

## Epidemiological Report

# Healthcare-associated infections surveillance

Historic Series 2004 – 2020

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## INTRODUCTION

The definition of nosocomial infection is of that one acquired after the patient admission or discharge, when it may be related to hospital admission or procedures. Currently, the term “healthcare-associated infections (HAIs)” has been more largely used. It includes all infections that may be acquired due to any health care, regardless of hospitalization.

Active epidemiologic surveillance is a pillar of HAIs control, as it allows us to determine the institutional endemic profile, to identify unforeseen events (outbreaks), and to channel the actions for their prevention and containment. From that perspective, HAIs monitoring is a safety factor for the patient.

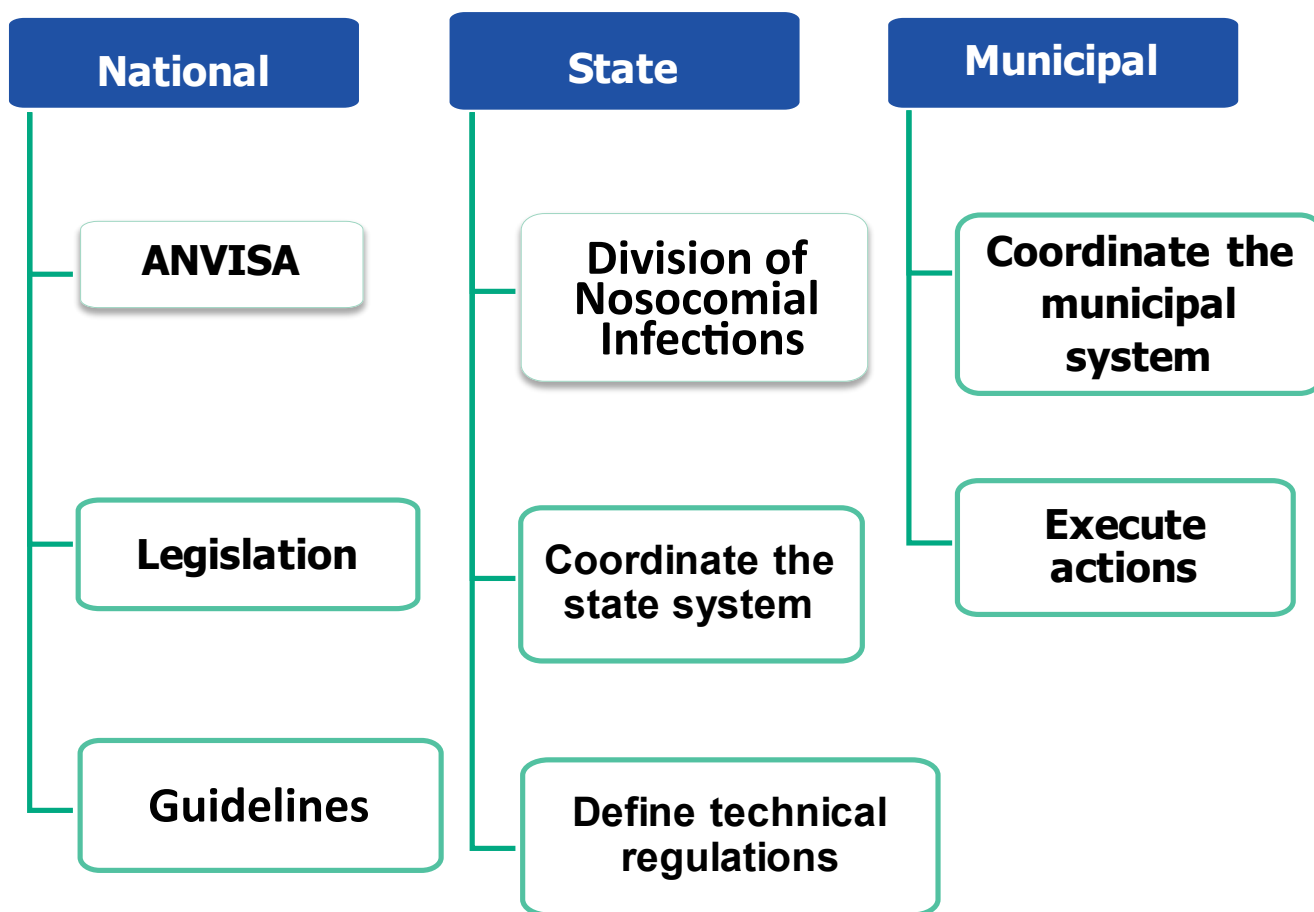
Phenomena of global scope, nowadays HAIs are an expressive public health issue affecting both developed and developing countries alike. Measuring their occurrence is a role of epidemiologic surveillance, which, by continuously acting, can assess their endemic levels and, at the same time, act against epidemic scenarios when they occur.

