

Antimicrobial Susceptibilities of Selected Pathogens, 2007



Sampling Methodology

- † all isolates tested
- ‡ ~10% sample of statewide isolates received at MDH
- § isolates from a normally sterile site

	<i>Campylobacter</i> spp. 1†	<i>Salmonella</i> Typhimurium 2†	Other <i>Salmonella</i> serotypes (non-typhoidal) 2†	<i>Shigella</i> spp. †	<i>Neisseria gonorrhoeae</i> 3	<i>Neisseria meningitidis</i> 4†§	Group A <i>Streptococcus</i> 5†§	Group B <i>Streptococcus</i> 6†§	<i>Streptococcus pneumoniae</i> 7†§	<i>Mycobacterium tuberculosis</i> 8†
Number of Isolates Tested	79	147	51	24	361	22	160	292	615	176

% Susceptible

β-lactam antibiotics	amoxicillin									92	
	ampicillin		56	98	29			100	100		
	penicillin					4	100	100	100	80	
	cefixime					100					
	cefuroxime sodium									89	
	cefotaxime							100	100	91	
	ceftriaxone		95	98	100	100	100			91	
	meropenem						100			90	

Other antibiotics	ciprofloxacin	78 ¹	99	100	100	91	100				
	levofloxacin						100	99	99	99	
	azithromycin	97				98	100				
	erythromycin	95						91	61	79	
	clindamycin							100/94 ⁵	77/67 ⁶	90	
	chloramphenicol		61	100	92		100			99	
	gentamicin	84									
	spectinomycin					100					
	tetracycline	44					36		94	89	
	trimethoprim/sulfamethoxazole		97	100	79		68			80	
	vancomycin							100	100	100	

TB antibiotics	ethambutol										98	
	isoniazid											90
	pyrazinamide											97
	rifampin						100					98

Trends, Comments, and Other Pathogens

1 <i>Campylobacter</i> spp.	Ciprofloxacin susceptibility was determined for all isolates (n=797). Only 37% of isolates from patients returning from foreign travel were susceptible to quinolones. Most susceptibilities were determined using 2008 CLSI breakpoints for <i>Campylobacter</i> . Susceptibilities for gentamicin and azithromycin were based on an MIC ≤ 2 µg/ml.
2 <i>Salmonella enterica</i> (non-typhoidal)	Antimicrobial treatment for enteric salmonellosis generally is not recommended.
3 <i>Neisseria gonorrhoeae</i>	In 2007, 361 <i>Neisseria gonorrhoeae</i> isolates were tested for antibiotic resistance. 251 (70%) were submitted by the Red Door Clinic in Minneapolis and 110 (31%) by Room 111 in Saint Paul. 288 isolates were associated with heterosexual transmission, of which 4.5% were resistant to ciprofloxacin. 64 isolates were from men who have sex with men; 28% of these were resistant to ciprofloxacin. In addition, 6 isolates (1.7%) demonstrated reduced susceptibility to azithromycin using provisional breakpoints (zone diameter ≤ 30mm).
4 <i>Neisseria meningitidis</i>	According to CLSI, MICs ≥ 8 µg/ml for nalidixic acid may correlate with diminished fluoroquinolone susceptibility. In 2007, no isolates had an MIC > 2 µg/ml. However, in January 2008, 2 isolates from cases occurring in northwestern MN had nalidixic acid MICs > 8 µg/ml and ciprofloxacin MICs of 0.25 µg/ml indicative of resistance. Azithromycin may be used as an alternative to ciprofloxacin for chemoprophylaxis against meningococcal disease in northwestern MN. (MMWR 2008; 57:173-5).
5 Group A <i>Streptococcus</i>	Among 15 erythromycin-resistant, clindamycin-susceptible isolates, 10 (67%) had inducible resistance to clindamycin by D-test.
6 Group B <i>Streptococcus</i>	96% (22/23) of early-onset infant, 92% (12/13) of late-onset infant, 50% (5/10) of maternal, and 88% (253/286) of other invasive GBS cases were tested. Among 49 erythromycin-resistant, clindamycin-susceptible isolates, 30 (61%) had inducible resistance to clindamycin by D-test. Overall, 67% were susceptible to clindamycin and were D-test negative (where applicable). 72% (28/39) of infant and maternal cases were susceptible to clindamycin and were D-test negative (where applicable).
7 <i>Streptococcus pneumoniae</i>	The 615 isolates tested represented 93% of 664 total cases. Reported above are the proportions of case-isolates susceptible by meningitis breakpoints for cefotaxime, ceftriaxone (intermediate = 1.0 µg/ml, resistant ≥ 2.0 µg/ml) and penicillin (resistant ≥ 0.12 µg/ml). By nonmeningitis breakpoints (intermediate = 2.0 µg/ml, resistant ≥ 4.0 µg/ml), 94% (579/615) and 94% (581/615) of isolates were susceptible to cefotaxime and ceftriaxone, respectively. By nonmeningitis breakpoints (intermediate = 4.0 µg/ml, resistant ≥ 8.0 µg/ml), 93% (573/615) of isolates were susceptible to penicillin. Isolates were screened for high-level resistance to rifampin at a single MIC; all were ≤ 2 µg/ml. 16% (96/615) of isolates were resistant to two or more antibiotic classes and 12% (71/615) were resistant to three or more antibiotic classes. (CLSI also has breakpoints for oral penicillin V; refer to the most recent CLSI recommendations for information).
8 <i>Mycobacterium tuberculosis</i> (TB)	National guidelines recommend initial four-drug therapy for TB disease, at least until first-line drug susceptibility results are known. Of the 22 drug-resistant TB cases reported in 2007, 18 (82%) were in foreign-born persons, including two of three multidrug-resistant (MDR-TB) cases (i.e., resistant to at least isoniazid [INH] and rifampin). There were no cases of extensively drug-resistant TB (XDR-TB) (i.e., resistance to at least INH, rifampin, any fluoroquinolone, and at least one second-line injectable drug).
Invasive methicillin-resistant <i>Staphylococcus aureus</i>	3,517 cases of MRSA infection were reported in 2007 through 12 sentinel sites and Ramsey County population-based surveillance, of which 271 (8%) (sentinel: 151; Ramsey County: 41) were invasive (blood: 82%). 71% (192/271) had an isolate submitted and antimicrobial susceptibility conducted. Of invasive cases with an isolate, 81% were epidemiologically classified as healthcare-associated. Overall susceptibilities were as follows: 100% to linezolid, trimethoprim/sulfamethoxazole, vancomycin; 99% to gentamicin, tetracycline; 98% to rifampin; 96% to mupirocin; 14% to a fluoroquinolone (ciprofloxacin or levofloxacin); 3% to erythromycin. 51% (33/65) of erythromycin-resistant, clindamycin-susceptible isolates tested positive for inducible clindamycin resistance using the D-test. For the 32 (17%) classified as community-associated (CA) cases, susceptibilities were: 52% to ciprofloxacin; 97% to mupirocin and tetracycline. 39% of all invasive isolates and 60% of invasive, epidemiologically-defined CA-MRSA isolates were susceptible to clindamycin and D-test negative (where applicable).
<i>Bordetella pertussis</i>	Erythromycin susceptibility testing was performed on 36 <i>B. pertussis</i> isolates. All 36 were susceptible to erythromycin using provisional CDC breakpoints.
<i>Escherichia coli</i> O157:H7	Antimicrobial treatment for <i>E. coli</i> O157:H7 infection is not recommended.

