

From awareness to action: can we do more to combat antimicrobial resistance in heavily immunocompromised patients?

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**On behalf of the I'AMR working group.*

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Abstract:

Antimicrobial resistance (AMR) represents a growing challenge for global health, with annual morbidity and associated costs predicted to rise in coming years. Effective antibiotics are the foundation of treatment for heavily immunocompromised patients, such as those undergoing cancer treatment or transplantation procedures, due to their high risk of adverse infection outcomes, so the growing threat of AMR presents particular risks to these patients.

We set out to explore the data available regarding the broad burdens of AMR faced by patients and healthcare systems, including underlying disease outcomes, economic costs and patient quality of life. We identified publications from a 5-year period (November 2018–2023) using PubMed. To ensure consistency of antimicrobial testing and reporting, publications reporting burdens from AMR bacterial infections in Europe and North America were eligible.

Our findings highlight that AMR is common in patients with solid tumours, haematological malignancies and solid-organ transplantations. Mortality was found to be variable depending on the type of cancer or site of transplant, as well as the severity of underlying disease; however, carbapenem-resistant infections were consistently associated with high mortality, likely due to the paucity of management options available for these infections. Consistent with this hypothesis, initial inappropriate empiric antibiotic therapy was also found to be linked to high utilisation of intensive care units (ICUs) and poor survival.

Longer hospital stays and higher ICU utilisation compared with susceptible or uncomplicated infections is a significant driver of higher direct healthcare costs. Importantly, the estimated direct healthcare costs of antibiotic therapy to combat infections are substantially less than the costs associated with common cancer treatments, haematopoietic stem cell transplant or solid-organ transplant; however, these, and the indirect costs to society from reduced societal participation and long-term employment, are not considered as part of analyses to calculate the costs of targeted therapies. Further research into the broader cost impacts of antibiotic use is needed within the context of vulnerable patient groups, such as in oncology and transplantation, for payors and policy makers to better understand the cost-effectiveness of different antibiotic drugs and infection management practises.

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Table 1.

Calls to action:
There is a need for greater education of clinicians across oncology and transplant to support the use the appropriate empiric antibiotic therapy tailored towards the patient and local epidemiology
Rapid diagnostics are needed to support optimal escalation and de-escalation of targeted therapy
Cost-effectiveness studies are needed to examine the indirect costs to patients and society that are not typically considered in existing cost analyses

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