Value of effective antimicrobial stewardship programmes (ASP)

What is antimicrobial stewardship?
A multi-disciplinary approach designed to optimise the use of antimicrobials, improve patient outcomes, reduce the development of antimicrobial resistance (AMR) and hospital-acquired infections, and decrease healthcare costs.

Why are ASPs needed?
Annually, AMR is estimated to be contributing to:
- 25,000 deaths in the EU
- 700,000 deaths globally
- €1.5 billion in extra costs in the EU alone

By 2050, a continued rise in AMR would lead to:
- 10 million deaths every year

World Bank estimates* on the impact of AMR by the year 2050
- 28 million people projected to fall into poverty because of AMR
- 7.5% decline in global livestock production
- Up to 1 trillion US$ global increase in healthcare costs
- 3.8% decline in global exports

Key steps in implementing ASPs
- Establish ASP teams
- Develop processes
- Monitoring of antimicrobial use
- Medical education for patients and HCPs
- Communication of guidance on antimicrobial prescribing

Goals of ASPs
- Improve patient outcomes
- Improve patient safety
- Reduce AMR
- Reduce healthcare costs

Current perspectives on the value of ASPs
Most studies that evaluate the cost and benefits of ASPs come from a hospital perspective, rather than a societal/patient or healthcare decision-maker perspective.

How are ASPs economically evaluated?
Parameters used to evaluate ASPs financially include:
- Implementation costs
- Antimicrobial costs
- Hospital day costs/total hospital cost per admission
- Operational costs
- Morbidity and/or mortality costs
- Societal costs

*Values were estimated by the World Bank using economic simulation tools
How are the clinical benefits of ASPs measured?

Healthcare costs encompass clinical parameters, such as length of stay and morbidity, as well as economic costs, such as antimicrobials.\(^6\)

Outcome metrics include:\(^2,18\)
- Length of stay
- Clinical improvement
- Risk-adjusted mortality
- Hospital re-admission rates
- Adverse drug reactions (number/percentage)
- Hospital-onset infections including AMR infections, superinfection, and \textit{Clostridium difficile}

What are the benefits of ASPs?

Overall, according to recent meta-analyses and systematic reviews, implementation of ASPs have had beneficial effects on:\(^7–8\)
- Different aspects of cost
- Antimicrobial use
- Patient outcomes
- AMR

Several studies have demonstrated ASPs have positive effects on the following:\(^7–18\)
- Length of stay
- Economic outcomes
- Mortality
- AMR rates

Effect of ASPs on antimicrobial cost

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<tr>
<th>Outcome</th>
<th>Citation</th>
<th>Effect of ASP on antimicrobial cost</th>
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<td>ASPs decrease antimicrobial costs</td>
<td>Akpan, et al. 2016(^7)</td>
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<td>Coulter, et al. 2015(^13)</td>
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<td>Smith, et al. 2015(^15)</td>
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<td>Zhang &amp; Singh, 2015(^16)</td>
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What are the challenges/barriers to introducing ASPs?

- Initial cost/investment
- Difficulties in quantifying/qualifying the effectiveness of ASPs and evaluating financially\(^2,19\)
- Integration and acceptance by hospital personnel\(^1\)
- Lack of recognition of the value of ASPs\(^1\)
- There has been a lack of support at policy level, however, the WHO National Action Plan process is working to ensure governments take action\(^20,21\)

References

5. NICE guidelines. Antimicrobial Stewardship: systems and processes for effective antimicrobial medicine use. 18 August 2015.
7. Akpan, et al. 2016\(^7\)
8. Karanika, et al. 2016\(^8\)
9. Mertz, et al. 2015\(^14\)
10. Smith, et al. 2015\(^15\)
11. Zhang & Singh, 2015\(^16\)