

Lab Week Newsletter



UPDATE 2002

OREGON'S EMERGING INFECTIONS PROGRAM

The Emerging Infections Program (EIP), the collaborative effort with the Centers for Disease Control and Prevention (CDC) and nine states is now in its 7th year. With the help of the clinical laboratories of Oregon, Oregon Health Services (OHS) has studied the epidemiology and morbidity of foodborne diseases through **FoodNet**, invasive diseases through **Active Bacterial Core Surveillance** and mysterious diseases through **UneXplained Illness and Death Surveillance**. Laboratories continue to contribute through case reporting and through isolate and specimen submission to the Oregon State Public Health Laboratory (OSPHL). For this, we extend our gratitude. This update 2002 highlights some of the information we have gathered with your help since last year. For additional information check our website: www.oshd.org/acd/eip.htm.

NEW COMMUNICABLE DISEASE REPORTING RULES

OHS recently finalized changes to the communicable disease reporting rules. The reporting poster is being revised and will be mailed to all laboratories later this spring. Look for a colorful work of art!!

In an effort to ensure that the rules not become obsolete as new diagnostic tests become available, the language in the new rule is more generic and requests reporting of tests "indicative of and specific for" the listed diseases or conditions, as opposed to the old language that listed specific tests. There is now only one list for health care providers and laboratories.

The changes in content are an attempt to explain what is meant by "unusual diseases of potential public health significance". As a consequence, a number of rare pathogens were added to the lab list of reportables. These organisms include all *Vibrio* spp., *Cyclospora cayentanensis*, all shiga-toxigenic *Escherichia coli* (STEC), *Legionella* spp., hantavirus, and organisms that are typically vectorborne, such as West Nile virus, *Ehrlichia* spp. and others. Possible agents of bioterrorism such as *Bacillus anthracis* and (Jenner forbid!) smallpox were also added.

Submission of isolates of *Vibrio* spp., *Listeria* spp. and *Yersinia* spp. to the OSPHL is specified. Reporting of all blood lead levels is now incorporated in the rules. Finally, reporting of positive tests for *Entamoeba histolytica* was discontinued. The entire rule is available on the website. Look for OAR 18 at (<http://www.oshd.org/acd/oars/rules.htm>).

Laboratories are the core of disease surveillance. We thank you for your conscientious commitment to public health programs.

WHAT'S NEW FOR FOODNET?

This spring Oregon FoodNet, along with other FoodNet sites, will be launching three new case-control studies. The first is a study of infant campylobacteriosis and salmonellosis, the second is a study of the sequelae of foodborne infection with *Campylobacter*, *Salmonella*, *Shigella*, *Yersinia* and *Escherichia*

coli O157 in persons greater than one year old, and the third is a study of infection with a specific *Salmonella* serotype, *Salmonella* Newport. These studies will attempt to identify behavioral, dietary, and medical risk factors, and calculate the proportion of disease risk attributable to certain factors. Epidemiologic and medical characteristics of affected individuals will be described.

Infant Case-Control Study

Infections with *Salmonella* and *Campylobacter* are the most common foodborne infections reported in Oregon and the United States. Age-specific isolation rates are highest in infants. While these organisms generally cause self-limited infection in healthy older children and adults, severe and life-threatening infection can occur in children under one year of age.

Sequelae of Foodborne Infection—Reactive Arthritis Case-Control Study

Data from outbreak investigations suggests that up to 4% of gastroenteritis due to *Salmonella*, *Shigella*, *Campylobacter*, and *Yersinia* and *E. coli* O157 lead to reactive arthritis. "Reactive arthritis" is a catchphrase for complications, which include pain and swelling in joints and the spine, skin rashes and eye irritation. It is not really known how often or why these complications occur or who is at risk.

Salmonella Newport Case-Control Study

Nationally, since 1998 *Salmonella* Newport has been the third most common serotype of *Salmonella* reported to the CDC. CDC National Antimicrobial Resistance Monitoring (NARMS) data show an increasing prevalence of multi-drug resistance (MDR) among isolates submitted, with 69% (31/45) of the MDR *S. Newport* isolates in 1999 and 2000 also resistant to ceftriaxone. Although most *Salmonella* infections don't require treatment, antimicrobials may be necessary with invasive disease or in immune suppressed individuals. Ceftriaxone is the drug of choice in children when treatment is warranted.