Reportable Diseases, MN Rule 4605.7040

Report Immediately by Telephone

Anthrax (*Bacillus anthracis*) **a**
Botulism (*Clostridium botulinum*)
Brucellosis (*Brucella* spp.) **a**
Cholera (*Vibrio cholerae*) **a**
Diphtheria (*Corynebacterium diphtheriae*) **a**
Hemolytic uremic syndrome **a**
Measles (rubeola) **a**
Meningococcal disease (*Neisseria meningitidis*)
 (all invasive disease) **a, b**

Orthopox virus **a**
Plague (*Yersinia pestis*) **a**
Poliomyelitis **a**
Q fever (*Coxiella burnetii*) **a**

Rabies
 (animal and human cases and suspected cases)
Rubella and congenital rubella syndrome **a**
Severe Acute Respiratory Syndrome (SARS)

(1. Suspect and probable cases of SARS. 2. Cases of health care workers hospitalized for pneumonia or acute respiratory distress syndrome.) **a**

Smallpox (variola) **a**
Tularemia (*Francisella tularensis*) **a**
Unusual or increased case incidence of any suspect infectious illness **a**

a Submission of clinical materials required. If a rapid, non-culture assay is used for diagnosis, we request that positives be cultured, and isolates submitted. If this is not possible, send specimens, enrichment broth, or other appropriate material. Call the MDH Public Health Laboratory at 651-201-4953 for instructions.

b Isolates are considered to be from invasive disease if they are isolated from a normally sterile site, e.g., blood, CSF, joint fluid, etc.

c Report on separate Sexually Transmitted Disease Report Card.

d Report on separate HIV Report Card.

e For criteria for reporting laboratory confirmed cases of influenza, see www.health.state.mn.us/divs/idepc/dtopics/reportable/index.html.

