Nebraska Public Health Laboratory Newsletter

A publication of the Nebraska Public Health Laboratory (NPHL) at the University of Nebraska Medical Center
Winter/Spring 1999

Bioterrorism

Although we do not want to believe bioterrorism will occur in Nebraska, the lessons learned from the Oklahoma bombing demonstate that terrorism can strike anywhere in the United States. We have already seen in the news several examples of exposures or threatened exposures to anthrax spores and these situations are expected to become more frequent. A national effort is being made to prepare for the threat of bioterrorism. The CDC is evaluating the ability of State agencies to reqpond to various types of exposures with the essential question being what capabilities should each state provide? When terrorist activities occur, they typically overwhelm even the best prepared laboratories and agencies intended to respond to the emergency. The NPHL is investigating new diagnostic capabilities for identifying organisms likely to be used in bioterrorism and is working closely with state authorities and the CDC in this effort. It is likely that wery hoqpital and regional laboratory throughout the state will want to prepare a response plan in the near future. We invite any coments or suggestions you may have regarding this important issue.
Steven H. Hinrichs. M.D.
Director, Nebraska Public Health Laboratory

Preliminary Influenza Report, 1998-99

By Carol Allensworth, MT (ASCP),SM
Douglns County Health Department

The first case of laboratory confirmed influenza in Nebraska was reported to the Douglas County Health Deparfinent in mid December. Throughout the month of December and into January, reported influenza cases increased gradually. Early in the season, influenza type B was the predominant type reported, but influenza type A started to circulate in early January and by the the first week of February was the predominant strain reported. The number of reported cases increased significantly the first two weeks in February, and this trend has continued through the end of February. During the last week of February, influenza type A comprised 80% of all reported cases and influenza type B comprised 20%.

These trends closely parallel what has been seen on a national basis. Influenza activity has continued to increase through February 20th across the U.S. Nationally, 78% of the influenza viruses identified this season were influenza type A and, 22% were type B. Although influenza type A has predominated this season, influenza type B has predominated in some regions during specific periods. Twenty five percent of the type A isolates have been subtyped, and 99% were A(H3N2) and l% were A (HlN1). Influenza A(HlNl) viruses have been reported from Florida, Massachusetts, Michigan, Nebraska, Texas, and Wisconsin. According to the CDC, all of the influenza A(H3N2) viruses characterized have been similar to A/Sydney/5197, the H3N2 component of the 1998-99 influenza vaccine. The HlNl isoates were antigenically characterized as A/ Bayern/7/95-like. A/Bayern/7/95-like is antigenically distinct from A/ Beijing/262/95, the HlNl vaccine strain, but the vaccine strain produces high titers of antibodies that cross react with A/ Bayern/7/95-like viruses. All of the influenza B viruses antigenically characterized by the CDC are similar to B/Beijing/184/93, the type B vaccine strain. Studies are in progress to subtype selected isolates from Douglas Co. with special interest in identifying cases of influerza A in individuals who were vaccinated.

Carol Allensworth is the supervisor of Epidemiology Section for Douglas County Health Department. She can be reached at 444-72t4

Laboratory Confirmed Influenza Reported to the Douglas County Health Department by Week of Report

Weekending:	Influenza B	Influenza A	Total
December 12, 1998	1	0	1
December 19, 1998	0	0	0
December 26, 1998	2	0	2
January 2, 1999	4	1	5
January 9, 1999	1	1	2
January 13, 1999	8	2	10
January 20, 1999	4	6	10
January 27, 1999	6	5	11
February 6, 1999	6	15	21
February 13, 1999	11	23	34
February 19, 1999	15	38	53
February 26, 1999	10	39	49
Total	68	130	198

Multistate Outbreak of Listeriosis

by Peter C. Iwen, M.S.

