

Strengthening United States Response to Resistant Gonorrhea in Wisconsin

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Background

Gonorrhea (GC) is the second most commonly reported notifiable disease in the United States, with more than 500,000 reported cases of gonorrhea per year and an estimated 1.14 million new infections that may actually occur each year. Of these infections, half are found to be **resistant to at least one antibiotic**. Gonorrhea control relies on jurisdictional ability to detect and treat each case of gonorrhea quickly and effectively with the right antibiotic.

In 2013, the **US Centers for Disease Control and Prevention (CDC)** released the first report to look at the burden and threats posed by antibiotic-resistant gonorrhea (ARGC) as one of the three most urgent threats of its kind in the country. As outlined in the **National Action Plan for Combating Antibiotic Resistant Bacteria (CARB)**, the **US Centers for Disease Control and Prevention's Division of STD Prevention (DSTDP)** began supporting new and continuing multipronged activities in fiscal year

2016 to slow the development and spread of ARGC.

Surveillance for Antibiotic Resistant Gonorrhea

In 2016, the Wisconsin Department of Health Services, Division of Public Health, STD Control Section (WI DPH STD), in collaboration with the Milwaukee Health Department and Laboratory (MHDL), competed successfully as one of nine national sites to receive DSTDP CARB funding through the Epidemiology and Laboratory Capacity (ELC) initiative for Strengthening the United States Response to Resistant Gonorrhea (SURRG). To better understand the epidemiologic factors that contribute to resistant gonorrhea, SURRG surveillance activities have been implemented in these nine, high GC morbidity jurisdictions. Activities include collection of specimens for culture and antibiotic susceptibility testing (AST) using Etest, a rapid method for detecting non-susceptible isolates. Two of the four regional laboratories in the Antibiotic Resistant Lab Network (AR Lab Network)

are assigned to receive shared SURRG GC isolates from the MHDL to perform confirmatory AST on a broad panel of antibiotics currently or previously recommended for gonorrhea treatment including but not limited to azithromycin, ceftriaxone, cefixime and gentamycin.

SURRG project staff in Wisconsin also focus efforts to document additional clinical, laboratory and enhanced field investigation data elements, confirm infection resolution in patient cases, test and treat partners and identify local social networks to assess local transmission dynamics and contribute to the development of national guidance and recommendations for an effective public health response to resistant gonorrhea.

MHDL also serves as a sentinel site in Wisconsin for the **Gonococcal Isolate Surveillance Project (GISP)**. This project is limited to sharing isolates and AST data from the MHDL with CDC for the first 25 gonorrhea isolates identified each month among males attending the MHD STD clinic, which also serves as the categorical STD SURRG clinic in Milwaukee.

