

Hospital Length of Stay and Antibiotic Prescription Practices for Patients Diagnosed with Gram Negative Infections – Evidence from the Hospitals in Romania

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INTRODUCTION

ECDC indicates that Romania is among the member states with the highest levels of antimicrobial resistance (AMR) in Europe. However, there is no National Antimicrobial Stewardship Program (ASP) implemented to facilitate national guidelines on antibiotic prescription. Furthermore, studies using local hospital data monitoring cases with bacterial infections are scarce.

OBJECTIVES

The aim of this study is to estimate the inpatient average length of stay (ALoS) and observe the prescription practices when treating gram negative bacterial infections in public hospitals in Romania.

METHODS

This analysis used official disease code data reported from 515 public and private hospitals in Romania in years 2018 and 2019. We used 13 disease codes for gram negative infections mainly indicative of Klebsiella, Pseudomonas and Escheria Coli. A separate analysis using data from 21 large public hospitals investigated to what extent prescription protocols for antibiotics included a microbiologic test.

RESULTS

Patient characteristics

In 2019 we found 25 027 patient episodes having at least one of the studied diagnosis codes, which translates into 129 cases treated for gram negative bacterial infections per 100,000 per year, on average.

Of all studied diagnosis codes 36% were indicative of Klebsiella and 23% were indicative of Pseudomonas.

