- For diseases that require immediate reporting call 24 hours a day, 7 days a week: 651-201-5414 or 1-877-676-5414.
- Report forms can be downloaded at: http://www.health.state.mn.us/diseasereport

REPORT IMMEDIATELY BY TELEPHONE

Anthrax (*Bacillus anthracis*) M
Botulism (*Clostridium botulinum*)
Brucellosis (*Brucella* spp.) M
Cholera (*Vibrio cholerae*) M
Diphtheria (*Corynebacterium diphtheriae*) M
Free-living amebic infection M
(including at least: *Acanthamoeba* spp., *Naegleria fowleri*, *Balamuthia* spp., *Sappinia* spp.)
Hemolytic uremic syndrome M
Measles (rubeola) M
Meningococcal disease (*Neisseria meningitidis*)
(invasive) M S
Middle East Respiratory Syndrome (MERS) M
Orthopox virus M
Plague (*Yersinia pestis*) M
Poliomyelitis M
Q fever (*Coxiella burnetii*) M
Rabies (animal and human cases and suspected cases)
Rubella and congenital rubella syndrome M
Severe Acute Respiratory Syndrome (SARS) M R
Smallpox (variola) M
Tularemia (*Francisella tularensis*) M
Unusual or increased case incidence of any suspect infectious illness M
Viral hemorrhagic fever M
(including but not limited to Ebola virus disease and Lassa fever)

SENTINEL SURVEILLANCE*

*Diseases reportable through sentinel surveillance are reportable based on the residence of the patient or the specific health care facility. Sentinel surveillance is not statewide reporting.

Staphylococcus aureus M S
Candidemia (*Candida* spp.) (blood isolates only) M S
Carbapenem-resistant *Acinetobacter* spp. (CRA), and *Pseudomonas aeruginosa* (CR-PA) M
Clostridium difficile M
Severe Acute Respiratory Illness M
Respiratory syncytial virus (RSV)

M Submission of clinical materials required. Submit isolates or, if an isolate is not available, submit material containing the infectious agent in the following order of preference: a patient specimen; nucleic acid; or other laboratory material. Call the MDH Public Health Laboratory at 651-201-4953 for instructions.

REPORT WITHIN ONE WORKING DAY

Amebiasis (*Entamoeba histolytica/dispar*)
Anaplasmosis (*Anaplasma phagocytophilum*)
Arboviral disease
(including, but not limited to, La Crosse encephalitis, eastern equine encephalitis, western equine encephalitis, St. Louis encephalitis, West Nile virus disease, Powassan virus disease, and Jamestown Canyon virus disease)
Babesiosis (*Babesia* spp.)
Blastomycosis (*Blastomyces dermatitidis*)
Campylobacteriosis (*Campylobacter* spp.) M
Carbapenem-resistant Enterobacteriaceae (CRE) M
Cat scratch disease (infection caused by *Bartonella* species)
Chancroid (*Haemophilus ducreyi*)
Chikungunya virus disease
Chlamydia trachomatis infections
Coccidioidomycosis
Cronobacter sakazakii in infants under one year of age M
Cryptosporidiosis (*Cryptosporidium* spp.) M
Cyclosporiasis (*Cyclospora* spp.) M
Dengue virus infection
Diphyllobothrium latum infection
Ehrlichiosis (*Ehrlichia* spp.)
Encephalitis (caused by viral agents)
Enteric *Escherichia coli* infection M
(*E. coli* O157:H7, other Shiga toxin-producing *E. coli*, enterohemorrhagic
E. coli, enteropathogenic *E. coli*, enteroinvasive *E. coli*, enteroaggregative
E. coli, enterotoxigenic *E. coli*, or other pathogenic *E. coli*)
Giardiasis (*Giardia intestinalis*)
Gonorrhea (*Neisseria gonorrhoeae* infections)
Haemophilus influenzae disease (all invasive disease) M S
Hantavirus infection
Hepatitis (all primary viral types including A, B, C, D, and E) B
Histoplasmosis (*Histoplasma capsulatum*)
Human immunodeficiency virus (HIV) infection, including Acquired Immunodeficiency Syndrome (AIDS) B
Influenza M
(unusual case incidence, critical illness, or laboratory-confirmed cases)
Kawasaki disease
Kingella spp. (invasive only) M S
Legionellosis (*Legionella* spp.) M
Leprosy (Hansen's disease) (*Mycobacterium leprae*)
Leptospirosis (*Leptospira interrogans*)
Listeriosis (*Listeria monocytogenes*) M
Lyme disease (*Borrelia burgdorferi*, and other *Borrelia* spp.)
Malaria (*Plasmodium* spp.)
Meningitis (caused by viral agents)
Mumps M
Neonatal sepsis M S
(bacteria isolated from a sterile site, excluding coagulase-negative *Staphylococcus*) less than seven days after birth
Pertussis (*Bordetella pertussis*) M
Psittacosis (*Chlamydophila psittaci*)
Retrovirus infections
Salmonellosis, including typhoid (*Salmonella* spp.) M
Shigellosis (*Shigella* spp.) M
Spotted fever rickettsiosis
(*Rickettsia* spp. infections, including Rocky Mountain spotted fever)
Staphylococcus aureus M
(only vancomycin-intermediate *Staphylococcus aureus* [VISA], vancomycin-resistant *Staphylococcus aureus* [VRSA], and death or critical illness due to community-associated *Staphylococcus aureus* in a previously healthy individual)
Streptococcal disease - invasive disease caused by Groups A and B streptococci and *S. pneumoniae* M S
Streptococcal disease - non-invasive *S. pneumoniae*
(urine antigen laboratory-confirmed pneumonia)
Syphilis (*Treponema pallidum*) B
Tetanus (*Clostridium tetani*)
Toxic shock syndrome M
Toxoplasmosis (*Toxoplasma gondii*)
Transmissible spongiform encephalopathy
Trichinosis (*Trichinella spiralis*)
Tuberculosis (*Mycobacterium tuberculosis* complex) M
(pulmonary or extrapulmonary sites of disease, including clinically diagnosed disease). Latent tuberculosis infection is not reportable.
Typhus (*Rickettsia* spp.)
Unexplained deaths and unexplained critical illness
(possibly due to infectious cause) M
Varicella (chickenpox) M
Vibrio spp. M
Yellow fever
Yersiniosis, enteric (*Yersinia* spp.) M
Zika virus disease B
Zoster (shingles) M
(all cases <18 years old; unusual case incidence/complications regardless of age)

