



BD Global Public Policy Position

## **Controlling Antimicrobial Resistance**

**ISSUE:** Antimicrobials are a mainstay of modern medicine, but decades of outmoded prescribing practices as well as their use in the food supply have driven a rise in organisms that are resistant to these life-saving drugs. Improvements in clinical and laboratory practices, combined with effective deployment of medical technology can help to ensure antimicrobials are utilized appropriately, reducing risk to patients and lowering costs associated with drug resistance.

### **Antimicrobial resistance is increasing rapidly worldwide**

Decades ago, shortly after the discovery and initial use of antimicrobials, resistant bacteria were identified, but cases were rare and frequently alternative, effective drugs were available. Today, drug-resistant organisms are common and widespread, and the pace of new antimicrobial development to replace ineffective treatment has been slow. As a result, approximately 700,000 people die every year because they have been infected with a drug-resistant pathogen<sup>1</sup>. The annual figure is projected to grow to 10 million deaths by 2050, making antimicrobial resistance (AMR) among the leading causes of death, greater than cancer<sup>2</sup>.

Fundamental change is required in the way that antimicrobials are prescribed and consumed in order to preserve the usefulness of existing products and to reduce the urgency of discovering new ones. To slow the spread of antimicrobial resistance and to ensure that the right drug is delivered to the right patient at the right time, medical technology that can enable prevention of the spread of infections as well as accurate diagnosis and treatment must be incorporated across the continuum of care.

### **Preventing and controlling infection is a crucial starting point**

Preventing the occurrence and spread of infections is the first line of defense in addressing AMR. Investments in improved water and sanitation are critical components of community-based prevention. Screening tests can be used in healthcare facilities when patients are admitted to determine if they are carrying a drug resistant organism helping to control transmission. Further, the spread of resistant organisms in healthcare facilities can be prevented when comprehensive infection prevention practices are followed.

Organisms that cause infections can live on a variety of surfaces in healthcare settings, including on unwashed hands as well as on medical equipment that both patients and healthcare workers touch. As a result, these deadly organisms can be easily transmitted and cause healthcare-associated infections (HAIs). The World Health Organization<sup>3</sup>, national public health agencies<sup>4</sup> and professional societies<sup>5</sup> have summarized the core components of infection prevention and control programs necessary to address the transmission of HAIs. All healthcare facilities need to follow these essential procedures to prevent the spread of infections and resistant organisms. In addition, depending on the setting of care and type of procedure, specific evidence-based interventions enabled by medical technologies should be deployed.

The risk of infections due to resistant organisms, both in healthcare settings and in the wider community, fuels the use of multiple and, frequently, broad spectrum antimicrobials, which in turn drives further antimicrobial resistance. Even with the development of new antimicrobials that enable treatment of once drug-resistant infections, organisms will continue to evolve and develop resistance. Therefore, preventing the spread of infection will always be a crucial component of controlling AMR.

### **Accurate diagnosis is essential to reducing misuse of antimicrobials**

Empirical decision-making (based on clinical observation and prior experience) will often result in patients quickly receiving potentially effective antimicrobials, but it is also a major driver of unnecessary use. These prescribing decisions, which are often grounded in limited diagnostic information, contribute significantly to the misuse of these important drugs.

Diagnostic tests can identify the organism causing the infection and also permit providers to distinguish between infections requiring antimicrobial treatment and those that do not, such as viral infections for which antibiotics are frequently empirically prescribed. Once the infective organism has been identified, diagnostic tests can also determine which specific antimicrobials are effective and can guide the physician in appropriate drug choice and dosage.

However, because there is a lag between the empiric prescribing decision and the availability of some test results, clinicians regularly prescribe antimicrobials before the organism causing the infection has been accurately identified and its susceptibility to antimicrobials determined. Once an antimicrobial has been prescribed, diagnostics should be consistently used to reexamine drug treatment plans. New rapid diagnostic tests for bacterial infections, which allow doctors to identify the cause of an infection in minutes instead of hours or days, have the potential to transform the treatment process from an empirical one to a precise one.

