BACKGROUND
One of the major factors favoring the selection of antibiotic-resistant bacteria is the misuse of antimicrobial agents. The misuse of antibiotics also promotes the breakthrough of opportunistic bacteria such as Clostridium difficile.1

• Since 2010, the Centre hospitalier universitaire de Sherbrooke (CHUS), located in Quebec, Canada, has been using a computer-assisted antimicrobial stewardship intervention program.

• The Antimicrobial Prescription Surveillance System (APSS) uses a knowledge bank and integrates different data from the computerized clinical record to identify potentially inappropriate prescriptions of antimicrobials based on certain criteria.2

To our knowledge, the outcomes associated with the acceptance or refusal of an antimicrobial stewardship program, on an individual level, have not been studied.

OBJECTIVE
To compare the clinical characteristics and mortality of patients for whom a recommendation from an antimicrobial stewardship program was accepted or refused.

METHODS
Setting and study design
• Retrospective cohort study of all hospitalized adult patients (≥18 years) who received intravenous or oral antimicrobials at the Centre hospitalier universitaire de Sherbrooke (Quebec, Canada)

Intervention
• Prospective audit and feedback (PAF) strategy
• APSS is an asynchronous system that facilitates the post-prescription review process by reorganizing relevant clinical information and producing alerts supported by references for potentially inappropriate prescriptions using validated algorithms derived from published guidelines and expert opinions.

• One full-time equivalent clinical pharmacist was assigned to the APSS on weekdays (Monday to Friday). A physician specializing in infectious diseases assisted the pharmacists 5 hours (b) per week to review their potential interventions prior to contacting prescribers.

Study population and selection of patients
• All patients receiving antimicrobial treatments at the CHUS from June 2014 to June 2016, who met the following criteria, were included in this study:
  I. Potentially-ineffective antimicrobial ordering alert generated by the computer system;
  II. Alert deemed adequate by an infectious diseases-trained pharmacist, as well as by an infectious disease consultant
  III. Communication with the attending physician to issue a recommendation and documentation of the acceptance/rejection in the software.

RESULTS
We identified a total of 1251 recommendations in 826 patients throughout the study period.

• Among them, 1144 (91.5%) were accepted.

The antimicrobials most frequently targeted by recommendations were:

- Piperacillin/tazobactam (n=273; 22%)
- Fluoroquinolones (n=267; 21%)
- Carabapenems (n=131; 11%)

Figure 1: Types of recommendations

Table 1: Characteristics of patients for whom antimicrobial stewardship recommendation was accepted and those for whom it was refused. Centre hospitalier universitaire de Sherbrooke, 2014-2016

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Recommendation accepted, n (%)</th>
<th>Recommendation refused, n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, year</td>
<td>75.6 (75)</td>
<td>73.1 (73)</td>
<td>0.16</td>
</tr>
<tr>
<td>Charlson score</td>
<td>1.35 (2.9)</td>
<td>1.04 (2.8)</td>
<td>0.09</td>
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<tr>
<td>Age, years old (≥18)</td>
<td>77.9 (5.9)</td>
<td>76.0 (5.2)</td>
<td>0.08</td>
</tr>
<tr>
<td>Diabetes type</td>
<td>53% (52)</td>
<td>63% (66)</td>
<td>0.05</td>
</tr>
<tr>
<td>Blood transfusion at entry</td>
<td>49 (56)</td>
<td>41 (47)</td>
<td>0.06</td>
</tr>
<tr>
<td>Duration between admission and recommendation</td>
<td>1.58 (1.04)</td>
<td>2.03 (1.14)</td>
<td>0.05</td>
</tr>
<tr>
<td>Risk factors</td>
<td>Adjusted odds ratio</td>
<td>95% confidence interval</td>
<td>P value</td>
</tr>
<tr>
<td>Charlson score</td>
<td>1.35</td>
<td>0.21-8.7</td>
<td>0.05</td>
</tr>
<tr>
<td>Duration of fluoroquinolone use following recommendation, days, median</td>
<td>0.21</td>
<td>0.0005</td>
<td></td>
</tr>
<tr>
<td>Duration of linezolid use following recommendation, days, median</td>
<td>0.23</td>
<td>0.0004</td>
<td></td>
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<tr>
<td>Duration of hospital stay following a recommendation issued, days, median</td>
<td>0.23</td>
<td>0.0093</td>
<td></td>
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<tr>
<td>Duration of stay in intensive care unit (ICU) following a recommendation issued while patient in ICU (n=68)</td>
<td>20.3</td>
<td>0.71</td>
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</tr>
</tbody>
</table>

CONCLUSION
• When a recommendation is accepted, the individual overall use of antimicrobials decreases.
• This also holds true for broad-spectrum antimicrobials.
• Not associated with worse clinical outcomes
• Acceptance of recommendation might lead to lower rates of mortality and length of stay
• ASP is well received by attending physicians
• Our study reinforce the need for a strong ASP, which is a financially and clinically significant literature

REFERENCES