



Clinical Forum

TULAREMIA AND PLAGUE IDENTIFIED IN IDAHO

ERIN PETERSON AND KRIS CARTER

In late May, a middle-aged man from southeastern Idaho sought care for a febrile illness. A bacterial isolate from his blood culture was sent to Idaho Bureau of Laboratories (IBL), where *Francisella tularensis* was confirmed. The source of exposure remains undetermined but may be related to outdoor activities. The man recovered with antibiotic therapy. In June, a man from northern Idaho was diagnosed with tularemia following a rabbit hunting related injury. This is the most common mode of transmission for tularemia.

In early June, an Elmore County child was hospitalized in Idaho after a brief illness. A bacterial isolate from one of the child's specimens was referred to IBL, where *Yersinia pestis* was identified. An epidemiologic and environmental investigation by Central District Health Department indicated that exposure to plague most likely occurred during travel to Oregon, and an environmental investigation in Oregon is ongoing. The child is recovering. Following confirmation in the child, plague has been confirmed in two domestic cats, also in Elmore County. The cats were most likely exposed from interactions with ground squirrels, known to be a reservoir of *Y. pestis*.

Francisella tularensis and *Yersinia pestis* are pathogens endemic to Idaho. Although human infections are rare, up to three tularemia cases a year are reported in Idaho, and plague cases are occasionally reported in Idaho and surrounding states (<https://www.cdc.gov/plague/maps/index.html>).

Both *F. tularensis* and *Y. pestis* are bacteria that are notorious for being misidentified on automated systems which can lead to mishandling and exposures within the lab. In fact, investigation into several possible lab exposures is ongoing. These recent cases are a good reminder for hospital laboratories to review and educate current staff on the Sentinel Laboratory Biological Threat Guidelines (<https://www.asm.org/index.php/guidelines/sentinel-guidelines>) and have staff certified to ship infectious substances.

If your lab suspects a select agent organism (see <https://www.selectagents.gov/selectagentsandtoxinslist.html> for a comprehensive list of select agents and toxins), please call IBL immediately at 208-334-0515 to coordinate shipment of the specimen and communicate the next steps you will need to take.

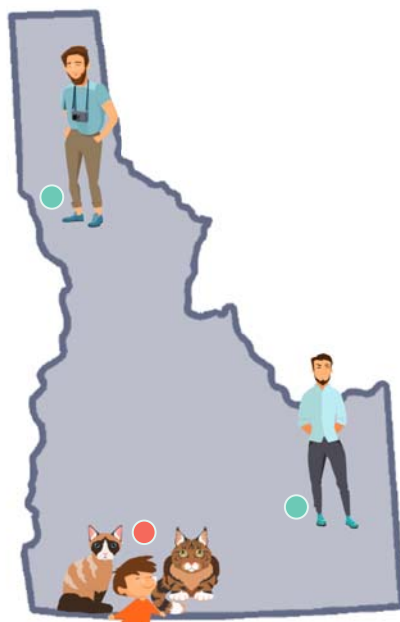


Figure 1. As of July 10, 2018, plague has been confirmed in one child and two cats this year. Tularemia has been found in two adults.



INSIDE THIS ISSUE

Tularemia and Plague in Idaho	1
Biosafety Cabinet Best Practices	2
Full Scale Exercise	3
Norovirus	4
CLIA Proficiency Testing Requirements	5
Updates	6

Biosafety Cabinet Best Practices

by Michael Stevenson, Ph.D.

A biosafety cabinet (BSC) is an enclosed, ventilated workspace that allows the user to work safely with materials containing potential biohazards. BSCs come in a variety of sizes and types. The most common BSC used in a laboratory setting is a Class II Type A2 cabinet. Class II means the BSC protects the sample, user, and work environment (a Class I BSC does not protect the sample). Type A2 means the air velocity in the cabinet is at least 100 feet per minute, and 70% of the air passing through is recirculated within the cabinet. The remaining air passes through high efficiency particulate air (HEPA) filters, which is typically exhausted into the lab.