According to the World Health Organization (WHO), it is a responsibility of governmental authorities to develop a system for monitoring healthcare-related infections and assessing the effectiveness of health interventions. In the Brazilian sphere, monitoring HAIs is a national guideline defining competence of all hierarchical levels of management. In Brazil, the national program is managed by the National Health Surveillance Agency (Anvisa) ([Figure 1](#)).

Following the aims of WHO, the Division of Nosocomial Infections at the “Prof. Alexandre Vranjac” Center for Epidemiologic Surveillance (DNI/CES) implemented, on February 17, 2004, the System for Epidemiologic Surveillance of Nosocomial Infections in the State of São Paulo (SESNI-SP). It is based on modern concepts of nosocomial infection, as well as on guidelines and standards established by the Ministerial Decree n. 2616/1998, promoting infection surveillance focused on critical units and surgery patients. For this purpose, it established indicators enabling to assess healthcare procedures quality.

The DNI/CES, apart from coordinating the state program for HAIs prevention and control, provides technical support and training for regional groups and the cities. It also follows, assesses, and discloses epidemiologic indicators established by the nosocomial infections surveillance system.

Figure 1. Management levels of the program for HAIs prevention and control.



Source: DNI/CES//DCC/SHD.

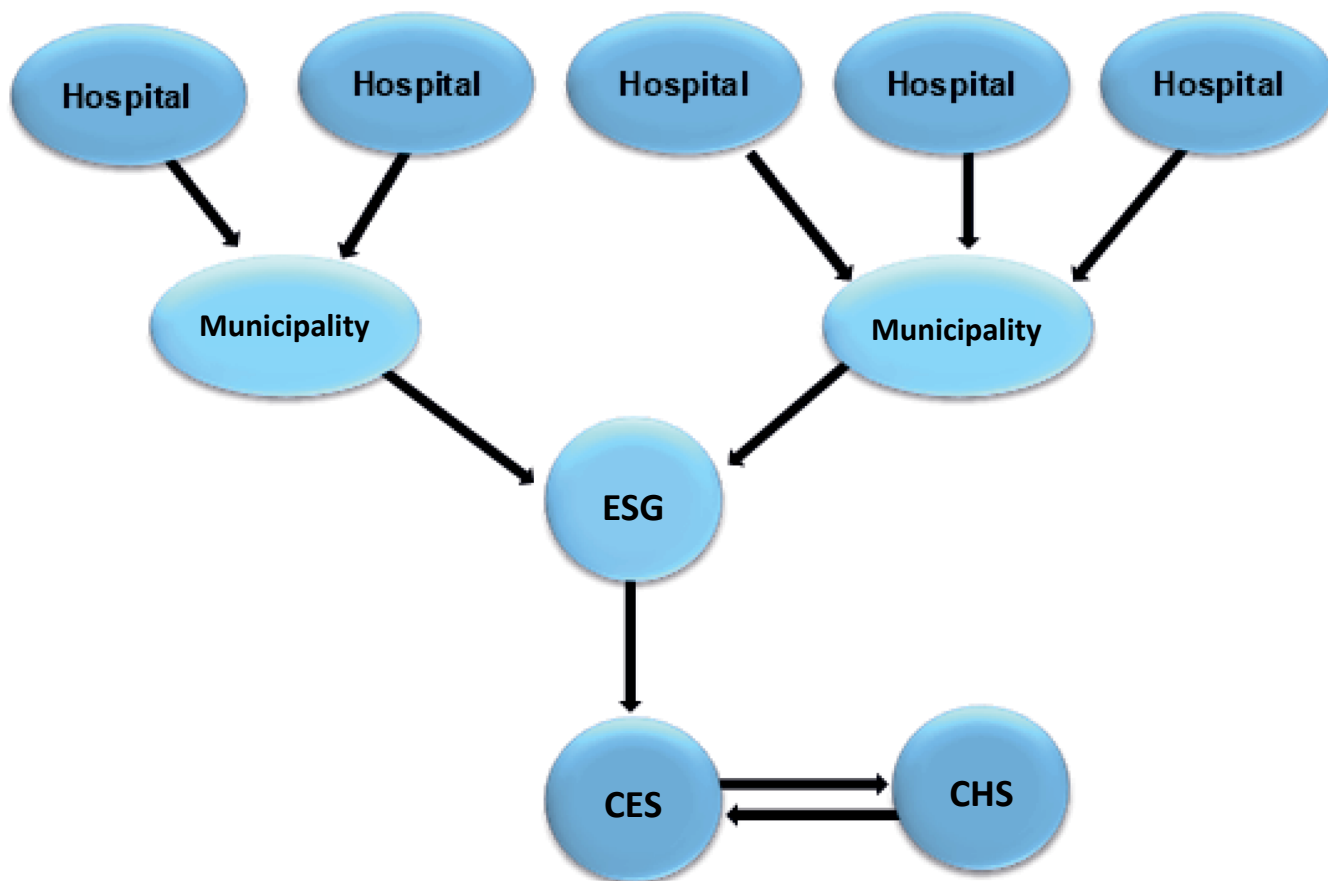
The SESNI-SP aims and characteristics are:

