Idaho Bureau
of Laboratories

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Clinical Forum

Idaho Statewide Antibiogram: A Tool for Surveillance, Tracking Trends and Public Health

Matthew Burns and Amanda J. Bruesch, MS

The Idaho Bureau of Laboratories is proud to finally announce the publication of Idaho's first statewide multi-facility antibiogram. Predicated on the efforts of the CDC Antibiotic Resistance Laboratory Network (AR Lab Network), IBL has been testing specimens and requesting data related to antibiotic resistant bacteria identified and tested in clinical labs across the state. With an increased interest in antibiotic resistance at the state and national level it became evident that data sharing was of increased importance and that the public health lab could serve a role in pulling together the data from all parties and aggregating it into a useful and meaningful tool.

We worked with more than 20 facilities across Idaho that perform antibiotic susceptibility testing and who were willing to share their data, to obtain facility-level antibiograms in various formats. Through much manual processing, we were able to turn those facility-level antibiograms into data that could be aggregated to calculate statewide levels of susceptibility for a wide range of bacteria against an expansive list of antibiotics.

The statewide antibiogram can be used to identify trends in antibiotic susceptibility, identify when new mechanisms of resistance may be appearing in Idaho based on reductions in susceptibility of some organisms to specific drugs, and to help guide public health efforts around antibiotic resistant bacteria.

The antibiogram may also be used as a benchmark for your facility's antibiogram, to see where your patient population stands compared to statewide averages with respect to antibiotic susceptible infections. To be clear, the statewide antibiogram should not be used for prescribing purposes. Those decisions should be based on your facility's practices and guidelines. If an antibiogram is needed for your facility, please reach out to your nearest regional medical center for guidance on a clinically appropriate antibiogram.

Continued on page 2

Inside this issue

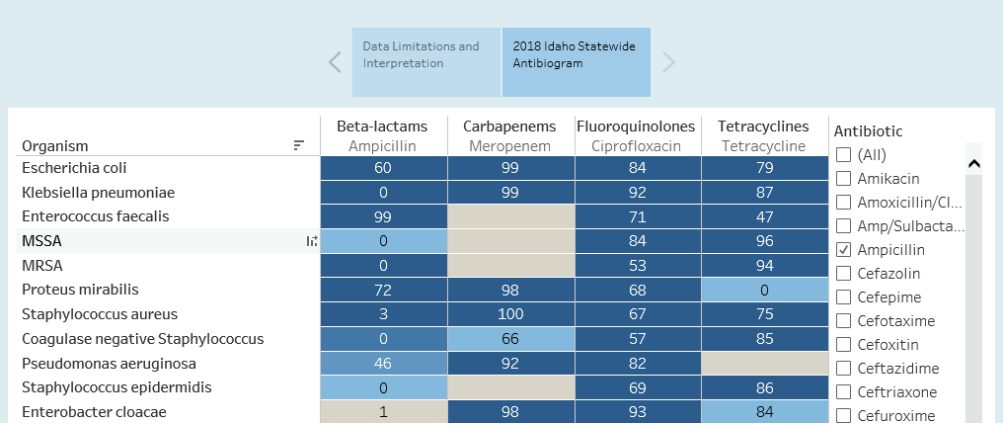
VPD Testing at IBL 3
New Test Request Form 3
Ask the Auditor 4
ISLN Survey 5
Updates 7

Continued from page 1

The antibiogram can be found at GetHealthy.DHW.Idaho.gov by clicking on the Population Health Data link and the Infectious Disease button. There you will see a link for the Idaho Antibiogram.

The antibiogram is presented as a two-panel story board. The first panel provides information on the limitations and interpretation of the data. The second panel is the table of drug and bacteria combinations. The antibiotics can be selected and deselected using the checkboxes on the right-hand side of the screen. Hovering your mouse over each cell will provide you with an interpretation of the data.

We have presented data on all organisms for which more than 30 isolates were tested in 2018, and all antibiotics that those organisms were tested against. Not all combinations of drugs and bacteria are clinically appropriate for individual patient treatment. Please reach out within your facility to determine where to obtain an antibiogram for prescribing purposes.



