

## DESCRIPTION

Antibiotics are powerful tools for fighting bacterial illnesses, such as strep throat, but they do not work for viral illnesses like the common cold or flu.<sup>1</sup> Antibiotic resistance is a critical public health issue. Since the 1940s, antibiotics have greatly reduced illness and death from infectious diseases. However, these drugs have been used so widely and for so long that the infectious organisms the antibiotics are designed to kill have adapted to them, making the drugs less effective. Antibiotic resistance is an ever-growing problem in Minnesota, as it is in the rest of the world. Inappropriate use of antibiotics and environmental changes multiply the potential for worldwide epidemics of all types of infectious diseases.<sup>2</sup>

## HOW WE ARE DOING

In 2013, the Centers for Disease Control and Prevention (CDC) published a report outlining the top 18 drug-resistant threats to the U.S. These threats were categorized as: 1) urgent, 2) serious, or 3) concerning. In general, threats assigned to the urgent and serious categories require more monitoring and prevention activities, whereas threats in the concerning category require less.<sup>2</sup> The following describes a selection of drug-resistant threats in Minnesota and Ramsey County.

Carbapenem-resistant Enterobacteriaceae (CRE) and quinolone-resistant Neisseria Gonorrhoeae (QRNG) are both in the “urgent” category. CRE cause a variety of infections including pneumonia, bloodstream, wound and urinary tract infections. CRE have become resistant to all or nearly all the antibiotics we have today. Almost half of hospital patients who get bloodstream infections from CRE bacteria die.<sup>2</sup> In 2016, 19 CRE isolates were identified in Minnesota residents; 47 percent (or nine patients) were residents of Ramsey or Hennepin County.<sup>3</sup>

The emergence of QRNG in recent years has become a particular concern.<sup>4</sup> Due to the high prevalence of QRNG in Minnesota, quinolones are no longer recommended for the treatment of gonococcal infections. Gonorrhea rates are highest in the cities of Minneapolis and Saint Paul, with the incidence in Saint Paul at 271 per 100,000 – 3.9 times higher than the rate in the suburban metropolitan area, and 6.9 times higher than the rate in Greater Minnesota.<sup>5</sup>

Two “serious” threats include Methicillin-resistant Staphylococcus aureus (MRSA) and Streptococcus pneumoniae Invasive Disease. An increasing number of patients are being seen with skin infections caused by Staphylococcus aureus bacteria that are resistant to many antibiotics. Rates of MRSA have dropped in Ramsey County since 2007 when the rate was 20.9 per 100,000 people, with a rate of 11.6 in 2016. Despite this general decline, there were 21 deaths from MRSA in 2016 in Hennepin and Ramsey counties; 12 of which were in people 70 years of age or older.<sup>6</sup>

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## Information to note

- Antibiotics prescribed for acute respiratory infections in kids younger than 15 years of age account for 58% of all antibiotics prescribed.
- The rate of MRSA in Ramsey and Hennepin County has dropped from a high of 20.9 per 100,000 in 2007 to 11.6 in 2016.

<sup>1</sup> About Antimicrobial Use and Resistance. Minnesota Department of Health. <http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/basics/basics.html>. Accessed March 7, 2018.

<sup>2</sup> Antibiotic / Antimicrobial Resistance. Centers for Disease Control and Prevention. <https://www.cdc.gov/drugresistance/>. Accessed March 5, 2018.

<sup>3</sup> Carbapenem-resistant Enterobacteriaceae, 2016. Minnesota Department of Health. <http://www.health.state.mn.us/divs/idepc/newsletters/dcn/sum16/cre.html>. Accessed February 27, 2018.

<sup>4</sup> Annual Summary of Communicable Diseases Reported to the Minnesota Department of Health, 2016. Minnesota Department of Health. <http://www.health.state.mn.us/divs/idepc/newsletters/dcn/sum16/2016dcn.pdf>. Accessed February 27, 2018.

<sup>5</sup> Sexually Transmitted Diseases, 2016. Minnesota Department of Health. <http://www.health.state.mn.us/divs/idepc/newsletters/dcn/sum16/std.html#gonorrhea>. Accessed August 6, 2018.

<sup>6</sup> Invasive Bacterial Disease Surveillance Report, 2016. Minnesota Department of Health. <http://www.health.state.mn.us/divs/idepc/dtopics/invbacterial/invbacrpt16.pdf>. Accessed February 7, 2018.

