

How Antimicrobial Resistance Threatens Cancer Care: Uncovering a Growing Crisis

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Executive Summary

Antimicrobial resistance (AMR) represents an escalating and underrecognized threat to oncology care. This white paper presents the outcomes of the international roundtable webinar “How AMR Threatens Cancer Care,” which was organized by AMR Insights and BD (Becton, Dickinson and Co.) and was held on 25 June 2025. The event brought together global experts to discuss key findings from recent large-scale studies published in *Lancet Oncology*, *Cancer Medicine*, and additional supporting literature. The data presented demonstrate that AMR disproportionately impacts cancer patients. Through expert analyses and real-world insights, this white paper emphasizes the urgent need for enhanced stewardship, advanced diagnostics, informed policy, and international collaboration to address the growing challenge.

1. Introduction

Infections remain a leading cause of morbidity and mortality among cancer patients, many of whom are immunocompromised due to chemotherapy and other medical interventions. The global rise in antimicrobial resistance complicates infection management by reducing the effectiveness of standard therapies. This situation leads to prolonged hospital stays, increased healthcare costs, and higher mortality rates. Despite its significant implications, AMR remains largely absent from mainstream oncology discourse, clinical guidelines, and large-scale cancer research. This white paper seeks to address this gap by highlighting the gravity of AMR in cancer care.

2. The Challenge: AMR in Cancer Care

Cancer patients are particularly vulnerable to infections due to their compromised immune systems and frequent exposure to healthcare environments. They often undergo invasive procedures and receive broad-spectrum antibiotics, all of which increase their risk of acquiring antimicrobial-resistant infections. However, AMR is not adequately recognized in oncology settings, which results in a lack of tailored prevention and treatment strategies.

Recent multicenter studies led by Vikas Gupta provide compelling evidence of the increased burden of AMR in cancer patients. These studies confirm that AMR rates are significantly higher in both hospital and outpatient settings among cancer patients compared to non-cancer populations. Additional findings from Sallah et al. and Shropshire et al. further underscore the scope and severity of AMR in oncology, especially in pediatric and hematologic malignancy populations. The combined

evidence emphasizes the urgent need for oncology care to integrate AMR mitigation strategies into routine practice.

3. Key Findings from the Publications

Several pivotal studies form the evidence base presented during the roundtable:

- Gupta et al. (2024), published in *Cancer Medicine*, investigates AMR in inpatient settings.
- Gupta et al. (2025), published in *Lancet Oncology*, explores the outpatient AMR burden.
- Sallah et al. (2025), published in *Lancet Oncology*, highlights AMR burden in children, adolescents, and young adults with hematologic malignancies.
- Shropshire et al. (2025), published in *Lancet Oncology*, discusses risk factors and outcomes of bloodstream infections among hospitalized patients with hematologic malignancies.

These studies collectively reveal that AMR rates are substantially higher in cancer patients, with outpatient resistance rates in some cases being even more alarming than inpatient rates. Sallah et al. highlight that bloodstream infections in young cancer patients are associated with considerable morbidity due to AMR, while Shropshire et al. emphasize the consequences of inadequate empirical treatment in immunocompromised patients.

The data further reveal that resistance is most prominent among gram-negative pathogens, particularly in urine and blood samples. High prevalence rates of vancomycin-resistant *Enterococcus* (VRE) and fluoroquinolone-resistant organisms were also observed. Notably, the use of incidence rates (/1000 admissions) rather than resistance proportions (% non-susceptible) shows a more accurate and concerning picture of the AMR burden in cancer care in hospitalized patients.

4. Overview of Webinar Slides

The roundtable session began with a data-rich presentation by Dr. Vikas Gupta, which provided a visual foundation for the discussion that followed. His slides highlighted key findings from the published studies and presented comparative analyses of AMR rates in cancer versus non-cancer populations.

The presentation showed that when AMR in hospitalized patients across 168 US facilities was evaluated using traditional antibiogram metrics (% non-susceptible), hospitalized cancer patients exhibited either similar or slightly elevated resistance rates for select pathogens, such as multidrug-resistant *Enterobacteriales* (MDR ENT), extended-spectrum beta-lactamase producers (ESBL+), and vancomycin-resistant *Enterococcus* (VRE). However, when assessed by incidence rates per 1,000 admissions, AMR was consistently higher, 1.5 – 2 X increase, in cancer patients for nearly all pathogen-drug combinations evaluated.

Outpatient data, drawn from a US nationwide multicenter study, revealed that cancer patients had significantly higher resistance rates than their non-cancer counterparts across multiple sources and pathogens. Particularly alarming were the findings in blood and urine cultures. In blood, fluoroquinolone-resistant and ESBL+ pathogens, as well as VRE, were markedly more prevalent in cancer outpatients. In urine samples, cancer outpatients exhibited elevated resistance to

carbapenems, fluoroquinolones, ESBL-producing organisms, methicillin-resistant *Staphylococcus aureus* (MRSA), and VRE.

