MINNESOTA DEPARTMENT OF HEALTH

DISEASE CONTROL NEWSLETTER

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Annual Summary of Communicable Diseases Reported to the Minnesota Department of Health, 1999

Introduction

Assessment is a core public health function, and surveillance for communicable diseases is one type of assessment activity that is continuous over time. Epidemiologic surveillance is the systematic collection, analysis, and dissemination of health data for the planning, implementation, and evaluation of public health programs. The Minnesota Department of Health (MDH) collects disease surveillance information on certain communicable diseases for the purposes of determining disease impact, assessing trends in disease occurrence, characterizing affected populations, prioritizing disease control efforts, and evaluating disease prevention strategies. In addition, prompt surveillance reports allow outbreaks to be recognized in a timely fashion, when control measures are likely to be most effective in preventing additional cases.

In Minnesota, communicable disease reporting is a centralized system whereby reporting sources submit standardized report forms to the Surveillance Coordinator at the MDH Acute Disease Epidemiology Section. These reports are monitored daily by individual program staff. Cases of disease are reported pursuant to Minnesota Rules Governing Communicable Diseases (MN Rules 4605.7000-4605.7800). The Commissioner of Health has determined that the diseases listed in Table 1 (page 26) must be reported to MDH. As stated in these rules, physicians, health care facilities, medical laboratories, veterinarians, and veterinary medical laboratories are required to report these diseases. These reporting sources may designate an individual within an institution to perform routine reporting duties (e.g., an infection control practitioner for a hospital). Data maintained by MDH are private and are protected under the Minnesota Government Data Practices Act (Section 13.38).

Since April 1995, MDH has been participating as one of the Emerging Infections Program (EIP) sites funded by the Centers for Disease Control and Prevention (CDC) and through this program has implemented active hospital and laboratory-based surveillance for several conditions, including selected invasive bacterial diseases and foodborne diseases. Isolates for pathogens associated with these diseases are required to be submitted to MDH (indicated in Table 1). The MDH laboratory performs state-of-the-art microbiologic evaluation of isolates, such as pulsed-field gel electrophoresis, to determine whether isolates of selected pathogens (e.g., enteric pathogens such as *Salmonella* and *Escherichia coli* O157:H7, and invasive pathogens such as *Neisseria meningitidis*) are related and therefore may be associated with a common source. In addition, testing of submitted isolates allows detection and monitoring of antimicrobial resistance, which continues to be an increasing problem with many pathogens.

Table 2 (page 27) summarizes the number of cases of selected communicable diseases reported to MDH during 1999 by district of the patient's residence. Pertinent observations for some of these diseases are discussed below. A summary of influenza surveillance data is included; however, these data do not appear in Table 2 because the influenza surveillance system is based on reported outbreaks rather than on individual cases and covers the 1999-2000 influenza season rather than the 1999 calendar year.

Arboviral Encephalitis

LaCrosse encephalitis and Western equine encephalitis (WEE) are the primary arboviral encephalitides found in Minnesota. Confirmed cases are defined as those which are clinically and epidemiologically compatible with arboviral encephalitis and meet one or more of the following laboratory criteria: a four-fold or greater rise in antibody titer to the virus; isolation of virus from, or detection of viral antigen in, tissues or body fluids; or detection of specific IgM antibody in cerebrospinal fluid. Probable cases are defined as clinically compatible cases occurring during a period when arboviral transmission is likely, with an elevated and stable (i.e., **continued...**

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Table 1. Diseases Reportable to the Minnesota Department of Health

Amebiasis (*Entamoeba histolytica*)
Anthrax (*Bacillus anthracis*)*
Babesiosis (*Babesia* species)
Blastomycosis (*Blastomyces dermatitidis*)
Botulism (*Clostridium botulinum*)*
Brucellosis (*Brucella* species)
Campylobacteriosis (*Campylobacter* species)+
Cat Scratch disease (infection caused by *Bartonella* species)
Chancroid (*Haemophilus ducreyi*)*,**
Chlamydia trachomatis infection**
Cholera (*Vibrio cholerae*)*,+
Cryptosporidiosis (*Cryptosporidium parvum*)
Dengue virus infection
Diphtheria (*Corynebacterium diphtheriae*)+
Diphyllobothrium latum infection
Ehrlichiosis (*Ehrlichia* species)
Encephalitis (caused by viral agents)
Enteric *Escherichia coli* infection (*E. coli* 0157:H7 and other pathogenic *E. coli* from gastrointestinal infections)+
Giardiasis (*Giardia lamblia*)
Gonorrhea (*Neisseria gonorrhoeae*)**
Haemophilus influenzae disease (all invasive disease)+
Hantavirus infection
Hemolytic Uremic Syndrome
Hepatitis (all primary viral types including A, B, C, D, and E)
Histoplasmosis (*Histoplasma capsulatum*)
Human Immunodeficiency Virus (HIV) infection, including Acquired Immunodeficiency Syndrome (AIDS)***
Influenza (unusual case incidence or laboratory confirmed cases)
Kawasaki Disease
Legionellosis (*Legionella* species)
Leprosy (*Mycobacterium leprae*)
Leptospirosis (*Leptospira interrogans*)
Listeriosis (*Listeria monocytogenes*)+
Lyme Disease (*Borrelia burgdorferi*)
Malaria (*Plasmodium* species)
Measles (Rubeola)*
Meningitis (caused by *Haemophilus influenzae*,+ *Neisseria meningitidis*,+ *Streptococcus pneumoniae*,+ or viral agents)
Meningococcemia (*Neisseria meningitidis*)+
Mumps*
Pertussis (*Bordetella pertussis*)*,+
Plague (*Yersinia pestis*)
Poliomyelitis*
Psittacosis (*Chlamydia psittaci*)
Q Fever (*Coxiella burnetii*)
Rabies (animal and human cases and suspects)*
Retrovirus infections (other than HIV)
Reye Syndrome
Rheumatic Fever (cases meeting the Jones Criteria only)
Rubella and Congenital Rubella Syndrome
Rocky Mountain Spotted Fever (*Rickettsia* species)
Salmonellosis, including typhoid (*Salmonella* species)+
Shigellosis (*Shigella* species)+
Streptococcal disease (all invasive disease caused by groups A and B streptococci and *S. pneumoniae*)+
Syphilis (*Treponema pallidum*)*,**
Tetanus (*Clostridium tetani*)
Toxic Shock Syndrome+
Toxoplasmosis (*Toxoplasma gondii*)
Trichinosis (*Trichinella spiralis*)
Tuberculosis (*Mycobacterium tuberculosis* and *Mycobacterium bovis*)+
Tularemia (*Francisella tularensis*)
Typhus (*Rickettsia* species)
Unexplained deaths possibly due to unidentified infectious causes
Yellow Fever
Yersiniosis (*Yersinia* species)+

*Report immediately by telephone at (612) 676-5414 or (877) 676-5414
**Report on separate Sexually Transmitted Disease Report Card
***Report on separate AIDS/HIV Report Card
+Submit isolates to the Minnesota Department of Health Public Health Laboratory

≤ two-fold change) antibody titer to the virus.

LaCrosse encephalitis is the most commonly reported arbovirus infection in Minnesota. The disease, which primarily affects children, is transmitted through the bite of infected *Aedes triseriatus* (Eastern Tree Hole) mosquitoes. Persons are exposed to infected mosquitoes in wooded or shady areas inhabited by this mosquito, especially in areas where water-holding containers (e.g., waste tires, buckets, or cans) are abundant and are utilized as mosquito breeding habitat. During 1999, one confirmed case and five probable cases were reported to MDH. During 1985-1998, 75 cases of LaCrosse encephalitis were reported to MDH, with a median of five cases (range, three to 12 cases) reported yearly. The disease has been reported in 16 southeastern Minnesota counties. The highest incidence rates occur in Houston County (mean annual incidence of 22 cases per 100,000 persons ≤19 years of age; range, 0 to 68 per 100,000). Disease onsets have been reported from June through September; most cases have onset from mid-July through mid-September.

Western equine encephalitis occurs infrequently in Minnesota, usually as part of a regional epidemic or epizootic in Midwestern states and southern Canada. However, during 1999 a single probable case of WEE was reported in a Marshall County resident; there were no reports from other states or Canadian provinces. Prior to this case, the most recent cases of WEE in Minnesota occurred during 1983 (one case) and 1975 (15 cases). The virus is transmitted to humans and horses through the bite of *Culex tarsalis* mosquitoes in years when virus-

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Table 2. Cases of Selected Communicable Diseases Reported to the Minnesota Department of Health by District of Residence, 1999

Disease	Metropolitan (2,544,353)	Northwestern (149,772)	Northeastern (246,151)	Central (659,943)	West Central (220,831)	South Central (280,270)	Southeastern (447,123)	Southwestern (233,821)	Unknown Residence	Total (4,782,264)
	District* (population; 1998 estimates)									
Campylobacteriosis	394	13	28	106	39	54	117	35	0	786
Cryptosporidiosis	18	2	1	16	6	8	35	5	0	91
Ehrlichiosis	7	1	5	22	0	1	0	0	0	36
Encephalitis - viral										
LaCrosse	3	0	0	1	0	1	1	0	0	6
Western	0	1	0	0	0	0	0	0	0	1
Escherichia coli 0157:H7 infection	81	1	4	21	10	8	35	15	0	175
Hemolytic Uremic Syndrome	2	1	0	3	0	1	4	2	0	13
Giardiasis	723	12	32	118	69	20	110	42	430	1556
Haemophilus influenzae invasive disease	29	2	2	6	4	6	5	2	0	56
HIV infection other than AIDS	186	1	9	5	0	3	5	3	13	225
AIDS cases (diagnosed in 1999)	141	0	1	7	1	2	5	0	0	157
Legionnaires' disease	11	1	1	2	0	0	2	1	0	18
Listeriosis	9	0	0	0	1	1	6	0	0	17
Lyme disease	151	1	5	106	1	4	15	0	0	283
Measles	1	0	0	0	0	0	0	0	0	1
Mumps	0	1	0	0	0	0	0	0	0	1
Neisseria meningitidis invasive disease	31	3	7	8	2	0	3	2	0	56
Pertussis	221	0	5	19	0	15	8	13	0	281
Rubella	4	0	0	0	0	0	1	0	0	5
Salmonellosis	325	12	23	81	60	25	58	42	0	626
Sexually transmitted diseases*										
Chlamydia trachomatis - genital infections	5609	183	288	561	128	104	465	112	0	7450
Gonorrhea	2567	15	51	93	17	17	58	12	0	2830
Syphilis total	53	0	2	8	1	1	6	1	0	72
primary/secondary	10	0	0	0	0	0	0	0	0	10
early latent**	9	0	0	0	0	0	0	0	0	9
late latent***	33	0	2	8	1	1	6	1	0	52
congenital	1	0	0	0	0	0	0	0	0	1
Chancroid	1	0	0	0	0	0	0	0	0	1
Shigellosis	235	0	1	7	2	0	7	2	0	254
Streptococcus pneumoniae invasive disease (Twin Cities only)	584	--	--	--	--	--	--	--	--	584
Streptococcal invasive disease - Group A	102	4	6	23	12	9	15	9	0	180
Streptococcal invasive disease - Group B	128	4	15	24	9	21	22	9	0	232
Tetanus	1	0	0	0	0	0	0	0	0	1
Tuberculosis	158	2	1	4	1	2	31	2	0	201
Vancomycin Resistant Enterococci+	102	3	2	21	1	4	9	3	0	145
Viral hepatitis, type A	105	0	1	3	2	7	4	6	0	128
Viral hepatitis, type B (acute infections only)	58	0	7	5	5	0	5	0	0	80
Viral hepatitis, type C (acute infections only)	14	0	3	2	2	0	3	1	0	25
Yersiniosis	14	1	1	6	3	1	8	3	0	37

*Cases for which the patient's residence is unknown are assigned the geographic location of the reporting clinic when known.
**Duration <1 year
***Duration >1 year
+Totals do not include out-of-state residents.