Reportable Diseases, MN Rule 4605.7040

FOOTNOTES

B Also report a pregnancy in a person with Zika; or a person chronically infected with hepatitis B, HIV, or syphilis.

S Invasive disease only: isolated from a normally sterile site, e.g.: blood, CSF, joint fluid, etc.

R In the event of SARS or another severe respiratory outbreak, also report cases of health care workers hospitalized for pneumonia or acute respiratory distress syndrome.

Antimicrobial Susceptibilities of Selected Pathogens, 2016

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 using a courier, use transport packaging appropriate for the specific courier and send to: 601 North Robert Street, St. Paul, MN 55155. To request 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.

DEPARTMENT OF HEALTH

Antimicrobial Susceptibilities of Selected Pathogens, 2016

Sampling Methodology
* all isolates tested
§ ~15% sample of statewide isolates received at MDH
† ~10% sample of statewide isolates received at MDH
‡ isolates from a normally sterile site

		Campylobacter spp.[1§]	*Salmonella enterica* (non-typhoidal)[2†]	*Shigella* spp.[3§]	*Neisseria gonorrhoeae*[4]	*Neisseria meningitidis*[5*‡]	Group A *Streptococcus*[6*‡]	Group B *Streptococcus*[7*‡]	*Streptococcus pneumoniae*[8*‡]	*Mycobacterium tuberculosis* complex[9*]	Healthcare-associated MRSA[10*‡]	Community-associated MRSA[10*‡]	*Haemophilus influenzae*[11*‡]
Number of Isolates Tested		132	84	50	90	5	265	513	456	136	134	46	118
		% susceptible											
ß-lactam antibiotics	amoxicillin								95				100
	ampicillin		80	98		80	100	100					69
	penicillin				0	80	100	100	82[#]/99[¶]				
	cefixime				100[4]								
	cefuroxime sodium								91				99
	cefotaxime						100	100	94[#]/99[¶]				100
	ceftriaxone		95	100	100[4]	100			93[#]/99[¶]				
	ceftaroline										100	100	
	meropenem					100			93				100
Other antibiotics	ciprofloxacin	75[1]	94	100	67	100							100
	levofloxacin					100	99	99	99		35	54	
	azithromycin	97		100[3]	93[4]	100							99
	erythromycin	97					88	47	61		19	28	
	clindamycin						96/89[6]	66/57[7]	92		63/54[10]	87/69[10]	
	chloramphenicol		95	100					98				99
	gentamicin	99											
	doxycycline										98	98	
	tetracycline	30			17		88		90		96	96	98
	trimethoprim/sulfamethoxazole		98	46					80		100	100	80
	linezolid										100	100	
	daptomycin										98	100	
	telavancin										100	100	
	vancomycin						100	100	100		99	100	
TB antibiotics	ethambutol									94			
	isoniazid									86			
	pyrazinamide									90			
	rifampin					100				94	95	100	100

