



Communicable & Infectious Diseases

Between 2000 and 2004, communicable and infectious diseases were the 4th leading causes of death among Kansas City residents. There is no good estimate of the number of individuals who contract such diseases through the year or the number of days of disability (eg, missed days of work or school). And, the economic impact of communicable and infectious diseases also is unknown in most cases.

Since exposure to various communicable and infectious diseases is universal, it was not surprising that Kansas City residents recognize the importance of protecting the community against such diseases. The data in Table 100 shows the responses of residents to a 2004 survey commissioned by the Kansas City Health Department.⁴⁰⁷

Table 100 Responses of 1,215 residents regarding the importance of various public health services, Kansas City, MO, 2003

Public health service	Very important	Somewhat important
Preventing the spread of infectious diseases	90.1%	8.6%
Protecting the public from new health threats	84.9%	11.9%
Protecting against food poisoning	82.5%	13.7%
Assessing and monitoring diseases	77.0%	17.7%

In 2006, the Kansas City Health Department again commissioned a survey of City residents and inquired about satisfaction with its services.⁴⁰⁸ From that survey 67.1% of 1,234 respondents were satisfied with how the Health Department prevents the spread of infectious diseases in the community and only 6.2% were dissatisfied. And, 65% were satisfied with how the Health Department protects the public from new health threats; 9% were dissatisfied. When asked which services should receive the most emphasis, 80.6% ranked the prevention of infectious diseases as the service the most important and 78.4% ranked the protection of the public as the second most important service.

⁴⁰⁷ Kansas City Health Department. 2004 Health Assessment Survey. www.kcmo.org/health.

⁴⁰⁸ Kansas City Health Department. 2006 Health Planning and Assessment Survey. www.kcmo.org/health.



There is a list of reportable diseases and conditions that legally mandates the reporting of selected diseases to the Kansas City Health Department. That list can be accessed on the Health Department's web site, <http://www.kcmo.org/health>. Although physicians and laboratories are required to file these reports, the completeness of reporting is highly variable for each disease. In Kansas City, laboratory reporting is more complete and timely than physician reporting. Table 101 lists, by year, the number of cases and the case rates per 100,000 population for a select number of reportable infectious and communicable diseases in Kansas City for the time period 2001-2005; a more comprehensive listing can be found in the Health Department's annual report located on the web site. The annual case counts for most diseases listed in Table 101 represent what is termed 'endemic' or normal levels for the community. While some diseases have exhibited a downward trend, eg hepatitis A, others have remained relatively stable, eg, gonorrhea, and others have increases, eg chlamydia. Many factors contribute to increases or decreases in the number of cases in the community.

The Centers for Disease Control and Prevention (CDC) have established Yr 2010 objectives for various infectious and communicable diseases. These rates have more relevance at the state level than at the level of cities. For some diseases, Kansas City is already below the national target level while for others it is doubtful that the City can ever reach the Yr 2010 objective (Table 102). Gonorrhea in Kansas City is a good example of an objective that probably will not be met.

SEXUALLY TRANSMITTED DISEASES

Over the 1990s, and particularly in the last 5 years, the incidence of certain sexually transmitted diseases had been declining in Kansas City. While it is tempting to attribute those declines to education and concern about HIV, it is impossible to prove. For example, the number of primary and secondary (P&S) syphilis cases actually increased significantly during the late 1980's through the mid-1990s, while the cases of both gonorrhea and HIV were declining.

Among sexually transmitted diseases, reported gonorrhea cases have averaged 2,369 between 2001 and 2005 which is less than half the 5,000-7,000 cases per year reported through the 1980s. There

COMMUNICABLE & INFECTIOUS DISEASES



Public Health
Prevent. Promote. Protect.

Kansas City, MO, Health Dept.

were 2,420 cases among residents in 2005. In 2004, the last year for which national statistics are available, Missouri ranked 10th in the incidence of gonorrhea, while St Louis City was 1st and Kansas City was 5th among the major cities nationwide. Fifty-seven percent of the gonorrhea cases in the state were reported from the two cities.

