

## Chapter 5

# Communicable Diseases

Disease identification, investigation, education, prevention, and surveillance are all vital to controlling the spread of communicable diseases in the community. This chapter provides summaries of the most common and important communicable diseases reported in Sonoma County. Highlights of this chapter include:

- ◆ In 2003, Sonoma County had the sixth highest cumulative incidence of AIDS among counties in California.
- ◆ Chlamydia was the most frequently reported communicable disease in 2003. Rates of both chlamydia and gonorrhea are increasing in Sonoma County.
- ◆ In 2003, 165 people newly diagnosed with chronic hepatitis C were reported in Sonoma County.
- ◆ The rate of personal belief exemptions for childhood vaccination is nearly three times higher in Sonoma County than in the state as a whole.



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**Table 5.1**  
**Reportable Communicable Diseases, Number of Cases per Year and 10-year Average, Sonoma County 1994-2003**

Disease	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	10 Year Average
AIDS	133	145	102	65	43	36	38	38	52	47	70
Amebiasis	12	12	16	4	5	3	4	5	3	3	7
Camylobacteriosis	169	147	170	164	137	118	122	129	115	112	138
Chlamydia	656	507	429	497	490	502	596	551	762	611	560
Cryptosporidiosis	1	3	4	17	10	3	3	0	1	0	4
E. coli – O157:H7	0	3	5	5	9	9	9	12	8	9	7
Giardiasis	104	124	131	68	68	60	42	64	44	41	75
Gonorrhea	85	53	45	42	34	31	61	40	85	109	59
Hepatitis A	81	106	56	39	31	24	28	27	21	30	44
Hepatitis B, Acute	20	21	18	41	15	17	8	10	5	6	16
Hepatitis B, Chronic	62	49	58	57	98	94	88	62	81	73	72
Hepatitis C, Acute	--	--	--	14	14	5	1	16	16	4	10*
Hepatitis C, Chronic	--	243	241	292	565	639	512	167	206	187	339**
Lyme Disease	3	13	15	10	17	13	9	6	5	11	10
Meningitis, Viral	8	7	13	29	19	9	12	10	16	52	18
Meningococcal Infection	2	3	8	4	10	5	5	10	4	1	5
Mumps	3	1	3	2	3	2	3	1	1	1	2
Pertussis	35	26	51	44	82	33	75	19	30	28	42
Pelvic Inflammatory Disease	100	69	75	60	35	12	21	6	10	9	40
Rubella	0	1	0	1	1	0	0	0	0	0	0
Salmonellosis	53	52	64	68	58	60	53	50	47	56	56
Shigellosis	33	44	32	38	40	20	34	21	22	16	30
P & S Syphilis	1	1	0	1	1	4	1	2	17	12	4
Tuberculosis	25	20	28	11	14	19	17	11	16	11	17

\*Seven-year average.

\*\*Nine-year average.

Sources: Automated Vital Statistics System HIV/AIDS reporting system.

Table 5.1 summarizes the most common and important communicable diseases reported in Sonoma County.<sup>1,2</sup> Although state law mandates that laboratories and health care providers report certain infectious diseases to the local health department, it is estimated that 20% to 50% of infectious disease cases go unreported.<sup>3</sup> Timely, accurate reporting is crucial to the effectiveness of control and prevention measures.

### Vaccine-preventable Diseases

Overall, reported cases of vaccine preventable diseases are at record low levels in the U.S. because of high vaccination levels in children. However, many children in Sonoma County are still not immunized and become ill from vaccine-preventable diseases, resulting in suffering, disability and increased health care costs.

In Sonoma County, pertussis (whooping cough) outbreaks

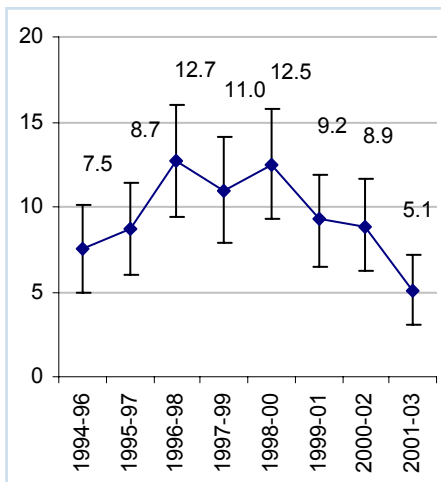
caused a sharp increase in reported cases of vaccine-preventable diseases between 1994 and 1999. These outbreaks, as well as the 1986 and 1993 measles outbreaks, primarily involved non-immunized children and adults, as well as some adults whose immunity had waned.<sup>4</sup>

### Pertussis

The high rates of pertussis (whooping cough) in the 1990s continued into the year 2000, then decreased to a lower level in the 2001-2003 period (Figure 5.1).



**Figure 5.1**  
**Rate\* of Pertussis Infections, Three-year Rolling Average, Sonoma County 1994-2003**



\*Rates are per 100,000 population.  
 Source: California Department of Health Services automated vital statistics system.

### Meningococcal Disease

Bacterial meningitis caused by *Neisseria meningitidis* can be a severe disease, with 10% to 14% of cases resulting in death.<sup>5</sup> Although all persons are susceptible to this disease, groups with increased risk include young children, and persons newly placed in group living situations, such as refugees, college freshmen, or military recruits.<sup>6</sup>

In Sonoma County between 1999 and 2004, 25 cases of meningococcal meningitis were reported. Of these, three were fatal.

### Influenza and Pneumonia

Among people who get the flu, adults age 65+, children under age

### Vaccine-preventable Diseases

- Diphtheria
- Haemophilus influenzae type b
- Hepatitis A
- Hepatitis B
- Influenza
- Measles
- Meningococcal Disease
- Mumps
- Pertussis
- Pneumococcal disease
- Polio
- Rubella
- Tetanus
- Varicella

2, those with chronic health problems, immune-compromised people, and pregnant women are more likely to develop serious and life-threatening complications, such as pneumonia.<sup>7</sup> The primary approach to reducing influenza-related deaths is annual vaccination among these groups.<sup>8</sup>

In 2004, the Centers for Disease Control and Prevention expanded the recommendation for priority influenza vaccine to also include persons age 50-64, because this group has an elevated prevalence of certain chronic medical conditions; and persons who live with or care for persons at high risk, such as

health care workers or household contacts, or persons who can transmit influenza to those persons at high risk.<sup>9</sup>

No data on the incidence of influenza or pneumonia in Sonoma County are available. Death and hospitalization data provide only a partial picture of the health problem.