County Distribution within Districts
Metropolitan = Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington
Northwestern = Beltrami, Clearwater, Hubbard, Kittson, Lake of the Woods, Marshall, Pennington, Polk, Red Lake, Roseau
Northeastern = Carlton, Cook, Lake, St. Louis
Central = Aitkin, Benton, Cass, Chisago, Crow Wing, Isanti, Itasca, Kanabec, Koochiching, Mille Lacs, Morrison, Pine, Sherburne, Stearns, Todd, Wadena, Wright
West Central = Becker, Clay, Douglas, Grant, Mahnomen, Norman, Otter Tail, Pope, Stevens, Traverse, Wilkin
South Central = Blue Earth, Brown, Faribault, LeSueur, McLeod, Martin, Meeker, Nicollet, Sibley, Waseca, Watonwan
Southeastern = Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha, Winona
Southwestern = Big Stone, Chippewa, Cottonwood, Jackson, Kandiyohi, Lac Qui Parle, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Renville, Rock, Swift, Yellow Medicine

infected vector populations are relatively high. The mosquitoes usually feed on birds and maintain WEE virus in a mosquito-bird cycle. However, in mid-summer when vector populations rise, a significant part of the mosquito feeding may switch to mammalian hosts such as humans and horses (both considered to be dead-end hosts for WEE virus).

Campylobacteriosis

Campylobacter continues to be the most commonly reported bacterial enteric pathogen in Minnesota (Figure 1). There were 786 cases of culture-confirmed *Campylobacter* infection reported to MDH in 1999 (16.4 per 100,000 population). Of *Campylobacter* isolates submitted to MDH, 88% were *C. jejuni* and 9% were *C. coli*. Fifty percent of cases resided in the seven-county Twin Cities metropolitan area. Fifty-one percent of cases were 20 to 49 years of age, and 12% of cases were 5 years of age or

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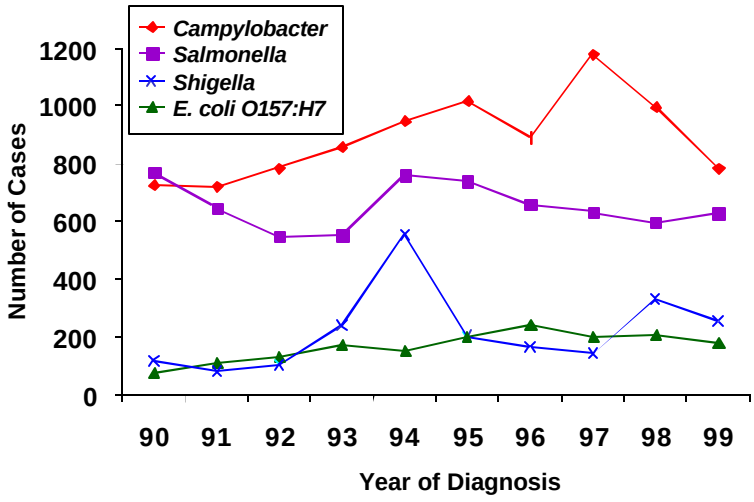
younger. Fifty-one percent of infections occurred during June through September. No outbreaks of campylobacteriosis were identified in 1999.

The primary feature of public health importance was the continued emergence of *C. jejuni* isolates resistant to fluoroquinolone antibiotics (e.g., ciprofloxacin), which commonly are used to treat campylobacteriosis. From 1992 to 1999, the proportion of quinolone-resistant *C. jejuni* isolates increased from 1.3% to 17.3%. Peaks in the proportion of resistant isolates peaked during the winter months of each year and were associated with foreign travel (particularly to Mexico). More than 80% of *C. jejuni* isolates from patients with a history of foreign travel (regardless of destination) during the week before onset of illness were resistant to fluoroquinolones. Domestically acquired quinolone-resistant *C. jejuni* infections also increased significantly from 1996 to 1999. Quinolone-resistant *C. jejuni* were recovered from 14% of retail chicken products acquired by MDH in the seven-county metropolitan area in 1997; identical molecular subtypes were found among resistant isolates from chicken products and resistant isolates from domestically acquired human infections. Thus, the increase in domestically acquired resistant cases among humans likely is due largely to the use of fluoroquinolones in poultry in the United States, which began late in 1995.

Figure 1. Reported Cases of *Campylobacter*, *Salmonella*, *Shigella*, and *Escherichia coli* O157:H7 Infection, Minnesota, 1990-1999



Cryptosporidiosis

During 1999, 91 cases of laboratory-confirmed *Cryptosporidium parvum* infection were reported to MDH (1.9 per 100,000 population). This represents a 47% decrease from the 173 cases reported in 1998 and a 62% decrease from the 242 cases reported in 1997. The large number of cases in 1997 was due in part to a waterborne outbreak of cryptosporidiosis associated with a water sprinkler fountain. One outbreak of cryptosporidiosis was identified in 1999, accounting for 10 confirmed cases. This outbreak was associated with a swimming pool in a mobile home park. Excluding outbreak-associated cases, there still was a substantial decrease in cases reported in 1999 (81 cases) compared to 1997 (153 cases) and 1998 (158 cases).

Demographic characteristics of cases in 1999 were similar to those in 1997 and 1998. Thirty-five cases (38%) were from southeastern Minnesota, and 18 (20%) were from the seven-county metropolitan area. Ages ranged from 2 months to 85 years, with a median age of 8 years. Children less than 10 years of age accounted for 53% of cases, and children less than 5 years of age for 39%. Sixty-three percent of cases occurred during July through October. Twenty-four percent of cases were hospitalized. No cases were known to be HIV-infected.

MDH conducted a case-control study of 63 sporadic cases of cryptosporidiosis identified among Minnesota residents from July through December 1998. The primary risk factors for cryptosporidiosis identified by this study included swimming in public pools, drinking well water, and exposure to calves.

Ehrlichiosis

Ehrlichiosis is an emerging tick-borne bacterial disease in several regions of the United States. Human granulocytic ehrlichiosis (HGE) is the primary form seen in Minnesota; HGE is transmitted to humans by *Ixodes scapularis* (deer tick or black-legged tick), the same tick that transmits Lyme disease. During 1999, 36 probable or confirmed cases of HGE were reported to MDH. The risk of acquiring HGE was highest in the same east-central Minnesota counties where Lyme disease risk was greatest.

The epidemiology of HGE in Minnesota was outlined in the May 2000 issue of the *Disease Control Newsletter* (Vol. 28, No. 3). That article also summarized the clinical presentation of HGE patients, diagnostic tests, case definitions, and treatment.

Escherichia coli 0157:H7 Infection and Hemolytic Uremic Syndrome (HUS)

During 1999, 175 cases of culture-confirmed *E. coli* O157:H7 infection were reported to MDH (3.7 per 100,000 population). The mean number of cases reported annually from 1995 to 1999 was 204, with a range of 175 to 239 cases (Figure 1). Seventy-nine percent of the cases reported in 1999 occurred during June through October.

Four outbreaks of *E. coli* O157:H7 infection were identified in 1999. One outbreak occurred in a childcare home and resulted in two confirmed cases, including one case of HUS. The second outbreak occurred at a family picnic and resulted in two confirmed cases, including one case of HUS. The third outbreak was part of a multi-state outbreak that was identified through routine subtyping of isolates by pulsed-field gel electrophoresis (PFGE). The source of the multi-state outbreak was ground beef produced by a plant in Minnesota and distributed nationally. Three confirmed cases associated with this outbreak occurred among Minnesota residents; all three cases were hospitalized, but none developed HUS.

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The fourth outbreak, also detected through routine subtyping of isolates, was caused by a specific PFGE subtype of non-motile *E. coli* O157. This outbreak was associated with ground beef purchased at grocery stores belonging to a specific chain in the seven-county metropolitan area. Ten culture confirmed cases were identified. Two cases became ill in late December, whereas the other eight cases became ill from January to March of 2000.

Thirteen cases of HUS were reported in 1999; all were post-diarrheal. *E. coli* O157:H7 was isolated from stool in 12 (92%) of the HUS cases. The only stool culture-negative case was serologically positive for *E. coli* O157 antibodies. Eleven (85%) of the HUS cases occurred during June through October. The mean number of HUS cases reported annually from 1995 to 1999 was 18 (range, 12 to 29 cases). During 1999, seven HUS cases (54%) were less than 10 years of age, and three (23%) were greater than 60 years of age. All HUS cases were hospitalized, with a mean duration of hospitalization of 17 days (range, 6 to 80 days). Two cases died; both were greater than 70 years of age.

Giardiasis

During 1999, 1,556 cases of *Giardia lamblia* infection were reported to MDH (32.5 per 100,000 population). This represents a 18% increase from the 1,324 cases reported in 1998 and a 40% increase from the mean annual number of cases reported from 1989 to 1998 (mean of 1,115 cases; range, 819 to 1,467). The median age of cases reported in 1999 was 25 years. As in previous years, cases were clustered among children less than 5 years of age (22%) and adults 30 to 39 years of age (20%); only 12% of cases were over 50 years of age. This age distribution suggests a higher risk for transmission among young children and the adults who care for them. However, cases were not systematically interviewed to identify potential sources of exposure, such as attendance at childcare facilities. No outbreaks of giardiasis were identified in 1999.

Haemophilus influenzae
Invasive Disease

Fifty-six cases of invasive *Haemophilus influenzae* disease were reported to MDH in 1999 (1.2 per 100,000 population). Cases ranged in age from newborn to 90 years, with a median age of 67 years. Eighteen cases (32%) had pneumonia, 25 (45%) had bacteremia without another focus of infection, and three (5%) had meningitis. Four deaths were reported.

Five cases (9%) were known to be type b (Hib), compared to two cases in 1998 and seven cases in 1997. One of the Hib cases reported in 1999 was a 6-month-old child who had no significant medical history. This child had received one Hib immunization as per the recommended schedule. The other four cases of Hib reported in 1999 occurred in adults. The child had cellulitis, three adults had bacteremia without another focus of infection, and one adult had pneumonia; all survived.

Thirty-two cases (57%) had untypeable isolates, seven (13%) were type f, three (5%) were type e, one (2%) was type c, and eight (14%) were unknown.

The four deaths occurred in cases ranging in age from 20 to 85 years. All four cases presented with pneumonia; three had significant underlying medical conditions. Isolates from three of the deaths were untypeable, and the isolate from the other death was type c.

HIV Infection and AIDS

In 1999, 157 cases of AIDS were reported to MDH (3.3 per 100,000 population). This represents a 63% decline in the reported annual incidence of AIDS cases since the peak in 1992 (423 cases) and the lowest reported annual incidence since 1987 (142 cases) (Figure 2). The recent decline is due in part to the benefits of highly active antiretroviral therapy (HAART). The peak incidence in 1992 likely is due to a change in the AIDS surveillance case definition in 1993 which allowed for retrospective diagnoses. This change incorporated CD4+ T-lymphocyte counts of <200/uL in the absence of other AIDS-indicator diseases.

In addition to AIDS cases reported in 1999, 225 newly identified cases of HIV infection which had not progressed to AIDS by year end were reported in 1999 (4.7 per 100,000 population) (Figure 2). While newly identified HIV (non-AIDS) case incidence rates have plateaued over the past 5 years, the 1999 incidence reflects a 45% decline from the 406 cases reported in 1987. This peak number is not represented in Figure 2 to avoid duplication of reported cases which progressed from an HIV (non-AIDS) diagnosis to AIDS. The plateau in HIV (non-AIDS) reports suggests that the epidemic may be stabilizing in Minnesota, since no changes in surveillance methodology have been made since 1993.