- To restructure the state epidemiologic surveillance.
- To properly report, according to the main features of the hospital.
- To produce the flow for collecting, processing, and disclosing HAIs indicators in the São Paulo state territory
- The chosen indicators consider the main features of the institution regarding specific procedures: surgical procedures, critical patients healthcare (in the ICU), severity, and long-stay hospitalization

- The definitions for infection diagnosis are based on the guidelines from both Anvisa and the Centers for Disease Control and Prevention (CDC).

Data are monthly reported on an Excel spreadsheet, according to the hospital type, and are available on the CES website following the SUS hierarchical flow.

**Figure 2.** Information flow for the nosocomial infection spreadsheets in the System for Epidemiologic Surveillance of NI in the State of São Paulo (SSP).



ESG: epidemiologic surveillance group  
 CHS: center of health surveillance

Source: DNI/CES/DCC/SHD.

With the implementation of SESNI-SP, the Bipartite Intermanagement Commission (between cities and the state), in the use of its powers, on a meeting hold on September 14, 2006, approved the Program for Healthcare-Associated Infections Prevention and Control in the State of São Paulo, through Deliberation BIC n. 116. The program is coordinated by the DNI in conjunction with the CHS and the Adolfo Lutz Institute (ALI), which has the following objectives:

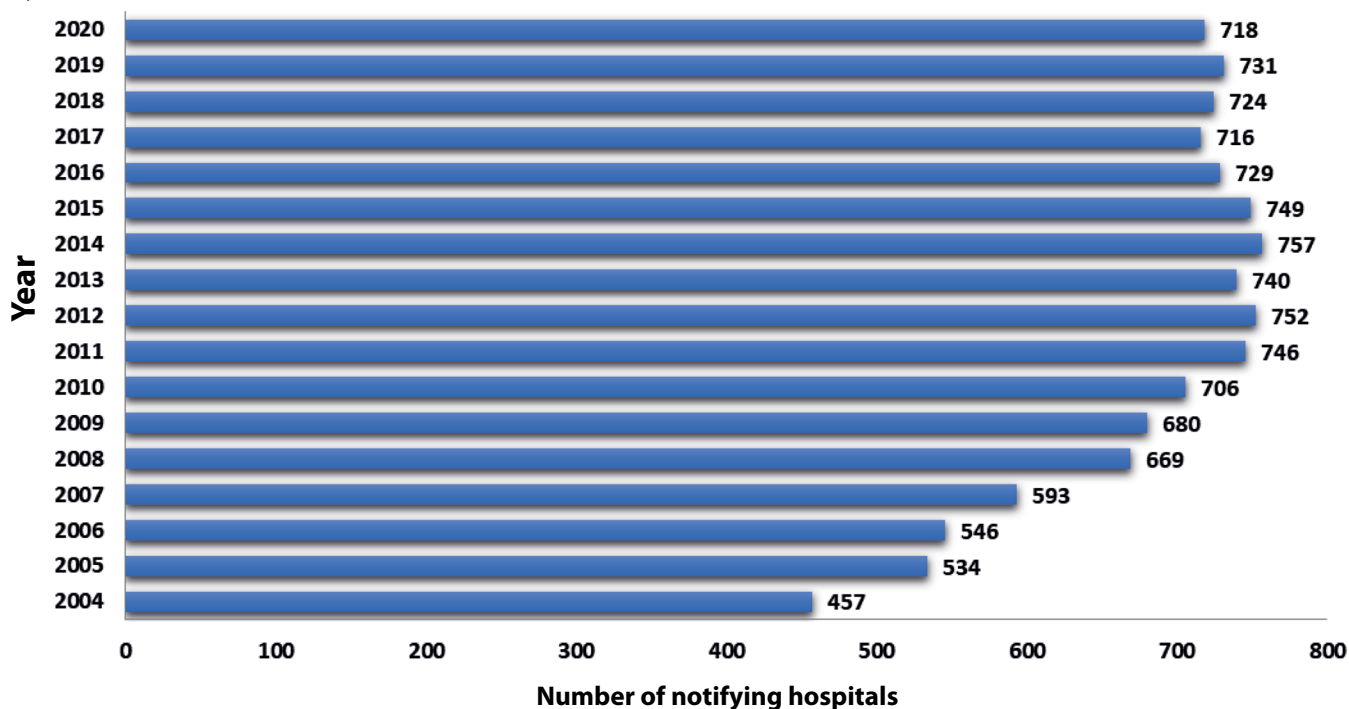
- To stimulate and ensure epidemiologic and health surveillance actions regarding prevention and control of healthcare-associated infections in the state scope.
- To carry out actions in order to encourage the establishment and improvement of municipal programs for HAIs prevention and control.
- To carry out actions for specific technical qualification of human resources in the state scope.

