DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health
Laboratory

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DELAWARE PUBLIC HEALTH LABORATORY RECEIVES AWARD

MARION T. FOWLER, BS, MT (ASCP)

The 2012 Laboratory Response Network's (LRN)National Meeting Planning Committee selected the Delaware Public Health Laboratory (DPHL) to receive the Association of Public Health Laboratories (APHL) **"2012 Award for Outstanding Sentinel Clinical Laboratory Training Program."** The award was presented to DPHL at the LRN national meeting in Denver, Colorado on October 10, 2012. Since 2002, DPHL has endeavored to cultivate working relationships, provide critical and pertinent training, and supply bioterrorism and public health information to all of Delaware's sentinel laboratories. DPHL is honored to receive national recognition by our peers outside of Delaware.

From left to right: Debra Rutledge, Marion Fowler, Emily Outten, and Tara Lydick

Sentinel clinical laboratories are a crucial part of the LRN system. Sentinel laboratory staff may be the first to isolate a potential bioterrorism (BT) agent from a human or animal specimen. The ability to identify this special group of organisms is an essential function of the clinical laboratory in order to protect public welfare and fulfill the laboratory's role as part of the Delaware laboratory system, the LRN, and the Centers for Disease and Prevention and Control (CDC). More importantly, quick diagnosis of a patient infected with a BT agent greatly improves a person's chance of survival. Although most BT agents are not spread from person to person, these select agents can be weaponized, easily dispersed, and cause panic in the public. For these reasons, sentinel laboratories must be able to quickly rule-out a BT agent or refer the samples or specimens to the DPHL for further testing and confirmation.

DPHL provides a variety of training programs to Delaware sentinel laboratories. The "Agents of Bioterrorism: Sentinel Laboratory Update" is a full day, hands-on, workshop experience for bench

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www.dhss.delaware.gov/dhss/dph/lab/labs.html

DPHL Receives Award Continued

and growth characteristics, safety equipment considerations, and personal protective equipment requirements to be used when working with these agents. The afternoon session is held in DPHL's Clinical Microbiology Section laboratory and uses agar plate streaks of mimic and/or attenuated BT organisms on a variety mediums with incubation periods of 24, 48 and 72 hours along with other look-alike organisms for comparison. The main objective of the workshop is to train microbiologists to look for the possible BT agents when reading culture plates and gram stains.

The document, "Sentinel Level Clinical Microbiology Laboratory Guidelines for Suspected Agents of Bioterrorism and Emerging Infectious Diseases," published by the American Society for Microbiology, CDC, and APHL provides Delaware's sentinel laboratories with the most up-to-date procedures for BT agent rule-out or referral. This guide is reviewed during the workshop.

Sentinel laboratories also receive training regarding packaging and shipping of a possible BT agents to DPHL or CDC. The state fire school and/or DPHL provide training entitled "Shipping Hazardous Materials: Infectious & Biological Substances." This hands-on training focuses on the tools for packaging Category A and B substances for air or ground transport. DPHL procedures are in place for in-state transport of possible BT agents isolates. There are also exercises for testing the sentinel laboratory's ability to ship. These are performed in conjunction with the College of American Pathologists Laboratory Preparedness Survey.

LABORATORY PREPAREDNESS UPDATE

MARION FOWLER, BS, MT (ASCP)

DEBRA RUTLEDGE, MBA, MT (ASP)

- In April 2012, Delaware's sentinel laboratories and the Delaware Public Health Laboratory (DPHL) participated in the College of American Pathologist's Laboratory Preparedness Exercise (CAP LPX A 2012) proficiency testing. In addition to demonstrating the ability to rule-out or refer a select agent, sentinel laboratories were required to package and ship a category A organism to DPHL. This exercise satisfied one of the federal bioterrorism grant requirements for state public health laboratories.

- In June and July of 2012, DPHL staff met with the eight Delaware sentinel laboratories. The review of shipping containers, inner containers and all pertinent paperwork for packaging and shipping was linked with the Laboratory Preparedness Exercise of April 2012 and graded using the most recent evaluation checklist for Category A substances. Incorrectly packaged specimens and improperly labeled boxes and/or paperwork was corrected during this visit. Managers discussed technical issues and new testing methodologies.