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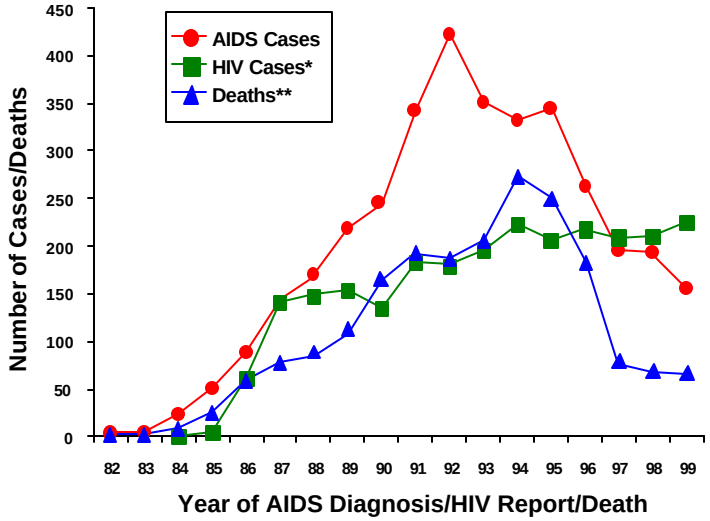
Figure 2. AIDS Cases by Year of Diagnosis, HIV Cases by Year of Report, and AIDS Deaths by Year of Death, Minnesota, 1982-1999



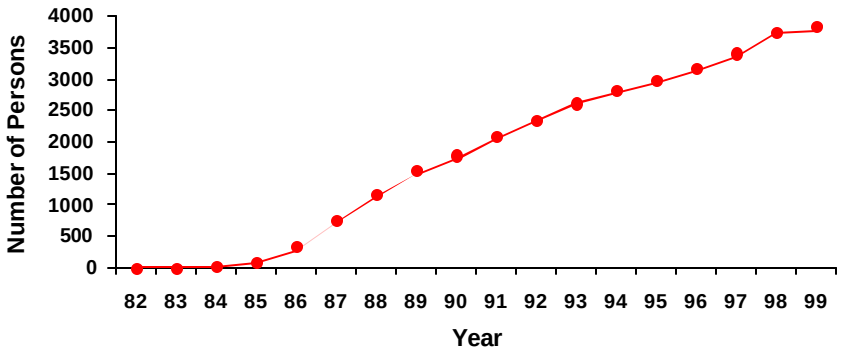
*Excludes cases which subsequently were diagnosed with AIDS.
**Deaths occurring during a year are not necessarily related to cases diagnosed during that year.

New treatments for HIV infection also have led to a marked reduction in mortality. Deaths due to AIDS have declined substantially since 1994 (Figure 2). The 65 deaths in persons with a diagnosis of AIDS in 1999 was the lowest number reported in Minnesota since 1986 (59 deaths).

Several trends in reported AIDS/HIV cases continue to evolve (Table 3). Male-to-male sex remained the most common exposure category for AIDS cases diagnosed in 1999 (69 cases, 44%), but the proportion has declined steadily over time. In contrast, the proportion of cases related to heterosexual contact has increased over time. The proportion of female AIDS cases has increased; females represented 8% of cases diagnosed in 1992, 9% of cases diagnosed cumulatively before 1998, and 19% of cases diagnosed in 1999. An increasing proportion of AIDS cases continues to be identified in people of color, while the proportion of cases identified in whites is decreasing. In 1999, 32% of AIDS cases were identified as black, 11% Hispanic, 4% American Indian, and 3% Asian/Pacific Islanders, compared to 16%, 5%, <1%, and 2%, respectively, prior to 1998. Conversely, in 1999, 50% of AIDS cases were identified as white, compared to 77% of cases prior to 1998.

When cumulative HIV (non-AIDS) infection data are compared to cumulative AIDS data, the HIV (non-AIDS) trends are even more pronounced than the trends in AIDS cases described above. For example, male-to-male sex is a risk factor for 55% of reported HIV (non-AIDS) cases and 69% of AIDS cases. Heterosexual transmission accounts for 11% of HIV (non-AIDS) cases and 6% of AIDS cases. Females comprise 18% of HIV (non-AIDS) cases compared to 10% of AIDS cases. Whites comprise 74% of AIDS cases and 63% of HIV (non-AIDS) cases, while blacks and Hispanics comprise 18% and 5% of AIDS cases and 28% and 5% of HIV (non-AIDS) cases, respectively. Injecting drug use as a risk factor accounts for 8% of AIDS cases and 10% of HIV (non-AIDS) cases.

Figure 3. Persons Living with HIV/AIDS at Year End, Minnesota, 1982-1999



Since 1985, 54 pediatric cases (<13 years of age) have been diagnosed with AIDS/HIV infection in Minnesota. Most of these children were diagnosed from 1987 to 1994, with the peak number of reported cases (n=8) in 1992. The majority (43 cases, 80%) were born to HIV-infected women and acquired their infection perinatally. With the increased identification of HIV infection in pregnant women and the increased use of antiretroviral therapy during pregnancy, the number of pediatric cases has decreased and remained constant at three cases per year since 1995.

As new treatments become available and the occurrence of AIDS is being delayed, using AIDS diagnoses as a marker for the epidemic is becoming less useful. Assessing trends based on recent HIV infections provides a better mechanism to evaluate current transmission risk and effectiveness of prevention efforts. In addition, because of increased survival, a growing number of persons are living with HIV infection (Figure 3). These data emphasize the continued importance of monitoring the epidemic to better direct policy and prevention efforts.

Influenza

Influenza surveillance in Minnesota relies on passive reporting from clinics, hospitals, laboratories, schools, and long-term care facilities. The current

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Table 3. Adult/Adolescent Cases of AIDS by Exposure Category, Sex, and Year of Diagnosis, Minnesota, 1982-1999

	Percentage of Cases in Exposure Category								
	1982-1997			1998			1999		
Exposure Category	Male (n=2909)	Female (n=276)	Total (n=3185)	Male (n=154)	Female (n=38)	Total (n=192)	Male (n=127)	Female (n=30)	Total (n=157)
Men Who Have Sex With Men	78	0	71	67	0	54	54	0	44
Injecting Drug Use (IDU)	6	25	8	12	16	13	9	23	11
Men Who Have Sex With Men and IDU	8	0	7	5	0	4	4	0	3
Hemophilia/Coagulation Disorder	2	<1	2	0	0	0	2	0	1
Heterosexual	1	50	5	2	45	10	6	33	11
Transfusion, Blood/Components	1	5	1	0	0	0	0	0	0
Other/Undetermined	4	19	6	14	39	19	26	43	29
Total	100	100	100	100	100	100	100	100	100

surveillance systems used in schools and long-term care facilities have been in place since the 1995-96 influenza season. A Sentinel Physician Influenza Surveillance Network consisting of three sentinel sites was initiated in Minnesota for the 1998-99 season. Ten sentinel sites participated during the 1999-2000 season, and MDH plans to further expand the number of sites to 18 (representing one sentinel site per 250,000 population).

The 1999-2000 influenza season began early and had an earlier than usual peak in influenza activity. The first influenza isolate in Minnesota was confirmed by the MDH Public Health Laboratory (PHL) on October 13, 1999. Since the 1990-91 season, the first influenza isolate usually has been collected and identified in mid-November. Surveillance indicators for 1999-2000 suggest that although influenza activity was within the normal range, considerably higher than usual activity occurred during late December and early January.

The MDH PHL received 640 influenza isolates for viral confirmation and strain identification. Of the isolates received, 628 (98%) were identified as influenza type A (H3N2)/Sydney-like, six (1%) were influenza A but sub-type was not available, five (1%) were influenza type A (H1N1)/Beijing-like, and one (<1%) was influenza type B/Yamanashi-like. Influenza type A Sydney-like also was the predominate strain circulating nationally. Strains that circulated in Minnesota during 1999-2000 were well matched to the strains included in the 1999-2000 influenza vaccine.

A probable outbreak of influenza-like illness (ILI) in a school was defined as a doubled absence rate with all of the following primary influenza symptoms reported among students: rapid onset, fever of 101° F or greater, illness lasting at least 3 days, and at least one secondary influenza symptom (i.e., myalgia, headache, cough, coryza, sore throat, chills). A possible ILI outbreak in a school was defined as a doubled absence rate and symptoms reported among students that included two of the primary influenza symptoms and at least one secondary influenza symptom.

Probable ILI outbreaks were reported from 64 schools in 31 counties throughout Minnesota. Possible outbreaks were reported from 70 schools in 30 counties. Schools began reporting ILI outbreaks in early January. Eighty-eight percent of probable and possible ILI outbreaks were reported during November and December. Since 1988-89, the number of schools reporting suspected influenza outbreaks has ranged from 38 schools in 20 counties in 1996-97, to a high of 441 schools in 71 counties in 1991-92.

In a long-term care facility, an ILI outbreak is suspected when three or more residents with a cough and fever ($\geq$101° F) or chills present in a single unit during a period of 48 to 72 hours. An ILI outbreak is confirmed when at least one resident has a positive culture or rapid-antigen test for influenza. During 1999-2000, 65 long-term care facilities reported confirmed or suspected ILI outbreaks. In 48 (74%) long-term care facilities, influenza was laboratory-confirmed by direct antigen or culture; influenza type A was identified in all of these facilities. All long-term care facility outbreaks were reported during October through January, and 72% were reported during November or December (i.e., early in the influenza season). Since 1988-89, the number of long-term care facilities reporting ILI outbreaks has ranged from six facilities in 1990-91 to 79 facilities in 1997-98.

Listeriosis

Seventeen cases of listeriosis, including two deaths, were reported to MDH in 1999. Since active laboratory surveillance for listeriosis was implemented in 1996, the annual number of cases has ranged from 10 in 1996 to 19 in 1998. During 1999, 14 cases (82%) were 50 years of age or older. Fifteen cases (88%) were hospitalized at the time of specimen collection. *Listeria* was most frequently isolated from blood (71%). Other sources of isolates were cerebrospinal fluid (12%), central line (6%), urine (6%), and placenta (6%).

One of 11 female cases in 1999 was pregnant. On the day she developed fever and chills, the woman went into premature labor and gave birth at 27 weeks. *Listeria monocytogenes* was isolated from the mother's blood and from the placenta. The baby developed complications due to prenatal infection and subsequently died.

Most cases were sporadic; however, five cases were linked to an outbreak of listeriosis that occurred in Olmsted County during September through December. The source of the outbreak was a grocery store deli; multiple isolates of *L. monocytogenes* with a pulsed-field gel electrophoresis pattern identical to case isolates were recovered from opened packages of sliced meat and from the deli environment. The original source of contamination was not determined.

Lyme Disease

The national surveillance case definition for a confirmed case of Lyme disease includes: 1) physician-diagnosed erythema migrans (EM) (solitary lesion must be $\geq$5 centimeters in diameter), or 2) at least one late manifestation of Lyme disease (neurologic, cardiac, or joint) and laboratory confirmation of infection. MDH has established the following as acceptable criteria for laboratory confirmation with regard to counting surveillance cases: 1) positive results of serologic testing conducted by CDC, or 2) a positive Western blot test from a clinical reference laboratory. A probable case of Lyme disease is defined as a person with at least one late manifestation of Lyme disease and laboratory evidence of infection but without a history of EM or appropriate laboratory confirmation.

During 1999, 283 cases meeting the national surveillance case definition for a confirmed case of Lyme disease were reported to MDH (6.0 per 100,000 population). This number represents an 8% increase in cases from the prior high of 261 cases reported in 1998 and a 20% increase from the mean annual number of cases reported from 1994 to 1998 (mean of 236 cases; range, 205 to 261) (Figure 4). During 1999, an additional 11 reports were classified as probable cases of Lyme disease.