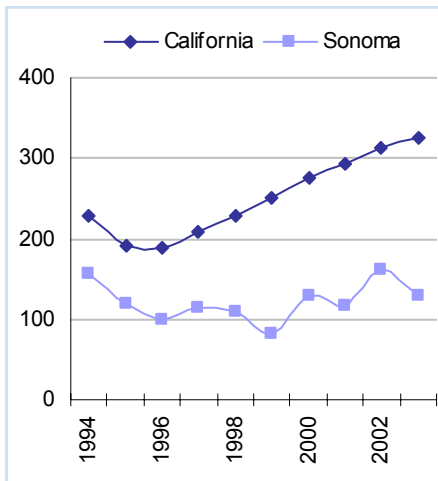
In 2003, there were 1,518 persons hospitalized in Sonoma County with a primary diagnosis of pneumonia or influenza (ICD10 J10-J18). Of these, 100 persons died, 84% of whom were age 65+.<sup>10</sup> In Sonoma County between 2000 and 2002, the age-adjusted rate of death from pneumonia and influenza was 24.1/100,000.<sup>11</sup> This is slightly lower than the California rate of 27.0/100,000. However, this difference is not statistically significant.<sup>12</sup>

### Other Vaccine Preventable Diseases

In Sonoma County:

- ◆ fewer than five cases of rubella were reported between 1994 and 2003;
- ◆ one case of mumps was reported in each year from 2001 to 2003;
- ◆ only one case of haemophilus influenzae type b (Hib) has been reported since 1995;

**Figure 5.2**  
Rate\* of Chlamydia Infections, Sonoma County and California 1994-2003



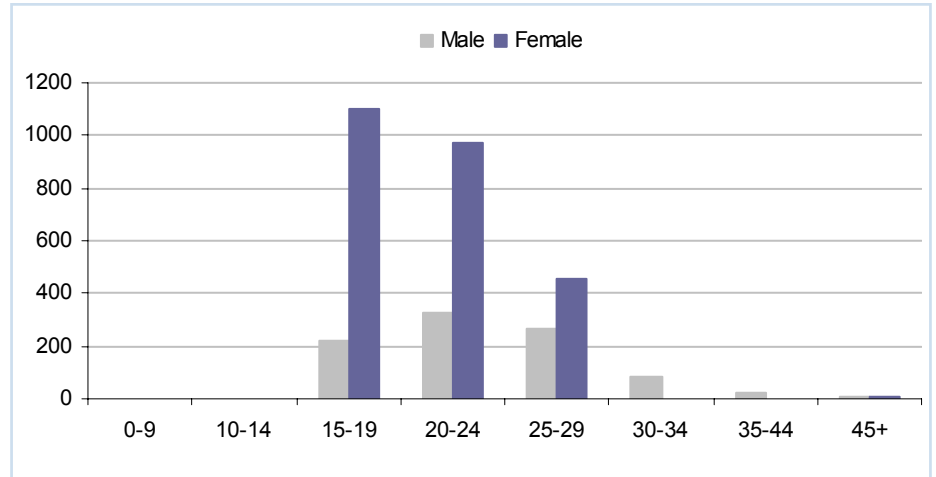
\*Rates are per 100,000 population.  
Source: California Department of Health Services automated vital statistics system.

- ◆ the most recent case of diphtheria was reported in 2000;
- ◆ the most recent case of Tetanus was reported in 2000;
- ◆ measles has not been reported since 1993; and
- ◆ polio has not been reported for over 25 years.

### Personal Belief Exemptions

California is 1 of 11 states allowing exemptions from immunization for religious or personal beliefs. In 2004, Sonoma County's personal belief exemption rate was 3.8%, three times higher than the comparable California rate.

**Figure 5.3**  
Gender and Age-specific Rate\* of Chlamydia Infections, Sonoma County 2003



\*Rates are per 100,000 population.  
Source: California Department of Health Services automated vital statistics system.

### Sexually Transmitted Diseases

Sexually transmitted diseases (STDs) include more than 25 diseases transmitted by sexual activity. Due to various behavioral, social and biological factors, STDs disproportionately affect teens and young adults, particularly females. STDs can cause infertility, can lead to complications during pregnancy and affect neonatal health, and can increase the risk of HIV transmission.

It is widely accepted that only one in four cases of diagnosed STDs are actually reported. Despite underreporting, rates of nearly all STDs are increasing in Sonoma County.

### Chlamydia

Chlamydia is the most commonly

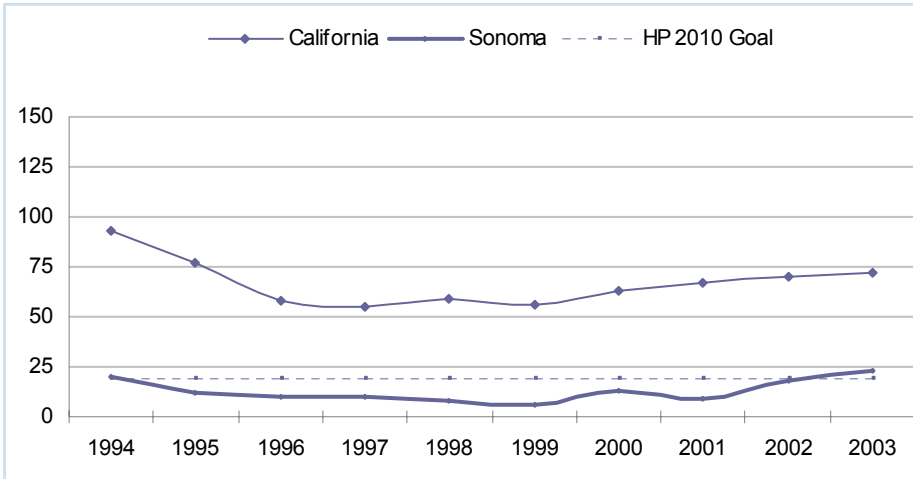
reported STD in the nation, and the most frequently reported disease in Sonoma County. Because the majority of chlamydia infections cause no symptoms, this disease is significantly under-diagnosed.