- Two sessions of the "Agents of Bioterrorism: Sentinel Laboratory Wet Workshop" were held on May 9 and 10, 2012 at DPHL. Twenty clinical laboratorians attended this training, which teaches sentinel hospital laboratory personnel how to handle possible bioterrorism specimens. The workshop included morning lectures and an afternoon lab session in which participants viewed plates, smears and biochemical tests of select agent organisms. Attenuated and mimic strains were used and all plates were formalin preserved. The workshop was a great success. Most laboratorians have few chances to see directly what these organisms look like in a laboratory setting. Knowing what to look for and what to do with potential bioterrorism agents (laboratory preparedness protocols) are important to properly do the identification work in a safe and expedient manner.

  After reviewing workshop evaluations, DPHL decided to change format to allow for more time at the bench. Each station will now be given a time limit so that participants are not rushed. Participants will also have a time to revisit stations.

- The CAP LPX B 2012 was received in September. All sentinel laboratories met their training requirements and contacted a LRN Reference laboratory if unable to rule out a suspect bioterrorism agent. Laboratories were not asked to package or ship isolates for this exercise.

- A Laboratory Preparedness Advisory Committee meeting was held on October 3, 2012. The meeting was well attended by our DPH partners and hospital sentinel laboratories. Greg Hovan, microbiology lab manager shared an overview of Delaware's Calicinet activities regarding Norovirus subtyping to assist in epidemiological outbreak monitoring. Emily Outten, molecular/virology lab manager and Martin Luta, Bureau of Communicable Diseases chief, provided an update of Influenza planning and DPH's surveillance program for this year's flu season, which started September 30. Paula Eggers, epidemiologist, discussed findings from the most recent VRSA case which became the 13th national case and third case in Delaware. Linda Popels, principal planner, gave an overview of the Emergency Management and Preparedness section's responsibilities. Marion Fowler, microbiologist II, provided a review of the wet workshop, Laboratory Preparedness Exercise (LPX) survey, packaging and shipping exercise. Margaret Zimmerman, environmental analytical lab manager, gave an update on packaging and shipping, exercises, and recent chemical testing requests. The meeting ended after a group discussion about several recent interesting cases handled by the laboratories.

STDs TESTING IN HIGH SCHOOLS

CATHY MOSLEY, STD PROGRAM MANAGER

In the United States, Delaware adolescents and young adults are most affected by Sexually Transmitted Diseases (STDs). Chlamydia and gonorrhea are most prevalent in both the United States and in Delaware.

Developing new approaches to test adolescents and young adults is a successful strategy for combating the rising STD rates. The Division of Public Health Laboratory (DPHL) is on the forefront of testing with urine-based amplified NAAT for chlamydia and gonorrhea in school based health centers. This innovative testing method began in high-risk Delaware school-based health centers in '99.

Last year, 9,064 chlamydia and gonorrhea tests were performed in 23 school-based health centers across the state. Chlamydia was diagnosed in 8.2% (373/4532) of those screened. Males accounted for 31% (115/373) of those cases and females accounted for 69% (258/373). Overall, 58% (215/373) were diagnosed in African American students and 17% (64/373) were diagnosed in Caucasian students. Hispanic students accounted for 3% (11/373) of the cases. Additionally, 25% (93/373) were diagnosed in students identified as "other race". For chlamydia: teens aged 15-18 accounted for 27% (99/373) of cases from school based health centers and those aged 19-24 accounted for 72% (268/373) of cases, and those aged 25 and older accounted for 2% (6/373).

Gonorrhea was diagnosed in 0.8% (35/4532) of those screened. Males accounted for 46% (16/35) of those cases and females accounted for 54% (19/35). Overall, 71% (25/35) were diagnosed in African American students and 11% (4/35) were diagnosed in Caucasian students. Hispanic students accounted for 3% (1/35). Additionally, 17% (6/35) were diagnosed in students identified as "other race". For gonorrhea: teens aged 15-18 accounted for 17% (6/35) of cases from school based health centers and those aged 19-24 accounted for 80% (28/35) of cases, and those aged 25 and older accounted for 3% (1/35).