Organism	Beta-lactams Ampicillin	Carbapenems Meropenem	Fluoroquinolones Ciprofloxacin	Tetracyclines Tetracycline
Escherichia coli	60	99	84	79
Klebsiella pneumoniae	0	99	92	87
Enterococcus faecalis	99		71	47
MSSA	0		84	96
MRSA	0		53	94
Proteus mirabilis	72	98	68	0
Staphylococcus aureus	3	100	67	75
Coagulase negative Staphylococcus	0	66	57	85
Pseudomonas aeruginosa	46	92	82	
Staphylococcus epidermidis	0		69	86
Enterobacter cloacae	1	98	93	84

Fig. 1. Screenshot of Idaho Statewide Antibiogram

IBL plans to continue to produce a statewide antibiogram each year and would like to ask all clinical laboratories that perform microbiology culture and susceptibility testing, either in house or using a reference lab, to submit your antibiogram data for inclusion in the statewide antibiogram. We are in the process of establishing a standard template into which each facility can place their data to aid in the compilation of the statewide antibiogram.

If your facility would like to contribute data to inform the statewide picture on antibiotic susceptibility, please contact Matthew Burns by email at Matthew.Burns@dhw.idaho.gov or by phone at (208) 334-0528.

Vaccine Preventable Disease Testing at IBL

Vonnita Barton

Vaccine preventable diseases (VPDs) continue to be a threat to the public health in the U.S. despite widespread vaccination. A 2018-2019 measles outbreak that occurred in Clark County Washington infected mostly children under 18 years old that were unimmunized with the measles, mumps and rubella (MMR) vaccine. Measles cases have occurred in 28 states with a total of 1109 confirmed measles cases from January 1 to July 3, 2019[1].

IBL maintains molecular testing capacity to respond effectively by aiding in the identification of re-emerging VPDs such as Measles and Mumps RT-PCR, and *Bordetella pertussis* PCR. Molecular detection methods are most successful when the appropriate samples are collected at the first onset of symptoms. Please refer to the IBL Sampling and Submission Guide for information. IBL does **not** provide serologic testing for any VPDs since these are available through many commercial laboratories. Always contact your local health department if presented with any suspect VPD patient. The CDC A-Z Index of Diseases & Conditions is a great reference to learn about VPDs.

IBL has tested 79 specimens on Idaho residents associated with measles outbreaks so far in 2019. Measles (and mumps) RT-PCR reactive samples are forwarded to a Vaccine Preventable Disease Reference Center for genotyping to determine the strain of the virus.

Effective April 30, 2019, IBL longer provides IgG or IgM serology testing for Mumps, Measles, Rubella or Varicella zoster virus. VPD IgG and IgM serologies are available through most commercial laboratories.

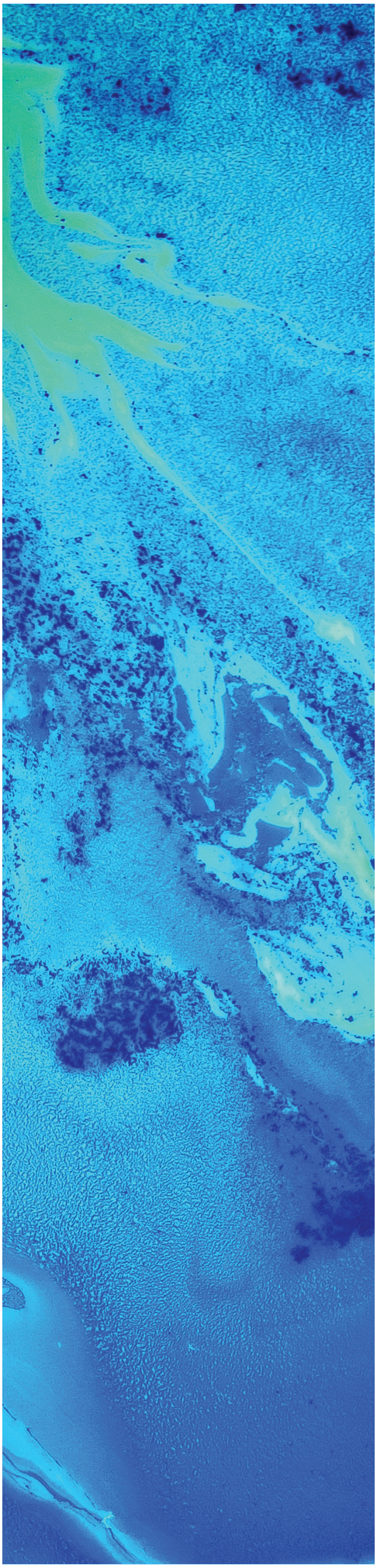
[1]Data obtained from CDC.gov.