Although lower than the rate for California, it is clear that the rate of chlamydia infections is increasing in this county (Figure 5.2). In Sonoma County, the rate of infection has increased from a low in 1999 of 81/100,000 to 129/100,000 in 2003. There are several possible factors contributing to this increase, including better testing methodology and acceptance, and improved screening.<sup>13</sup>

Chlamydia is a significant problem for women of childbearing age (Figure 5.3), although these rates are skewed since the majority of screening programs are directed

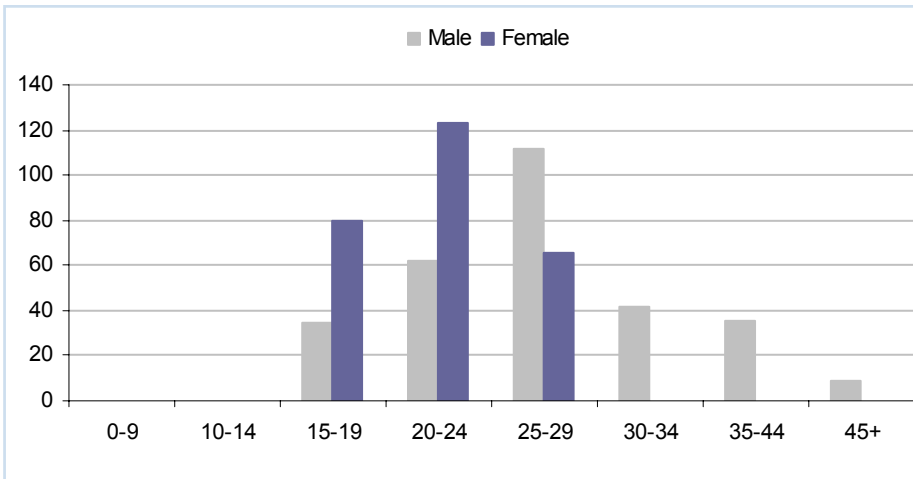


**Figure 5.4**  
Rate\* of Gonorrhea Infections, Sonoma County and California 1994-2003



\*Rates are per 100,000 population.  
Source: California Department of Health Services automated vital statistics system.

**Figure 5.5**  
Gender and Age-specific Rate\* of Gonorrhea Infections, Sonoma County 2003



\*Rates are per 100,000 population.  
Source: California Department of Health Services automated vital statistics system.

towards this group. It is likely that the rates for this disease are similar in men and women, and the rates presented for women more closely estimate the true impact of disease on both sexes. Age groups with the

highest rates are women age 15-19 (1,104/100,000) and men age 20-24 (328/100,000).

Disparities also exist in rates of chlamydia with regard to ethnicity.

In particular, the rate of disease in Hispanic women is five times higher than the rate in White, non-Hispanic women (510.0/100,000 compared to 98.6/100,000, respectively). This disparity also exists among males, with Hispanic men having a 4.5 times higher rate than White, non-Hispanic men (166.3/100,000 compared to 36.7/100,000, respectively). The data also suggests that a similar disparity exists between other racial/ethnic groups. However, the total number of cases is too small to evaluate reliably.

### Gonorrhea

Once decreasing across the nation, the incidence rate of gonorrhea in California and Sonoma County has been steadily increasing since 1999 (Figure 5.4). In 1999, the Sonoma County rate was 5.8/100,000; in 2003, the rate was almost four times higher at 23/100,000. This rate did not meet the Healthy People 2010 goal of 19/100,000.<sup>14</sup>

Gonorrhea affects young adults of both genders and is also prevalent among middle-aged men. The rates of gonorrhea are highest in women age 20-24 and men age 25-29 (Figure 5.5). Several factors contribute to the higher proportion of cases seen in men compared to women. First, the symptoms of gonorrheal infection in men are much more pronounced than in women, and most often will prompt a health care visit. Second, the incidence of this disease and

other STDs have been increasing among gay and bisexual men, thereby increasing the proportion of males with gonorrhea.<sup>15</sup>

The upward trend in gonorrhea incidence is pronounced for all groups. Between 1999 and 2003, the rate of gonorrhea in Sonoma County:

- ◆ increased in Hispanics from 8/100,000 to 44/100,000;
- ◆ increased in White, non-Hispanics from 5/100,000 to 17/100,000; and
- ◆ increased in Asian/Pacific Islanders from 0 to 10/100,000.

Untreated, gonorrhea can cause infertility (through pelvic inflammatory disease in women), proctitis and prostate scarring in men, and blood or joint infections.<sup>16</sup>

### Primary and Secondary Syphilis

From 1996 to 1998, no cases of syphilis were reported in Sonoma County, and across the US, syphilis rates were declining. Unfortunately, the nationwide decline has reversed, starting in 2000 in California and 2001 in Sonoma County. The 2003 rate of disease in Sonoma County was 2.3/100,000, significantly higher than the Healthy People 2010 goal of 0.2/100,000.<sup>17</sup>

In Sonoma County, the increase in

primary and secondary syphilis cases has primarily been in males. This trend is similar to California, where outbreaks of syphilis have occurred among men who have sex with men.<sup>18</sup> All cases reported in 2003 were in males, with the highest age-specific rate of 30/100,000 in males age 30-34 (Figure 5.6).

When separated by race and ethnicity, the upward trend in syphilis incidence appears to be concentrated in specific groups. Between 1999 and 2003, the rate of syphilis:

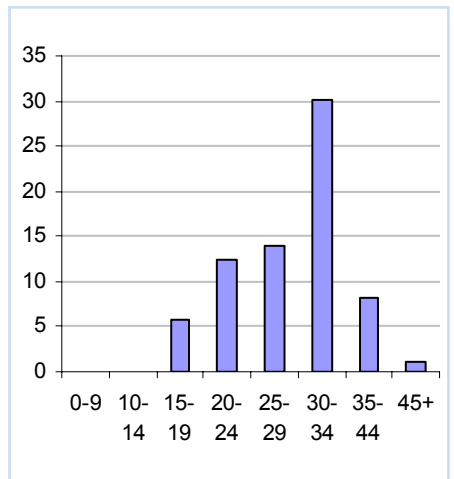
- ◆ increased in African Americans from 0 to 13/100,000;
- ◆ increased in White, non-Hispanics from 0 to 2/100,000; and
- ◆ Dipped to 0 in the year 2000, then increased to 6/100,000 in 2003 in Hispanics.