Install and maintain

- Do not position the BSC in an area of the room where traffic and air circulation are high.
- The BSC should be certified at least annually, when it is moved, or when HEPA filters are changed.

Before you start

- If the BSC is not left continuously on, allow the BSC fan to run for at least 10 minutes before beginning work.
- Each day of use, note the magnehelic gauge reading to monitor any degradation of the HEPA filter efficiency.
- Wipe the interior BSC surface (e.g. floor, walls) with disinfectant (e.g. 70% alcohol).

When you're working

- Sample work should flow from a clean to a dirty side.
- Move arms in and out of the cabinet slowly and perpendicular to the front opening.
- Work as far to the back of the cabinet as possible, but within comfortable reach.

When you're done

- Properly disinfect items before removing them from the BSC.
- Wipe the interior BSC surface with disinfectant.
- If the BSC is not left continuously on, let the BSC run for 10 minutes before turning off the fan and closing the sash.

To learn more about the proper use of a BSC, view the free online BSC training module provided by the Centers for Disease Control and Prevention (<https://www.cdc.gov/labtraining/training-courses/biological-safety-cabinets.html>). This course is approved for 1.0 contact hours of P.A.C.E. credit.



Figure 1. IBL analysts Ashley Machado Fullmer and Erin Peterson process the exercise sample to be tested for Ebola virus.

TRANQUIL TERMINUS FULL SCALE EXERCISE – THE “WHAT IF” EBOLA SCENARIO

MICHAEL STEVENSON, PH.D. AND ERIN PETERSON

What if a person showed up at an Idaho hospital displaying symptoms and travel history that would suggest Ebola virus infection? How would the hospital and other emergency response stakeholders respond? This was addressed during the week of April 9, 2018 when St. Luke’s and St. Alphonsus hospitals, local emergency response players, and Central District Health Department in Boise partook in a federal full-scale exercise (FSE), called *Tranquil Terminus*. Idaho Bureau of Laboratories (IBL) participated by receiving a blood sample and performing the PCR test for detecting Ebola virus.

IBL’s involvement began on the day of the exercise via a State Communications Center (StateComm) bridge call. St. Alphonsus notified IBL that blood had been drawn from the volunteer “patient.” IBL staff drove to the hospital via a preplanned route, observed St. Alphonsus staff triple package the sample correctly as a Category A infectious substance, and then drove the sample back to IBL where it was delivered to scientific staff for analysis.

Before processing the exercise sample, IBL scientists donned personal protective equipment (PPE) that included a full body Tyvek suit, double gloves, and a powered air purifying respirator (PAPR). “Virus” inactivation and nucleic acid extraction was immediately followed with testing via RT rt-PCR. Total time from the arrival of the specimen at IBL to final results was 3 hours and 15 minutes.

This exercise was valuable for IBL to demonstrate staff competency and capability to respond in a timely manner to an emergency incident. The FSE was found to be a worthwhile experience for all stakeholders involved, and with the re-emergence of Ebola in the Democratic Republic of the Congo, emergency response is critical if such an outbreak were to occur in Idaho.



WHO CARES WHAT “KIND” OF NOROVIRUS I HAVE?

KARI GETZ

Idaho Bureau of Laboratories (IBL) conducts sequence testing on positive norovirus samples received from across the state. These test results fulfill an important surveillance role to keep the public safe.

You’ve probably heard of the “cruise ship virus,” formally called Norwalk (now Norovirus). These illnesses are more common in long term care facilities but became well known in past years when several cruise ships had to dock, unload their sick passengers, and swab the decks and other surfaces for norovirus testing. According to the Centers for Disease Control and Prevention (CDC), norovirus causes upward of 90% of viral gastroenteritis worldwide, leading to illness, hospitalization and even fatalities every year. Noroviruses are part of the viral family *Caliciviridae* and are categorized into five Genogroups, GI-GV; GI and GII are the most common genogroups affecting humans.

