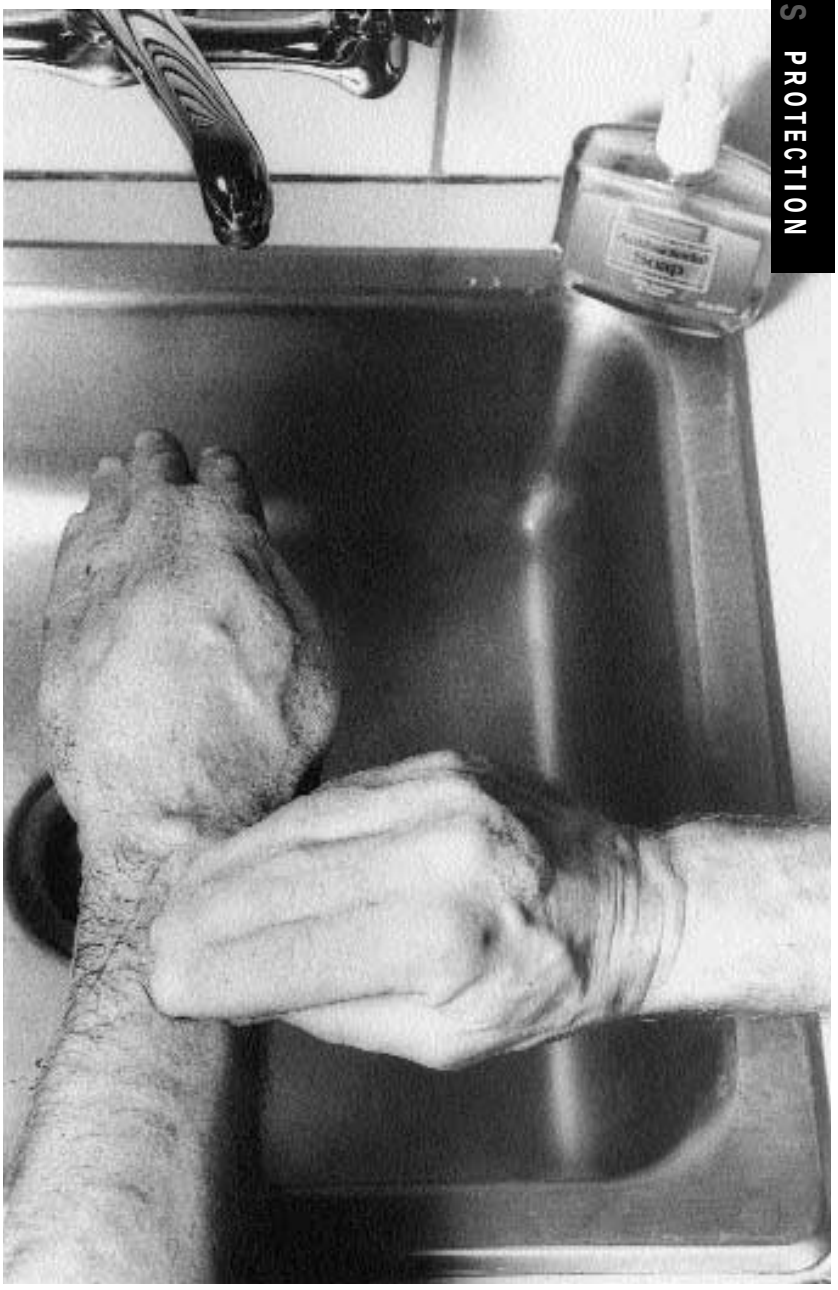
Protect Your Staff, Protect Yourself

Animal shelter personnel face occupational health risks that workers in most other professions don't have to worry about. They're called zoonotic diseases, and they're a very real threat to your health.

Diseases in the shelter, she thought, were an animal thing. Runny noses, sneezing, fever, diarrhea...those were things animals gave to each other, not to people. No one at the shelter thought to protect themselves from sick or injured animals. So when Julie Morris started feeling sick, she assumed it was just a nasty flu. She had diarrhea, cramps, nausea, and fever, but didn't think to seek treatment until she was so weak she couldn't climb the stairs to her apartment. What she had was giardiasis, and she had most likely contracted it from a sick animal at her shelter.

Morris, now fully recovered from that illness of long ago and working at the American Society for the Prevention of Cruelty to Animals, said that at the time no one wore gloves or washed their hands as often as they should have. Like many shelter workers, she found out too late that disease-control measures were important not just for the health of the animals, but for the health of the people caring for them.



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Julie Miller Dowling researched and wrote this feature section. Geoffrey L. Handy and Cynthia Stitely contributed. Frederick Angulo, DVM, Ph.D., of the Centers for Disease Control and Prevention, and Monika Walters, M.D., served as reviewers.

Ignoring the Threat

When people think of the things animals give humans, they rightfully think of the positives—unconditional love, companionship, and loyalty all come to mind. But as Morris's experience shows, animals can give other things, too. For shelter personnel charged with caring for a steady stream of animals coming from unknown backgrounds, diseases transmissible from animals to humans are a very real threat—especially for people with compromised (weakened) immune systems, such as HIV-infected individuals.

However, although these diseases can be debilitating—even life-threatening—shelters don't always give them the attention they deserve. Some find it difficult to take seriously a word like "zoonosis," which is the strange, academic-sounding term given to any disease an animal can transmit to a human (and vice versa). The complex, Latin-sounding names given to most diseases make them sound like words you had to memorize in your high-school biology class, not worry about at the shelter.

HSUS/Bevan

Although some infected animals will show signs that they are ill, many will be asymptomatic, meaning they carry a disease but exhibit no symptoms. That's why it's important to be careful when handling all animals, not just those who appear sick.

MANAGER'S NOTEBOOK

Protect the Legal Health of Your Organization,

Several years ago, a kennel attendant for Noah's Ark Animal Welfare Association in Ledgewood, New Jersey, contracted toxoplasmosis. She filed a workers' compensation claim, alleging that she had contracted the disease at the shelter.

"It was her doctor's assessment that the disease was directly related to the job," says Nichola Redmond, shelter manager at the time and now program coordinator for The HSUS's Mid-Atlantic Regional Office. "I was told by the insurance company that where she contracted the disease could neither be proven nor disproved, and that to avoid litigation we should pay the claim."

The state reimbursed the employee for missed work. The shelter's general liability insurance policy reimbursed her for medical bills.