## EPIDEMIOLOGICAL CONTEXT

### Adherence to the epidemiological surveillance system

Hospital adherence to the SESNI-SP has always been strict, especially in recent years (over 90%), and it remained on that level even in 2020, during the covid-19 pandemic (Graph 1). Such fact is essential for assuring a continuously active, solid system.

**Graph 1.** Total number of hospitals notifying to the System for Epidemiologic Surveillance of Nosocomial Infections in the SSP, 2004-2020.



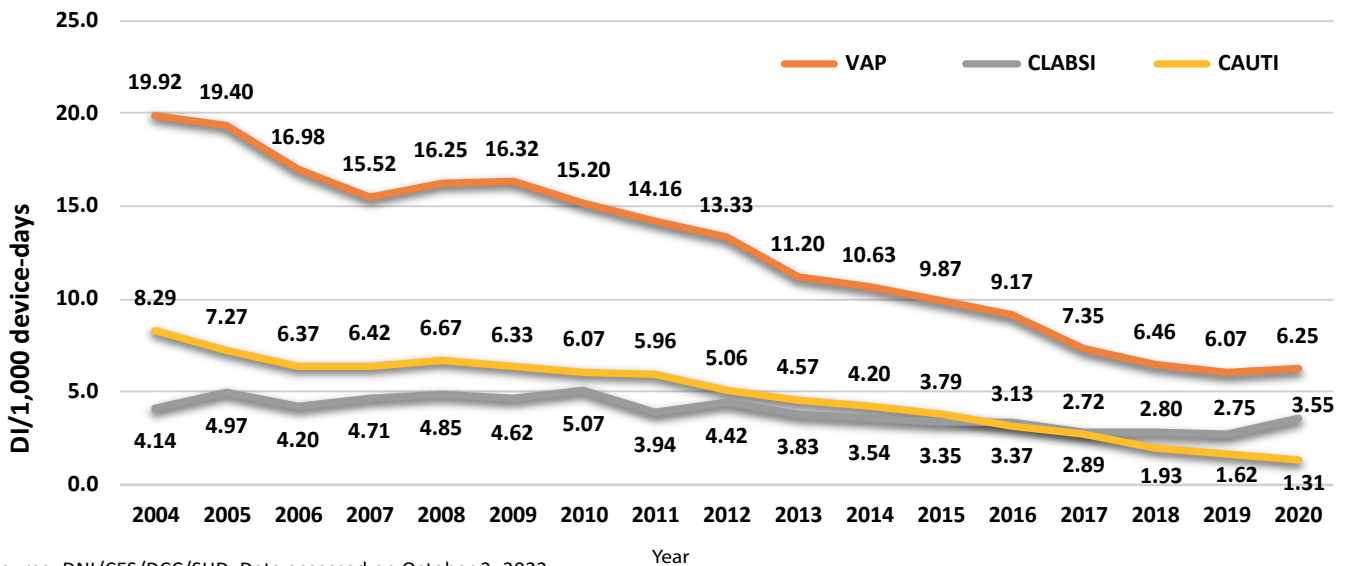
Source: DNI/CES/DCC/SHD. Data accessed on October 3, 2022.

