

Annual Summary of Communicable Diseases Reported to the Minnesota Department of Health, 2000

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 MDH. 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 18) 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 food-borne 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 19) summarizes the number of cases of selected communicable diseases reported to MDH during 2000 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 individual cases, and the data pertain to the 2000-2001 influenza season rather than the 2000 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., two-fold change or less) antibody titer to the virus.

LaCrosse encephalitis is the most commonly reported arboviral infection in Minnesota. The disease, which primarily affects children, is transmitted through the bite of infected
continued...

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Table 1. Diseases Reportable to the Minnesota Department of Health

Amebiasis (<i>Entamoeba histolytica</i>)	Leptospirosis (<i>Leptospira interrogans</i>)
Anthrax (<i>Bacillus anthracis</i>)*	Listeriosis (<i>Listeria monocytogenes</i>)*
Babesiosis (<i>Babesia</i> species)	Lyme Disease (<i>Borrelia burgdorferi</i>)
Blastomycosis (<i>Blastomyces dermatitidis</i>)	Malaria (<i>Plasmodium</i> species)
Botulism (<i>Clostridium botulinum</i>)*	Measles (Rubeola)*
Brucellosis (<i>Brucella</i> species)	Meningitis (caused by <i>Haemophilus influenzae</i> ,* <i>Neisseria meningitidis</i> ,* <i>Streptococcus</i> <i>pneumoniae</i> ,* or viral agents)
Campylobacteriosis (<i>Campylobacter</i> species)*	Meningococemia (<i>Neisseria meningitidis</i>)*
Cat Scratch disease (infection caused by <i>Bartonella</i> species)	Mumps*
Chancroid (<i>Haemophilus ducreyi</i>)*,**	Pertussis (<i>Bordetella pertussis</i>)*,+
<i>Chlamydia trachomatis</i> infection**	Plague (<i>Yersinia pestis</i>)
Cholera (<i>Vibrio cholerae</i>)*,+	Poliomyelitis*
Cryptosporidiosis (<i>Cryptosporidium parvum</i>)	Psittacosis (<i>Chlamydia psittaci</i>)
Dengue virus infection	Q Fever (<i>Coxiella burnetii</i>)
Diphtheria (<i>Corynebacterium diphtheriae</i>)*	Rabies (animal and human cases and suspects)*
<i>Diphyllobothrium latum</i> infection	Retrovirus infections (other than HIV)
Ehrlichiosis (<i>Ehrlichia</i> species)	Reye Syndrome
Encephalitis (caused by viral agents)	Rheumatic Fever (cases meeting the Jones Criteria only)
Enteric <i>Escherichia coli</i> infection (<i>E. coli</i> O157:H7 and other pathogenic <i>E. coli</i> from gastrointestinal infections)*	Rubella and Congenital Rubella Syndrome
Giardiasis (<i>Giardia lamblia</i>)	Rocky Mountain Spotted Fever (<i>Rickettsia</i> species)
Gonorrhea (<i>Neisseria gonorrhoeae</i>)**	Salmonellosis, including typhoid (<i>Salmonella</i> species)*
<i>Haemophilus influenzae</i> disease (all invasive disease)*	Shigellosis (<i>Shigella</i> species)*
Hantavirus infection	Streptococcal disease (all invasive disease caused by groups A and B streptococci and <i>S. pneumoniae</i>)*
Hemolytic Uremic Syndrome	Syphilis (<i>Treponema pallidum</i>)*,**
Hepatitis (all primary viral types including A, B, C, D, and E)	Tetanus (<i>Clostridium tetani</i>)
Histoplasmosis (<i>Histoplasma capsulatum</i>)	Toxic Shock Syndrome*
Human Immunodeficiency Virus (HIV) infection, including Acquired Immunodeficiency Syndrome (AIDS)***	Toxoplasmosis (<i>Toxoplasma gondii</i>)
Influenza (unusual case incidence or laboratory confirmed cases)	Trichinosis (<i>Trichinella spiralis</i>)
Kawasaki Disease	Tuberculosis (<i>Mycobacterium tuberculosis</i> and <i>Mycobacterium bovis</i>)*
Legionellosis (<i>Legionella</i> species)	Tularemia (<i>Francisella tularensis</i>)
Leprosy (<i>Mycobacterium leprae</i>)	Typhus (<i>Rickettsia</i> species)
	Unexplained deaths possibly due to unidentified infectious causes
	Yellow Fever
	Yersiniosis (<i>Yersinia</i> 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

Ochlerotatus 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 may be utilized as mosquito breeding habitat. During 2000, eight probable cases of LaCrosse encephalitis were reported to MDH. From 1985 to 1999, 81 cases were reported, with a median of five cases (range, three to 12 cases) reported yearly. The disease has been reported in 16 southeastern Minnesota counties (Figure 1). The

highest incidence rates statewide occur in Houston County (mean annual incidence of 21 cases per 100,000 persons \leq 19 years of age; range, 0 to 68 per 100,000). During 2000, six of eight cases were residents of the western Twin Cities metropolitan area (i.e., Carver, Hennepin, and Wright Counties). Disease onsets have been reported from June through September; most cases have onset from mid-July through mid-September.

WEE occurs infrequently in Minnesota, often as part of a regional epidemic or epizootic in midwestern states and

southern Canada. There were no reported cases during 2000. The most recent reports were single cases during 1999 and 1983 and 15 cases in 1975. The virus is transmitted to humans and horses through the bite of *Culex tarsalis* mosquitoes in years when virus-infected vector populations are relatively high. The mosquitoes usually feed on birds and maintain WEE virus in a mosquito-bird cycle of transmission. However, in mid-summer when vector populations rise, a significant part of the mosquito's feeding may switch to mammalian hosts such as **continued...**

Table 2. Cases of Selected Communicable Diseases Reported to the Minnesota Department of Health by District of Residence, 2000

Disease	District*										Total (4,919,479)
	(population; 2000 Census data)										
	Metropolitan (2,642,056)	Northwestern (152,001)	Northeastern (248,425)	Central (683,787)	West Central (222,691)	South Central (280,332)	Southeastern (460,102)	Southwestern (230,085)	Unknown Residence		
Campylobacteriosis	589	12	26	146	43	52	140	71	0	1079	
Cryptosporidiosis	43	0	28	27	5	22	60	12	0	197	
Ehrlichiosis	24	2	2	48	0	0	2	1	0	79	
Encephalitis - viral											
LaCrosse	5	0	0	1	0	0	2	0	0	8	
Western	0	0	0	0	0	0	0	0	0	0	
<i>Escherichia coli</i> O157:H7 infection	109	6	1	29	7	16	31	17	0	216	
Hemolytic Uremic Syndrome	6	0	0	2	0	2	1	2	0	13	
Giardiasis	605	6	21	178	33	17	122	38	207	1227	
<i>Haemophilus influenzae</i> invasive disease	31	2	4	9	1	2	1	2	0	52	
HIV infection other than AIDS	216	1	3	6	2	2	6	3	1	240	
AIDS cases (diagnosed in 2000)	142	0	2	8	1	1	3	4	0	161	
Legionnaires' disease	8	0	0	2	0	2	3	2	0	17	
Listeriosis	6	0	0	1	0	0	0	0	0	7	
Lyme disease	249	3	9	165	2	3	31	3	0	465	
Measles	0	0	1	0	0	0	0	0	0	1	
Mumps	3	0	0	2	1	0	1	0	0	7	
<i>Neisseria meningitidis</i> invasive disease	13	0	4	0	4	0	1	0	0	22	
Pertussis	460	14	3	38	11	11	23	15	0	575	
Rubella	1	0	0	0	0	0	0	0	0	1	
Salmonellosis	364	7	14	72	25	30	68	32	0	612	
Sexually transmitted diseases*											
<i>Chlamydia trachomatis</i> - genital infections	6166	203	294	503	148	198	464	126	0	8102	
Gonorrhea	2843	14	90	99	19	31	44	20	0	3160	
Syphilis total	63	0	1	9	1	0	4	1	0	79	
primary/secondary	13	0	1	1	1	0	0	0	0	16	
early latent**	16	0	0	2	0	0	0	0	0	18	
late latent***	32	0	0	6	0	0	4	1	0	43	
congenital	2	0	0	0	0	0	0	0	0	2	
Chancroid	0	0	0	0	0	0	0	0	0	0	
Shigellosis	766	11	16	50	7	15	15	23	1	904	
<i>Streptococcus pneumoniae</i> invasive disease (Twin Cities only)	439	--	--	--	--	--	--	--	--	439	
Streptococcal invasive disease - Group A	96	4	12	14	5	5	8	5	0	149	
Streptococcal invasive disease - Group B	175	8	24	21	9	23	24	10	0	294	
Tetanus	0	0	0	1	0	0	1	0	0	2	
Tuberculosis	137	5	1	6	3	2	18	6	0	178	
Viral hepatitis, type A	131	0	6	10	1	19	26	4	0	197	
Viral hepatitis, type B (acute infections only)	46	0	1	4	0	2	5	0	0	58	
Viral hepatitis, type C (acute infections only)	5	0	4	1	1	0	3	1	0	15	
Yersiniosis	4	0	0	1	1	1	3	0	0	10	

*Cases for which the patient's residence is unknown are assigned the geographic location of the reporting clinic.

**Duration ≤1 year

***Duration >1 year

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, Mahnomon, Norman, Otter Tail, Pope, Stevens, Traverse, Wilkin

South Central = Blue Earth, Brown, Faribault, LeSueur, McLoud, Martin, Meeke, 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

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 2). There were 1,079 cases of culture-confirmed *Campylobacter* infection reported to MDH in 2000 (22.0 per 100,000 population). This represents a

37% increase from the 786 cases reported in 1999. Of *Campylobacter* isolates submitted to MDH, 90% were *C. jejuni* and 7% were *C. coli*. Fifty-five 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 14% of cases were 5 years of age or younger. Fifty-three percent of infections occurred during June through September. One

outbreak of campylobacteriosis was identified in 2000; the source of the outbreak was malts made with unpasteurized milk and served at a dairy farm. There was one culture-confirmed case and seven suspected cases associated with this outbreak.

The primary feature of public health importance among *Campylobacter* continued...

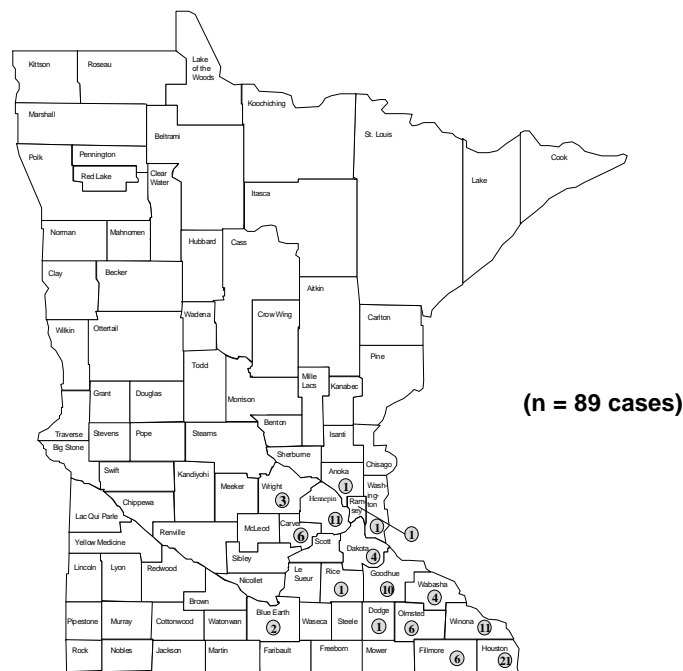
cases was the continued presence of *Campylobacter* isolates resistant to fluoroquinolone antibiotics (e.g., ciprofloxacin), which commonly are used to treat campylobacteriosis. From 1992 to 1999, the proportion of quinolone-resistant *C. jejuni* isolates increased from 1.3% to 17.3%. In 2000, the proportion of quinolone-resistant *Campylobacter* isolates was 11.4%. The proportion of resistant isolates peaked during the winter months of each year; these increases were associated with foreign travel (particularly to Mexico). During 2000, more than 60% 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 have increased significantly since 1996. Quinolone-resistant *C. jejuni* isolates 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.

