Tularemia cases increasing in Minnesota: 2025 update

MDH Webinar | 20 August 2025

Presenters

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Administrivia: Webinar info, Continuing Ed credits, etc.

- Webinar will be recorded – posting details to follow
- P.A.C.E. credits offered for those attending the live version of the presentation
  - The Minnesota Department of Health is approved as a provider of continuing education programs in the clinical laboratory sciences by the ASCLS P.A.C.E. ® Program.
  - Emailed detailed forthcoming later this week to those who indicated interest in P.A.C.E.
- Please put questions about the webinar content in the Q&A – staff will be monitoring.
  - Questions about the webinar itself (registration issues, etc.) can go in the chat.

No conflicts of interests to declare

- We will not be discussing specific commercial therapeutic interventions.
- We are not being supported (financially or otherwise) by any pharmaceutical, device, or other business/manufacturer/group with vested interests in these subjects.
- Opinions stated here are our own professional statements and may not directly represent those of the State of Minnesota or the Minnesota Department of Health.

Course Objectives

- Discuss the rise in human and animal cases of tularemia in Minnesota over the past three years
- Describe the sentinel laboratory testing algorithm for ruling out *F. tularensis*
- Identify the biosafety concerns for laboratorians when working with potential *Francisella tularensis* specimens

Tularemia in Minnesota

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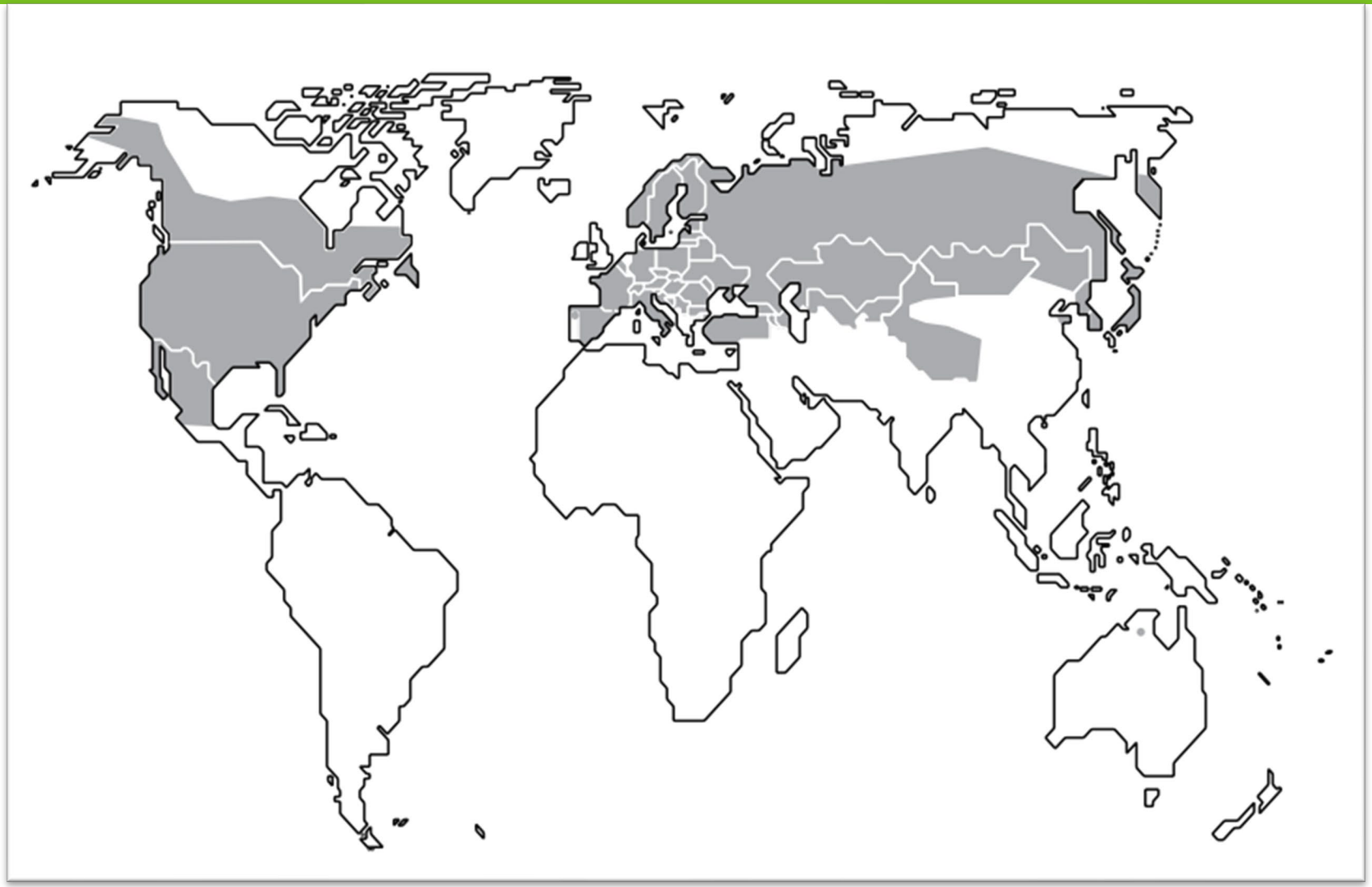
Francisella tularensis

- Tier 1 Select Agent
  - Many countries researched or stockpiled it as a bioweapon
- One of most pathogenic bacteria known
  - Infectious dose of 10 organisms
- Persists in the environment

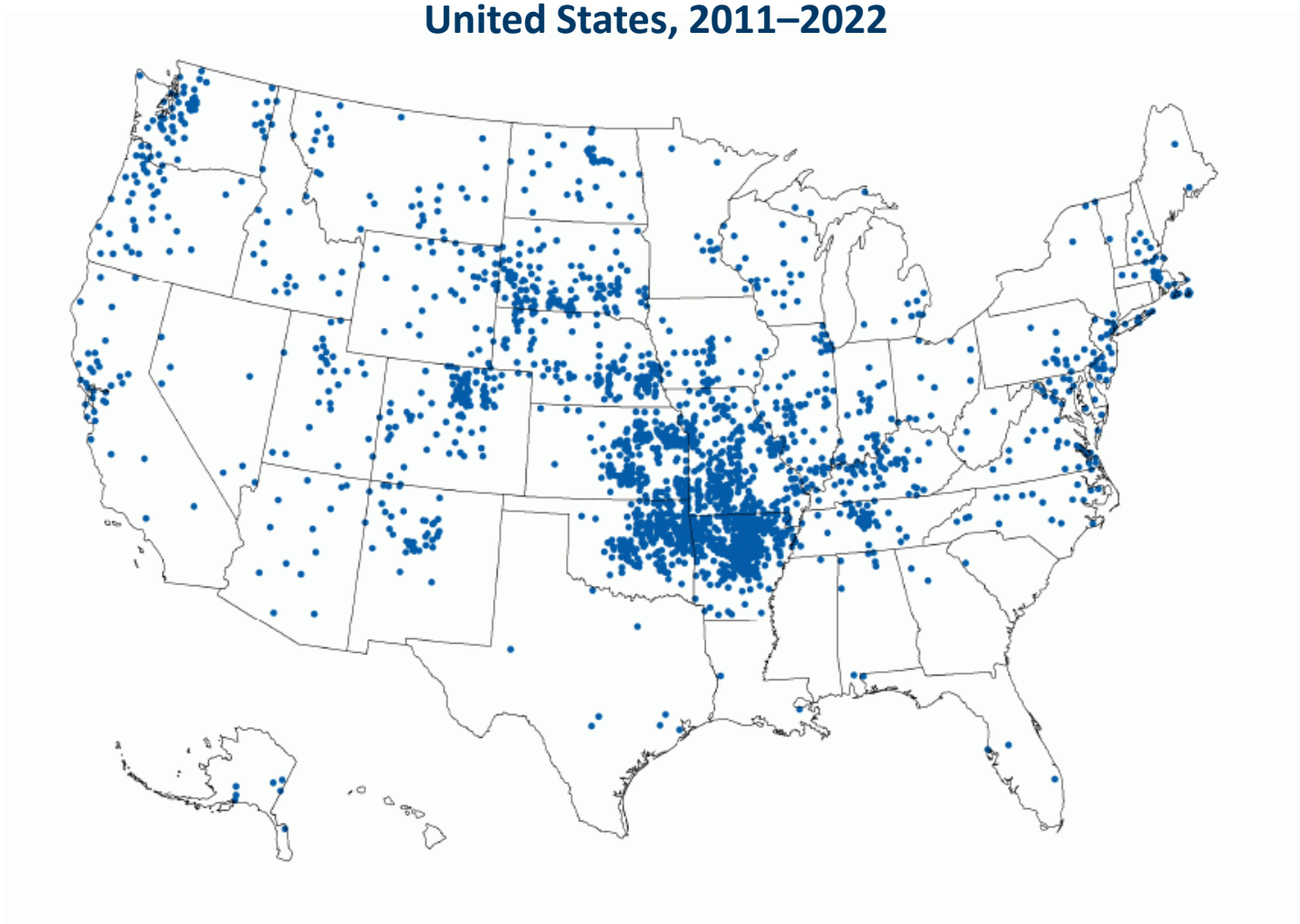
Global Distribution



Source: Anders Johansson, Umeå University, Umeå, Sweden and de Carvalho et al., 2007

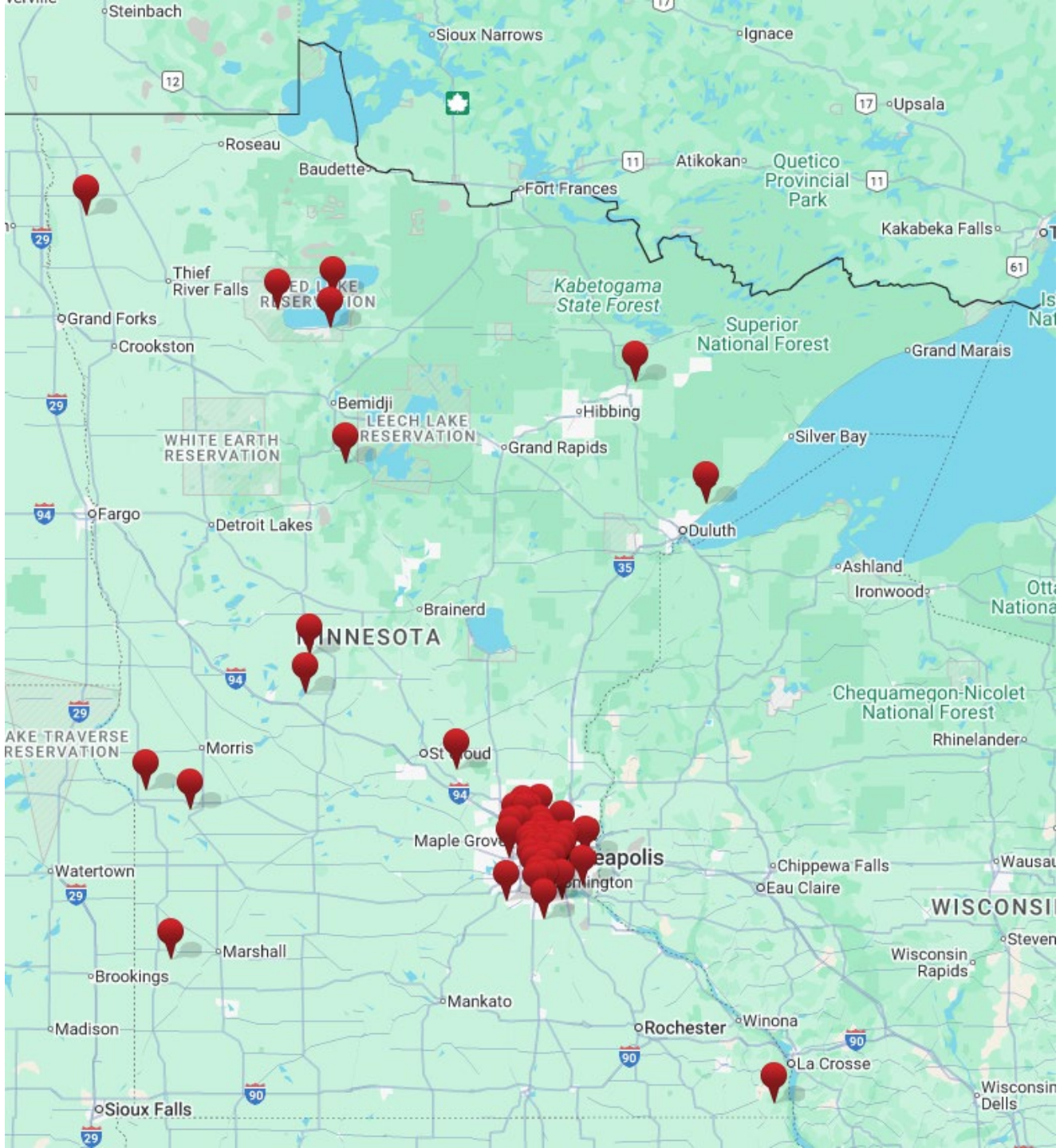
Tularemia is most common in the central US