In 2009, the CDC launched a surveillance network, called CaliciNet to track norovirus outbreaks and major strains in the U.S. as well as identify new emerging strains. IBL was one of the first state laboratories to join this network and is an outbreak support center currently providing genotyping support for Idaho, Alaska, and Montana.

While genotyping doesn’t help the physician who is treating the patient, as there is no “cure” for norovirus (just supportive care), it plays an important role with surveillance. For example, if a food handler with a norovirus infection (and questionable hygiene) is working in a packaging plant and unknowingly contaminates food items with norovirus, the contaminated food items could be shipped all over the

country, with the potential to infect many people who could in turn infect others. State public health laboratories, including IBL, perform sequencing on norovirus positive samples and upload the sequencing information to the national CaliciNet database, where CDC can then track these norovirus genotypes, which may link to a common source of infection. Meanwhile, state and local epidemiologists work at the local level to provide education about treatment, disinfection, and recurrence prevention to affected facilities.

Surveillance also allows CDC to determine which strains are circulating each year. Norovirus is an RNA virus and is very prone to mutations. The CaliciNet database allows CDC to look for new emerging strains. The structure of the virus is also protected by a “capsule” called a capsid, which can make it very difficult to kill. In fact, the virus can still be transmitted after symptoms resolve.

Vaccines are being developed and tested in human populations, but the mutational abilities of norovirus strains make vaccine effectiveness very difficult. The bottom line is, you can get infected and re-infected with norovirus each and every year. Proper hygiene is your best defense!

Positive norovirus stool samples from all outbreaks should be sent to IBL for sequencing and national surveillance. View the norovirus sampling and submission guide at www.statelab.idaho.gov for details on sample requirements and submission information.

CLIA REQUIREMENTS FOR REGULATED PROFICIENCY TESTING

JENNIFER STREET

One of the most common deficiencies cited in Idaho hospital labs and clinics was proficiency testing (PT). Follow these guidelines to reduce the incidence of PT citations in your lab.

DON'T:

- ✗ Send or refer PT samples to another laboratory for testing.
- ✗ Send PT samples for “reflex¹, confirmatory², or distributive³” testing.
- ✗ Report PT sample results from another laboratory.
- ✗ Communicate with another laboratory regarding PT testing until after the program submission deadline.
- ✗ Run PT samples by themselves or in a “special run.”
- ✗ Test multiple times (unless it is part of your standard procedure).
- ✗ Change the PT program until after a full year of PT testing.
- ✗ Forget to enroll in PTs for all regulated analytes.

DO:

- ✓ Test PT samples the same as patient testing and by the same personnel that test patient samples.
- ✓ Wait until after the closing date for submission of results before using the PT samples for other testing purposes.
- ✓ Ensure the Laboratory Director (or designee) and the testing personnel sign the attestation statements.
- ✓ Document the review and evaluation of the results from the PT provider.
- ✓ Document the investigation and corrective actions taken for any failed or unacceptable result. (Even a score of 80% must be investigated).
- ✓ Maintain ALL PT documents: PT report forms, instrument printouts, attestation statements, worksheets, results submitted (to include electronic copy submission records), and emails or correspondence regarding PT sample testing.
- ✓ Verify the accuracy of unregulated analytes and those that are not evaluated or graded by the PT program.