New IBL Clinical Test Request Form

Vonnita Barton

The Idaho Bureau of Labs has combined several different submittal forms into one Clinical Test Request Form. All clinical tests types including Bacteriology, General Immunology, Mycobacteriology, Mycology, Parasitology, and Virology are all listed on one form.

Please discontinue use of all former submittal forms for the types of tests listed above and begin using this updated form immediately. The small yellow TB cards will be phased out and all future submittals will use this new Clinical Test Request form.



Ask the Auditor

Jennifer Street

Question:

Are there changes coming to proficiency testing?

Answer:

Yes! On February 4, 2019, Health and Human Services released a proposed rule change for PT requirements. A review process was conducted by the CDC and PT Workgroups to evaluate the overall impact the proposed changes would have on laboratories and patients. The purpose for the revision was to have a better system to reflect the types of tests performed and reported in laboratories. The Federal Register document has been released and now available for review.

The proposed changes will include an additional 34 regulated analytes that have been identified as having an important impact on patient care, as well as removing 5 current analytes from the list that require PT. Examples of the additional analytes will include hepatitis antibodies, cardiac markers, hormones, inflammatory markers, and additional drug analytes. For the complete list, refer to the Federal Register document.

The specialty/subspecialties of Microbiology will also be updated to reflect what and how laboratories are reporting. The current reporting structure to identify the extent or level of testing does not provide a way for laboratories to report the presence or absence of growth, or presumptive identification of organisms. The update will include the ability to report stain(s), susceptibility and resistance testing, antigen and/or toxin detection, and microbial identification or detection. Additionally, the proposal will include a list of medically relevant aerobic and anaerobic organisms for specific sample sources.

Finally, the proposed changes will adjust the acceptance limits for some analytes. The update will narrow the acceptable limits for many analytes and will also include a change to fixed percentage acceptance limits for results from the mean of participants, rather than using concentration units or a mixture of percentage and concentration units for 53 analytes.

There are several additional changes that address specific specialties, provide new definitions to the terminology used throughout Subpart I, PT referral, and the financial impact these changes may have on laboratories.

Please take the time to review the document, and if you have any questions please email the CLIA program.

Got a question?

Drop us a line! Email LabImprovement@dhw.idaho.gov for your CLIA-related questions.

2019 Idaho Sentinel Laboratory Survey Results

Gabriel Kimlinger

IBL launched an Idaho Sentinel Laboratory Network (ISLN) Survey at the beginning of 2019 to update contact information, solicit participants in this year's Biothreat-Rule-Out-Refer Exercises (BT-RORE), collect diagnostic testing information, select dates and locations for IBL hosted workshops, and pinpoint interest in future Clinical Forum Newsletter topics. We thank you for taking the time to fill out the survey, and below are summary highlights.

Twenty-four Sentinel Laboratories that indicated a willingness to participate in the BT-RORE on the ISLN Survey were mailed three lyophilized isolates numbered 1a-2019, 1b-2019, and 1c-2019 to rule out or refer as lookalike agents of bioterrorism. The isolates were mailed on March 28 and results collected April 30. The purpose of this exercise was to test the communication between Laboratory Response Network (LRN) Sentinel Laboratories and Idaho's LRN Reference Laboratory. If the participating laboratories were unable to rule out an agent of bioterrorism after performing the established Sentinel Level Clinical Microbiology Laboratory Guidelines on the isolates, they were required to contact IBL as the LRN Reference Laboratory for Idaho.

Upon submitting results online, each lab received a copy of their individual results and IBL sent out the aggregate results upon conclusion of the exercise. 100% of the participating labs correctly identified sample 1a-2019 as a biothreat agent (*Bacillus anthracis*), 83% correctly identified sample 1b-2019 as a non-biothreat agent (*Haemophilus influenzae*), and 79% correctly identified sample 1c-2019 as a biothreat agent (*Francisella tularensis*). Thank you to all the participants and we look forward to conducting another exercise this fall.

The ISLN Survey asked Sentinel Laboratories which commercial identification systems they are using. Fig. 1 shows that of the 26 Sentinel Laboratories that use commercial identification systems, most are using the Beckman Coulter Microscan.