ACTIVE BACTERIAL CORE SURVEILLANCE PROJECT (ABCs)

In 2002, the ABCs project continued into the eighth year in Oregon and the Portland Tri-County area (Clackamas, Multnomah, and Washington counties; estimated 2001 population: 1,467,300). All 17 acute-care hospitals in the Tri-County area participate by submission of sterile-site isolates of *Streptococcus pneumoniae* and groups A and B *Streptococcus*. Because invasive *Haemophilus influenzae*, and *Neisseria meningitidis* diseases are reportable in Oregon, cases confirmed by sterile-site isolates are included from the entire state (2001 population: 3,471,700). For more information about Oregon's ABCs check: <http://www.oshd.org/acd/abc.htm> or CDC at: <http://www.cdc.gov/ncidod/dbmd/abc/>.

Neisseria meningitidis

Invasive meningococcal disease (IMD) continues to occur in Oregon at rates higher than those seen in most of the nation. In 2001, Oregon case counts continued the trend to decline (Table 1), for an overall incidence of 1.8 per 100,000. More specifically, incidence declined in children 5 to 9 years of age and in persons 15–30 years old. Case-fatality for all serogroups combined, from 1995–2001, was 8.5%.

Serogroup B continues its dominance: 40 (66%) of 61 isolates available for testing in 2001 were serogroup B. Serogroup B disease declined in children 15–19 years of age compared to previous years.

Case-fatality for serogroup B, from 1995–2001, was 8.4%.

Haemophilus influenzae

The annual incidence of invasive *H. influenzae* has remained fairly constant with a total of 214 cases reported from 1996 through 2001. In 2001, invasive *H. influenzae* disease incidence was highest in children 4 years and younger and adults over 60 years of age. The predominant serotype continues to be the non-typeable isolate. Hib has declined with no cases in children <15 in 2000 or 2001; it continues to cause disease in adults. In 2001, 2 cases of Hib were documented in women, 53 and 78 years of age.

Group A *Streptococcus*

Surveillance for invasive group A *Streptococcus* (GAS) disease has confirmed a total of 283 cases from July 1995 to December 2001. The incidence of invasive GAS is markedly variable but generally increases with age: from 1 per 100,000 population in children ≤ 4 to 9.6 per 100,000 in adults ≥ 65 . In 2001, the number of cases, 30, was the lowest of all ABC surveillance years. Cellulitis-related conditions were the most common syndrome: 41% of all cases. For all years of ABCs, case-fatality was 2.3% in children ≤ 17 ; 10.1% in adults 18 to 64 years of age; and 22.9% in adults ≥ 65 .

GAS Serotyping

Emm-typing has been obtained on 173 (81%) of the 215 available GAS isolates. The most common emm-type in Oregon is "01", accounting for 21% of isolates typed. The other common emm-types were "03" (7%), "11" (11%), "28" (9%), and "114" (9%).

GAS Susceptibility

To assess susceptibility, the CDC laboratory tested 59 GAS isolates from July 1995 to December 1997 with 3 antimicrobials: penicillin, erythromycin, and clindamycin. An additional 29 isolates from 1999 were tested with these same 3 and ampicillin, cefotaxime, cefuroxime, ceftazolin, and vancomycin: all were penicillin-susceptible, while 75% and 68% were susceptible to erythromycin and clindamycin respectively. More testing is planned with the 2000 and 2001 isolates.

Group B *Streptococcus*

Five-hundred fourteen cases of invasive group B *Streptococcus* (GBS) disease were collected from July 1995 to December 2001 (Table 1). The highest incidence is in children <1 year of age. Early-onset disease, invasive GBS disease in infants less than 7 days of age, has fallen from 0.6 to 0.3 cases per 1000 live births. The decline in early-onset disease is primarily attributed to the prenatal GBS screening or assessment for maternal risk of invasive GBS and administration of a single dose of perinatal prophylactic antibiotics.

