



ANTHROPOZOONOTIC DISEASES, DIAGNOSTICS AND TREATMENT METHODS

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Abstract: Anthropozoonoses are a group of infectious diseases transmitted from animals to humans and of significant epidemiological and social importance for both human and animal health. The causative agents of these diseases can be various pathogenic microorganisms, including bacteria, viruses, fungi, and helminths. Wild, semi-wild and domestic animals play an important reservoir role in the spread of zoonotic infections. Depending on the characteristics of the pathogen and the direction of transmission, zoonoses are divided into bacterial, viral, mycotic and helminthic groups, as well as amphixenosis, anthropozoonosis and zooanthroponoses. Human infection with anthropozoonoses occurs mainly as a result of direct contact with sick or carrier animals, contact with biological materials during veterinary and diagnostic examinations, examination of sick animal carcasses, as well as the use of infected food and other products of animal origin. Diseases such as brucellosis, tuberculosis, anthrax, listeriosis and rabies are important examples of anthropozoonoses. In the prevention of these diseases, identification of sources of infection among animals, epidemiological surveillance, early diagnosis, and prevention of the chain of infection between humans and animals are of great importance.

Keywords: anthrax, brucellosis, salmonellosis, tuberculosis, tularemia.

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Received: 1 September 2026 Accepted: 8 September 2026 Published: 18 September 2026

DOI: 10.54414/TNEL1688

Introduction

Anthropozoonotic diseases are a group of infectious diseases that can be transmitted from animals to humans and, in some cases, from humans to animals in natural conditions. These diseases are of significant epidemiological importance for human and animal health, and their causative agents can be bacteria, viruses, fungi, and parasites. In the spread of anthropozoonoses, various domestic and wild animal species, including dogs, cats, birds, sheep, cattle, rodents, and other mammals, can act as a source or

reservoir of infection (Bell et al. 1988).

Depending on the biological characteristics of the agent, the transmission of infection to humans occurs in various ways, mainly through direct and indirect contact, inhalation, and the alimentary route. Salmonellosis, brucellosis, leptospirosis, campylobacteriosis, rabies, Lyme disease, plague, tularemia, sporotrichosis, dermatophytosis, echinococcosis, cysticercosis, and toxoplasmosis are examples of anthropozoonotic diseases.

Identifying sources of infection, controlling transmission routes, regular veterinary examinations of animals, vaccination, parasite control, and sanitary and hygienic measures play an important role in preventing these diseases. Timely vaccination of animals is one of the main methods of preventing the spread of the disease, especially in the prevention of serious zoonoses such as rabies (Azərbaycan Milli Ensiklopediyası 2009; Wilson 2014).

Anthroozoonotic Disease Agents ***Bacteria and Viruses***

A significant part of anthroozoonoses is associated with infections of bacterial and viral origin. Bacteria play an important role in the spread of zoonoses by causing various infectious processes in the human and animal body. One of the main features of bacterial anthroozoons is that they can exist for a long time in various animal species and that these animals act as a source or reservoir of infection. Infection in humans occurs mainly through direct contact with sick or bacteria-carrying animals, ingestion of animal-derived food products, contact with infected materials, and in some cases through the respiratory tract. Brucellosis, salmonellosis, campylobacteriosis, leptospirosis, plague, and tularemia are examples of bacterial zoonoses. In preventing the spread of these diseases, veterinary control of animals, identification of infected animals, sanitary measures, and vaccination against some infections are of great importance (Göker & Oren 2024).

Viral zoonoses, on the other hand, arise as a result of the transmission of viruses between animals and humans, and their spread characteristics depend on the biological characteristics of the causative agent, reservoir, and transmission mechanism. In viral zoonoses, wild and domestic animals can be natural reservoirs or sources of infection for viruses. Infection

in humans can occur through direct contact, animal bites, respiratory, alimentary, and, in some cases, vectors. Rabies is an important example in this regard and is mainly transmitted as a result of contact with the bite or saliva of an infected animal. Some zoonotic influenza viruses can be transmitted from animals to humans through the respiratory tract. The main difference between bacterial and viral anthroozoonoses is manifested in the biological characteristics of their causative agents, as well as their maintenance in animals, mechanisms of transmission to humans, and preventive approaches. Therefore, the identification of the source of infection, transmission route, and risk factors for each anthroozoonotic disease is one of the main conditions for preventing the spread of the disease (Breitbart & Rohwer 2005).

Parasites and Fungi

Parasitic anthroozoonoses are diseases caused by parasites using human and animal organisms as a food and living environment. The causative agents of these diseases are mainly helminths, protozoa, and various arthropods. Animals can participate in the spread of parasitic anthroozoonoses as primary or intermediate hosts. The complex life cycle of some parasites requires the use of two or more hosts to complete their development. Human infection can occur through contact with infected animals, ingestion of contaminated food and water, as well as the participation of ticks and other arthropods. Some arthropods play the role of vectors in the transmission of parasites and other pathogens from one host to another. This feature is of great importance in distinguishing parasitic anthroozoonoses from other infections. Echinococcosis, toxoplasmosis, cysticercosis, and other parasitic diseases can be attributed to this group (Ələsgərov 2016).



