

# The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Results on Antimicrobial Prescriptions in Japanese Hospitals

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## INTRODUCTION AND PURPOSE

Antimicrobial resistant bacteria are a pressing concern in Japan. Antimicrobial stewardship is considered one of the important measures to control resistant bacteria. Surveillance of antimicrobial use is necessary for achieving this but no official surveillance system of antimicrobial use exists in Japan. The aim of this study was to assess antimicrobial prescribing for adults and children admitted to Japanese hospitals by means of Global-PPS, and to identify targets for improvement of antimicrobial use in Japan.

## METHODS

A voluntary point prevalence survey (PPS) of hospitals in Japan was conducted in 2015. The survey included all inpatients receiving an antimicrobial agent on the day of the PPS. Data collected included age, sex, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance with guidelines, and documentation of indications and stop/review date of the prescription. Denominators included the total number of inpatients. A web-based application designed by the University of Antwerp ([www.global-pps.com](http://www.global-pps.com)) was used for data entry, validation, and reporting.

## RESULTS

The survey covered 18 Japanese hospitals. The antimicrobial prevalence rate was 29.5% (**Table 1**). Antimicrobial rates between wards varied from 8.6% (neonatal ward) to 83.2% (adult transplant ward). Among 3,381 antimicrobials used, 53.8% were prescribed for treatment and 42.6% for prophylaxis. The main indications for antimicrobial use were medical prophylaxis (26.2%), community-acquired infection (22.0%), non-intervention-related hospital-acquired infection (19.3%), and surgical prophylaxis (16.3%). Among 1,484 treated patients, 58.0% was HAI. The most prescribed antibiotic group was J01D (other beta-lactam antibacterials, which includes cephalosporins and carbapenems; 36.1%). Although the top 3 antibiotics used were sulfamethoxazole and trimethoprim (10.8%), cefazolin (8.6%), and piperacillin and enzyme inhibitor (6.2%), the patterns of antibiotic use were different among indications (**Table 2, 3**). Among surgical prophylactic antimicrobials, 75.9% were prescribed for more than one day (**Figure 1**). Details on antibiotic quality indicators are shown in **Table 4**.

**Table 3. Top 5 antibiotics for prophylactic use**

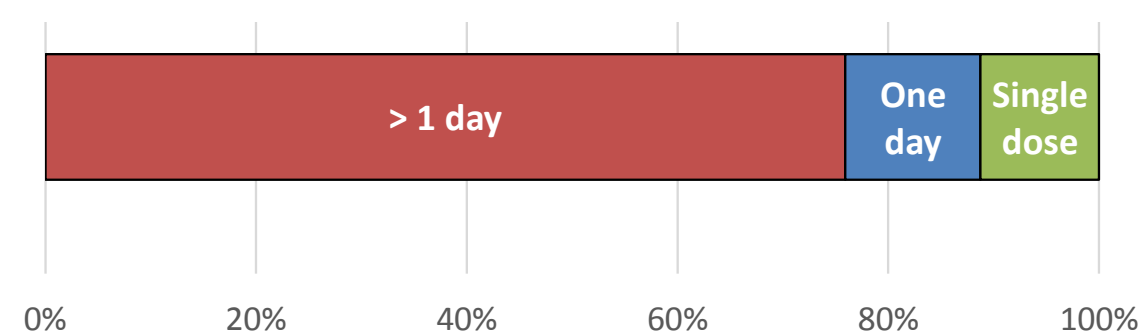
| Medical prophylaxis               |       | Surgical prophylaxis |       |
|-----------------------------------|-------|----------------------|-------|
| Sulfamethoxazole and trimethoprim | 45.1% | Cefazolin            | 38.2% |
| Fluconazole                       | 13.3% | Cefcapene            | 10.9% |
| Levofloxacin                      | 7.1%  | Cefmetazole          | 8.9%  |
| Itraconazole                      | 7.0%  | Cefditoren           | 6.3%  |
| Voriconazole                      | 4.5%  | Cefotiam             | 5.3%  |

**Table 1. Antimicrobial prevalence rates (%) by type of hospital**

| Type of hospital           | Number of patients | Number of treated patients | Antimicrobial prevalence rates |
|----------------------------|--------------------|----------------------------|--------------------------------|
| Secondary (n=7)            | 1698               | 525                        | 30.9%                          |
| Tertiary (n=6)             | 4860               | 1344                       | 27.7%                          |
| Paediatrics (n=2)          | 543                | 125                        | 23.0%                          |
| Specialized hospital (n=3) | 1692               | 596                        | 35.2%                          |
| <b>Total (n=18)</b>        | <b>8793</b>        | <b>2590</b>                | <b>29.5%</b>                   |

**Table 2. Top 5 antibiotics for therapeutic use**

| Community acquired infection      |       | Hospital acquired infection       |       |
|-----------------------------------|-------|-----------------------------------|-------|
| Ampicillin and enzyme inhibitor   | 11.6% | Piperacillin and enzyme inhibitor | 12.5% |
| Ceftriaxone                       | 10.0% | Vancomycin                        | 10.1% |
| Piperacillin and enzyme inhibitor | 7.1%  | Meropenem                         | 7.4%  |
| Ampicillin                        | 5.8%  | Ampicillin and enzyme inhibitor   | 7.0%  |
| Meropenem                         | 5.4%  | Cefepime                          | 6.1%  |



**Figure 1. Duration of surgical prophylaxis**

**Table 4. Quality indicators of antibiotic use**

|                             | Yes   |
|-----------------------------|-------|
| Reason in notes             | 61.8% |
| Guideline compliant         | 60.7% |
| Stop/review date documented | 27.3% |
| Targeted prescribing        | 30.2% |

## CONCLUSION

We identified some characteristics of antimicrobial prescribing in Japan through this PPS: higher use of J01D (cephalosporins and carbapenems), longer antibiotic use for surgical prophylaxis than expected, and low level of quality indicators. These findings indicate that local data are necessary for hospitals and public health centers in order to increase the impact of antimicrobial stewardship programs and campaigns in Japan. This survey was the first PPS of antimicrobial prescription in multiple Japanese hospitals and provides basic information for designing efficient antimicrobial stewardship programs. Repeated surveys are important to promote antimicrobial surveillance and appropriate use in the future.