Cryptosporidiosis

During 2000, 197 cases of laboratory-confirmed *Cryptosporidium parvum* infection were reported (4.0 per 100,000 population). This represents a 116% increase from the 91 cases reported in 1999 and a 34% increase from the mean annual number of cases reported from 1996 to 1999 (mean, 147 cases; range, 81 to 242 cases).

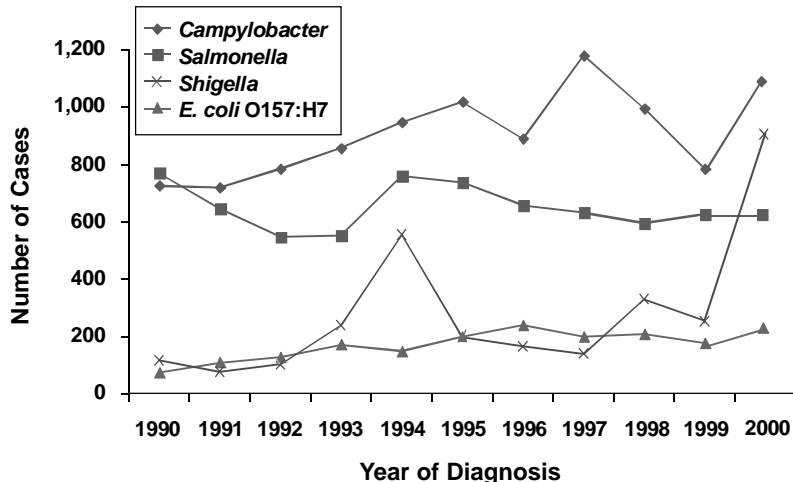
Demographic characteristics of cases in 2000 were similar to previous years. Sixty (30%) cases were from southeastern Minnesota, and 43 (22%) were from the seven-county metropolitan area. Cases ranged in age from 3 months to 81 years, with a median of 9 years. Children less than 10 years of age accounted for 52% of cases, while children less than 5 years of age accounted for 30%. Seventy-eight percent of cases had onset during July through October. Twelve percent of cases were hospitalized.

Figure 1. Reported Cases of LaCrosse Encephalitis by County of Residence, Minnesota, 1985-2000*



*Includes confirmed and probable cases.

Figure 2. Reported Cases of *Campylobacter*, *Salmonella*, *Shigella*, and *Escherichia coli* O157:H7 Infection, Minnesota, 1990-2000



Seven outbreaks of cryptosporidiosis were identified in 2000, accounting for 48 (24%) confirmed cases. Four outbreaks were associated with swimming pools, two were associated with beaches, and one was associated with contact with ill calves at a day camp. Excluding outbreak-associated cases, there still was a substantial increase in cases reported in 2000 (149 cases) compared to 1999 (81 cases).

Ehrlichiosis

Human granulocytic ehrlichiosis (HGE) is an emerging tick-borne bacterial disease in Minnesota. Although the agent of HGE has not been named, it is thought to be similar or identical to two veterinary pathogens (i.e., *Ehrlichia equi* and *Ehrlichia phagocytophila*). HGE is transmitted to humans by *Ixodes scapularis* (deer tick or black-legged tick), the same tick that trans-continued...

mits Lyme disease. During 2000, 79 confirmed or probable cases of HGE were reported (1.6 per 100,000 population). This number represents a 119% increase in cases from the prior high of 36 cases reported in 1999. The national surveillance case definition for a confirmed case of HGE includes a compatible clinical illness with a four-fold increase in HGE antibody titer by IFA, a positive polymerase chain reaction, or intracytoplasmic morulae and an IFA antibody titer to HGE $\geq 1:64$. Probable HGE cases have a compatible clinical illness and either an IFA serologic titer to HGE $\geq 1:64$ or detection of intracytoplasmic morulae.

Forty-eight (61%) cases reported to MDH in 2000 were male. The median age of cases was 52 years (range, 2 to 83 years). The distribution of illness onsets was bimodal, with a peak in May and June (50% of cases) and a smaller peak in October and November (21% of cases). The latter peak likely was due to bites from infected adult *I. scapularis* ticks. Recent evidence suggests that *I. scapularis* may be able to transmit the agent of HGE to people within 24 hours after attaching to the person. Thus, while daily removal of attached ticks may prevent Lyme disease (where 1 to 2 days of tick attachment are necessary to transmit *Borrelia burgdorferi*), the practice may not prevent all cases of HGE. Additionally, co-infections of Lyme disease and HGE from the same tick bite are possible. During 2000 eight (10%) of 79 HGE cases also met the case definition for early-stage Lyme disease (with a physician-diagnosed erythema migrans). People are at most risk of HGE in the same east-central Minnesota counties where the risk of Lyme disease is greatest (see section on Lyme disease, page 24).

***Escherichia coli* O157:H7 Infection and Hemolytic Uremic Syndrome (HUS)**

During 2000, 216 cases of culture-confirmed *E. coli* O157 infection were reported (4.4 per 100,000 population). The mean number of cases reported annually from 1996 to 2000 was 208, with a range of 175 to 239 cases (Figure 2). Fifty-nine percent of the cases reported in 2000 had onset during June through October.

Four outbreaks of *E. coli* O157:H7 infections were identified in 2000. The

first outbreak occurred among children at an elementary school in Minneapolis and was linked to consumption of a hamburger hotdish served as part of the school lunch program. Six children had culture-confirmed *E. coli* O157:H7 infections, and another 12 suspected cases had symptoms that suggested infection. Two children were hospitalized, but none developed HUS. The second outbreak occurred as a result of contact with calves at a farm where a family reunion was being held and resulted in two confirmed cases among children. Both cases developed HUS. The third outbreak was identified through routine subtyping of isolates by pulsed-field gel electrophoresis (PFGE). The source of the outbreak was retail frozen ground beef patties produced by a plant in Minnesota. One of the cases had leftover ground beef patties that were tested by the Minnesota Department of Agriculture; *E. coli* O157:H7 of the outbreak PFGE subtype was cultured from these patties. Three confirmed cases were associated with this outbreak; none was hospitalized. The fourth outbreak was a multi-state outbreak that also was detected through routine PFGE subtyping of isolates. Among Minnesota residents, this outbreak was associated with ground beef purchased at grocery stores serviced by a single Minnesota distributor. Forty cases were confirmed by culture and an additional two cases by serological testing. Onsets of illness ranged from November 11, 2000, to February 20, 2001. Twenty-four cases were hospitalized. Three cases developed HUS, and two cases underwent colectomy surgery. There were no deaths associated with this outbreak. Other cases of the same PFGE subtype of *E. coli* O157:H7 were identified in Wisconsin and Ohio. Their illnesses were linked to consumption of ground beef supplied by the same processor that supplied the distributor in Minnesota.

Thirteen cases of HUS were reported in 2000; all were post-diarrheal. *E. coli* O157:H7 was isolated from stool in seven (54%) of the HUS cases. *E. coli* O111:non-motile was isolated from the stool of one (8%) other HUS case. One (8%) culture-negative HUS case had a sibling who was culture-positive for *E. coli* O157:H7. Three (23%) additional cases were serologically positive for *E. coli* O157:H7 antibodies. Only one

(8%) case was negative by culture and serology. The mean number of HUS cases reported annually from 1996 to 2000 was 17 (range, 12 to 29 cases). During 2000, ten (77%) HUS cases were less than 10 years of age. Twelve (92%) of the HUS cases were hospitalized, with a mean duration of hospitalization of 20 days (range, 3 to 39 days). One case, a 1-year-old female, died.

Giardiasis

During 2000, 1,227 cases of giardiasis were reported (24.9 per 100,000 population). This represents a 21% decrease from the 1,556 cases reported in 1999 but is similar to the mean annual number of cases reported from 1989 to 1999 (mean, 1,210 cases; range, 819 to 1,556). The median age of cases reported in 2000 was 23 years. As in previous years, cases were clustered among children less than 5 years of age (23%) and adults 30 to 39 years of age (23%); 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 interviewed systematically to identify potential sources of exposure, such as attendance at childcare facilities. One water-borne outbreak of giardiasis was identified in 2000, accounting for eight confirmed cases. The outbreak was caused by cross-contamination between a sewage system and well water.

***Haemophilus influenzae* Invasive Disease**

Fifty-two cases of invasive *Haemophilus influenzae* disease were reported in 2000 (1.1 per 100,000 population). Cases ranged in age from less than 1 day to 98 years, with a median age of 68 years. Seventeen (33%) cases had pneumonia, 26 (50%) had bacteremia without another focus of infection, four (8%) had meningitis, and five (9%) had other conditions. Thirteen (25%) deaths were reported among these cases.

Three (6%) cases were known to be type b (Hib), compared to five cases in 1999 and two cases in 1998. All of the Hib cases reported in 2000 occurred in adults with underlying medical conditions. Two cases had bacteremia without another focus of infection, and **continued...**

one had pneumonia; one patient with bacteremia survived.

Twenty-eight (54%) cases had untypeable isolates; three (6%) were type e; two (4%) were type f; one (2%) was type c, and 15 (29%) isolates were not available for testing at MDH.

The 13 deaths occurred in patients ranging in age from 41 to 98 years. Nine cases presented with pneumonia and four with bacteremia without another focus of infection. All 13 cases had *H. influenzae* isolated from blood. Ten were known to have underlying medical conditions. Isolates from six of the deaths were untypeable; two were type b; one was type f; one was type c, and three isolates were not available at MDH for serotyping.

HIV Infection and AIDS

In 2000, 161 cases of AIDS were diagnosed and reported (3.3 per 100,000 population). This represents a 62% decline in the annual incidence of reported AIDS cases since the peak in 1992 (423 cases) (Figure 3). 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 diagnosed in 2000, 240 newly diagnosed cases of HIV infection that had not progressed to AIDS by the year's end were reported in 2000 (4.9 per 100,000 population) (Figure 3). Although this is an 8%

increase from 1999, the increase was due mostly to 13 HIV-infected refugees from Africa who immigrated to Minnesota. While newly identified HIV (non-AIDS) case incidence rates have

plateaued over the past 6 years, the 2000 incidence rate reflects a 41% decline from the 404 cases reported in 1987. This peak number is not re-continued...

