



## Zoonotic Diseases: Guidance for KAUST researchers and reporting of illness

### Zoonotic Diseases

Zoonotic diseases are infectious diseases that spread between animals and humans. Globally, approximately 75% of recently emerging infectious diseases affecting humans originate from animals, and about 60% of all human pathogens are zoonotic.

#### Transmission Routes:

- Direct contact with infected animals (e.g., saliva, blood, urine, feces).
- Indirect contact via contaminated surfaces, food, or water.
- Inhalation of aerosols from animal waste, bedding, or birthing fluids.
- Arthropod vectors such as flies, ticks, and mosquitoes.
- Pests such as rodents.

Zoonotic disease awareness is critical for researchers and staff working with animals in laboratories or fieldwork. KAUST requires strict adherence to biosafety protocols and immediate reporting of symptoms that may indicate zoonotic infections.

Below is a condensed list of diseases transmissible to humans. Many of these diseases are reportable to public health authorities. In Saudi Arabia and the surrounding region, wildlife and domesticated animals (e.g., camels, goats, sheep, bats, rodents, and feral cats) may carry zoonotic pathogens.

### Brucellosis

Brucellosis is a bacterial disease caused by *Brucella* species, commonly found in sheep, goats, camels, and cattle. Humans are infected through direct contact with birthing tissues, blood, urine, or other secretions from infected animals, as well as through the consumption of unpasteurized milk, cheese, or undercooked meat. In humans, brucellosis can cause prolonged fever, joint pain, fatigue, headaches, and, if untreated, chronic infection affecting multiple organs. Laboratory workers, veterinarians, and individuals handling livestock are at heightened risk. Preventing infection requires avoiding unpasteurized dairy products, wearing PPE when working with animals, and practicing proper disinfection and hygiene protocols.

### Contagious Ecthyma (Soremouth)

Caused by the Orf virus, contagious ecthyma in people is called Orf. People become infected by **direct contact** with skin lesions or scabs usually on the face and mouth of infected animals. In people, usually only one single lesion (local sore/wound) develops.



### and reporting of illness

#### Chlamydiosis

Chlamydiosis is a bacterial disease in sheep and goats is caused by *Chlamydophila abortus*. Pregnant animals can shed large numbers of *C. abortus* in the placenta and uterine discharges when they abort or give birth. Although rare, people can be infected by **direct contact** with birthing tissues, but there are additional ways to be infected. In people, animal-associated chlamydiosis causes flu-like signs (fever, body aches, headache), reddened eyes, and pneumonia. Pregnant women should avoid contact with pregnant or aborting animals.

#### Campylobacteriosis

A major cause of enteritis in humans, *Campylobacter* spp. (e.g., *C. jejuni* and *C. coli*) often infects people by the consumption of contaminated or undercooked meat and unpasteurized milk or dairy products (**oral**). People can also be infected by untreated water or contact with infected animals or feces. People infected with campylobacteriosis can have diarrhea, fever, nausea, vomiting, abdominal pain, headache and muscle pain. People with compromised immune systems are at higher risk for severe or recurrent infections.

#### Cryptosporidiosis

Cryptosporidiosis results from infection by *Cryptosporidium parvum*, a coccidian parasite common in the environment and carried by many animals without symptoms. People often become infected by **ingestion** following contact with objects contaminated with feces or unwashed hands after contact with ill animals. Infections in people can cause stomach cramps, watery diarrhea, nausea and a poor appetite. Vomiting, fever, and muscle aches may also occur.

#### Hantavirus

Hantavirus is a viral infection carried by rodents, particularly through their urine, droppings, and saliva. Humans are most often infected by inhaling aerosolized particles from rodent excreta, which can occur when disturbing nesting materials, sweeping contaminated floors, or working in enclosed or poorly ventilated spaces where rodent activity has occurred. For researchers conducting fieldwork in desert or rural areas of Saudi Arabia, where rodent activity may be common, the risk of hantavirus exposure is elevated when entering abandoned buildings, field camps, or caves.

In humans, hantavirus infection can lead to hantavirus pulmonary syndrome (HPS), a severe respiratory illness that begins with flu-like symptoms such as fever, muscle aches, and cough, and can rapidly progress to fluid buildup in the lungs and respiratory failure. There is no specific treatment or vaccine for hantavirus, making prevention the only line of defense.

#### Histoplasmosis (linked to bats and bird droppings)

Histoplasmosis is a fungal infection caused by *Histoplasma capsulatum*, which thrives in soil enriched by bird droppings or bat guano. Humans become infected by inhaling airborne fungal spores, often when disturbing contaminated soil, cleaning bat roosts, or working in caves. While many infections are mild and



### and reporting of illness

may go unnoticed, histoplasmosis can cause flu-like symptoms such as fever, cough, and chest pain. In people with weakened immune systems, the disease can progress to a severe and potentially life-threatening respiratory or systemic infection. Prevention includes avoiding dusty environments with bird or bat droppings, wearing N95 masks or respirators when working in affected areas, and wetting down surfaces before cleaning to prevent aerosolization of spores.