Fortunately, Redmond had earlier been given responsibility for making sure that Noah's Ark was legally protected, and had taken appropriate steps. "I came up with scenarios that might occur and made sure that we were covered," she said. "Our board of directors instructed us to do this."

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Because toxoplasmosis can endanger the fetus, pregnant employees should be educated about associated risks and be given the opportunity to perform alternate duties until after delivery.

Managing Risks

This case illustrates the potential liability any shelter faces from claims based on occupational hazards such as zoonotic diseases. It also shows how a responsible humane organization took steps to protect itself.

Succeeding at risk management means instituting sensible safety precautions, updating forms and contracts, and buying the right insurance coverage.

The first step is to make sure adequate safeguards are in place to protect staff and volunteers. Make sure your facility complies with workplace-safety rules mandated by the federal Occupational Safety and Health Administration (OSHA). In addition, your shelter must have proper air-circulation systems, wash stations, access to first aid, cleaning and disinfecting procedures, personal protective equipment (such as gloves of various thickness and eye wear), animal-restraining equipment, and record-keeping procedures.

Also, your shelter should conduct training programs for staff and volunteers that include dissemination of health-related information. Your agency should understand the Americans with Disabilities Act and accommodate employees who are immunocompromised (such as those with HIV/AIDS) or who have other disabilities as defined by that federal law. People who are immunocompromised are most at risk of contracting a severe

In addition, a shelter's hectic atmosphere has a way of trivializing these hidden threats. In fact, it's not uncommon for shelter workers and even administrators to accept hazards as just "coming with the territory" and to view even basic precautions, like disinfecting a cat scratch or wearing latex gloves, as luxuries. After all, who has time to put on gloves when they're trying to rescue a stranded animal? But as Morris and others have learned the hard way, taking a minute to prevent a debilitating disease is far easier than the time, pain, and expense of recovering from one.

"I don't think you have to be paranoid, but I think you do have to be realistic," says Morris. "You should think about protecting yourself and protecting your animals. For example, use basic precautions like washing your hands. At the same time, don't let it affect you so that you can't have individual relationships with the animals."

Protecting Animals and Humans

Fortunately, protecting yourself and other staff from zoonoses like cat-scratch disease and giardiasis requires little more than bolstering the policies and procedures

Love and companionship, not zoonotic diseases, top the list of things animals give us.

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Too

zoonotic illness.

Shelter managers tread a fine line when balancing the need to protect employees with the right of employees to perform their jobs. The classic shelter example involves a kennel worker who becomes pregnant and thereby puts herself at risk of complications resulting from contracting toxoplasmosis. The shelter manager should educate the employee about the risks associated with cleaning litter pans, and then offer the employee a different assignment until after the pregnancy. The shelter must not force the employee to accept that assignment. If a pregnant employee refuses to be temporarily reassigned, then the shelter should have her sign a waiver of liability stating that she was apprised of potential risks, and provide her with protective clothing, such as gloves.

Adoption Program Risks

Keep in mind that a shelter's potential liability might not end with employees or volunteers. Say an adopter or a member of her family contracts a zoonotic illness shortly after adopting a pet from you. If the family sued your organization, would you be protected?

To date, according to the American Veterinary Medical Association, lawsuits against veterinarians in the United States for negligence resulting in human harm from zoonoses have either been dropped or settled out of court. A pet store settled with a family for $1.5 million after a child who purchased a puppy there lost sight in one eye as a result of a zoonotic infection. The pet store allegedly was deficient in both record-keeping and deworming procedures.

The HSUS knows of no case to date in which a shelter was sued after an adopted animal was believed to have transmitted a disease to the adopter or a member of his family. However, shelters *have* been successfully sued in cases where adopted animals have bitten humans or required veterinary care. Last summer, for example, the Escondido (Calif.) Humane Society was ordered to reimburse two families $1,109 for the veterinary bills of puppies adopted from the organization who were allegedly diseased and later died.

Your shelter's adoption contract should already state that your shelter makes no representations or guarantees about the health of shelter animals. It should also require that the adopted animal be examined by a veterinarian within three to seven days after leaving your shelter. Your shelter should develop a vaccination and deworming program for all pets up for adoption if your shelter does not already have such a program.

Also add information to your adoption kit to educate adopters about potential zoonotic risks and the steps they should take to reduce their exposure; the article on page 14 can be adapted for this purpose.

Finally, check to make sure your shelter's general liability policy protects your organization. If your policy already covers your agency for adopting out a dog who later bites someone, then your organization is likely covered for any human harm that might result from the transmission of a zoonotic disease. ■

Keeping your facility clean helps control disease transmission between animals and between animals and humans.

all shelters should have anyway to fulfill their mission of sheltering animals humanely. When examining how well your shelter treats the animals in its care, add "and humans" to the questions on your checklist:

■ Does shelter management enforce necessary safety policies that protect animals *and humans*?

■ Do sanitation procedures protect the health of animals *and humans*?

■ Are you and other staff and volunteers trained in animal-handling techniques that protect animals *and humans*?

Your shelter should institute the following basic policies and procedures. All are designed to protect not just the animals in your care, but also you, other staff, and adopters.

■ Thoroughly examine animals put up for adoption to ensure they are in good health.

■ Separate sick animals from healthy animals and infant animals from older ones.

■ Create a "wellness" program for your animals that includes vaccinations, deworming, testing, nutrition, and stress reduction.

■ Make sure your disease-control program includes not just disinfection of cages and kennels, but also proper temperature control and adequate ventilation.

■ Require staff and volunteers to wash their hands after touching each animal, and make sure plenty of wash stations are available and equipped with antibacterial soap.

■ Monitor visitors in the cat rooms and kennel areas carefully; post signs instructing people not to stick their hands in cages and kennels.

■ Include a section about disease transmission in your policies and procedures manual.

■ Get to know people at your local and state health departments, which are usually staffed by people with expertise in zoonotic-disease control.

■ Help keep the animals in the community healthy by requiring that adopters take their animals for a veterinary examination and vaccinations within three to seven days after adopting.

Protection, Not Panic

Some shelter managers worry that if they make a big deal about zoonotic diseases, they're going to create panic among staff—perhaps even to the detriment of the very animals the shelter is charged with protecting.