Meanwhile, cases of chlamydia infections increased from 2,209 in 2001 to 4,215 in 2005. This increase was associated with increased testing and reporting levels in the community rather than any actual increase in infections. As with gonorrhea, Missouri ranked high among the states (10th) in the incidence of chlamydia, with St Louis City ranking 2nd and Kansas City 6th among the major cities. Forty-three percent of the reported chlamydia cases in Missouri came from St Louis City and Kansas City.

Based on the national data for 2004, Missouri ranked 25th among states for reported cases of P&S syphilis, while St Louis City ranked 5th and Kansas City 29th. Again, the two cities reported the majority of P&S syphilis cases statewide, 73%. While P&S syphilis cases do not include all reported cases of syphilis in a community, they represent the best indicator of recent transmission patterns.

Another important indicator related to syphilis is the occurrence of cases of congenital syphilis. Between 2001 and 2005, Kansas City recorded only 1 case of congenital syphilis in 2003.



Table 101 Cases and rates per 100,000 population* for selected infectious and communicable diseases, Kansas City, MO

Disease	2005		2004		2003		2002		2001	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Campylobacter	36	8.2	32	7.2	25	5.7	31	7.0	39	8.8
Chlamydia	4,215	954.6	4,385	993.1	3,695	836.8	2,951	668.3	2,209	500.3
Cryptosporidium	6	1.4	7	1.6	10	2.3	4	0.9	8	1.8
<i>Escherichia coli</i> O157:H7	2	0.4	2	0.4	7	1.6	1	0.2	3	0.7
Gonorrhea	2,420	548.1	2,567	581.4	2,356	533.6	2,491	564.2	2,010	443.0
Hepatitis A	3	0.7	1	0.2	14	3.2	7	1.6	23	5.2
Hepatitis B	39	8.8	15	3.4	167	37.8	131	29.7	113	25.6
Hepatitis C	279	63.2	223	50.5	631	142.9	626	141.8	691	156.5
HIV	117	26.5	122	27.6	112	25.4	113	25.6	130	29.4
Influenza	820	185.7	141	31.9	1,129	255.7	383	86.7	87	19.7
Legionellosis	6	1.4	1	0.2	2	0.4	2	0.4	2	0.4
Meningitis, meningococcal	5	1.1	1	0.2	2	0.4	4	0.9	2	0.4
Meningitis, other bacterial	2	0.4	1	0.2	3	0.7	6	1.4	7	1.6
Pertussis	29	6.6	40	9.0	9	2.0	5	1.1	4	0.9
Salmonellosis	46	10.4	34	7.7	35	7.9	28	6.3	38	8.6
Shigellosis	349	79.0	11	2.5	9	2.0	6	1.4	16	3.6
Syphilis, P&S	61	13.8	23	5.2	16	3.6	7	1.6	5	1.1
Tuberculosis	24	5.4	21	4.7	26	5.9	28	6.3	32	7.2
West Nile	1	0.2	8	1.8	8	1.8	5	1.1		
Yersiniosis	0	-	0	-	0	-	3	0.7	4	0.9

*Population for rate calculations based on estimated population of 441,545 from the Yr 2000 census data .



Table 102 Infection rates in Kansas City and Yr 2010 national objectives

Disease	Ave. Rate for 2001-2005	Yr 2010 Objective
Campylobacter	7.4	12.3
<i>Escherichia coli</i> O157:H7	0.7	1.0
Gonorrhea	534.1	19.0
Hepatitis A	2.2	4.5
Listeriosis	0.0	0.25
Meningitis, meningococcal	0.6	1.0
Salmonellosis	8.2	6.8
Syphilis, primary & secondary	5.1	0.2
Tuberculosis	5.9	1.0

HIV INFECTIONS

The effectiveness of current therapies in controlling the progression of HIV infection towards death and in reducing hospitalizations from the disease is reflected in Figures 100 and 101. The distribution, by sex and race/ethnicity, of the 3,922 cases reported in Kansas City since 1981 is shown in Figure 102. HIV remains largely a disease of men-who-have-sex-with-men.

