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Mandatory and recommended national indicators on HAI prevention and control in Europe

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Contents

- Why this survey
- How it has been conducted
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- Conclusions and future development

Why this survey

- The monitoring and spread of data on HAIs are necessary tools to guarantee an efficient prevention and control activity
- Monitoring needs indicators
- Currently there exist many indicators on HAIs at European/National/Regional/Single Trust level

Zingg W et al. Lancet Infect Dis. 2015 Feb;15(2):212-24
Price L et al. Lancet Infect Dis. 2018 May;18(5):e159-e171
Gastmeier P et al. J Hosp Infect 2008;70(Suppl 1):11-6
Haley RW et al. Am J Epidemiol 1985;121(2):182-205

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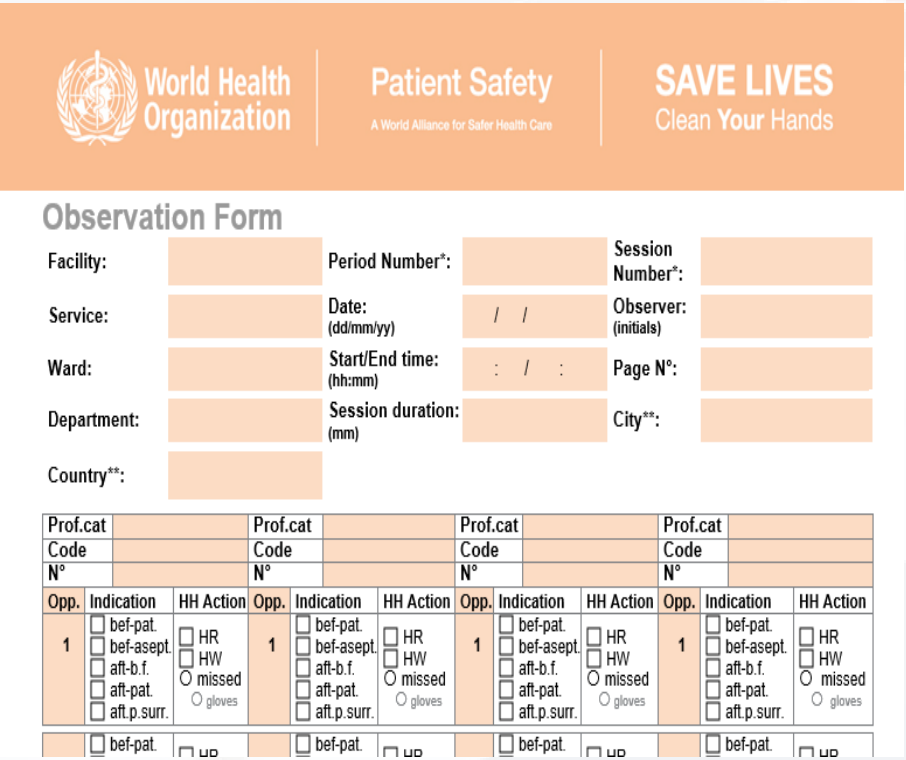
Why this survey

There exist indicators promoted by international agencies



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Observation Form

Facility:		Period Number*:		Session Number*:	
Service:		Date: (dd/mm/yy)	/ /	Observer: (initials)	
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World Health Organization

$$\text{Compliance (\%)} = \frac{\text{Actions}}{\text{Opportunities}} \text{ x } 100$$

http://www.who.int/infection-prevention/tools/hand-hygiene/en/

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Why this survey

There exist indicators promoted by international agencies

4. Indicators to be produced at the European level on the occurrence and characteristics of SSIs

For each procedure under surveillance and for each level of the NHSN risk index, the EU database will produce the rates of SSIs (superficial, deep, organ-space, total), as a percentage of the number of interventions and as an incidence density (number of SSI with onset before hospital discharge per 1 000 patient days in the hospital).

4.1 Percentage of SSIs by category

The first indicator (% SSIs) gives the most complete picture for a given operative procedure, but is highly dependent on the intensity of post-discharge surveillance, which varies considerably between hospitals and between countries.

Percentage of SSIs (by category) = $\frac{\text{all first SSIs* in that category x 100}}{\text{all operations in that category}}$

**SSIs are included, if {DateOfOnset}−{DateOfOperation}+1 ≤31 or ≤91 days if implant is in place.*

4.2 Percentage of SSIs excluding post-discharge diagnosed SSIs

The second indicator only considers infections detected in the hospital (post-discharge diagnosed SSIs are excluded). It corrects differences between in post-discharge surveillance between hospitals and countries, but provides an incomplete epidemiological picture and is not adjusted for differences in length of post-operative stay.

