



## PREVENTION OPPORTUNITIES UNDER THE BIG SKY

### SURVEILLANCE FOR ANTIMICROBIAL RESISTANCE IN MONTANA

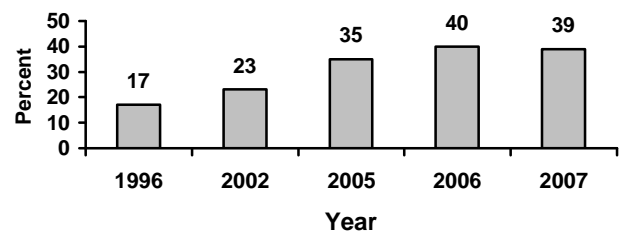
After discovery in the late 1920's, antimicrobial agents (antibiotics) transformed the ability of clinicians to reduce illness and death from infectious diseases. Unfortunately, many bacteria that cause infections of public health importance such as pneumonia, diarrheal diseases, and tuberculosis have become resistant to many of the primary antimicrobials used to treat them. The emergence and spread of antimicrobial resistance (AMR) is now threatening the ability of clinicians to treat infections and save lives; the World Health Organization has deemed AMR as one of the world's most pressing public health problems.

**Surveillance – Measuring the Problem** While AMR was once thought to be a problem confined to a small percentage of hospitalized patients, it now raises a frequent clinical dilemma for medical practitioners as well as poses a growing public health problem. To address the pressing public health issue, several federal agencies developed “A Public Health Action Plan to Combat Antimicrobial Resistance”.<sup>1</sup> A top priority specified in the Action Plan is to implement surveillance for AMR. Surveillance is essential to provide an early warning of emerging problems, monitor changing patterns of resistance, and target and evaluate prevention and control measures.

**Surveillance in Montana** Since 1996, the Montana Public Health Laboratory (PHL) has used laboratory surveys, including requests for antibiograms from all laboratories known to perform antimicrobial susceptibility testing (AST), to establish surveillance for AMR. The results of the surveys and antibiograms have been aggregated into a statewide antibiogram by staff from laboratory and communicable disease epidemiology programs at DPHHS. This work has facilitated the Montana National Laboratory System (NLS) Program and supported the Montana Antimicrobial Resistance Awareness (MARA) Program. The state-level antibiogram can provide an important perspective for Montana clinicians and public health practitioners. Because the state-level antibiogram represents the results of individual bacteriologic cultures, some of which may be duplicate or follow-up cultures for the same individual patient infection, the data should be used from the surveillance perspective only and not for making decisions regarding antimicrobial therapy for an individual patient. Clinicians should review AMR profiles maintained at local hospitals and consult with infectious disease specialists in order to make informed decisions for antimicrobial choice for individual patients.

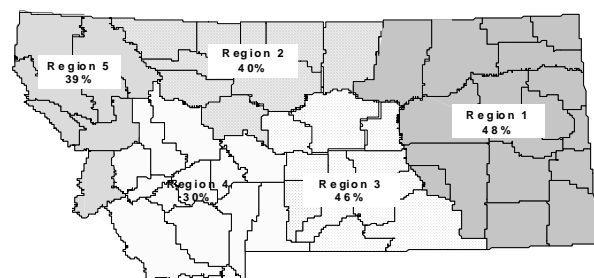
**A Clinical and Public Health Intersection: MRSA** Methicillin-resistant *Staphylococcus aureus* serves as a “poster child” for the clinical and public health AMR intersection. MRSA infections have been recognized as a problem both in health care settings and, more recently, in the community. The statewide antibiogram indicates that Montana, like the nation, has experienced an increase in the proportion of clinical *S. aureus* isolates documented to be resistant to methicillin (Figure 1).<sup>2</sup>

Figure 1. Proportion of *Staphylococcus aureus* isolates resistant to methicillin (MRSA) reported by clinical laboratories, Montana, 1996-2007



The proportion of *S. aureus* documented to be MRSA has varied by geographic region in Montana (Figure 2).

Figure 2. Proportion of *Staphylococcus aureus* isolates resistant to methicillin (MRSA) by Health Planning Region, Montana, 2006



These differences among regions allow public health and health care providers an opportunity to investigate AMR patterns further and potentially to target intervention and prevention strategies.

**Cooperation for Control and Prevention** While the factors driving AMR are diverse and multifactorial, most researchers agree that inappropriate use of antimicrobials is the major driver of escalating resistance. Inappropriate use includes not only using antimicrobials when they are not indicated (e.g., viral infections), but also inappropriate duration of therapy, improper dose, or even use of the wrong antimicrobial agent. Tools to promote appropriate use of antimicrobials have been developed to assist clinicians, patients, veterinarians, agricultural producers, and public health officials. Prescribers are encouraged to work closely with microbiology laboratories, infection control practitioners, and

infectious disease specialists. Local susceptibility or antibiogram data should be readily available to clinicians.

Laboratory staff that perform antimicrobial susceptibility testing must be properly trained and aware of current testing practices to provide high quality information for both individual patient care and public health surveillance. The Montana PHL has been working with clinical laboratories to facilitate proper antibiogram data collection, especially in small, rural laboratories where organizing AMR data manually is a challenge. In addition, training workshops are provided to laboratory professionals in Montana to help these professionals stay current on changes in laboratory AMR testing practices.

#### **Recommendations for the detection, prevention, and control of antimicrobial resistance**

- Stay familiar with local, state, and national surveillance information in order to make good clinical decisions.
- Review guidelines which are available for providers, patients, veterinarians, agricultural producers, and public health practitioners. Guidelines and other information are available at:

Montana Antimicrobial Resistance Awareness Program <http://mara.mt.gov/mara-index.shtml>

Montana Public Health Laboratory <http://healthlab.hhs.mt.gov>

Montana DPHHS Communicable Disease Epidemiology <http://cdepi.hhs.mt.gov>

For more information or 24/7 consultation, contact the Public Health Laboratory at 800-821-7284 or the Montana Antimicrobial Resistance Awareness Program, Communicable Disease Epidemiology Section, at 406-444-0273.

#### References:

1. Interagency Task Force on Antimicrobial Resistance. A public health action plan to combat antimicrobial resistance; Part 1: Domestic Issues. CDC. 1999; 1-46. <http://www.cdc.gov/drugresistance/actionplan/index.htm>
2. Centers for Disease Control and Prevention. Community-Associated MRSA Information for the Public. 2008. [http://www.cdc.gov/ncidod/dhqp/ar\\_MRSA\\_ca\\_public.html#5](http://www.cdc.gov/ncidod/dhqp/ar_MRSA_ca_public.html#5)

---

2,600 copies of this public document were published at an estimated cost of \$0.45 per copy, for a total cost of \$1,170.00, which includes \$403.00 for printing and \$767.00 for distribution.



1400 Broadway  
Helena, MT 59620-2951  
Anna Whiting Sorrell, Director, DPHHS  
Steven Helgerson, MD, MPH, State Med. Officer  
Jane Smilie, MPH, Administrator, PHSD  
Mail Stop: 69078