### History string of AICU epidemiological indicators

In the Adult Intensive Care Unit (AICU), invasive device-related infections –incidence density (ID) of ventilator-associated pneumonia (VAP); ID of central line-associated bloodstream infection (CLABSI); and ID of catheter-associated urinary tract infection (CAUTI) as well as isolate microorganisms in blood cultures from NI patients, are systematically evaluated.

Graph 2 shows the continuous reduction in the ID median of all infections monitored by the SESNI-SP until 2019. However, in 2020 there were increased pneumonia and bloodstream infection rates which were associated to the reduced time of surveillance and maintainability of HAIs prevention packs, greater patient severity, longer hospitalizations, and overworked health professionals throughout the current health crisis. Such results were not exclusive to Brazilian hospitals, but also to those in developed countries such as the United States.

**Graph 2.** History string of DI/1000 device-days median AICU hospitals from SSP, 2004-2020.

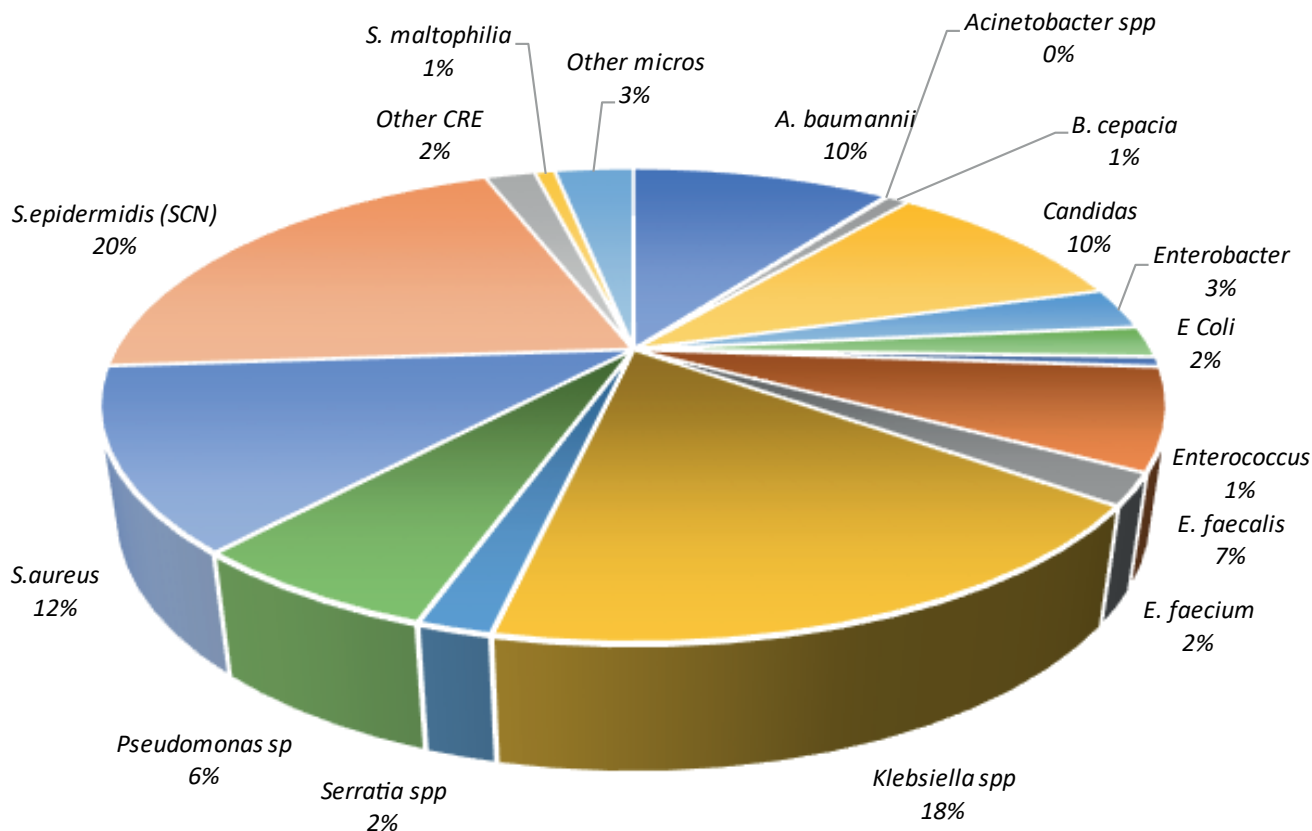


Source: DNI/CES/DCC/SHD. Data accessed on October 3, 2022.

