



## 3. QUALITY OF CARE: SAFETY

### 3.1. Prevalence of healthcare-associated infections (QS-1)

#### 3.1.1. Documentation sheet

<b>Description</b>	Proportion of patients with at least one healthcare-associated infections (HAI) on any day in acute care hospitals.
<b>Calculation</b>	The prevalence of HAIs was reported as the Proportion of patients with at least one HAI over the total number of patients, based upon a point prevalence survey (PPS).
<b>Rationale</b>	Healthcare-associated infections represent a threat (burden) to the safety of patients (morbidity, mortality, length of stay, treatment costs).
<b>Primary data source</b>	Sciensano, Service healthcare-associated infections & antimicrobial resistance ( <a href="http://www.nsih.be">www.nsih.be</a> ); in collaboration with ECDC
<b>Source of results</b>	2011 Point Prevalence Survey: European Centre for Disease Prevention and Control (ECDC) <sup>1</sup> 2017 Point Prevalence Survey: Vandael et al., 2018 <sup>2</sup>
<b>Technical definitions</b>	An active infection was defined as healthcare-associated (associated with acute care hospital stay only) when: <ol style="list-style-type: none"> <li>1. The onset of the signs and symptoms was on Day 3 of the current admission or later (with Day 1 being the day of admission); OR</li> <li>2. The signs and symptoms were present on admission or became apparent before Day 3, but the patient had been discharged from an acute care hospital less than two days before admission; OR</li> <li>3. The signs and symptoms of an active surgical site infection were present on admission or started before Day 3, and the surgical site infection occurred within 30 days of a surgical intervention (or in the case of surgery involving an implant, a deep or organ/space surgical site infection that developed within a year of the intervention); OR</li> <li>4. The signs and symptoms of a <i>Clostridium difficile</i> infection were present on admission or started before Day 3, with the patient having been discharged from an acute care hospital less than 28 days before the current admission.</li> </ol>
<b>International comparability</b>	Yes: the PPS is conducted by different EU member states in collaboration with ECDC, following a standardised protocol.
<b>Limitation</b>	Limited periodicity; so far only two point prevalence surveys have been conducted.
<b>Dimensions</b>	Quality (safety)
<b>Related indicators</b>	Incidence of post-operative sepsis; Incidence of hospital-acquired MRSA (methicillin resistant <i>Staphylococcus aureus</i> ) infections



### 3.1.1. Results

#### Belgium

In total, 47 Belgian acute care hospital sites (33 mergers, participation rate 32.4%) participated in the ECDC PPS 2017. In these hospitals, 11 800 patients were included.

In the ECDC PPS 2017, 911 HAIs were registered. The crude prevalence of having at least one HAI was 7.3% (95% CI 6.8-7.7%). This is a status quo in comparison with the Belgian results of the ECDC PPS 2011 (7.1%, 95% CI 6.1-8.3)<sup>1</sup>.

The HAI prevalence ranged from 0.0% to 18.1% in the participating hospitals. In total, 856 patients (mean age 66.4 years  $\pm$ 20.7, 51.5% male) had at least one HAI (patients  $\geq$ 65 years: 8.6% (95% CI 7.9-9.3%), <65 years: 5.7% (95% CI 5.1-6.3%)). In 53 (6.2%) patients, two HAIs were detected, and 1 patient (0.1%) had three HAIs.

The most frequently registered HAIs were pneumonia (N=197, 21.6%), urinary tract infections (N=194, 21.3%), surgical site infections (N=154, 16.9%), blood stream infections (N=105, 11.5%) and gastro-intestinal infections (N=87, 9.6%; including 30 (3.3%) with *Clostridium difficile*). One-fifth of the HAIs (N=190, 20.9%) was linked to an invasive device. Most of the HAIs were linked to the current hospital (N=810, 88.9%) and the current ward (N=617, 67.7%).

Overall 721 microorganisms were reported. The top 10 most commonly isolated microorganisms were *Escherichia coli* (N=162, 17.8%), *Staphylococcus aureus* (N=81, 8.9%), *Pseudomonas aeruginosa* (N=47, 5.2%), *Enterococcus faecalis* (N=44, 4.8%), *Klebsiella pneumoniae* (N=38, 4.2%), *Enterobacter cloacae* (N=38, 4.2%), *Staphylococcus epidermidis* (N=37, 4.1%), *Clostridium difficile* (N=30, 3.3%), *Proteus mirabilis* (N=20, 2.2%), and *Candida albicans* (N=19, 2.1%).

