

The background of the entire page is a microscopic image showing numerous purple, spherical bacteria with a textured, almost crystalline surface. These bacteria are scattered across a blue, wavy, and textured background that resembles water or a gelatinous surface. The lighting creates highlights and shadows on the bacteria, giving them a three-dimensional appearance.

# State of Play for Belgium

## Healthcare-Associated Infections

A Joint Call: to shape future policy on patient safety and Healthcare-Associated Infection prevention and control.

**“Every infection prevented is an antibiotic treatment avoided. Prevention and control actions can save millions of lives every year”** – World Health Organisation [1]

# HAIs

are the most frequent adverse event during care delivery and a threat to patient safety

## DEFINITION

According to the World Health Organization, a Healthcare-Associated infection, also referred to as “nosocomial” or “hospital” infection, **is an infection occurring in a patient during the process of care in a hospital or in another healthcare facility, which was not present or incubating at the time of admission.** They also include infections acquired by patients in the hospital or facility but appearing after discharge. Occupationally, they also include infections among staff.<sup>1</sup>

## KEY FACTS<sup>3</sup>



HAIs are the most frequent adverse event during care delivery.

No country can yet claim to have solved the problem

Some can be treated easily, others have serious effects on patients health

Effects include:

- Prolonged stays in the hospital
- Long-term disability
- Increased resistance of microorganisms to antimicrobials
- Increased hospital costs for patients and the healthcare system

## PREVALENCE<sup>3</sup>

In the European Union

1/15

Patients have at least one HAI per given day

98.000

patients with at least one HAI per day in hospitals in Europe

In long-term care facilities

1/26

patients per day

130.000

Patients with at least one HAI / day

HAI alone causes more deaths in Europe than any other infectious disease under surveillance of the ECDC.

8,9 million HAIs

Are estimated to occur each year in European hospitals and long-term care facilities combined

# HAI IN BELGIUM<sup>4,5</sup>

Healthcare-Associated Infections are still a major health issue in Belgium

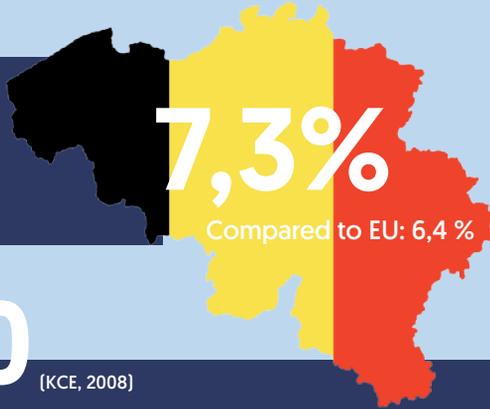
## KEY FACTS



Prevalence rate of patients infected in Belgian hospitals per day [KCE, 2017]

**7,3%**

Compared to EU: 6,4 %



**116,000**

[KCE, 2008]

Maximum estimate: patients per year that get affected in Belgium<sup>4\*</sup>

\*Under more realistic assumptions, being cumulative incidence lower than prevalence, the number of patients can be estimated at 103,000 per year.



**900,000**

[KCE, 2008]

Of the roughly 15 mil hospitalisation days in acute hospitals per year, 900.000 are associated with at least one nosocomial infection present that day.

Disclaimer: most data for HAIs in Belgium is outdated and dates back to 2018.

Prevalence data however is limited available from 2017: the prevalence of hospital-acquired infections (HAIs) in hospitalised patients is 7.3% in 2017 (similar to the 2011 results, 7.1%). This is higher than what would be expected based on the case mix of Belgian patients (compared to the case mix and results of European patients included in the European Centre for Disease and Control survey) and it is also above the EU average [6.4%]. Progress remains thus to be made in HAI prevention.<sup>5</sup>

By comparison, the point prevalence of care infections was 4,9 % in NL in 2018. [PREZIES, 2019]

## Where do HAIs occur? <sup>4,5,6</sup>

These are the most reported HAIs in Belgium

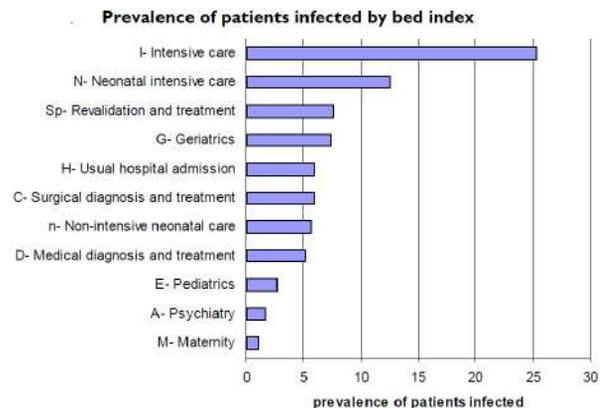
The most frequently reported HAIs (N=911) were pneumonia [21.6%], urinary tract infections [21.3%] and surgical site infections [16.9%].