Average annual tularemia incidence, by race — United States, 2011–2022

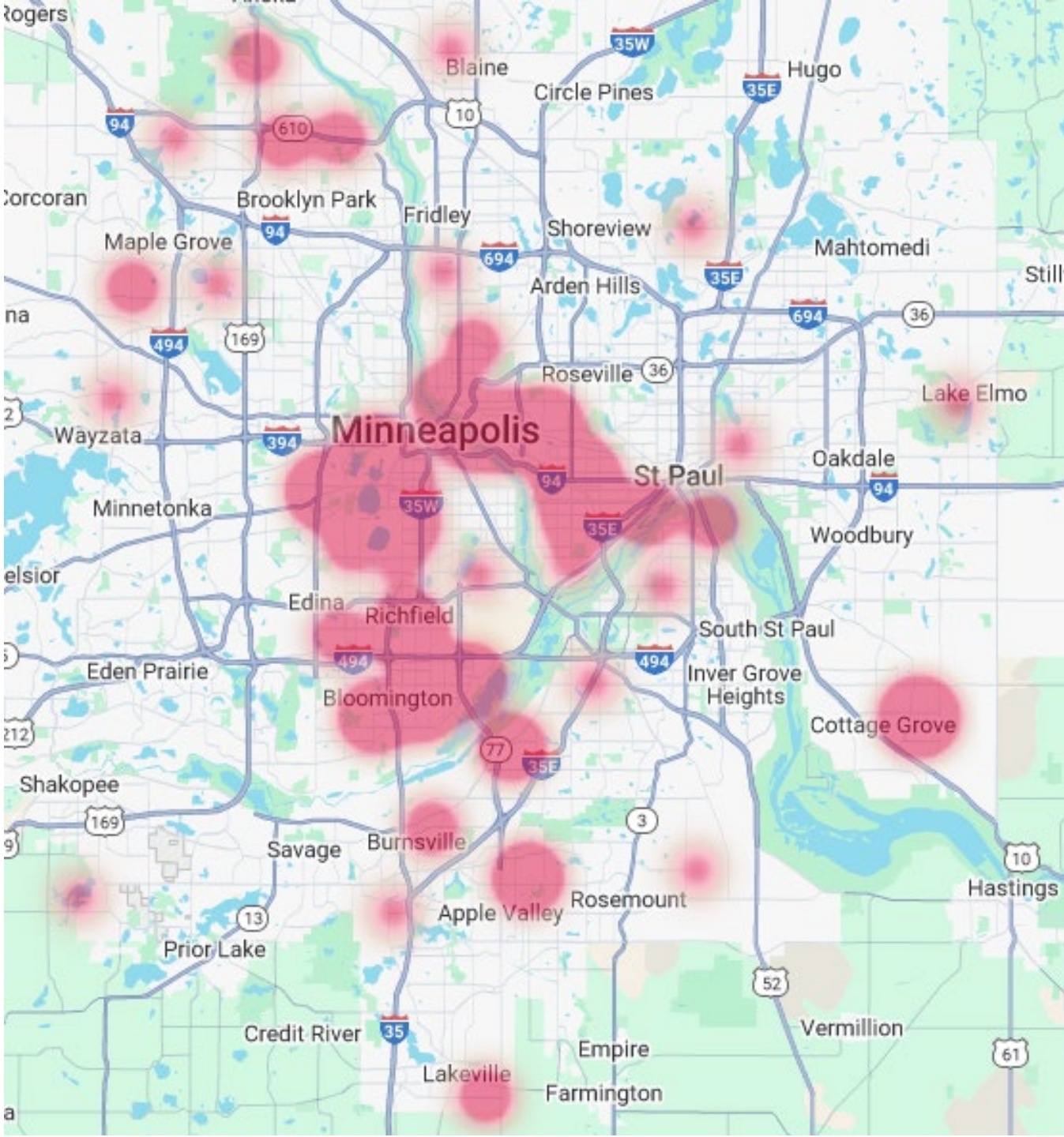


Source: https://www.cdc.gov/mmwr/volumes/73/wr/mm735152a1.htm

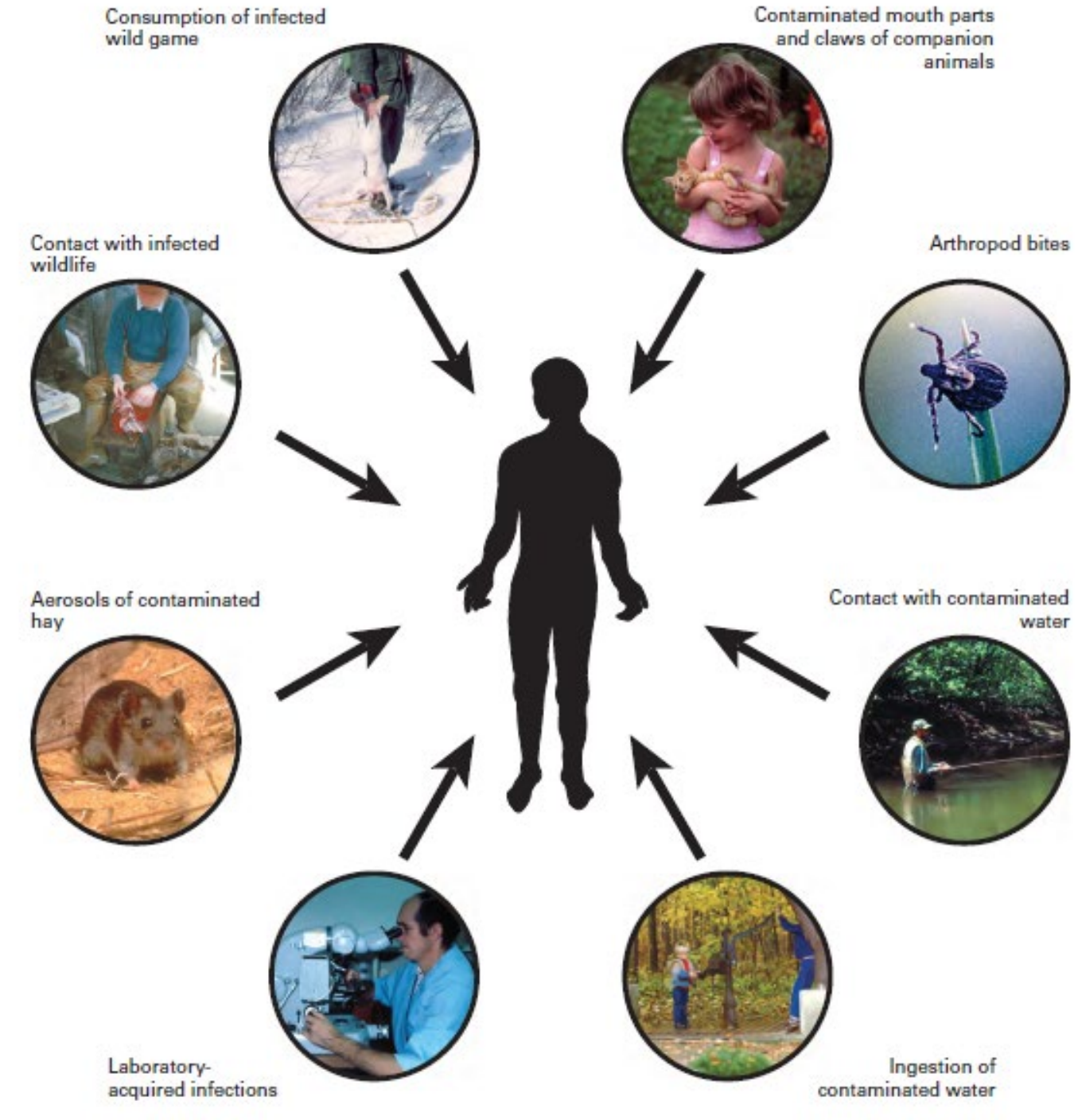
Human and animal tularemia cases have been reported from all over the state in the past 10 years



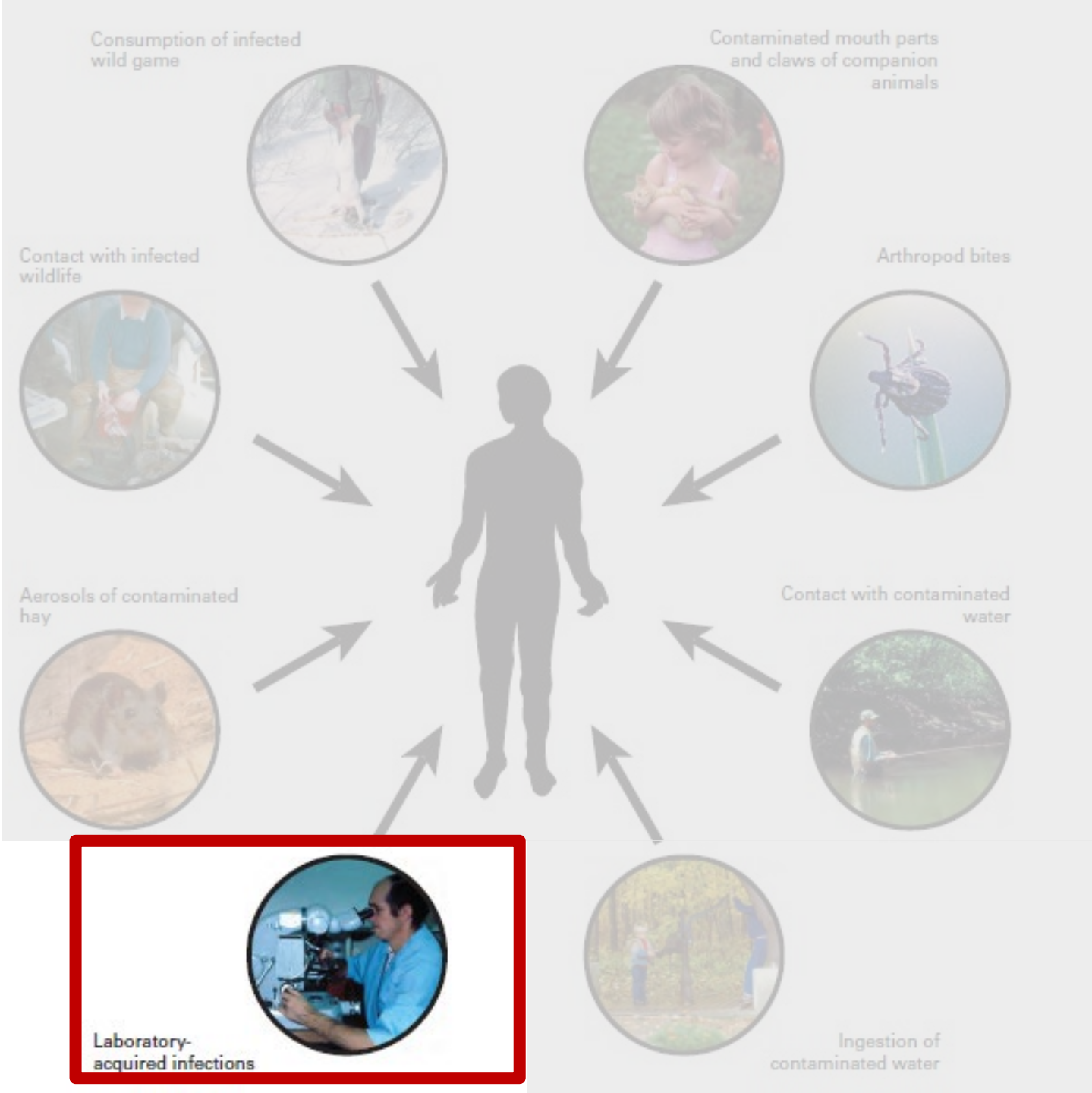
The Twin Cities metro has hot spots



Tularemia routes of exposure



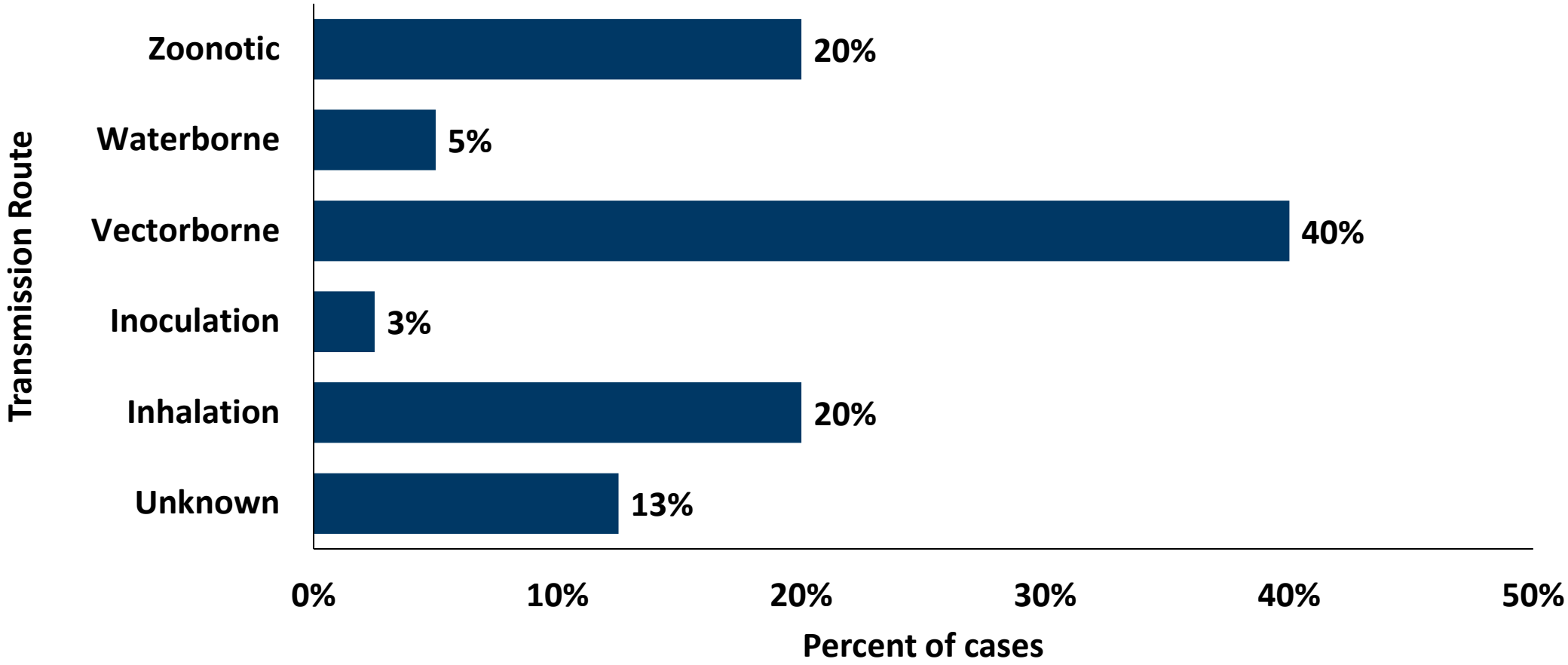
Tularemia routes of exposure



Occupational exposure with *F. tularensis* is “an accident which seems…to befall practically all laboratory workers who attempt the cultivation”

–Medical Research Council of England, 1922

Tularemia Transmission Routes, Human Cases, MN, 2004-2025*



*Data are preliminary as data collection is ongoing


More than 200 species can be infected
Wild and domestic
Ticks maintain and are reservoirs