### Leptospirosis

Leptospirosis is caused by *Leptospira* bacteria, commonly spread through rodent urine in water or soil. Researchers are at risk when wading in flood-prone or stagnant water, or while working in environments contaminated by rodents. Infection occurs when the bacteria enter cuts or abrasions or contact mucous membranes. Symptoms vary widely and may include fever, chills, muscle pain, headaches, vomiting, and, in severe cases, liver or kidney damage. Individuals working outdoors or in wet environments where rodents are present are at higher risk. Preventive measures include avoiding direct contact with potentially contaminated water, wearing protective clothing and gloves, and maintaining rodent control measures.

### Listeriosis

*Listeria monocytogenes* causes listeriosis, a bacterial disease in ruminants and humans. Most infections in people occur by eating raw meat or unpasteurized dairy products (**oral**), but there are additional ways to be infected. Animals can shed *L. monocytogenes* in the feces, milk and uterine discharges. Pregnant women or immunocompromised people should take special care to avoid unpasteurized dairy products. Unlike other bacteria, *L. monocytogenes* can grow in cold temperature, including in the refrigerator. A skin infection form of the disease can occur in people who handle sick animals.

### MERS-CoV (Middle East Respiratory Syndrome Coronavirus)

MERS-CoV is a viral respiratory illness primarily linked to dromedary camels, which act as the main animal reservoir. Humans can contract MERS-CoV through direct contact with infected camels, their bodily fluids, or by consuming raw or undercooked camel products, such as meat or unpasteurized milk. Respiratory droplets from infected camels or human-to-human transmission in healthcare or laboratory settings have also been documented. Symptoms in humans range from mild flu-like signs, such as fever, cough, and shortness of breath, to severe pneumonia and organ failure in high-risk individuals. To reduce the risk of infection, it is essential to avoid direct camel contact, practice good hygiene, and wear appropriate personal protective equipment (PPE) when handling camels or their samples.

### Q Fever (Query Fever, Coxiellosis)

Q fever results from infection by the bacterium, *Coxiella burnetii*, which can infect people who inhale aerosolized organisms, or by additional routes. Most human infections are associated with cattle, sheep and goats, and often occur when the animal gives birth. Symptoms of Q fever include fever, chills, night sweats, headache, fatigue and chest pains. Q fever can cause abortion or premature delivery in pregnant women, so pregnant women should avoid contact with pregnant or aborting animals.



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### Rabies

Rabies is a severe, viral disease that can affect all mammals, including bats, dogs, cats, and foxes. People most often get rabies from the bite (**direct contact**) of an infected animal, but can also be exposed to the virus by entry of saliva, brain or spinal cord fluid of an infected animal into cuts or breaks in the skin or mucous membranes. Early human symptoms include fever, headache, confusion and abnormal behavior (neurological signs). Once signs begin, recovery is very rare. If you are bitten by an animal, immediately contact local animal control so the animal may be tested or quarantined, and contact your physician and Occupational Health immediately to determine whether post-exposure treatment is indicated. See [Medical Standard: Rabies Vaccine](#) for more guidance.

### Ringworm (Dermatophytosis)

Ringworm is a common fungal disease caused by dermatophytes. People can become infected by **direct contact** with the spores on an infected animal. The spores may be on the animal's hair/wool or skin, and can even be on **fomites** such as brushes or clippers. Dermatophytosis tends to be more common in show lambs than production flocks. Itchiness is the most common symptom, and the spots are generally inflamed at the edge with redness, scaling, and occasionally blistering.

### Salmonella

People most commonly get salmonellosis from eating (**oral**) improperly cooked food, such as meat, eggs or unpasteurized milk/dairy products. People can also get salmonellosis by **direct contact** with feces/diarrhea from infected animals. People with salmonellosis may have diarrhea, fever and abdominal cramping.

### Occupational Health (OH) Reporting and Follow-Up

If you feel unwell, especially with flu-like symptoms, gastrointestinal issues, or skin lesions after working with animals, you must:

1. Seek medical evaluation promptly to determine if the illness may be related to zoonotic exposure. Report symptoms to family medicine doctor and/or ER immediately.
2. Report symptoms to KAUST Occupational Health (OH) by emailing [occupational.health@kaust.edu.sa](mailto:occupational.health@kaust.edu.sa) or calling 8087545.
3. Follow KAUST incident reporting procedures for workplace exposures.