Syphilis has been targeted nationally for eradication.<sup>19</sup> This disease is easy to diagnose and cure. In addition to improving community health overall, syphilis eradication would reduce two other significant health events: increased risk of transmission of HIV and congenital syphilis.

### HIV/AIDS

Acquired Immune Deficiency Syndrome (AIDS) is a serious disease

**Figure 5.6**  
Age-specific Rate\* of Syphilis Infection in Males, Sonoma County 2003



\*Rates are per 100,000 population.  
Source: California Department of Health Services automated vital statistics system.

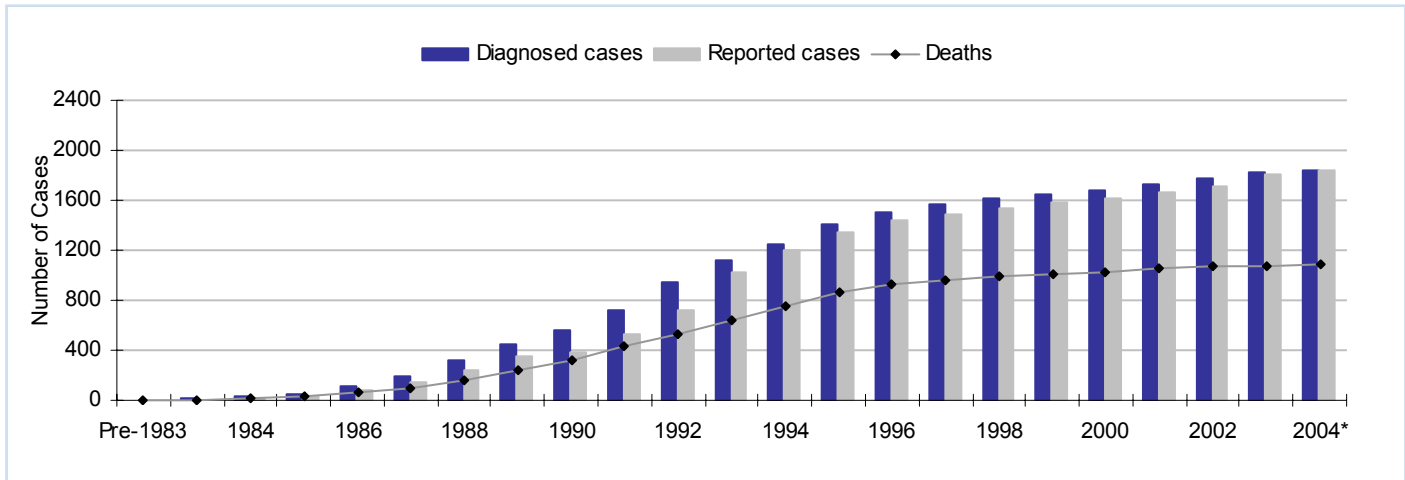
first recognized as a distinct syndrome in 1981. Infection by the Human Immunodeficiency Virus (HIV) can lead to progressive damage to the immune system and other organs, resulting in AIDS—the advanced stage of this disease.

HIV can be transmitted in two main ways: unsafe sexual practices with an infected person and the sharing of needles or syringes with an infected person. Also, women infected with HIV can transmit the virus to their babies during pregnancy or birth, and possibly through breastfeeding.<sup>20</sup>

The HIV and AIDS case information in this report reflects data from the HIV/AIDS Reporting System. This database includes only HIV and AIDS cases that were diag-



**Figure 5.7**  
**Cumulative AIDS Cases by Year Reported, Year of Diagnosis, and Year of Death, Sonoma County 1981 through June 2004**



Source: Sonoma County Department of Health Services annual report "Epidemiology of HIV/AIDS in Sonoma County," June 2004.

nosed in Sonoma County. Those people living with HIV/AIDS that currently live in Sonoma County but were diagnosed with HIV or AIDS in another county are not included in the tables and graphs in this report.

**The Epidemic: Overview**

As of June 30, 2004, a total of 1,840 cases of AIDS have been diagnosed in Sonoma County (Figure 5.7).<sup>21</sup> Of these, a total of 1,081 AIDS patients have died, giving Sonoma County a case fatality ratio of 59%.

Although advances in treatment have occurred, there is still no cure, and AIDS and HIV still have a significant presence in the County. Sonoma County had the sixth highest cumulative incidence of AIDS cases diagnosed and reported among the 58 counties in California, and the fifth highest cumulative

incidence of HIV.

A slight increase in the annual number of new AIDS cases has occurred over the past four years. There are at least 759 persons living with AIDS in Sonoma County and an additional 396 persons are living with HIV, bringing the total population living with this disease to well over 1,100 residents. Due to limitation in data collection, this number is not a true reflection of the local burden of HIV and AIDS, and only represents persons diagnosed with HIV or AIDS in Sonoma County. It is estimated that at the end of 2004, there were actually between 1,833 and 2,090 persons living with HIV or AIDS in Sonoma County.

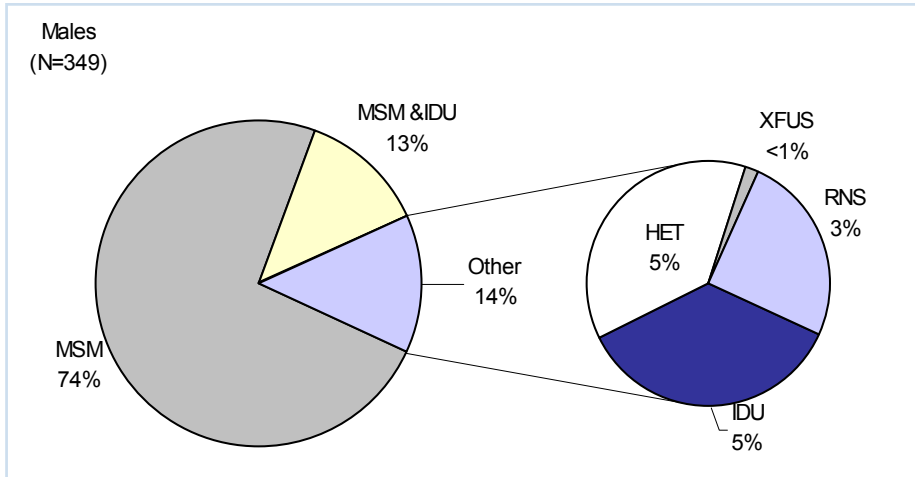
The HIV epidemic is dynamic and changing. In recent years, several