F. tularensis tularensis (Type A) More pathogenic

F. Tularensis holarctica (Type B)

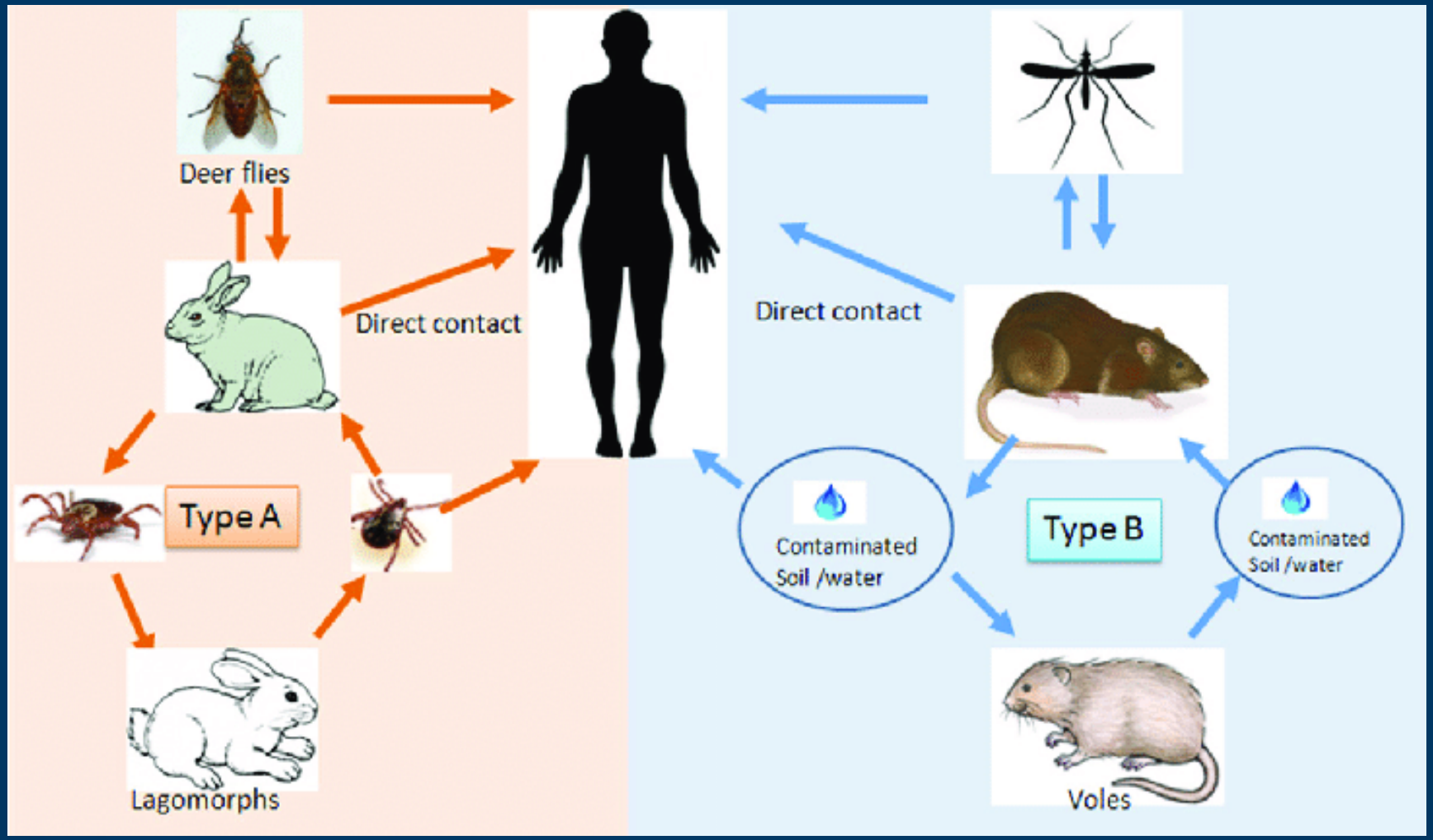
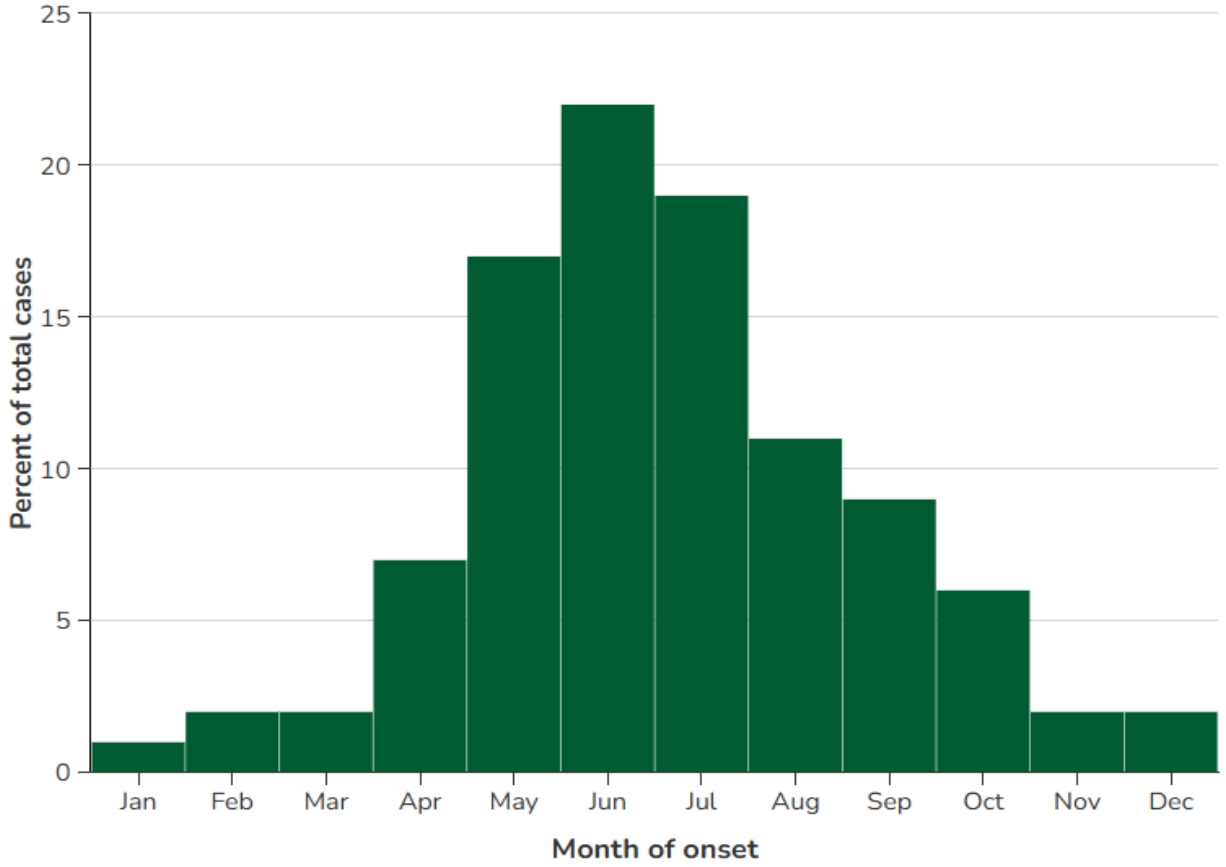


Image from: Dinc, Gokcen & Demiraslan, Hayati & Doganay, Mehmet. (2017). Unexpected Risks for Campers and Hikers: Tick-Borne Infections. International Journal of Travel Medicine and Global Health. 5. 5-13. 10.15171/ijtmgh.2017.02.

Tularemia is seasonal

- Most common in May—September
  - Increase in insect bites/outdoor activities
- Animal contact can occur year-round

Tularemia month of onset, 2001–2023



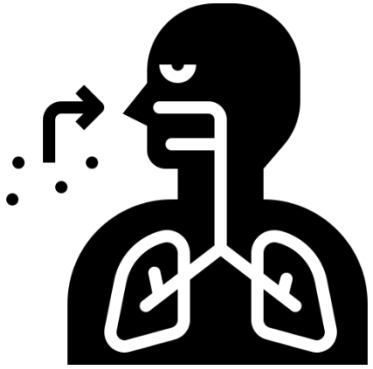
Source: CDC Tularemia Surveillance Statistics

There are six defined clinical forms, all often including fever

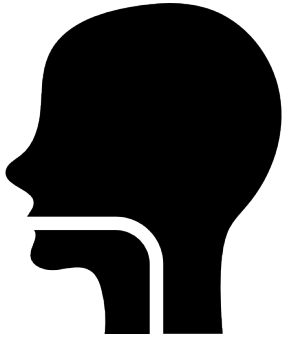
Ulceroglandular
Skin ulcer + swelling of regional lymph nodes

Glandular
Swelling of regional lymph nodes

Oculoglandular
Eye inflammation + swelling of regional lymph nodes



Pneumonic
Cough, chest pain, difficulty breathing

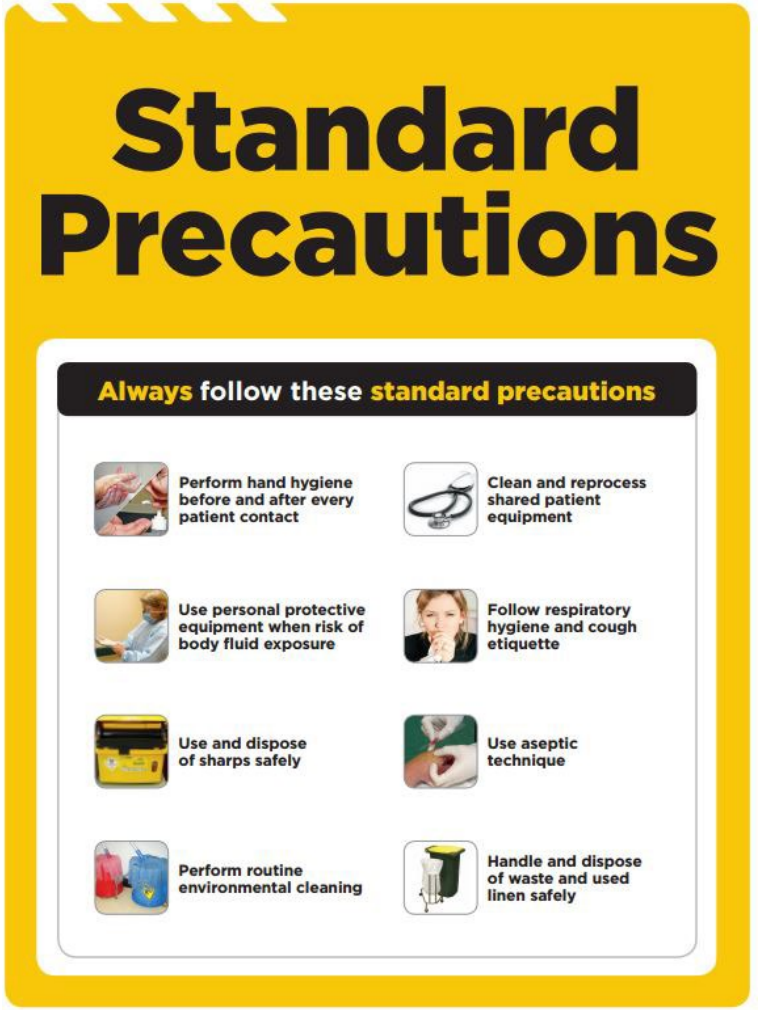


Oropharyngeal
Sore throat, mouth ulcers + swelling of neck lymph nodes

Typhoidal
Generalized symptoms

Infection Prevention and Control

- Standard precautions
- No person-to-person transmission
- Isolation is not recommended



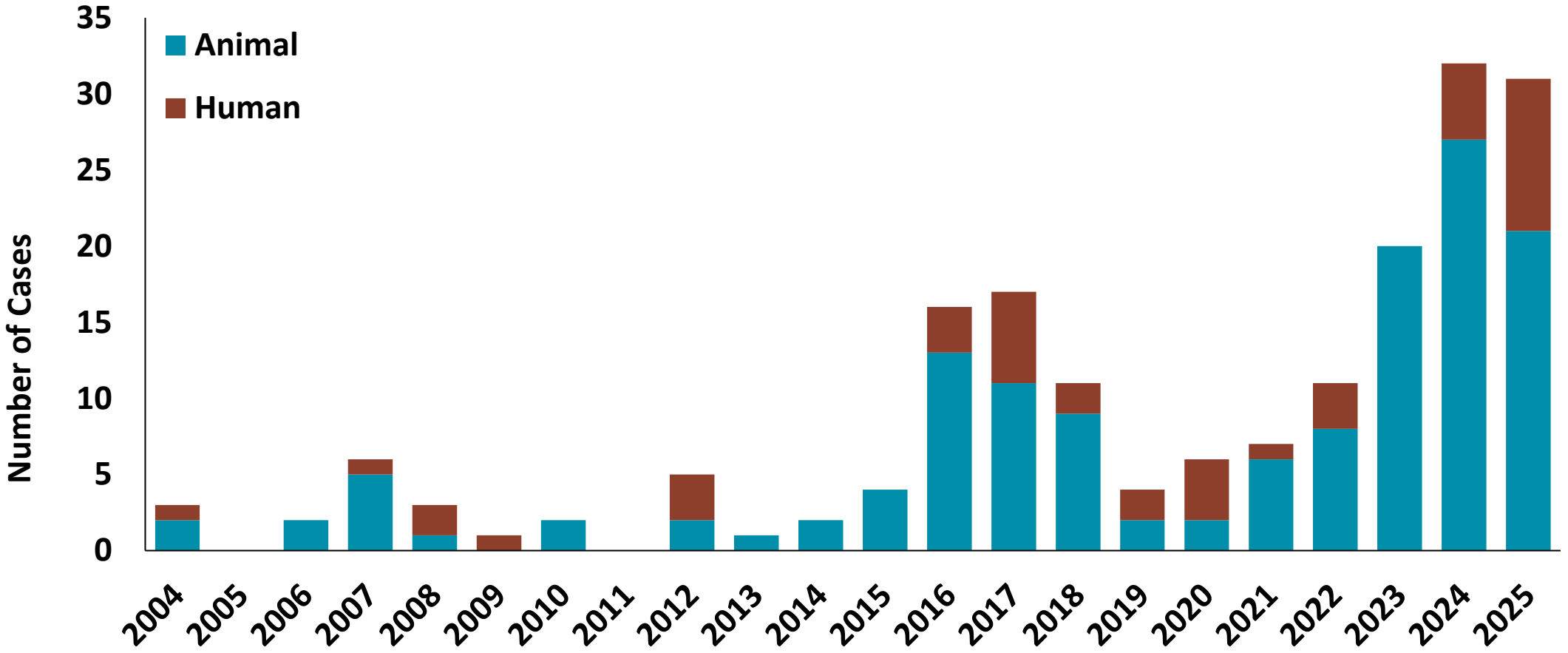
Treatment

Age Category	Drug	Dosage	Maximum	Duration (Days)
Adults	Gentamicin*§	5 mg/kg IM or IV daily (with desired peak serum levels of at least 5 mcg/mL)	Monitor serum drug levels	10 – 14
	Ciprofloxacin*	400 mg IV or 500 mg PO twice daily	N/A	10 – 14
	Doxycycline	100 mg IV or PO twice daily	N/A	14 – 21
Children	Gentamicin*§	2.5 mg/kg IM or IV 3 times daily**	Monitor serum drug levels and consult a pediatric infectious disease specialist	10 – 14
	Ciprofloxacin*	15 mg/kg IV or PO twice daily	800 mg per day	10 – 14
	Doxycycline	2.2 mg/kg IV or PO twice daily	100 mg IV or PO twice daily	14 – 21

*Not a U.S. FDA-approved use but has been used successfully to treat patients with tularemia.
**Once-daily dosing could be considered in consultation with a pediatric infectious disease specialist and a pharmacist
§Gentamicin is preferred for treatment of severe tularemia. Dose should be adjusted for renal insufficiency

Source: CDC Tularemia Treatment Guidelines

Annual Number of Tularemia Cases, 2004–2025*



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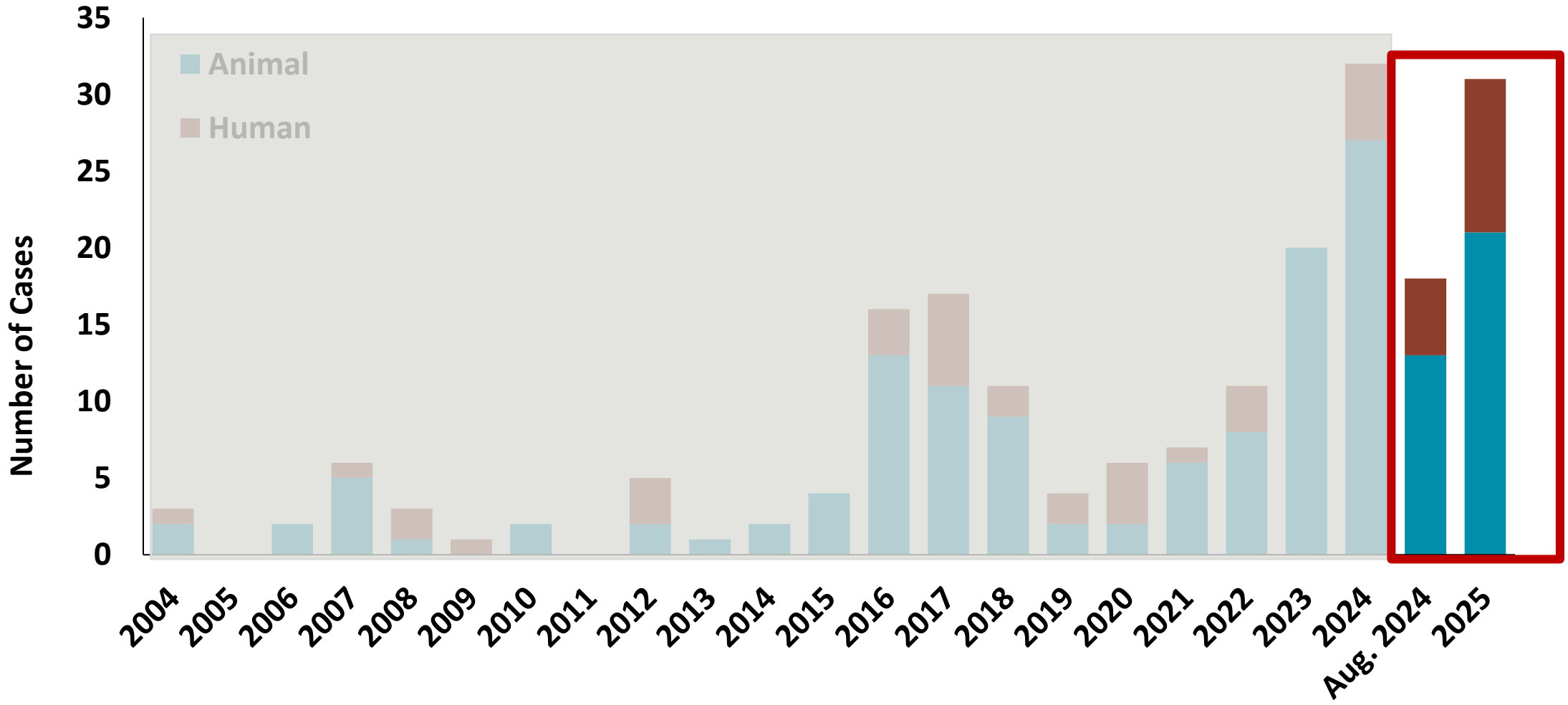
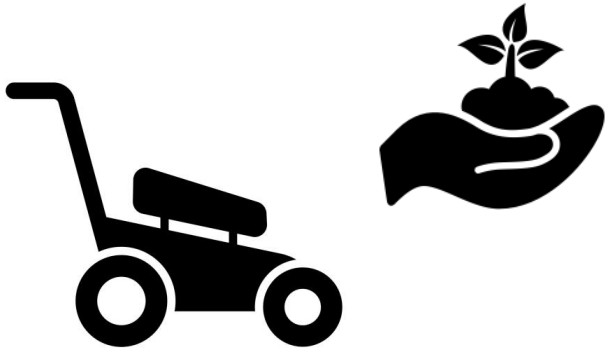
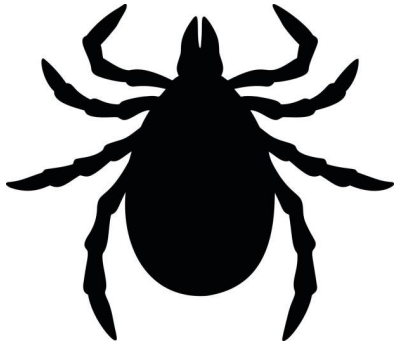
Annual Number of Tularemia Cases, 2004–2025*