One hundred sixty-three confirmed cases (58%) were male. The median age of cases was 31 years (range, 1 to 85 years). Forty-one percent of cases were 1 to 20 years of age, and 30% of cases were 41 to 60 years of age. Physician-diagnosed EM was present in 227 (80%) cases. Sixty-six cases

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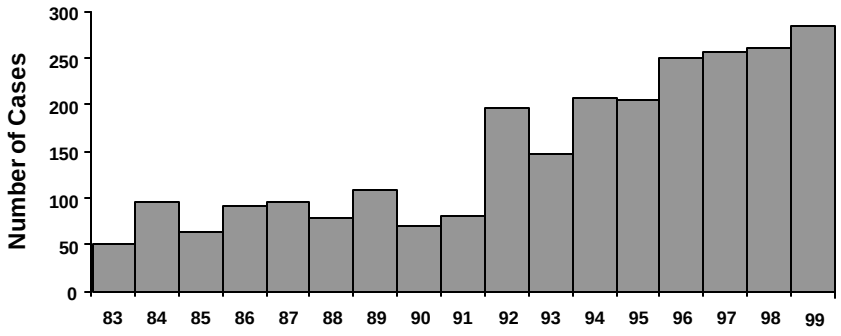
Figure 4. Reported Cases of Lyme Disease, Minnesota, 1983-1999



(23%) had at least one late manifestation of Lyme disease (47 of 66 had a history of objective joint swelling) and confirmation by a positive Western blot test. Onsets of illness peaked in June and July (30% and 38% of cases, respectively). Onset peaks correspond to the peak of nymphal *Ixodes scapularis* (deer tick, or black-legged tick) activity in Minnesota.

Similar to data from previous years, 151 (53%) of Lyme disease cases in 1999 were residents of the seven-county metropolitan area. However, only 34 (12%) cases likely were exposed to infected *I. scapularis* in metropolitan area counties, primarily Anoka, Washington, and extreme northern Ramsey counties. Most cases are reported in patients who either live in or travel to endemic counties in east-central Minnesota or western Wisconsin. Several east-central Minnesota counties continue to have the highest incidence rates of Lyme disease within Minnesota (e.g., Aitkin, Kanabec, Crow Wing, Mille Lacs, and Pine Counties had incidence rates of 101, 93, 57, 44, and 34 cases per 100,000 population, respectively). Additional details on Lyme Disease in Minnesota can be found in the May 2000 issue of the *Disease Control Newsletter* (Vol. 28, No. 3).

Malaria

In 1999, 71 cases of malaria (all imported) were reported to MDH. These cases and the 76 cases reported in 1998 represent the highest numbers reported since the end of the Korean War. The median age of cases was 19 years (range, 1 to 64 years). Of the 71 cases, 58 (82%) were black, nine (13%) were white, three (4%) were Asian, and one (1%) was of unknown race. Only 17 cases (24%) were U.S. citizens, and nine (13%) were born in the U.S. The majority of cases (89%) resided in the seven-county metropolitan area, including 34 cases (48%) in Hennepin County. Most cases (80%) had symptomatic infections, but 13 (18%) were immigrants to the U.S. who were asymptomatic at the time their infections were identified by screening.

The geographical region where malaria likely was acquired by the cases reported in Minnesota included Africa (61 cases), Asia (6 cases), and Central America and South America (one case each); one case traveled to both Africa and Asia, and one had unknown exposure. Twenty-four countries were considered possible countries of origin of the malarial infections. The countries from which the highest numbers of cases possibly originated were in Africa, including Liberia (25 cases), the Ivory Coast (16), Ghana (11), Nigeria (seven), and Kenya (five).

Measles

Measles is no longer an indigenous disease in the United States. However, international importation of measles remains an important source of measles transmission in the U.S. In Minnesota, nine measles cases were reported from 1997 to 1999; four (44%) were imported, three (33%) were associated with an imported case, and one (11%) had a recent history of foreign travel.

One case of measles was reported to the MDH during 1999. The case occurred in a 5-year-old Somali child who had a rash upon arrival in Minnesota. The case was laboratory-confirmed with a positive serologic test for measles IgM antibody. Measles serologic testing was performed on all five family members. A 10-year-old asymptomatic sibling was IgM- and IgG-positive, indicating recent infection or immunization, although the father did not provide a history of either a recent rash illness or immunization for this child. Other family members were IgG-positive and IgM-negative, indicating past immunity. Because the case was infectious during air travel from Kenya to Minneapolis, the airlines and local refugee resettlement agencies working with other Somali refugees on the flights were notified of the exposure. No other cases were identified despite heightened surveillance for rash illness. Ongoing measles transmission has been identified in Kenyan refugee camps where many Somali refugees reside.

Maintaining a thorough measles surveillance program and high measles vaccination coverage are essential components of a measles elimination strategy. Although current measles activity is low in the U.S. and in Minnesota, importation of cases from outside the U.S. and the presence of groups with philosophical or religious opposition to vaccination require that surveillance for measles and other rash illnesses remains heightened. Increased attention to reducing missed opportunities for vaccination of preschoolers is needed. High vaccination coverage levels among preschool- and school-aged children and improved implementation and enforcement of the recommendation for two doses of measles vaccine among high school and college students is necessary in all communities to eliminate transmission of endemic measles. The absence of transmission in the community from the case reported in Minnesota in 1999 is evidence that these goals are being achieved.

All suspected cases of measles should be reported immediately to MDH. The Centers for Disease Control and Prevention recommends serologic testing for measles and rubella for patients with rash illnesses compatible with either measles or rubella. Blood specimens for IgM serologic testing

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should be drawn at least 72 hours after rash onset. Blood specimens for acute and convalescent IgG serologic testing should be drawn within 10 days (preferably within 7 days) after rash onset, and again 3 to 5 weeks later. Acute and convalescent specimens should be tested as paired sera.

Mumps

One case of mumps was reported to MDH during 1999, compared to 13 cases in 1998. The 1999 case was laboratory-confirmed by positive IgM serology. The case, a 2-year-old child, had received one dose of MMR vaccine at 12 months of age and had no history of travel. There was no evidence of additional transmission from this case. Since 1990, a mean of 11 cases of mumps have been reported annually to MDH, with the majority of cases occurring among adults.

A shift in the age distribution of reported mumps cases from a focus in school-aged children to adults reflects the success of the two-dose MMR immunization strategy in reducing the incidence of mumps in populations for whom it is indicated and highlights the need to assess mumps immunization status of adults. Current recommendations for mumps vaccine include adults born in 1957 or later.

Because of the difficulty in distinguishing infectious parotitis (mumps) from other forms of parotitis and the possibility of false-positive mumps IgM serology, both IgM and IgG mumps-specific serologic testing is recommended for all sporadic cases. The acute specimen for IgM and IgG testing should be drawn at least 3 days after onset of parotitis, and the convalescent IgG specimen should be drawn 3 to 5 weeks later. The acute and convalescent IgG serology tests should be run as paired sera.

Neisseria meningitidis

Invasive Disease

Fifty-six cases of *Neisseria meningitidis* invasive disease were reported in 1999 (1.2 per 100,000 population), compared to 36 cases in 1998. The distribution of serogroups was similar to 1998, with 25 (45%) serogroup C cases, 12 (21%) serogroup B cases, 14 (25%) serogroup Y cases, one (2%) serogroup W135 case, one (2%) serogroup Z case, and two cases which were not groupable. One case was hospitalized in another state and serogroup information was not available.

Ages of cases ranged from 10 days to 82 years, with a mean age of 19 years. Fifty-five percent of the cases resided in the Twin Cities metropolitan area. Thirty cases (54%) had meningitis, 19 (34%) had bacteremia without another focus of infection, five (9%) had pneumonia, one (2%) had otitis, and one (2%) had septic arthritis.

Four deaths occurred. A 26-year-old female died of meningitis attributed to serogroup Y. The other deaths resulted from meningococcemia and included a 7-year-old female with serogroup C, a 24-year-old female with serogroup B, and a 75-year-old female with serogroup Z.

Most cases were sporadic, with no links to other cases through either epidemiology or molecular subtyping. An outbreak of serogroup C meningococcal disease involved four American Indian patients (ages 5, 8, 13, 20 years) from the Duluth/Cloquet area. The first case had onset of illness in 1998; the others had onsets in January 1999. All of the outbreak-associated isolates were closely related by pulsed-field gel electrophoresis (PFGE). Three isolates were an identical subtype; the other isolate differed by one band. Direct contact was not established between any of the cases.

Antibiotic prophylaxis was provided for all outbreak-associated cases and their close contacts. Vaccination clinics were conducted on the Fond du Lac Reservation and in Duluth, and immunizations were provided for American Indians 2 to 29 years of age living on or near the Fond du Lac Reservation or in the city of Duluth. Staff and students at the elementary school that the 8-year-old case attended also were immunized. Approximately 2,300 people were vaccinated. No additional cases were reported from the Duluth/Cloquet area following the vaccination clinics. However, a subsequent case with a matching PFGE subtype was reported in the Twin Cities area 4 weeks later. The case was an American Indian child who had close contact with persons from the Duluth/Cloquet area. A sibling also was hospitalized with similar symptoms, but the diagnosis of meningococcal disease was not culture-confirmed in the sibling.

Since the fall of 1998, MDH has collected additional information on college-aged students with *Neisseria meningitidis* invasive disease as part of a nationwide effort to determine whether providing meningococcal vaccine to incoming college freshmen would effectively prevent disease in this age group. Four cases reported in Minnesota in 1999 were college students. Each student attended a different school, and each resided in a different area of the state. Three cases were due to serogroup C, and one was due to serogroup Y (serogroups A, C, Y, and W135 are covered in the quadrivalent vaccine). In the fall of 1999, the Centers for Disease Control and Prevention Advisory Committee on Immunization Practices recommended that health care providers inform college students about meningococcal disease and about the availibility of vaccine.

Pertussis

Two hundred eighty-one cases of pertussis were reported during 1999 (5.9 per 100,000 population). Laboratory confirmation was available for 142 cases (51%); 80 were confirmed by culture and 62 by polymerase chain reaction (PCR). The number of PCR-confirmed cases increased due to a change in methodology at a large private laboratory in May 1999. The remainder of cases were epidemiologically linked to culture-confirmed cases (83, 30%) or met the clinical case definition (56, 20%). Two hundred twenty-one (79%) cases occurred in residents of the Twin Cities metropolitan area. One death due to pertussis was reported in 1999.

Although pertussis often is referred to as “whooping cough,” very young children, older individuals, and previously immunized persons may not have the typical “whoop” associated with pertussis. Paroxysmal coughing is the most commonly reported symptom. In 1999, 97% of reported pertussis cases experienced paroxysmal coughing, and 31% experienced whooping. Post-tussive vomiting was reported in 54% of cases, and apnea was reported in 32%.
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Due to waning immunity following either natural infection or vaccination, pertussis can affect persons of any age and increasingly is recognized in older children and adults. During 1999, cases ranged in age from less than 1 month to 83 years. The largest proportion of cases (30%) were children between 5 and 12 years of age. Thirty-nine cases (14%) were infants less than 6 months of age, and 43 (15%) were children 6 months through 4 years of age. Persons 13 to 17 years of age and persons 18 years of age or older accounted for 14% and 27% of cases, respectively.

The severity of pertussis increases significantly with decreasing age; pertussis is most severe in infants and young children. Pneumonia was diagnosed in 17 (6%) cases, nine (53%) of whom were less than 6 months of age. Thirty-two (11%) cases were hospitalized; twenty-five (78%) of these patients were younger than 6 months of age. The pertussis-related death occurred in an 11-day-old infant.