Pneumococcal disease is an infection caused by a type of bacteria called *Streptococcus pneumoniae*. It can cause pneumonia, bloodstream infections, and meningitis. In 2016, 485 (8.8 per 100,000) cases of invasive pneumococcal disease were reported across Minnesota. Pneumonia occurred most frequently (48% of infections), followed by bacteremia without another focus of infection (30%), septic shock (9%), and meningitis (6%). Forty-seven (10%) individuals died.<sup>7</sup>

## DISPARITIES

Antibiotics prescribed for acute respiratory infections in kids younger than 15 years of age account for 58% of all antibiotics prescribed, yet most of these acute respiratory infections do not require antibiotic treatment.<sup>1</sup>

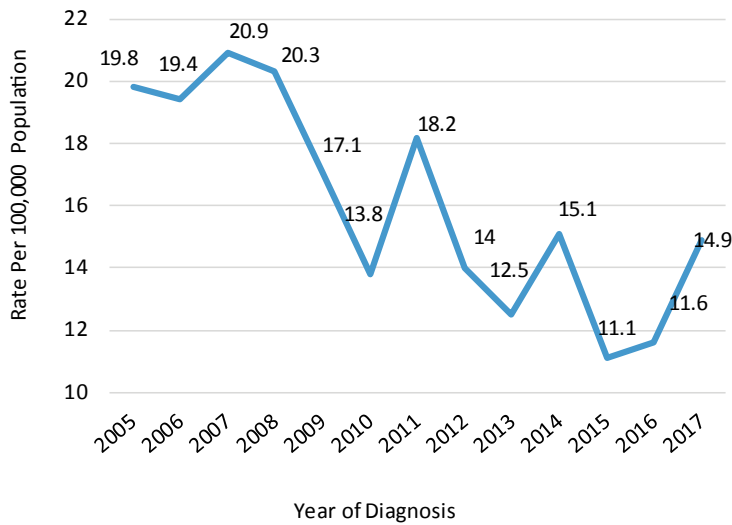
## RISK FACTORS

Many infections are acquired through exposure at hospitals and healthcare facilities. Bacteria can be spread from patient to patient on unclean hands or through unclean equipment.<sup>8</sup>

## WHAT RAMSEY COUNTY GOVERNMENT IS DOING

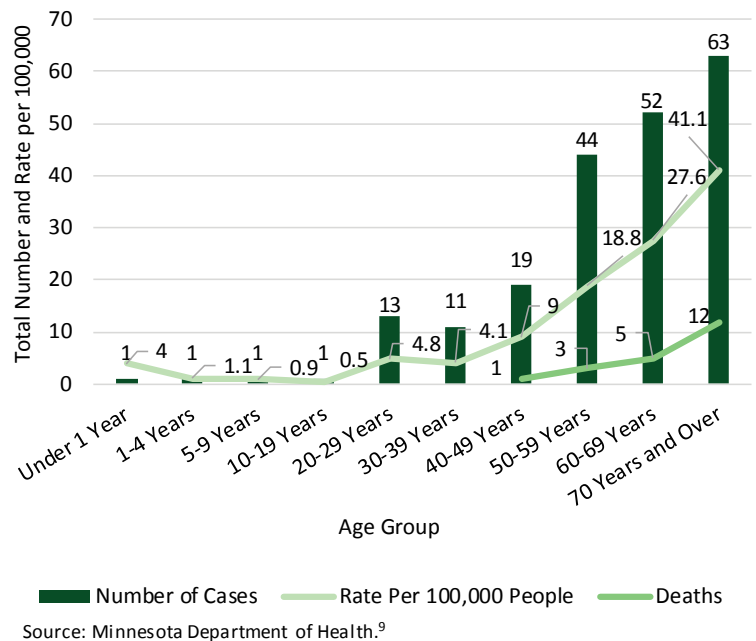
Surveillance of antibiotic-resistant infections is conducted by the Minnesota Department of Health (MDH), not counties. This surveillance facilitates the timely identification of people in need of immediate treatment. In 2015, MDH partnered with the Minnesota Department of Agriculture (MDA), Board of Animal Health (BAH), Minnesota Pollution Control Agency (MPCA), and partners in industry, academia, and professional associations and boards to establish a steering committee focused on promoting judicious antibiotic use in Minnesota.

Rate of Invasive MRSA Disease, Ramsey and Hennepin Counties 2005 - 2016



Source: Minnesota Department of Health.<sup>9</sup>

Invasive MRSA Disease by Age Group Ramsey and Hennepin Counties, 2016



Source: Minnesota Department of Health.<sup>9</sup>

<sup>7</sup> *Streptococcus pneumoniae* Invasive Disease, 2016. Minnesota Department of Health. <http://www.health.state.mn.us/divs/idepc/newsletters/dcn/sum16/spneumo.html>. Accessed February 27, 2018.

<sup>8</sup> Infections Acquired in the Hospital. Minnesota Hospital Quality Report. <http://www.mnhospitalquality.org/#/consumer/hospitals/infographic/15>. Accessed February 7, 2018.

<sup>9</sup> Source: Invasive Bacterial Disease Surveillance Report, 2016. Minnesota Department of Health Web site. [http://www.health.state.mn.us/divs/idepc/dtopics/inv\\_bacterial/invbacprt15.pdf](http://www.health.state.mn.us/divs/idepc/dtopics/inv_bacterial/invbacprt15.pdf). Accessed November 8, 2017.