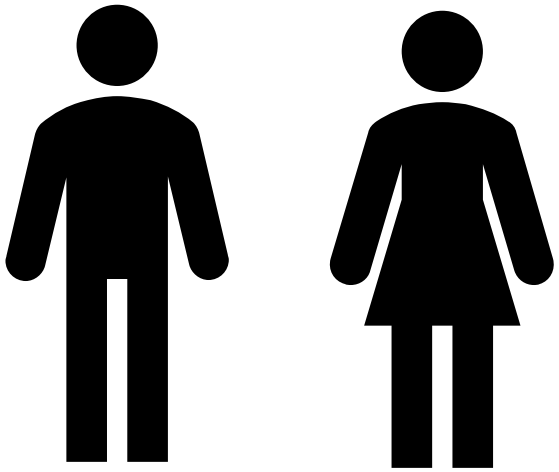


2025 Exposures





Tularemia cases, 2005-2025



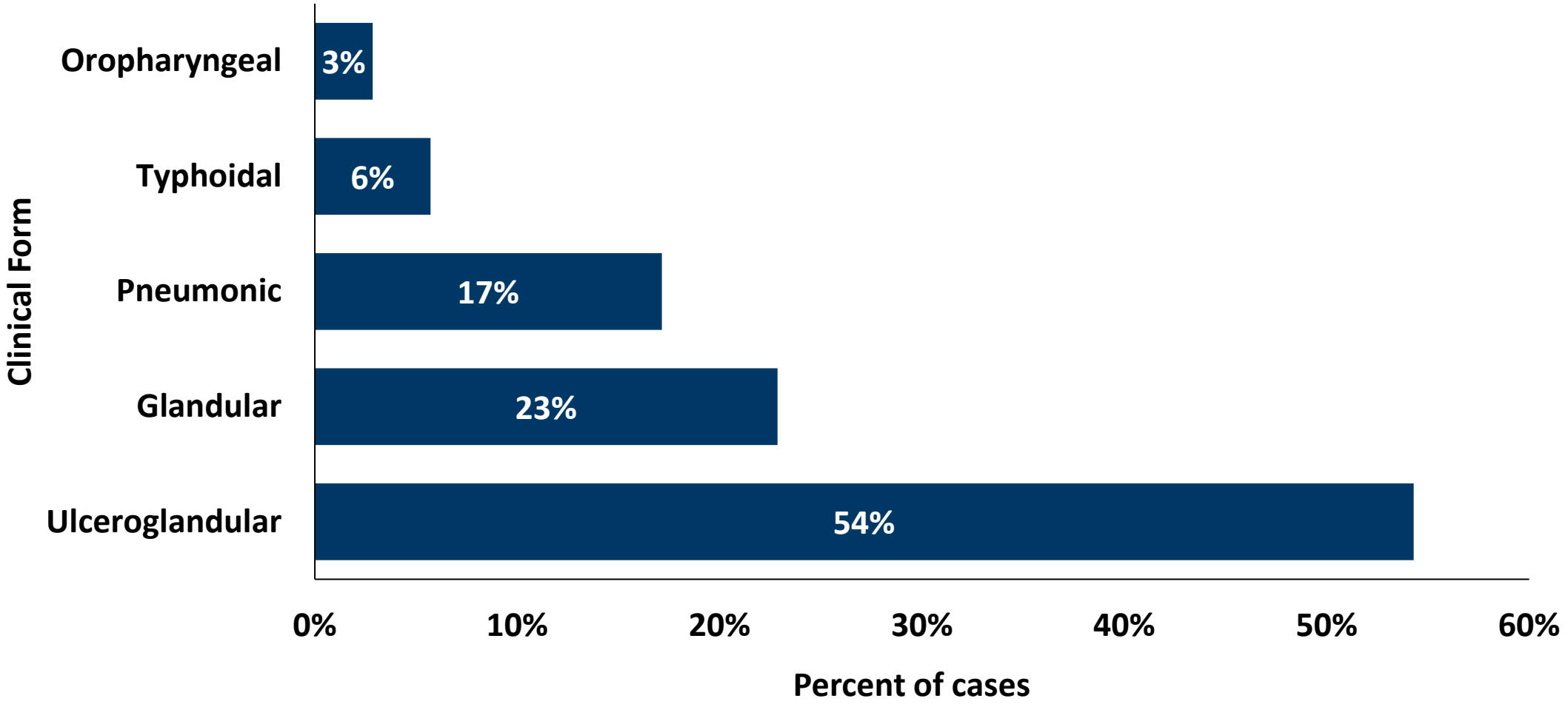
53% male

Median age 45-years-old (range, 1-91)

72% hospitalized

Median hospitalization: 5 days (range, 1-14 days)

Forms of Tularemia in Humans, MN, 2004-2025*



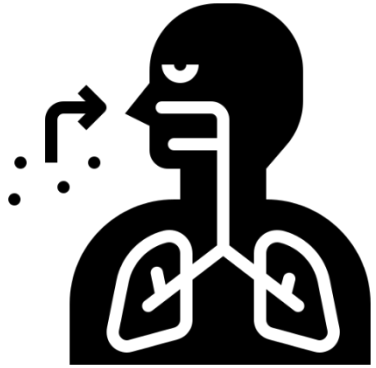
*Data are preliminary as data collection is ongoing

2025 Clinical Forms

3

Ulceroglandular

3



Pneumonic

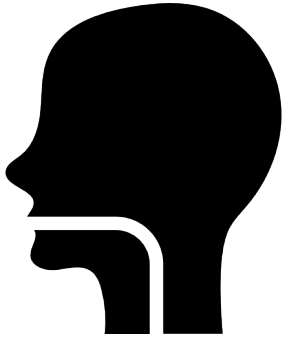
2

Typhoidal

1

Glandular

1



Oropharyngeal

Ulceroglandular tularemia

7/27/25

7/30/25

8/4/25

Testing methodologies

Culture-confirmed

- 2 cat bite wounds
- 2 lymph node
- 2 blood culture
- 1 tick bite wound

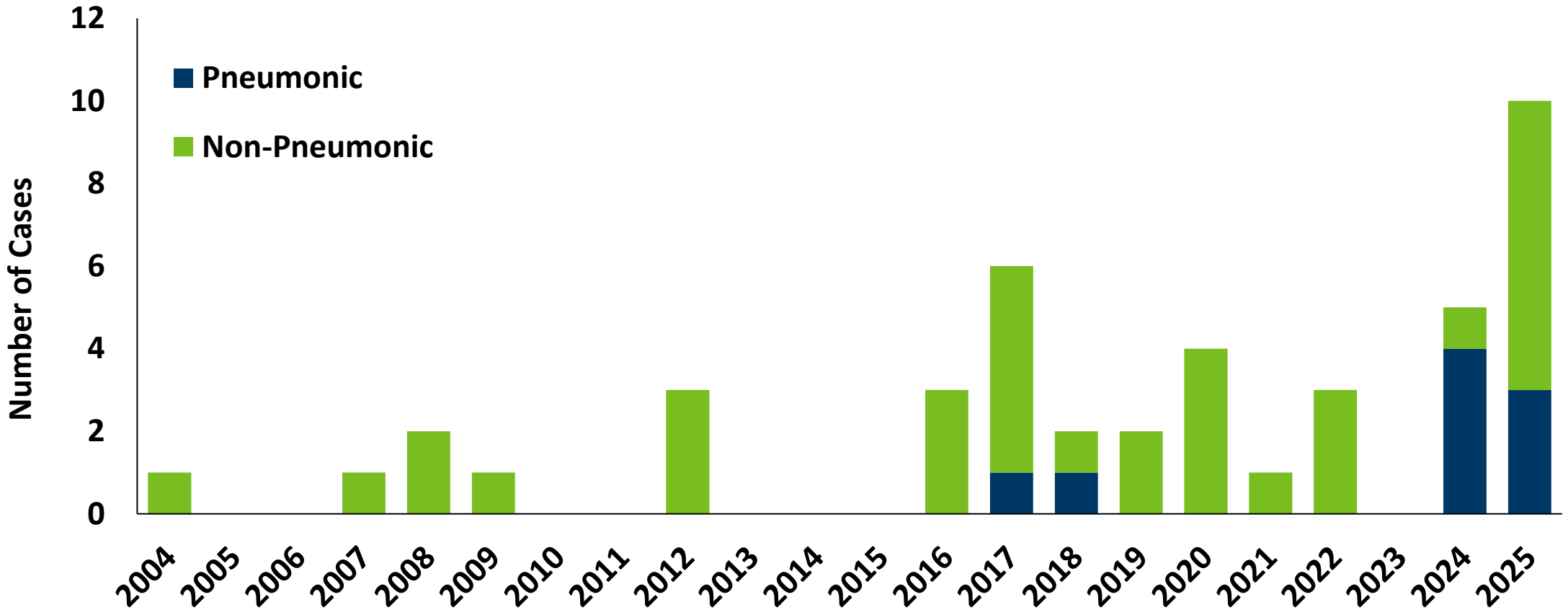
Serology

- 1 IgG+/IgM-
- 1 IgM +/ IgG-
- 1 IgG+/ IgM+

Karius

- 1 Karius positive

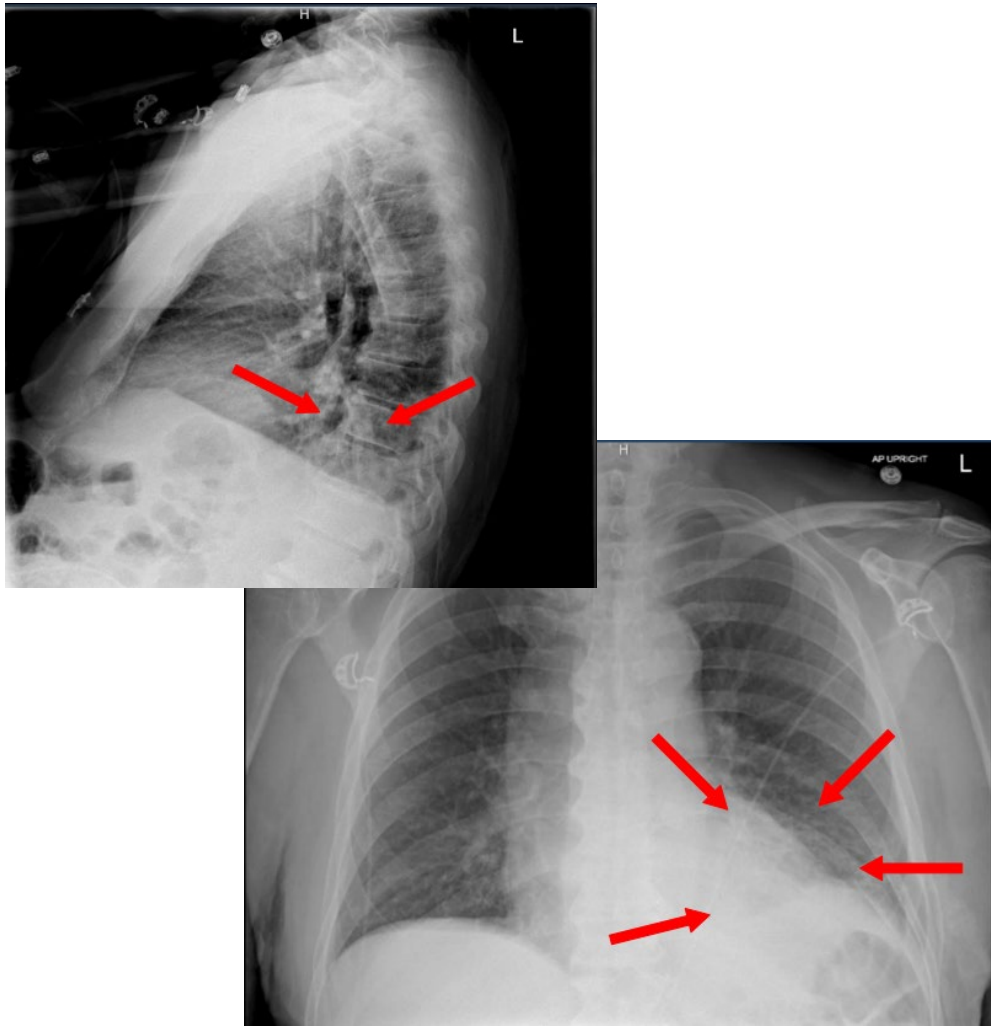
Human Tularemia Cases, 2004–2025*



*Data are preliminary as data collection is ongoing

Recent pneumonic cases

- Seven pneumonic cases identified 2024-2025
- *F. tularensis* identified in blood cultures, pericardial fluid, and lung lymph nodes
- Most looked like community-acquired pneumonia



An excuse not to do yard work?

Francisella tularensis: the Laboratory Side of Tularemia

Aaron Barnes, MD, PhD | EPR Lab Supervisor

Francisella tularensis - General

Subspecies	Locations	Common Hosts	Virulence (relative)	Notes
F.t. tularensis (Type A)	**N. America**	Rabbits, other rodents	High	
F.t. holartica (Type B)	Europe, Asia, **N. America**	Widespread	Medium-High	Associated with aquatic environments
F.t. mediastica	Central Asia, Russia	Various small mammals	Medium-Low	Poorly studied; no definitive human cases identified to date
F. novicida	**N. America** (mostly western U.S.)	Widespread	Low	

F. Tularensis – Testing at MDH-PHL

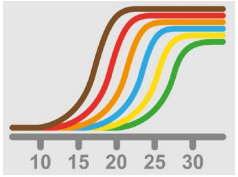
Typical source: isolated colony

WB

Tissue

RT-PCR #1

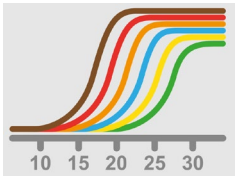
Francisella spp.