Percentage of SSIs excluding post-discarge (by category) = $\frac{\text{all first in-hospital SSIs* in that category x 100}}{\text{all operations with known discharge date in that category}}$

**SSIs are included, if {DateOfOnset}−{DateOfOperation}+1 ≤31 or ≤91 days if implant is in place and DateOfOnset < DateOfHospitalDischarge.*

Step 1. Delete/exclude all operations (with or without SSI) where DateOfHospitalDischarge is unknown.

Step 2. Exclude from numerator (not from denominator!) all SSIs where DateOfOnset > DateOfHospitalDischarge (= consider these records as having no SSI).

Step 3. Apply 30d/90d rule on (in-hospital) SSIs.

4.3 Incidence density of in-hospital SSIs

The third indicator (number of in-hospital SSIs/1 000 patient-days in the hospital) only considers infections detected in the hospital and therefore it does not reflect the complete epidemiological picture, e.g. in procedures with short post-operative hospital stay. However, it is independent of post-discharge surveillance and corrects for differences in post-operative hospital stay, and therefore this indicator may be more reliable for inter-hospital or inter-network comparisons.

Incidence density in-hospital SSIs (by category) = $\frac{\text{all in-hospital SSIs* in that category x 1 000}}{\text{In-hospital postoperative patient days with known discharge date in that category}}$

3.3 Structure and process indicators for SSI prevention

SSI protocol

Two PAP indicators have been added to the SSI protocol:

- **administration of PAP within 60 minutes before incision** (except when administering vancomycin and fluoroquinolones)
- **discontinuation of PAP within 24 hours after initiation of surgery.**

Both of these SPIs are based on the ECDC systematic review and evidence-based guidance on perioperative antibiotic prophylaxis [12]. Adhering to optimal timing for preoperative prophylaxis as well as avoiding the prolongation of prophylaxis are also strong recommendations in the WHO Global Guidelines for the Prevention of Surgical Site Infection supported by a moderate quality of evidence [13]. They are also included in the WHO safe surgery checklist, and supported by the Society of Healthcare Epidemiology of America/Infectious Diseases Society of America (SHEA/IDSA) practice recommendation for prevention of SSIs [14,15,16]. Data for both indicators should be collected from the review of the patient charts or checklists.

For the first PAP indicator, the compliance with the administration within 60 minutes before incision will be assessed for all surgical procedures where PAP was indicated (according to the local protocol) and administered:

$$\frac{\text{Number of PAP administered within 60 minutes before incision}}{\text{Number of all surgical procedures where PAP was indicated and administered}}$$

For the second PAP indicator the compliance with the discontinuation of PAP within 24 hours after initiation of surgery will be assessed for all surgical procedures where PAP was indicated (according to the local protocol) and administered:

$$\frac{\text{Number of PAP discontinued within 24 hours after initiation of surgery}}{\text{Number of all surgical procedures where PAP was indicated and administered}}$$

3.3.2.2 Preoperative skin preparation

The following preoperative skin preparation indicators have been added to the protocol:

- **No hair removal,** or if hair removal was necessary, only clipping.
- **Use of alcohol-based antiseptic solutions based on Chlorhexidine gluconate (CHG) for surgical site skin preparation** in the operating room (OR) (if no patient contraindication exists).

Moderate evidence is presented both in the WHO Global Guidelines for the Prevention of Surgical Site Infection and in the SHEA/IDSA practice recommendation for prevention of SSIs for no hair removal, with a strong recommendation in the WHO Guidelines [13,14,15]. Furthermore, moderate or moderate to low evidence is also backing the alcohol-based antiseptic solutions based on CHG preoperative skin antisepsis in the SHEA/IDSA practice recommendation as well as the WHO Guidelines [13, 14,15]. The abovementioned indicator for alcohol-based skin antisepsis includes all alcohol-based skin antisepsis solutions based on CHG used in the OR prior to the incision but does not include other skin antisepsis performed before the entry to the OR. Data for both SPIs should be collected by observation or from the review of the patient charts, even if included in the local protocol or standard operating procedure. In case of hair removal, patient's possible self-shaving performed at home is recommended to be recorded as a non-compliant observation.

