

# TerranearPMC Safety Share

## Week of April 27, 2015 – Emerging Zoonoses

Organizations such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have been studying diseases that can be transmitted between animals and humans. Such diseases are known as zoonoses, of which the most notable are bird flu and tuberculosis and can wreak havoc on the health of both organisms. From cyst-causing tapeworms to avian flu, zoonoses diseases have reached world-wide concern. Fighting these diseases in the hardest-hit countries is crucial to protecting global health as well as to reducing severe levels of poverty and illness among the world's 1 billion poor livestock keepers.

Researchers have found 13 so-called zoonoses as being responsible for 2.2 million human deaths every year. The study, detailed in the 2012 report "Mapping of Poverty and Likely Zoonoses Hotspots," shows the vast majority of these illnesses and deaths occur in low- and middle-income countries. For instance, Africa's Ethiopia, Nigeria and Tanzania, along with India, had the highest rates of associated illness and death. In addition, other areas including northeastern United States, Western Europe (particularly the United Kingdom), Brazil and parts of Southeast Asia may be hotspots of emerging zoonoses.

An emerging zoonosis is a disease that is newly infecting humans, has just become virulent, or has just become drug-resistant. Bacteria and viruses that are deadly to one type of creature can evolve quickly to infect another. While the swine flu outbreak is the latest example, a host of infectious and deadly diseases have hopped from animals to humans *and* from humans to animals.

The cross-species infection can originate on farms or markets, where conditions foster mixing of pathogens, giving them opportunities to swap genes and gear up to kill previously foreign hosts (i.e. human beings). The transfer can occur from such seemingly benign activities as letting a performance monkey on some Indonesian street corner climb on your head. Microbes of two varieties can even gather in your gut, and evolve to morph you into a deadly, contagious host.

Many disease-carrying parasites are not picky about hosts. Human diseases can decimate animal populations, too, from such well-meaning activities as ecotourism (tourism to places having unspoiled natural resources). According to researchers, about 60 percent of all human diseases and 75 percent of all emerging infectious diseases are zoonotic. Most human infections with zoonoses come from livestock, including pigs, chickens, cattle, goats, sheep and camels.

Out of 56 zoonoses studied, the researchers found 13 that were most important in terms of their impact on human health (deaths), and livestock sector, along with their amenability to agriculture-based control. These are (in descending order): gastrointestinal disease; leptospirosis; cysticercosis; zoonotic tuberculosis (TB); rabies; leishmaniasis (caused by a bite from certain sandflies where the most common species cause skin sores, and affecting a number of internal organs, usually spleen, liver, and bone marrow); brucellosis (a bacterial disease that mainly infects livestock); echinococcosis; toxoplasmosis; Q fever; zoonotic *trypanosomiasis* (sleeping sickness), hepatitis E; and anthrax.



## TerranearPMC Safety Share

In poor counties zoonoses have been associated with many livestock where:

- 27 percent of livestock showed signs of current or past infection with bacterial food-borne disease that causes food contamination (a type of zoonotic gastrointestinal disease)
- 12 percent of animals have recent or current infections with brucellosis
- 10 percent of livestock in Africa are infected with *trypanosomiasis*
- 7 percent of livestock are currently infected with TB
- 17 percent of smallholder pigs show signs of current infection with cysticercosis
- 26 percent of livestock show signs of current or past infection with leptospirosis
- 25 percent of livestock show signs of current or past infection with Q fever

Researchers say that nearly three-quarters of rural poor people and about one-third of the urban poor depend on livestock for food, income, and other services. As such, the loss of one milking animal can devastate these households, though even worse, is the loss of a loved one to a zoonotic disease.

The new map of hotspots will provide researchers and officials specific locations on which to focus their efforts. The highest zoonosis burden, they found, occurs in just a few countries, particularly Ethiopia, Nigeria and India. These three countries also have the highest number of poor livestock keepers and the highest number of malnourished people. As such, the latest research will allow zoonotic experts to focus on the hotspots of zoonoses and poverty, and therefore contribute to control the spread of disease by stopping the disease vector through their potential to be transmitted from different animal species.

While WHO has mostly focused on third world nations, zoonoses is a significant concern in our homes; specifically, our pets. These are; Influenza: H1N1 and H5N1 (which your veterinarian and physician can test for), Methicillin Resistant Staphylococcus Aureus (aka MRSA – a disease that has received lots of attention in recent years, generally starting as small red bumps that resemble pimples, boils or spider bites, while quickly turn into deep, painful abscesses that require surgical draining), Rabies (a viral infection that is transmitted to humans from the saliva of an affected which affects the nervous system and is deadly if left untreated), ringworm (a fungus spread by direct contact that causes skin and scalp issues), salmonellosis (a bacterial infection that causes diarrhea, fever and abdominal cramps and known to be fatal in some cases), and toxocariasis (known to cause eye lesions that can lead to blindness or swelling of organs in the body).

These diseases may make one wonder if it even makes sense to own a pet. Well, not quite! While the list of zoonotic diseases is fairly lengthy, there are quite a number of measures to take to ensure transmission of these illnesses are preventable. First of all, practice good hygiene. Wash your hands thoroughly with hot, soapy water after playing with your pets or handling their waste. Keep feces cleaned up in the yard and litter boxes. Vaccinate and deworm regularly, and contact your physician and veterinarian if you think you or pet could have a zoonotic disease.

**No act of kindness, no matter how small, is ever wasted**

Aesop