In fact, the greater danger lies in failing to provide this information. If people aren't informed about diseases, disease control, and protection, they'll likely do one of two things: Those ignorant of the risks will fail to take precautions and may acquire a zoonotic illness, and then end up fearing the animals they work with or leaving the profession they love. On the other hand, those with incorrect and embellished information may overstate the risks and base their actions on fear instead of common sense.

Shelters are legally obligated to both inform their employees of job-related risks and establish reasonable safeguards to protect their employees from these risks. The key to protecting you, your staff, potential adopters, and the public from contracting a zoonotic illness is to provide accurate, easy-to-understand information about these diseases, teach how to minimize the risks, and remind yourself and others that people are far more likely to receive love, loyalty, and companionship from these animals than they are a disease. ■

It is beyond the scope of this section to include information about each of the 200-plus known zoonotic diseases and to tell you everything you need to know to protect yourself from them. But the section can provide you with a general overview. On the pages that follow, you'll find 14 fact sheets on zoonotic diseases of most concern to shelter workers. You'll also read about basic precautions you need to take to protect yourself and other shelter workers from these diseases.

ARE YOU PROTECTING YOURSELF?

Ten tips to help you avoid developing a serious zoonotic illness.

1. Stay current on appropriate vaccinations, such as tetanus and rabies. (Consult your state or local health department to find out which vaccinations are appropriate in your area.)
2. Wash your hands frequently with antibacterial soap, especially after handling any animal and prior to eating or smoking.
3. Wear long pants and sturdy shoes or boots (no sandles or shorts).
4. Use gloves (preferably disposable) when changing litter pans, washing food and water dishes, or cleaning up feces, urine, or vomit.
5. Disinfect scratches and bite wounds thoroughly.
6. Don't allow animals to lick your face or any wounds.
7. Learn safe and humane animal-handling techniques and use proper equipment.
8. Seek assistance when handling animals whose dispositions are questionable.
9. Report any bites or injuries to the shelter supervisor and to your physician.
10. Tell your physician that you work closely with animals, and visit him or her regularly.

ZOONOTIC DISEASES

The zoonotic disease fact sheets featured here can be used as an educational resource for shelter employees and volunteers. Humane agencies are encouraged to clip them out and distribute them at training sessions and incorporate them into their policies and procedures manuals. Also, because physicians may overlook zoonotic diseases, employees who suspect they may have one of these illnesses should take the appropriate fact sheet to their physician.

Bartonellosis (Cat-Scratch Disease)

WHAT IS IT? Bartonellosis, usually called cat-scratch disease (CSD) is a disease acquired by humans and associated with cats. The cause of cat-scratch disease was recently discovered to be a bacteria, *Bartonella henselae* (formerly called *Rochalimaea henselae*). CSD had for a long time caused much confusion and controversy because no one knew exactly what caused the disease or how to diagnose and treat it.

WHICH ANIMALS CARRY IT? As the name implies, the disease is most often associated with cats. Studies show that kittens younger than one year old are more likely to be associated with CSD than are older cats. Also, kittens with fleas are more likely to transmit CSD. Some experts believe that cats may be just one of several transmitters of the disease-causing organism. Research is still being conducted to determine which other animals may pose a zoonotic risk.

HOW DO YOU GET IT? Experts believe that *B. henselae* is transmitted to humans through cat scratches and bites. Most people who get CSD are under the age of 20. Animal shelter workers who work closely with cats have an added risk and should disinfect and monitor any scratch or bite they get from a cat.

WHAT ARE THE SYMPTOMS IN HUMANS? Initially, victims develop a small, pimple-like lesion at the site of the scratch or bite. Symptoms include swollen lymph nodes, fever, fatigue, loss of appetite, and headache. In extreme cases, CSD-infected people can develop encephalitis or another severe illness and must be hospitalized; others suffer symptoms for years. Also, because the symptoms resemble signs of more serious illnesses such as cancer and tuberculosis, some patients have had to undergo a series of expensive tests before they were diagnosed with CSD. Researchers suspect that people may build up an immunity against the disease.

WHAT ARE THE SIGNS IN ANIMALS? Cats are asymptomatic (meaning they do not show symptoms) even when *B. henselae* is diagnosed in their blood.

HOW CAN SHELTER WORKERS AVOID IT?

- Wear protective clothing (puncture-resistant gloves, for example) when handling frightened or aggressive cats.
- Wash hands thoroughly with antibacterial soap after scratches and bites.

HOW ARE HUMANS WITH THE DISEASE TREATED? In most cases, the disease isn't life-threatening and will go away on its own. Physicians treat patients who experience prolonged fevers, enlarged liver and spleen, and severe swelling of lymph nodes with an antibiotic. People with severe cases, particularly those who are immunocompromised, may require hospitalization. Shelter workers who suspect they may have CSD should make sure their physicians know of their close work with animals.

Brucellosis (also known as Malta fever, Undulant fever, and Bang's disease)

WHAT IS IT? Brucellosis is a bacterial disease caused by an organism called *Brucella*. The disease can affect various organs in the body via the bloodstream.

WHICH ANIMALS CARRY IT? Brucellosis is primarily found in wild animals and domestic farm animals, such as cows, pigs, and goats. The *brucella* species *B. canis* infects dogs, particularly beagles.

HOW DO YOU GET IT? Most people get brucellosis by consuming products from diseased livestock, particularly unpasteurized milk from infected cows. Animal care workers are more likely to contract brucellosis by coming into contact with the blood or urine of infected dogs, wild animals, or farm animals. Brucella organisms can enter the body through cuts in the skin, contact with mucous membranes, inhalation, or ingestion.

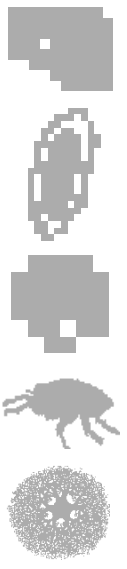
WHAT ARE THE SYMPTOMS IN HUMANS? Symptoms include intermittent or irregular fever, headache, weakness, profuse sweating, chills, and weight loss. Because symptoms are vague and difficult to diagnose, the disease is often overlooked.

WHAT ARE THE SIGNS IN ANIMALS? Because brucellosis affects dogs' reproductive systems, the most telling sign is when a healthy-appearing pregnant dog spontaneously aborts her fetus. Other effects of the disease, including sterility, are less apparent.

HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands frequently, especially after touching dogs or cleaning up after them and before handling food, eating, or smoking.
- Keep cuts, scratches, and other abrasions covered, especially while cleaning up after animals.
- Wear gloves when there is a possibility of coming into contact with dog urine or blood, such as when cleaning kennels or treating injured dogs.
- Report any bites and scratches, and have them treated.
- Let personal physician know of close work with animals.