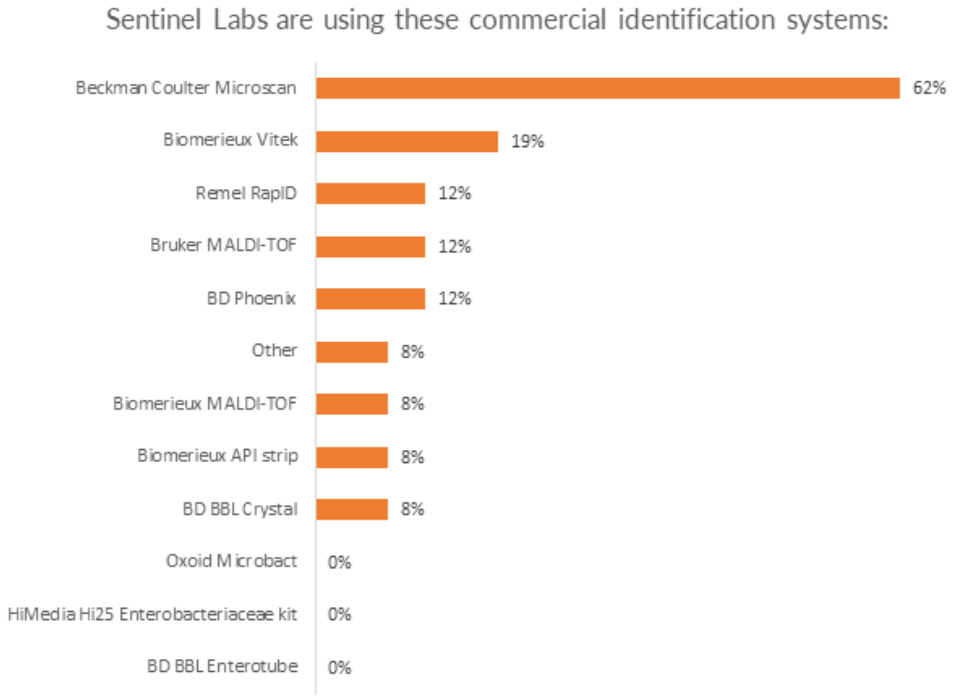


Fig. 1. Commercial identification systems used by Idaho Sentinel Laboratories

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Continued from page 5

The survey also asked which culture independent diagnostic testing (CIDT) methods each Sentinel Laboratory are using. Fig. 2 shows that most Sentinel Laboratories are using the BioFire FilmArray Respiratory Panel and the Cepheid GeneXpert. It also shows the changes in CIDT methods between the last time we asked this question in 2017 (sample size of 27 labs) and 2019 (sample size of 22 labs).

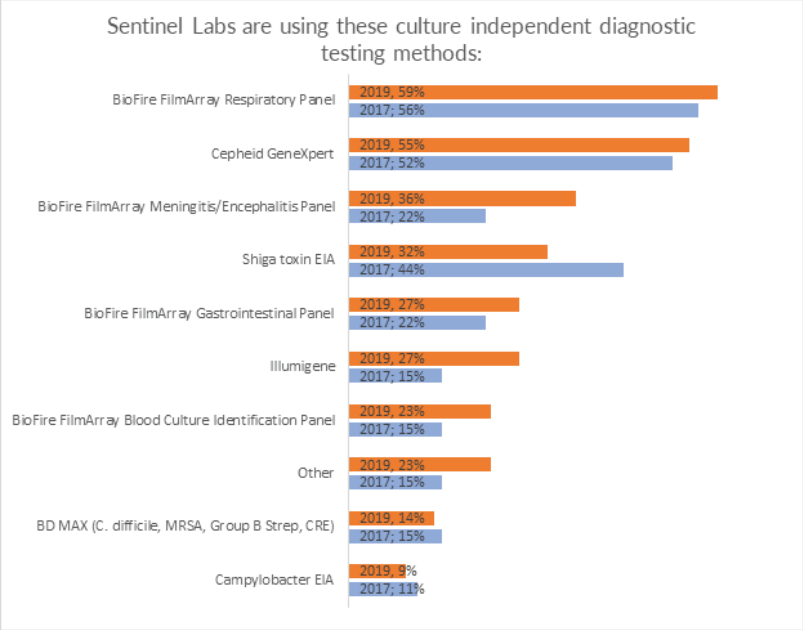

Fig. 2. Culture independent diagnostic testing methods used by Idaho Sentinel Laboratories