The compliance with no hair removal (or if hair removal was necessary, only clipping) will be assessed for all surgeries in the selected operation type:

$$\frac{\text{Number of surgical procedures with no hair removal, or only clipping}}{\text{Number of all surgical procedures in the procedure type}}$$

https://ecdc.europa.eu/sites/portal/files/documents/HAI-Net-SSI-protocol-v2.2.pdf

ecdc EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

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HAI in ICU protocol

ecdc
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Indicator	Definition
Bloodstream infection (BSI)	
Incidence density of healthcare-associated BSI in the ICU	# BSI (of all origin) >D2*1000/n of patient-days
Pathogen-specific BSI incidence rate	# BSI (of all origin, by pathogen) >D2*1000/n of patient-days
Standardised BSI ratio	Observed n of patients with BSI/Expected n of patients with bloodstream infection
Stratification of device-adjusted infection rates	Infection rates by ICU type Infection rates by risk factors
Pneumonia	
Incidence density of healthcare-associated pneumonia (clinical + microbiologically confirmed) in the ICU	# pneumonia (of all origin) >D2*1000/n of patient-days
% microbiologically confirmed pneumonia	# PN with microbiologically documentation by semi-quantitative (BAL,PB…) or quantitative culture of endotracheal aspirate/total PN
Pathogen-specific pneumonia incidence rate	# pneumonia (of all origin, by pathogen) >D2*1000/n of patient-days
Intubator-associated pneumonia rate in the ICU	# device-associated pneumonia*1000/n of intubation days
Standardised pneumonia ratio	Observed n of patients with pneumonia/Expected n of patients with pneumonia
Stratification of infection rates	Infection rates by ICU type Infection rates by risk factors

Indicator	Definition
Urinary tract infection	
Incidence density of healthcare-associated UTI in the ICU	# UTI >D2*1000/n of patient-days
Pathogen-specific UTI incidence rate	# UTI (of all origin, by pathogen) >D2*1000/n of patient-days
Catheter-associated UTI rate in the ICU	# device-associated UTI*1000/n of urinary catheter days
Stratification of infection rates	Infection rates by risk factors
Catheter infection	
Incidence density of catheter infections in the ICU	# catheter-associated infections*1000/n of central line days (catheter-total)
Antimicrobial use in the ICU	
Antimicrobial treatment utilisation rate	N of antibiotic treatment days/N of patient-days
Ratio documented treatment/empiric treatment	N of documented AB treatment days/N of empiric AB treatment days
Stratified AM use	N of antibiotic treatment days/N of patient-days by risk factors
Device use in the ICU	
Central line utilisation rate	N of central line days/N of patient-days
Intubation utilisation rate	N of days with intubation/N of patient-days
Urinary catheter utilisation rate	N of urinary catheter days/N of patient-days

https://www.ecdc.europa.eu/sites/portal/files/documents/HAI-Net-ICU-protocol-v2.2_0.pdf

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Survey aims

- There are few data about indicators adopted by European countries about HAI prevention and control
- To provide a picture of the state of the art about use of IPC indicators with the perspective of scientific and professional societies

Question:

How many and which indicators on HAI are in use in European countries?

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Survey timeline

31/05/2017
EUNETIPS Spring meeting: decision to conduct a survey on existing quality IPC indicators

15/11/2017
First pilot survey

07/12/2017
EUNETIPS Winter meeting: approval of the survey 2nd draft

20/02/2018
Second pilot survey among few members

12/08/2018
survey launch

28/09/2018
survey ending

15/10/2018
data analysis completed

How the survey has been conducted

- Developed and collected with the software *Google forms®*, analysed in *MS excel 365®* and *SPSS 21®*,
- Filled in by the national scientific society representatives

How the survey has been conducted

- **Indicators included** in the study:
  - Mandatory or recommended
  - By national governments, agencies, institutions, etc.
  - Currently collected

- **Indicators excluded** from the study:
  - Adopted by single hospitals, institutions, trusts, counties, regions
  - Suggested but not collected on routine basis
  - (lists of) indicators emerging from reviews or consensus

How the survey has been conducted

- 2 sections:
  - Section A collects general national data. Filled in once for each Country
  - Section B collects details of each indicator in use (if existing). Filled in once for each indicator

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Section A

Explores the past, present and future (planned) adoption of national indicators

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Country *

Your answer

In 2018, are there in place mandatory/recommended indicators for infection prevention and control at a national level? *

- Yes
- No
- I don't know
- Other:

If "Yes": how many mandatory/recommended indicators for infection prevention and control at a national level are in use?
After finishing "SECTION A", please fill in "SECTION B" form, once for each indicator

Your answer

Has any indicator, previously used, been removed in the last five years? *

- Yes
- No

If Yes, could you specify something about them?
Fill the answer for each removed indicator (e.g.: Indicator 1 was measuring ... the numerator was .... the denominator was .... it was removed because ... ; Indicator 2 was measuring ... the numerator was .... the denominator was .... it was removed because ... ; Indicator 3 was measuring ... the numerator was .... the denominator was .... it was removed because ...)