**Table 5.2**  
**Risk Factor Classifications for HIV and AIDS**

Classification	Definition
MSM	Men who have sex with men
IDU	Injection drug users
MSM IDU	Men who have sex with men and also inject drugs
HET	Heterosexual exposure
HEM	Hemophilia/coagulation disorder
XFUS	Receipt of blood transfusion, blood components or tissue
RNS	Risk not specified

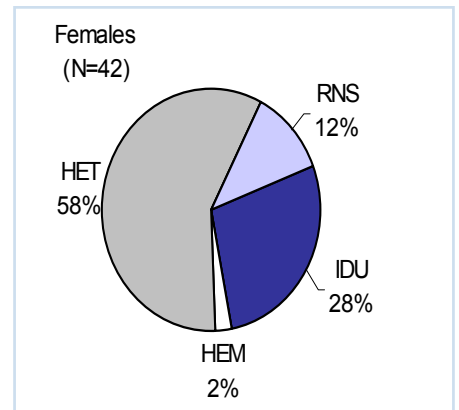
Source: Sonoma County Department of Health Services annual report "Epidemiology of HIV/AIDS in Sonoma County," June 2004.

**Figure 5.8**  
**Male HIV Cases by Exposure Category, Sonoma County 1981-2003**



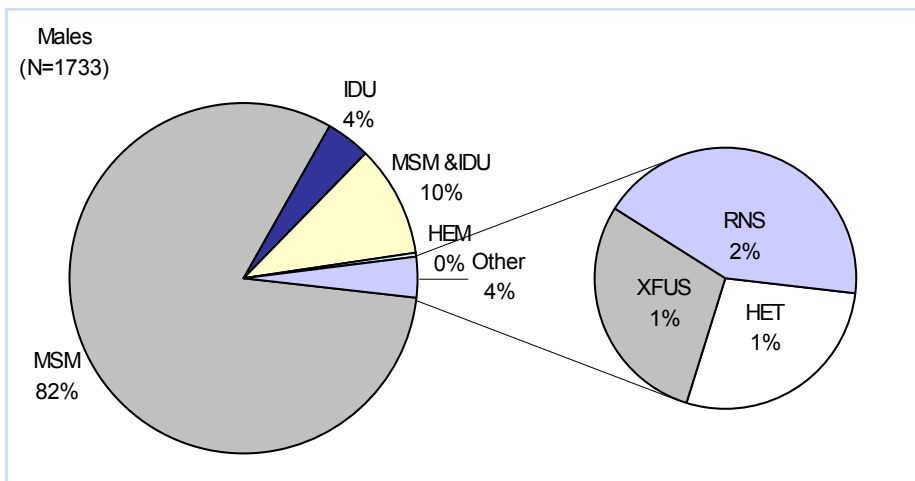
Source: Sonoma County Department of Health Services annual report "Epidemiology of HIV/AIDS in Sonoma County," June 2004.

**Figure 5.9**  
**Female HIV Cases by Exposure Category, Sonoma County 1981-2003**



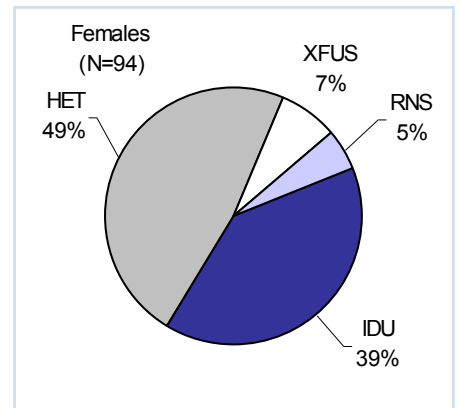
Source: Sonoma County Department of Health Services annual report "Epidemiology of HIV/AIDS in Sonoma County," June 2004.

**Figure 5.10**  
**Male AIDS Cases by Exposure Category, Sonoma County 1982-June 2004**



Source: Sonoma County Department of Health Services annual report "Epidemiology of HIV/AIDS in Sonoma County," June 2004.

**Figure 5.11**  
**Female AIDS Cases by Exposure Category, Sonoma County 1982-June 2004**



Source: Sonoma County Department of Health Services annual report "Epidemiology of HIV/AIDS in Sonoma County," June 2004.



important shifts have occurred.

The proportion of new AIDS cases among women increased, rising from 2.7% in 2000 to 14% in 2003. Similarly, the proportion of new HIV cases among women also grew, from 7.7% in 2000 to 18.4% in 2003.

The proportionate distribution of cases by race and ethnicity has also changed. Among new AIDS cases, persons reporting Hispanic ethnicity increased from 4% in 1993 to 24% in 2003. Persons reporting White race, non-Hispanic ethnicity decreased from 94% in 2003 to 64% in 2003.

For both HIV and AIDS, shifts have occurred in the prevalence of reported risk factors. For example, there was a notable increase in the proportion of new cases reporting heterosexual sex as a primary risk factor (AIDS, 5.6% in 1999 and 18% in 2003; HIV 9% in 1999 and 24% in 2003).

### Risk Factors for HIV

Men who have sex with men (MSM) is the most common classification of self-reported risk factor for HIV infection in males at 74% (Figure 5.8).

Men who have sex with men and also inject drugs (MSM IDU) is the second most common risk factor at 13%. For HIV, heterosexual exposure (HET) and injection drug users (IDU) account for 5% of reported

risk factors.

Other/risk not specified (RNS) accounts for 3% of HIV cases, and receipt of blood transfusion, blood components or tissue (XFUS) accounts for <1%.

For HIV in females, heterosexual exposure (HET) is the leading risk factor at 58% (Figure 5.9). Injection drug use is the second highest risk factor at 28%.

Hemophilia/coagulation disorder as a risk factor accounts for 2% of HIV cases.