HOW ARE HUMANS WITH THE DISEASE TREATED? Physicians typically prescribe antibiotics to treat infection.



Bubonic Plague

WHAT IS IT? The Bubonic plague is a severe disease caused by a type of bacteria that is found in rodents and which manifests itself in a variety of ways in humans. Although the disease is still relatively rare and is limited to the western United States, it is a growing concern.

WHICH ANIMALS CARRY IT? Rodents carry the disease-causing bacteria. Companion animals, particularly cats, who have come into contact with infected rodents can pass the disease to their owners or animal care workers.

HOW DO YOU GET IT? The most common way people get the disease is by getting bitten by infected fleas from an infected rodent itself or from a companion animal who came into contact with that rodent.

WHAT ARE THE SYMPTOMS IN HUMANS? Symptoms include sudden fever, chills, headache, nausea, and swollen lymph nodes.

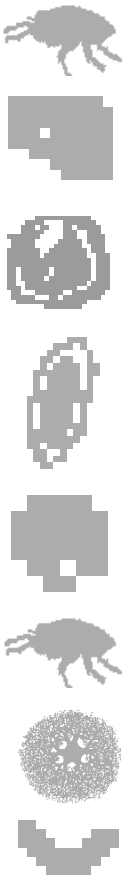
WHAT ARE THE SIGNS IN ANIMALS? Symptoms aren't always easy to diagnose, but infected cats may be very lethargic, have a fever, and often have swelling around the jaw or mouth. Dogs, because of their immune systems, rarely fall ill from the disease or transmit it to their owners.

HOW CAN SHELTER WORKERS AVOID IT?

- Wear gloves when handling cats of unknown background, particularly if you work in a shelter in the West or Southwest.
- When and where there is an increased risk of aerosol transmission, such as where cats are sneezing or coughing, wear a protective mask.
- Protect against cat scratches and bites, and thoroughly disinfect these wounds if you get them.
- If you work in a high-risk area, talk with your physician about the vaccine for plague.

HOW ARE HUMANS WITH THE DISEASE TREATED? People are usually given antibiotics and their abcesses are drained. Also, because the plague is highly contagious, those infected are isolated and their clothing and environment are disinfected. Shelter workers who suspect they may have the plague should make sure their personal physicians know of their close work with animals.

Campylobacteriosis



WHAT IS IT? Campylobacteriosis is a bacterial infection that affects the intestinal tract and sometimes the bloodstream. Although less well known than the widely-publicized gastrointestinal disease salmonellosis, campylobacteriosis is actually more common. It infects between two and six million people a year in the United States.

WHICH ANIMALS CARRY IT? Wild animals, especially birds, carry *Campylobacter*. Also, domestic animals, including horses, pigs, chickens, cats, puppies, and hamsters, can carry the infection.

HOW DO YOU GET IT? Most people typically contract the disease by consuming contaminated food or water, such as unpasteurized milk and uncooked poultry. Puppies and kittens with diarrhea can transmit *Campylobacter,* making the disease a particular risk to shelter workers. Inadequate sanitation, disease control, and personal hygiene compound the risks.

WHAT ARE THE SYMPTOMS IN HUMANS? Symptoms include abdominal pain, cramps, fever, chills, and diarrhea (which is frequently bloody).

WHAT ARE THE SIGNS IN ANIMALS? Signs include diarrhea (watery or bloody diarrhea in puppies and kittens) and loss of appetite. However, even healthy-looking animals may excrete the bacteria in their feces.

HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands frequently, especially after cleaning up after animals and before handling food, eating, or smoking.
- Keep scratches, and other abrasions covered, especially while cleaning up after animals.
- Wear gloves when there is a possibility of coming into contact with animal feces (especially those of puppies and cats).
- Wear gloves when handling wild birds or other wild animals.

HOW ARE HUMANS WITH THE DISEASE TREATED? Most people with the disease will recover on their own, requiring only fluids to prevent dehydration associated with diarrhea. Antibiotics are often prescribed for people with severe cases or to prevent a recurrence of the symptoms. Shelter workers who suspect they may have campylobacteriosis should make sure their personal physicians know of their close work with animals.

Cryptosporidiosis

WHAT IS IT? Cryptosporidiosis is a parasitic disease caused by a one-celled organism called *Cryptosporidium parvum* that until recently was undetectable because of its small size. Recognized as a zoonotic disease in 1976, cryptosporidiosis is a serious emerging disease in the United States.

WHICH ANIMALS CARRY IT? All species of mammals can carry the disease, including companion animals. Farm animals are common carriers.

HOW DO YOU GET IT? People can get cryptosporidiosis in a variety of ways, including human-to-human contact, exposure to contaminated food or water, and exposure to infected animals. Although contaminated drinking water poses the greatest risk to the general public, animal care workers have their own set of risks. Cleaning up animal feces, handling sick animals, or touching contaminated surfaces are prime examples. Inadequate sanitation, disease control, and personal hygiene compound these risks.

WHAT ARE THE SYMPTOMS IN HUMANS? Common symptoms include watery diarrhea, headache, abdominal cramps, nausea, vomiting, and fever. These symptoms may lead to weight loss and dehydration.

WHAT ARE THE SIGNS IN ANIMALS? Diarrhea is a common symptom in animals, particularly young animals who have not developed immunity to the infection.

HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands frequently, especially after touching animals or cleaning up after them and before handling food, eating, or smoking.
- Keep cuts, scratches, and other abrasions covered, especially while cleaning up after animals.
- Wear gloves when there is a possibility of coming into contact with animal feces (especially those of puppies and cats).

HOW ARE HUMANS WITH THE DISEASE TREATED? Although no drug will cure cryptosporidiosis, healthy people improve without taking antibiotics or antiparasitic medications. (Their physicians may prescribe medication to slow the diarrhea during recovery.) People with the disease should drink plenty of fluids and get extra rest to combat diarrheal illness associated with the disease. Some immunocompromised people with cryptosporidiosis may have chronic diarrhea because the infection stays in the intestinal tract. Shelter workers who suspect they may have cryptosporidiosis should make sure their personal physicians know of their close work with animals.