Figure 100 Age-adjusted death rates per 100,000 population due to HIV in Kansas City, MO

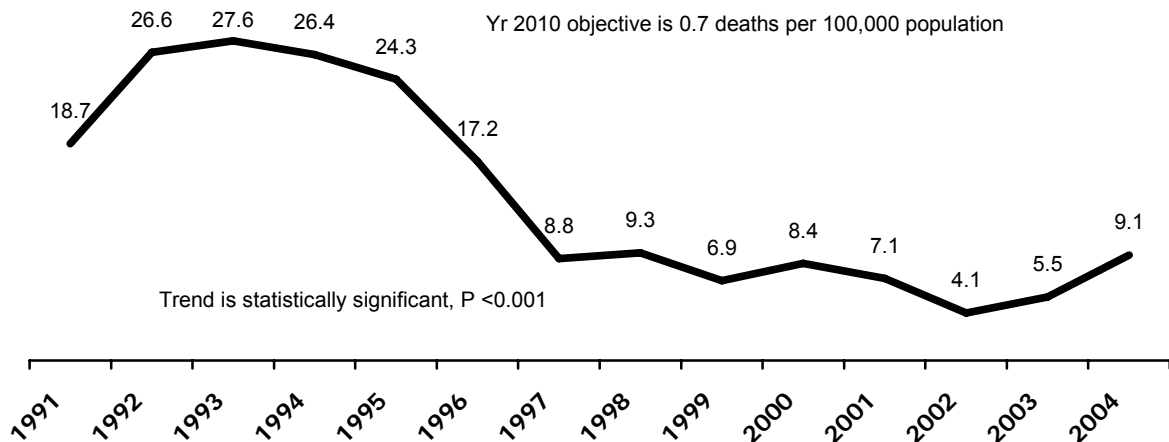




Figure 101 Age-adjusted per 100,000 population hospitalization rates for HIV infections, Kansas City, MO

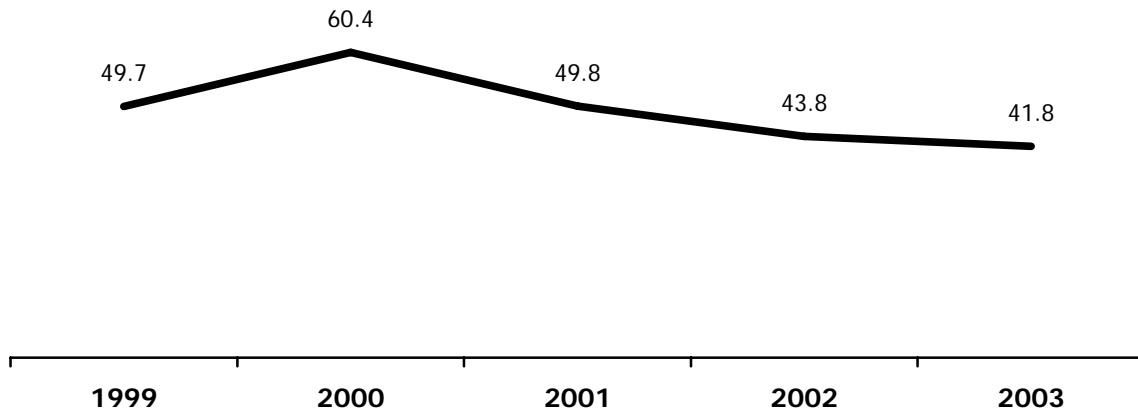


Figure 102 HIV diagnosis by race and sex in Kansas City, MO





VACCINE PREVENTABLE DISEASES

Only a few vaccine-preventable diseases still are of concern in Kansas City. One of these is influenza. With the ageing of the population, national estimates for influenza-related deaths have been revised upward. It is now believed that this vaccine preventable disease kills 36,000 Americans in mild flu seasons and between 50,000 and 70,000 in bad years.⁴⁰⁹ In Kansas City, influenza and pneumococcal pneumonia infections are still too common each year (Table 103 and Figure 103), but getting adults vaccinated remains a challenge across the nation.