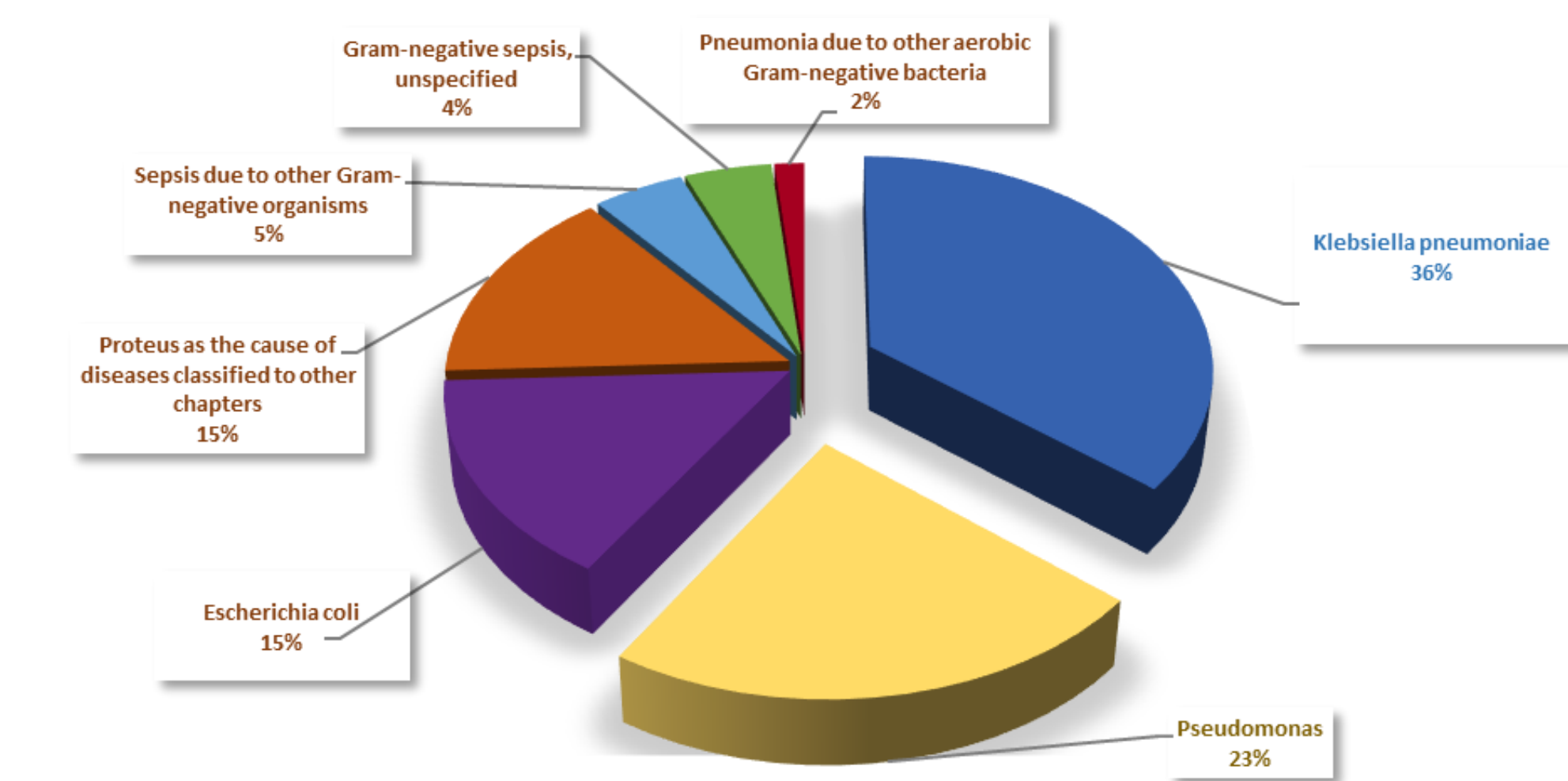


Figure 1: Use of Gram negative infection diagnosis codes

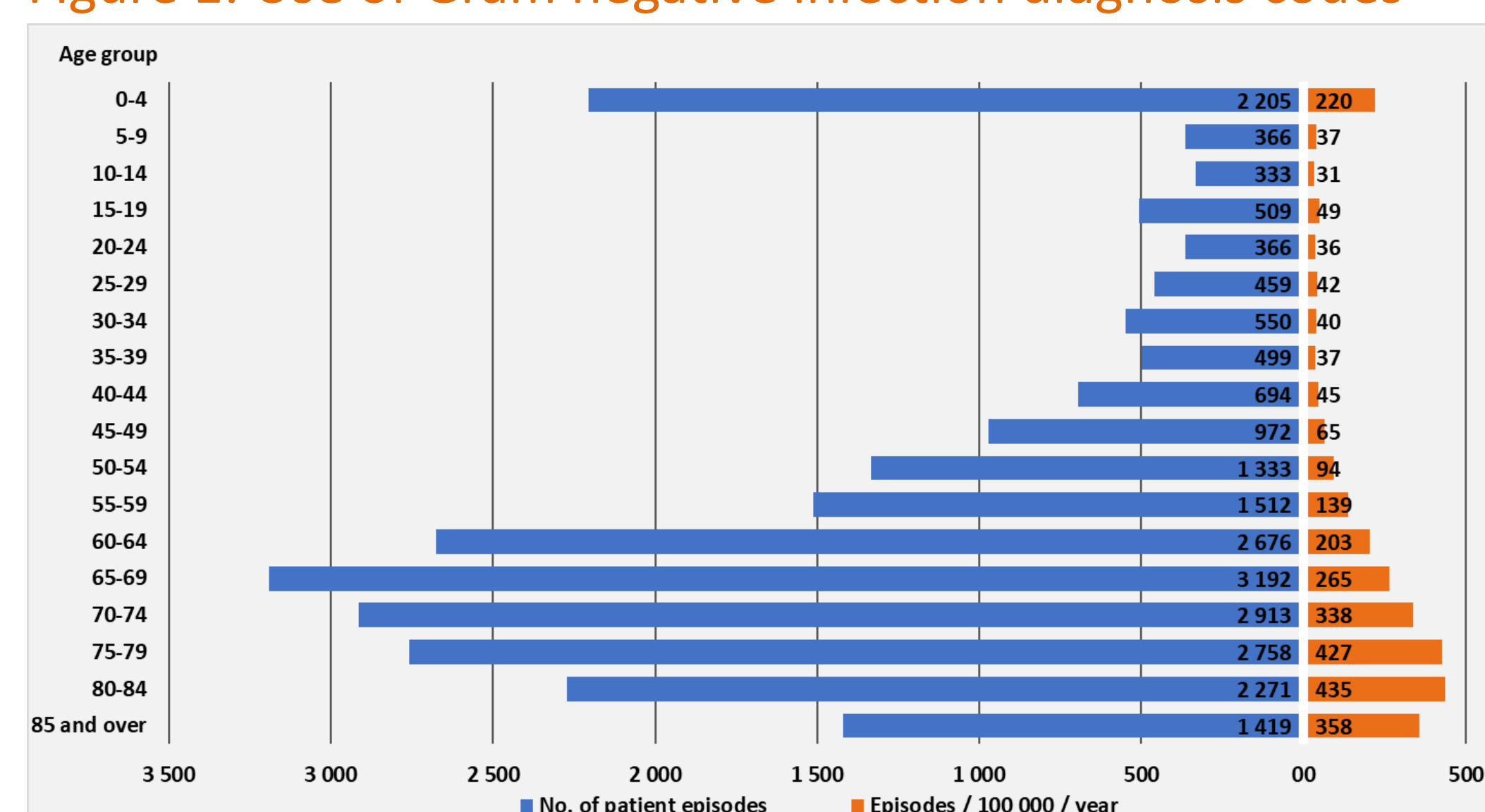


Figure 2: Distribution of Gram negative patient episodes according to age group

More than a half of the studied patient episodes were in the age category 60-84 years.

Hospital length of stay

We found that the average ALoS was 12 days [95% CI: 11.3-12.2] with approximately 1.5 days [95% CI: 1.3-1.8] spent on average at the intensive care unit (ICU). 85% of all patient episodes have not been treated at the ICU (ALoS 10.21 days), 15% of all patient episodes spent at least 1 day at the ICU (ALoS 20.38 days, ICU ALoS 10.69 days), 5.1% of all patient episodes were only treated at the ICU (ALoS 13.89 days).