Older children and adults with pertussis may expose unprotected infants at risk for the most severe consequences of infection. During 1999, 43 cases of pertussis were reported in infants less than 1 year of age. A likely source of exposure (i.e., a person with an illness meeting the clinical case definition or with laboratory-confirmed pertussis) was identified for 20 cases (47%). Fourteen of these 20 cases (70%) likely were infected by an adult (most often parents, grandparents, or another adult relative), and six cases (30%) likely were infected by children (usually siblings). Twenty-three infant cases (53%) had no identified source of exposure. One case in a 3-week-old infant was epidemiologically linked to the mother, who had culture-confirmed pertussis. The mother's cough onset was 16 days prior to the infant's onset and 2 days before the infant's birth. The mother's pertussis was not identified until the infant was hospitalized. No additional cases were identified among contacts exposed during the mother's hospitalization. These cases highlight the need for a high index of suspicion for pertussis in adolescents and adults with cough illness (particularly pregnant women) and the importance of antibiotic treatment. Erythromycin is not contraindicated in pregnancy.

Although unvaccinated children are at highest risk for pertussis, fully immunized children may develop disease. Vaccine efficacy for currently licensed vaccines is estimated to be 71% to 84% for preventing serious pertussis disease. Of 165 cases from 2 months to 15 years of age with a known vaccination history, 10 (67%) had received age-appropriate immunization for pertussis (including infants 2 to 5 months of age for whom a primary series is not yet indicated). Of the 149 cases from 7 months through 15 years of age, 78% had received at least a primary series of three doses. Disease in previously immunized persons usually is mild. Of the 54 cases from 7 months to 7 years of age, 18 (33%) were considered preventable (i.e., the patients received fewer than three doses of DTP vaccine before onset of illness).

Physicians should include pertussis in the differential diagnosis of cough illness in persons of all ages regardless of immunization status. Until approved booster vaccination for pertussis is available to protect older children and adults, prompt diagnosis and treatment of cases and prophylaxis of contacts are the only means to limit transmission.

For all 80 culture-confirmed cases, *B. pertussis* isolates were subtyped by pulsed-field gel electrophoresis (PFGE) and tested for antibiotic susceptibility. Twelve distinct PFGE patterns were identified; four patterns (33%) were represented by a single case isolate. The two most common patterns accounted for 59 (74%) of the isolates and occurred throughout the year.

The first case of erythromycin-resistant *B. pertussis* in Minnesota was identified in October 1999. Only five other erythromycin-resistant *B. pertussis* cases have been identified in the U.S.; the first was identified in Arizona in 1994. The Minnesota case occurred in a 10-year-old white female from Carver County. She had received one dose of pertussis-containing vaccine at 2 months of age; however, three subsequent vaccinations included only diphtheria and tetanus toxoids (DT) due to a medical contraindication. A nasopharyngeal specimen collected 35 days after cough onset was positive for *B. pertussis* on culture and PCR, despite 5 days of erythromycin-equivalent macrolide therapy. A second culture collected more than 6 weeks later was negative for *B. pertussis*. All other *B. pertussis* isolates tested to date have had low minimum inhibitory concentrations, falling within the reference range for susceptibility to the antibiotics evaluated.

Rubella/Congenital Rubella Syndrome

Five cases of rubella were reported during 1999. No cases were reported during the previous 6 years, although one case of congenital rubella syndrome was reported in 1998. The rubella cases in 1999 included three Hispanic adults 25, 26, and 27 years of age living in Minneapolis, a 13-month-old Southeast Asian child in Hennepin County, and an 11-month-old white, non-Hispanic child in greater Minnesota. All five cases were laboratory-confirmed with a positive serologic test for rubella IgM antibody.

Rubella often is under-diagnosed due to the mild nature of illness and because 25% to 50% of cases are asymptomatic. In 1999, surveillance was heightened in response to reports of rubella outbreaks among Hispanic individuals working in the meat-packing industry in Nebraska and Iowa. MDH alerted clinicians and public health professionals statewide to the potential for rubella cases in Minnesota and provided information to facilitate laboratory testing. Targeted community education efforts and immunization clinics were conducted in high-risk areas of the state where meat processing plants employ significant numbers of Hispanic workers. Over 2,000 doses of vaccine were administered to susceptible high-risk persons. Although the rubella cases reported in Minnesota in 1999 had no identified ties to cases in Nebraska and Iowa or the meat processing industry, the heightened surveillance and outbreak control efforts may have contributed to the detection of these cases and prevented transmission.

All suspected cases of rubella should be reported immediately to MDH. The Centers for Disease Control and Prevention recommends serologic

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testing for both rubella and measles for patients with rash illnesses compatible with rubella or measles. Prevention of congenital rubella syndrome and rubella in post-pubescent populations is the objective of rubella immunization programs and continues to warrant attention in Minnesota, particularly as importation of disease increases.

Salmonellosis

During 1999, 626 culture-confirmed cases of *Salmonella* infection were reported to MDH (13.1 per 100,000 population). This represents a 4% increase from the 601 cases reported in 1998 (Figure 1). Sixty-one percent of cases were caused by the following five serotypes: *S. typhimurium* (172 cases), *S. heidelberg* (88 cases), *S. enteritidis* (66 cases), *S. muenchen* (29 cases), and *S. montevideo* (28 cases). Twenty-two percent of cases were less than 10 years of age. Fifty-one percent of cases occurred during June through September.

Five foodborne outbreaks of salmonellosis were identified in 1999, four of which occurred in restaurant settings. In June, three patrons of a restaurant became ill with *S. heidelberg* infection. Follow-up at the restaurant identified two employees who also were culture-positive for *S. heidelberg*. No common food source was identified. The second outbreak involved one patron and nine employees of a restaurant who were diagnosed with *S. montevideo* infection in July. The third outbreak was due to a rare pulsed-field gel electrophoresis (PFGE) subtype of *S. typhimurium* which was identified in five people; illness was associated with eating at a specific restaurant. The fourth restaurant outbreak involved *S. heidelberg* infections associated with a specific restaurant during June and July. Twenty-five patrons and 10 employees became ill with culture-confirmed *S. heidelberg* infection; another 15 employees had stool samples that were positive for *S. heidelberg* but reportedly were asymptomatic. During June, six Minnesota residents were part of a multi-state outbreak of *S. muenchen* infection associated with consumption of unpasteurized orange juice which was produced in Arizona and widely distributed.

Three non-foodborne outbreaks of *Salmonella* were identified in 1999, all of which were due to multi-drug resistant *S. typhimurium* phage type DT104 (resistant to ampicillin, chloramphenicol, streptomycin, sulfamethoxazole, and tetracycline). Two of the outbreaks occurred in childcare homes. There were six culture-confirmed cases among children in one outbreak and two in the second outbreak. The third non-foodborne outbreak was linked to kittens adopted from a metropolitan area humane society. Four cases were identified among persons who lived in households that had purchased kittens from the humane society. Two additional cases were childcare contacts of a case who had purchased a kitten. Human and cat isolates had an identical PFGE subtype.

Sexually Transmitted Diseases

Rates of laboratory-confirmed chlamydia, gonorrhea, syphilis, and chancroid are monitored by the MDH through a passive, combined physician and laboratory-based sexually transmitted disease (STD) surveillance system. Other common STDs caused by viral pathogens, such as herpes simplex virus and human papillomavirus, are not reportable to MDH. Factors that influence the completeness and accuracy of STD surveillance data include level of screening, accuracy of diagnostic tests, and compliance with disease reporting. Apparent changes in STD incidence rates may be due to one of these factors or to actual changes in STD occurrence.

The number of cases and rates (per 100,000 population) of reportable bacterial STDs for 1995 through 1999 are presented in Table 4. Chlamydia, gonorrhea, and primary/secondary syphilis case numbers and rates by residence, age, gender, and race/ethnicity for 1999 are shown in Table 5.

Chlamydia Infection

Chlamydia trachomatis infection is the most commonly reported STD in Minnesota. In 1999, 7,450 cases of chlamydia infection were reported (155.8 per 100,000 population). This represents a 6% increase compared to 1998 and continuation of a trend of increasing chlamydia rates that began in 1996.

Adolescents and young adults are most at risk for acquiring chlamydia infection. The chlamydia rate was greatest among 20- to 24-year-olds (865 per 100,000 population), while the next greatest rate was among 15- to 19-year-olds (763 per 100,000). The rate of chlamydia among adults 25 to 29 years of age was markedly lower (356 per 100,000), and the rates among older age groups were even lower. The rate of chlamydia infection among women (228 per 100,000) was almost three times higher than the rate among men (85 per 100,000); however, this is due primarily to more frequent screening among women.

The rate of chlamydia infection is

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Table 4. Number of Cases and Incidence Rates (per 100,000 population) of Chlamydia, Gonorrhea, and Syphilis, Minnesota, 1995-1999

	1995		1996		1997		1998		1999	
Disease	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**
Chlamydia	6,121	134.0	5,418	118.0	6,804	146.0	6,997	149.0	7,450	158.0
Gonorrhea	2,819	62.0	2,622	57.0	2,438	53.0	2,716	58.0	2,830	60.0
Syphilis Total	181	4.0	123	2.7	118	2.5	78	1.7	72	1.5
Primary/ Secondary	42	0.9	15	0.3	16	0.3	9	0.2	10	0.2
Early Latent*	55	1.2	29	0.6	20	0.4	8	0.2	9	0.2
Late Latent**	81	1.8	78	1.7	82	1.8		1.3	52	1.1
Congenital***	3	4.7	1	1.6	0	0.0		0.0	1	1.5

* Duration <1 year

** Duration >1 year

*** Rate per 100,000 live births

highest in communities of color. The rate for blacks (1,731 per 100,000 population) was 25 times higher than the rate for whites (69 per 100,000). Although blacks comprise only 3% of the population in Minnesota, 33% of the chlamydia cases occurred among blacks. The rates for American Indians (609 per 100,000) and Hispanics (589 per 100,000) were nearly nine times higher than the rate for whites. The rate for Asians (259 per 100,000) was approximately four times higher than the rate for whites.

Reported chlamydia infections are geographically distributed throughout the state, although the rates were highest in Minneapolis (714 per 100,000 population) and St. Paul (533 per 100,000). The rate in the suburban metropolitan area (85 per 100,000) was very similar to the rate in greater Minnesota (84 per 100,000).

Gonorrhea

Gonorrhea, caused by *Neisseria gonorrhoeae*, is the second most commonly reported STD in Minnesota. In 1999, 2,830 cases were reported (59.2 per 100,000 population). This represents a 3% increase from 1998 and is the second consecutive year in which the reported incidence has increased. Reasons for these increases are unknown.

Adolescents and young adults also have the greatest risk for gonorrhea. The rate for 15- to 19-year-olds was 243 per 100,000 population; the rate for 20- to 24-year-olds was 280 per 100,000; and the rate for 25- to 29-year-olds was 162 per 100,000. Gonorrhea rates for men (57 per 100,000) and women (62 per 100,000) were comparable. Communities of color also are disproportionately affected by gonorrhea. Blacks accounted for 60% of gonorrhea cases. The gonorrhea rate for blacks (1,199 per 100,000) was nearly 90-fold higher than the rate for whites (14 per 100,000). Likewise, the rates for American Indians (143 per 100,000) and Hispanics (119 per 100,000) were nine to 10 times higher than the rate for whites. The rate for Asians (23 per 100,000) was nearly twice the rate for whites.

Gonorrhea cases are focused in the core urban populations; gonorrhea rates are highest in Minneapolis and St. Paul. The rate in Minneapolis (428 per 100,000 population) was approximately twice as high as the rate in St. Paul (217 per 100,000), about 18 times higher than the rate in the suburban metropolitan area (23 per 100,000), and more than 35 times higher than the rate in greater Minnesota (12 per 100,000).