Seventy percent (16) of Delaware's 23 school based health centers, offering testing, are located in New Castle County and 17% (four) are located in Kent County followed by 5% (three) of the centers in Sussex County.

In school based health centers, chlamydia was diagnosed highest in New Castle County centers with 53% (199/373) of cases followed by Kent County centers with 42% (155/373) of cases and Sussex County with 5% (19/35) of cases.

In school based health centers, gonorrhea was diagnosed highest in Kent County with 63% (22/35) of cases followed by New Castle County with 34% (12/35) cases and Sussex County with 3% (1/35) of cases.

In 2011, school based health centers, in collaboration with the DPHL, diagnosed and treated over 400 cases of chlamydia and gonorrhea in adolescents and young adults provided this service.

Table 1 and 2 below show DE-identified school based health centers and their respective positivity by site.

Table 1 Chlamydia in School Based Health Centers, Delaware 2011

Agency	Negative	Positive	Total	County	Positivity
A	42	6	48	NCC	12.50%
B	61	8	69	NCC	11.59%
C	57	8	65	NCC	12.31%
D	63	8	71	NCC	11.27%
E	99	14	113	K	12.39%
F	79	6	85	NCC	7.06%
G	129	17	146	K	11.64%
H	58	5	63	NCC	7.94%
I	593	110	703	K	15.65%
J	70	10	80	S	12.50%
K	70	5	75	NCC	6.67%
L	45	6	51	NCC	11.76%
M	93	5	98	NCC	5.10%
N	89	7	96	NCC	7.29%
O	37	1	38	NCC	2.63%
P	20	5	25	NCC	20.00%
Q	66	6	72	NCC	8.33%
R	133	14	147	K	9.52%
S	39	4	43	S	9.30%
T	2183	112	2295	NCC	4.88%
U	44	5	49	S	10.20%
V	19	0	19	NCC	0.00%
W	70	11	81	NCC	13.58%
TOTAL	4159	373	4532		8.23%

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STDs Testing Continued

Table 2 Gonorrhea in School Based Health Centers, Delaware 2011

Agency	Negative	Positive	Total	Positivity	County
A	47	1	48	2.08%	NCC
B	69	0	69	0.00%	NCC
C	65	0	65	0.00%	NCC
D	71	0	71	0.00%	NCC
E	111	2	113	1.77%	K
F	85	0	85	0.00%	NCC
G	141	5	146	3.42%	K
H	63	0	63	0.00%	NCC
I	688	15	703	2.13%	K
J	80	0	80	0.00%	S
K	75	0	75	0.00%	NCC
L	51	0	51	0.00%	NCC
M	97	1	98	1.02%	NCC
N	95	1	96	1.04%	NCC
O	38	0	38	0.00%	NCC
P	25	0	25	0.00%	NCC
Q	71	1	72	1.39%	NCC
R	147	0	147	0.00%	K
S	43	0	43	0.00%	S
T	2287	8	2295	0.35%	NCC
U	48	1	49	2.04%	S
V	19	0	19	0.00%	NCC
W	81	0	81	0.00%	NCC
TOTAL	4497	35	4532	0.77%	

Collaborative efforts among multiple agencies, spanning both public and private entities, are necessary to be successful in combating high STDs rates among adolescents and young adults in Delaware. The Delaware Division of Public Health Laboratory is an example of how innovation in quality can be utilized to bring testing to the populations at greatest risk for STDs.

THERE WAS A FOX……

SUSAN DEE, MICROBIOLOGIST III

Shortly before Labor Day weekend, the Delaware Public Health Laboratory (DPHL) virology lab, received a fox for rabies testing. According to the documents submitted two people were walking in Rehoboth, DE, when the fox bit and scratched them. Testing was initiated and, by 10:00 a.m., on the following day, the result showed that the fox was rabid. The epidemiologists in the DPH's rabies program, as well as the State Veterinarian at the Department of Agriculture, were informed.

Upon further investigation as to the circumstances surrounding this event, it was discovered that the fox had attacked different people at two different locations within a short time frame.