There are several sources of data regarding influenza and pneumococcal vaccination rates for persons >65 years of age. One source is the federal Behavioral Risk Factor Survey System (BRFSS). According to the 2003 BRFSS data, in Missouri, 69.9% of adults >65 y of age received influenza vaccine in the prior year and 61.1% had received a pneumococcal vaccine at some time in their life. Nearly two-thirds (65.1%) of these seniors received their influenza vaccination through a private physician or health clinic, 13.5% through a store-hosted clinic, and 4.4% through a local health department.

Table 103 Pneumonia/influenza and pertussis in Kansas City, MO, 1998-2003

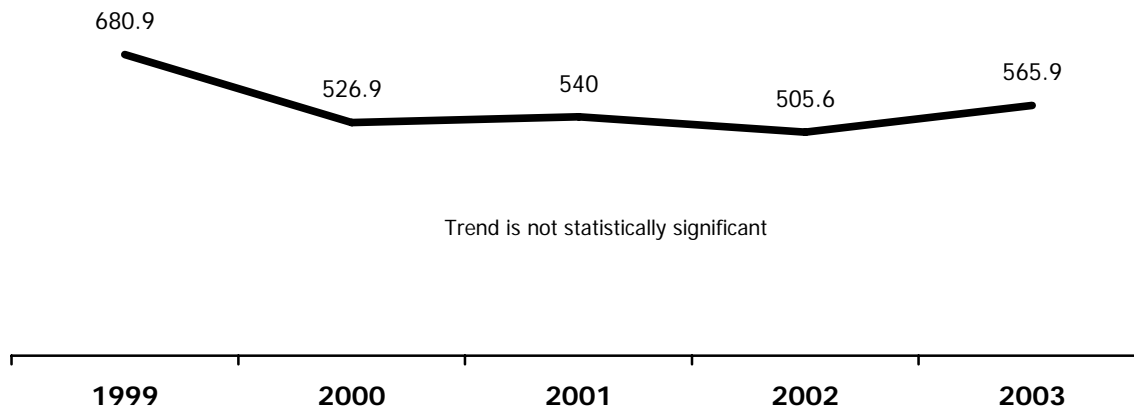
Year	Pneumonia/Influenza		Pertussis	
	Cases*	Hospitalized	Cases	Hospitalized
1999	111	2,670	20	14
2000	100	2,328	14	10
2001	87	2,238	4	27
2002	383	2,122	5	4
2003	1,129		9	

* Cases are only persons on whom a influenza test was positive and reported to the Health Department. In 1999, rapid tests for influenza became available and the level of testing increased in the community often in conjunction with prescribing of new influenza anti-viral medications.

⁴⁰⁹ Thompson WW et al. 2002. Mortality associated with influenza and respiratory syncytial virus in the United States. *J Am Med Assoc* 289:179-186.



Figure 103 Age-adjusted rates per 100,000 population for hospitalization due to pneumonia/influenza, Kansas City, MO



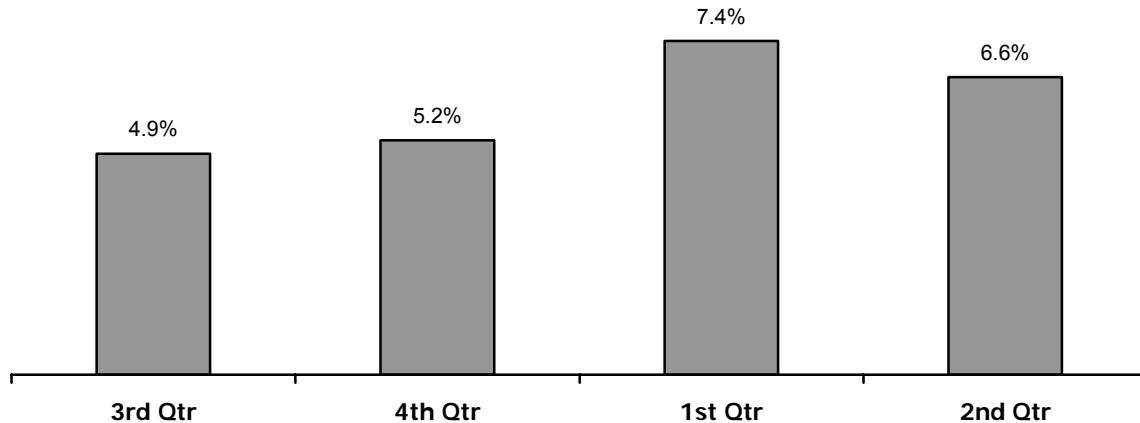
Another source of data is the federal National Health Interview Survey (NHIS).⁴¹⁰ Data from January-September 2004, indicated that 66.4% of adults ≥ 65 y of age had received an influenza shot in the prior 12 months and that 57.2% had ever received a pneumococcal vaccination. The influenza vaccination rates were 41% for persons 50-64 y old and 19.4% for those 18-49 y of age.