#### Regional coverage

No information available.

#### International comparisons

In total, 1735 hospitals from 28 EU/EEA countries and one EU candidate country (Serbia) participated in the ECDC PPS of HAI and antimicrobial use in European acute care hospitals in the period 2016 to 2017<sup>3</sup>. However, it is important to note that the comparability of HAI prevalence percentages between European countries needs to be improved. Before making comparisons between countries in HAI prevalence, including case-mix adjusted prevalence, considerable efforts should be taken to harmonise the interpretation of case definitions, validate results and enhance diagnostic capacity in many EU/EEA Member States. Direct comparison of HAI prevalence percentages between countries were not an objective of the ECDC PPS.

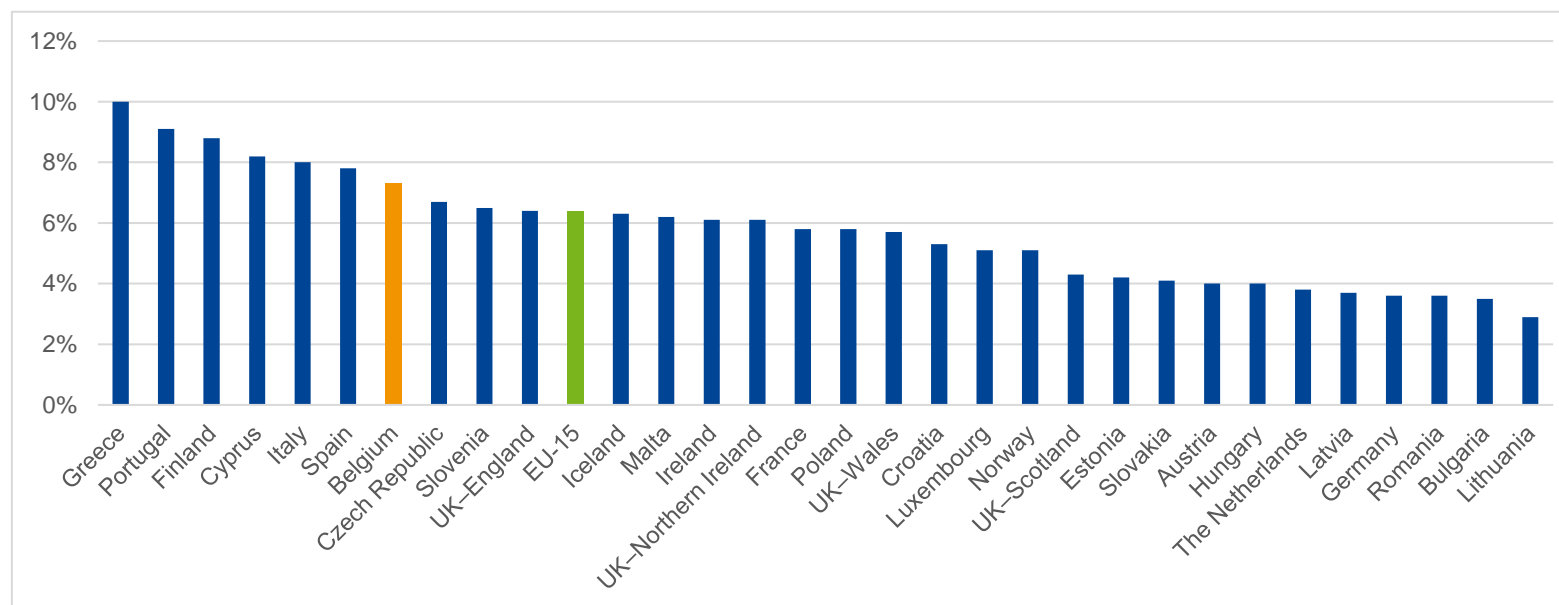
The prevalence of HAIs is known to be influenced by a variety of factors such as the type of hospital and healthcare system, the severity of the patient case mix (co-morbidities), methodological differences such as different interpretations of the case definitions for HAIs, differences in availability of diagnostic tests, differences in the level of training and skills of healthcare workers (surveillance, hand hygiene compliance, antimicrobial stewardship, bundle care...) applying the definitions and differences in reporting behaviour between hospitals and between countries. The latter are largely determined by possible legal or financial incentives or disincentives for reporting HAIs. Some of these determinants were included in the protocol and were used to interpret the observed HAI prevalence results, but others were not measured in the PPS and therefore their influence could not be assessed.