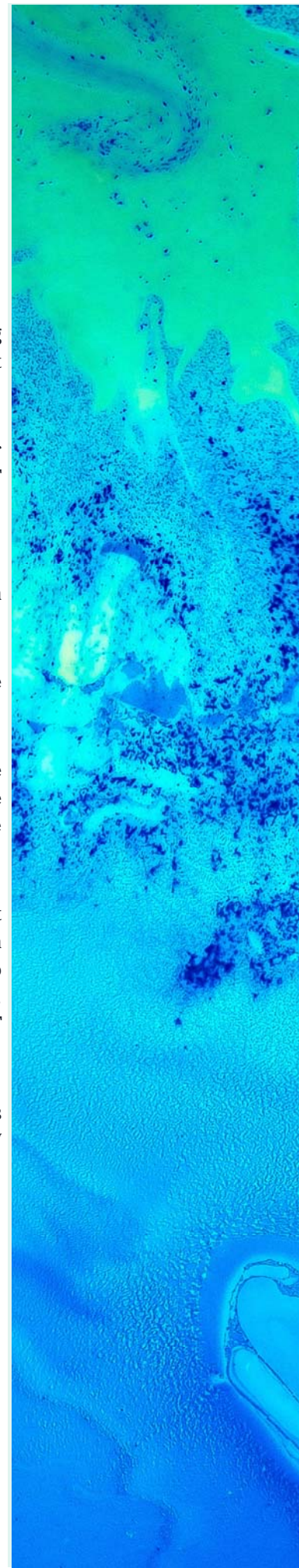
¹**Reflex testing:** any confirmatory testing or additional testing that is requested by a lab (e.g., sending a positive *E. coli* sample for serotyping)

²**Confirmatory testing:** testing performed by a second analytical procedure

³**Distributive testing:** an aliquot of the same sample being shared between 2 or more labs

Reference:

CLIA Proficiency Testing Brochure. [CMS September 2008, www.cms.hhs.gov/clia](http://www.cms.hhs.gov/clia).



IDAHO BUREAU OF LABORATORIES

The role of the Idaho Bureau of Laboratories (IBL) is to provide laboratory services that support the programs in Department of Health and Welfare, the public health districts, other state agencies, and Idaho residents. IBL offers services in four areas: testing, inspection, training, and outreach. IBL is certified by the Environmental Protection Agency for drinking water analysis and by the Centers for Medicare and Medicaid Services as a high-complexity clinical laboratory. The laboratory is a registered entity with the Centers for Disease Control and Prevention's Division of Select Agents and Toxins and is the only Laboratory Response Network reference laboratory for the confirmation of biological and chemical threat agents in Idaho.



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DIVISION OF PUBLIC HEALTH

Updates

REMINDER

Please forward any primary specimens that are positive for *Cryptosporidium* spp. to Idaho Bureau of Laboratories. We will accept any samples except those preserved with formalin. Your assistance with this is crucial to developing an effective *Cryptosporidium* surveillance network in Idaho.

NOTIFICATION OF PUBLICATION: IDAHO OUTBREAK

First United States Outbreak of *Mycobacterium abscessus* Hand and Foot Disease Among Children Associated With a Wading Pool, published 29 May 2018

Authors: Kris K Carter, Ingrid Lundgren, Sarah Correll, Tom Schmalz, Tammie McCarter, Joshua Stroud, **Amanda Bruesch (IBL)**, Christine G Hahn

Full text article: <https://doi.org/10.1093/jpids/piy036>

NEW RESOURCES

- New Association of Public Health Laboratories (APHL) resources for biothreat rule out identification assistance, Biothreat Agent Bench Cards for the Sentinel Laboratory and Biothreat Agent Poster: available at www.statelab.idaho.gov => Sentinel Labs => Select Agents
- New APHL community, **Laboratory Biosafety CoLLABorate**: to engage both public health professionals and non-public health clinical laboratory representatives in biosafety and biosecurity to connect and facilitate the sharing of ideas, biosafety tools and other resources as well as assist with answering biosafety-related questions. Follow these steps to join:
 1. 'Create an Account' at aphl.org –if you do not already have an account.
 2. Contact APHL at biosafety@aphl.org with your name, institution and position title.
 3. If accepted, APHL will send an email acknowledging your acceptance into the Biosafety Community and share tools for use of the platform.

COMING SOON

Idaho Bureau of Laboratories (IBL) will be sending the annual Partner Needs Assessment this fall. The purpose is to solicit feedback to help us better meet your needs and improve preparedness throughout Idaho. The assessment will be sent via email, so be on the lookout for its arrival. Thank you for your time in completing this survey!