Nationally, influenza activity is monitored through various surveillance methods, one of which is the percentage of persons dying from pneumonia/influenza each week in 122 cities including Kansas City. Due to the small numbers and variations in death reporting, the data from Kansas City is not useful for monitoring influenza activity. Between 2001 and 2005, 6.1% of all deaths recorded (resident and non-resident) in the City were due to pneumonia/influenza (7.2% in 2001, 5.9% in 2002, 5.7% in 2003, 5.7% in 2004, 6.0% in 2005). There is seasonal variation in these percentages, being highest during the 1st quarter of the year (Figure 104).

⁴¹⁰ National Centers for Health Statistics. 2005. Early release of selected estimates based on data from January-September 2004 National Health Interview Survey. www.cdc.gov/nchs.



Figure 104 Pneumonia/influenza death rates for all deaths, resident and non-resident, per quarter, Kansas City, MO, 2001-2005



Among the vaccine-preventable diseases affecting children in Kansas City, only pertussis (whooping cough) is reported with any consistency. Typically pertussis cases occur among children too young to have received the vaccine or who have not completed the vaccine series. Immunized individuals become susceptible to infection within 10-12 years with cases of pertussis infection occurring among adolescents and adults. In 2005, 17.2% of the pertussis cases in Kansas City were among persons ≥ 15 y of age.

In mid-2005, the Food and Drug Administration approved pertussis vaccines that can be administered to adolescents and adults. The goal with that vaccine is to eventually reduce transmission of pertussis amongst adolescents and adults, thus reducing the risk of an unimmunized or under immunized child for contracting pertussis.

Of major concern with childhood vaccines is parental objection to having their child vaccinated.⁴¹¹ Nationally, 12% of parents are opposed to vaccination, primarily for safety reasons. The 2004 Health Assessment Survey conducted in Kansas City found that 3% of respondents did not think it was a

⁴¹¹ Kennedy AM et al. 2005. Vaccine beliefs of parents who oppose compulsory vaccination. *Public Health Rep* 120:252-258.



good idea to vaccinate children. Of those respondents in opposition to vaccination, 60% had concerns about vaccine safety, 16% felt that the vaccines were not needed, and 24% expressed other reasons. The 2006 Health Planning and Assessment Survey found similar results with 3.4% believing children should not be vaccinated; 48% because of concerns about vaccine safety, 24% that the vaccines were not needed, and 28% expressing other reasons.