Table 5. Number of Cases and Rates (per 100,000 population) of Chlamydia, Gonorrhea, and Primary/Secondary Syphilis by Demographic Characteristics, Minnesota, 1999

	Chlamydia		Gonorrhea		Prim./Second. Syphilis	
Demographic Group	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**
Total	7450	158	2830	60	10	0.2
Residence						
Minneapolis	2620	714	1570	428	5	1.4
St. Paul	1370	533	558	217	3	1.2
Suburban*	1619	85	439	23	2	0.1
Greater Minnesota	1841	84	263	12	0	0.0
Age (years)						
<10 years	8	1	1	0	0	0.0
10-14 years	186	50	40	11	0	0.0
15-19 years	2820	763	896	243	0	0.0
20-24 years	2575	865	833	280	1	0.3
25-29 years	1070	356	486	162	3	1.0
30-34 years	434	125	241	69	1	0.3
35-44 years	299	37	281	35	4	0.5
45+ years	58	4	52	3	1	0.1
Gender						
Male	1979	85	1336	57	5	0.2
Female	5471	228	1494	62	5	0.2
Race						
White	3029	69	598	14	5	0.1
Black	2434	1731	1686	1199	4	2.8
American Indian	350	609	82	143	0	0.0
Asian	321	259	28	23	0	0.0
Other/Unknown**	1316	---	436	---	1	---
Ethnicity						
Hispanic***	512	589	103	119	1	1.2

* Seven-county metropolitan area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington Counties), excluding Minneapolis and St. Paul

** No population data available to calculate rates

*** Persons of Hispanic origin may be of any race

Syphilis

Syphilis is caused by infection with the spirochete *Treponema pallidum*. Primary and secondary syphilis cases typically are used to monitor morbidity trends because they represent recently acquired infections.

Primary and Secondary Syphilis

The rate of primary and secondary syphilis in Minnesota is quite low compared to chlamydia and gonorrhea. Only 10 cases of primary/secondary syphilis were reported for 1999 (0.2 per 100,000 population). The primary/secondary syphilis rate did not change from 1998 to 1999.

The highest rates of primary/secondary syphilis occur among persons in older age groups. Men and women had identical rates of primary/secondary syphilis. The primary/secondary syphilis rate for blacks (2.8 per 100,000 population) was nearly 30 times higher than the rate for whites (0.1 per

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100,000). For primary/secondary syphilis, four of the 10 cases (40%) were black, and five (50%) were white.

Syphilis is now exclusively an urban disease. No cases of primary/secondary syphilis were reported from greater Minnesota. The 10 cases of primary/secondary syphilis were distributed between the city of Minneapolis (five cases), the city of St. Paul (three cases), and the suburban metropolitan area (two cases).

Congenital Syphilis
One case of congenital syphilis was reported in 1999 (1.5 per 100,000 live births).

Chancroid
Chancroid is very rare in Minnesota. In 1999, one case of chancroid was reported. This was the first reported case since 1993.

Summary
Although overall STD rates in Minnesota are low compared to many other areas of the United States, certain subpopulations in Minnesota have high STD rates. Specifically, STDs disproportionately affect adolescents and young adults, women, and people of color. The Minnesota Year 2000 Objectives have not yet been reached for the overall gonorrhea rate and for the chlamydia, gonorrhea, and primary and secondary syphilis rates among high-risk subpopulations.

Shigellosis
Two hundred fifty-four culture-confirmed cases of *Shigella* infection were reported in 1999 (5.3 per 100,000 population). This represents a 23% decrease from the 331 cases reported in 1998 but the second highest total reported since 1994 (Figure 1). The large number of cases in 1998 was due in part to a large foodborne outbreak of shigellosis that involved two restaurants in the metropolitan area.

In 1999, *Shigella sonnei* accounted for 207 cases (81%), *S. flexneri* for 37 cases (15%), *S. boydii* for five cases (2%), and *S. dysenteriae* for two cases (1%). Ages ranged from 1 month to 76 years, with a median age of 7 years. The majority of cases (56%) were less than 10 years of age. Twenty-three cases (9%) were hospitalized; no deaths were reported. Ninety-three percent of all *Shigella* cases resided in the Twin Cities metropolitan area; 63% lived in Hennepin County.

Five outbreaks of *S. sonnei* infection were identified in daycare centers, resulting in at least 220 illnesses and 97 culture-confirmed cases (49% of all *S. sonnei* cases reported in Minnesota in 1999). Pulsed-field gel electrophoresis (PFGE) testing identified a common subtype pattern among *S. sonnei* isolates from all five outbreaks; antimicrobial susceptibility tests indicated that isolates of this PFGE subtype were resistant to ampicillin but susceptible to trimethoprim-sulfamethoxazole (TMP-SMX) and third-generation cephalosporins.

In Minnesota, every tenth isolate of *Shigella* received at MDH was tested for antimicrobial resistance, but only one isolate was included from each outbreak. Of the 20 *Shigella* isolates tested in 1999, seventeen (85%) were resistant to ampicillin, five (25%) were resistant to TMP-SMX, and five (25%) were resistant to both ampicillin and TMP-SMX.

***Streptococcus pneumoniae* Invasive Disease**
Active surveillance for invasive pneumococcal disease has been conducted in the seven-county Twin Cities metropolitan area since April 1995. Among metropolitan area residents in 1999, there were 584 cases of invasive *Streptococcus pneumoniae* infection reported to MDH (23.2 cases per 100,000 population). This rate was higher than that seen in prior years (18.8 per 100,000 in 1997 and 20.2 per 100,000 in 1998). Incidence of invasive pneumococcal disease varies considerably by age, with the highest rates of disease in children younger than 2 years of age and in adults 65 years of age or older (Table 6).

The numbers of invasive pneumococcal cases were at usual levels in 1999 until the final quarter, when cases among older adults increased compared with prior years. In that quarter, incidence was significantly higher in those at least 35 years old (especially those 65 years of age or older), compared with the mean fourth quarter incidence rates in these age groups from the prior 3 years. In the first quarter of 2000, rates

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Table 6. Rates of Invasive Pneumococcal Infection per 100,000 Residents of the Seven-County Twin Cities Metropolitan Area by Age Group and Time Period

	Annual Rates:	Quarterly Rates:			
		Fourth Quarter		First Quarter	
Age Group (Years)	1999 Rate (95% CI)	1999 Rate (95% CI)	Mean for 1996-98 Rate (95% CI)	2000 Rate (95% CI)	Mean for 1997-99 Rate (95% CI)
<2	205.7 (170.0-240.0)	69.9 (52.1-92.0)	78.3 (66.2-90.3)	50.7 (35.7-69.9)	50.1 (40.0-59.7)
2-4	50.0 (37.5-65.4)	18.9 (11.5-29.1)	14.7 (10.8-19.6)	7.5 (3.3-14.9)	9.7 (6.6-13.8)
5-34	5.9 (4.6-7.6)	2.0 (1.2-3.0)	1.6 (1.2-2.1)	1.3 (0.7-2.1)	1.7 (1.3-2.2)
35-64	16.8 (14.2-19.4)	6.0* (4.6-7.8)	4.0 (3.3-4.8)	4.6 (3.4-6.2)	3.9 (3.2-4.6)
≥65	59.3 (49.7-69.0)	27.1* (21.1-34.3)	17.0 (14-20.1)	13.0 (8.9-18.2)	15.5 (12.6-18.4)
Total	23.2 (21.3-25.1)	8.8* (7.6-10.0)	6.8 (6.2-7.4)	5.4 (4.5-6.4)	5.6 (5.1-6.2)

*Fourth quarter rate for 1999 significantly higher than mean fourth quarter rate from the 3 prior years ($p<0.05$).

in these and other age groups were close to the mean first quarter rates from the 3 prior years (Table 6). Therefore, it appears that the "pneumococcal season" for 1999 was not simply early, but rather that it was more widespread for older adults in the Twin Cities.

Bacteremia without a known focus of infection (258 cases, 44%) was the most frequent invasive infection in 1999. Pneumonia with an isolate from blood or pleural fluid was almost as frequent overall (253 cases, 43%) and was more common among adults. There were 39 cases (7%) of meningitis and 34 (6%) infections of other types, including otitis media, cellulitis, arthritis, and others (each associated with a sterile site isolate). In 1999, there were 52 (9%) deaths among cases; this was a somewhat higher proportion than that observed in the 3 prior years (104 deaths among 1,471 cases, 7%), but this was not a statistically significant difference.

Isolates for 559 cases (96%) were submitted to the MDH Public Health Laboratory for serotyping and antimicrobial susceptibility testing. One hundred thirty-five isolates (24%) were non-susceptible to penicillin, including 43 (8%) penicillin-intermediate isolates [each with a minimum inhibitory concentration (MIC) between 0.12 and 1.0 μg/ml], and 92 (16%) penicillin-resistant isolates (MIC $\geq$2.0 μg/ml). This proportion was higher than that observed in 1998, when 95 of 469 isolates (20%) were non-susceptible to penicillin, 34 (7%) had intermediate susceptibility, and 61 (13%) were resistant to penicillin. Considering resistance to any of the beta lactam agents as resistance to the beta lactam class, resistance to more than one antimicrobial drug class was seen in 125 (22%) of the cases with available isolates; this was increased from 80 (17%) multi-drug resistant cases in 1998. Further information on pneumococcal resistance to various antimicrobial agents is available at the MDH web site (http://www.health.state.mn.us and also at http://www.health.state.mn.us/divs/dpc/ades/antibiog/antibiog.pdf).

For adults 65 years of age or older, 110 (79%) of 139 case isolates submitted were serotypes included in the 23-valent polysaccharide pneumococcal vaccine. For children less than 5 years of age, 145 of 200 isolates (73%) were serotypes included in the newly licensed 7-valent pneumococcal conjugate vaccine. The American Academy of Pediatrics (AAP) issued recommendations for use of this conjugate pneumococcal vaccine on June 5, 2000. These can be accessed from the AAP web site (http://www.aap.org). It is expected that the Advisory Committee on Immunization Practices (ACIP) soon will issue recommendations for use of this vaccine; when released, this statement should be available at the ACIP web site (http://www.cdc.gov/nip/publications/ACIP-list.htm). A more detailed report on invasive pneumococcal disease in young children also was recently published in the *Disease Control Newsletter* (March/April 2000: Vol. 28, No. 2, pp. 10-13).

Streptococcal Invasive Disease - Group A

One hundred eighty cases of invasive group A streptococcal (GAS) disease (3.8 per 100,000 population), including 19 deaths, were reported in 1999, compared to 173 cases and 23 deaths in 1998.

Ages of cases ranged from 14 days to 99 years, with a mean age of 46 years. Fifty-seven percent of cases were residents of the seven-county metropolitan area. Fifty cases (28%) had bacteremia without another focus of infection, 47 (26%) had cellulitis, and 21 (12%) had primary pneumonia. Seventeen cases (9%) had necrotizing fasciitis. Four cases had streptococcal toxic shock syndrome; one had pneumonia, one had cellulitis, and two did not have other associated foci of infection.

Of the 19 deaths, six (32%) had necrotizing fasciitis, five (26%) had bacteremia without another focus of infection, four (21%) had pneumonia, three (16%) had cellulitis, and one (5%) had peritonitis.

Isolates were available for 163 cases (91%). Sixty-seven different molecular subtypes were identified by pulsed-field gel electrophoresis (PFGE). Forty-six subtype patterns were represented by only one isolate each; other subtypes were represented by two to 23 isolates each. No links were noted between cases with identical subtypes. The deaths were distributed among 10 different subtypes. Four deaths were attributed to one PFGE subtype; three additional deaths were attributed to another PFGE subtype, and two deaths to another. The remaining seven deaths for which isolates were available were each a different PFGE subtype.

Streptococcal Invasive Disease - Group B

Two hundred thirty-two cases (4.9 per 100,000 population), including 24 deaths, were reported in 1999. These cases include only those in which group B *Streptococcus* was isolated from a normally sterile site (except for eight cases in which there was a miscarriage or stillbirth, in which placenta was the site). Fifty-five percent of the cases occurred among residents of the Twin Cities metropolitan area. Forty-six cases (20%) were infants less than 1 year of age, and 105 cases (45%) were 60 years of age or older.

One hundred seventeen cases (50%) presented with bacteremia without another focus of infection. The other most common types of infection were cellulitis (12%), pneumonia (6%), osteomyelitis (5%), arthritis (7%), and meningitis (4%). In 172 cases (74%), the isolate site was blood only.