According to a Cape Gazette article by Dennis Forney dated September 14, 2012, the initial call regarding a fox eating a boogie board in someone's yard was received by the local police department . While the officer investigated this call, he received another call stating that a woman had been bitten by a fox. While looking for the fox at the second location, a third call came through dispatch that another woman had been bitten by a fox a few blocks away.

The officer, realizing that two people had already been bitten, searched for the fox. Upon sighting the animal, the officer fired and killed the fox. The brain of the fox was taken by a Kent County Animal Control officer who transported it to the DPHL for testing. Both victims received treatment for rabies. Credit goes to the quick response of the officer who took action to prevent others from becoming a victim.

WEST NILE VIRUS DETECTION IN DELAWARE

JESSICA MCKNIGHT, MICROBIOLOGIST II

The Delaware Public Health Laboratory (DPHL) participates, in collaboration with the Delaware Department of Natural Resources and Environmental Control (DNREC), in West Nile Virus (WNV) surveillance. This collaboration has resulted in increased community awareness of WNV by the identification of seven human positive cases of WNV/SLE (St. Louis encephalitis) and 22 positive birds. This data was collected between May 1- October 1, 2011.

WNV is an arbovirus under the family *Flavivirus* and is characterized by its icosahedral shape. WNV is transmitted between mosquito vectors and bird reservoir hosts during blood-meal feeding. Although most birds survive the infection, crows and jays often succumb to the infection and die. In most cases, humans only develop a mild clinical illness with fever, headache, or body aches. About one in every 150 WNV infections results in meningitis or encephalitis and sometimes death. [1]

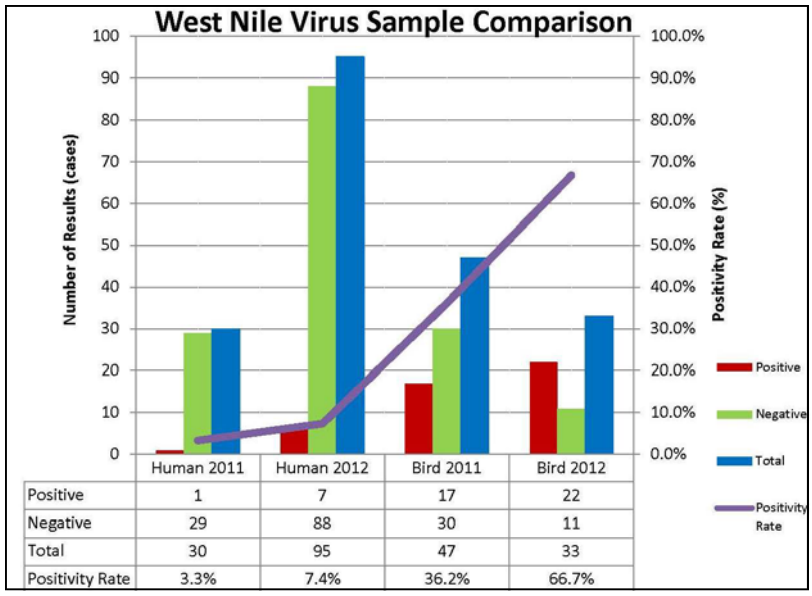
Brains from deceased birds are submitted to DPHL for the detection of WNV by Real-Time, Reverse Transcriptase Polymerase Chain Reaction (*q*RT-PCR). The *q*RT-PCR is used to first convert the viral RNA to complementary DNA (cDNA) and then amplify and detect the existing DNA. For human specimens, such as serum and cerebral spinal fluid (CSF), DPHL conducts a microsphere –based immunologic assay (MIA). MIA is similar to an enzyme-linked immunosorbent assay (ELISA) with the assay components attached to different colored microspheres (or beads), and results are read using a modified flow cytometer. The software identifies which tests are being run based on the individual colored bead and sorts the data based on the color ratio of the beads.