Primary bacteremia is the most common syndrome and accounts for almost half of all invasive disease. Case-fatality rate is 0.8% in children ≤ 17 , 7.6% in adults 18 and older, and 11.8% in adults 65 years and older.

Streptococcus pneumoniae

From July 1995 through December 2001, 1589 cases of invasive pneumococcal disease (IPD) were documented. Comparisons by year and age group demonstrate that the highest incidence of invasive disease persists in children <2 years and adults ≥ 65

years of age. Of interest, in 2001, the incidence in children ≤ 2 years of age did decline below prior years of surveillance. This may coincide with the availability of the 7-valent conjugate pneumococcal vaccine for children. Primary bacteremia is the dominant invasive disease syndrome in kids <5 years of age. Bacteremic pneumonia remains the primary syndrome in all other persons: it accounts for 70% of all IPD. IPD case-fatality is very low for children ≤ 5 years at 0.7% but doubles to 1.5% for children 5 to 17 years of age. It is comparable for all persons 18 to 64 years of age, and women over 65 years, at 11%. For men 65 years and older, case-fatality is highest at 19%.

Pneumococcal Serotyping and Vaccine-Preventable Disease

Pneumococcal isolates from 1998 to present are serotyped at the CDC Bacterial Respiratory Diseases Laboratory. For children <2 years of age, 85% (83/98) of isolates were serotypes covered by the recently approved 7-valent conjugate pneumococcal vaccine. For adults ≥ 65 , 85% (181/213) of isolates are serotypes covered by the 23-valent pneumococcal vaccine.

Pneumococcal Susceptibility Testing

For IPD cases, 1195 isolates have been tested by a reference lab for antimicrobial susceptibility using National Committee for Clinical Laboratory Standards (NCCLS)-approved minimum inhibitory concentration (MIC) breakpoints for each antibiotic. The sources of these isolates include 1137 (95%) from blood, 38 (3%) from CSF, and 20 (2%) from other normally sterile tissues or body fluids. Susceptibilities to tested antimicrobials are shown in Table 2.

Table 1. Cases and (inc)idence per 100,000 of ABCs pathogens in Oregon, 1996–2001

| Pathogen | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|-------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| ** statewide ***tri-county | No. (Inc.) | No. (Inc.) | No. (Inc.) | No. (Inc.) | No. (Inc.) | No. (Inc.) |
| <i>N. meningitidis</i> ** | 109 (3.4) | 94 (3.0) | 66 (2.0) | 73 (2.2) | 67 (1.9) | 61 (1.8) |
| <i>H. influenzae</i> ** | 29 (0.9) | 30 (0.9) | 36 (1.1) | 51 (1.5) | 30 (0.9) | 38 (1.1) |
| Group A <i>Streptococcus</i> *** | 46 (3.5) | 54 (4.0) | 48 (3.6) | 47 (3.4) | 39 (2.7) | 30 (2.0) |
| Group B <i>Streptococcus</i> *** | 80 (6.0) | 73 (5.5) | 84 (6.2) | 76 (5.5) | 71 (5.0) | 80 (5.5) |
| <i>S pneumoniae</i> *** | 267 (20.0) | 229 (17.0) | 287 (21.0) | 243 (17.6) | 248 (17.0) | 225 (15.5) |

Table 2. Percent of *Streptococcus pneumoniae* susceptible to various antibiotics, by year, Portland Tri-County, 1996-2001

| Antibiotic | 1996 n=191 | 1997 n=177 | 1998 n=244 | 1999 n=209 | 2000 n=180 | 2001 n=126 |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Amoxicillin | 93 | 90 | 87 | 85 | 83 | 87 |
| Cefotaxime | 93 | 92 | 87 | 86 | 85 | 87 |
| Cefuroxime | 93 | -- | 86 | 82 | 82 | 87 |
| Chloramphenicol | 95 | 96 | 99 | 98 | 98 | 96 |
| Clindamycin | 98 | 96 | 98 | 95 | 96 | 98 |
| Erythromycin | 95 | 89 | 91 | 83 | 86 | 79 |
| Ofloxacin | 96 | 92 | --- | --- | -- | -- |
| Levofloxacin | -- | -- | 99.6 | 100 | 100 | 100 |
| Penicillin | 86 | 83 | 79 | 77 | 74 | 76 |
| Rifampin | 100 | 100 | 99.6 | 100 | 98 | 99 |
| Tetracycline | 95 | 90 | 91 | 90 | 88 | 91 |
| TMP-SMX | 80 | 73 | 73 | 66 | 66 | 63 |
| Vancomycin | 100 | 100 | 100 | 100 | 100 | 100 |