Report Within One Working Day

Amebiasis (*Entamoeba histolytica/dispar*)
Anaplasmosis (*Anaplasma phagocytophilum*)
Arboviral disease (including, but not limited to, LaCrosse encephalitis, eastern equine encephalitis, western equine encephalitis, St. Louis encephalitis, and West Nile virus)

Babesiosis (*Babesia* spp.)
Blastomycosis (*Blastomyces dermatitidis*)
Campylobacteriosis (*Campylobacter* spp.) **a**
Cat scratch disease (infection caused by *Bartonella* spp.)
Chancroid (*Haemophilus ducreyi*) **c**
Chlamydia trachomatis infection **c**
Coccidioidomycosis

Cryptosporidiosis (*Cryptosporidium* spp.) **a**
Cyclosporiasis (*Cyclospora* spp.) **a**
Dengue virus infection
Diphyllobothrium latum infection
Ehrlichiosis (*Ehrlichia* spp.)
Encephalitis (caused by viral agents)
Enteric E. coli infection

(*E. coli* O157:H7, other enterohemorrhagic [Shiga toxin-producing] *E. coli*, enteropathogenic *E. coli*, enteroinvasive *E. coli*, enterotoxigenic *E. coli*) **a**

Enterobacter sakazakii (infants under 1 year of age) **a**

Giardiasis (*Giardia lamblia*)

Gonorrhea (*Neisseria gonorrhoeae*) **c**

Haemophilus influenzae disease
 (all invasive disease) **a**

Hantavirus infection

Hepatitis (all primary viral types including A, B, C, D, and E)

Histoplasmosis (*Histoplasma capsulatum*)

Human immunodeficiency virus (HIV) infection, including Acquired Immunodeficiency Syndrome (AIDS) **a, d**

Influenza
 (unusual case incidence, critical illness, or laboratory confirmed cases) **a, e**

Kawasaki disease

Kingella spp. (invasive only) **a, b**

Legionellosis (*Legionella* spp.) **a**

Leprosy (Hansen's disease) (*Mycobacterium leprae*)

Leptospirosis (*Leptospira interrogans*)

Listeriosis (*Listeria monocytogenes*) **a**
Lyme disease (*Borrelia burgdorferi*)
Malaria (*Plasmodium* spp.)
Meningitis (caused by viral agents)
Mumps

Neonatal sepsis, less than 7 days after birth (bacteria isolated from a sterile site, excluding coagulase-negative *Staphylococcus*) **a, b**
Pertussis (*Bordetella pertussis*) **a**
Psittacosis (*Chlamydia psittaci*)
Retrovirus infection
Reye syndrome

Rheumatic fever (cases meeting the Jones Criteria only)
Rocky Mountain spotted fever (*Rickettsia rickettsii*, *R. canadensis*)
Salmonellosis, including typhoid (*Salmonella* spp.) **a**
Shigellosis (*Shigella* spp.) **a**
Staphylococcus aureus (vancomycin-intermediate *S. aureus* [VISA], vancomycin-resistant *S. aureus* [VRSA], and death or critical illness due to community-associated *S. aureus* in a previously healthy individual) **a**

Streptococcal disease (all invasive disease caused by Groups A and B streptococci and *S. pneumoniae*) **a, b**
Syphilis (*Treponema pallidum*) **c**
Tetanus (*Clostridium tetani*)
Toxic shock syndrome **a**

Toxoplasmosis (*Toxoplasma gondii*)
Transmissible spongiform encephalopathy
Trichinosis (*Trichinella spiralis*)
Tuberculosis (*Mycobacterium tuberculosis* complex)
 (Pulmonary or extrapulmonary sites of disease, including laboratory confirmed or clinically diagnosed disease, are reportable. Latent tuberculosis infection is not reportable.) **a**

Typhus (*Rickettsia* spp.)
Unexplained deaths and unexplained critical illness (possibly due to infectious cause) **a**
Varicella-zoster disease (1. Primary [chickenpox]: unusual case incidence, critical illness, or laboratory-confirmed cases. 2. Recurrent [shingles]: unusual case incidence or critical illness.) **a**

Vibrio spp. **a**
Yellow fever
Yersiniosis, enteric (*Yersinia* spp.) **a**

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Minnesota Department of Health
 625 North Robert Street
 PO Box 64975
 St. Paul, MN 55164-0975
www.health.state.mn.us

To Report a Case:

Fill out a Minnesota Department of Health case report form and mail to the above address. For diseases that require immediate reporting, or for questions about reporting, call the Acute Disease Investigation and Control Section at: 651-201-5414 or 1-877-676-5414 or fax form to 651-201-5743.

To Send an Isolate to MDH:

If you are sending an isolate by U.S. mail, use regulatory compliant transport packaging and send to: PO Box 64899, St. Paul, MN 55164. If you are using a courier, use transport packaging appropriate for the specific courier and send to: 601 North Robert Street, St. Paul, MN 55155. To request pre-paid transport labels (both mail and courier) and packaging, or for other assistance, call the Public Health Laboratory Specimen Handling Unit at: 651-201-4953.

The MDH Antibiogram is available on the MDH web site (<http://www.health.state.mn.us>). Laminated copies can be ordered from: Antibiogram, Minnesota Department of Health, Acute Disease Investigation and Control Section, 625 North Robert Street, PO Box 64975, St. Paul, MN 55164-0975.

Sentinel Surveillance (at sites designated by the Commissioner)

Methicillin-resistant *Staphylococcus aureus*