~4 hrs

RT-PCR #2

Sub-speciation

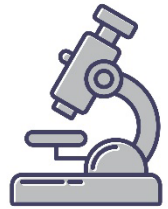


~4 hrs

Culture

1-3 days

DFA



1 day

Francisella tularensis – Culture

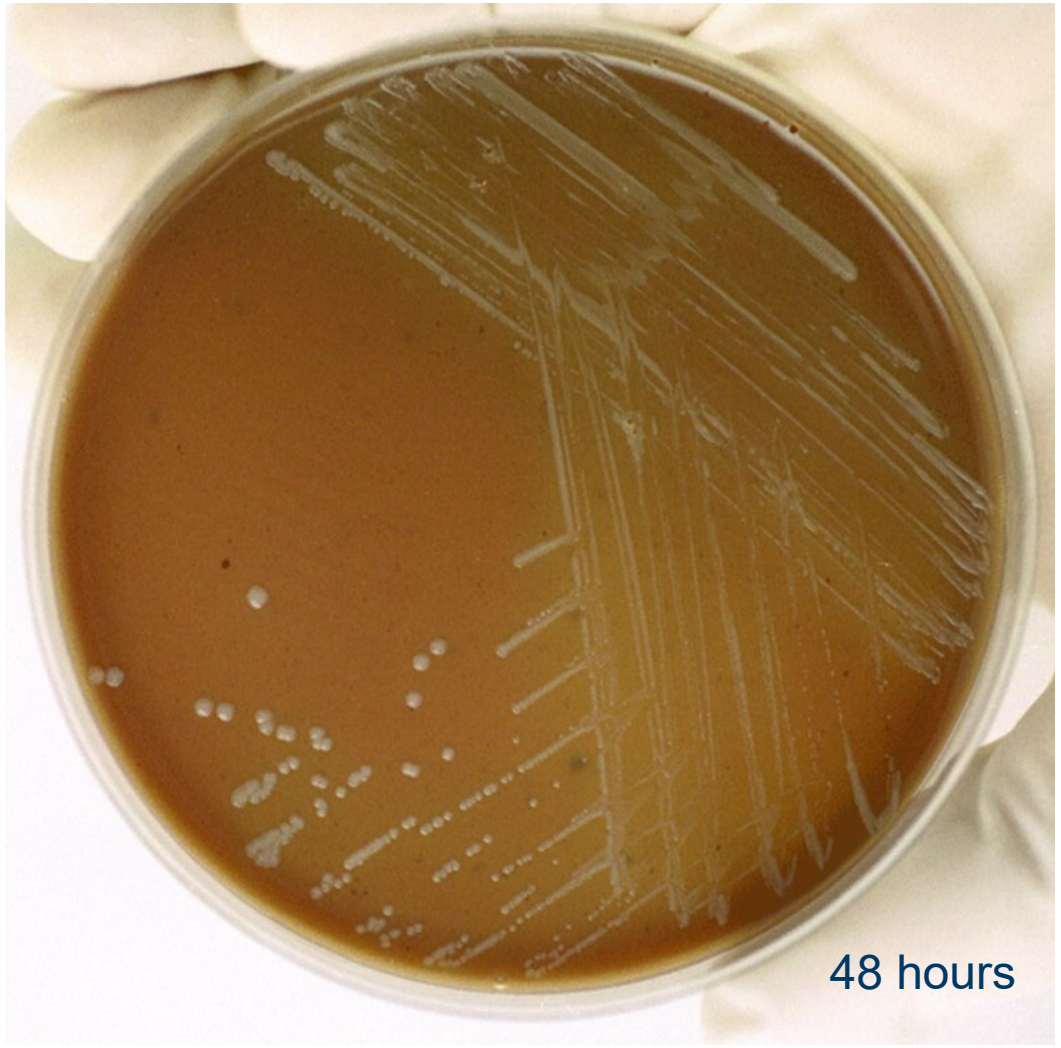
F. tularensis **requires** cysteine supplementation; poor growth on SBA; no growth on MAC/EMB

24 hour growth:

- Little to no growth
- Tiny, pinpoint colonies

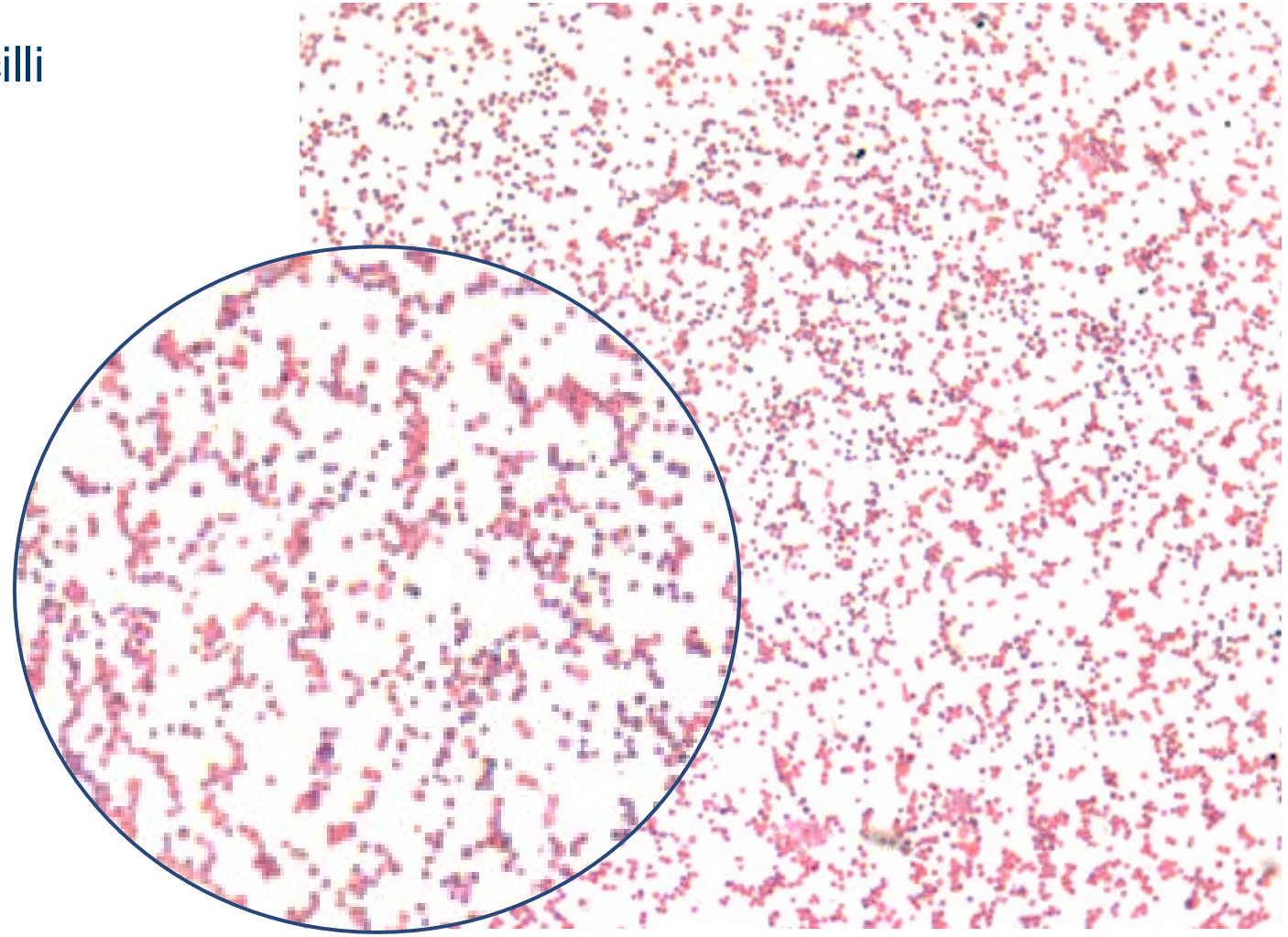
48 hour growth:

- White to grey / bluish grey
- Opaque
- Flat colonies with smooth edges
- 1-2 mm diameter



Francisella tularensis – Cell morphology

- Pleomorphic, Gram negative coccobacilli
- Extremely tiny
  - 0.2-0.5 µm x 0.5-0.7 µm
- **Poorly staining**
  - Can appear Gram variable
- Can look like *Brucella* spp.



Francisella tularensis – Biochemical Tests

- Misidentification using automated detection systems is common so **classic biochemical testing is preferred**.
  - Vitek NHI panel may identify as:
    - *Aggregatibacter* spp.
    - *Haemophilus influenza*
  - Bruker MALDI
    - Typically, no ID:
    - *Oligella* spp or *Psychrobacter* spp have been reported.
- If *F. tularensis* is suspected, **do not** perform testing using automated systems
  - Aerosol generating potential

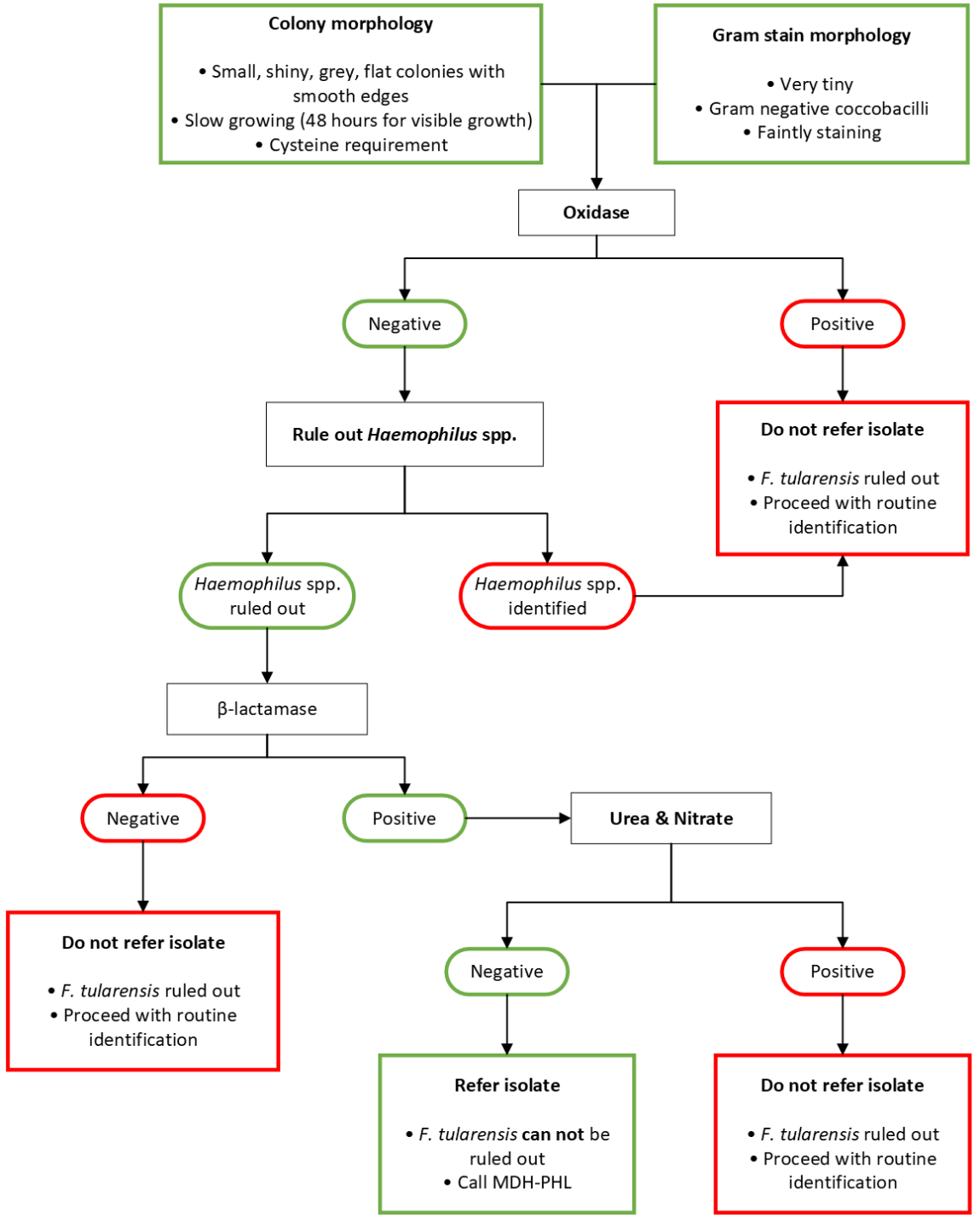
Test	Result
Oxidase	Negative
Catalase	Weak positive*
Motility	Negative
Nitrate	Negative
Urea	Negative
β-lactamase	Positive

* Catalase can appear negative

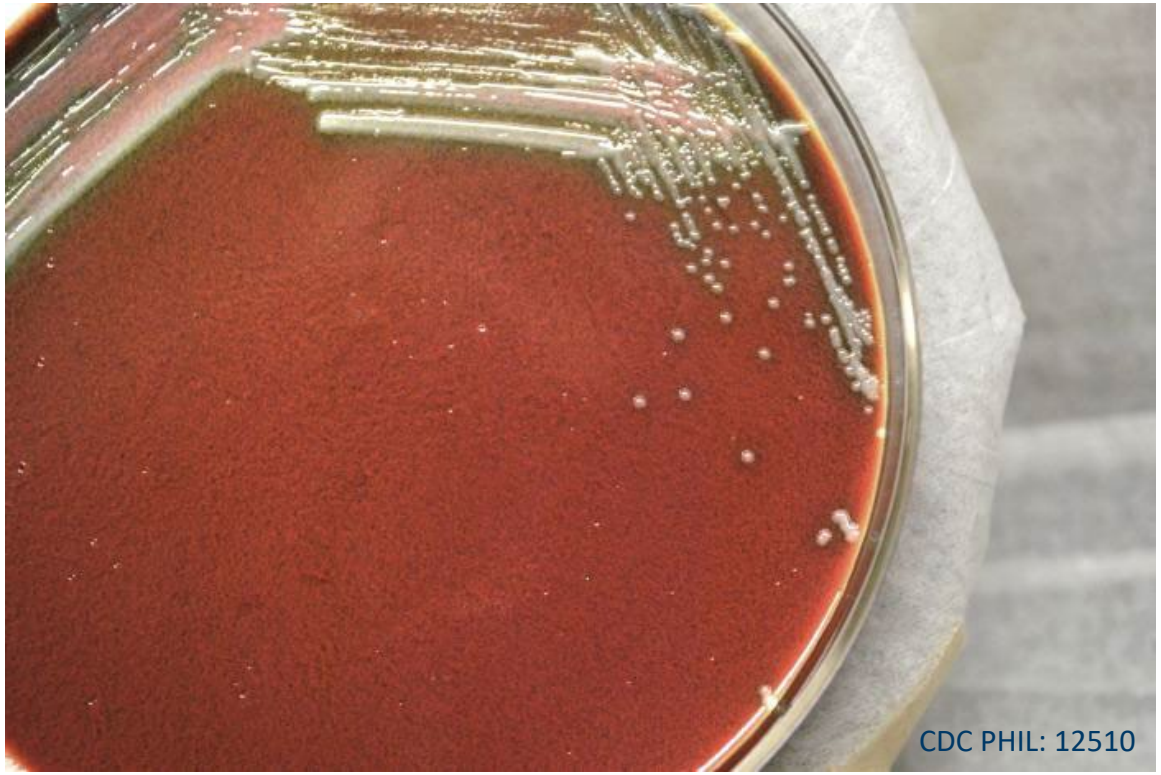
Francisella tularensis

When to refer an isolate to MDH for rule-out:

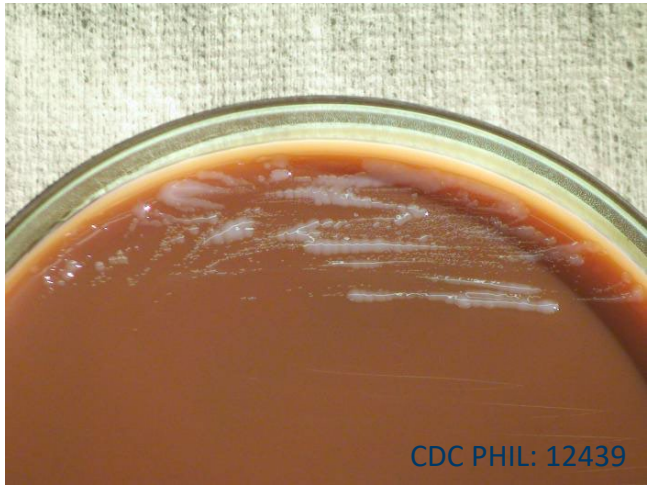
- **Biochemical tests:**
  - Oxidase, urease, nitrate negative
  - β-lactamase positive
- **Gram stain:**
  - Gram negative coccobacilli
  - Faintly staining
  - Very tiny
- **Colony morphology (Chocolate agar):**
  - Small, shiny, gray colonies
  - Flat colonies with smooth edges
  - Slow growing (48 hours for visible growth)



F. tularensis – MDH-PHL: Culture



F. tularensis on CHAB media, 48 hrs post-inoculation



F. tularensis on CHOC media, 48 hrs post-inoculation

BCYE

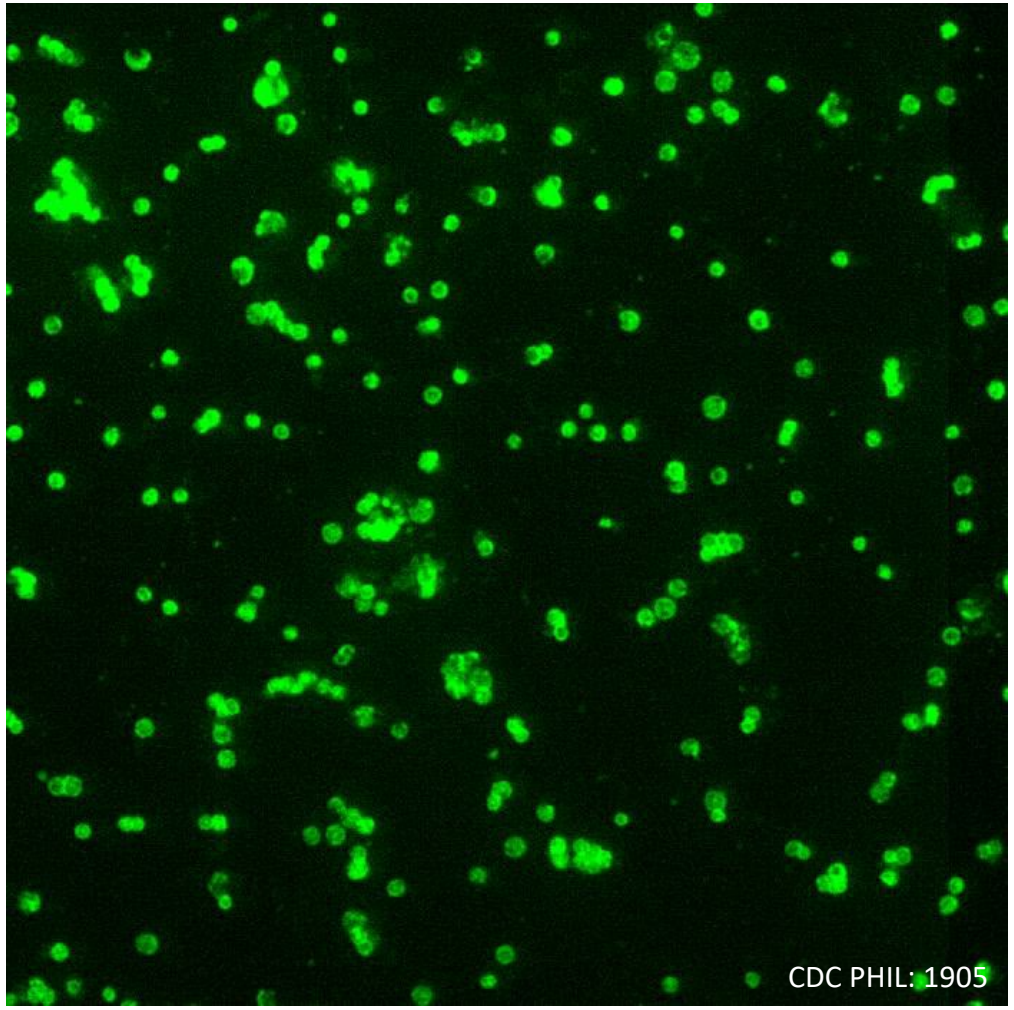
Poor or no growth

- SBA / blood agar
- MAC
- EMB

F. tularensis – MDH-PHL: Microscopy

Direct fluorescent antibody (DFA) labeling of *F. tularensis* highlighting the coccobacillary morphology

(polyclonal antibody; FITC; mag: 1,000X)

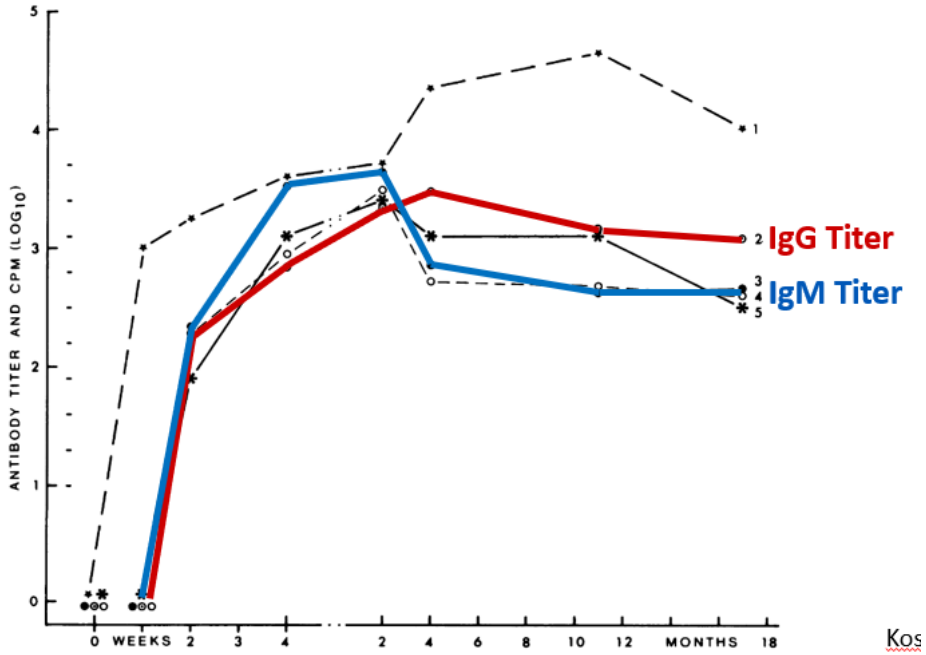


Differentiating *F. tularensis* from other similar Gram-negative bacteria

Test	*F. tularensis*	*Brucella* spp.	*Haemophilus* spp.	*P. multocida*
Oxidase	-	+	variable	+
Urease	-	+	variable	-
Morphology	Very tiny CCB	Tiny CCB	Small CCB	Small CCB
Specimen source	Almost any	Blood, bone marrow	Blood, CSF, other	Wound, blood, respiratory
Motility	-	-	-	-
Factors X or V requirement?	-	-	+	-
Cysteine requirement?	+	-	-	-

F. tularensis: Other testing

- Serology: Collect at least 14 days after illness onset
  - IgM and IgG often rise concurrently
  - Widely available at commercial labs
  - Variable clinical utility
    - Not useful as test-for-cure
    - False positives, due to non-specific binding and cross-reactivity (especially to *Brucella)*
- Future testing : metagenomic sequencing / pathogen-agnostic testing



Koskela and Hevra, Infect Immun (1982)

F. tularensis – Antimicrobial susceptibility testing

- **AST**
  - Susceptible to Gent, Cipro, Doxy
  - B-lactams not used
    - FTU-1: a class A beta-lactamase
  - Natural changes in resistance patterns are functionally non-existent
  - In rare occasions, AST can be done (but not at the local level)

Biosafety

Eric Lundquist | Biosafety Coordinator

Risk Assessment

- "The process of evaluating risks that arise from agent and laboratory hazards, taking into account the adequacy of existing controls, prioritizing those risks, and deciding if the risks are acceptable."

~Biosafety in Microbiological and Biomedical Laboratories (BMBL): 6th Edition

Who Does Risk Assessments?

- Ideally, a multidisciplinary team
  - **Laboratory staff**
  - Infection Preventionists
  - Management/supervisors
  - Health and safety specialists (biosafety, occupational health…)
  - Facility staff

Hazard Analysis Worksheet

Process/Procedure Hazard Analysis Worksheet

What is being assessed: Can be a whole process/multiple procedures, a single procedure, or common tasks in multiple procedures.
Who was involved in the hazard analysis: List all names of who Was involved in the Hazard Analysis.
Date analysis was completed: Click or tap to enter a date.

Identification of Hazards: Biological

Are infectious agents or clinical samples involved? ☐ Yes ☐ No. If no, skip to the chemical section

If yes, what organisms may be found? List all organism that apply.

What sample types are received? list all types of samples that are expected (ie. swab in VTM, stool sample, etc.)

Typical routes of transmission? ☐ Inhalation ☐ Mucosal ☐ Ingestion ☐ Percutaneous

Is it a select agent? ☐ Yes ☐ No Tier 1? ☐

If an exposure were to occur without any mitigation what could happen?

☐ Minor illness ☐ Illness requiring physician visit ☐ Illness requiring ☐ Hospitalization ☐ Death without treatment

Vaccination available? ☐ Yes ☐ No

Is the organism inactivated? ☐ Yes ☐ No

If yes how? what steps are taken to inactivate the organism(s) in question?

Has inactivation been shown by testing? ☐ Yes ☐ No

What is the overall consequence if an exposure occurs, taking into account the information above?

Taking into account all information in this subsection, what would happen if someone is exposed to the organism, taking into account the information above. What medical followup would be necessary?

* Add links or citations to additional agent information to the references section

Volumes involved

Volume of sample received? Enter the typical amount of sample recieved.

Volume pipetted during testing? What amount of the sample is used during testing?

Does testing involve cultured material? ☐ Yes ☐ No

If yes how much? Enter how much cultured material is used for testing.

How is it used? What is the cultured material used for, for example, extraction, restreaking, etc.

Are there potential aerosol-generating steps? ☐ Yes ☐ No

If yes what are they:

☐ Centrifuging ☐ Inoculating media ☐ Cooling loops ☐ Pipetting ☐ Pouring ☐ Splitting ☐ Decanting
☐ Removing caps ☐ Heat Fixing ☐ Blending ☐ Grinding ☐ Shaking ☐ Sonicating ☐ Vortexing
☐ Mixing ☐ Opening containers ☐ Mixing with a Pipette ☐ Other: If other, please specify.

If samples are pipetted:

Is the pipette blown out? ☐ Yes ☐ No

Is it a filter tip? ☐ Yes ☐ No

What is the likelihood of an aerosol being generated and why?

Thinking of the steps identified and othr hazards involved in those steps what is chance of an exposure to a hazard occurring and/or how frequently and why?

Where are these steps currently done?

Where are the identifies steps being performed, for example biosafety cabinet, bench top, etc.

Are current mitigations and standard precautions sufficient to minimize risk? ☐ Yes ☐ No

If yes what are they: Describe the current mitigations that are in place and why they are sufficient to minimize the risk to a hazard.

If no why not? (Risk Assessment Summary form must be filled out): Describe the why the current mitigations are not sufficient to minimize the risk to a hazard.

Are sharps used? ☐ Yes ☐ No

If yes what kinds: ☐ Scalpels ☐ Syringes ☐ Glass slides ☐ Other: If other, please specify.

What are they used for? Describe what the sharps are used for.

How are they disposed of? Describe how sharps are disposed of.

Have safer sharps been considered? ☐ Yes ☐ No

If no why not? Describe why safer sharps have not been considered.

If yes were they implemented? ☐ Yes ☐ No

If not why not? Describe the reason safer sharps were not implimented.

Glass substituted with plastic where possible? ☐ Yes ☐ No

Are current mitigations and standard precautions sufficient to minimize risk? ☐ Yes ☐ No

If yes what are they: Describe the current mitigations that are in place and why they are sufficient to minimize the risk to a hazard.

If no why not? (Risk Assessment Summary form must be filled out): Describe the why the current mitigations are not sufficient to minimize the risk to a hazard.

Identification of Hazards: Chemical

Are hazardous chemicals used? ☐ Yes ☐ No If yes add to table below

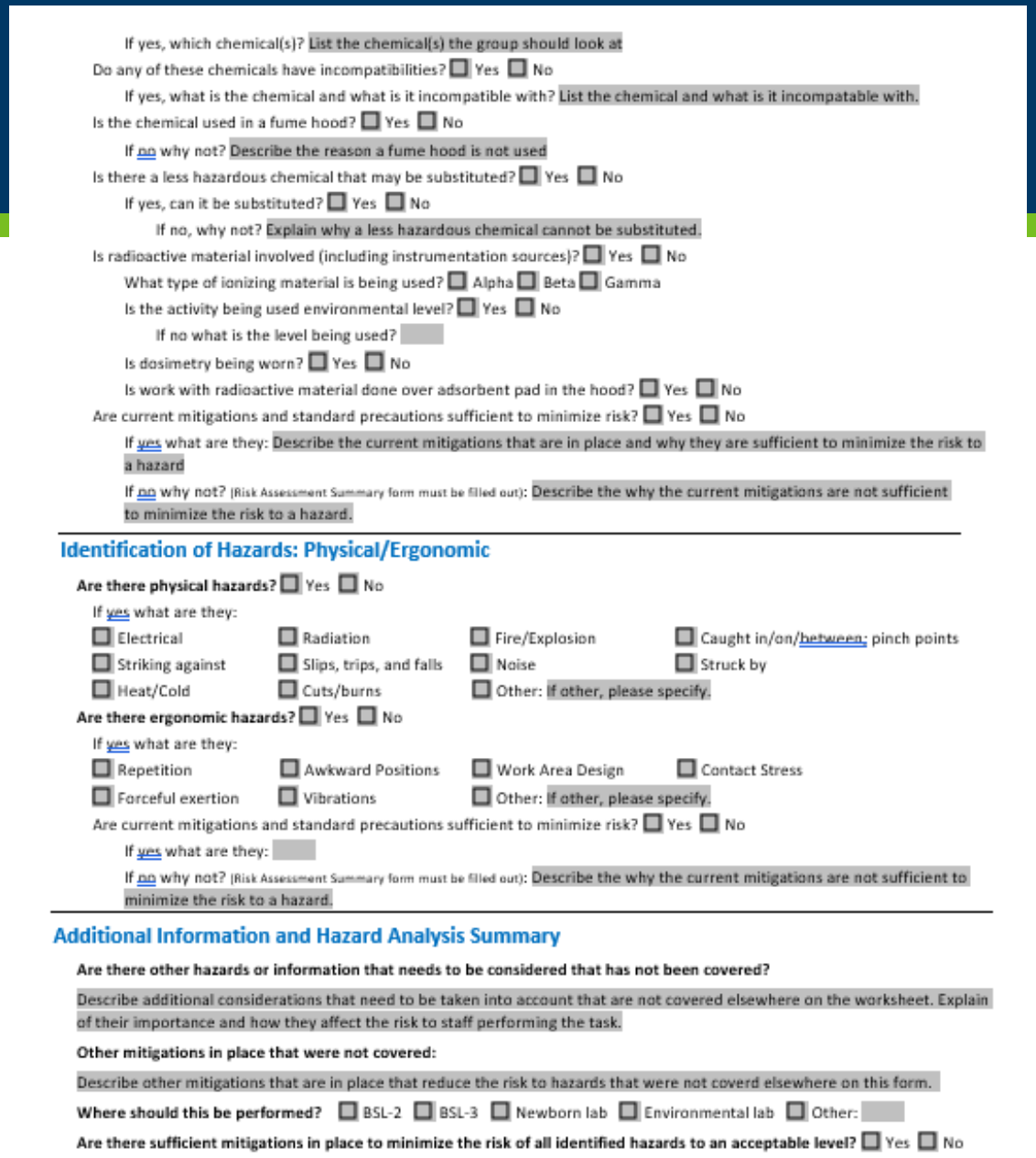
Are samples chemically preserved? ☐ Yes ☐ No If yes add to table below

Chemical Name	Hazard(s)	On OSHA table Z?	Concentration used?	Amount used?	How and where is it used?	Route of exposure?	Who is at risk?
	☐ Significant health effects	☐ Yes ☐ No					☐ Self ☐ Others
	☐ Significant health effects	☐ Yes ☐ No					☐ Self ☐ Others
	☐ Significant health effects	☐ Yes ☐ No					☐ Self ☐ Others
	☐ Significant health effects	☐ Yes ☐ No					☐ Self ☐ Others
	☐ Significant health effects	☐ Yes ☐ No					☐ Self ☐ Others
	☐ Significant health effects	☐ Yes ☐ No					☐ Self ☐ Others

* significant health effects include but not limited to carcinogens, mutagens, teratogens, etc.