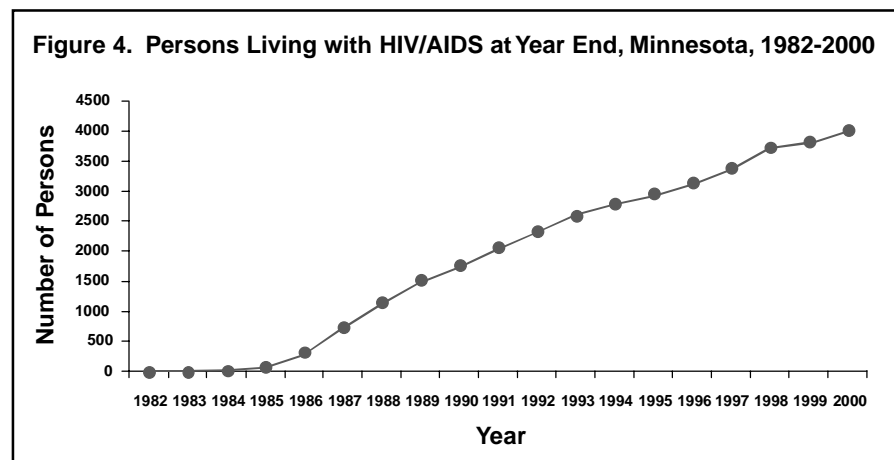
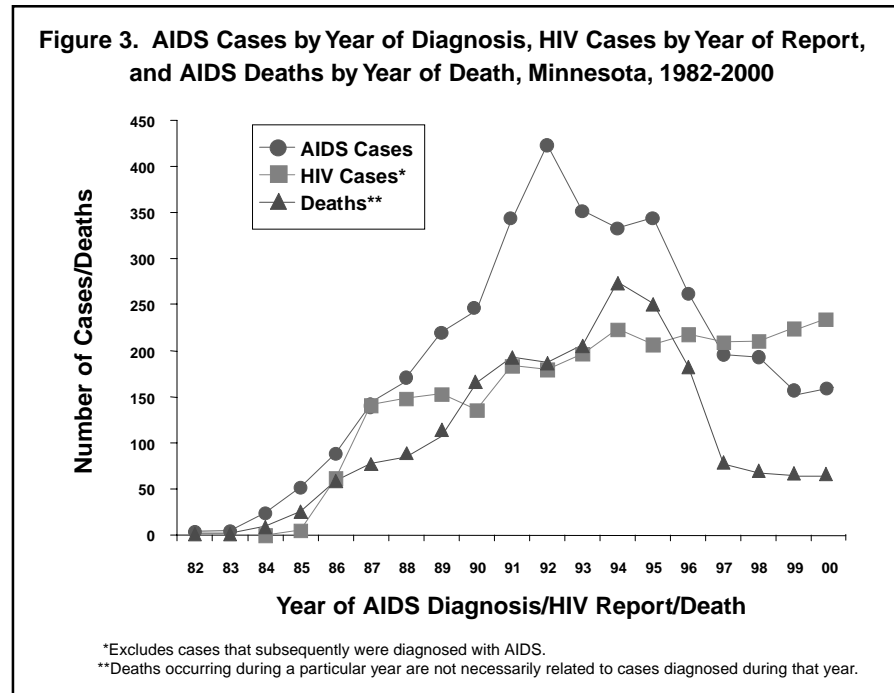


Table 3. Adult/Adolescent Cases of AIDS by Exposure Category, Sex, and Year of Diagnosis, Minnesota, 1982-2000

Percentage of Cases in Exposure Category

Exposure Category	1982-1998			1999			2000		
	Male (n=3,065)	Female (n=317)	Total (n=3,382)	Male (n=129)	Female (n=32)	Total (n=161)	Male (n=128)	Female (n=33)	Total (n=161)
Men Who Have Sex With Men	77	0	70	54	0	43	57	0	45
Injecting Drug Use (IDU)	7	25	8	9	28	13	4	12	6
Men Who Have Sex With Men and IDU	7	0	7	4	0	3	5	0	4
Hemophilia/Coagulation Disorder	2	<1	2	2	0	1	0	0	0
Heterosexual	1	49	6	5	31	11	12	40	17
Transfusion, Blood/Components	<1	5	1	0	0	0	0	0	0
Other/Undetermined	5	21	6	26	41	29	22	48	28
Total	100	100	100	100	100	100	100	100	100

sented in Figure 3 to avoid duplication of reported cases which progressed from an HIV (non-AIDS) diagnosis to AIDS. The plateau in HIV (non-AIDS) cases suggests that the epidemic may be stabilizing in Minnesota, since no changes in surveillance methodology have been made since 1993.

HAART also has led to a marked reduction in mortality. Deaths due to AIDS have declined substantially since 1994, the peak year for deaths (Figure 3). The 67 deaths in persons with a diagnosis of AIDS in 2000 reflects a 75% decline from the 273 deaths in 1994.

Several trends in reported adult/adolescent AIDS cases continue to evolve (Table 3). Male-to-male sex remained the most common exposure category among AIDS cases diagnosed in 2000 (70 cases, 44%), but the proportion of cases with this risk factor has declined steadily over time. In contrast, the proportion of cases related to heterosexual contact has increased. The proportion of female AIDS cases also has increased; females represent 10% of cases diagnosed cumulatively from 1982 to 2000 and 20% of cases diagnosed in 2000. 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 2000, 41% of AIDS cases were black, 11% were Hispanic, 4% were American Indian, and 1% were Asian/Pacific Islander, compared to 18%, 5%, 2%, and <1%, respectively, from 1982 to 1999. Conversely, in 2000, 42% of AIDS cases were white, compared to 74% of cases from 1982 to 1999.

Trends in cumulative HIV (non-AIDS) infection data are even more pronounced than the trends in AIDS cases described above. For example, male-to-male sex is a risk factor for 60% of reported HIV (non-AIDS) cases and 68% of AIDS cases. Heterosexual transmission accounts for 13% of HIV (non-AIDS) cases and 6% of AIDS cases. Females comprise 19% of HIV (non-AIDS) cases compared to 10% of AIDS cases. Whites comprise 73% of AIDS cases and 62% of HIV (non-AIDS) cases, while blacks and Hispanics comprise 19% and 5% of AIDS cases and 30% and 5% of HIV (non-AIDS) cases, respectively. Injecting

drug use as a risk factor accounts for 8% of AIDS cases and 11% of HIV (non-AIDS) cases.

Since 1982, 59 pediatric cases (<13 years of age) have been reported with AIDS/HIV infection in Minnesota. The majority (46 cases, 78%) were born to HIV-infected women and acquired their infection perinatally. Of these, 15 were born outside of Minnesota. With the increased identification of HIV infection in pregnant women and the increased use of antiretroviral therapy during pregnancy, perinatal transmission has declined. No children born in Minnesota in 1999 or 2000 have been identified with HIV infection.

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 risk of transmission and effectiveness of prevention efforts. In addition, because of increased survival, a growing number of persons are living with HIV infection (Figure 4). These data emphasize the continued importance of monitoring the epidemic to direct policy and prevention efforts.

Influenza

The 2000-2001 influenza season was mild nationally and in Minnesota; deaths attributable to influenza did not exceed the epidemic threshold at any time during the season. The season's first influenza isolate in Minnesota was confirmed by the MDH Public Health Laboratory on December 13, 2000. This represents a typical start of influenza activity; since the 1990-91 season, the first influenza isolate usually has been collected and identified between mid-November and mid-December.

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

influenza surveillance for the 2000-2001 season, and MDH plans to further expand the number of sites to 18 (representing one sentinel site per 250,000 population).

MDH received 338 influenza isolates from Minnesota residents for viral confirmation and strain identification. Of the influenza virus isolates received, 272 (80%) were identified as influenza type A(H1N1)/New Caledonia-like; 60 (18%) were influenza B/Yamanashi-like; one (<1%) was influenza type A (H3N2)/Panama-like, and two (<1%) were influenza type B but the strain could not be identified. Strains that circulated in Minnesota during 2000-01 were well matched to the strains included in the 2000-01 influenza vaccine. Influenza type A/New Caledonia and type B/Yamanashi also were the predominate strains circulating nationally.

A probable outbreak of influenza-like illness (ILI) in a school is 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 (e.g., myalgia, headache, cough, coryza, sore throat, chills). A possible ILI outbreak in a school is defined as a doubled absence rate and reported symptoms among students, including two of the primary influenza symptoms and at least one secondary influenza symptom. Reports of probable ILI outbreaks were received from 144 schools in 49 counties throughout Minnesota; possible outbreaks were reported in 94 schools in 38 counties. Schools began reporting ILI outbreaks in mid-December; 89% of probable and possible ILI outbreaks were reported during January and February. Since 1988-89, the number of schools reporting suspected influenza outbreaks has ranged from 38 schools in 20 counties in 1996-97 to 441 schools in 71 counties during 1991-92.

Reported influenza activity in long-term care facilities was very mild compared to previous years. Eleven long-term care facilities reported confirmed or suspected ILI outbreaks. An ILI outbreak is suspected when three or more residents with a cough and fever
continued...

(≥101EF) or chills present on 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. In three (27%) long-term care facilities, influenza was laboratory-confirmed by direct antigen or culture. Five long-term care facilities reported outbreaks with onset in January, five in February, and one in March. 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.

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 ≥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 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 2000, 465 cases meeting the case definition for a confirmed case of Lyme disease were reported (9.5 per 100,000 population). This number represents a 64% increase in cases from the prior high of 283 cases reported in 1999 (Figure 5). During 2000, an additional 13 reports were classified as probable cases of Lyme disease.

Two hundred eighty-one (60%) confirmed cases were male. The median age of cases was 35 years (range, 1 to 87 years). Physician-diagnosed EM was present in 399 (86%) cases. Ninety-one (20%) cases had at least one late manifestation of Lyme disease (56 had a history of objective joint swelling, and 29 reported cranial neuritis) and confirmation by a positive Western blot test. Onsets of illness peaked in July (44% of cases), corresponding to the peak activity of

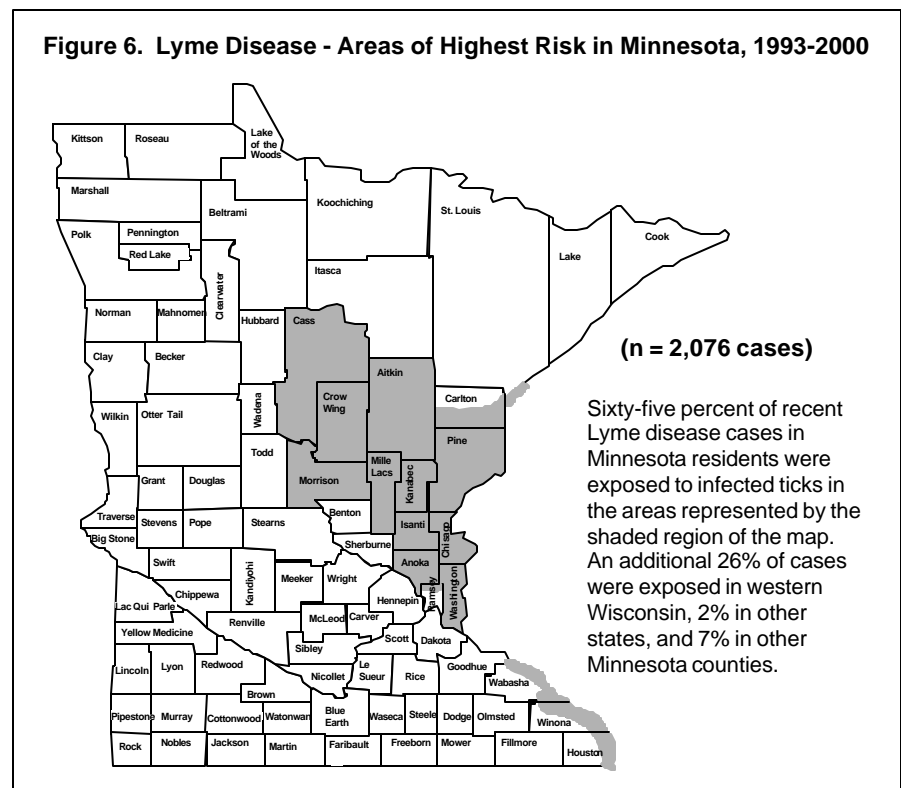
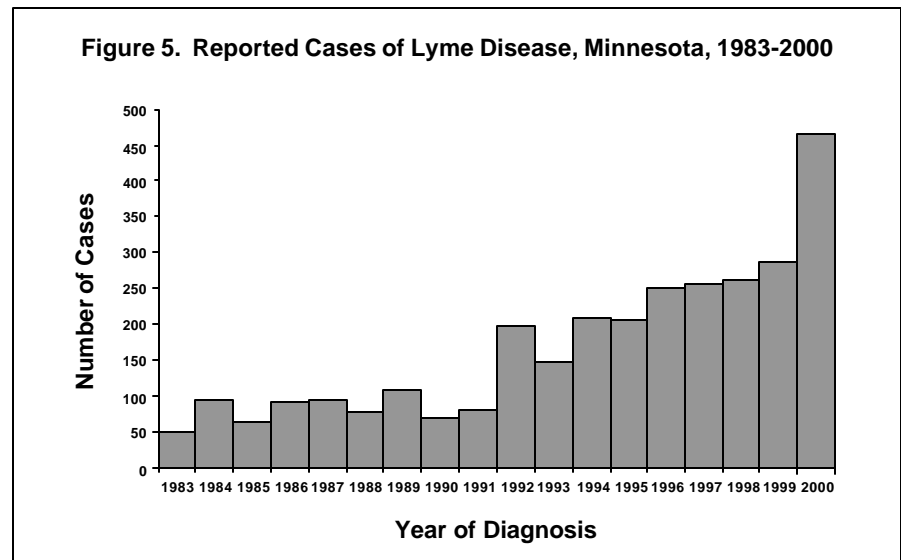
nymphal *Ixodes scapularis* (deer tick, or black-legged tick) in June.