Your answer

Is there a plan for the introduction of new indicators for 2018? *

- Yes
- No

If Yes, could you please tell us something more about the plan for the introduction of new indicators for 2018?

Your answer

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Section B

Specification of adopted indicators

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Country

Your answer

Indicator name/definition *

Your answer

Indicator details: Numerator *

Your answer

Indicator details: Denominator *

Your answer

Indicator details: Unit of measurement/type of standardisation

Your answer

Is the indicator mandatory or recommended?

- Mandatory
- Recommended

The indicator is mandatory/recommended:

- by national law
- by national plans
- by national accreditation schemes
- Other:

Is there any consequence for producing or not the indicator?

- Yes: penalties
- Yes: rewards
- No
- I don't know
- Other:

Please, specify penalties/rewards/other:

Your answer

Data source:

- Clinical records
- Administrative data
- Ad hoc surveys
- Official acts/Declarations from CEO
- Other:

Data are collected:

- Monthly
- Quarterly
- Twice a year
- Yearly
- Other:

Is the indicator available on a website? If yes, please insert the link:

Your answer

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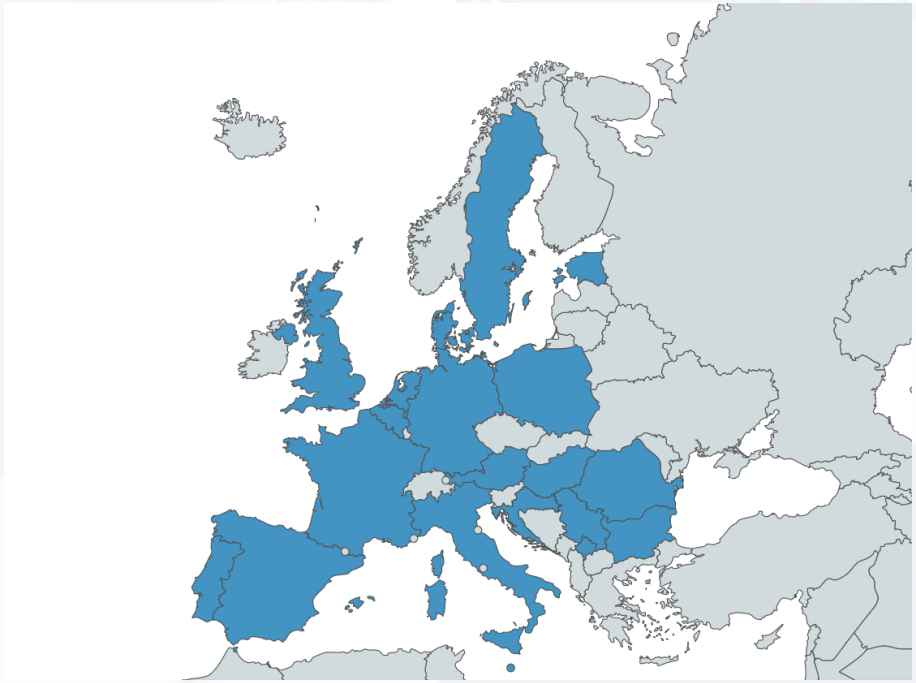
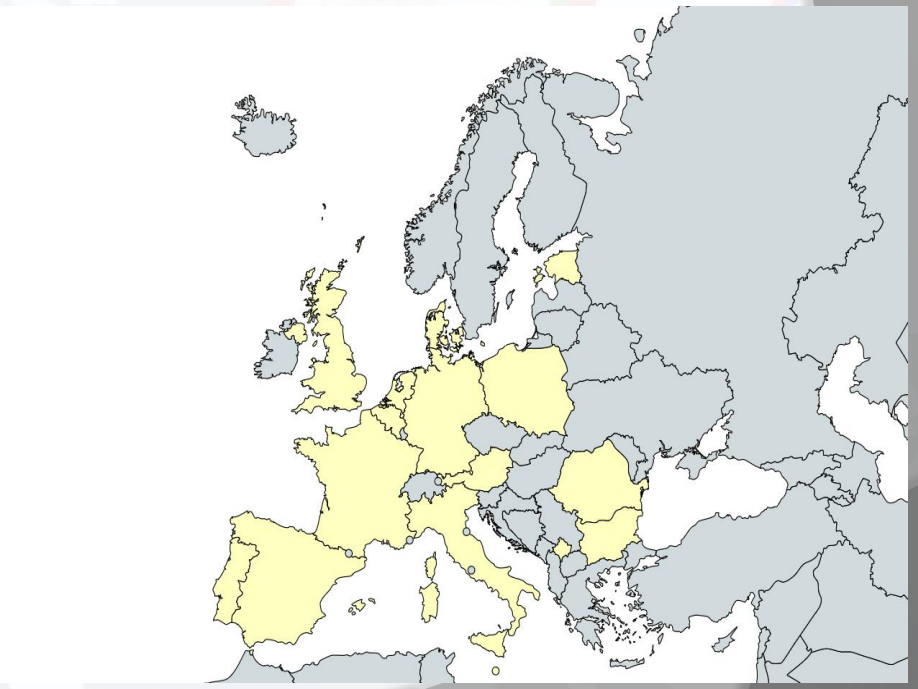
Results:

- 80.0% answers from EUNETIPS countries (16/20) represented in the network at the time of the survey launch



EUNETIPS countries



Responding countries

Results – presence of adopted indicators

- 12 (75%) countries: at least one national indicator:
  - 2 countries stopped at least one indicator in the last five years
  - 4 countries are planning to start the data collection of at least one new indicator during 2018
- 4 (25%) countries: no national indicator in use:
  - neither removal in the last five years nor planning of introduction during 2018

N. of countries	N. of indicators
1	17
1	9
1	8
1	7
1	6
4	2
3	1
4	0

Results

58 indicators from 12 countries

- 30 (51.7%) mandatory
  - 21 by national laws
  - 9 by national plans

- 28 (48.3%) recommended
  - 9 by national laws
  - 2 by national plans
  - 1 national accreditation
  - 16 by specific protocol funded by National Health Institution

Results

Indicator categorisation n. 58

Category	Mandatory n. 30	Recommended n. 28	Total
HAI surveillance	18 (90.0%)	2 (10.0%)	**20**
Compliance to bundle/IPC activities	0 -	15 (100.0%)	**15**
Surveillance of infections caused by a specific pathogen	7 (70.0%)	3 (30.0%)	**10**
Hand Hygiene	3 (50.0%)	3 (50.0%)	**6**
IC team	2 (40.0%)	3 (60.0%)	**5**
Antibiotic use/consumption	0 -	2 (100.0%)	**2**

Results

Indicators for the HAI surveillance category stratified for mandatory/recommended

HAI	Mandatory	Recommended	Total
SSI all	3	1	**4**
BSI-catheter related	2	1	**3**
BSI all	2	0	**2**
HAI all	2	0	**2**
Pneumoniae	2	0	**2**
UTI	2	0	**2**
GI	1	0	**1**
Sepsis	1	0	**1**
SSI-orthopedic	1	0	**1**
UTI-catheter related	1	0	**1**
VAP in ICU	1	0	**1**
Total	**18**	**2**	**20**

SSI: surgical site infections, BSI: bloodstream infections, UTI: urinary tract infections, GI: gastointestinal infections, VAP: ventilatory associated pneumonia; ICU: intensive care unit

Results

For the mandatory ones (n. 30):

- 2 are related to some kind of rewards
  - 1 incentives
  - 1 not specified
- 3 are related to penalties
  - 2 financial penalties
  - 1 not specified
- 7 part of accreditation system evaluation

For the recommended ones (n. 28):

- 9 are related to some kind of rewards
- 1 part of accreditation system evaluation

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Results

The 63.8 % (37/58) of indicators are collected yearly, the 15.5% (9/58) twice a year, the 12,1% (7/58) monthly

	Yearly	Twice a year	Monthly	Other	Missing	Total
HAI surveillance	16 (80.0%)	0 -	1 (5.0%)	3 (15.0%)	0	**20**
Compliance to IPC activities or bundle	11 (73.3%)	3 (20.0%)	0 -	0 -	1 (6.7%)	**15**
Surveillance of infections caused by a specific pathogen	1 (10.0%)	3 (30.0%)	6 (30.0%)	0 -	0 -	**10**
Hand Hygiene	4 (66.7%)	1 (16.7%)	0	1 (16.7%)	0	**6**
IC team	4 (80.0%)	1 (20.0%)	0	0	0	**5**
Antibiotic use/consumption	1 (50.0%)	1 (50.0%)	0	0	0	**2**
Total	**37 (63.8%)**	**9 (15.5%)**	**7 (12.1%)**	**4 (6.9%)**	**1 (1.7%)**	**58**