Should any of these chemicals be looked at by the Chemical Safety Group? ☐ Yes ☐ No

Hazard Analysis Worksheet



If yes, which chemical(s)? List the chemical(s) the group should look at

Do any of these chemicals have incompatibilities? ☐ Yes ☐ No

If yes, what is the chemical and what is it incompatible with? List the chemical and what is it incompatable with.

Is the chemical used in a fume hood? ☐ Yes ☐ No

If no why not? Describe the reason a fume hood is not used

Is there a less hazardous chemical that may be substituted? ☐ Yes ☐ No

If yes, can it be substituted? ☐ Yes ☐ No

If no, why not? Explain why a less hazardous chemical cannot be substituted.

Is radioactive material involved (including instrumentation sources)? ☐ Yes ☐ No

What type of ionizing material is being used? ☐ Alpha ☐ Beta ☐ Gamma

Is the activity being used environmental level? ☐ Yes ☐ No

If no what is the level being used?

Is dosimetry being worn? ☐ Yes ☐ No

Is work with radioactive material done over adsorbent pad in the hood? ☐ Yes ☐ No

Are current mitigations and standard precautions sufficient to minimize risk? ☐ Yes ☐ No

If yes what are they: Describe the current mitigations that are in place and why they are sufficient to minimize the risk to a hazard

If no why not? (Risk Assessment Summary form must be filled out): Describe the why the current mitigations are not sufficient to minimize the risk to a hazard.

Identification of Hazards: Physical/Ergonomic

Are there physical hazards? ☐ Yes ☐ No

If yes what are they:

☐ Electrical ☐ Radiation ☐ Fire/Explosion ☐ Caught in/on/between; pinch points

☐ Striking against ☐ Slips, trips, and falls ☐ Noise ☐ Struck by

☐ Heat/Cold ☐ Cuts/burns ☐ Other: If other, please specify.

Are there ergonomic hazards? ☐ Yes ☐ No

If yes what are they:

☐ Repetition ☐ Awkward Positions ☐ Work Area Design ☐ Contact Stress

☐ Forceful exertion ☐ Vibrations ☐ Other: If other, please specify.

Are current mitigations and standard precautions sufficient to minimize risk? ☐ Yes ☐ No

If yes what are they:

If no why not? (Risk Assessment Summary form must be filled out): Describe the why the current mitigations are not sufficient to minimize the risk to a hazard.

Additional Information and Hazard Analysis Summary

Are there other hazards or information that needs to be considered that has not been covered?

Describe additional considerations that need to be taken into account that are not covered elsewhere on the worksheet. Explain of their importance and how they affect the risk to staff performing the task.

Other mitigations in place that were not covered:

Describe other mitigations that are in place that reduce the risk to hazards that were not coverd elsewhere on this form.

Where should this be performed? ☐ BSL-2 ☐ BSL-3 ☐ Newborn lab ☐ Environmental lab ☐ Other:

Are there sufficient mitigations in place to minimize the risk of all identified hazards to an acceptable level? ☐ Yes ☐ No

"Are there sufficient mitigations in place to minimize the risk of all identified hazards to an acceptable level?"

Risk Assessment Summary Form

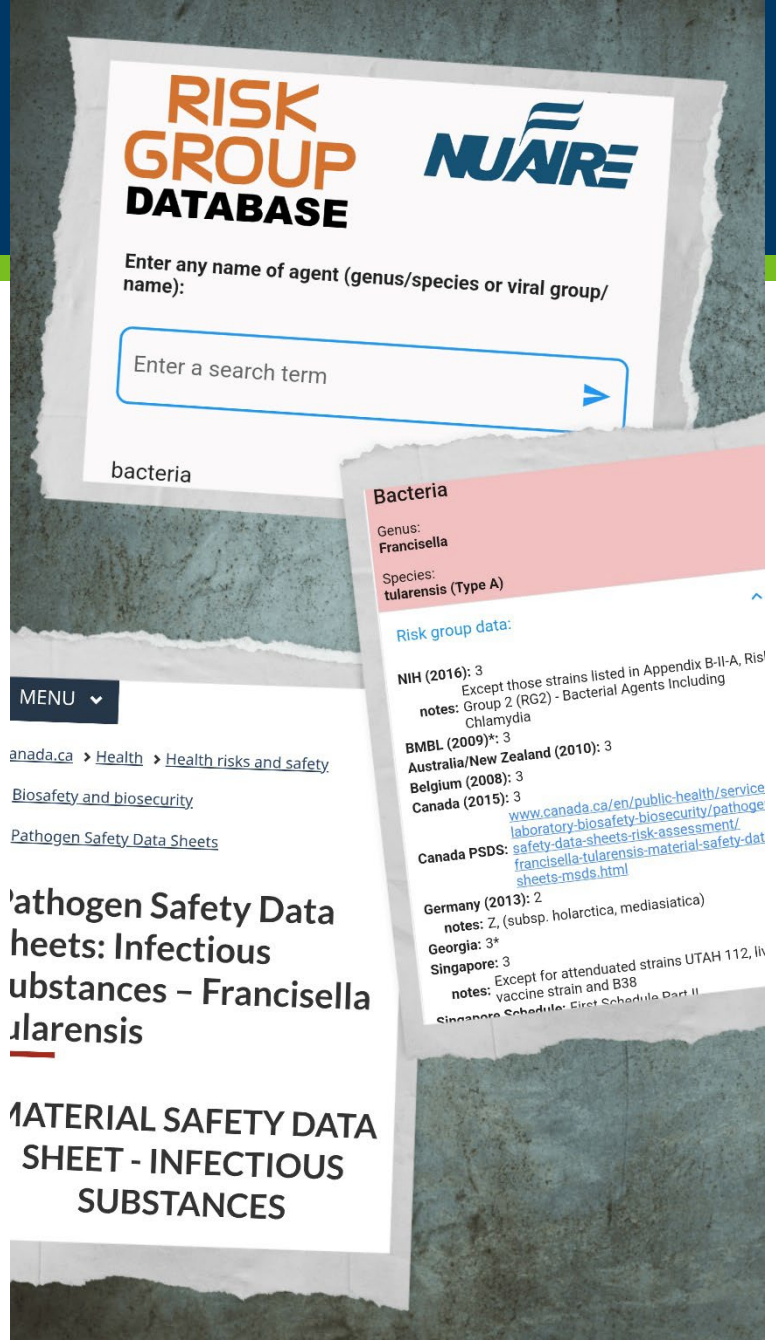
Minnesota Department of Health Public Health Laboratory Division

Safety Risk Assessment Summary Form

Procedure/Process Name			
Individuals Performing Risk Assessment			
Biological			
Agent(s):			
Infectious Dose:			
Route(s) of Transmission:			
Agent Risk Group:			
Chemical			
Chemical(s) of concern:			
Chemical Characteristic(s):			
Route(s) of Exposure:			
Physical:			
Ergonomic:			
Required PPE: Lab Coat, Gloves, Eye Protection (either safety glasses or face shield)			
Procedure	Task/what is being done?	Hazard/what could go wrong	Control (Mitigation) to minimize risk?

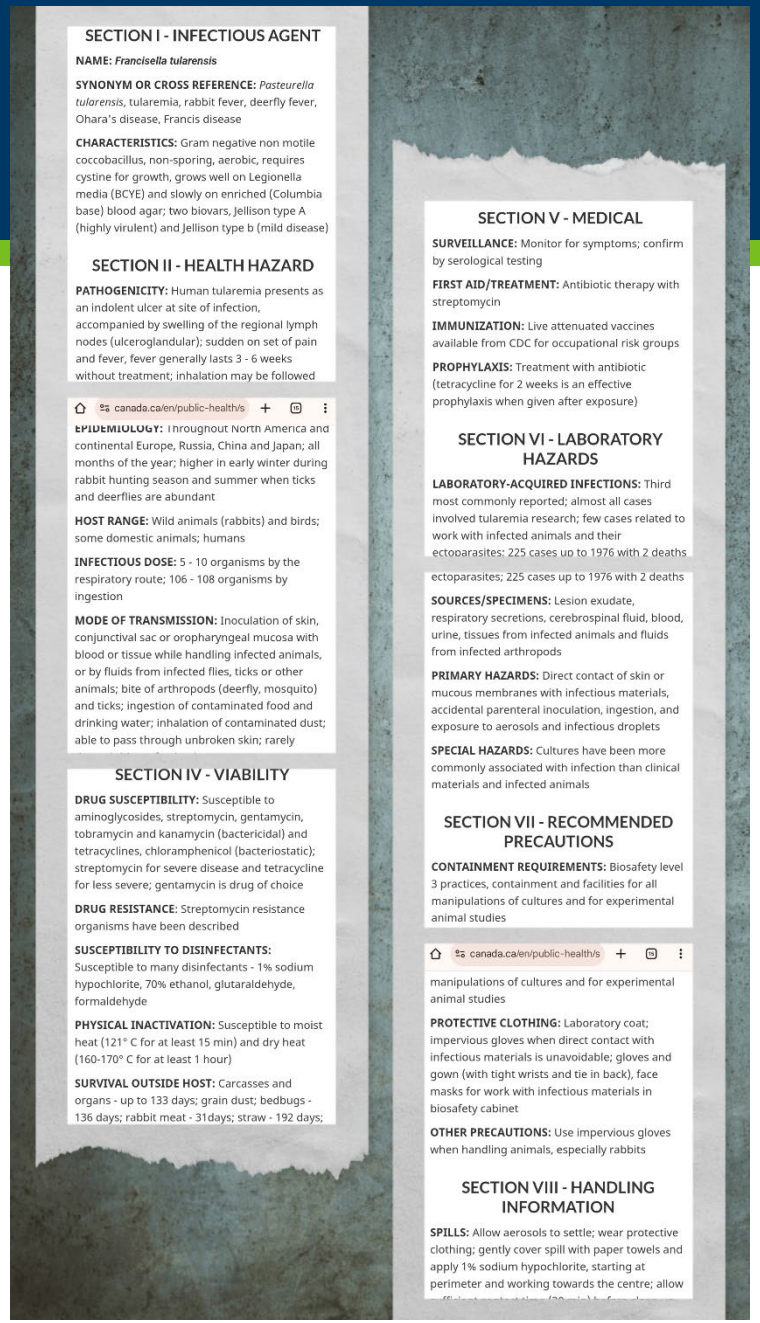
Other considerations:

Risk Assessment Tool



- American Biological Safety Association (ABSA)
- Risk Group Database
- Links to Canada Pathogen Safety Data Sheets

9 Sections



SECTION I - INFECTIOUS AGENT

NAME: *Francisella tularensis*

SYNONYM OR CROSS REFERENCE: *Pasteurella tularensis*, tularemia, rabbit fever, deerfly fever, Ohara's disease, Francis disease

CHARACTERISTICS: Gram negative non motile coccobacillus, non-sporing, aerobic, requires cystine for growth, grows well on Legionella media (BCYE) and slowly on enriched (Columbia base) blood agar; two biovars, Jellison type A (highly virulent) and Jellison type b (mild disease)

SECTION II - HEALTH HAZARD

PATHOGENICITY: Human tularemia presents as an indolent ulcer at site of infection, accompanied by swelling of the regional lymph nodes (ulceroglandular); sudden on set of pain and fever, fever generally lasts 3 - 6 weeks without treatment; inhalation may be followed

canada.ca/en/public-health/s

EPIDEMIOLOGY: Throughout North America and continental Europe, Russia, China and Japan; all months of the year; higher in early winter during rabbit hunting season and summer when ticks and deerflies are abundant

HOST RANGE: Wild animals (rabbits) and birds; some domestic animals; humans

INFECTIOUS DOSE: 5 - 10 organisms by the respiratory route; 106 - 108 organisms by ingestion

MODE OF TRANSMISSION: Inoculation of skin, conjunctival sac or oropharyngeal mucosa with blood or tissue while handling infected animals, or by fluids from infected flies, ticks or other animals; bite of arthropods (deerfly, mosquito) and ticks; ingestion of contaminated food and drinking water; inhalation of contaminated dust; able to pass through unbroken skin; rarely

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Susceptible to aminoglycosides, streptomycin, gentamycin, tobramycin and kanamycin (bactericidal) and tetracyclines, chloramphenicol (bacteriostatic); streptomycin for severe disease and tetracycline for less severe; gentamycin is drug of choice

DRUG RESISTANCE: Streptomycin resistance organisms have been described

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium hypochlorite, 70% ethanol, glutaraldehyde, formaldehyde

PHYSICAL INACTIVATION: Susceptible to moist heat (121° C for at least 15 min) and dry heat (160-170° C for at least 1 hour)

SURVIVAL OUTSIDE HOST: Carcasses and organs - up to 133 days; grain dust; bedbugs - 136 days; rabbit meat - 31days; straw - 192 days;

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm by serological testing

FIRST AID/TREATMENT: Antibiotic therapy with streptomycin

IMMUNIZATION: Live attenuated vaccines available from CDC for occupational risk groups

PROPHYLAXIS: Treatment with antibiotic (tetracycline for 2 weeks is an effective prophylaxis when given after exposure)

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: Third most commonly reported; almost all cases involved tularemia research; few cases related to work with infected animals and their ectoparasites; 225 cases up to 1976 with 2 deaths

ectoparasites; 225 cases up to 1976 with 2 deaths

SOURCES/SPECIMENS: Lesion exudate, respiratory secretions, cerebrospinal fluid, blood, urine, tissues from infected animals and fluids from infected arthropods