Similar to data from previous years, 249 (54%) Lyme disease cases in 2000 occurred among residents of the seven-county metropolitan area. However, only 62 (13%) cases likely were exposed to infected *I. scapularis* in metropolitan 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 (Figure 6) or western

Wisconsin. Several east-central Minnesota counties continue to have the highest incidence of Lyme disease in Minnesota (e.g., Kanabec, Crow Wing, Aitkin, Pine, and Cass Counties had incidence rates of 83, 80, 77, 53, and 44 cases per 100,000 population, respectively).

Malaria

In 2000, 42 cases of malaria (all imported) were reported. These cases and the 147 cases reported from 1998 to 1999 represent the highest numbers **continued...**



reported since the end of the Korean War. The median age of cases was 31 years (range, 2 to 52 years). Of the 42 cases, 45% were black, 17% were white, 17% were Asian, and 21% were of unknown race. Thirteen (31%) cases were U.S. citizens, and nine (21%) were born in the U.S. The majority of cases (90%) resided in the seven-county metropolitan area, including 22 (52%) cases in Hennepin County. Of 37 cases in which the *Plasmodium* species was identified, 51% were due to *P. falciparum*, 41% were due to *P. vivax*, and 8% were due to *P. malariae*.

The geographical region where malaria likely was acquired by the cases reported in Minnesota included Africa (26 cases), Asia (10 cases), Central America (two cases), and South America (one case); one case traveled to both Africa and South America, and two had unknown exposures. Twenty-two countries were considered possible countries of origin of the malarial infections. The countries from which the largest numbers of cases possibly originated included Nigeria (eight), India (eight), and Liberia (four).

Measles

One case of measles was reported during 2000. The case occurred in a 23-month-old, unvaccinated, white, non-Hispanic child residing in northern Minnesota who developed measles after traveling to India and Malaysia. Prodrome symptoms of fever, cough, coryza, and conjunctivitis occurred 1 day after returning to Minnesota; rash developed 5 days later. The case was laboratory-confirmed with a positive serologic test for measles IgM antibody. No additional cases of measles resulted from exposure to this case. Parents and other exposed relatives either were determined to be immune, given measles immune globulin within 6 days of exposure, or excluded from all activities outside the home for 12 days.

Measles is no longer an indigenous disease in the U.S. International importation of measles, however, remains an important source of measles transmission in this country. In Minnesota during the past 4 years, ten cases of measles have been reported; six (60%) were imported, and three (30%) were associated with an imported case.

All suspected measles cases should be reported immediately to MDH. The CDC currently recommends serologic testing for measles and rubella for patients presenting with rash illnesses compatible with either measles or rubella. Blood specimens for IgM serology should be drawn at least 72 hours after rash onset. Blood specimens for acute and convalescent IgG serology should be drawn within 10 (preferably within 7) days after rash onset and again 3 to 5 weeks later. Acute and convalescent specimens should be tested as paired sera. Viral cultures from clinical specimens (e.g., blood and urine) may be sent to CDC via the MDH for genotypic strain identification and tracking of importation and transmission patterns.

Methicillin-Resistant *Staphylococcus aureus* (MRSA)

Strains of *Staphylococcus aureus* that are resistant to methicillin (and possibly other antibiotics) are referred to as methicillin-resistant *Staphylococcus aureus* (MRSA). Such strains were first recognized in the United States in the late 1960s. Established risk factors for MRSA include recent hospitalization or surgery and residence in a long-term care facility.

In 1997, MDH began receiving unsolicited reports from several health care facilities in Minnesota describing increasing numbers of healthy young patients presenting with infections caused by MRSA. Many of these patients appeared to have none of the established risk factors for MRSA infection. Although most of the reported infections were not severe, some resulted in hospitalization or death. A review of the scientific literature indicated that MRSA infection among persons with no apparent risk factors was unusual. The infections being reported in Minnesota appeared to have been acquired in the community rather than in the health care setting, thereby suggesting a possible change in the epidemiology of MRSA. The phenomenon of community-acquired MRSA (CA-MRSA) also was being reported elsewhere in the U.S. and the world. An article by MDH authors and others reported the deaths of four children from Minnesota and North Dakota due to CA-MRSA [*MMWR* 1999;48(32):707-710].

In an effort to determine the incidence of CA-MRSA in Minnesota, MDH initiated active surveillance in January 2000 at 12 sentinel hospitals statewide. The hospitals (six in the seven-county metropolitan area and six in greater Minnesota) were selected to represent various geographic regions of Minnesota. These facilities were asked to submit case reports and MRSA isolates to MDH for all cases of MRSA (both community-acquired and health care-associated) identified at their facilities during 2000. The purpose of this surveillance system included monitoring the incidence of CA-MRSA infections in Minnesota, identifying possible risk factors for CA-MRSA, and identifying the antibiotic susceptibility patterns and genetic subtypes of MRSA isolates submitted to MDH.

To meet the provisional diagnosis of CA-MRSA as defined for the MDH surveillance system, a patient must not have had: a positive culture for MRSA from any specimen obtained more than 48 hours after admission to a hospital (if admitted); history of MRSA infection or colonization; or, hospitalization, surgery, residency in a long-term care facility, hemodialysis or peritoneal dialysis, or indwelling percutaneous devices or catheters within the past year.

During 2000, 1,164 cases of MRSA infection were reported by the 12 sentinel hospitals. Eleven percent of these cases were determined to be community-acquired, 85% were health care-associated, and 3% were of unknown origin. The MDH Public Health Laboratory received MRSA isolates from 932 (80%) cases and completed genetic subtyping on 338 (29%) of these isolates. CA-MRSA patients were, on average, younger than patients with health care-associated MRSA (23 years vs. 68 years, respectively) and more likely to have MRSA isolated from a skin site (74% vs. 40%, respectively). In addition, very few of the CA-MRSA patients were health care workers or had household members who were health care workers. The data also confirmed that most CA-MRSA isolates had genetic subtype and antibiotic susceptibility patterns that were distinct from health care-associated MRSA isolates. CA-MRSA isolates typically belonged to a particu-

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lar clonal group and generally were susceptible to all of the following drugs: ciprofloxacin, clindamycin, gentamicin, tetracycline, and trimethoprim-sulfamethoxazole. These findings support the theory that CA-MRSA bacteria have not “escaped” from the healthcare setting, but rather have evolved independently and represent a change in the epidemiology of MRSA.

Mumps

Seven cases of mumps were reported during 2000, compared with one case in 1999 and 13 cases in 1998. The seven cases included three children ages 6, 11, and 13 years and four adults ages 25, 34, 42, and 44 years. The 6- and 13-year-old both had a history of two doses of age-appropriate MMR vaccine, and the 11-year-old had a history of one dose of MMR vaccine. None of the adults had a known history of MMR vaccine. None of the cases had a history of travel, and there was no evidence of secondary transmission.

The cases reported in 2000 all were laboratory-confirmed by positive IgM serology; however, none had acute and convalescent serum results available to demonstrate a rise in serum IgG antibody. Although a positive serologic test for mumps IgM antibody is considered laboratory confirmation, false-positive IFA tests for mumps IgM have been reported. Therefore, it is recommended that both IgM and IgG serologic testing for mumps should be performed for all sporadic cases of mumps. Blood specimens for acute and convalescent serum IgG should be drawn as soon as possible after onset of swelling and 3 to 5 weeks later; tests should be run as paired sera. Confirmed cases of mumps also should meet the clinical case definition (i.e., acute onset or unilateral or bilateral tender swelling of the parotid or other salivary gland lasting ≥ 2 days).

The mumps cases reported in 2000 highlight the need to assess mumps immunization status of adults and to implement current recommendations for mumps vaccine for adults born in 1957 or later.

Neisseria meningitidis Invasive Disease

Twenty-two cases of *Neisseria meningitidis* invasive disease were reported in 2000 (0.4 per 100,000

population), compared to 56 cases in 1999. The distribution of serogroups was similar to 1999, with 11 (50%) serogroup C cases, four (18%) serogroup B cases, six (27%) serogroup Y cases, and one (5%) serogroup W135 case.

Ages of cases ranged from 2 months to 95 years, with a mean age of 36 years. Fifty-nine percent of the cases resided in the Twin Cities metropolitan area. Eleven (50%) cases had meningitis, six (27%) had bacteremia without another focus of infection, three (14%) had bacteremia with pneumonia, and two (9%) had bacteremia with otitis media. All cases were sporadic with no apparent epidemiologic links.

Three deaths occurred due to *Neisseria meningitidis* invasive disease. A 21-year-old female died of meningitis attributed to serogroup C. A 68-year-old female with serogroup Y pneumonia and an 80-year-old male with serogroup C meningococemia also died.

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. Serogroups A, C, Y, and W135 are covered in the quadrivalent vaccine. Two cases reported in Minnesota in 2000 were college students. The students attended different schools in different states. One case was due to serogroup C and the other to serogroup Y. In the fall of 1999, the Advisory Committee on Immunization Practices (ACIP) recommended that health care providers inform college students about meningococcal disease and the availability of vaccine.

Pertussis

Five hundred seventy-five cases of pertussis (11.7 per 100,000 population) were reported in 2000. This is the largest number of cases reported since 1955 when 594 cases were reported. Laboratory confirmation was available for 376 (65%) reported cases; 194 were confirmed by culture and 182 by polymerase chain reaction (PCR). The remaining cases were either epidemiologically linked to culture-confirmed

cases (140, 24%) or met a clinical case definition (53, 9%). Four hundred sixty (80%) cases occurred in residents of the Twin Cities metropolitan area. No deaths due to pertussis were reported in 2000.

Although pertussis often is referred to as “whooping cough,” very young children, older individuals, and previously immunized persons may not exhibit the typical “whoop.” Paroxysmal coughing is the most commonly reported symptom. In 2000, nearly all (94%) reported pertussis cases experienced paroxysmal coughing, and 32% experienced whooping. Post-tussive vomiting was reported in 53% of the cases. Nearly a third (31%) of cases reported apnea.

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 2000, ages of reported cases ranged from 10 days to 92 years. Eighty-one (14%) case-patients were infants less than 6 months of age, and 97 (17%) were children between 6 months and 4 years of age. The largest age group was children between 5 and 12 years of age (32%). Persons 13 to 17 years of age and persons 18 years of age or older accounted for 16% and 21% 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 26 (5%) cases, thirteen (50%) of whom were less than 18 months of age. Fifty-four (9%) case-patients were hospitalized; thirty-eight (70%) of the hospitalized patients were younger than 6 months of age.

In Minnesota, pertussis infection in older children and adults may result in exposure of unprotected infants who are at risk for the most severe consequences of infection. During 2000, 96 cases of pertussis were reported in infants less than 1 year of age. A likely source of exposure was identified for 51 (52%) of these cases. Twenty-six (51%) cases likely were infected by an adult (most often a parent, grandparent, or another adult relative); six (12%) cases likely were infected by an adolescent (usually a sibling or other relative), and 18 (35%) cases likely

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were infected by children (usually a sibling). One infant's likely source of infection was of unknown age. Forty-five (46%) cases had no identified source of exposure. These cases highlight the need for a high index of suspicion for pertussis in adolescents and adults with cough illness and the importance of antibiotic treatment.

