

1.1. Prevalence of healthcare-associated infections (QS-1)

1.1.1. Documentation sheet

Description	Proportion of patients with at least one healthcare-associated infections (HAI) on a given day in acute care hospitals.
Calculation	The prevalence of HAIs was reported as the Proportion of patients with at least one HAI over the total number of eligible patients, based upon a point prevalence survey (PPS).
Rationale	Healthcare-associated infections represent a threat (burden) to the safety of patients (morbidity, mortality, length of stay, treatment costs).
Primary data source	Sciensano, Service healthcare-associated infections & antimicrobial resistance (https://www.sciensano.be/nl/over-sciensano/organigram-van-sciensano/zorginfecties-en-antibioticaresistentie); in collaboration with ECDC
Source of results	https://www.sciensano.be/nl/projecten/puntprevalentiestudie-van-zorginfecties-en-antimicrobieel-gebruik-acute-ziekenhuizen 2011 Point Prevalence Survey: European Centre for Disease Prevention and Control (ECDC) ¹ 2017 Point Prevalence Survey: Vandael et al., 2018 ² 2022 Point Prevalence Survey: Catteau et al., 2024 ³
Technical definitions	<p>An active healthcare-associated infection (associated to acute care hospital stay) present on the day of the survey is defined as follows:</p> <ol style="list-style-type: none"> 1. An infection is active when signs and symptoms of the infection are present on the survey date <i>or</i> signs and symptoms were present in the past and the patient is (still) receiving treatment for that infection on the survey date. The presence of symptoms and signs should be verified until the start of the treatment in order to determine whether the treated infection matches one of the case definitions of healthcare-associated infection. <p>AND</p> <ol style="list-style-type: none"> 2. The onset of symptoms was on Day 3 or later (day of admission = Day 1) of the current admission <i>or</i> the patient presents with an infection but has been readmitted less than 48 hours after a previous discharge or transfer from a healthcare facility; <i>or</i> 3. The patient has been admitted (or develops symptoms within two days) with an infection that meets the case definition of an active surgical site infection (SSI), i.e. the SSI occurred within 30 days of the operation (or in the case of surgery involving an implant, was a deep or organ/space SSI that developed within 90 days of the operation) and the patient either has symptoms that meet the case definition and/or is on antimicrobial treatment for that infection; <i>or</i> 4. The patient has been admitted (or develops symptoms within two days) with <i>C. difficile</i> infection less than 28 days after a previous discharge or transfer from a healthcare facility; <i>or</i> 5. An invasive device was placed on Day 1 or Day 2, resulting in an HAI before Day 3; <i>or</i>



	6. Onset of symptoms on Day 1 or Day 2 in a newborn; or 7. The patient was diagnosed with COVID-19 and the onset of symptoms (or first positive test if asymptomatic) was on Day 3 or later (day of admission = Day 1) of the current admission or the patient has COVID-19 on admission (or onset before Day 3) and was (re-)admitted less than 48 hours after a stay of more than 7 days in the same or another healthcare facility (see notes).
International comparability	Yes: the PPS is conducted by different EU member states in collaboration with ECDC, following a standardised protocol.
Limitation	Limited periodicity; so far only three point prevalence surveys have been conducted.
Dimensions	Quality (safety)
Related indicators	Incidence of post-operative sepsis; Incidence of hospital-acquired MRSA (methicillin resistant <i>Staphylococcus aureus</i>) infections
Reviewer	Katrien Latour, Service healthcare-associated infections & antimicrobial resistance, Sciensano

1.1.2. Results

Belgium

In total, 56 Belgian acute care hospital sites (35 mergers, participation rate 34.3%) participated in the ECDC PPS 2022. In these hospitals, 10 142 patients were included.

Following the revised protocol introduced in 2022, which included the addition of HAI codes for COVID-19 and the designation of HAIs originating from long-term care facilities (LTCFs), a total of 1,029 HAIs were recorded in 937 patients. The crude prevalence of having at least one HAI was 9.2% (95% CI 8.7-9.8%). When excluding HAIs originating from long-term care facilities (not included in the 2017 ECDC-PPS), the prevalence slightly dropped to 8.5% (95% CI: 7.5% to 9.5%). This is higher than the Belgian results of the ECDC PPS 2017 (7.3%, 95% 6.8-7.7%)² and 2011 (7.1%, 95% CI 6.1-8.3)¹.

The HAI prevalence ranged from 1.7% to 24.9% in the participating hospitals. In total, 937 patients (mean age 67.2 years \pm 1.4, 45.9% male) had at least one HAI. In 84 (9.0%) patients, two HAIs were detected, and 4 patients (0.4%) had three HAIs.