Trends, Comments, and Other Pathogens

[1] *Campylobacter* spp.	Quinolone susceptibility was determined for all isolates (n=985); isolates that were screened as nalidixic acid-susceptible were assumed to be ciprofloxacin-susceptible. Only 20% of isolates from patients returning from foreign travel (n=157) were susceptible to quinolones. *Campylobacter* susceptiblities were determined using CDC NARMS 2014 report standards (www.cdc.gov/narms).
[2] *Salmonella enterica* (non-typhoidal)	Antimicrobial treatment for uncomplicated gastroenteritis due to *Salmonella* is not generally recommended.
[3] *Shigella* spp.	For cases in which treatment is required and susceptibility is unknown or an ampicillin and trimethoprim/sulfamethoxazole-resistant strain is isolated, azithromycin for 3 days, ceftriaxone for 2 to 5 days, or a fluoroquinolone (such as ciprofloxacin) for 3 days is recommended. For susceptible strains, ampicillin or trimethoprim/sulfamethoxazole is effective; amoxicillin is less effective because of its rapid absorption from the gastrointestinal tract (*Red Book*, 2015). Isolates with no zone of inhibition of bacterial growth using 15 µg of azithromycin were considered to have decreased susceptibility. An increase in infections with decreased azithromycin susceptibility has been reported in adult males nationally; recent outbreaks were published in the June 5, 2015 *MMWR* (http://bit.ly/29zq9nl).
[4] *Neisseria gonorrhoeae*	Routine resistance testing for *Neisseria gonorrhoeae* by the MDH PHL was discontinued in 2008. Susceptibility results were obtained from the CDC's Contracted Laboratories, and are for isolates obtained through the Gonococcal Isolate Surveillance Program. Isolates (n = 90) were received from the Red Door Clinic in Minneapolis. Resistance criteria for the following antibiotics have not been established therefore the data reflect reduced susceptibility using provisional MIC breakpoints for cefixime ≥0.5 µg/ml, ceftriaxone ≥0.5 µg/ml, and azithromycin ≥2.0 µg/ml. Also, the number of *N. gonorrhoeae* isolates submitted for testing decreased from 105 in 2015 to 90 in 2016.
[5] *Neisseria meningitidis*	In 2016, 1 case-isolate was intermediate to both ampicillin (MIC =.25 µg/ml) and penicillin (MIC =.12 µg/ml). There were no case isolates with ciprofloxacin resistance. The MIC interpretive criteria for azithromycin, ciprofloxacin, levofloxacin, and rifampin apply to prophylactic therapy and do not apply to therapy of patients with invasive meningococcal disease.
[6] Group A *Streptococcus*	The 265 isolates tested represent 96% of the 277 total cases. Among the 20 erythromycin resistant-clindamycin susceptible or intermediate isolates, 19 had inducible clindamycin resistance for a total of 89% of isolates that were susceptible to clindamycin and did not exhibit inducible clindamycin resistance.
[7] Group B *Streptococcus*	100% (21/21) of early-onset infant, 100% (13/13) late-onset infants, 100% (4/4) of maternal, and 95% (475/506) of other invasive GBS cases were tested. Among 104 erythromycin resistant - clindamycin susceptible or intermediate isolates, 48 (46%) had inducible resistance to clindamycin for a total of 57% (291/513) that were susceptible to clindamycin and did not exhibit inducible clindamycin resistance. 80% (30/38) of infant and maternal cases were susceptible to clindamycin and did not exhibit inducible clindamycin resistance.
[8] *Streptococcus pneumoniae*	The 456 isolates tested represent 94% of 485 total cases. [#]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). [¶]Case-isolates susceptible by nonmeningitis breakpoints for cefotaxime, ceftriaxone (intermediate = 2.0 µg/ml, resistant ≥ 4.0 µg/ml), and penicillin (intermediate = 4.0 µg/ml, resistant ≥ 8.0 µg/ml). Isolates were screened for high-level resistance to rifampin at a single MIC; 100% (456/456) were ≤ 2 µg/ml. Using meningitis breakpoints, 17% (76/456) of isolates were resistant to two or more antibiotic classes and 9% (41/456) 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).