Although unvaccinated children are at highest risk for pertussis, fully immunized children also may develop disease. The efficacy of current pertussis vaccines is approximately 71 to 84%. Among 373 pertussis cases reported in 2000 who were 2 months to 15 years of age and had a known vaccination history, 64% had received age-appropriate immunization for pertussis. (This includes infants 2 to 5 months of age for whom a primary series is not yet indicated.) Two hundred eight (63%) of the 331 cases 7 months through 15 years of age had received at least a primary series of three doses. Of 113 cases among persons 7 months to 7 years of age, 35% were considered preventable – i.e., pertussis occurring in a patient who is between 7 months and 7 years of age and has received fewer than three doses of DTP vaccine before onset of illness.

Clinical isolates of *B. pertussis* must be submitted to the MDH Public Health Laboratory. Of the 194 culture-confirmed cases, 189 (97%) *B. pertussis* isolates were subtyped by pulsed-field gel electrophoresis (PFGE) and tested for antibiotic susceptibility to erythromycin, ampicillin, and trimethoprim-sulfamethoxazole using E-test. Nine distinct PFGE patterns were identified; three (33%) occurred in only a single case isolate. The two most common patterns identified accounted for 80% of the total isolates and occurred throughout the year.

The first case of erythromycin-resistant *B. pertussis* in Minnesota was identified in October 1999. Statewide, all 705 other isolates tested to date have had low minimum inhibitory concentrations, falling within the reference range for susceptibility to the antibiotics evaluated. Only five other erythromycin-resistant *B. pertussis* cases have been identified in the United States.

Rubella/Congenital Rubella Syndrome

One case of rubella was reported to MDH during 2000, compared with five cases in 1999. The case was an unvaccinated, 5-year-old, white, non-Hispanic female living in suburban Hennepin County. Rubella was laboratory-confirmed by a positive serologic test for rubella IgM antibody. The case had no known exposure or history of travel. No secondary transmission from this case was detected. The most recent case of congenital rubella syndrome was reported in 1998.

Rubella typically is under-diagnosed due to the mild nature of the illness; 25% to 50% of cases are asymptomatic. Undiagnosed cases may be a source of infection for unvaccinated and non-immune persons. All suspected cases of rubella should be reported immediately to MDH. The CDC currently recommends serologic testing for rubella and measles for patients presenting with rash illnesses compatible with either rubella or measles.

Salmonellosis

During 2000, 612 culture-confirmed cases of *Salmonella* infection were reported (12.4 per 100,000 population). This is similar to the number of cases reported in 1998 (601 cases) and 1999 (626 cases) (Figure 2). Fifty-nine percent of cases were caused by five serotypes, including *S. Typhimurium* (169 cases), *S. Enteritidis* (98 cases), *S. Heidelberg* (49 cases), *S. Saintpaul* (24 cases), and *S. Newport* (21 cases). Thirty percent of cases were less than 10 years of age. Forty-nine percent of cases had onset during June through September.

Five food-borne outbreaks of salmonellosis were identified in 2000, three of which occurred in restaurant settings. In April, five patrons of one restaurant became ill with *S. Heidelberg* infection. Three of twelve restaurant employees also were culture-positive for *S. Heidelberg* but reportedly were asymptomatic. No common food source was identified. The second outbreak involved four patrons and two employees of a restaurant who were diagnosed with *S. Typhimurium* infections in May. Although no single food vehicle was identified, the most likely source of infection was cross-

contamination of ready-to-eat foods by raw meat products. The third outbreak occurred in June at a private home. Smoked turkey served at a party was the source of *S. Typhimurium* that resulted in five confirmed infections. The fourth outbreak occurred at a wedding reception at a private home in July. Two cases had confirmed *S. Heidelberg* infection, and an additional 12 persons had compatible illness. Smoked turkey was the most likely source of this outbreak. The fifth food-borne outbreak occurred at a restaurant in September. Ten patrons, including two non-Minnesota residents, became ill with culture-confirmed *S. Enteritidis* infections. Follow-up at the restaurant identified two employees who were culture-positive for *S. Enteritidis*. Four additional patrons had compatible illnesses but were not culture-confirmed.

Four non-foodborne outbreaks of salmonellosis were identified in 2000. Two of the outbreaks occurred at child care settings, and one occurred at an assisted living facility. The fourth outbreak was due to contact with animals. In March, an outbreak of *S. Saintpaul* infections in a child care setting resulted in four culture-confirmed cases. Contact with chicks purchased from a single retailer resulted in four *S. Montevideo* infections in May. In July, three culture-confirmed cases and three suspected cases of *S. Muenchen* infection occurred at an assisted living facility. In August, three culture-confirmed cases and two suspected cases of *S. Java* infection occurred at a child care setting.

Sexually Transmitted Diseases Sources and Limitations of Data

Laboratory-confirmed infections of chlamydia, gonorrhea, syphilis, and chancroid are monitored by MDH through a passive, physician- and laboratory-based surveillance system. Other common sexually transmitted diseases (STDs) caused by viral pathogens, such as herpes simplex virus and human papillomavirus, are not reportable conditions. Population estimates used to calculate rates for a given year correspond to the prior year; for example, 2000 rates are calculated using 2000 case data and 1999 population data.

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Chlamydia Infection

Chlamydia trachomatis infection is the most commonly reported STD in Minnesota. In 2000, 8,102 cases of chlamydia infection (170 per 100,000 population) were reported. This rate represents an 8% increase compared to 1999; since 1996, the incidence of chlamydia in Minnesota has increased 44% (Figure 7, Table 4). Possible explanations for the rising chlamydia rate include increased screening, increased use of more accurate diagnostic tests, and/or increased occurrence of disease.

Adolescents and young adults are most at risk for acquiring chlamydia infection (Table 5). The chlamydia rate is highest among 20- to 24-year-olds (956 per 100,000 population), while the next highest rate is among 15- to 19-year-olds (735 per 100,000). The incidence of chlamydia among adults aged 25 to 29 years is markedly lower (418 per 100,000), and rates among older age groups are lower yet. The rate of chlamydia infection among women (242 per 100,000) is more than twice the rate among men (96 per 100,000); however, this difference primarily is due to more frequent screening among women.

The rate of chlamydia infection is highest in communities of color (Table 5). The rate among blacks (1,769 per 100,000 population) is approximately 25 times higher than that among whites (73 per 100,000 population). Although blacks comprise only 3% of the population in Minnesota, 32% of chlamydia cases occur in this subgroup of the population. The rates among American Indians (540 per 100,000) and Hispanics (652 per 100,000) are seven to nine times higher than that among whites, and the rate among Asians (314 per 100,000) is four times higher than the rate among whites.

Chlamydia infections are distributed geographically throughout the state, although incidence rates are highest in Minneapolis (684 per 100,000 population) and St. Paul (604 per 100,000) (Table 5). The rate in the suburban metropolitan area (98 per 100,000) is more similar to the rate in greater Minnesota (87 per 100,000).

Gonorrhea

Gonorrhea, caused by *Neisseria gonorrhoeae*, is the second most

commonly reported STD in Minnesota. In 2000, 3,160 cases (66 per 100,000 population) were reported. From 1999 to 2000, the rate of gonorrhea increased 10%; increases also occurred in 1998 and 1999 (Figure 7, Table 4). Overall, the incidence of gonorrhea has increased 25% since 1997. Reasons for these increases are unknown.

Adolescents and young adults also have the greatest risk for gonorrhea (Table 5). The rate for 15- to 19-year-olds is 233 per 100,000 population, the rate for 20- to 24-year-olds is 309 per 100,000, and the rate for 25- to 29-year-olds is 180 per 100,000. Gonorrhea rates for men (63 per 100,000) and women (69 per 100,000) are comparable. Communities of color also are disproportionately affected by gonorrhea. Blacks account for 54% of cases. The gonorrhea rate among blacks (1,149 per 100,000) is 64 times higher than the rate among whites (18 per 100,000). Likewise, the rates among American Indians (123 per 100,000) and Hispanics (135 per 100,000) are seven to eight times higher than that among whites. The rate among Asians (34 per 100,000) is nearly twice the rate among whites.

Gonorrhea cases are concentrated in the core urban populations of Minneapolis and St. Paul (Table 5). The rate in Minneapolis (407 per 100,000 population) is 1.6 times higher than the rate in St. Paul (262 per 100,000), 14 times higher than the rate in the suburban metropolitan area (29 per 100,000), and 29 times higher than the rate in greater Minnesota (14 per 100,000).

Syphilis

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

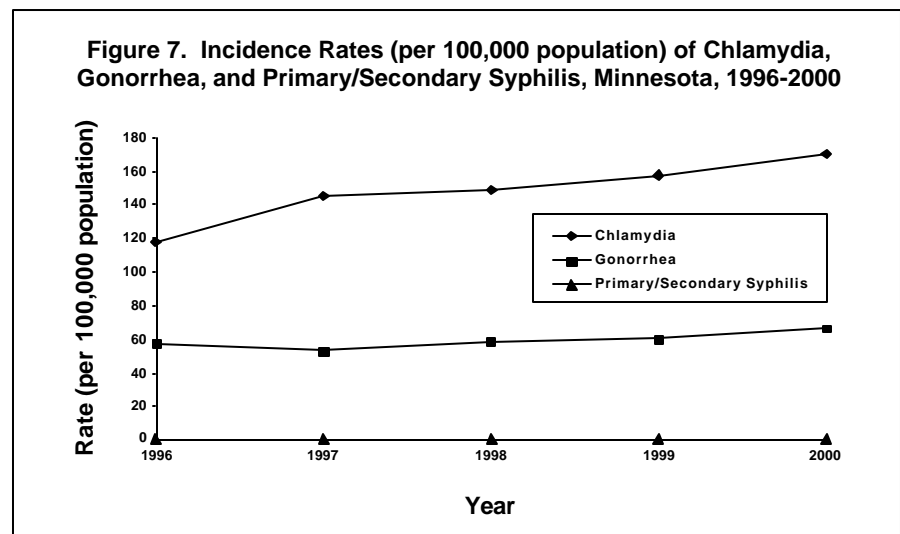
Primary and Secondary Syphilis

The rate of primary and secondary syphilis in Minnesota is low compared to rates of chlamydia or gonorrhea (Figure 7, Table 4). Only 16 cases of primary/secondary syphilis (0.3 per 100,000 population) were reported in 2000. However, the primary/secondary syphilis rate increased 50% from 1999 to 2000, and the rate of early latent syphilis increased 100% during this same time period.

The highest rates of primary/secondary syphilis occur among 25- to 34-year olds (Table 5). Men and women have similar rates of primary/secondary syphilis (0.5 per 100,000 population and 0.2 per 100,000, respectively). The primary/secondary syphilis rate among blacks (7.4 per 100,000) is nearly 75 times higher than the rate among whites (0.1 per 100,000). Eleven (69%) of 16 cases of primary/secondary syphilis occurred among blacks, and three (19%) cases occurred among whites.

Syphilis primarily is an urban disease (Table 5). Three cases of primary/secondary syphilis were reported from greater Minnesota. The remaining 13 cases of primary/secondary syphilis were distributed between Minneapolis (nine cases; 2.3 per 100,000 population) and St. Paul (four cases; 1.3 per 100,000 population).

Figure 7. Incidence Rates (per 100,000 population) of Chlamydia, Gonorrhea, and Primary/Secondary Syphilis, Minnesota, 1996-2000



tion), St. Paul (two cases; 0.7 per 100,000), and the suburban metropoli-

tan area (two cases; 0.1 per 100,000).

Of the 16 cases of primary/secondary syphilis, seven were indigenous and seven were imported; whether the infection was acquired in Minnesota was unknown for two cases.

