

The Wisconsin Antibiotic Resistance Network (WARN)

Five years of improving antimicrobial prescribing in Wisconsin

by Steven C. Ebert, PharmD; Mary Jo Knobloch, MPH; and Edward Belongia, MD

In a 2003 report on microbial threats to health, the Institute of Medicine declared, “The world is facing an imminent crisis in the control of infectious diseases as the result of a gradual but steady increase in the resistance of a number of antimicrobial agents to available therapeutic drugs.”¹ There is strong evidence to support this statement. In the past two decades we have seen the dramatic emergence of multi-drug resistant *Streptococcus pneumoniae* infections in the United States. Fluoroquinolone resistant pneumococcal strains are emerging, with the potential to limit treatment options for patients with serious infections.² In Wisconsin, 22% of invasive pneumococcal isolates had reduced susceptibility to penicillin in 2003, and 10% of isolates were multi-drug resistant. Methicillin-resistant *Staphylococcus aureus* (MRSA) infections have increased in prevalence, and there have been increasing reports of

strong and consistent link between antibiotic use and the development of antimicrobial resistance at the individual and population level.⁷⁻¹² Inappropriate use of antibiotics for bronchitis and other viral infections has been widely documented, although trends suggest a modest decline in outpatient antibiotic prescribing.¹³ At the same time, outpatient use of newer, broad spectrum antibiotics has increased substantially, which may shorten the useful life span of these agents.¹³ The magnitude of over-prescribing is huge: unnecessary antibiotics account for 55% of all antibiotics prescribed for acute respiratory infections, at a cost of over \$700 million.¹⁴

Physician and public education can improve antimicrobial prescribing, as shown in a study conducted in northern Wisconsin communities in the late 1990s.¹⁵ This work was extended statewide in 1999 when the Wisconsin Antibiotic Resistance Network (WARN) was formed.

From 1999-2003, the Centers for Disease Control and Prevention (CDC) funded the Marshfield Clinic Research Foundation to design, implement and evaluate a statewide judicious use campaign as part of a

national strategy. Edward Belongia, MD collaborated with the Wisconsin Medical Society and the Wisconsin Division of Public Health to lead the way nationally with the development of WARN.

Utilizing CDC funds and additional funds from the Wisconsin Division of Public Health’s Epidemiology and Laboratory Capacity program, WARN developed and implemented multifaceted educational interventions targeting clinicians,

Since the inception of WARN, the median percent of patients reported to have requested an antibiotic declined by 40% in Wisconsin.

MRSA infections in healthy community-dwelling adults and children, including fatal infections in healthy children.³⁻⁵ In 2002, the first infections caused by vancomycin-resistant *S. aureus* (VRSA) were detected in the United States.⁶ Given these alarming trends, it is entirely appropriate that the Healthiest Wisconsin 2010 report lists antibiotic resistance as a key issue to be addressed in this state.

Multiple studies have demonstrated a



Who are these characters anyway?

These friendly and colorful characters are Annie Biotic and Moxie Cillin (the Anti-Bs) created in the first year of WARN to serve as part of the logo and as identifiers of the program. Moxie (left) and Annie (right) have served as program “representatives” for over five years and are found on all WARN educational materials. Annie and Moxie have also appeared as real-life characters at numerous day care centers around the state, on WARN television public service announcements and even in parades and at festivals!

the general public and parents of young children. Public education efforts included the development and distribution of educational materials, presentations at 170 child care centers throughout the state, annual mailing to all licensed group and family child care centers, media campaigns and Web site development.

Clinician education efforts included the development and distribution of WARN Clinical Practice Fact Sheets for Respiratory Illness, the annual pneumococcal susceptibility report, annual mailing to approximately 9,000 primary care providers, two statewide satellite conferences, professional presentations by WARN speakers bureau members and detailing conferences targeting clinicians and managed care pharmacists.

WARN’s transition into a coalition began with a summit held in October

2002 to gather stakeholders and WARN partners from around the state. Over 40 health care professionals representing insurers, clinic systems, public health, professional organizations (including PSW), and medical schools attended the summit. Fourteen individuals volunteered as Governing Council members, and workgroups were formed to accomplish both public education and clinical goals.

Accomplishments since the formation of a coalition (December 2003) include a sustained level of information dissemination, presentations and displays at conferences, Web enhancement, and regular workgroup meetings. The clinician education workgroup just recently developed a new WARN educational item highlighting prescribing guidelines for specific illnesses.

WARN also collaborated with the UW Medical School and Gundersen Lutheran, Inc. to develop and implement a conference focused on emerging infectious disease issues in long-term care facilities. Over 200 clinicians attended the meeting in May 2004. In addition, the WARN speakers bureau, consisting of WARN Governing Council members, presents WARN information to both clinical and general public audiences on a regular basis.

How effective have WARN's efforts been in reducing antimicrobial use in Wisconsin? The answer to date is "mixed." Using physicians in Minnesota as a comparison group, Belongia and colleagues conducted a survey of primary care physicians to measure the percent of patients who request an antibiotic for acute upper respiratory infections. From 1999 (prior to WARN) to 2002 (after WARN implementation), the median percent of patients reported to have requested an antibiotic declined by 40% in Wisconsin, compared with 25% in Minnesota. This suggests that WARN's message about unnecessary antibiotic use was being received by patients.¹⁶ A follow-up study used IMS data to measure primary care physicians' prescribing rates of all antibiotics and broad-spectrum antibiotics between 1999 and 2002. Prescribing rates of all antibiotics in Wisconsin and Minnesota declined equally; likewise, prescribing rates for broad-spectrum antibiotics remained unchanged in both states.¹⁷ This suggests that further efforts specifically aimed at

prescribers are needed to reduce unnecessary use of antibiotics.

Although studies in different populations have shown a modest impact from multifaceted educational interventions, relatively little work has been done to systematically develop and implement organizational (managed care) policies that promote improved antibiotic prescribing practices. We have also found that many managed care organizations in Wisconsin do not track antibiotic prescribing measures.

In the upcoming years, we hope to extend the many accomplishments of WARN to improve the capacity of managed care organizations to monitor antibiotic prescribing performance, and use this information to assess the impact of interventions that are designed and supported by the clinical leaders of each organization.

The target populations will be the decision-makers at managed care organizations and associated primary care providers. In addition to changing prescribing behavior, an important outcome will be the ability to replicate the process in other managed care organizations, which will ultimately impact on individual patients and statewide antibiotic use. ●



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