**Shortage of antimicrobial agents in Europe: Results of an international survey**

S. Harbarth, P.M. Filius, S. Natsch, F. Mackenzie, I. Gyssens
on behalf of the ESCMID Study Group on Antibiotic Policies (ESGAP)

**Background**

Shortages of antimicrobial agents have affected the U.S. since the late 1990s. In two IDSA surveys conducted in 1999 & 2000, members indicated that shortages had affected numerous therapeutic indications.

There is little information available regarding the shortage of antimicrobial agents in Europe.

**Objectives**

This survey attempted to determine to what extent shortages have already influenced prescribing practices in European hospitals.

**Methods**

The study was conducted as an international, 9-item survey sent out via email in October 2006 to 384 hospitals throughout Europe. The subjects were infectious disease physicians, clinical microbiologists or pharmacists. Data were entered in a spreadsheet, checked for accuracy, and transported to SPSS for descriptive analysis.

**Results**

- Participants from 28 countries and 83 hospitals responded (response rate, 22%).
- 59/83 (71%) of the respondents had experienced a shortage of antimicrobial agents within the last 12 months.
- Shortages were not evenly distributed among countries. Only 4 countries did not report any shortage.
- There was great variability in the duration of the shortages (range: 1 week - 18 months).

**Most frequently affected agents**

| Antibiotic | Frequency
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Cefepime</td>
<td>30</td>
</tr>
<tr>
<td>Meropenem</td>
<td>26</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>25</td>
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<tr>
<td>Piperacillin</td>
<td>22</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>18</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
</tr>
</tbody>
</table>

**Consequences**

- 45 hospitals (54%) had to develop alternative policies or adapt their hospital practice guidelines due to the shortage.
- 27 hospitals (33%) had trouble finding equivalent drugs for substitution.
- Only 16 hospitals (19%) reported that they had always been adequately informed by the producer or distributor about the upcoming shortage.

**Results (2)**

- Other shortages: Shortages of other cephalosporins, colistin, doxycycline, rifampicin, vancomycin, nitrofurantoin, fosfomycin, amphotericin B, amikacin and tobramycin occurred infrequently.
- Substitutes were either more expensive (e.g. carbapenems instead of cefepime), more broad-spectrum (e.g. cefuroxim, ceftriaxone or co-amoxiclav instead of oxacillin and penicillin), or less efficacious (e.g. neomycin and chlorhexidine instead of mupirocin nasal ointment).

**Conclusions**

- A substantial number of hospital pharmacies in Europe have experienced antimicrobial drug shortages within the last 12 months.
- Shortage of meropenem, mupirocin and cefepime were considered to have the largest impact on patient care.
- Shortage-triggered policy changes may negatively affect antimicrobial prescribing patterns and expenses.
- This survey provides important information that will guide further ESGAP initiatives to document and ultimately prevent shortages.