External Parasitic Infections (Caused by Lice, Mites, and Fleas)

[for tick-related illnesses, see "Lyme disease"]

WHAT IS IT? External parasitic infections are caused by tiny organisms that feed on the skin of animals. Mites, which are very minute arachnids that frequently infest animals and plants, can cause the zoonotic disease sarcoptic mange. Lice, which are small, wingless insects that feed off warm- blooded animals, can cause an infestation called pediculosis. Fleas, which are wingless, blood-sucking insects, can create an allergic reaction called flea allergy dermatitis in both animals and humans.

WHICH ANIMALS CARRY IT? All warm-blooded animals can carry mites, lice, and fleas.

HOW DO YOU GET IT? People can contract lice-, mite-, or flea-related infections by coming into close physical contact with infested animals and their infested bedding. The species of mite that causes sarcoptic mange can infect humans but will not likely reproduce on them. (Note: the human variant of the disease scabies is considered a human-to-human disease, not a zoonotic disease.) Likewise, fleas who live on animals or in the environment will bite people but not likely infest or reproduce on them.

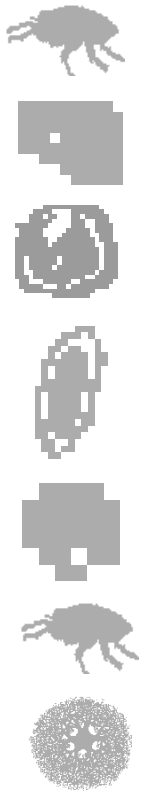
WHAT ARE THE SYMPTOMS IN HUMANS? The zoonotic mite disease sarcoptic mange can cause mild to severe skin infection and sometimes a secondary bacterial infection. Lice-caused pediculosis can also cause mild to severe skin irritation, which may develop into a bacterial infection when people scratch. Flea allergy dermatitis can create skin irritation and lesions in some people.

WHAT ARE THE SIGNS IN ANIMALS? Sarcoptic mange, which is caused by mites who infect the animal's skin, results in skin irritation (redness), inflammation, sores, and hair loss. Fleas also can cause extreme allergic reactions in animals. (Note: Demodectic mange, while severe and often difficult to treat in animals, is not transmissible from animals to humans.)

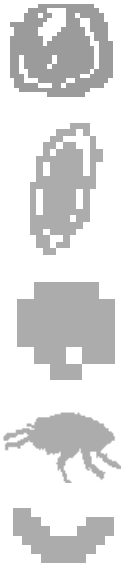
HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands and exposed skin frequently, especially after touching animals or cleaning up after them and before handling food, eating, or smoking.
- Evaluate incoming animals for external parasites and treat the animals accordingly.
- Rid not just the animal but also the animal's environment (such as bedding) of these parasites.
- Groom animals regularly.

HOW ARE HUMANS WITH THE DISEASE TREATED? Because the mites that cause sarcoptic mange in animals cannot reproduce on humans, the disease usually goes away on its own and requires no treatment. However, a physician may treat more severe cases with medicated lotion. The lice-caused pediculosis is treated with medicated shampoos or cream rinses that contain lice-killing ingredients. People with severe flea allergy dermatitis are often treated with anti-inflammatory medication. Shelter workers who suspect they may have one of these infections should make sure their personal physicians know of their close work with animals.



Giardiasis (also known as Beaver fever)



WHAT IS IT? Giardiasis is a disease that affects the intestinal tract and liver. It is caused by a microscopic parasite called *Giardia lamblia.*

WHICH ANIMALS CARRY IT? Both wild and domestic animals carry the disease.

HOW DO YOU GET IT? People can get giardiasis in a variety of ways, including human-to-human contact, exposure to contaminated food or water, and exposure to infected animals. Although the greatest risk to the general public is consumption of contaminated drinking water or close contact with an infected human, animal care workers have their own set of risks. Cleaning up animal feces or touching surfaces contaminated by feces are prime examples. Inadequate sanitation, disease control, and personal hygiene compound these risks.

WHAT ARE THE SYMPTOMS IN HUMANS? Although some people experience no symptoms, typical symptoms include mild or severe diarrhea, abdominal pain, and occasional weight loss. Fever is rarely present.

WHAT ARE THE SIGNS IN ANIMALS? Diarrhea, chronic weight loss, and pale, malodorous feces are some common clinical signs in domestic animals. However, even animals with no obvious symptoms can carry *Giardia.*

HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands frequently, especially after touching animals or cleaning up after them and before handling food, eating, or smoking.
- Keep cuts, scratches, and other abrasions covered, especially while cleaning up after animals.
- Wear gloves when there is a possibility of coming into contact with animal feces.

HOW ARE HUMANS WITH THE DISEASE TREATED? Physicians generally prescribe antibiotics. Some individuals may recover on their own without medication. Shelter workers who suspect they may have giardiasis should make sure their personal physicians know of their close work with animals.

Leptospirosis (also known as Canicola fever and Weil's disease)

WHAT IS IT? Leptospirosis is a bacterial disease produced by an organism that resides in the kidney called *Leptospira interrogans*.

WHICH ANIMALS CARRY IT? Many types of domestic and wild mammals, such as skunks, rabbits, raccoons, and mice, carry and excrete the disease-causing bacteria. For animal control workers, the predominant risk is from dogs; cats are rarely infected.

HOW DO YOU GET IT? People can contract leptospirosis by accidentally consuming contaminated food or water or by coming into close contact with an infected animal's urine (or an animal carcass). Although the disease is relatively rare in humans, shelter workers' close contact with animals puts them at higher risk (for example, cleaning up urine-soaked newspapers in a puppy's cage).

WHAT ARE THE SYMPTOMS IN HUMANS? Symptoms include prolonged fever, chills, weakness, abdominal and muscle pain, and sometimes jaundice and anemia. Fatality is low but the disease is especially dangerous for the elderly, people with compromised immune systems, and people with kidney damage.

WHAT ARE THE SIGNS IN ANIMALS? Diarrhea is a common symptom. Early signs include loss of appetite, vomiting, and fever. As the disease progresses, symptoms may include hypothermia, depression, and muscle soreness.

HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands frequently, especially after touching animals or cleaning up after them and before handling food, eating, or smoking.
- Keep cuts, scratches, and other abrasions covered, especially while cleaning up after animals.
- Wear protective clothing and gloves when handling wild animals.
- Wear gloves when there is a possibility of coming into contact with animal urine (especially dog urine).