### Risk Factors for AIDS

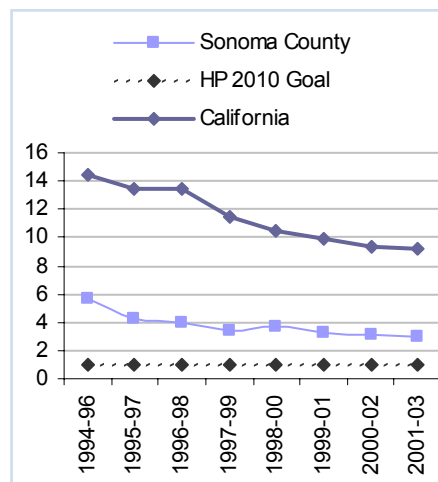
Of the total number of AIDS cases in Sonoma County since 1982, 82% of the males reported having sex with other men as the primary risk factor (Figure 5.10).

The next highest percentage of males with AIDS (10%) reported having sex with other men and also injection drug use as the primary risk factor. Injection drug use was reported as the primary risk factor in 4% of all male cases.

The remaining four risk factors (HEM, HET, XFUS and RNS) together accounted for only 4% of AIDS cases in Sonoma County.

AIDS risk factors for females are different from males. Unlike males, where 1% of all cases report heterosexual exposure (HET), 49% of the female cases report this activity as

**Figure 5.12**  
Rate\* of Tuberculosis Infection, Three-year Rolling Average, Sonoma County and California 1994-2003



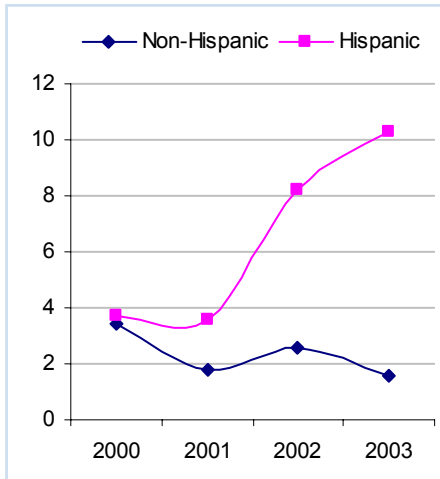
\*Rates are per 100,000 population.  
Source: California Department of Health Services automated vital statistics system.

their primary risk factor (Figure 5.11). The second greatest risk factor for females was injection drug use (IDU), at 39%, compared to 4% for males.

### Tuberculosis

California continues to have the second highest rate of tuberculosis (TB) in the nation.<sup>22</sup> Sonoma County is ranked 34th among counties in California, with a rate of 3.3/100,000 in 2003.<sup>23</sup> The number of new TB cases per year has decreased in Sonoma County, consistent with the statewide decline (Figure 5.12). Although the numbers are decreasing, Sonoma County has not yet met the Healthy People 2010 goal of 1.0/100,000.<sup>24</sup>

**Figure 5.13**  
Rates\* of Tuberculosis, Sonoma County  
2000-2003



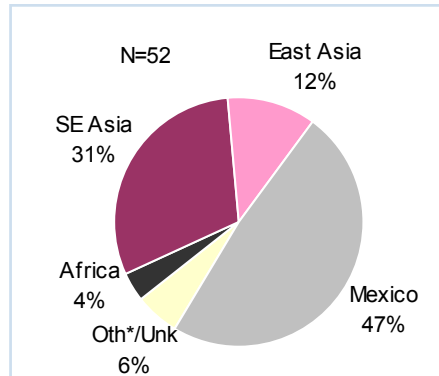
\*Rates are per 100,000 population.  
Source: California Department of Health Services TB Control Branch.

People at higher risk for TB include immigrants from parts of the world where TB is still widespread, people with HIV infections, the homeless, the elderly and close contacts of people with infectious TB. Persons who report Asian race or Hispanic ethnicity account for more cases of TB than expected, particularly among recent immigrants, perhaps reflecting higher TB rates in their countries of origin.

In 2003, 60% of TB cases reported Hispanic ethnicity and 7% reported Asian race. Compared to the 2003 Sonoma County population, in which 18% are Hispanic and 4% are Asian, these groups are disproportionately affected by TB.<sup>25</sup>

During the four-year period of 2000-2003, the average rate of TB

**Figure 5.14**  
Country of Origin, Foreign-born TB cases,  
Sonoma County 2000-2004



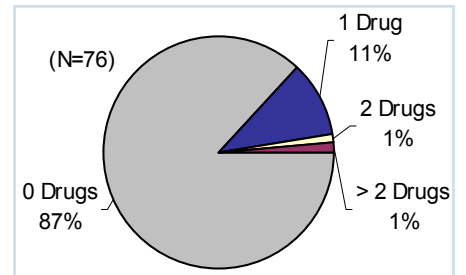
\* Other/Unknown includes one case each from Haiti and India, and one not specified.  
Source: State of California Department of Health Services, TB Control Branch.

among Asians remained consistently high (23/100,000). The average rate of TB in persons reporting Hispanic ethnicity increased from 3.7/100,000 to 10.3/100,000 during the same time period (Figure 5.13).

In 2003, 75% of all reported tuberculosis cases in California occurred in persons born outside of the United States.<sup>26</sup> In Sonoma County, foreign-born persons accounted for 67% of cases in 2003, and 76% of cases in 2004. The most common country of origin between 2000 and 2003 was Mexico (47%), followed by countries in southeast Asia (31%) (Figure 5.14).

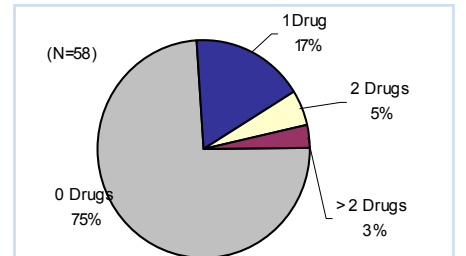
Single and multiple drug-resistant TB strains continue to be an emerging problem in Sonoma County. The proportion of cases with TB resistance to one or more drugs increased from 19% between 1995

**Figure 5.15**  
Distribution of Antibiotic Resistance  
among Resistant Isolates, Sonoma  
County 1995-1999



Source: California Department of Health Services automated vital statistics system.