Since early August 1998, approximately 82 illnesses caused by a single strain of Listeria monocytogenes hute been reported to the Centers for Disease Control and Prwentionby 19 states. However, strains of this isolate have been confirmed in Nebraska. A total of 17 deaths have been reported; 12 adults and 5 miscarriages/stillbirths. The CDC and state and local health departmenls have identified the vehicle for transmission as hot dogs and possibly deli meats produced under many brand names by one manufacturer. On December 22, the manufacturer voluntarily recalled specific production lots of hot dogs and deli meats that might be contaminated. All L. monocytogenes isolates from these cases were serotype 4b and share an unusual pattern when serotyped by pulse field gel electrophoresis or by ribotyping methods. Historically the pattern is rare among L. monocytogenes isolated from humans.

Listeria monocytogenes is found in soil and water and can contaminate a variety of raw foods, such as uncooked meats and vegetables, as well as foods that become contaminated after processing, such as soft cheeses and cold cuts. Consumption of food contaminated with,L. monocytogenes can cause listeriosis, an uncornmon but potentially fatal disease. This disease affects primmily pregnant women, newborns, and adults with weakened immune systems.

Since 1989, the Food Safety and Inqpection Service of the United States Departrnent of Agriculture has had a zero tolerance for L. monocytogenes inready-to-eat products such as hot dogs and luncheon meats and conducts conducts a monitoring program wilhin plants to test for the pathogen. The following product categories are included in the monitoring program: (l) beefjerky, (2) roast beef, cooked beef, and cooked corned beef, (3) sliced ham and luncheon meat, (4) small-diameter sausage, (5) large diameter sausage, (6) cooked, uncured poulty, (7) salads and spreads, and (8) dry and semi-dry fermented sausage. In calendar year 1998, approximately 2.5 o/o of ready-to-eat products analyzed through this monitoring program tested positive for L. monocytogenes.

Listeria monocytogenes is readily isolated from normally sterile body sites such as blood, cerebrospinal fluid, amniotic fluid, orfetal tissue. After collection, specimens should be tranqported to the laboratory as soon as possible or stored at 4oC prior to testing. If a food source is suspected, food samples should be collected aseptically in sterile containers. Whenwer possible, foods packaged in original containers should be submitted. Ice cream and other frozen products are best transported in the frozen state in the original container.

Most clinical laboratories are equipped to isolate and identify Z. monocytogenes from clinical specimens. Howwer, the isolation of the organism from food requires special media for selective enrichment which is generally not available in most laboratories. If a food source is suspected, Dr. Tom Safranek, the Nebraska State Epidemiologist should be contacted to determine if the sample warents testing. If testing is ecommended, he will instruct where to send the qpecimen for waluation. Isolates of L.monocytogenes for epidemiological investigations are submitted to the NPHL. Submit these isolates on a nonselective media such as Trypticaseh soy agar. The "Special Microbiology Requisition Form" should be filled out and accompany all isolates submitted. To receive a copy of this form by FAX, or to request more information concerning the submission of microorganism to the NPHL, contact Peter Iwen at (402) 559-7774.

Reference

l. CDC. Multistate outbreak of listeriosis-United States, 1998. MMWR 1998; 47 :1117-1118

Incidence* of Selected Pathogens by Year; FoodNet, 1996-1997*****

Organism	1996	1997
Campylobacter	23.5	24.7
Escherichia coli O157:H7	2.7	2.1
Listeria	0.5	0.5
Salmonella	14.5	13.7
Shigella	8.9	7.9
Vibrio	0.1	0.3
Yersinia	1.0	0.9
Cyptosporidium	Not reported	2.8
Cyclospora	Not reported	0.3
Overall	**51.2**	**50.1******