HOW ARE HUMANS WITH THE DISEASE TREATED? People are often treated with antibiotics. In extreme cases, kidney dialysis may be necessary. Shelter workers who suspect they may have leptospirosis should make sure their personal physicians know of their close work with animals.

Lyme Disease

WHAT IS IT? Lyme disease is a tick-borne disease caused by a spirochete called *Borrelia burgdorferi.* This disease is named for Lyme, Connecticut, where the first cluster of cases was discovered. It is different from other zoonotic diseases in that the parasite on the animal, not the animal himself, transmits Lyme disease.

WHICH ANIMALS CARRY IT? Mammals, including dogs, cats, white-tailed deer, and other wild and domestic animals, serve as hosts to the disease-carrying tick.

HOW DO YOU GET IT? Humans get Lyme disease through a bite from a very small tick commonly referred to as a deer tick. To transmit the disease, the tick must be attached to the human for at least several hours. That's why it is so important to remove ticks from skin immediately.

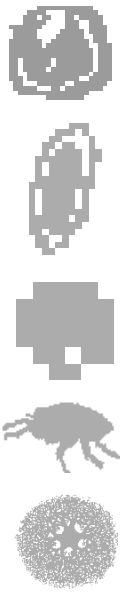
WHAT ARE THE SYMPTOMS IN HUMANS? The first symptom is normally an expanding circular (or "bull's eye") rash appearing at the site of the bite 2 to 30 days after the bite occurs. Flu-like symptoms (headaches, nausea, fever, muscle aches) may also appear. Left untreated, the disease may cause complications in the heart and nervous system (second stage) including "heart block," meningitis, and facial palsy. Arthritis, swelling, and joint pain may be recurring effects of untreated Lyme disease.

WHAT ARE THE SIGNS IN ANIMALS? Symptoms in animals include fever, lethargy, decreased appetite, sudden or severe lameness, and joint swelling.

HOW CAN SHELTER WORKERS AVOID IT?

- Inspect animals coming into the shelter for ticks.
- Use tweezers and wear gloves to remove ticks, taking care not to squeeze or puncture the body of the tick, which may contain infectious fluids.
- Wear clothing that covers your skin: long-sleeved shirts, pants, etc.
- If exposed to tick-infested areas (such as during field work), check your body and clothing after coming inside. Then shower and wash your clothes soon after the workday.

HOW ARE HUMANS WITH THE DISEASE TREATED? If diagnosed early, the disease can be treated effectively with antibiotics.



Nematode (Worm) Infections

WHAT IS IT? The infections of most concern to shelter workers and pet owners are: *Canine Roundworm disease* (Visceral Larva Migrans, Toxocariasis), *Hookworm disease* (Cutaneous Larva Migrans, Ancylostomiasis, Creeping Eruption), *Raccoon Roundworm disease* (Helminth Disease, Baylisascaris procyonis). All of these diseases are caused by parasitic worm larvae which usually infest their hosts by hitching a ride in food sources or feces but sometimes by burrowing directly into the host's skin.

WHICH ANIMALS CARRY IT? Parasitic larvae can infest both wild and domestic animals. Shelters and pet owners are more likely to contract worm-related infections from cats and dogs simply because they are near these animals more frequently.

HOW DO YOU GET IT? Shelter workers typically acquire worm-related zoonotic diseases when they come into close contact with infested animals or somehow become infected by ingesting or touching infected feces or contaminated surfaces. Some people acquire infections when the larvae penetrates the skin.

WHAT ARE THE SYMPTOMS IN HUMANS? The symptoms depend on what organs the larvae migrate to. Some worms can penetrate more than one region of the body.

- Worms that invade the intestinal regions (such as hookworm and roundworm) can cause bloody stools, diarrhea, weight loss, loss of appetite, vomiting, abdominal pain, and jaundice.
- Worms that penetrate respiratory regions (such as canine roundworm and hookworm) can cause coughing, chest pain, and sometimes asthma or pneumonia-like symptoms.
- Worms that can penetrate the eye region (such as canine roundworm, raccoon roundworm, and occasionally hookworm) sometimes cause failing vision and other eye-related ailments.
- Worms that can penetrate the brain (such as raccoon roundworm) can, in rare cases, cause lethargy, loss of muscle coordination, and potentially coma.
- Worms that penetrate the skin cause irritation, blisters, rash, burning sensation, and severe itching along the route of migration.

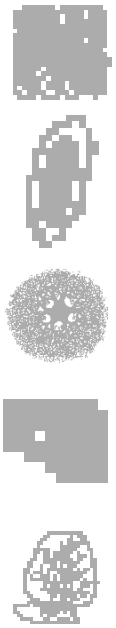
WHAT ARE THE SIGNS IN ANIMALS?
Common signs that an animal has one of these intestinal worms include pale gums, weight loss, "scooting," and diarrhea.

HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands frequently, especially after touching animals or cleaning up after them and before handling food and eating.
- Keep cuts, scratches, and other abrasions covered.
- Keep cages and kennels clean and free of dirt.
- Wear gloves when there is a possibility of coming into contact with animal feces (especially from young puppies).
- Disinfect hands and exposed skin that may have come into contact with animal feces or surfaces contaminated with animal feces.
- Wear protective clothing when handling wild animals such as raccoons.
- Because disinfectants cannot kill raccoon roundworm, designate one carrier or cage for containing raccoons only.

HOW ARE HUMANS WITH THE DISEASE TREATED?
Physicians typically prescribe an anthelminthic drug for intestinal parasitic larvae infections. Inflammation-reducing drugs are often prescribed for symptoms of roundworm disease (toxocariosis). For external infections, the doctor may prescribe a medication to clear up the infection and to relieve itching. Shelter workers who suspect they may have one of these infections should make sure their personal physicians know of their close work with animals.

Pasteurellosis



WHAT IS IT? Pasteurellosis is a bacterial infection that results from bite wounds. It can be caused by one or more species of organisms that belong to a group (genus) known as *Pasteurella*. *Pasteurella multocida* is the species most frequently associated with the bacterial infection resulting from domestic-pet bites, especially cats.

WHICH ANIMALS CARRY IT? Many mammals carry *Pasteurella* bacteria. However, dog and cat bites are the most common source of infection in people.

HOW DO YOU GET IT? *Pasteurella* is typically transmitted to people through bite wounds. People are more likely to get the infection if the puncture wound is not cleansed properly and left untreated for more than 24 hours. Also, studies have indicated that bite wounds on the hands are more likely to result in pasteurellosis than are bite wounds on other parts of the body.