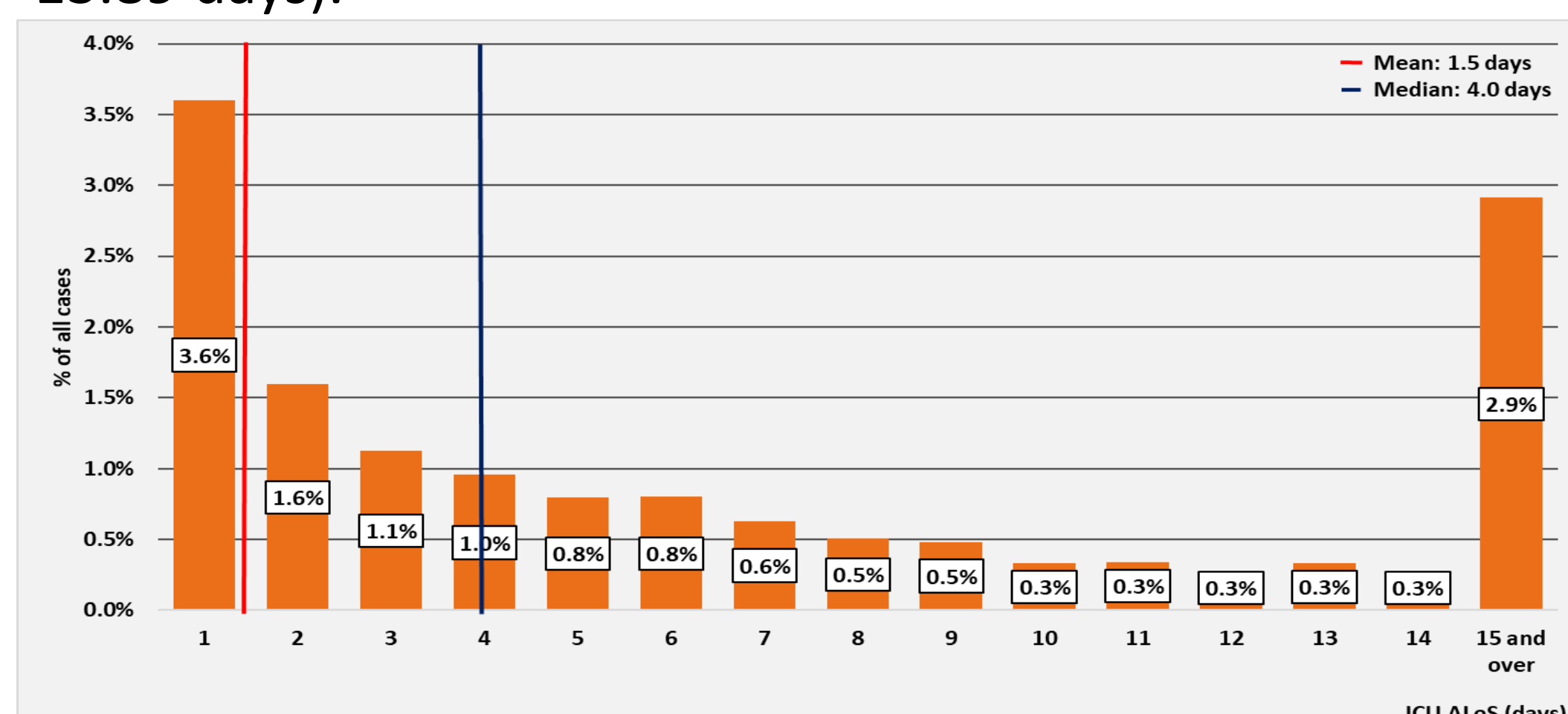


Figure 3: Distribution of patient episodes with Gram negative infections according to ICU ALoS

Antibiotic prescription practices

According to the prescription practices studied in the pool of 21 hospitals, only in 57% of the cases the antibiotic prescription practices included a microbiologic test. In 81% of the cases the results were positive. The majority of the cases were treated by cephalosporin prescription and 32% of the cases were treated at the ICU.

DISCUSSION

About 50% of all studied patient episodes were treated at Infectious disease, Internal medicine, Dermatology, Pediatrics, Pneumology, and Nephrology hospital wards.

The majority of the cases were admitted to university or county-level hospitals, suggesting that these have the professional capacity to diagnose and treat the patients, which is a general characterization of the Romanian public hospital system.

More patients are admitted from the urban areas, proving that the population in these areas is more concerned by their health and are more willing to seek medical attention.

The cases treated at the ICU deserve special attention as these are more susceptible to infections. For this we performed special analysis of the cases with an ICU ALoS exceeding 3 days. There were over 2 400 patient episodes and the top 10 hospitals treat over 25% of these cases.

The microbiologic test practices of the Romanian hospitals are somewhat contradictory. Only 57% of the cases with an infection diagnosis had a test performed. Only 9% of the cases with a diagnosis of infection were treated with antibiotics. On the other hand, of the patients receiving antibiotics only 50% had a diagnosis code of infection. All this suggest non-compliant coding and reporting habits, and also the use of antibiotic treatment without sufficient

clinical or paraclinical substantiation.

As the literature suggests, proper antibiotics administration shortens the length of stay, which would also be the case of Romania. The coding practices and the proper use of the diagnosis codes for infectious diseases can influence inpatient care parameters considerably as coding and reporting problems were already studied in Romania. The improper prescription and administration of antibiotics affects not only the hospital parameters and health outcomes, but the costs associated with healthcare as well.

CONCLUSIONS

Considering that almost half of the patients treated with antibiotics in Romanian public hospitals did not have a bacterial microbiologic test accompanying their antibiotic (AB) treatment, we can conclude that antibiotics are often used preventively or in an ad hoc manner. An optimal use of AB treatment in Romania and a decrease of the ALoS can be achieved through the development of national guidelines on rapid diagnosis and appropriate treatment of bacterial infections.

Correct coding and reporting of cases with Gram negative infections ought to be of permanent concern for the medical staff and hospital management as to ensure proper treatment for the patients and to avoid unnecessary expenses.

LIMITATIONS

Our study population only includes the patient episodes reported to the National Health Insurance House (NHIH) for reimbursement purposes, thus not containing the cases treated in private practices. Nonetheless, in case of the infectious pathology the effect is not considered significant.

The coding practices and the use of the diagnosis codes for infectious diseases can influence the results considerably.

Although the number of hospitals analyzed regarding the testing habits and antibiotics use is limited, it offers an overall view of the treatment habits.

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