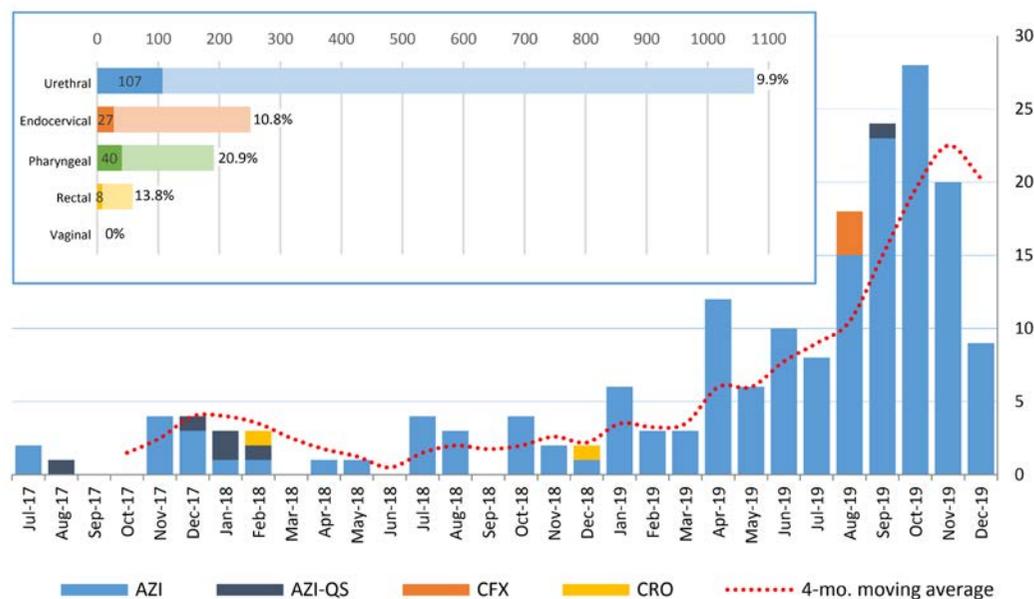


Figure 1: Milwaukee SURRG Clinic Alert and non-Alert Isolates by Month and Specimen Type Top: Total non-alert and alert isolates by anatomical site of infection April 2017-December 2019. Darker bars: alert isolates, Lighter bars: non-alerts. Percent alert by specimen type shown alongside each bar. Bottom: Alert isolates identified in SURRG clinics by month July 2017-December 2019. AZI: Azithromycin; AZI-QS: Azithromycin Quick Send (MIC >16); CFX: Cefixime; CRO: Ceftriaxone

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Monitor Trends

The Wisconsin-Milwaukee SURRG Program engages cross sector collaborations across multiple agencies to maintain the infrastructure needed to implement, maintain and monitor ARGC trends. In Wisconsin, these agencies include five SURRG clinics (one STD clinic and four non-STD community partner clinics) in the city of Milwaukee, MHD, regional reference AR Lab Network and CDC laboratories, DSTDP SURRG Program staff, MHD laboratorians, clinicians, data analysts, field investigation disease intervention specialists, WI DPH STD Program staff, and technical assistance and epidemiologic consultation from the Health Care Education and Training agency (HCET) whose offices are located in Wisconsin and Indiana.

Local data management and analytic activities support quality assurance monitoring, reporting on project performance measures, inform programmatic improvements, and describe social networks to enhance understanding of the transmission dynamics of antibiotic resistant GC in Milwaukee. Clinical, epidemiologic data and laboratory results are evaluated and analyzed locally. Selected SURRG data elements from Milwaukee, WI are transmitted to CDC as one of the 8 SURRG project sites contributing data nationally, to contribute to nationwide susceptibility and resistance patterns and trends..

These robust collaborations have enabled swift use of laboratory and clinical data to improve methods of culture collection and the use of population-specific selective criteria for culture collection to increase detection and recovery rates of gonorrhea isolates for AST. These criteria have expanded local capacity in Milwaukee for prompt detection and response to resistant gonorrhea identified through increased culturing of genital and extragenital sites of sexual activity among men, men who report sex with men (MSM) and symptomatic female patients who are at risk of resistant gonorrhea infection.

During calendar year 2019, twenty percent of patients cultured for gonorrhea in SURRG clinics were identified as having an Alert isolate, defined as a

GC positive specimen with reduced-antimicrobial susceptibility to at least one of the antibiotics recommended for dual treatment of gonorrhea (126 patients with one or more Alert isolates of 620 GC culture positive patients identified in SURRG clinics). Of these patients with Alert isolates, 77% returned for test of cure and partner services in 2019. The majority of non-susceptible isolates (98%) identified in 2019 had reduced susceptibility to azithromycin. To date, no known treatment failures have occurred in Wisconsin.

Next Steps

Maintain capacity: Protocols will be maintained to ensure identification of antibiotic resistant gonorrhea by conducting AST using Etest on at least 15 percent of total reported GC cases in the jurisdiction per year.

- **Provide resources to other jurisdictions:** The MHD Public Health Laboratory will serve as a GC-AST testing site and resource for the state of Wisconsin to integrate GC-culture, AST and test of cure as routine surveillance and intervention practices.
- **Provide flexible sample collection options:** Implementation of self-collect swabs for both genital and extra-genital GC-AST surveillance will increase identification of ARGC in higher risk populations.
- **Implement advanced molecular diagnostic surveillance:** Development of culture-independent GC-AST molecular testing will enhance field investigations for timely identification of social networks to mitigate the spread of GC and ARGC threats locally.
- **Inform clinical and public health partners:** Dissemination of these findings will inform effective clinical and public health practices and interventions to prevent and control transmission of GC and ARGC. ■

References

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ACKNOWLEDGMENTS

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