[9] *Mycobacterium tuberculosis* (TB) complex	National guidelines recommend initial four-drug therapy for TB disease, at least until first-line drug susceptibility results are known. Of the 28 TB cases reported in 2016 resistant to at least one first-line drug, all (100%) were born outside the U.S. There were 8 new cases of multidrug-resistant TB (MDR-TB)(i.e. resistant to at least isoniazid and rifampin). All were also resistant to ethambutol, and two cases were resistant to all four first-line TB medications (isoniazid, rifampin, ethambutol and pyrazinamide).
[10] Methicillin-resistant *Staphylococcus aureus* (MRSA)	206 cases of invasive MRSA infection were reported in 2016 in Ramsey and Hennepin Counties, 87% (180/206) had an isolate submitted and antimicrobial susceptibility testing conducted. Of cases with an isolate tested, 74% (134/180) were epidemiologically classified as healthcare-associated (hospital and community onset). Healthcare-associated isolates were screened for mupirocin resistance with 1% (1/134) exhibiting high-level resistance (MIC >256 µg/ml), 63% (84/134) of isolates were susceptible to clindamycin by broth microdilution; however, among 58 erythromycin resistant-clindamycin susceptible or intermediate isolates, 12 had inducible clindamycin resistance for a total of 54% (72/134) that were susceptible to clindamycin and did not exhibit inducible clindamycin resistance. For community-associated cases (46/180 isolates), 2% (1/46) exhibited high-level mupirocin resistance. 87% (40/46) were susceptible to clindamycin by broth microdilution; however, among 27 erythromycin resistant-clindamycin susceptible or intermediate isolates 30% (8/27) had inducible clindamycin resistance for a total of 69% (32/46) that were susceptible to clindamycin and did not exhibit inducible clindamycin resistance. In 2016, 2 isolates were confirmed as vancomycin intermediate.
[11] *Haemophilus influenzae*	In 2016, 35 (30%) of the case-isolates were resistant to ampicillin and produced ß-lactamase, but all were susceptible to amoxicillin-clavulanate, which contains a ß-lactamase inhibitor. 2 case isolates showed intermediate resistance to ampicillin and did not produce ß-lactamase. 10 case-isolates showed resistance (I or R) to 2 or more antibiotics. Of those 10, 3 case-isolates showed resistance to 3 antibiotics.
Bordetella pertussis	In 2015, 26 case-isolates of pertussis were screened for erythromycin susceptibility in Minnesota and none were resistant.
Carbapenem-resistant Enterobacteriaceae (CRE)	The 2016 CRE definition is based on 2016 CLSI breakpoints and includes Enterobacteriaceae that are resistant to at least one carbapenem (doripenem, ertapenem, imipenem, or meropenem) or are positive for carbapenemase production. Of the 511 isolates submitted in 2016 from 439 patients, 40 (8%) isolates (representing 26 patients) were bla_{KPC}-positive, including 21 (53%) *Klebsiella pneumoniae*, 10 (25%) *Enterobacter cloacae*, 5 (13%) *E. coli*, 3 (8%) *Citrobacter freundii*, and 1 (3%) *Serratia marcescens*: 18/26 (69%) patients with bla_{KPC}-positive isolates were residents of Minnesota. Additionally, 10 isolates (representing 8 patients) were positive for bla_{NDM}, including 5 (50%) *Klebsiella pneumoniae*, 3 (30%) *E. coli*, 1 (10%) *Citrobacter freundii*, and 1 (10%) *Providencia rettgeri*. 6/10 (60%) patients with bla_{NDM}-positive isolates were Minnesota residents; all but one had exposure to health care overseas (Asia, Africa). 3 isolates were positive for carbapenemases not routinely tested for: 2 *Providencia rettgeri* isolates from 2 Minnesota residents were bla_{IMP}-27 positive and 1 *Serratia marcescens* isolate from a non-Minnesota resident was positive for bla_{VIM} (Asia).
Escherichia coli O157:H7	Antimicrobial treatment for Shiga toxin-producing *E. coli* infection is not recommended.