**Figure 5.16**  
Distribution of Antibiotic Resistance  
among Resistant Isolates, Sonoma  
County 2000-2004

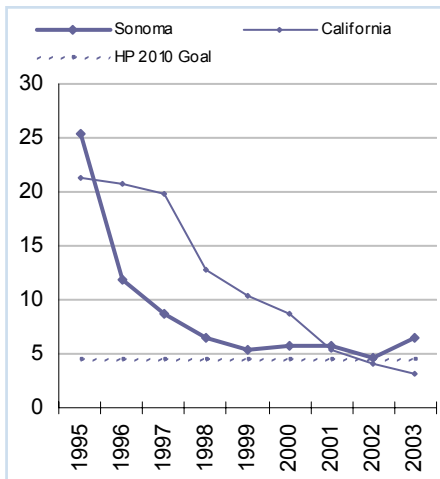


Source: California Department of Health Services automated vital statistics system.

and 1999, to 23% between 2000 and 2004. In addition, the proportion of isolates resistant to two or more drugs increased from 4% between 1995 and 1999 (Figure 5.15) to 6% between 2000 and 2004 (Figure 5.16). There have been three multi-drug resistant cases (isolates resistant to Isoniazid and Rifampin) in Sonoma County, one each in 1994, 2002, and 2003.



**Figure 5.17**  
**Rate\* of Hepatitis A Infections, Sonoma County and California 1995-2003**



\*Rates are per 100,000 population.  
Source: California Department of Health Services automated vital statistics system.

## Hepatitis

There are several strains of viral hepatitis, the most common of which are A, B and C strains. Hepatitis B and C have both acute and chronic phases of illness, while hepatitis A is always acute. Hepatitis B-chronic and hepatitis C-chronic viruses can lead to liver disease and other serious health problems. Vaccines are available for both hepatitis A and B, but there is no vaccine for hepatitis C.

### Hepatitis A

Hepatitis A is commonly associated with improper food handling or other food contamination, such as fecal-oral transmission. Between 1999 and 2003, an average of 26 cases of hepatitis A were reported

in Sonoma County. In 2003, the rate of hepatitis A was 6.5/100,000, which was higher than the Healthy People 2010 goal of 4.5/100,000.<sup>27</sup> The rate of hepatitis A has significantly decreased over the past 10 years in both California and Sonoma County (Figure 5.17). To reduce individual risk for hepatitis A, a vaccine is available. The vaccine is recommended for certain high-risk groups, including close household and sexual contacts of infected persons, persons traveling to certain countries with high prevalence of Hepatitis A, injection drug users and men who have sex with men.<sup>28</sup>

### Hepatitis B

An acute infection with hepatitis B, a blood borne pathogen, can become chronic, resulting in death from cirrhosis or liver cancer. Hepatitis B is associated with sexual activity and injection drug use.<sup>29</sup> In the early 1990s, the Centers for Disease Control and Prevention added the hepatitis B vaccine to its recommended childhood immunization schedule, and recommended the vaccine for individuals at high risk of hepatitis B.

In Sonoma County, the rate of reported acute hepatitis B infections fell from 5.4/100,000 in 1995 to 1.9/100,000 in 2003. Between 1995 and 2003, an average of 71 cases of chronic hepatitis B infection were reported each year, giving an approximate rate of 15/100,000 per year.

### Hepatitis C

Hepatitis C is called the “silent killer,” staying undiagnosed for many years because its symptoms are not readily apparent. A large percentage of people (between 75% and 80%) with acute hepatitis C eventually acquire chronic liver disease, and 1% to 5% of these may die from liver cancer or cirrhosis.<sup>30</sup> Hepatitis C-associated chronic liver disease is the leading cause of liver transplantation in the nation.<sup>31</sup>

Hepatitis C infection is most prevalent among people with high levels or repeated direct exposure to blood or blood products. Primarily, Hepatitis C infection is seen in injection drug users, long-term hemodialysis patients, individuals with high-risk sexual practices, and health care workers (occupational exposure). It remains controversial whether or not hepatitis C can also be transmitted via inhalant drug use. The disease is easier to contract via injection drug use than HIV, and it is present in more than 75% of injection drug users nationwide.<sup>32</sup>

In 2003, there were 165 cases of newly diagnosed chronic hepatitis C reported in Sonoma County. Of these, 52% were male, and 67% were age 30-49.

In 2003, 1,437 persons were tested for hepatitis C at publicly funded HIV and hepatitis C testing sites. In this high-risk population, 234 persons (16.3%) tested positive. This percentage overestimates the hepa-

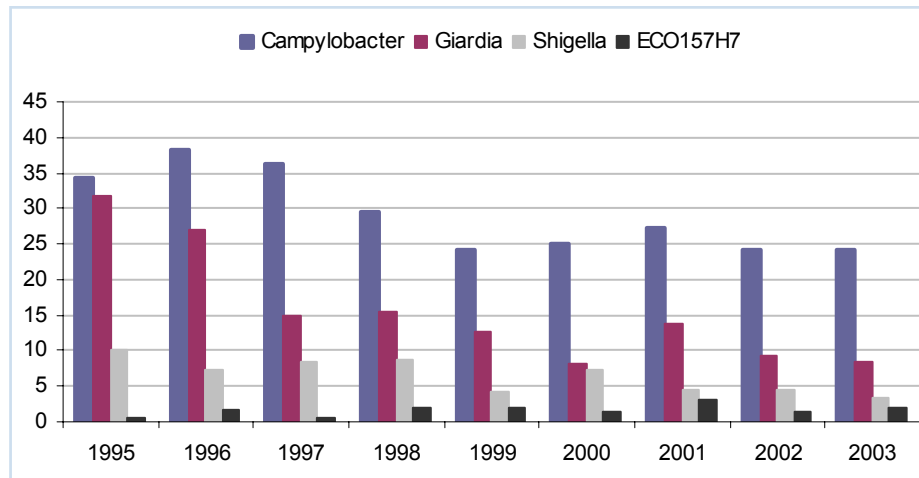
titis C prevalence in the general population, but likely underestimates the prevalence in high-risk groups, such as intravenous drug users, since it does not include people who had previously been diagnosed with hepatitis C, and may include duplicate entries from persons who test multiple times.<sup>33</sup>

## Gastrointestinal Infections

Gastrointestinal infections are commonly associated with handling and eating raw, undercooked or unpasteurized foods contaminated with bacteria or viruses. Proper personal hygiene, such as frequent hand washing, and careful food handling and storage, such as keeping foods at appropriate temperatures, can help reduce the rate of person-to-person and person-to-food-to-person transmission.<sup>34</sup>

While all persons are at risk, those most likely to suffer severe complications from intestinal infections include the elderly, immune-compromised individuals, newborns and pregnant women.<sup>35</sup> In addition, infant and toddlers in day care settings, where fecal-oral transmission can be common, are at risk for outbreaks of intestinal infections. Exclusion of infected infants/toddlers from day care settings is often necessary to control the spread of illness. Pet reptiles are also a significant source of salmonella infection and pose a risk to children and immune-compromised adults.<sup>36</sup>

**Figure 5.18**  
Trends\* in Selected Gastrointestinal Infections, Sonoma County 1995-2003



\*Rates are per 100,000 population.