CDC, Incidence of foodborne illness-FoodNet, 1997. MMWR 1998; 37: 782-85

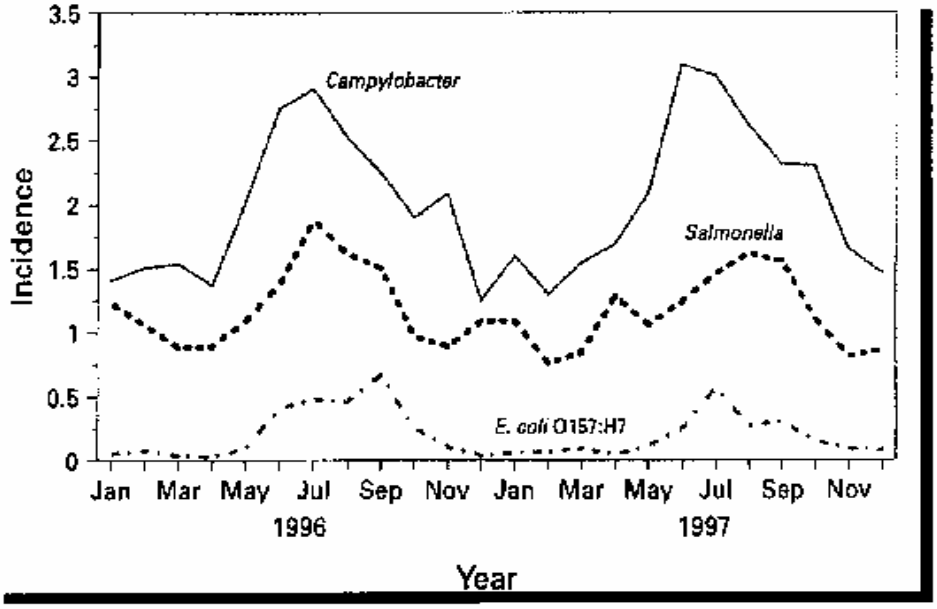
* Per 100,000 Population

**In 1996, laboratory confirmed cases of *Campylobacter, Escherichia coli* O157:H7, *Listeria, Salmonella, Shigella, Vibrio,* and *Yersinia* infections were identified in Minnesota, Oregon, and two counties in California, three in Connecticut, and eight in Gerogia (expanding to 20 in 1997.) In 1997, surveillance for laboratory-confirmed cases of *Cryptosporidium* and *Cyclospora* infections was added state wide in Minnesota and Connecticut and in eight counties (including the two counties with bacterial surveillance) in California.

**The Foodborne Diseases Active Surveillance Network (FoodNet), the primary foodborne diseases component of CDC's Emerging Infections Program, was developed to better characterize, understand, and respond to foodborne illnesses in the United States.

****Excludes *Cryptosporidium* and *Cyclospora.*

Monthly Incidence* of Selected Pathogens—FoodNet, 1996-1997**



* Per 100,000 population.

** Laboratory-confirmed cases of *Campylobacter*, *Escherichia coli* O157:H7, and *Salmonella* infections were identified in Minnesota, Oregon, and selected counties in California (two), Connecticut (three), and Georgia (eight in 1996 and 20 in 1997). The Foodborne Diseases Active Surveillance Network (FoodNet), the primary foodborne diseases component of CDC's Emerging Infections Program, was developed to better characterize, understand, and respond to foodborne illnesses in the United States. MMWR 1998; 37: 782-85.

Multidrug Resistant *Salmonella* in Nebraska

by Paul D. Fey, Ph.D.

An estimated 800,000 to four million salmonella infections occur in the United States each year. Most infections are gastrointestinal, self-limiting, and do not require antibiotic treatment. However, in the approximately 3-l0% of patients that become septic after contracting salmonella gastroenteritis, appropriate antibiotic therapy is essential. Therefore, it is imperative to monitor resistance in the salmonella to clinically relevant antibiotics (e.g. fluoroquinolones, ceftriaxone, trimethoprim-sulfamethoxazole) both locally and nationally.

Antimicrobial-resistance surveillance studies performed recently in both the United States and the United Kingdom have shown a marked increase of a five-drug resistant resistant stain of *Salmonella* serotype Typhimurium serotype designated as phage type DT104. The Typhimurium prevalence of DT104, which is usually resistant to ampicillin, chloramphenicol, sreptomycin, sulphonamides, and tetarycline, has increased from 0.6% in 1979-80 to 34% in 1996. Similarly, submissions of DT104 to the Laboratory of Enteric Pathogens in the UK increased from 250 in 1990 to 4006 in 1996. l4% of these isolates in 1996 from the UK were also resistant to ciprofloxacin. Of further concern, a report from the UK suggests that DTl04 may be associated with siglificanfly greater morbidity and mortality than other phage types of *Salmonella* serotype Typhimurium.