WHAT ARE THE SYMPTOMS IN HUMANS? Symptoms include pain and swelling of the wound within two days of the bite. Also, infected bite wounds are usually slow to heal and release discolored and watery discharge. Some people may experience fever, headache, chills, swollen glands, and insomnia. If the wound is left untreated, severe complications such as abscesses, arthritis, and meningitis can result.

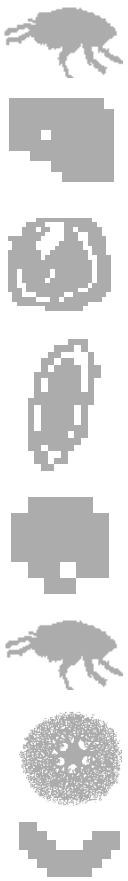
WHAT ARE THE SIGNS IN ANIMALS? *P. multocida* and many other species of bacteria normally reside in the mouths of healthy dogs, cats, and other species. When animals become infected with pasteurellosis, respiratory problems are a common sign.

HOW CAN SHELTER WORKERS AVOID IT?

- Wear puncture-resistant gloves and other protective gear when handling frightened or aggressive dogs or cats.
- When dealing with an aggressive cat or dog, have someone assist you who is trained in animal-handling.
- Use safe animal-handling techniques and proper equipment.
- Immediately disinfect *all* bite wounds, even small ones.
- Have your personal physician examine and treat any severe puncture wound, especially if you notice any unusual pain or swelling.

HOW ARE HUMANS WITH THE DISEASE TREATED? Pasteurellosis is usually treated with penicillin (or tetracycline for people allergic to penicillin).

Rabies



WHAT IS IT? Rabies is a deadly disease caused by an RNA virus (of the family Rhabdoviridaen). This virus attacks the central nervous systems of mammals. With rare exception, rabies is always fatal: Only three humans are known to have survived the disease.

WHICH ANIMALS CARRY IT? Any warm-blooded mammal can get rabies. However, some animals, such as skunks, coyotes, raccoons, and bats, are more susceptible to the virus than others. Cats and dogs, while less susceptible to rabies than many animals, are more likely to transmit the virus from wild animals to humans. Animals rarely afflicted with rabies include humans, rats, squirrels, opossums, and rabbits. Because rabies infects mammals only, birds, amphibians, reptiles, and fish can't get the disease.

HOW DO YOU GET IT? The virus, which is present in the salivary glands of infected animals, is usually transmitted through a bite or a break in the skin (such as a scratch or cut). It can also be transmitted through mucous membranes (such as eyes), but this is less likely. Because the virus shows up only intermittently in saliva, exposure from a rabid animal does not necessarily mean the virus was transmitted. Aerosol transmission of rabies in heavily-infested bat caves and laboratory settings has also been documented, but this mode poses little risk to the general public.

WHAT ARE THE SYMPTOMS IN HUMANS? The first rabies symptoms in humans mimic the flu (weakness, fatigue, lack of appetite, headache, fever), which is why diagnosing rabies is difficult. Many victims also report a tingling at the exposure site. Symptoms progress to hyperactivity, disorientation, hallucinations, and convulsions. The disease slowly and painfully paralyzes its victims. At the final stage, they typically lapse into a coma and die from respiratory arrest.

WHAT ARE THE SIGNS IN ANIMALS? Although it's not always possible to determine whether an animal has rabies just by looking at him, some symptoms strongly indicate rabies. The stereotypical "foaming at the mouth" isn't necessarily the clearest indicator that an animal has rabies. The first visible sign of rabies is a change in behavior, ranging from depression or disorientation to aggression and violence. Several other animal diseases, such as distemper and toxoplasmosis, may mimic rabies, and this further complicates the diagnosis.

HOW CAN SHELTER WORKERS AVOID IT?

- Make sure you're current on your rabies preexposure and tetanus vaccinations.
- Use protective equipment and clothing.
- Report all scratches and bites immediately to supervisors.
- Immediately wash all wounds with soap and water for ten full minutes.
- If exposed to the rabies virus, get postexposure treatment immediately.
- Follow recommended rabies quarantine, monitoring, reporting, and adoption policies outlined in the September 1995 issue of *Shelter Sense.*

HOW ARE HUMANS WITH THE DISEASE TREATED? The disease is fatal and cannot be treated. Prevention is the only way to avoid the disease.

Salmonellosis

WHAT IS IT? Salmonellosis is a disease caused by the bacteria species *Salmonella.* It is one of the most common zoonotic diseases in humans, affecting between two and six million people every year in the United States.

WHICH ANIMALS CARRY IT? Birds and reptiles (especially iguanas) are the animals most frequently associated with *Salmonella.* The disease is so common in turtles that laws have been passed to ban their interstate shipment and sale. Wild and domestic animals, including dogs and cats, occasionally carry the disease.

HOW DO YOU GET IT? Most people typically contract the disease by consuming food or water contaminated with the bacteria *Salmonella.* The animal shelter exposes its workers to a greater risk of direct exposure from infected animals because it cares for the very animals most susceptible to the disease—those who are diseased, stressed, or live in overcrowded conditions. However, all people—including shelter workers—face greater risk from eating undercooked chicken and other meat products than they do from contact with animals.

WHAT ARE THE SYMPTOMS IN HUMANS? Symptoms include diarrhea (usually watery and occasionally bloody), nausea, vomiting, fever, chills, and abdominal cramps. If the bacteria leaves the bloodstream and enters the central nervous system, meningitis/encephalitis may develop. Salmonellosis is a very serious disease in humans, especially for young children and people with compromised immune systems.

WHAT ARE THE SIGNS IN ANIMALS? Diarrhea and vomiting are the most likely signs that an animal may have salmonellosis.

HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands frequently, especially after touching animals or cleaning up after them and before handling food, eating, or smoking.
- Keep cuts, scratches, and other abrasions covered, especially while cleaning up after animals.
- Wear latex gloves when handling birds and reptiles.
- Disinfect hands and exposed skin that may have come into contact with animal feces or surfaces contaminated with animal feces.

HOW ARE HUMANS WITH THE DISEASE TREATED? Most people are treated with fluid replacement therapy. Treatment for severe cases varies depending on the symptoms; in extreme cases, hospitalization is required. Shelter workers who suspect they may have salmonellosis should make sure their personal physicians know of their close work with animals.

