaluating performance. e.g. preparing protocols for the evaluation of performance; training investigators; analyzing data and interpreting results related to the evaluation.	☐	☐
	Infection control training of employees. e.g. evaluating the training needs of the healthcare organization and of the HCWs; designing a training programme on IC/HH activities and procedures for all employees.	☐	☐
	Contributing to research. e.g. contributing to the research by collecting data according to the surveillance design and defined methodology.	☐	☐
3. Surveillance and Investigation of Healthcare-Associated Infections (HAIs)	**Designing a surveillance system.** e.g. formulating the scope, methodology and practical organization of the HAI surveillance system based on the population served, services provided and professional involvement.	☐	☐
	Managing (implementation, follow up, evaluation) a surveillance system. e.g.; producing periodic structured reports; regularly reviewing the risks, needs and priorities in order to adjust surveillance targets and objectives; using feedback tools.	☐	☐
	Identifying, investigating and managingoutbreaks. e.g. managing an outbreak of infections.	☐	☐
4. Infection Control Activities	**Elaborating Infection Control Interventions.** e.g. preparing IC/HH policies and procedures; decontamination and sterilization of medical devices; drawing up of clinical procedures when special precautions for IC/HH are required.	☐	☐
	Implementing Infection Control Healthcare procedures. e.g. disseminating pertinent policies and procedures to applicable departments.	☐	☐
	Contributing to reducing antimicrobial resistance (AMR). e.g. identifying the specific local determinants of AMR; implementing a plan to reduce AMR; involving key people in the implementation of a plan to reduce AMR.	☐	☐
	Advising appropriate laboratory testing and use of laboratory data. e.g. advising about appropriate surveillance and screening/testing; being able to interpret microbiological data.	☐	☐
	Decontamination and sterilization of medical devices. e.g. selecting appropriate methods and products for decontamination.	☐	☐
	Controlling environmental sources of infections e.g. proposing appropriateIC/HH measures for the management of waste, air, water, laundry and food; contributing to risk reduction in the architectural and functional design of units and associated essential services.	☐	☐
Comments:			

Section 3. The future

Chapter 1. Plans for further organisation of infection control/hospital hygiene training in your country

Question 38
Did European IC/HH Core Competencies have any impact on IC/HH training in your country?
☐ Yes
☐ No
If yes, please describe it:

If no, please report why:

Question 39
Please, indicate the main obstacles in your country for improving IC/HH professional training (report them following your priorities):

Question 40
Are there any plans for further organization of IC/HH training in your country?
☐ Yes
☐ No
If yes, please specify them:

Chapter 2. EU-level training

Question 41
What would be for your country the added value of training at EU level in IC/HH for health care professionals complementary to existing training and educational services at national or regional level?

Question 42
What should be the aim of EU-level training for IC/HH professionals?

Question 43
What would be the best target group for EU-level training? (profession, level of experience, etc.)

Question 44		
To what degree would following training formats be suitable for your country?		
Training formats	Degree	Please specify your answer (duration, structured full curricula, specific core competencies, important make or break issues, etc.)
Distant learning (stand-alone e-learning courses)	☐ Very suitable ☐ Somewhat suitable ☐ Neutral ☐ Not very suitable ☐ Not at all suitable	
Exchange of professional (professional going to another country to work/learn from the situation in another care facility)	☐ Very suitable ☐ Somewhat suitable ☐ Neutral ☐ Not very suitable ☐ Not at all suitable	
Toolkit based learning (the toolkit will exist of assignments or a project that can be executed by the participant in their own care facility and can be adjusted to the local situation and resources)	☐ Very suitable ☐ Somewhat suitable ☐ Neutral ☐ Not very suitable ☐ Not at all suitable	
EU-level courses (face to face classroom or instructor-led training taking place in location of interest)	☐ Very suitable ☐ Somewhat suitable ☐ Neutral ☐ Not very suitable ☐ Not at all suitable	
Other format, specify:	☐ Very suitable ☐ Somewhat suitable ☐ Neutral ☐ Not very suitable ☐ Not at all suitable	
Question 45		
What other aspects do you consider important for EU-level training in IC/HH? (constraints, facilitating factors, etc.)		

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