LABORATORIES DO A GREAT JOB OF REPORTING

Laboratories continue to do an excellent job of reporting enteric pathogens. Starting in 1996, we've annually evaluated for completeness of reporting of *Campylobacter*, *E. coli* O157, *Listeria*, *Salmonella*, *Shigella*, *Vibrio*, *Yersinia*, and *Cryptosporidium*. Case investigations sent by the counties to OHS are compared with clinical laboratory generated computer lists sent directly to OHS, manual lab record review or through response to faxed lists generated at OHS. In 2001, 97% of positive results were reported by laboratories to the local health departments and then by the local health departments on to OHS. Reporting for 1996, 1997, 1998, 1999 and 2000 has been 94%, 96%, 96%, 97%, and 95% respectively. Thank you for your diligent work at disease reporting.

STATEWIDE ELECTRONIC NETWORK FOR CLINICAL MICROBIOLOGISTS

Calling All Clinical Microbiologists: now is the time to join your 41 colleagues who are subscribed to the Oregon Microbiology Laboratorians (ORMICLab) e-mail listserv supported by the State of Oregon Library system. By subscribing, you can easily e-mail the entire group with important microbiology issues or receive statewide and interstate outbreak alerts. To subscribe, or if you have questions, contact Maureen.P.Cassidy@state.or.us or Teresa.E.McGivern@state.or.us or call 503/731-4024.

OREGON FOODBORNE DISEASE SURVEILLANCE THROUGH FOODNET

Salmonellosis and Campylobacteriosis Decline

Active surveillance for culture-confirmed *Campylobacter*, *E. coli* O157, *Listeria*, *Salmonella*, *Shigella*, *Vibrio*, *Yersinia*, *Cyclospora* and *Cryptosporidium* infections continued in Oregon in 2001.

Figure X shows rates for infection by *Campylobacter*, *Salmonella*, *Shigella*, and *E. coli* O157 from 1996–2001. The rates for *Campylobacter*, *Salmonella*, and *Shigella* decreased from 1996 to 2001. For *E. coli* O157 the rate has not changed appreciably from 1996 to 2001. Figure Y shows the rates for *Listeria*, *Yersinia*, *Vibrio*, and *Cryptosporidium* and *Cyclospora*. Rates decreased for *Listeria*, and *Yersinia* from 1996-2001. For *Cryptosporidium*, the rate increased from 1996 to 2001. Rates for *Vibrio* increased from 1996 to 1997 but decreased in 2001. There were only 3 cases of cyclosporiasis for all years combined; 2 in 1997 and one in 1998.

As a new surveillance process, all Shiga-toxin-positive specimens identified by the one private lab doing such testing are sent to OSPHL for O typing and H typing. All Shiga-toxin-positive *E. coli* isolates not identified as O157 are sent to CDC for identification. In 2001, two O26:H11, one O26:NM, one O rough (untypeable):H11, one O118:H16, and one O103:H2 were identified.