### **Surveillance plays an instrumental role in controlling antimicrobial resistance**

Control of antimicrobial resistance requires surveillance to ensure that the appropriate therapy is provided to patients. Surveillance tools can streamline identification of patients at greatest risk of antimicrobial resistance by assimilating information generated by a variety of sources as part of routine care. The near real-time availability of these data can enable clinicians to make more targeted empiric decisions to optimize antimicrobial use. It is also critical for healthcare facilities to collect and aggregate data on antimicrobial use and resistance to drive the organizational change required to address unnecessary and inappropriate use of antimicrobials.

In addition, surveillance tools can be used to create an early warning system to detect HAI cases before an outbreak occurs, so that action can be taken to prevent or gain rapid control of an outbreak. These surveillance systems also allow for timely identification of lapses in infection prevention practices and elimination of those breakdowns. Electronic surveillance systems enable healthcare facilities to transmit data to public health authorities in order to monitor local, regional and national trends.

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In our effort to advance the world of health, BD supports the following policy objectives that are aligned with best practices to control antimicrobial resistance and build on our position on prevention and control of HAIs<sup>6</sup>.

1. **Raise awareness and advance prescribing and treatment guidelines**
  - a. ***Raise awareness*** of the critical importance of antimicrobial resistance and the role of medical technology in addressing this public health challenge
  - b. ***Advance guidelines*** for prescribing antimicrobials and using medical technology to prevent, diagnose and treat infections in order to inform care delivery and identify opportunities for modification of therapy
2. **Prevent the spread of infections**
  - a. ***Require surveillance and reporting of infections and emerging pathogens*** within healthcare facilities and the community
  - b. ***Establish comprehensive infection prevention and control programs*** in healthcare facilities to reduce the incidence of healthcare-associated infections and spread of antimicrobial resistant pathogens
  - c. ***Ensure adequate incentives and payment policies*** to support cost-effective technologies to prevent and diagnose infections and ***promote quality measures*** linked to financial rewards and penalties to build capacity to prevent infections in healthcare facilities
3. **Ensure accurate diagnosis and treatment of patients**
  - a. ***Implement diagnostic test protocols*** to identify and confirm the type of infection, enabling physicians to tailor treatment and potentially decrease reliance on broad-spectrum antibiotics, and ***promote development of Sepsis detection programs*** to reduce time to actionable result
  - b. ***Deploy antimicrobial susceptibility tests*** (AST) to ensure the appropriate use of all available antimicrobials
  - c. ***Incentivize innovation in infectious disease diagnostics*** in order to improve speed and accuracy and move testing and decision making closer to the point of care
4. **Monitor antimicrobial use and resistance**
  - a. ***Establish antimicrobial stewardship programs*** covering all settings of care in order to reduce antimicrobial overutilization and the emergence of resistance
  - b. ***Adopt electronic surveillance technologies*** to monitor resistance trends and to drive adherence to critical components of effective antimicrobial stewardship

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<sup>1</sup> Review on AMR, *Antimicrobial resistance: Tackling a crisis for the health and wealth of nations*, 2014.

<sup>2</sup> Review on AMR, *Tackling drug-resistant infections globally: Final report and recommendations*, 2016.

<sup>3</sup> World Health Organization, *Core components for infection prevention and control programmes*, 2008

<sup>4</sup> Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings <http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf>

<sup>5</sup> Deborah S. Yokoe, Deverick J. Anderson, Sean M. Berenholtz, David P. Calfee, Erik R. Dubberke, Katherine D. Eilingson, Dale N. Gerding, Janet P. Haas, Keith S. Kaye, Michael Klompas, Evelyn Lo, Jonas Marschall, Leonard A. Mermel, Lindsay E. Nicolle, Cassandra D. Salgado, Kristina Bryant, David Classen, Katrina Crist, Valerie M. Deloney, Neil O. Fishman, Nancy Foster, Donald A. Goldmann, Eve Humphreys, John A. Jernigan, Jennifer Padberg, Trish M. Perl, Kelly Podgorny, Edward J. Septimus, Margaret VanAmringe, Tom Weaver, Robert A. Weinstein, Robert Wise and Lisa L. Maragakis (2014). A Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals: 2014 Updates. *Infection Control & Hospital Epidemiology*, 35, pp S21-S31.

<sup>6</sup> BD Global Public Policy Position: Prevention and Control of Healthcare-Associated Infections (HAIs), April 2011.