Table 4. Number of Cases and Incidence Rates (per 100,000 population) of Chlamydia, Gonorrhea, and Syphilis, Minnesota, 1996-2000

Disease	1996		1997		1998		1999		2000		Percent Change in Rate 1999/2000
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	
Chlamydia	5418	117.6	6804	146.4	6996	149.2	7459	157.8	8102	169.7	8%
Gonorrhea	2622	56.9	2438	52.5	2716	57.9	2830	59.9	3160	66.2	10%
Syphilis Total	123	2.7	118	2.5	78	1.7	72	1.5	79	1.7	13%
Primary/											
Secondary	15	0.3	16	0.3	9	0.2	10	0.2	16	0.3	50%
Early Latent*	29	0.6	20	0.4	8	0.2	9	0.2	18	0.4	100%
Late Latent**	78	1.7	82	1.8	61	1.3	52	1.1	43	0.9	-18%
Congenital***	1	1.6	0	0.0	0	0.0	1	1.5	2	3.0	100%
Chancroid	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0	0%

* Duration ≤1 year

** Duration >1 year

*** Rate per 100,000 live births

Table 5. Number of Cases and Incidence Rates (per 100,000 population) of Chlamydia, Gonorrhea, and Primary/Secondary Syphilis by Residence, Age, Gender, and Race/Ethnicity, Minnesota, 2000

Demographic Group	Chlamydia		Gonorrhea		Prim./Second. Syphilis	
	No.	Rate	No.	Rate	No.	Rate
Total	8102	170	3160	66	16	0.3
<i>Residence</i>						
Minneapolis	2673	684	1589	407	9	2.3
St. Paul	1647	604	714	262	2	0.7
Suburban*	1846	98	540	29	2	0.1
Greater Minnesota	1936	87	317	14	3	0.1
<i>Age</i>						
<10 years	6	1	0	0	0	0.0
10-14 years	146	39	50	13	0	0.0
15-19 years	2762	735	874	233	2	0.5
20-24 years	2944	956	951	309	2	0.6
25-29 years	1230	418	531	180	3	1.0
30-34 years	554	165	322	96	3	0.9
35-44 years	378	47	323	40	1	0.1
≥45 years	82	5	109	7	5	0.3
<i>Gender</i>						
Male	2246	96	1479	63	11	0.5
Female	5856	242	1681	69	5	0.2
<i>Race</i>						
White	3230	73	784	18	3	0.1
Black	2629	1769	1707	1149	11	7.4
American Indian	316	540	72	123	1	1.7
Asian	410	314	44	34	0	0.0
Other or Unknown**	1517	---	553	---	1	---
<i>Ethnicity</i>						
Hispanic***	604	652	125	135	0	0.0

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

** No population data available to calculate rates

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

Congenital Syphilis

Two cases of congenital syphilis (3.0 per 100,000 live births) were reported in Minnesota during 2000. One of the cases was a foreign-born adoptee; the other case's mother received no prenatal care.

Chancroid

Chancroid is very rare in Minnesota; no cases were reported in 2000.

Summary

Although overall STD rates in Minnesota are low compared to many other areas of the U.S., certain population subgroups in Minnesota have very high STD rates. Specifically, STDs disproportionately affect adolescents and young adults and persons of color. Incidence rates of STDs in Minnesota are increasing overall and among certain subgroups of the population.

Shigellosis

During 2000, 904 culture-confirmed cases of *Shigella* infection were reported (18.4 per 100,000 population). This represents the largest number of *Shigella* cases ever reported in Minnesota and a 256% increase from the 254 cases reported in 1999 (Figure 2).

In 2000, *Shigella sonnei* accounted for 880 (97%) cases, *S. flexneri* for 21 (2%) cases, and *S. boydii* for one (<1%) case (two isolates were not serotyped). Cases ranged in age from 8 days to 87 years, with a median of 8 years. The majority (57%) of cases were less than 10 years of age; children less than 5 years of age accounted for 32% of cases. One hundred three (11%) cases were hospitalized; one death was reported. Eighty-five percent of all *Shigella* cases resided in the Twin Cities metropolitan area, including 35% in Hennepin County and 24% in Anoka County.

Forty outbreaks of shigellosis were identified in 2000; all were due to *S. sonnei*. These outbreaks resulted in at least 641 illnesses, including 338 culture-confirmed cases (representing continued...

38% of reported *S. sonnei* cases). The outbreaks occurred in a variety of settings, including daycare facilities (24 outbreaks), elementary schools (12 outbreaks), swimming beaches (two outbreaks), a restaurant (one outbreak), and an employee picnic (one outbreak).

Every tenth isolate of *Shigella* received at MDH was tested for antimicrobial resistance, but only one isolate was included from each outbreak. Of 80 isolates tested in 2000, 75 (94%) were resistant to ampicillin, eight (10%) were resistant to trimethoprim-sulfamethoxazole, and five (6%) were resistant to both of these drugs.

***Streptococcus pneumoniae* Invasive Disease**

In 2000, 439 cases of invasive *Streptococcus pneumoniae* infection were reported among residents of the seven-county Twin Cities metropolitan area. These cases were reported as part of active, laboratory-based surveillance conducted by the EIP. Rates of invasive disease varied considerably by age; the highest rates of illness occurred in children 6 to 18 months of age, with the next highest rates among adults 75 years of age or older. In 2000, the rate of infection among children younger than 5 years dropped to 74 per 100,000 population. In this age group, the mean annual incidence from April 1995 to December 1999 was 110 per 100,000 (Figure 8). Rates among adults 75 years of age or older also declined somewhat; the rate in 2000 was 59 per 100,000, compared to a mean annual incidence of 74 per 100,000 in this age group from April 1995 to December 1999. In the first half of 2000, the overall number of cases (269) was close to the total seen on average (268) during the months of January through June from 1996 to 1999. In the first half of 2000, the number of cases in children less than 5 years of age also was close to the average from the 4 prior years. In the second half of 2000, the number of cases among children less than 5 years of age was lower than the average number of cases in each age group reported from July to December in 1996-99. There were 39 cases among children 1 year of age or younger and 14 cases among children 2 to 4 years of age.

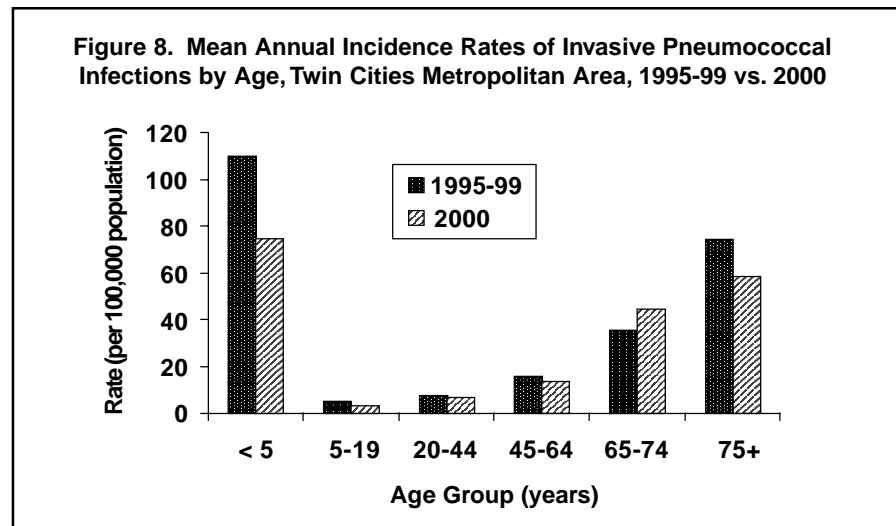
In March 2000, a new pediatric

polysaccharide-protein conjugate vaccine (Prevnar™) covering seven pneumococcal serotypes (PCV-7) was licensed for use; the ACIP published recommendations for use of the vaccine in October 2000 (<http://www.cdc.gov/nip/publications/ACIP-list.htm>). The vaccine is recommended for all children under 2 years of age as well as children 2 to 4 years of age (through 59 months) with chronic medical problems (especially sickle cell disease, asplenia, or HIV infection). PCV-7 also should be considered for use in children 2 to 4 years of age who belong to one or more groups at higher risk of pneumococcal disease (i.e., children 24 to 35 months of age; children of Alaskan Native, American Indian, or African American descent, and children in daycare for 4 or more hours per week with two or more unrelated children). The decrease in incidence of invasive pneumococcal disease among children less than 5 years of age likely is attributable to use of this vaccine. Reduced rates among these young children and the elderly also may have been influenced by a relatively mild 2000-2001 influenza season.

Pneumonia accounted for 49% of the invasive pneumococcal infections in 2000, including those accompanied by bacteremia or isolation of pneumococci from another sterile site such as pleural fluid. Meningitis occurred in 21 (5%) cases, and bacteremia without another known focus of infection occurred in 169 (38%). Deaths during hospitalization or the episode of illness occurred for 31 (7%) cases which is similar to the proportion seen in prior years.

Among 136 isolates from children less than 5 years of age in 2000, 70% represented serotypes included in the PCV-7 vaccine. Among 124 isolates from adults 65 years of age or older, 85% were serotypes included in the 23-valent polysaccharide pneumococcal vaccine. This vaccine has been in use since 1983 and is recommended for use among adults 65 years of age or older and adults and children (over 2 years of age) with certain chronic medical conditions. ACIP recommendations for both pneumococcal conjugate and polysaccharide vaccines comment on use of polysaccharide vaccine (<http://www.cdc.gov/nip/publications/ACIP-list.htm>).

In 2000, penicillin-resistance among invasive pneumococcal isolates submitted through EIP surveillance continued to rise. Compared with 1995 when 7% (22/305) of isolates were penicillin-resistant, 17% (68/411) of isolates in 2000 were resistant to penicillin (i.e., minimum inhibitory concentrations ≥ 2 $\mu\text{g/ml}$ -high level resistance). Resistance to other antibiotics also has risen; the percentage of isolates resistant to two or more drug classes rose from 11% (33/305) in 1995 to 24% (98/411) in 2000. Among all antibiotics for which susceptibility data are monitored, resistance to erythromycin has risen most rapidly; 26% (105/411) of isolates in 2000 were erythromycin-resistant, compared to 8% (23/305) of isolates in 1995. Among 33 penicillin-resistant isolates from children less than 5 years of age in 2000, 29 (88%) represented serotypes included in the PCV-7 vaccine; **continued...**



among penicillin non-susceptible isolates from this age group, 85% (39/46) were serotypes included in the vaccine. Among 18 penicillin-resistant isolates from adults aged 65 years of age or older in 2000, 15 (83%) were serotypes included in PPV-23; among penicillin non-susceptible isolates from this age group, 78% (25/32) were serotypes included in the vaccine. Susceptibility data for invasive pneumococcal isolates collected in the seven-county metropolitan area as part of active surveillance from 1995 to 2000 are available on the MDH web site (<http://www.health.state.mn.us/divs/dpc/ades/invbact/s-pneumo.pdf>).

Streptococcal Invasive Disease - Group A

One hundred forty-nine cases (3.0 per 100,000 population) of invasive group A streptococcal (GAS) disease (including 13 deaths) were reported in 2000, compared to 180 cases and 19 deaths in 1999.

Ages of cases ranged from 1 day to 94 years, with a mean of 46 years. Sixty-four percent of cases were residents of the seven-county Twin Cities metropolitan area. Thirty-two (21%) cases had bacteremia without another focus of infection; 44 (30%) had cellulitis, and 18 (12%) had primary pneumonia. Thirteen (9%) cases had necrotizing fasciitis. Nine (6%) cases had streptococcal toxic shock syndrome (STSS); two of the STSS patients had necrotizing fasciitis; one had pneumonia; one had cellulitis, and the remaining five did not have other associated foci of infection.

Of the 13 deaths, five (38%) had STSS, three (23%) had bacteremia without another focus of infection, and one (8%) had meningitis. The remaining cases had bacteremia with another focus of infection, including two (15%) with pneumonia, one (8%) with cellulitis, and one (8%) with an abscess.