Microbe resistance has been considered a public health issue due to its impact on treatment of hospitalized patients, mainly in Intensive Care Unit (ICU).

In 2020, 7,166 microorganisms in hemoculture samples from CVC-related BSI patients were isolated. Gram-positive (*Staphylococcus epidermidis* and *S. aureus*) microorganisms were most frequently isolated, but *Klebsiella* spp and *Acinetobacter baumannii* also had a great proportion of isolates ([Figure 3](#)).

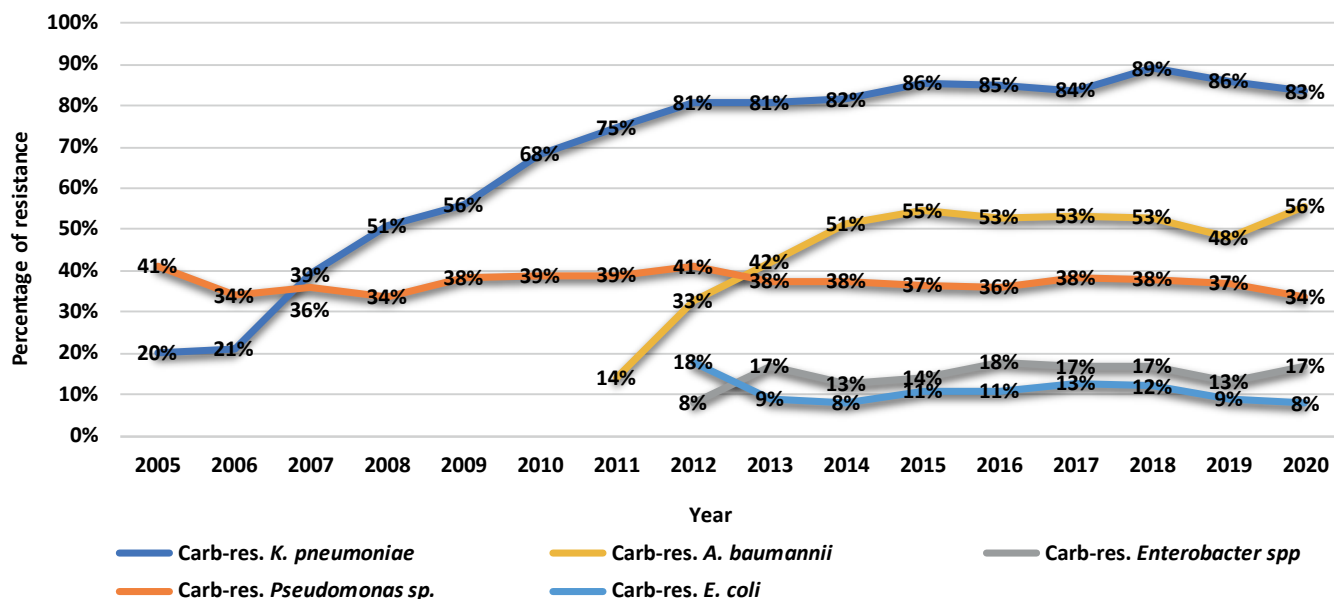
**Figure 3.** Distribution of isolate microorganisms in hemocultures from NI patients registered in the System for Epidemiologic Surveillance of NI in the SSP, 2020.



Source: DNI/CES/DCC/SHD. Data accessed on October 3, 2022.

The percentage of resistance to carbapenem antimicrobial agents in São Paulo hospitals is high - over 80% for *A. baumannii* and over 50% for *K. pneumoniae* (Graph 3) – but it tends to be stable regarding resistance proportion.

**Graph 3.** Percentage of resistance of major multidrug-resistant agents isolated in blood cultures from BSI/CVC patients, 2005-2020.



Source: DNI/CES//DCC/SHD. Data accessed on October 3, 2022.



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