The data collected from May 1- October 1, 2011 and the 2012 WNV season shows an increased incidence of WNV in humans and birds as demonstrated by Figure 1. Whereas in 2011 there was only one diagnosed case of WNV in Delaware, in 2012, there was an increase to seven cases of WNV infections. Of those seven cases, one confirmed death was reported. WNV detection in birds has nearly doubled from a positivity rate of 36.2% in 2011 to 66.7% in 2012. Although, more birds were screened for WNV in 2011, more positives were yielded from the 2012 season.

This data correlates with the national averages of diagnosed cases of WNV in humans and birds. Nearly every state has experienced an increased incidence of WNV in humans and as a result, there has been a shortage of clinical tests offered by public health laboratories. Fortunately, Delaware has had success in maintaining capacity for WNV testing for humans and birds due to the assistance of our clinical providers and DPHL's collaboration with DNREC.

Figure 1. West Nile Virus (WNV) Sample Comparison from years 2011 and 2012. A comparison study was performed from May 1- October 1, 2011, and 2012. The study examined the number of reported cases of WNV in birds and humans in Delaware. Positivity rate was calculated by [(number of positive cases / total tested)*100%] to determine the rate of increased positives from year to year. According to the figure above, there has been an increased incidence in WNV in both birds and humans from 2011- 2012.

[1] http://www.cdc.gov/ncidod/dvbid/westnile/ecology.htm, 2012.



	Human 2011	Human 2012	Bird 2011	Bird 2012
Positive	1	7	17	22
Negative	29	88	30	11
Total	30	95	47	33
Positivity Rate	3.3%	7.4%	36.2%	66.7%

EMPLOYEE NEWS
WELCOME TO THE LAB!

Margaret Zimmerman recently joined the DPHL as the environmental analytical laboratory manager. Over the past twenty years Margaret was part of the DNREC-Division of Water-Environmental Laboratory in Dover as an Analytical Chemist. Margaret is originally from Schuylkill County, Pennsylvania. She has a B.S. in biology with a minor in chemistry from Wesley College in Dover, DE. Since 1998, Margaret is also an American Society for Quality (ASQ) Certified Quality Auditor and, since 2005, the recording secretary for the Delaware Quality Partnership. She has been extensively trained in organizational and systems management and was active with the Delaware Quality Award for several years as an examiner and team leader and was an active member of the DNREC Values Team, which included the Cabinet Secretary and Deputy Secretary. She looks forward to sharing her knowledge with her colleagues.

CONGRATS to Greg Hovan!

Congratulations to Greg Hovan on his promotion to laboratory manager in the Clinical Microbiology section at DPHL.

Greg has been with the laboratory since 2009, originally as a contract microbiologist and more recently as a microbiologist II. Greg has been instrumental in validating several molecular methods. Greg was certified by CDC to perform strain typing of Norovirus using molecular methods, thereby allowing DPHL to become part of CDC's Calicinet program. Greg has also been performing 16S sequencing on bacterial isolates.

Greg moved to Delaware in summer of '08 after graduating with a degree in Biochemistry from Bridgewater State University in Massachusetts. Greg is married to Cynthia and has a one-year-old daughter. They live in Lincoln with 4 cats and a Labrador puppy named Colt. Greg is currently on the downhill slope of the graduate program for a Master's in Business Administration from Wilmington University. Besides taking care of his family and working for the state, he enjoys puzzles, sports, and playing musical instruments.

DELAWARE'S DIVISION OF PUBLIC HEALTH LABORATORY

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Built: 1990

Business Hours: 8:00 a.m. – 4:30 p.m.

Purpose: The Division of Public Health Laboratory currently offers consultation and laboratory services to state agencies, Delaware Health and Social Services and Division of Public Health programs including:

- HIV surveillance and prevention
- Immunization
- Epidemiology
- Newborn Screening
- STD prevention
- TB Elimination
- Drinking water
- Preparedness

Karyl Rattay, MD, MS
Director, Delaware's Division of Public Health

Christina Pleasanton, Deputy Director,
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If you have questions regarding these articles or would like to receive a hard copy of this newsletter, contact the Delaware Public Health Laboratory at 302.223.1520. To receive this newsletter by email, contact Pat Selg, Editor, at pat.selg@state.de.us

"To Protect and Enhance the Health of the People of Delaware"