In response to date, time, and location preferences from the ISLN Survey and in cross-reference with the schedules of hosting staff, IBL hosted two Biothreat Preparedness Workshops, one in Boise and one in Idaho Falls. The Biothreat Preparedness Workshop provides an overview of the sentinel laboratory's role in the presumptive identification of biothreat agents. Participants reviewed the Laboratory Response Network (LRN) and sentinel laboratory protocols for ruling out suspect agents. Laboratory demonstrations outlined the microbiology of these agents so that the culture, staining, and biochemical characteristics could be recognized. IBL is an approved provider of ASCLS P.A.C.E.® continuing education contact hours to meet continuing education requirements for certification. Participants who successfully completed this workshop were awarded 5.5 ASCLS P.A.C.E.® contact hours.

Respondents to the ISLN Survey showed interest in future Clinical Forum articles detailing a variety of topics including Quality Assurance/Quality Control, Biological Safety Guidelines, CLIA Regulations, IBL Test Services, and others (See Fig. 3). We continue to address CLIA Regulations with our regular "Ask the Auditor" column and we will use the other responses to guide consideration of topics in future *Clinical Forum* issues.

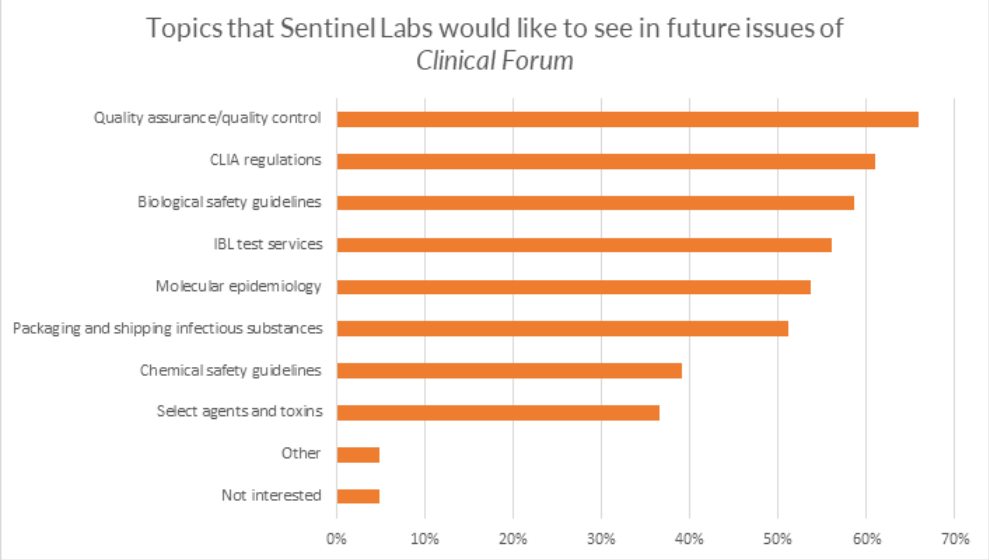

Fig. 3. Topics desired for future issues of Clinical Forum.

About the Idaho Bureau of Laboratories

The role of the Idaho Bureau of Laboratories (IBL) is to provide laboratory services that support the programs in the 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

New IBL Staff: Aimee Ceniseros

Aimee Ceniseros is a Microbiologist, Sr. at IBL. Aimee has been working in a microbiology lab since 2016 and has recently graduated from Boise State University with a B.S. in Biology with Microbiology Emphasis. She is excited to continue her experience in the field and gain more knowledge about the microbiological world!

Antibiotic Word Search

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                  H N V B X G U W Z
              P Y R Y Z T H B Z G X M I
            X X R Y Y T L M X L D G B E C A Q
          L R X F F A E D X V B R K N N U Z K A
        L U F X B Y V O R M Z Q V K V E C I F A Y
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            Q U L X W S Z D J A A V W T U N G
                D C R T Q A U G T A T W I
                    F S E L B T C E P
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LEVOFLOXACIN	ERTAPENEM
CLINDAMYCIN	VANCOMYCIN
DOXYCYCLINE	CEFEPIME
AZITHROMYCIN	AZTREONAM