Toxoplasmosis

WHAT IS IT? Toxoplasmosis is a parasitic disease caused by a single-celled protozoan called *Toxoplasma gondii*. The organism resides in the intestinal tract of cats and in the tissues of many food animals and rodents.

WHICH ANIMALS CARRY IT? Although cats are the only animals that can shed the parasite's eggs (oocysts) in their feces, *T. gondii also* resides in animals' tissues and is released when other animals or humans consume that tissue.

HOW DO YOU GET IT? People usually get toxoplasmosis by eating raw or undercooked meat of an animal whose tissue contained the disease-causing organism. People can also get the disease if they ingest food and water contaminated with cat feces.

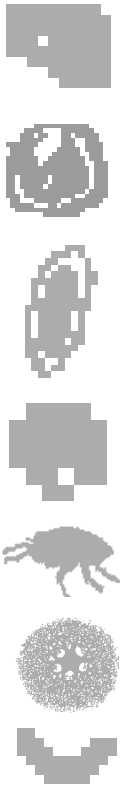
WHAT ARE THE SYMPTOMS IN HUMANS? Most cases of clinical disease resemble the flu; symptoms include fever, enlarged lymph nodes, fatigue, headache, and sore throat. However, although many people are infected with *T. gondii,* most healthy people develop minimal or no symptoms. People likely to develop clinical—even dangerous—symptoms are children and people with compromised immune systems. Also, pregnant women who become infected with toxoplasmosis risk infecting their fetus, which can result in stillbirths, spontaneous abortions, and birth defects. Once inside the body, the parasite never leaves it. Although in healthy people the parasite remains inactive, it can "reactivate" in immunocompromised people.

WHAT ARE THE SIGNS IN ANIMALS? It's difficult to tell that animals have toxoplasmosis just by looking at them. When symptoms are apparent, they usually include vague signs like diarrhea, weight loss, and fever.

HOW CAN SHELTER WORKERS AVOID IT?

- Wash hands frequently, especially after cleaning up after cats and before handling food, eating, or smoking.
- Keep cuts, scratches, and other abrasions covered, especially while cleaning up after cats.
- If you are pregnant or immunocompromised, try to have someone else clean litter boxes. If you must do this task, make sure you wear gloves and disinfect hands afterward.
- (For all employees) disinfect hands and exposed skin that may have come into contact with cat feces or surfaces contaminated with cat feces.

HOW ARE HUMANS WITH THE DISEASE TREATED? Most people require no treatment. People showing symptoms of toxoplasmosis are generally treated with antibiotics. Treatment for pregnant women is more complex. Shelter workers who suspect they may have toxoplasmosis should make sure their personal physicians know of their close work with animals.



TIPS FOR PET OWNERS

Pet owners are far more likely to contract most zoonotic diseases from contaminated food or drinking water than they are from their healthy companion animals. Still, as added precautions, pet owners should follow these safety tips:

- Take your pets to the veterinarian for routine check-ups and at the first sign of health problems (like diarrhea).
- Have your pets dewormed and vaccinated.
- Keep your animals and home as free of fleas as possible.
- Prevent bites and scratches by teaching children to play gently with pets.
- If your pet scratches or bites you, wash the wound thoroughly and apply an antibacterial ointment. (For severe bites or scratches, call your physician.)
- Keep your cat's nails trimmed (but do not subject them to declaw surgery).
- Wear gloves when scooping or changing litter.
- Wear gloves when cleaning up after puppies and removing feces from lawn.
- Make sure children wash their hands thoroughly after they handle pets.
- Cover children's sandboxes when the children are not playing.
- Wear gloves during and wash hands after gardening.
- Keep all pets indoors (or under close supervision).

Where to Go for More Information

Organizations

- *Your state health department or public health veterinarian*. They likely have information on zoonotic diseases, especially those prevalent in your region.
- *Centers for Disease Control and Prevention*; CDC, Atlanta, GA 30333; 404-639-3311.
- *National Institute of Allergy and Infectious Diseases*; National Institutes of Health, Bethesda, MD 20205; 301-496-4000.
- *American Veterinary Medical Association*; 1931 N. Meacham Rd., #100, Schaumburg, IL 60173; 800-248-2862.

Books

These books contain helpful chapters and charts on zoonotic diseases. Because most of the books are expensive, check them out at your local library or medical library. If your library doesn't have them, you may be able to request an Inter-Library Loan.

- *Zoonosis Updates, from the Journal of the American Veterinary Medical Association* (1995); available for $20 ($12 for AVMA members) at the AVMA address listed above.
- *Handbook of Zoonoses, Second Edition* (1994), George W. Beran, CRC Press.
- *The Merck Veterinary Manual, Seventh Edition* (1991), Merck & Co, Inc.
- *Hagan and Bruner's Microbiology and Infectious Diseases of Domestic Animals, Eighth Edition* (1992), Comstock Publishing Associates.
- *Clinical Textbook for Veterinary Technicians, Third Edition*, Dennis M. McCurnin; W.B. Saunders Company.

World Wide Web Pages

If you have access to the Internet, connect to the World Wide Web pages below for helpful information about zoonotic diseases. (The addresses are case-sensitive, so be sure to type them exactly as they appear below.)

- *Centers for Disease Control and Prevention (CDC)*
  http://www.cdc.gov/cdc.html
- *National Center for Infectious Diseases (NCID)*
  http://cdc.gov/ncidod/ncid.htm
- *National Institute of Allergy and Infectious Diseases*
  http:/web.fie.com/fedix/nih.html
- *MIC-KIBIC at the Karolinska Institute*
  http:/www.mic.ki.se/Diseases/index.html
- *Martindale's Health Science Guide '96*
  http://www-sci.lib.uci.edu/~martindale/AHealth.html
- *MedWeb: Public Health*
  http://www.cc.emory.edu/WHSCL/Medweb.ph.html
- *MedHelp General Library*
  http://medhlp.netusa.net/general.htm
- *FAQs Pets and HIV*
  http://www.sonic.net/~pals/ptfaqs.html

Back issues of Shelter Sense

To receive back issues containing these articles about zoonotic diseases, disease control, and safety precautions, contact *Animal Sheltering* magazine.

- Proper sanitation: March 1989
- Lyme disease: June/July 1990
- Protection during disasters: November 1994
- Zoonoses and HIV/AIDS: February 1995
- Feline disease control: March 1995
- Rabies control: September 1995