Isolates for 120 (81%) cases were available at MDH. Fifty-three different molecular subtypes were identified by pulsed-field gel electrophoresis (PFGE). Thirty-seven (70%) subtype patterns were represented by one isolate each; other subtypes were represented by two to 28 isolates each. No epidemiologic linkages were noted between cases with identical subtypes,

except for two pairs of cases from two nursing homes and a pair of extended family members (child and grandparent) living in different households. The deaths were distributed among six different subtypes, with no PFGE subtype accounting for more than two deaths. Isolates were unavailable for four of the patients who died.

Streptococcal Invasive Disease - Group B

Two hundred ninety-four cases (6.0 per 100,000 population) of Group B streptococcal invasive disease (including 17 deaths) were reported in 2000. These cases included only those in which group B *Streptococcus* (GBS) was isolated from a normally sterile site, in addition to nine cases involving a miscarriage or stillbirth in which placenta was the site of disease. Sixty percent of cases occurred among residents of the Twin Cities metropolitan area. Fifty-seven (19%) cases were infants less than 1 year of age, and 126 (43%) cases were 60 years of age or older.

Overall, 156 (53%) cases presented with bacteremia without another focus of infection. The other most common types of infection were cellulitis (11%), pneumonia (6%), osteomyelitis (4%), arthritis (4%), and meningitis (4%). A majority (68%) of cases had GBS isolated from blood only.

There were 71 cases of infant (early-onset or late-onset) or maternal GBS disease, compared to 53 such cases in 1999. Thirty-three infants developed invasive disease within the first 6 days following birth (i.e., early-onset disease), and 23 infants became ill at 7 to 89 days of age (i.e., late-onset disease). Ten stillbirths and spontaneous abortions were associated with 15 maternal invasive GBS infections.

In May 1996, the CDC, the American College of Obstetricians and Gynecologists, and the American Academy of Pediatrics published guidelines which urged providers to take either a screening-based or risk-based approach to determine use of intrapartum antibiotic prophylaxis (IAP) for the prevention of perinatal GBS disease (*MMWR*; vol. 45, May 31, 1996; <http://wonder.cdc.gov/wonder/prevguid/m0043277/m0043277.asp>). If a screening-based approach is used,

vaginal/rectal cultures should be obtained at 35-37 weeks gestation and cultured using a selective broth medium.

From 1997 to 2000, 1,082 cases of GBS invasive disease were reported; 825 (76%) were adult non-maternal, 120 (11%) were early-onset, 79 (7%) were late-onset, 54 (5%) were maternal, and 4 (<1%) were among children 90 days to 14 years of age. Medical charts were reviewed for all 120 women in Minnesota whose infants developed early-onset GBS disease. These included 34 women in 1997, 28 in 1998, 25 in 1999, and 33 in 2000. The infants included 61 females and 59 males. Sixty-five percent of cases were white, 6% were black, 5% were other races, and 24% were of unknown race. Four (3%) infants died. Twenty infants born at less than 37 weeks gestation accounted for 17% of early-onset cases. Bacteremia without focus (80%) was the most common type of infection, followed by pneumonia (14%) and meningitis (5%).

Thirty-three (28%) of these 120 women were screened prenatally for GBS; 12 were positive (and seven of these women received IAP), 19 were GBS negative, and two had unknown results. Among women who were GBS negative, up to 89% may have been screened inappropriately with either documentation of the wrong site or wrong time in gestation, or no documentation of site and time. Twenty-seven (23%) of these 120 women had at least one documented GBS risk factor (gestation <37 weeks - 20; intrapartum fever - 7; rupture of membranes at \geq 18 hours - 7; GBS bacteriuria - 5). Overall, 18 (15%) of the 120 women received IAP. Only 15 (48%) of 31 women who had a positive screening result or were not screened and had at least one GBS risk factor received IAP (50% in 1997, 33% in 1998, 50% in 1999, and 55% in 2000).

Providers are urged to review consensus guidelines for the prevention of perinatal GBS disease. Additional information, including a laboratory protocol on the prevention of perinatal GBS disease, can be found on the following website: <http://www.cdc.gov/mmwr/preview/mmwrhtml/00043277.htm>.

continued...

Tetanus

Two cases of tetanus were reported during 2000. The first case occurred in a 34-year-old, white, non-Hispanic male with no history of tetanus immunization as an adult. He presented at a regional hospital emergency room in greater Minnesota following a seizure which occurred 13 days after a puncture wound caused by stepping on a nail. Sixteen days after the injury, he developed arm pain, arm and jaw stiffness, and numbness. He received Td, TIG, and intravenous penicillin. The case was hospitalized for 9 days, including 3 days in intensive care.

The second case occurred in a 65-year-old, white, non-Hispanic female with no history of tetanus immunization. She sustained a knee laceration after falling on railroad ties and subsequently received tetanus toxoid within 6 hours of the injury. One week later, she was hospitalized for general tetanus symptoms and received TIG. She was hospitalized for 41 days, during which time she was on mechanical ventilation for 30 days.

Tetanus is preventable through adequate vaccination. Due to the extreme potency of tetanus toxin, tetanus disease does not confer immunity. Therefore, completing the vaccination series is recommended for previously unvaccinated persons who develop tetanus. Tetanus cases occur almost exclusively among persons who are unvaccinated or inadequately vaccinated. A recent serologic survey of immunity to tetanus found that although 80% of persons 6 to 39 years of age had tetanus immunity, the prevalence of immunity dropped sharply with increasing age; only 28% of persons 70 years of age or older were immune.

Tuberculosis

While the number of tuberculosis (TB) cases reported nationally has been declining since 1993, the incidence and epidemiology of TB in Minnesota are following different trends. In 2000, 178 new cases of TB disease (3.6 per 100,000 population) were reported. This is the second largest number of cases reported in 20 years, after the 201 cases reported in 1999. For the fourth consecutive year, the incidence of TB disease in Minnesota remains at or above the national goal of 3.5 cases per 100,000 for the year 2000.

During 2000, 25 of the 87 counties in Minnesota reported at least one case of TB disease. However, the majority (76%) of TB cases occurred in the seven-county Twin Cities metropolitan

area, particularly among residents of Hennepin (9.4 per 100,000) and Ramsey (4.7 per 100,000) Counties. Approximately 20% of cases occurred **continued...**

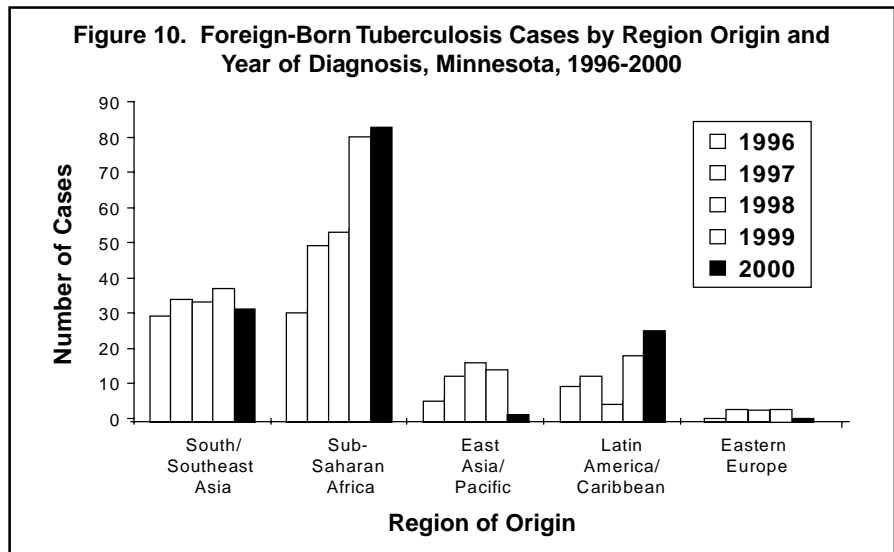
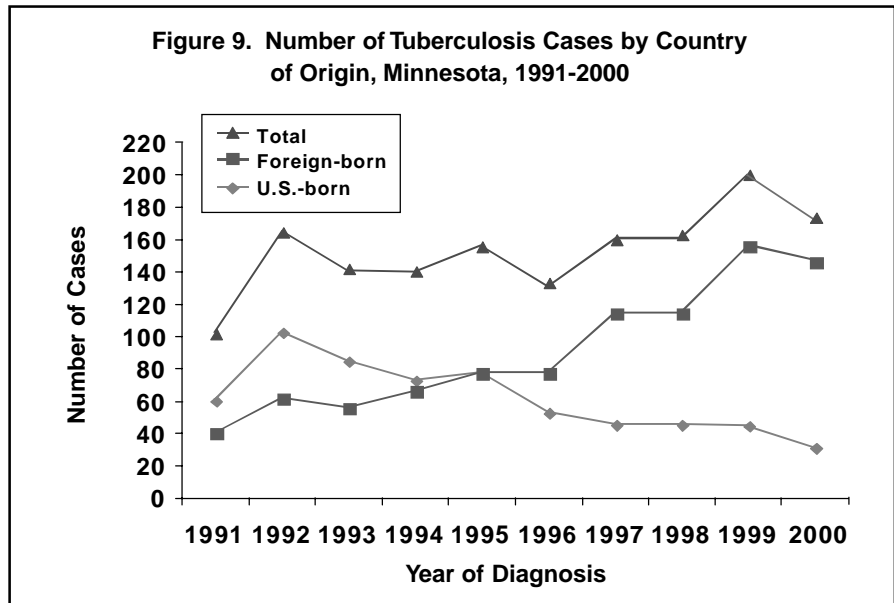


Table 6. Cases of Drug-Resistant Tuberculosis by Place of Birth and Year, Minnesota, 1996-2000

Year	Foreign-Born Cases		U.S.-Born Cases	
	Cases with Susceptibility Results*	Resistant No. (%)	Cases with Susceptibility Results*	Resistant No. (%)
1996	63	11 (17)	41	3 (7)
1997	91	19 (21)	43	2 (5)
1998	92	23 (25)	42	4 (10)
1999	131	29 (22)	35	1 (3)
2000	114	34 (30)	26	3 (12)
Total	491	116 (24)	187	13 (7)

*Culture-confirmed cases with drug susceptibility results available

in greater Minnesota, with increasing incidence in specific areas.

The most significant factor in the epidemiology of TB in Minnesota is the large and increasing percentage of TB cases that occur among foreign-born persons (Figure 9). The percentage continued to increase in 2000, with 146 (82%) cases occurring in this population. This trend reflects the changing demographics of immigrant populations arriving in the state, particularly persons arriving from regions of the world where TB is prevalent. Among the 146 foreign-born persons diagnosed with TB disease in Minnesota during 2000, 41 (28%) were diagnosed within 12 months of arrival in the United States; an additional 30 (21%) were diagnosed 2 to 5 years after arriving in this country. The most common regions of origin for foreign-born persons with TB disease reported in 2000 included sub-Saharan Africa (58%), South/Southeast Asia (22%), and Latin American/Caribbean countries (18%) (Figure 10). More than half of foreign-born TB cases were 20 to 39 years of age, while the most common (28%) age group among U.S.-born cases was those 60 years of age or older. Foreign-born TB cases were more likely than those born in the U.S. to have extra-pulmonary sites of disease (42% vs. 33%, respectively). Other less frequent risk factors among TB cases in Minnesota included HIV infection (4%), homelessness (3%), incarceration in a correctional facility (2%), and residence in a nursing home (2%).

The increasing incidence of drug-resistant TB is a critical public health and clinical concern globally. In 2000, Minnesota reported 37 (26%) cases of drug-resistant TB among the 140 culture-confirmed cases for whom drug susceptibility results were available, including 23 (16%) cases resistant to isoniazid and one (1%) case of multi-drug resistant (MDR) disease resistant to isoniazid, rifampin, pyrazinamide, and streptomycin. Compared to data from the past 5 years, these figures represent an increase in both overall drug resistance and INH-resistance. However, the specific drug which showed the largest increase in resistance was streptomycin (17% of cases were resistant), which is the least commonly used of the five first-line anti-TB medications. Foreign-born TB

patients in Minnesota are approximately three times more likely than those born in the U.S. to have drug-resistant disease (Table 6). Of 37 persons with drug-resistant TB disease reported in 2000, 34 (92%) were born outside the U.S., including the case of MDR-TB. These cases likely represented primary drug resistance acquired overseas rather than secondary resistance resulting from nonadherence to prescribed therapy. Current national guidelines recommend initial four-drug therapy for all TB cases in areas where the prevalence of INH resistance is 4% or greater. Twelve percent of all TB cases reported in Minnesota from 1996 to 2000 were resistant to at least INH; therefore, all TB cases in Minnesota initially should receive four-drug therapy until drug sensitivities are known.