Microbiological results were available for 62.0% of the HAIs. A total of 721 microorganisms were reported.

The most commonly isolated microorganism was Escherichia coli [17.8%].

In 2018, the mean incidence of HABSIs (Hospital-Associated Blood Stream Infections) was 8.6/10,000 patient-days (pd) hospital-wide and 29.2/10,000 pd for the BSI occurring two days or more after admission at the intensive care unit (ICU).

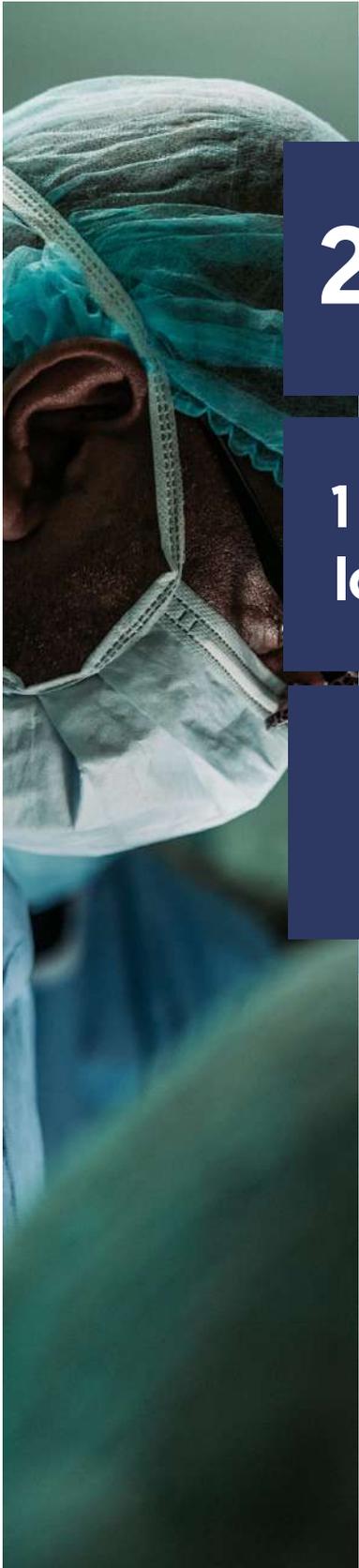
Central line-associated bloodstream infections (CLABSI) have a mean incidence per 10,000 pd (patient-days) of 2.0 (in 2018).



# EFFECTS of HAI<sup>4</sup>

HAIs result in human suffering, higher mortality, and economic burden

## Healthcare payer perspective



**2625**

Excess mortality in BE per year

**1 week longer**

Compared with the average patient, patients with a nosocomial infection stay one week longer in hospital compared with matched control patients.

**€ 400.000.000**

the excess cost for the healthcare payer per year

## Hospital perspective

It is clear that from a hospital perspective, resources will be saved (variable costs will be reduced) by preventing infections. However, it has been shown that the majority of the expenditures associated with hospital resources are fixed and difficult to avoid in the short term, e.g. infrastructure.

# AMR AND HAI<sup>8</sup>

## HAI is an important cause of antimicrobial resistance (AMR)

The challenge for the future will not be to try to prevent all infections, as some of them will remain unavoidable. Medical innovations will allow for an increased number of novel treatments that will compromise antibiotic materials, microorganisms will adapt to this new environment and enhance the risk for new HAIs. The challenge will be to prevent the occurrence of non-treatable microorganisms that would make unavoidable infections additionally untreatable.



**75%** of drug-resistant bacteria are due to HAIs



**1 in 3** bacteria associated with HAIs, both in hospitals and in long-term care facilities, was resistant to antibiotics



**19%** AMR will keep growing, with up to 19% of infections with AMR by 2030

# 50% OF HAIs<sup>2,9</sup>

Are considered to be preventable

## Multiple factors contribute to HAI

### Healthcare Related Factors include

- Use of invasive devices
- Surgical procedures
- Selection pressure from excessive antibiotic use

### Environmental Factors include

- Contaminated air-conditioning systems
- Physical layout of the facility

### Patient-Related Factors include

- Age
- Underlying diseases or conditions
- Antibiotic use

Most countries lack surveillance systems for healthcare-associated infections.

Those countries that do have systems, often struggle with the complexity and lack of standardized criteria for diagnosing the infections. International guidelines have been set up for a.o. Surgical Site Infections, by the WHO, but the lack and inconsistency regarding conversion to the national level. While there is an increasing body of evidence for various evidence-based interventions to reduce HAIs, they continue to be a problem and multi-drug resistant organisms (MDRO) rates continue to rise.