The most frequently registered HAIs were pneumonia (N=225, 21.9%), urinary tract infections (N=190, 18.5%), surgical site infections (N=140,

13.6%), blood stream infections (N=126, 12.2%) and gastro-intestinal infections (N=93, 9.0%; including 29 (2.8%) infections with *Clostridioides difficile*). COVID-19 infections ranked as the 6th most prevalent HAI, with a frequency of 87 cases and a frequency of 8.5%. Approximately one-fifth of the HAIs (N=196, 20.7%) was linked to an invasive device. Most of the HAIs were linked to the current hospital (N=842, 81.8%) and the current ward (N=668, 64.9%). Out of 1,029 cases of HAI, 8.1% (83 cases) were identified as being acquired in LTCF, affecting a total of 78 patients (8.3% of all patients affected by HAI). The most commonly observed LTCF-associated HAIs were pneumonia (N=30, 36.1%), followed by UTIs (N=16, 19.3%) and BSIs (N=10, 12.0%).

Overall, 870 microorganisms were reported. The top 10 most commonly isolated microorganisms were *Escherichia coli* (N=146, 16.8%), *Staphylococcus aureus* (N=94, 10.8%), *Klebsiella pneumoniae* (N=89, 10.2%), SARS-CoV-2 (N=69, 7.9%), *Pseudomonas aeruginosa* (N=68, 7.8%), coagulase-negative staphylococci (N=49, 5.6%), *Enterococcus faecalis* (N=44, 5.0%), *Enterobacter spp* (N=42, 4.8%), *Candida spp* (N=36, 4.1%) and *Streptococcus spp* (N=36, 4.0%). *Clostridioides (Clostridium) difficile* (N=31, 3.6%) was the 11th most frequently isolated microorganism.

Regional coverage



No information available.

International comparisons

In 2022–2023, 28 EU/EEA countries and three Western Balkan countries (Kosovo, Montenegro and Serbia) participated in the third ECDC PPS of HAIs and antimicrobial use in European acute care hospitals⁴. 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. Data representativeness in the 2022–2023 PPS was optimal (representative sample and sample size achieved) in 14 (52%) countries and good (sample size achieved) in 11 (41%) countries. In three countries (Bulgaria, Latvia and the Netherlands), the number of hospitals or hospital

beds included in the PPS sample was too small to consider the samples as representative of the total hospital population in these countries.

The prevalence of patients with at least one HAI in the EU/EEA sample was 7.1% (country range: 3.1–13.8%). When extrapolated to the average daily number of occupied beds per country, the weighted HAI prevalence was 6.3% (cumulative 95% confidence interval [CI]: 5.3–7.4%). Correcting for results of national validation studies, the adjusted prevalence of patients with at least one HAI was estimated at 8.0% (95% confidence interval: 6.6–9.6%).

Discussion

After adjusting for case-mix, Belgium has a higher than expected HAI prevalence, implying progress remains to be made with HAI prevention. The high prevalence of HAIs in Belgian acute care hospitals, which significantly increased in 2022, warrants further investigation and is in line with other surveillance reports in Belgium. The limited number of FTEs dedicated to IPC and AMS in Belgian acute care hospitals should be a focal point in discussions about enhancing these programs. The Hospital Outbreak Support Teams (HOST) pilot projects were launched by the FOD Public Health in 2021, aim to strengthen infection prevention and control (IPC) and antimicrobial stewardship (AMS) teams in hospitals, and reinforce connections between hospitals, residential facilities, and front-line IPC and AMS players⁵. Currently, three evaluations are underway to assess the HOST, IPC and AMS programs in Belgium. These evaluations will provide recommendations, aligned with international standards, to improve program standards, funding, as well as internal and external reporting.



Key points

- The prevalence of patients with at least one healthcare-associated infection on any given day in 2022 was estimated at 9.2% (95% CI 8.7-9.8%). When excluding HAIs originating from long-term care facilities (not included in the 2017 ECDC-PPS), the prevalence slightly dropped to 8.5% (95% CI: 7.5% to 9.5%). This is higher than the Belgian results of the ECDC PPS 2017 (7.3%, 95% 6.8-7.7%) and 2011 (7.1%, 95% CI 6.1-8.3).
- The three most frequently registered healthcare-associated infections were pneumonia (22%), urinary tract infections (18%), and surgical site infections (14%).
- The three most frequently reported microorganisms from healthcare-associated infections were *Escherichia coli* (17%), *Staphylococcus aureus* (11%) and *Klebsiella pneumoniae* (10%).
- The prevalence of patients with healthcare-associated infections in Belgium was higher than the 7.1% (crude prevalence) found in all participating EU/EEA countries. Progress remains to be made with healthcare-associated infections prevention.

References

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