Source: California Department of Health Services automated vital statistics system.

Many gastrointestinal infections go unreported because symptoms are not severe enough for a person to seek medical treatment. Symptoms of intestinal infections range from mild to severe, and in some cases may lead to hospitalization or death.

Over the past 9 years, the incidence of salmonellosis has remained fairly constant, with approximately 56 cases reported each year. This infection is the third most commonly reported intestinal infection, with an average rate of 12/100,000 between 1995 and 2003, consistently higher than the Healthy People 2010 goal of 6.8/100,000.<sup>37</sup>

Among the most severe of gastrointestinal infections are *E. coli* O157:H7, shigellosis, and salmonellosis. The number of reported *E. coli* O157:H7 (the most virulent strain of

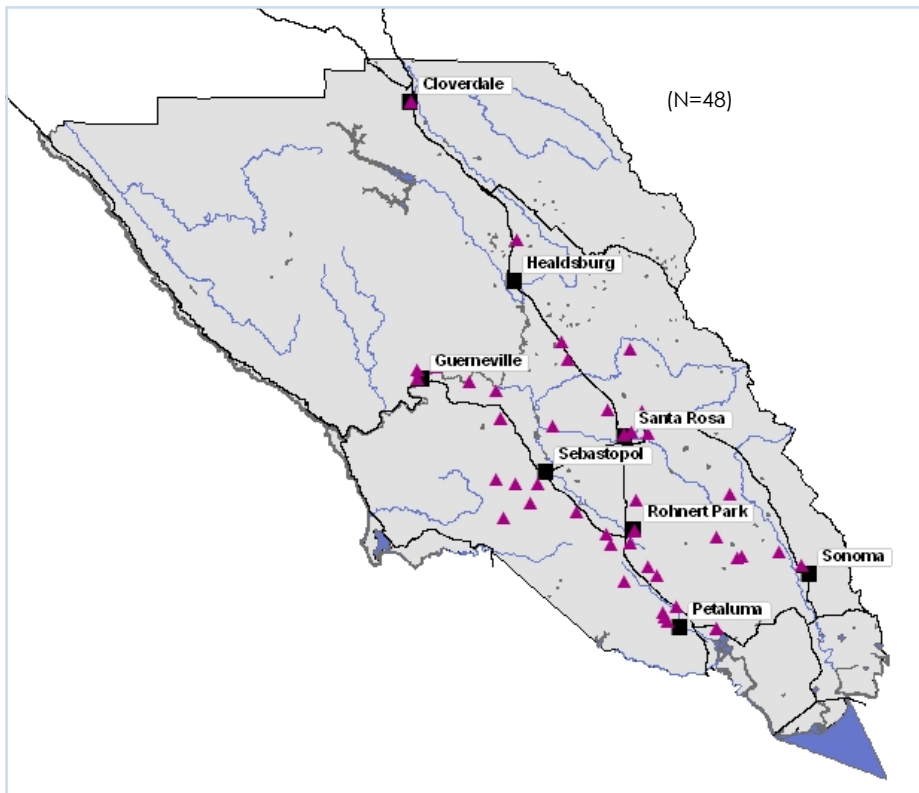
*E. coli*) cases have slowly increased in Sonoma County (Figure 5.18), surpassing the Healthy People 2010 goal of 1.0/100,000.<sup>38</sup> The number of reported shigella infections has decreased, dropping from 10/100,000 in 1995 to 3/100,000 in 2003.

While less severe, campylobacter infection was the most frequently reported gastrointestinal illness in 2003 in Sonoma County. The rate of infection, however, has decreased from 34/100,000 in 1995 to 24/100,000 in 2003, but is still twice as high as the Healthy People 2010 target for campylobacter (12.3/100,000).<sup>39</sup>

Giardiasis, a parasitic disease, was the second most commonly reported intestinal infection in 2003. Since 1995, the rate of giardia infections has decreased by 75%, from



**Figure 5.19**  
Locations of Birds Found Positive for West Nile Virus, Sonoma County July-October 2004



Source: Marin/Sonoma Mosquito & Vector Control District.

32/100,000 to 8/100,000 in 2003.

Another significant source of gastrointestinal illness is norovirus infection. While not a reportable illness, norovirus has been linked to at least five outbreaks of gastroenteritis in Sonoma County since 2002.

### Vector-borne Diseases

Vector-borne diseases are contracted through exposure to infected insects, such as ticks or mosquitoes, or animals, such as bats or

raccoons.

### Tick-borne Disease

One case each of Rocky Mountain Spotted Fever (local exposure) and tick-borne relapsing fever (out-of-county exposure) were reported in Sonoma County in 2003.<sup>40</sup>

Between 2001 and 2003, an average of 1.4% of ticks submitted for testing at the Sonoma County Public Health Laboratory were infected with *Borrelia burgdorferi*, the bacteria that causes Lyme disease in hu-

mans. In 2003, 9 human cases of Lyme disease were reported.

### Rabies

From 2001 to 2003, the Sonoma County Public Health Laboratory tested 486 animals for rabies. Of these, two bats tested positive. No human rabies cases have been reported in Sonoma County since 1935 when rabies cases were first tracked by the County.

For information on other vector-borne diseases see chapter 12.

### West Nile Virus


In 2004, West Nile virus was first detected in Sonoma County in both birds and mosquitoes (Figure 5.19). In California, 828 human infections were reported in 23 counties, with the majority of infections in the southern half of the state. It is expected that in 2005, the number of human infections in northern California will increase as the virus continues to spread through the western region of the nation. As of 2004, no cases have been reported in humans in Sonoma County.




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