Availability: 77,6% (45/58) on-line reports

Results

Presence of at least one indicator of a specific category in the 12 countries

Category	Countries n. 12
HAI surveillance	8 (66.7%)
Hand Hygiene	5 (41.7%)
Compliance to IPC activities or bundle	3 (25.0%)
IC team	3 (25.0%)
Surveillance of infections caused by a specific pathogen	2 (16.7%)
Antibiotic use/consumption	2 (16.7%)

Results

Data source

Category	Administrative data	Data from clinical records/ad hoc survey	Other	Missing data	Total
HAI surveillance	1 (5.0%)	12 (60.0%)	6 (30.0%)	1 (5.0%)	**20**
Compliance to IPC activities or bundle	0	15 (100.0%)	0	0	**15**
Surveillance of infections caused by a specific pathogen	1 (10.0%)	9 (90.0%)	0 -	0	**10**
Hand Hygiene	2 (33.3%)	2 (33.3%)	1 (16.7%)	1 (16.7%)	**6**
IC team	2 (40.0%)	3 (60.0%)	0 -	0	**5**
Antibiotic use/consumption	0	2 (50.0%)	0 -	0	**2**
Total	**6 (10.3%)**	**43 (74.1%)**	**7 (12.1%)**	**2 (3.4%)**	**58**

Results

Surveillance of infections caused by a specific pathogen category n. 10:

Pathogen	Mandatory	Recommended	Total
C. difficile	2	0	**2**
K. pneumoniae	1	1	**2**
MRSA	1	1	**2**
CRE	0	1	**1**
E. coli	1	0	**1**
P. aeruginosa	1	0	**1**
MSSA	1	0	**1**
Total	**7**	**3**	**10**

MRSA: Methicillin-resistant *Staphylococcus aureus*;
CRE: Carbapenem-resistant Enterobacteriaceae;
MSSA: Methicillin-sensitive *Staphylococcus aureus*

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Results

Hand hygiene category n. 6

	Mandatory	Recommended	**Total**
Percentage: Used litres of alcohol based handrub/litres of alcohol handrub estimate	1	0	**1**
Compliance WHO actions/opportunities	1	0	**1**
Not specified	1	0	**1**
Compliance: first WHO moment actions/ first WHO opportunities	0	1	**1**
Consumption in litres x 1,000 patient-days in ICU	0	1	**1**
Consumption in litres x 1,000 patient-days in wards	0	1	**1**
Total	**3**	**3**	**6**

Indicators (n. 15) for the category "Compliance to IPC activities or bundle" are all different and only recommended and provided only from 3 Countries

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Conclusions 1

- 75% of respondent countries (12/16) collect at least one national IPC indicator in 2018
- Countries with no indicators in use in 2018, have no plans to introduce them and no evidence of use in the past five years

Conclusions 2

- The mostly adopted indicators are related to HAI surveillance (66.6%) and hand hygiene (41.7%).

- Many indicators to measure the same issues but:
  - use of different numerators/denominators (i.e. for hand hygiene)
  - measurement of a non-homogeneous topics (i.e. for HAI surveillance)

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Future development

- The possibility in the future to extend the survey to other European countries

- Need to introduce in all the European countries indicators, built with the same methodology, for comparing data easily and effectively and starting from the available ones like:
  - Healthcare-Associated Infections Surveillance Network (HAI-Net) of the ECDC that includes surveillance programmes about:
    - *C. difficile* infections
    - HAI in acute hospital and LTCF
    - HAI in ICU
    - SSI
  - Hand hygiene tools provided by WHO

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Future development

- Promote the adoption of some shared indicators for antimicrobial consumption
  - According to the "European Council recommendations 2009/C 151/01 of June 9th 2009 "on patient safety, including the prevention and control of healthcare-associated infections" also

- Data from surveys promoted by scientific and professional societies can be important:
  - to provide a complete picture of the state of the art about HAI prevention and Control in Europe
  - To motivate professionals in promoting the use of indicators
  - To increase the awareness at national and local level about the state of the art of HAI prevention and control activities.

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Thank you for your attention

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