Figure X. Cases of foodborne diseases – Oregon January 1996- December 2001

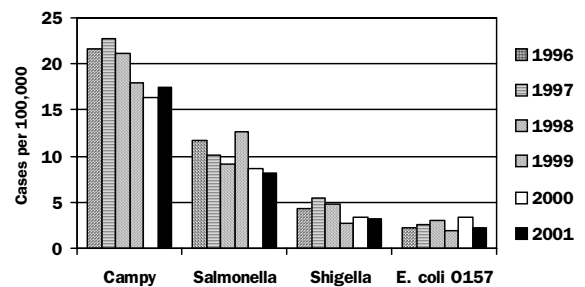
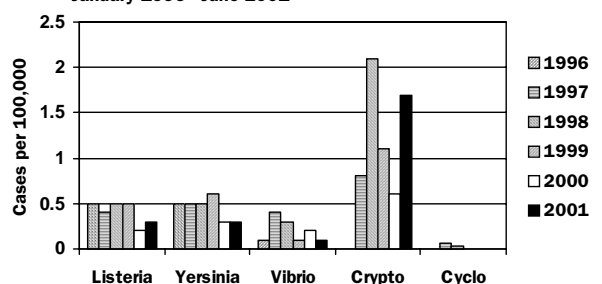


Figure Y. Cases of foodborne disease - Oregon January 1996 - June 2001



LISTERIOSIS

Seventeen confirmed listeriosis cases have been enrolled in the three-year study to end 12-31-02. Of the 17, 8 were female and 9 male. Eight (47%) cases were 70 years or greater, with 5 deaths. Four (24%) cases were pregnant women; 3 were Hispanic. An infant death and a fetal demise were associated with two of the cases.

This study is being duplicated in 8 other U.S. sites <http://www.cdc.gov/foodnet/> and will reassess dietary and behavioral risk factors, assess the type and quantity of listeriosis information given to high-risk patients by health-care providers, identify opportunities for prevention, and describe the spectrum of illness, antimicrobial resistance patterns, and molecular subtypes associated with listeriosis in both Oregon citizens and nationally. Information on Oregon listeriosis cases and educational materials can be found at: <http://www.oshd.org/acd/listeria/home.htm>.

CRYPTOSPORIDIOSIS

There was a total of 58 cases of infection with *Cryptosporidium* from 4/1/99-3/31/01. Twenty-six (45%) were enrolled in the case-control study.

Univariate-matched analysis, matched-odds ratio (MOR) showed two risk factors associated with infection with *Cryptosporidium*: contact with calves (MOR=13, p=0.005) and drinking bottled water (MOR=3.1, p=0.04) in the two weeks prior to illness.

Farm animals shed *Cryptosporidium*, and having contact with a farm animal is a plausible risk factor for cryptosporidiosis. Proper hand washing should be emphasized after touching farm animals.

The sample was not big enough to show other risk factors. The aggregate data from other FoodNet sites may reveal additional risk factors. Bottled water could be a surrogate for other factors. We thought that it might be a marker for travel in that travelers tend to drink bottled water, but travel was not a risk factor for infection with *Cryptosporidium*.

NATIONAL ANTIMICROBIAL RESISTANCE MONITORING SYSTEM (NARMS)

National Antimicrobial Resistance Monitoring System (NARMS) is a partnership among CDC, U.S. Food and Drug Administration, the U.S. Department of Agriculture and twenty-eight states. This program was started because of human health concerns related to the use of antimicrobials in food animals. Both human and animal enteric isolates are collected nationwide. Loss of susceptibility of enteric bacteria to various antimicrobials used in humans and animals is monitored. Although antimicrobial therapy generally is not warranted for most human gastroenteritis it may be indicated in invasive disease. The ultimate goal of the program is to make sure antimicrobials remain effective when treatment is indicated.

OHS participates in NARMS and sends every 10th non-typhoidal *Salmonella*, every 10th *Shigella*, every 5th *E. coli* O157, all *Salmonella Typhi*, *Listeria*, *Vibrio* and one *Campylobacter* isolate per week to CDC for antimicrobial susceptibility testing. All isolates except *Campylobacter* are sent from the OSPHL. Two large reference labs send one *Campylobacter* isolate per week to CDC. We have sent 26 *Salmonella*, 10 *Shigella*, 13 *E. coli* O157, 8 *Salmonella Typhi*, 5 *Vibrio* and 42 *Campylobacter* isolates to CDC in 2001. Most susceptibility testing, with the exception of *Campylobacter*, is near completion. Oregon *Campylobacter* data was not available from CDC at the time of this writing but data from previous years showed increasing resistance to ciprofloxacin; 14% in 1998 to 20% in 2001. For more information about NARMS check <http://www.cdc.gov/narms>.

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