Before looking into the specific control measures that can contribute to HAI prevention, it is important to stress that HAIs don't follow the same transmission dynamics as classical infectious diseases and multidrug-resistant microorganisms.

As opposed to classical infections, HAIs due to antibiotic-resistant microorganisms do not present a defined incubation period, shedder or carrier time, nor follow the natural transmission routes (airborne or contact-droplet) as found in the textbooks. This is mainly due to the medical environment as well as novel medical interventions from infection sources and transmission ways that have not been described before (e.g. endoscopes, air-flow, new medical devices, structural merging of clinical departments).

# HOW?<sup>10,11</sup>

## Can we prevent these?

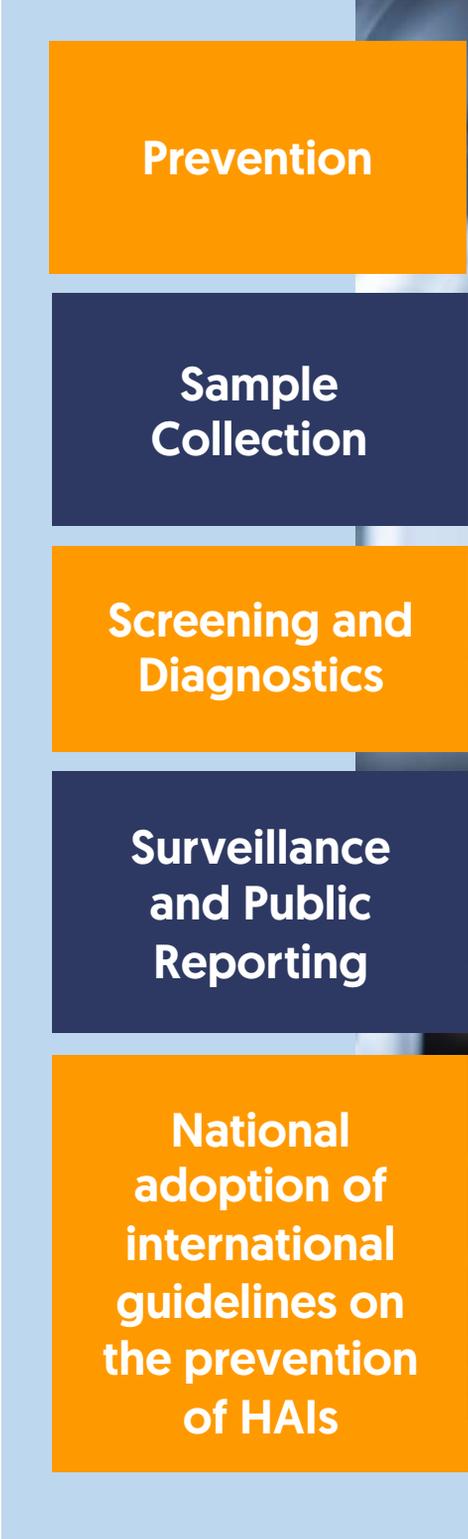
As the major preventive goal is to prevent infections and maintain optimal antimicrobial treatment, we consequently need to prevent all avoidable HCAI and keep the non-avoidable infections at least treatable.

The latter is possible through preventing the spread of MDRO as well as nonorganism-based AMR avoiding long-term colonization of the human population. Otherwise, a situation could be reached where we will see non-avoidable and non-treatable HAI. Something we must not allow to occur.

For more than 30 years, it has been recognized that many of these infections are partially preventable and healthcare can be made safer. Two broad approaches have been used: surveillance and the bundle concept. The first is a passive strategy in which surveillance protocols lead to reductions in infections through prompt and timely feedback.

**Surveillance** should include standardized definitions of numerators and denominators, identification and description of data sources and data collection personnel and selection of the appropriate measures. This includes emphasis on reporting both antimicrobial resistance and antibiotic use data as well as improving the utility of that data through transparency and data harmonization.

While surveillance provides important baseline data, in recent years, **more active intervention protocols have been introduced to further reduce the incidence of HAI.** The **bundle concept** has focused attention on the reduction of DAI [device-associated infections] in particular. After successful trials, a multimodal approach for the prevention of HAI has emerged. In this multimodal approach, different strategies are included, such as education and training, standardized processes, use of maximal sterile barrier precautions, use of chlorhexidine in alcohol for skin preparation, hand hygiene and catheter care, etc.



Prevention

Sample  
Collection

Screening and  
Diagnostics

Surveillance  
and Public  
Reporting

National  
adoption of  
international  
guidelines on  
the prevention  
of HAIs

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