There were 53 cases of infant early-onset, late-onset, or maternal GBS disease, compared to 55 cases in 1998. Ten stillbirths and spontaneous abortions were associated with 12 maternal invasive GBS infections. Twenty-five infants developed invasive disease within the first 6 days following birth (i.e., early-onset disease), and 16 infants became ill at 7 to 90 days of age (i.e., late-onset disease).

Minnesota was one of two EIP sites selected in September 1997 to participate in the Centers for Disease Control and Prevention Perinatal Group B Streptococcal Disease Prevention Project. Surveys of laboratories, prenatal care providers, and pediatric providers were done to assess current laboratory and medical practices regarding testing, prophylaxis, and treatment of perinatal GBS disease. An important finding of the January 1998 laboratory survey demonstrated that only 42% (42/101) of laboratories used

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selective broth (the recommended method) for culturing GBS, and only 54% (55/101) received specimens from vaginal or rectal sites (the recommended specimen). A repeat laboratory survey conducted in August 1999 showed that 79% (72/91) of laboratories were using selective broth, and 74% (67/91) received appropriate specimens, representing significant increases over the previous survey. An interesting finding of the prenatal provider survey showed that only 76% (108/142) of prenatal providers who screened pregnant women for GBS collected the recommended vaginal and rectal specimens. Results of the laboratory survey and the prenatal provider survey are available at http://www.health.state.mn.us/divs/dpc/ades/invasive.html or by contacting the Acute Disease Epidemiology Section at (612) 676-5414.

Tetanus

One case of tetanus was reported to MDH during 1999. The case occurred in a 46-year-old white Hispanic male who had no history of tetanus immunization. He presented at a metropolitan hospital emergency room and received tetanus toxoid within 7 hours of receiving a stellate laceration wound to the head as a result of falling down an outdoor stairway. Onset of generalized tetanus occurred 3 days after the injury. Within 6 hours of onset of symptoms, the patient presented again at the emergency room and received 500 units of tetanus immune globulin. Five days after onset, the patient was admitted at a second hospital. The wound was debrided and the case-patient received Unasyn (ampicillin and sulbactum) antibiotic therapy. The patient was hospitalized for 55 days, during which time he was in the intensive care unit on mechanical ventilation for 38 days. The patient recovered. Because tetanus disease does not confer lifelong immunity, completing the vaccination series is recommended for unvaccinated tetanus cases.

Tetanus is preventable through adequate vaccination, and cases of tetanus occur almost exclusively among persons who are unvaccinated or inadequately vaccinated. A recent serologic survey of immunity to tetanus in the U.S. found that although 80% of persons 6 to 39 years of age had levels of tetanus immunity, the prevalence of immunity dropped sharply with increasing age, until it reached 27.8% in persons 70 years of age or older.

Tetanus spores are normal inhabitants of human and animal intestines and are present in soil contaminated with animal or human feces. Fecal contamination of surgical or other wounds presents a risk for hospitalized patients and patients prone to falls. Outdoor activities such as gardening place non-immune persons at risk for tetanus. Persons with tetanus frequently have a history of minor wounds which they did not consider sufficiently severe to warrant a visit to a health care provider. Health care providers who treat adults should review their patients' vaccination status at every opportunity and administer tetanus vaccine and other indicated vaccines as appropriate.

Tuberculosis

While the number of tuberculosis (TB) cases reported nationally has been declining since 1993, the incidence of TB in Minnesota is increasing markedly (Figure 5). In 1999, 201 new cases of TB disease were reported statewide (4.2 per 100,000 population). This is the largest number of cases reported since 1980 and a 25% increase from the 161 cases reported in 1998. During 1999, 23 of the 87 counties in the state reported at least one case of TB disease. However, the majority (79%) of TB cases occurred in the seven-county Twin Cities metropolitan area, particularly among residents of Hennepin (57%) and Ramsey (12%) Counties. Approximately 20% of cases occurred in greater Minnesota, with increasing incidence in specific areas.

The most notable trend in the epidemiology of TB in Minnesota is the large and increasing number of cases among foreign-born persons. The percentage of TB cases among persons born outside the U.S. continued to increase in 1999, with 156 of 201 cases (78%) occurring among this population. From 1995 to 1999, the number of foreign-born TB cases in Minnesota doubled, while the number of cases among U.S.-born persons decreased 42% (Figure 5). This trend reflects the changing demographics of immigrant populations arriving in the state, particularly increasing numbers of persons arriving from regions of the world (such as Sub-Saharan Africa) where TB is prevalent. Other risk factors among TB cases in Minnesota include incarceration in a correctional facility (2%), homelessness (3%), and HIV infection (3%); however, the percentage of cases with these risk factors declined in 1999.

In 1999, 26 cases (17%) of drug-resistant TB occurred among the 157 culture-confirmed cases for whom drug susceptibility results were available, including 18 cases (11%) resistant to isoniazid and four cases (3%) of multi-

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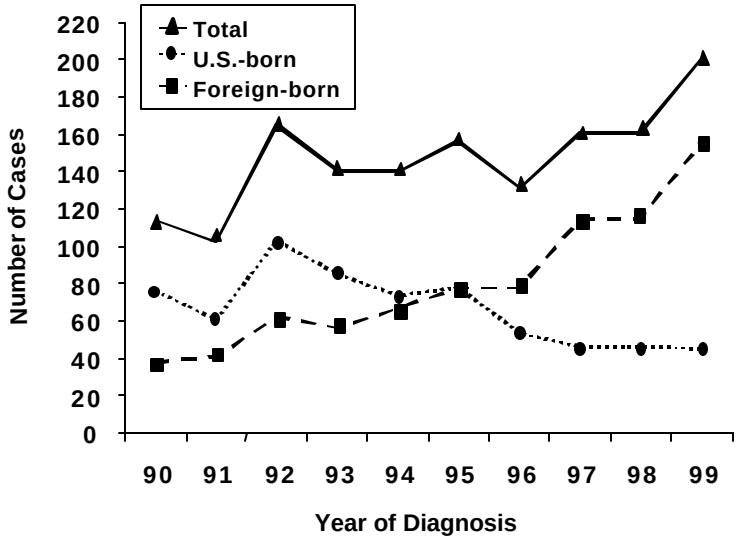
Figure 5. Number of Tuberculosis Cases by Country of Origin, Minnesota, 1990-1999



drug resistant disease resistant to both isoniazid and rifampin. Of 26 persons with drug-resistant TB disease reported in 1999, 25 (96%) were born outside the U.S.

A more detailed description of the epidemiology of TB in Minnesota (as well as other articles regarding clinical and culturally specific issues related to TB in Minnesota) was published in the January/February 2000 issue of the *Disease Control Newsletter*. This information is available on the MDH web site (http://www.health.state.mn.us/divs/dpc/ades/pub.htm).

Unexplained Critical Illnesses and Deaths of Possible Infectious Etiology

Surveillance for unexplained critical illnesses and deaths of possible infectious etiology began in September 1995 as part of EIP. Eligibility criteria include Minnesota residents between the ages of 1 and 49 years, previously healthy with no chronic medical conditions (e.g., diabetes), and critical illness or death due to an illness suggestive of an infectious etiology. Thirty-five possible cases were reported to MDH in 1999. Twenty-five of these cases subsequently were excluded. Thirteen were excluded because etiologies subsequently were determined (one of which was non-infectious), eight were excluded due to underlying conditions, two had no hallmarks of infection, one did not meet the age criteria, and one was excluded because the case was not a Minnesota resident.

Of the remaining 10 cases, four presented with cardiac syndromes (myocarditis), three with respiratory symptoms, two with shock/sepsis, and one with neurologic symptoms. The cardiac cases were 1, 6, 15, and 49 years of age. The respiratory cases were 15, 25, and 26 years of age. The sepsis cases were 20 and 44 years of age, respectively, and the neurologic case was 22 years of age. One patient with a cardiac syndrome and two patients with respiratory syndromes survived. The remaining patients died. One cardiac and two respiratory cases resided in the seven-county metropolitan area; the remaining cases resided in greater Minnesota.

Laboratory specimens were available for most of the cases and have been sent to the Centers for Disease Control and Prevention. Testing is not completed and no definite etiologies have been determined for any of the cases at this time.

Vancomycin-Resistant Enterococci

As part of EIP, surveillance in Minnesota hospitals for vancomycin-resistant enterococci (VRE) was conducted from July 1995 through the end of 1999. Cases included patients hospitalized in Minnesota with VRE isolated from a normally sterile site, a wound, or another source, excluding urinary, stool, and rectal sources. In 1999, 186 incident cases were reported, representing a 4% increase from the 178 cases reported in 1998. Sterile site infections (blood, cerebrospinal fluid, and/or peritoneal fluid isolates) were reported in 59 cases (32%); the remaining infections were due to wounds (61, 33%) and other sources (66, 35%), including pulmonary secretions, bile, and indwelling devices.

Cases included 145 Minnesota residents (78%) and 41 patients from outside of Minnesota (41, 22%). The majority of cases (153, 82%) were reported from hospitals in the seven-county Twin Cities metropolitan area, and the remaining 33 cases (18%) were reported from hospitals in greater Minnesota. Cases among males (106, 57%) were more frequent than among females (80, 43%). There were more cases among older individuals, including 129 cases (69%) among those 50 years of age or older, and 51 cases (27%) among those at least 70 years of age. In 63 cases (34%), VRE was first isolated after 20 days of hospitalization; in 30 cases (16%), the case-defining VRE isolate was obtained on the first day of hospitalization. Fifty-nine cases (32%) died; 43 (23%) died within 3 weeks of the culture date, but VRE was reported to MDH as a factor contributing to the death for only three cases.

Even though enterococcus is an important pathogen and control of VRE continues to be very challenging in a variety of health care settings, MDH surveillance for VRE was discontinued in 2000. After a marked increase in the incidence of VRE from July 1995 to 1997, the numbers of reported cases from 1998 to 1999 were relatively stable. The age distribution of cases also has been consistent. Each year since 1996, approximately one-third of cases had isolates from sterile sites. Because most of the cases meeting the case definition represent infection rather than colonization with VRE, these surveillance findings suggest that in Minnesota hospitals, VRE infections occur among a relatively stable population of patients with special susceptibilities related to age, complex medical problems, and/or extended periods of hospitalization.

Although surveillance for VRE has been discontinued, health care professionals with questions about control of VRE in acute care, long-term care, or other health care settings are encouraged to contact the MDH Institutional Infection Control Unit at (612) 676-5414.

Viral Hepatitis A

In 1999, 128 cases of hepatitis A virus (HAV) infection were reported to MDH (2.7 per 100,000 population), including one death. One hundred five cases (82%) were residents of the seven-county metropolitan area, with 74 (58%) residing in Hennepin County. Seventy-two cases (56%) were male. Of the 124 cases for whom race was reported, 92 (74%) were white, 23 (19%) were black, six (5%) were American Indian, and three (2%) were Asian. Although the greatest number of cases were white, incidence rates were higher among blacks (16.4 per 100,000) and American Indians (10.4 per 100,000). The incidence rate among Asians (2.4 per 100,000) was only slightly higher than that among whites (2.1 cases per 100,000). Hispanic ethnicity, which can be any race, was reported for 11 cases (12.7 per 100,000). Cases ranged in age from 1 to 91 years; however, the majority of cases (89, 70%) occurred in children and adults under 40 years of age.