PRIMARY HAZARDS: Direct contact of skin or mucous membranes with infectious materials, accidental parenteral inoculation, ingestion, and exposure to aerosols and infectious droplets

SPECIAL HAZARDS: Cultures have been more commonly associated with infection than clinical materials and infected animals

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 3 practices, containment and facilities for all manipulations of cultures and for experimental animal studies

canada.ca/en/public-health/s

manipulations of cultures and for experimental animal studies

PROTECTIVE CLOTHING: Laboratory coat; impervious gloves when direct contact with infectious materials is unavoidable; gloves and gown (with tight wrists and tie in back), face masks for work with infectious materials in biosafety cabinet

OTHER PRECAUTIONS: Use impervious gloves when handling animals, especially rabbits

SECTION VIII - HANDLING INFORMATION

SPILLS: Allow aerosols to settle; wear protective clothing; gently cover spill with paper towels and apply 1% sodium hypochlorite, starting at perimeter and working towards the centre; allow

- Infectious Agent
- Health Hazard
- Dissemination
- Viability
- Medical
- Laboratory Hazards
- Recommended Precautions
- Handling Information
- Miscellaneous Information

Trigger Points

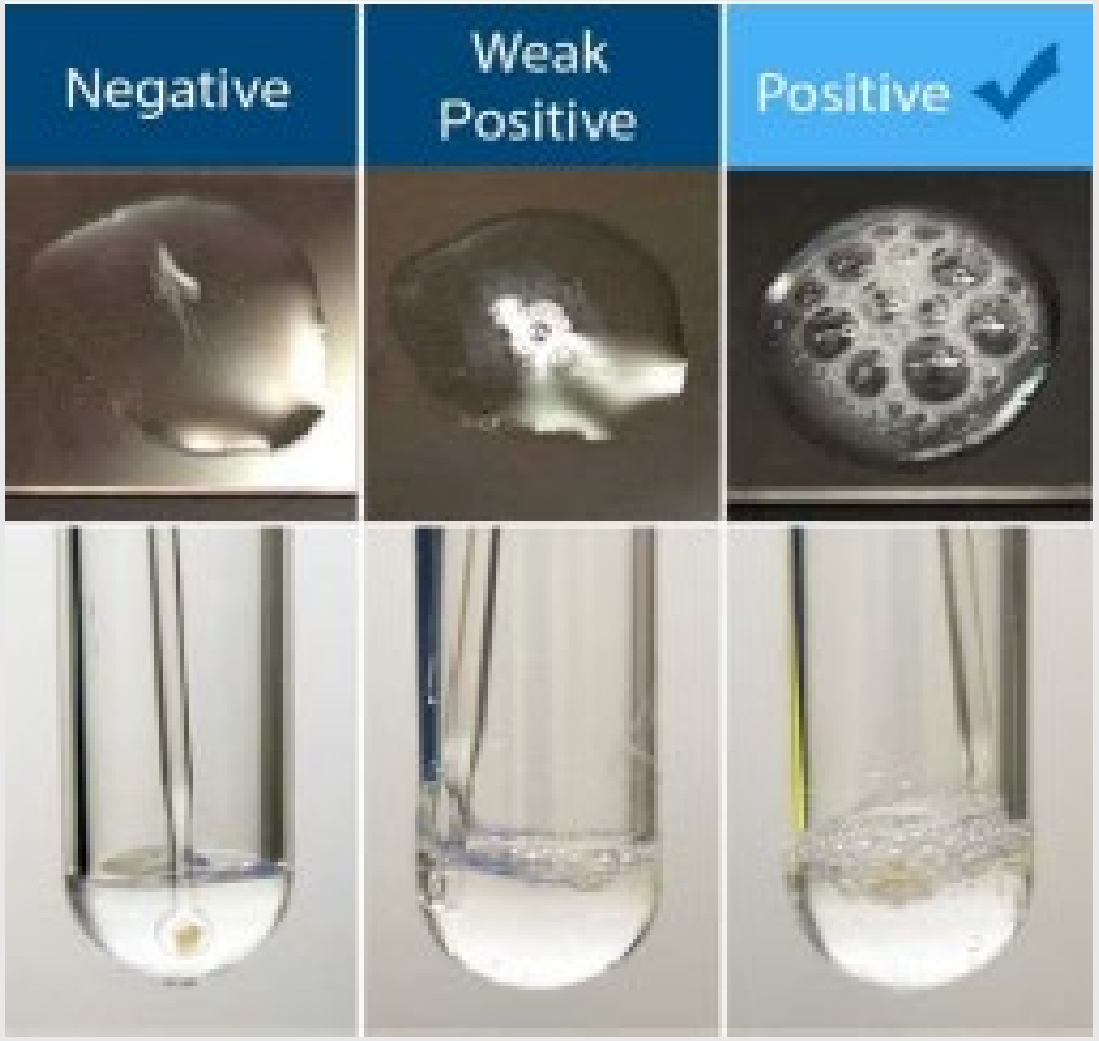
- Growth from sterile sites (blood, CSF, body fluids)
- Poor growth after 48-72 hours
- Growth only on Chocolate agar, or better growth on Chocolate than SBA
- Any culture with filamentous mold

~Biosafety in Microbiological and Biomedical Laboratories (BMBL): 6th Edition

Key Biosafety Considerations

- Innoculate positive Blood Cultures in a Biosafety Cabinet (BSC)
- Tape plates on positive Blood Cultures that are slow to flag positive
- Read all Day 1 Blood and Sterile Site Cultures in BSC
- If you see Gram variable coccobacilli or tiny GNB on any site on initial Gram stain:
  - Tape plate shut before incubating
  - Read in BSC
- Consider setting up a Chocolate agar:
  - On any culture that involves an animal or tick bite
  - On any culture with GVB or tiny GNB on initial Gram stain

When you have suspicion, perform work done in BSC

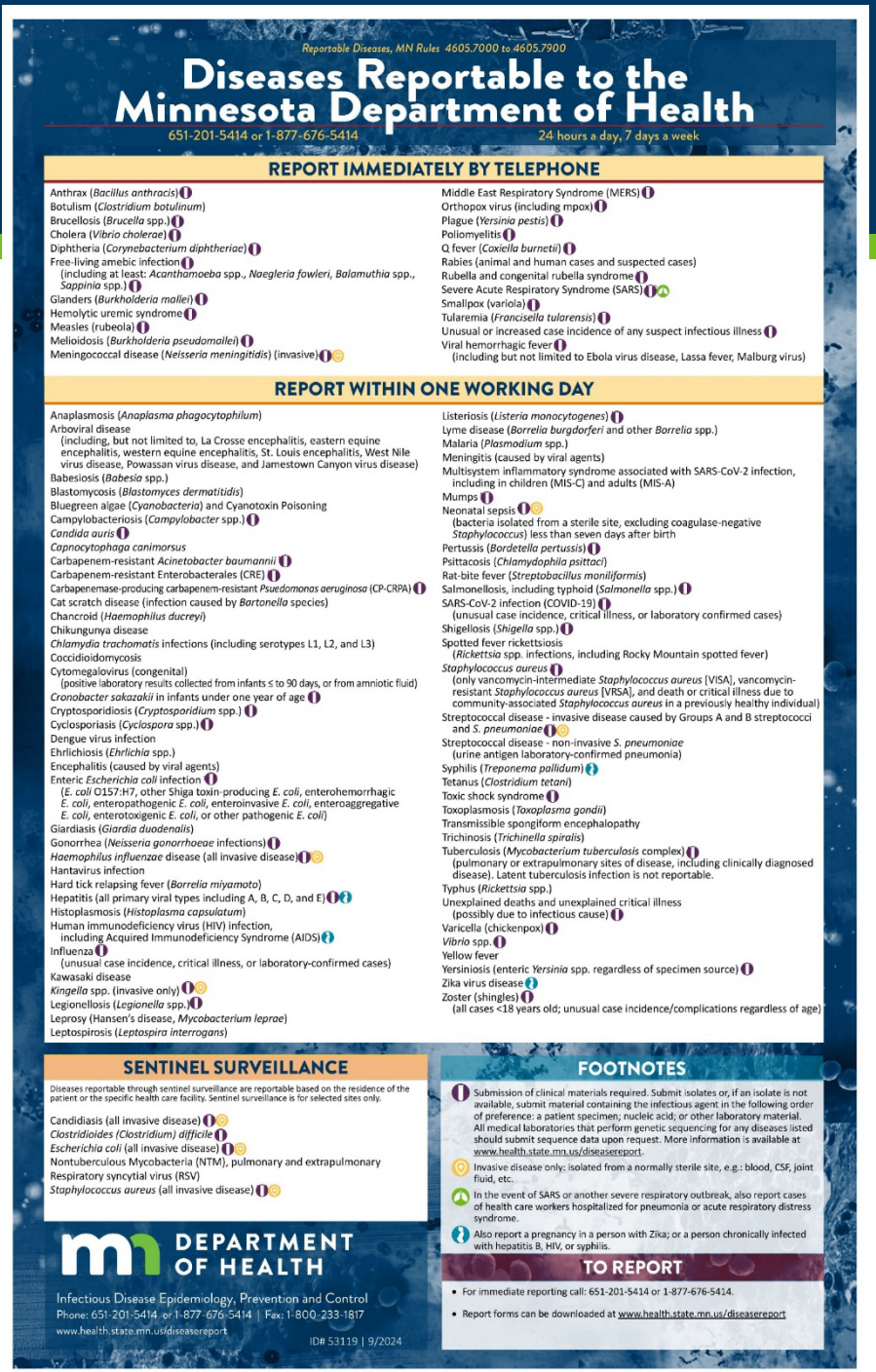


- Any manipulation should be done in a BSC
- Aerosol generating procedures such as catalase are done in a BSC
- Aliquot and pipet in a BSC
- Subculture in a BSC
- Make and fix Gram stain slide in a BSC

BSC Setup

Review: Reportable Diseases

- Information about MN reportable diseases: www.health.state.mn.us/diseases/reportable/rule/index.html
- Two categories:
  - Report immediately by telephone
  - Report withing one working day
- For immediate reporting call:
  - 651-201-5414 or 1-877-676-5414
- Report forms can be downloaded at www.health.state.mn.us/diseasereport



Reportable Diseases, MN Rules 4605.7000 to 4605.7900

Diseases Reportable to the Minnesota Department of Health

651-201-5414 or 1-877-676-5414 — 24 hours a day, 7 days a week

REPORT IMMEDIATELY BY TELEPHONE

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

REPORT WITHIN ONE WORKING DAY

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*)
Bluegreen algae (*Cyanobacteria*) and Cyanotoxin Poisoning
Campylobacteriosis (*Campylobacter* spp.)
Candida auris
Capnocytophaga canimorsus
Carbapenem-resistant *Acinetobacter baumannii*
Carbapenem-resistant Enterobacterales (CRE)
Carbapenemase-producing carbapenem-resistant *Psuedomonas aeruginosa* (CP-CRPA)
Cat scratch disease (infection caused by *Bartonella* species)
Chancroid (*Haemophilus ducreyi*)
Chikungunya disease
Chlamydia trachomatis infections (including serotypes L1, L2, and L3)
Coccidioidomycosis
Cytomegalovirus (congenital)
(positive laboratory results collected from infants ≤ to 90 days, or from amniotic fluid)
Cronobacter sakazakii in infants under one year of age
Cryptosporidiosis (*Cryptosporidium* spp.)
Cyclosporiasis (*Cyclospora* spp.)
Dengue virus infection
Ehrlichiosis (*Ehrlichia* spp.)
Encephalitis (caused by viral agents)
Enteric *Escherichia coli* infection
(*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 duodenalis*)
Gonorrhea (*Neisseria gonorrhoeae* infections)
Haemophilus influenzae disease (all invasive disease)
Hantavirus infection
Hard tick relapsing fever (*Borrelia miyamoto*)
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)
Influenza
(unusual case incidence, critical illness, or laboratory-confirmed cases)
Kawasaki disease
Kingella spp. (invasive only)
Legionellosis (*Legionella* spp.)
Leprosy (Hansen's disease, *Mycobacterium leprae*)
Leptospirosis (*Leptospira interrogans*)
Listeriosis (*Listeria monocytogenes*)
Lyme disease (*Borrelia burgdorferi* and other *Borrelia* spp.)
Malaria (*Plasmodium* spp.)
Meningitis (caused by viral agents)
Multisystem inflammatory syndrome associated with SARS-CoV-2 infection, including in children (MIS-C) and adults (MIS-A)
Mumps
Neonatal sepsis
(bacteria isolated from a sterile site, excluding coagulase-negative *Staphylococcus*) less than seven days after birth
Pertussis (*Bordetella pertussis*)
Psittacosis (*Chlamydophila psittaci*)
Rat-bite fever (*Streptobacillus moniliformis*)
Salmonellosis, including typhoid (*Salmonella* spp.)
SARS-CoV-2 infection (COVID-19)
(unusual case incidence, critical illness, or laboratory confirmed cases)
Shigellosis (*Shigella* spp.)
Spotted fever rickettsiosis
(*Rickettsia* spp. infections, including Rocky Mountain spotted fever)
Staphylococcus aureus
(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*
Streptococcal disease - non-invasive *S. pneumoniae*
(urine antigen laboratory-confirmed pneumonia)
Syphilis (*Treponema pallidum*)
Tetanus (*Clostridium tetani*)
Toxic shock syndrome
Toxoplasmosis (*Toxoplasma gondii*)
Transmissible spongiform encephalopathy
Trichinosis (*Trichinella spiralis*)
Tuberculosis (*Mycobacterium tuberculosis* complex)
(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)
Varicella (chickenpox)
Vibrio spp.
Yellow fever
Yersiniosis (enteric *Yersinia* spp. regardless of specimen source)
Zika virus disease
Zoster (shingles)
(all cases <18 years old; unusual case incidence/complications regardless of age)

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 for selected sites only.

Candidiasis (all invasive disease)
Clostridioides (Clostridium) difficile
Escherichia coli (all invasive disease)
Nontuberculous Mycobacteria (NTM), pulmonary and extrapulmonary
Respiratory syncytial virus (RSV)
Staphylococcus aureus (all invasive disease)

FOOTNOTES

- 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. All medical laboratories that perform genetic sequencing for any diseases listed should submit sequence data upon request. More information is available at www.health.state.mn.us/diseasereport.
- Invasive disease only: isolated from a normally sterile site, e.g.: blood, CSF, joint fluid, etc.
- 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.
- Also report a pregnancy in a person with Zika; or a person chronically infected with hepatitis B, HIV, or syphilis.

TO REPORT

- For immediate reporting call: 651-201-5414 or 1-877-676-5414.
- Report forms can be downloaded at www.health.state.mn.us/diseasereport

DEPARTMENT OF HEALTH

Infectious Disease Epidemiology, Prevention and Control
Phone: 651-201-5414 or 1-877-676-5414 | Fax: 1-800-233-1817
www.health.state.mn.us/diseasereport

ID# 53119 | 9/2024

Summary: Tularemia in MN (2025)

- Human and animal cases have been increasing to historically elevated rates
- Clinicians and laboratorians now need an increased level of concern for *F. tularensis* given increased rates
- While tularemia hot spots occur in the Twin Cities metro, cases are found throughout the state.
- Sentinel labs should closely follow the ASM guidelines and submit all suspect F. tularensis cases for rule-out testing at MDH-PHL.
- Biosafety issues around F. tularensis for laboratorians may require some changes in workflow, but can be addressed to keep everyone safe.

Contact info

Consults and On-call resources

MDH Epi on call (24x7x365)	Biothreat on call (24x7x365)
• Clinical questions, case reporting, infection prevention, etc. • **651-201-5414** or **1-877-676-5414**	• Lab questions, rule out submissions, biosafety • **612-282-3723**

Presenters

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