Due to the national and international epidemic of DTl04, the Nebraska Pubic Health Laboratory (NPHL) has been testing all *Salmonella* serotype Typhimurium for resistance to ampicillin, chloramphenicol, and tetracycline to screen for the DTl04 phage type. In May of 1998, a *Salmonella* serotype Typhimurium var. copenhagen (SS/34) was sent to the NPHL from Kimball County, Nebraska. This isolate was resistant to ampicillin, chloramphenicol, tetracycline, as well as ceffiaxone. Due to the unusual nature of this resistance profile, the isolate was sent to the Centers for Disease Control and Prevention for phage typing. The isolate was found to react to a specific set of salmonella phages, but did not conform to any known phage type and was not related to the DT104 phage type. Further susceptibility testing performed at the NPHL found that SS/034 was resistant to all penicillins, penicillin/b-lactamase inhibitor combinations, gentamicin, tobramycin, kanamycin, steptomycin, first-second and third-generation cephalosporins, chloramphenicol, tetracycline, and sulphonamides. Subsequent genetic studies have shown all resistance determinants excluding kanamycin are encoded on a large (-200 Kb) conjugative plasmid. Additionally, DNA sequencing has revealed that the b-lactamase which is conferring the resistance to the third-generation cephalosporins is a member of the BIL-1, LAT-1, CMY-2 family of plasmidic cephymycinases. These b-lactamases are all highly related to the chromosomal b-lactamase of *Citrobacter freundii*.

Expanded-spectrum cephalosporin resistance in the *Salmonella* is rare in the United States, and has not reached the prevalence as that found in *Klebsiella pneumoniae* and *Escherichia coli*. In fact, according to the CDC, this is the first case of a domestically acquired *Salmonella* infection which is resistant to expanded-spectrum cephalosporins in the United States, making it the most resistant *Salmonella* ever isolated in the United States. Additional surveillance is needed to determine the prevalence of isolates similar to SS/034, as well as phage type DT104, in the State of Nebraska, the United States, and abroad.

For further information, please contact Dr. Paul D. Fey.

Nebraska Public Health Laboratory

University of Nebraska Medical Center
PO Box 1180
600 south 42nd Street
Omaha, Nebraska, 68198-1180

The client
Mailing Address
Goes Here

New National Laboratory Training Network Coordinator Named

The new Nebraska coordinator for the National Laboratory Training Network (NTLN) is Kathy Talmon, MT(ASCP) according to Karen Beckenridge, Regional Coordinator. The NLTN is a cooperative project of the CDC and the Association for Public Health Labortories. The goal of the NTLN is to provide up-to-date information and training exercises for laboratory personnel on issues related to public health and infection control.

Kathy Talmon is a medical technologist in the NPHL and has senred as the coordinator of test results referred to the CDC from Nebraska. Ms. Talmon prwiously worked for the State of Nebraska Public Health Laboratory in Lincoln. According to Steven Hinrichs, M.D., Director, Nebraska Public Health Laboratory, "Kathy has a wide range of knowledge in many areas related to microbiology and brings her experience in public health rnatters to this new project. We greatly appreciate her willingness to take on this voluntary position that provides continuing education to technologists and medical persormel across Nebraska."

To receive additional information regarding NLTN program, Kathy can be reached at (402) 559-7737.

The Nebraska Public Health Laboratory Newsletter is a publication of the Department of Pathology and Microbiology, Samuel M. Cohen, M.D., Ph.D., Professor and Chairman, at the University of Nebraska Medical Center. The views expressed here do not necessarily reflect the opinions of the Nebraska Department of Health and Human Services.

Director, Steven H. Hinrichs, M.D. e-mail: shinrich@unmc.edu
Editor, Brian N. Lenz, MT(ASCP) e-mail: blenz@unmc.edu

Please direct suggestions, questions, or comments to: Editor, NPHL Newsletter,
Department of Pathology and Microbiology, 600 South 42nd Street, Omaha, Ne., 68198-1180