Comparing crude prevalence percentages of HAI between countries without taking into account differences in case mix, representativeness and confidence intervals and differences in sensitivity and specificity is therefore not meaningful. Representativeness of the PPS data by country are evaluated based on compliance with the recommended sampling methodology of hospitals and sample size. In the ECDC PPS 2017, counting UK administrations separately, the country representativeness of the sample was optimal in 20 countries, good in 10, and poor in 2 countries (Bulgaria and the Netherlands).



Figure 36 compares the estimates obtained in the 31 EU/EEA countries. The prevalence of patients with at least one HAI ranged from 2.9% in Lithuania to 10.0% in Greece. The HAI prevalence in the EU-15 (excluding Denmark and Sweden) was 6.4%. The prevalence of patients with HAIs in Belgium was 7.3% (95% CI 6.4–8.3%), thus higher than the European mean estimates.

**Figure 36 – Prevalence of healthcare-associated infections in European acute care hospitals, 2016–2017**



Source: Suetens et al., 2018<sup>3</sup>



## Discussion

After adjusting for case-mix, Belgium has a higher than expected HAI prevalence, implying progress remains to be made with HAI prevention. Care-bundles have recently been introduced for specific HAI such as VAP (Ventilator Associated Pneumonia). Attention also has been given to the safe surgery list and an audit has been performed by BAPCOC (Belgian Antibiotic Policy Coordination Committee) on surgical prophylaxis on a voluntary basis. Annual national hand hygiene campaigns show continuous improvements of both basic requirements and compliance.<sup>4</sup> Finally, a multidrug resistant organisms (MDRO) task force has been set up to enhance infection prevention and control in the near future. Emphasis is given among others on microbiological and epidemiological surveillances, antimicrobial consumption improvement, and outbreak support (MDRO protocol, Belgisch Staatsblad – Moniteur belge 21-11-2013, p 86540-86545).

## Key points

- **The prevalence of patients with at least one healthcare-associated infection on any given day in 2017 was estimated at 7.3% (95% CI 6.8-7.7%). This is a status quo in comparison with the Belgian results of the ECDC PPS 2011 (7.1%, 95% CI 6.1-8.3).**
- **The three most frequently registered healthcare-associated infections were pneumonia (22%), urinary tract infections (21%), and surgical site infections (17%).**
- **The three most frequently reported microorganisms from healthcare-associated infections were *Escherichia coli* (18%), *Staphylococcus aureus* (9%) and *Pseudomonas aeruginosa* (5%).**
- **The prevalence of patients with healthcare-associated infections in Belgium was higher than the EU-15 mean estimate of 6.4%.**
- **Progress remains to be made with healthcare-associated infections prevention.**

## References

1. European Centre for Disease Prevention and Control. Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals. 2011-2012. Stockholm, 2015. Available from: <https://www.ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/healthcare-associated-infections-antimicrobial-use-PPS.pdf>
2. Vandael E, Catry B, Latour K. Point Prevalence Study of healthcare-associated infections and antimicrobial use in Belgian acute care hospitals: Results of the ECDC PPS 2017. Brussels, Belgium: Sciensano; 2018. 34p. Report Number: D/2018/14.440/37. Available from: <http://www.nsih.be/>
3. Suetens C, Latour K, Kärki T, Ricchizzi E, Kinross P, Moro ML, Jans B, Hopkins S, Hansen S, Lyytikäinen O, Reilly J, Deptula A, Zingg W, Plachouras D, Monnet DL, The Healthcare-Associated Infections Prevalence Study Group. Prevalence of healthcare-associated infections, estimated incidence and composite antimicrobial resistance index in acute care hospitals and long-term care facilities: results from two European point prevalence surveys, 2016 to 2017. Euro Surveill. 2018;23(46). <https://doi.org/10.2807/1560-7917.ES.2018.23.46.1800516>.
4. De Pauw H, Uwineza A, Benhammadi N, Catry B. Resultaten van de 7de nationale campagne ter bevordering van de handhygiëne in ziekenhuizen. Brussels, Belgium: Wetenschappelijk Instituut Volksgezondheid; 2018. 49p. Available from: [http://www.nsih.be/surv\\_hh/download/WIV-ISP%20Resultaten%20Nationaal%20HH%202016-2017.pdf](http://www.nsih.be/surv_hh/download/WIV-ISP%20Resultaten%20Nationaal%20HH%202016-2017.pdf)