More detailed TB surveillance data and other TB-related resources are available on the MDH web site (<http://www.health.state.mn.us/tb>).

Unexplained Critical Illnesses and Deaths of Possible Infectious Etiology

Surveillance for unexplained critical illnesses and deaths of possible infectious etiology in Minnesota began in September 1995 as part of the EIP. Original eligibility criteria for the project specified that cases must be Minnesota residents between the ages of 1 and 49 years who were previously healthy with no chronic medical conditions (e.g., diabetes) and had critical illnesses or died due to illnesses suggestive of infectious etiology. During 2000, the CDC revised the protocol for the project. In future years, only deaths among persons 1 to 39 years of age will be eligible for enrollment in the core surveillance project. However, MDH requests that any case of unexplained critical illness or death that appears to have a possible infectious cause be reported regardless of age and underlying conditions. A subset of reported cases will continue to be eligible for testing at CDC. Also, some testing may be available through CDC and/or MDH at the physician's request for cases that are not eligible for enrollment in the project.

Seventeen possible cases were reported in 2000. The patients' health care providers subsequently determined causes of illness for six of these

cases. Of the 11 remaining cases, five presented with respiratory symptoms, four with neurologic symptoms, and two with shock/sepsis. The respiratory cases were 20, 24, 40 (two patients), and 55 years of age. The neurologic cases were 21, 27, 40, and 46 years of age, and the sepsis cases were 19 and 25 years of age. Two patients with respiratory syndromes (a 20-year-old and a 40-year-old) and two patients with neurologic syndromes (a 27-year-old and a 46-year-old) died. Three respiratory cases, three neurologic cases, and one sepsis case resided in the seven-county Twin Cities metropolitan area; the remaining cases resided in greater Minnesota.

The four case-patients who died were eligible for inclusion in the project. The two case-patients over the age of 39 years died before changes in the protocol took effect. Laboratory specimens for all except the 27-year-old neurologic case have been submitted to CDC. Possible etiologies for two cases have been determined through the project since it began. Using universal primers for polymerase chain reaction, *Streptococcus pneumoniae* was detected in pleural fluid of a case-patient with a respiratory syndrome. Influenza A was detected by immunohistochemistry of lung tissue of a case-patient diagnosed with myocarditis.

Viral Hepatitis A

In 2000, 197 cases of hepatitis A (4 per 100,000 population) were reported. One hundred thirty-one (66%) cases were residents of the seven-county metropolitan area, with 100 (51%) residing in Hennepin or Ramsey Counties. Over half (57%) of the cases were male. Of the 189 cases for whom race was known, 144 (76%) were white, 33 (17%) were black, six (3%) were Asian, three (2%) were American Indian, and three (2%) reported some other race(s). Although the greatest number of cases were white, incidence rates were higher among blacks (19 cases per 100,000), American Indians (6 per 100,000), and Asians (4 per 100,000) than among whites (3 per 100,000). Hispanic ethnicity, which can be any race, was reported for 16 cases (11 per 100,000). Cases ranged in age from 3 months to 86 years; 65% of cases occurred among adults 20 to 64 years of age.

continued...

In 2000, 79 (40%) cases of hepatitis A were outbreak-associated. Of the five outbreaks investigated, three were common-source food-borne outbreaks, one occurred among homeless shelter residents, and one was a community outbreak. Four cases were associated with a food-borne outbreak at a private home in Washington County. A restaurant-associated outbreak in Ramsey County accounted for 38 cases, eight of whom were restaurant employees. In response to the outbreak, immune globulin (IG) was recommended for patrons. As a result, over 1,000 patrons received IG at two mass clinics conducted by the St. Paul-Ramsey County Department of Public Health. Because of the potentially large impact on transmission via food handlers, MDH recommends that food handlers be vaccinated against hepatitis A.

An outbreak in Mower County began with the infection of five family members and resulted in 13 additional cases. Two cases from the index family were food handlers. Eight hepatitis A cases (including one Hennepin County resident) were associated with a specific restaurant. Three cases were associated with child care or foster care settings. Two additional cases identified during this outbreak could not be linked to the restaurant or child/foster care. These cases may have been sporadic and identified because of heightened surveillance, or they may have had contact with asymptomatic or subclinical cases not identified during the outbreak.

An outbreak associated with homeless shelters in Hennepin County began in the summer of 1999 and continued into the spring of 2000. In 2000, seven shelter-associated infections were identified. The Hennepin County Community Health Department implemented a short-term hepatitis A prevention project in selected homeless shelters. Staff and residents 2 years of age or older were offered hepatitis A vaccine. Immunization rates of 39% (range, 32 to 46%) were achieved with one dose of hepatitis A vaccine. Since the initiation of the program, no new cases of hepatitis A have been identified among homeless shelter residents in Hennepin County.

Watonwan County experienced a

community outbreak of hepatitis A in which 12 cases were identified in the community. Two cases had a history of travel to Mexico. Nine cases were clustered among three households. The source of the household clusters could not be determined but likely was due to transmission of hepatitis A virus from subclinical or asymptomatic cases (who most often are infants or children).

Of the remaining 118 sporadic cases of hepatitis A reported in 2000, a risk factor for infection could be identified for 74 (63%). Twenty-seven (23%) cases were associated with travel, 22 of whom traveled to South America or Mexico. Twenty-five (21%) cases had known contact with another case; ten (8%) cases were men who had sex with men, and one (1%) case had consumed raw shellfish. Ten (8%) cases (including nine children and one child care provider) were associated with child care settings but were not related to any known outbreaks. Thirty-seven (31%) of the sporadic cases occurred among persons for whom hepatitis A vaccine is indicated; one case reported both travel history and being a man who had sex with men. Persons who travel to hepatitis A endemic countries and men who have sex with men should be educated about their risk and offered hepatitis A vaccine.

Viral Hepatitis B

In the year 2000, 58 cases of acute hepatitis B virus (HBV) infection were reported (1.2 per 100,000 population), with no deaths. Forty-six (79%) cases were residents of the seven-county metropolitan area, with 25 (43%) cases residing in Hennepin County. Forty-one (71%) cases were male. Thirty (52%) cases were young adults between 19 and 39 years of age. Twenty-eight (48%) cases were white, 13 (22%) were black, 10 (17%) were Asian, and one (2%) was American Indian; race was unknown for six (10%) cases. Although the majority of cases were white, incidence rates were higher among blacks (7.6 per 100,000), Asians (7.0 per 100,000), and American Indians (1.8 per 100,000) than among whites (0.6 per 100,000). Hispanic ethnicity, which can be of any race, was reported for two cases (1.4 per 100,000).

Of the 58 reported cases, 19 (33%) were patients with documented asymptomatic seroconversions,

including six (10%) perinatal infections. These six infants tested positive for hepatitis B surface antigen (HBsAg) during post-vaccination screening. All six infants began hepatitis B immunoprophylaxis (i.e., hepatitis B immune globulin and HBV vaccine) at birth and completed the three-dose vaccine series. Four of these infants were age-appropriately vaccinated with second and third doses, and two were delayed in the receipt of one or more doses of vaccine. In 2000, the MDH received post-vaccination test results for 235 infants born to HBsAg-positive mothers.

Forty-nine (84%) of the 58 reported cases of HBV infection were interviewed regarding possible modes of transmission. For 18 (37%) cases, the likely mode of transmission was sexual. Six (12%) cases were men who reported having sex with men; four (8%) cases reported heterosexual contact with a known carrier of HBsAg; six (12%) cases reported heterosexual contact with multiple partners within 6 months prior to onset of symptoms, and two (4%) cases gave recent histories of sex with an HBsAg-positive partner with undocumented sexual preference. One (2%) case used needles to inject drugs. In addition to the six perinatal cases, five (10%) cases reported non-sexual contact with an HBsAg-positive person; these cases included two children recently adopted from outside the United States. No cases were reported as a result of occupational exposure. Risk factors for acquiring HBV infection were not identified for the remaining 19 (39%) cases who were interviewed. The median age among these 19 cases and the nine cases who were unavailable for an interview was 34 years (range, 20 to 67 years) which is consistent with possible sexual transmission.

MDH recommends HBV vaccination for all children and adolescents not previously vaccinated or infected with HBV. The Minnesota School Immunization Law requires HBV immunization for all children entering kindergarten and seventh grade. The vaccine also is recommended for all adults who are at increased risk of infection. Due to the continued high rate of sexually transmitted HBV infections, health care providers are encouraged to discuss **continued...**

HBV testing and immunization with at-risk patients.

Viral Hepatitis C

In 2000, 15 cases of acute hepatitis C virus (HCV) infection were reported (0.3 per 100,000 population). Thirteen (87%) cases had clinical symptoms, and two had asymptomatic seroconversions. Five (33%) cases resided in the seven-county metropolitan area (Dakota, Hennepin, and Ramsey Counties), and 10 (67%) resided in greater Minnesota (Cass, Mahnomon, Rice, St. Louis, Wabasha, and Yellow Medicine Counties). The

median age among cases was 36 years (range, 26 to 43 years). Slightly more than half (53%) of cases were male.

Twelve (80%) cases were white; one (7%) was black; one (7%) was American Indian, and race was unknown for the one (6%) case of Hispanic ethnicity.

Among the 15 cases, seven (47%) reported using needles to inject drugs, four (27%) had sexual contact with a known HCV antibody (anti-HCV)-positive partner within 6 months prior to onset of symptoms, and one (6%) reported non-sexual contact with an anti-HCV positive person. No risk

factor was determined for three (20%) cases. No cases related to occupational exposure were reported.

More than 2,700 reports of newly identified anti-HCV positive persons were received in 2000, most of whom are chronically infected. The 15 acute cases represent less than 1% of these recently diagnosed persons. Persons who test positive for HCV also should be screened for susceptibility to hepatitis A and B infections and immunized appropriately.

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7:55 Preliminary Program

Introductory/Welcoming
Remarks

Bart W. Galle, Jr., Phillip K.
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Moderator: Michael T. Osterholm

8:00 New Developments in
Management of Urinary Tract
Infections
continued...

Walter Stamm
 8:45 **Outpatient Antibiotic Use:
 Good Stewardship**
 David N. Williams
 9:30 ***Clostridium difficile*:
 Epidemiology and New
 Approaches to Prevention and
 Therapy**
 Dale N. Gerding
 10:15 Refreshment Break
 Moderator: David N. Williams
 10:45 **What's Hot Where It's Hot:**

**Recent Developments in
 Travel Medicine**
 Jay Keystone
 11:30 **Antibiotic Pharmacokinetics:
 Clinical Applications**
 John C. Rotschafer
 12:15 Lunch
 Moderator: Phillip K. Peterson
 1:00 **Hot Topics in Emerging
 Infections in Minnesota**
 Staff - MDH
 1:45 **Current Issues in**

Immunization
 G. Scott Giebink
 2:30 **Influenza: Overview of
 Immunization and Treatment**
 Kristin L. Nichol
 3:15 Refreshment Break
 Moderator: Richard N. Danila
 3:45 **Bovine Spongiform
 Encephalopathy: What
 Does It Mean for America?**
 Michael T. Osterholm
 4:30 Adjourn

Jan K. Malcolm, Commissioner of Health

Division of Infectious Disease Epidemiology, Prevention and Control
 Harry F. Hull, M.D. Division Director & State Epidemiologist
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