TUBERCULOSIS

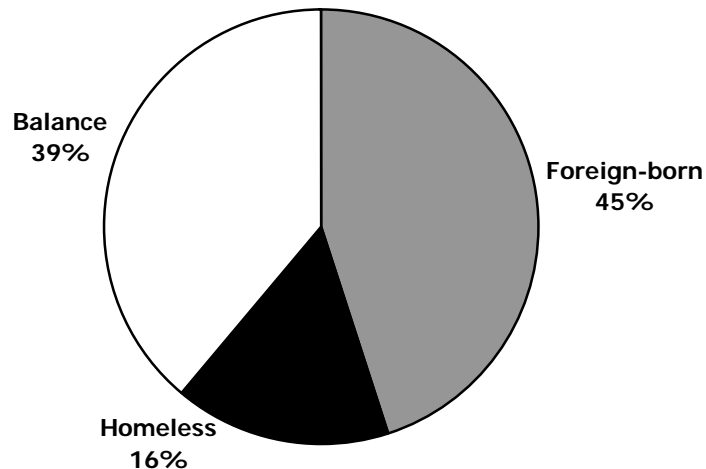
Of the infectious and communicable diseases, tuberculosis is the one most affected by the changing demography of the community. Forty-five percent of tuberculosis cases in Kansas City residents since 2001 were among the foreign-born (Figure 105). Nationally, the percentage of cases of tuberculosis among the foreign-born has been steadily increasing over the past decade — 54% in 2004.⁴¹² The case-rate of tuberculosis among the foreign-born in the United States is nearly 9 times higher than that of persons born in this country. In Kansas City, for 2001-2005, the case-rate for tuberculosis in the foreign-born was 13.2 times higher than the rate for the US-born population.

The fact that 16% of tuberculosis cases occur among the homeless is not unexpected. The communal nature of shelters, the limited use of medical care, and other behaviors all contribute to the transmission of the bacteria that cause tuberculosis, as well as the activation of latent tuberculosis infections into clinical disease.

⁴¹² Centers for Disease Control and Prevention. 2005. Reported tuberculosis in the United States, 2004.
www.cdc.gov/nchstp/tb



Figure 105 Tuberculosis in Kansas City, MO, 2001-2005



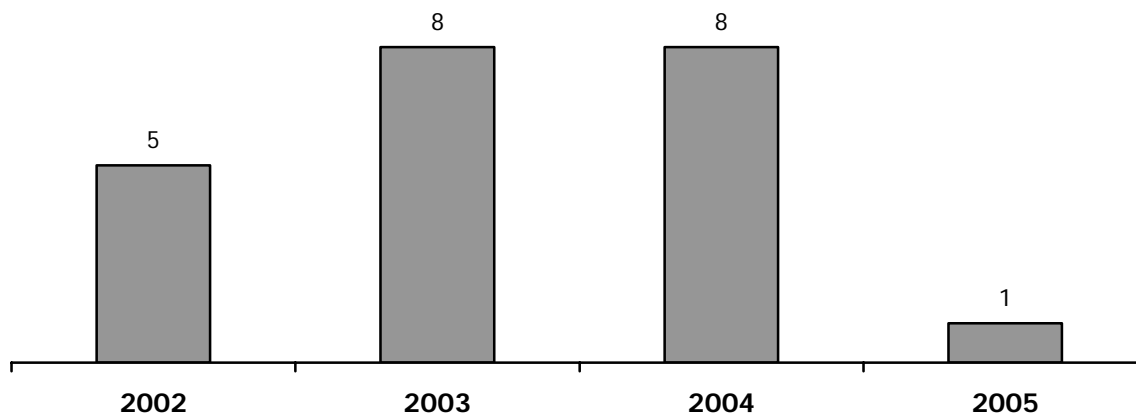
WEST NILE VIRUS

West Nile virus was introduced into North America in 1999 in New York City. Since that time, this mosquito transmitted virus has spread across the United States, Canada, Mexico and parts of the Caribbean and Central America. The virus infects birds and is spread to new areas by the movement of infected birds. While certain bird species, such as crows, are usually killed by the virus, other species appear to suffer no ill effects and serve as reservoirs of infection for mosquitoes. Humans, horses, and dogs, appear to be dead-end hosts for the virus, meaning the virus levels in their blood are too low to infect mosquitoes that may feed on them. West Nile virus, however, can cause illness and death among these dead-end hosts.

Prior to 2002, West Nile virus was not found in the metropolitan area, but now it must be considered endemic with possible illnesses and deaths being reported each year among people and animals. In 2005, there were 10 human cases of West Nile virus infection on the Missouri side of the metropolitan area. Cases among Kansas City residents are shown in Figure 106.



Figure 106 Human cases of West Nile virus infection among Kansas City residents



The Kansas City Health Department and the Parks and Recreation Department treat all of the ponds and lakes in City parks and golf courses with mosquito larvicide to kill the young mosquito larvae after they hatched. Two applications are applied, once in the spring and again in late summer.