Dr. Gupta concluded his presentation by summarizing that AMR occurs more frequently in cancer patients, especially in the outpatient setting where resistance was up to 3 X higher. The presentation emphasized the importance of adapting stewardship and diagnostic efforts to this high-risk patient population and encouraged institutions to build upon this foundational research through local surveillance and intervention strategies.

5. Expert Perspectives and Analysis

The roundtable brought together international experts from academia, clinical practice, and microbiological research, each providing a unique lens on the complex intersection between AMR and oncology.

Dr. Debbie Goff, an infectious disease pharmacist and global stewardship expert, highlighted the transformative implications of the recent data. She emphasized the underestimated burden of AMR in outpatient settings, pointing out that the trend of shifting cancer care from inpatient to outpatient environments has not reduced infection risks as previously assumed. Dr. Goff advocated for developing cancer-unit-specific antibiograms to detect AMR patterns more precisely. She also stressed the importance of diagnostic stewardship, urging healthcare systems to implement rapid diagnostic testing in ambulatory care settings, where empiric prescribing is most vulnerable to failure.

Dr. Margaret Lubwama, a clinical microbiologist at Makerere University College of Health Sciences, presented findings from Uganda that align with the global data. She underscored that AMR rates among cancer patients in sub-Saharan Africa are significantly high, with over 80% of ESBL-producing *E. coli* showing resistance to fluoroquinolones and other front-line antibiotics. Dr. Lubwama's research extended to environmental swabbing in oncology wards, revealing the presence of multidrug-resistant organisms on surfaces such as toilet bowls, which suggests potential transmission via environmental reservoirs. Her proposed next steps include whole genome sequencing to identify cross-transmission routes, co-designing infection prevention protocols with hospital staff, and integrating community stakeholders in policy formulation.

Dr. Afreenish Amir, a medical microbiologist, speaking from her experience in Pakistan's national AMR surveillance initiatives, stressed the importance of comprehensive metadata in AMR analysis for cancer patients. She emphasized that understanding the context—hospitalization history, antibiotic usage, immune status, and facility type—is critical for policy relevance. Dr. Amir proposed a framework linking microbiological data with antimicrobial usage and outcome indicators to inform empirical treatment guidelines, essential medicines lists, and national stewardship strategies. She also called for alignment with global AMR initiatives such as GLASS and the WHO Research Agenda on Human Health.

Dr. Vikas Gupta, lead author of the foundational studies and a Senior Director, Clinical Affairs (Q-linea), emphasized the strategic decision to publish in oncology journals. He noted that traditional infectious disease channels fail to reach the oncology community, where AMR awareness is often limited. By engaging oncologists directly through their literature and professional networks, Dr. Gupta and colleagues aim to foster recognition of AMR as an oncologic risk factor. He encouraged replication of these studies in other countries, particularly LMICs, to broaden the evidence base. He

also called for coordinated international efforts to monitor AMR trends in oncology and adapt stewardship practices accordingly.

Finally, Diane Flayhart, Director, Global Public Health at BD, who moderated the session, concluded by reinforcing the importance of interdisciplinary collaboration. She praised the integration of diagnostic and therapeutic perspectives and highlighted the role of data transparency and targeted publication strategies in raising awareness. The roundtable served not only to disseminate new data but also to galvanize a global call to action for safeguarding cancer care against the rising tide of antimicrobial resistance.

6. Recommendations

Based on the discussion and data presented, several recommendations emerge for various stakeholders. Healthcare institutions should prioritize the development of oncology-specific antibiograms and implement rapid diagnostic testing, especially in outpatient settings. They should also regularly audit antibiotic use in cancer treatment pathways to ensure appropriate prescribing.

Policymakers and global health organizations need to incorporate AMR into cancer control programs and fund multicenter studies in low- and middle-income countries (LMICs). Incorporating the voices of patients impacted by AMR into the development of the programs and studies will help to engage the public. National AMR strategies should align with cancer care objectives to better protect vulnerable populations.

For researchers and institutions, there is a pressing need to evaluate AMR data using incidence rates in addition to resistance proportions. Environmental surveillance should be expanded to detect and address potential transmission routes. Furthermore, efforts should be made to engage oncology communities through conferences and academic publications to raise awareness and promote interdisciplinary collaboration.

7. Conclusion

Antimicrobial resistance is a growing threat to cancer care, presenting challenges that extend across treatment, prevention, and policy domains. The data and discussions from the roundtable underscore the need for an integrated response that brings together infectious disease specialists, oncologists, microbiologists, and policymakers. Only through collaboration, research, and strategic action can we ensure that cancer patients are protected from the life-threatening complications of AMR.

8. References

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 5. AMR Insights Webinar: How AMR Threatens Cancer Care. AMR Insights, June 25, 2025. <https://www.amr-insights.eu/roundtable-how-amr-threatens-cancer-care/>
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Appendix

A full recording of the webinar and presentation slides are available through the AMR Insights website. This white paper was developed as a collaborative outcome of the panelists and organizers of the webinar. The initiative was jointly led by AMR Insights and BD (Becton, Dickinson and Co.).