Of the 128 reported cases, five were unavailable for interview. A foodborne outbreak in another state accounted for four of the 123 cases (3%) that were interviewed. Of the remaining sporadic cases questioned about risk factors, 38 (32%) had known contact with another case, 10 (8%) were men who reported having sex with men, two (2%) had

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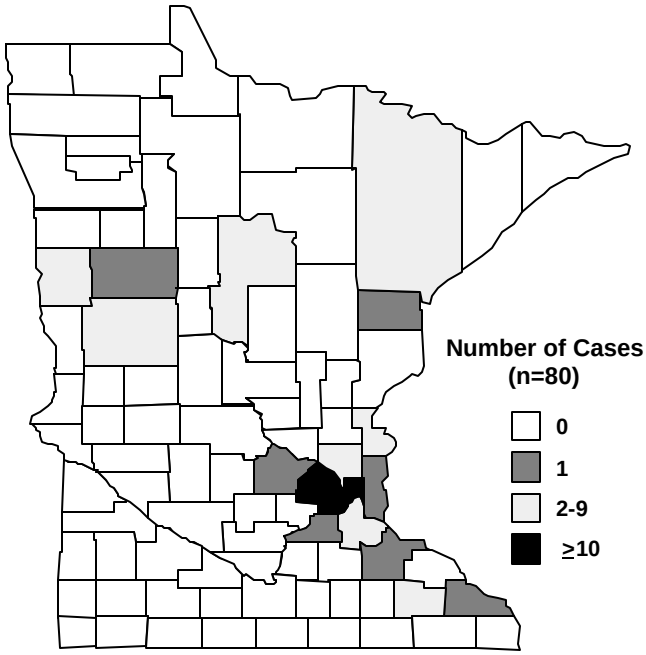
consumed raw shellfish, two (2%) used needles to inject drugs, and one (1%) was associated with childcare but unrelated to any known outbreaks. Foreign travel accounted for 21 cases (18%), 12 of whom had traveled to Mexico. None of these cases had received hepatitis A vaccine or immune globulin prior to travel. No risk factor could be identified for 45 (37%) of those interviewed.

Of cases reported in 1999, 31 (24%) occurred in risk groups for whom hepatitis A vaccine is recommended, including travelers to HAV-endemic areas and men who have sex with men. Health care providers are encouraged to educate their patients about the risk of hepatitis A associated with foreign travel. Patients who may travel to developing countries in the future should be offered hepatitis A vaccine. Similarly, men who have sex with men should be educated about their risk and offered vaccine. Because the majority of cases acquired HAV infection while in the U.S., and more than a third had no identified risk factor, any person over 2 years of age who desires immunity to HAV infection also should be vaccinated.

Figure 6. Reported Cases of Hepatitis B by County of Residence, Minnesota, 1999



Viral Hepatitis B

In 1999, 80 cases of acute hepatitis B virus (HBV) infection were reported to MDH (1.7 per 100,000 population), including one death. Fifty-eight cases (73%) were residents of the seven-county metropolitan area, with 27 cases (34%) residing in Hennepin County. More than half of cases (47, 59%) were male. Fifty-two cases (65%) were young adults between 18 and 39 years of age. Forty-five cases (56%) were white, 13 (16%) were black, 10 (13%) were Asian, and nine (11%) were American Indian; race was unreported for three cases (4%). Although the greatest number of cases were white, incidence rates were higher among American Indians (15.6 per 100,000), blacks (9.2 per 100,000), and Asians (8.1 per 100,000) than among whites (1.0 per 100,000). Hispanic ethnicity, which can be any race, was reported for four cases (4.6 per 100,000).

Of the 80 reported cases, 17 (21%) were documented asymptomatic seroconversions, including seven perinatal infections. These seven infants tested positive during post-vaccination screening; the MDH Perinatal Hepatitis B Prevention Program received post-vaccination test results for 242 infants born to HBsAg-positive mothers during 1999. All seven positive infants began hepatitis B immunoprophylaxis (hepatitis B immune globulin and HBV vaccine) at birth and completed the three-dose vaccine series. Three of these infants were age-appropriately vaccinated with second and third doses, and four were delayed in the receipt of one or more doses of vaccine.

Seventy-one (89%) of the 80 reported cases were questioned about possible modes of transmission. For 25 cases (35%), the likely mode of transmission was sexual. Ten cases (14%) were men who reported having sex with men; eight cases (11%) reported heterosexual contact with a known carrier of hepatitis B surface antigen (HBsAg); six cases (8%) reported heterosexual contact with multiple partners within 6 months prior to onset of symptoms; and one case (1%) gave a recent history of multiple sex partners with undocumented sexual preference. In addition to the seven perinatal cases (10%), six cases (8%) reported non-sexual contact with a HBsAg-positive person; these cases included two parents of infected adopted children. Six cases (8%) used needles to inject drugs, and one case (1%) had received a tattoo within 6 months prior to onset of symptoms. Hemodialysis accounted for transmission in one case (1%), one case (1%) received a blood transfusion within 6 months prior to onset of symptoms, and one case (1%) underwent hemodialysis and received a blood transfusion within 6 months of HBsAg-positive seroconversion. No cases were reported as a result of occupational exposure. No risk factors for acquiring HBV infection were identified for the remaining 23 cases (32%). The median age for this group was 30 years (range, 13 to 50 years), which suggests possible sexual transmission.

Most of the acute hepatitis B cases in 1999 had known risk factors for acquiring HBV infection. MDH recommends hepatitis B vaccination for all children and adolescents not previously vaccinated. The 1998 Minnesota Legislature amended the School Immunization Law to require hepatitis B immunization for kindergartners beginning in school year 2000-01 and for seventh graders beginning in school year 2001-02. In addition, this vaccine is recommended for all adults who are at increased risk of infection. Based on

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the occurrence of two cases in adoptive parents in 1999, prospective vaccination of persons in households expecting adoptees from HBV endemic countries is encouraged.

Viral Hepatitis C

In 1999, 25 cases of acute hepatitis C virus (HCV) infection were reported to MDH. Fourteen cases (56%) were residents of the seven-county metropolitan area (Dakota, Hennepin, Ramsey, and Washington Counties), and 11 cases (44%) resided in greater Minnesota (Aitkin, Cass, Chippewa, Clay, Olmsted, Otter Tail, Rice, and St. Louis Counties). The median age of cases was 31 years (range, 20 to 50 years). Slightly more than half of cases (13, 52%) were male. Nineteen cases (76%) were white, three cases (12%) were American Indian, one case (4%) was Asian, one case (4%) was black, and race was unreported for one case (4%). Hispanic ethnicity, which can be any race, was reported for three cases (12%).

Of the 25 reported cases, 12 (48%) reported using needles to inject drugs, and four (16%) had heterosexual contact and two (8%) non-sexual contact with a known anti-HCV positive person within 6 months prior to onset of symptoms. Two cases (8%) reported having occupational exposure to blood (including one accidental needlestick) and one case (4%) had received a recent blood transfusion. No risk factor could be determined for four cases (16%).

This is the second year that MDH has conducted systematic surveillance for HCV. Over 2,700 positive anti-HCV reports were received in 1999. However, most were determined to be chronic infections; acute cases of HCV infection accounted for less than 1% of all reported infections. These data demonstrate that the recent apparent increase in the number of reported hepatitis C cases represents an "epidemic of detection" of cases resulting from transmission that occurred several decades ago rather that an increase in the incidence of acute cases. Persons with medical histories that include blood transfusion or organ transplantation prior to July 1992, receipt of clotting factor concentrates before 1987, chronic hemodialysis, or evidence of liver disease should be tested for HCV infection. In addition, persons with a history of injecting drug use; children born to HCV-positive women; and health care workers and others with occupational needlesticks, sharps, or mucosal exposure are at risk for HCV infection and should be screened. Persons who are infected with HCV should be screened for evidence of immunity to hepatitis A and B infection and immunized appropriately.

Emerging Infections in Clinical Practice
Friday, October 6, 2000
Earle Brown Heritage Center, Brooklyn Center, Minnesota

The importance of emerging infectious diseases continues to increase worldwide and throughout the U.S. Understanding trends and disease occurrence can benefit primary care providers, as well as practitioners of infectious diseases, infection control, public health, clinical microbiology, and pharmacy. In addition, treatment and diagnostic strategies for a variety of infectious conditions continue to change; updated information is important for all practitioners. This course provides an update on major issues surrounding emerging infectious diseases that have an impact on current clinical practice and the important relationship between clinical practice and public health prevention. New trends in antibiotic resistance and new developments in antibacterial therapy are a special focus of this year's course.

EDUCATIONAL OBJECTIVES

Following this conference, participants will be able to:

- identify new therapies for community-acquired pneumonia, fungal infections, and meningitis;
- describe the current scope and features of antibiotic resistance;
- list common and emerging infections in immigrants;
- discuss current approaches to the prevention and treatment of influenza;
- describe the latest knowledge concerning chronic fatigue syndrome;
- discuss the use of new technology in infectious disease, including molecular techniques in the laboratory and the Internet in the office.

TO REGISTER

Choose one of the following methods to register for this course:

- mail your registration form along with your check or credit card information (VISA, MasterCard or American Express);
- call the Office of Continuing Medical Education (CME) directly at (612) 626-7600 or toll-free 1-800-776-8636;
- fax your registration and credit card information to CME at (612) 626-7766; or
- e-mail the registration and credit card information to: cmereg@tc.umn.edu (be sure to include the title of the course).

REGISTRATION FEES

The fees include records processing, course materials, refreshment breaks, and lunch. Registration fee, less a $20 administration charge, is refundable if CME is notified of cancellation prior to the course.

ACCREDITATION

Physicians: The University of Minnesota designates this continuing medical education activity for 6.5 credit hours in Category 1 of the Physicians' Recognition Award of the American Medical Association. The University of Minnesota is accredited by the Accreditation Council for Continuing Medical Education to sponsor continuing medical education for physicians. This program has been reviewed and is acceptable for 6.5 prescribed hours by the American Academy of Family Physicians.

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Nurses: This program has been designed to meet Minnesota Board of Nursing Continuing Education requirements and is acceptable for 8 contact hours of continuing education.

Pharmacists: The University of Minnesota College of Pharmacy is approved by the American Council on Pharmaceutical Education as a provider of continuing pharmaceutical education. The Universal Program Number is #031-999-00-036-L-01. This conference provides 7.0 hours of pharmacy continuing education credit (0.7 CEUs).

PRELIMINARY PROGRAM

7:30 REGISTRATION

8:00 *Welcome, Announcements and Opening Remarks*
Bart W. Galle, Phillip K. Peterson, Michael T. Osterholm

Moderator: Michael T. Osterholm

8:15 Community-Acquired Pneumonia: New Therapies
John G. Bartlett

8:45 *Questions and Answers*

9:00 Treatment of Fungal Infections
William E. Dismukes

9:30 *Questions and Answers*

9:45 The Antibiotic Resistance Pandemic
Dale Gerding

10:15 *Questions and Answers*

10:30 **BREAK**

10:45 Infections in Immigrants
David N. Williams

11:15 *Questions and Answers*

11:30 Meningitis: An Update
W. Michael Scheld

12:00 *Questions and Answers*

12:15 **LUNCHEON**

1:15 Influenza
Lawrence Corey

1:45 *Questions and Answers*

2:00 Use of Molecular Techniques in the Public Health Laboratory: Implications for the Clinician
John Besser

2:30 *Questions and Answers*

2:45 Chronic Fatigue Syndrome: What Have We Learned?
Philip K. Peterson

3:15 *Questions and Answers*

3:30 **BREAK**

3:45 The Internet Revolution and Infectious Diseases
Michael T. Osterholm

4:15 *Questions and Answers*

4:30 **ADJOURN**

REGISTRATION FORM
Emerging Infections Course
October 6, 2000

MAIL TO: Emerging Infections Course
Continuing Medical Education
Suite 107, 615 Washington Ave. SE
Minneapolis, MN 55414
or Fax to: (612) 626-7766

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Registration Fees

☐ **$125 Physician**

☐ **$115 Non-University of Minnesota medical resident or fellow**

☐ **$85 Clinical Faculty, University of Minnesota Medical School**

☐ **$85 Non-physician health professional**

☐ **$85 Retired Minnesota physician**

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Subject Index

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Commissioner of Health

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