RABIES AND ANIMAL BITES

Animal rabies cases in Kansas City occur sporadically and, since 1980, almost exclusively involve bats (Table 104). The last known human case of rabies in the City occurred in 1933.

Despite the relative rarity of true human exposures to rabid animals in Kansas City, the possibility of rabies needs to be considered every time a person is bitten by a carnivorous animal, eg dog, cat, and raccoon, or a bat. Table 105 shows the rates per 100,000 population of animal bites reported to the City's Animal Control Division each year over the past decade. These rates represent minimal estimates of the actual number of bites that residents incur.



Public Health
Prevent. Promote. Protect.

Kansas City, MO, Health Dept.

Table 104 Rabies in Kansas City, MO

Year	Bat	Cat	Other	Year	Bat	Cat	Other	Year	Bat	Cat	Other
1980		1		1990	1			2000	1		
1981				1991	1			2001			
1982	1			1992				2002			
1983				1993	1			2003	1		
1984	2			1994				2004			
1985	1			1995				2005	1		
1986				1996				2006			
1987				1997	3			2007			
1988				1998	4			2008			
1989	1			1999				2009			
Total	5	1			10				3		

Table 105 Animal bites per 100,000 Kansas City, MO, residents

Year	Dog	Cat	Other
1996	134.4	20.5	3.9
1997	129.0	23.2	4.5
1998	116.3	22.7	2.3
1999	107.7	17.4	3.4
2000	112.3	13.8	4.3
2001	72.9	13.8	0.2
2002	95.6	15.2	5.2
2003	84.2	12.4	2.5
2004	94.7	15.4	7.9
2005	84.2	12.0	10.9

In 2005, the Health Department and the Animal Health and Public Safety Division of the Neighborhood and Community Services Department collaboratively reviewed emergency department visits and hospitalizations of City residents resulting from dog bites.⁴¹³ For 1998-2002, there were 3,467 emergency department visits and 96 hospitalizations due to dog bite, for an annual average rate of 157.0 emergency department visits per 100,000 population and 4.3 hospitalizations per 100,000 population. For the entire population of Kansas City, these rates represented 693 dog bites seen in emergency departments and 19 hospitalizations each year. Based on the results of the study, it was estimated that only 10-36% of dog bites requiring medical attention were actually reported to the Animal Health and Public Safety Division.

⁴¹³ Hoff GL et al. 2005. Emergency department visits and hospitalizations resulting from dog bites, Kansas City, MO, 1998-2002. *Missouri Med* 102 565-568.



The highest rates for emergency department visits were for persons less than 15 years of age, while for hospitalizations the highest rates for those less than 10 years of age. The emergency department visit rate for males (183.9) was 39% higher than for females (131.9), although hospitalization rates were similar (4.4 and 4.3, respectively). The rates of emergency department visits for whites and blacks were similar, 151.5 and 147.5, respectively, but whites were 25% more likely to be hospitalized. Hispanics had much lower rates for both emergency department visits (80.9), and hospitalizations (0.7).

For emergency department visits, open wounds to the head or extremities accounted for 82.2% of the visits, with superficial injuries and contusions to head accounting for another 12.3%. For hospitalized dog bite victims, open wounds of the head and cellulitis and abscesses of sites other than the fingers or toes accounted for 69.7% of the hospitalizations.

Reported charges for 3,644 emergency department visits totaled \$1,452,845, with a median charge of \$300 per visit. For 92 hospitalizations, the reported charges totaled \$550,044, with a median charge of \$4,698 per hospitalization. These costs include only the original hospital charges and not physician charges or the cost of follow-up visits.

HANDWASHING

Handwashing is probably the single most important hygienic step that a person can do to prevent contracting or transmitting communicable and infectious agents. The 2004 Health Assessment Survey 95% of respondents claimed to always or usually wash their hands after using the bathroom and 86% made similar claims about washing their hands before eating meals.

COMMUNICABLE & INFECTIOUS DISEASES