United States

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# The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): First Results of Antimicrobial prescribing in United States Hospitals

GLOBAL-PPS
Antimicrobial Consumption and Resistance

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## INTRODUCTION AND PURPOSE

### Introduction

Studies estimate that up to 50% of antimicrobial prescribing is inappropriate. Overuse and misuse of antibiotics is the single most important factor in selecting for antimicrobial resistance. The Centers for Disease Control and Prevention(CDC) estimate over 2 million people are infected with antibiotic resistant organisms yearly in the US.

This report reviews the antimicrobial prescribing in the United States(US) with a population of almost 320 million. 15 hospitals were surveyed all affiliated with Hospital Corporation of America(HCA). HCA is the largest healthcare system in the US with over 160 acute care facilities in 20 states.

### Purpose

The purpose of the study is to quantify the quality of antimicrobial prescribing and to evaluate the determinants of inappropriate antimicrobial prescribing in the US in hospitalized adults, children and neonates. Results will identify targets to improve antimicrobial prescribing based on local needs assessment.

## BACKGROUND

Antimicrobial resistance (AR) and *Clostridium difficile* infections continue to rise in the US. Both the CDC and the President's Action Plan on AR strongly advise implementing an effective antimicrobial stewardship program. Having a uniform and standard method for surveillance of antimicrobial prescribing and to evaluate the variation in antimicrobial prescribing is an important step to identify opportunities for improvement.

## METHODS

PPS was conducted from March to September 2015, in 15 US hospitals 5 tertiary, 9 primary, and 1 specialty. The survey included all inpatients receiving an antimicrobial on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application is used for data-entry, validation and reporting as designed by the University of Antwerp (http://www.global-pps.com).

## RESULTS

The overall antimicrobial (AM) prevalence rate in adults and paediatric units was 45% and 49% respectively, highest in the transplant units and adult intensive care units (ICU) and lowest in neonatal ICU. The majority of infections were community acquired (CA) (61%). For CA infections 82% AM was considered empiric and 18% targeted. MRSA was the most frequent organism for targeted treatment. We saw a similar pattern for healthcare-associated infections. The most common diagnoses for therapeutic AM was pneumonia, urinary tract infections, and skin and soft tissue infections. Guideline compliance was >80%. Intravenous route was preferred in ~85% of cases. Highest proportion of AM use was penicillins and other beta-lactams followed by quinolones. Of the beta-lactams extended spectrum penicillins and third and fourth-generation cephalosporins were most commonly prescribed. In paediatrics we observed more aminoglycosides use and lower use of quinolones compared to adult hospitals. Prophylactic AM use was higher in medical compared to surgical. The most frequently used AM for medical prophylaxis was trimethropim/ sulfamethoxazole, fluconazole, and levofloxacin. Cefazolin was the most commonly administered drug for surgical prophylaxis.

| Table 1 | Country | |
| --- | --- | --- |
| | **N** | **%** |
| **MEDICAL** | | |
| Reason in notes | 952 | 88.3 |
| Guidelines missing | 283 | 26.3 |
| Guideline compliant | 497 | 83.8 |
| Stop/review date documented | 313 | 29.0 |
| **SURGICAL** | | |
| Reason in notes | 296 | 82.0 |
| Guidelines missing | 81 | 22.4 |
| Guidelines compliant | 188 | 87.0 |
| Stop/review date documented | 132 | 36.6 |
| **ICU** | | |
| Reason in notes | 362 | 86.6 |
| Guidelines missing | 80 | 19.1 |
| Guideline compliant | 177 | 81.9 |
| Stop/review date documented | 108 | 25.8 |

40% of patients received more than one day for surgical prophylaxis. Details on antibiotic quality indicators are shown in *Table 1*. Reason in notes for stop/review was only ~30%.

## CONCLUSION

In conclusion we found a high prevalence of AM use in the US especially in transplant and adult ICUs. Overall AM prevalence was higher in the US compared to Europe. Most AM administration was for empiric treatment. Medical prophylaxis was common and surgical prophylaxis was continued beyond 1 day in over a third of cases. A stop date or review was documented in only 30% of cases. This survey provides the quantity and quality of antimicrobial prescribing globally and at the hospital level. These baseline results highlight areas for improvement and enable hospitals to benchmark improvement over time focusing on surgical prophylaxis and duration of treatment by implementing a 72-hour time-out.