Objective: To analyse the economic impact of clinical pharmacist’s interventions (CPI) as part of the healthcare team regarding antimicrobial therapy in the Intensive Care Unit (ICU).

Methods: Retrospective analysis of CPI regarding antimicrobials in the ICU in 5 months of 2015

Clinical pharmacist (CP)
- Participates in daily rounds
- Monitors pharmacotherapy
- Recommends treatment
- 33% of CPI are anti-infective related

CP registers daily CPI in the information system:
- Drug
- Type of intervention
- Acceptance by physicians
- Estimated cost impact: changes in drugs, time and products for preparation and administration, and CP time.

Economic impact of CPI:
Cost with CPI – Cost without CPI
- Assumption: change to recommended therapy would have happened 2 days later without CPI.
- Cost with CPI: Cost from CPI to 2 days later with the recommended treatment
- Cost without CPI: Estimated cost during 2 days if change would not have happened
- Sensitivity analysis: change would have happened in 1 to 4 days.
- Ratio Avoided cost: Invested money

Results: A total of 212 interventions were recorded, corresponding to 114 patients (61% surgical patients, 68% males, median of age 69.5 years (range: 19-95)).

![Figure 1. Percentage of each type of CPI and cost per intervention](image)

### Table 2. Economic analysis of CPI during the 5-month study period

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost with CP</th>
<th>Cost without CP</th>
<th>Difference in cost (cost with CP-cost without CP)</th>
<th>Sensitivity analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of CP time</td>
<td>2,859 €</td>
<td>--</td>
<td>+2,859 €</td>
<td>--</td>
</tr>
<tr>
<td>Cost of drugs, preparation, administration</td>
<td>12,219 €</td>
<td>22,056 €</td>
<td>-9,837 €</td>
<td>--</td>
</tr>
<tr>
<td>Total cost (CP+drugs+preparation+administration)</td>
<td>15,078 €</td>
<td>22,056 €</td>
<td>-6,978 €</td>
<td>31.6% decrease in costs with CP (32.9 €/intervention, 61.2 €/patient)</td>
</tr>
</tbody>
</table>

Ratio avoided cost: invested money 3.4:1 → 3.4 € were avoided per 1 € invested in having a CP

- 96% of the CPI were considered important with improvement of patients care.
- Physicians acceptance rate was 97.6%.

Limitations: costs not considered: length of stay, adverse drug events, mortality, readmissions

Conclusions: Having a Clinical Pharmacist as a member of the healthcare team in the ICU performing interventions related to antimicrobials is critical to improve care and decreases costs.