Fungal anthropozoonoses are characterized by fungi causing infections in humans and animals and transmission from animals to humans. The main source of infection in these diseases can be sick animals or fungal carriers. Human infection occurs mainly as a result of direct contact with sick animals and contact with their hair, skin, and other infected materials. Dermatophytosis is an example of fungal zoonoses that can be transmitted from animals to humans. Unlike parasitic anthropozoonoses, the main transmission mechanism in fungal infections is often associated with direct contact between infected animals and humans. Therefore, early identification of sick animals, veterinary control, compliance with hygiene rules, and limiting contact with infected animals play an important role in the prevention of fungal anthropozoonoses (Arora 1986).

Anthropozoonotic Diseases

Anthrax

Anthrax is an acute zoonotic infectious

disease that affects both humans and animals and is caused by the bacterium *Bacillus anthracis*. The causative agent is a Gram-positive, rod-shaped, spore-forming bacterium whose spores are highly resistant to environmental conditions and can remain viable in soil for long periods. Humans are mainly infected through contact with infected or dead animals, contaminated soil, or contaminated animal products. The bacterium can enter the body through damaged skin and mucous membranes, as well as through the digestive and respiratory tracts. In humans, anthrax occurs mainly in cutaneous, pulmonary, and gastrointestinal forms, with the cutaneous form being the most common. Diagnosis is based on clinical and epidemiological findings, together with laboratory tests. Treatment primarily involves appropriate antibiotic therapy (Hendricks et al. 2014). Preventive measures include veterinary surveillance, early identification of infected animals, proper sanitation and hygiene, and avoiding contact with contaminated materials (Figure 1).

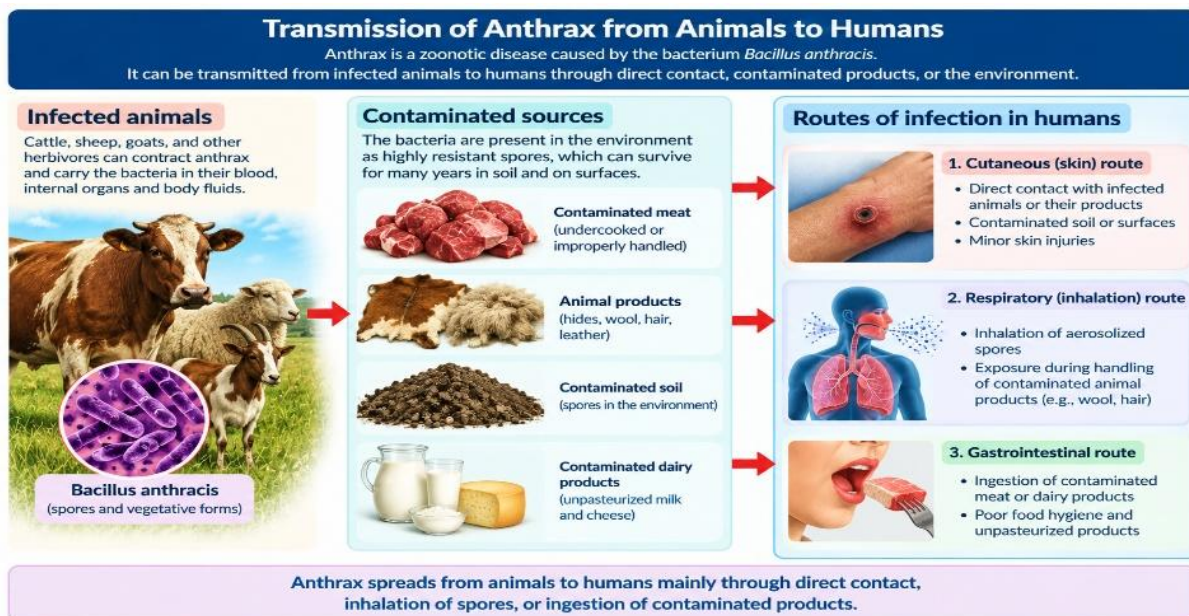


Figure 1. Transmission of anthrax disease.

Tuberculosis

Tuberculosis (TB) is a chronic infectious disease characterized by the formation of specific nodules called tubercles in various organs and tissues. The main causative agent is *Mycobacterium tuberculosis*, although different species of mycobacteria can cause infection in humans and animals. Tuberculosis primarily affects the lungs but can also spread to other organs and tissues. The pathogen mainly enters the human body through aerosol and alimentary routes, causing pathological changes in the lung tissue, lymphatic system, and other organs.

Tuberculosis is of significant epidemiological importance for livestock, wild animals, birds, and humans. *M. bovis* plays an important role in tuberculosis infections of animal origin. Diagnosis is based on clinical and epidemiological data, as well as allergic tests, histological examinations, and bacteriological tests. Treatment is based on long-term antimicrobial therapy. Early diagnosis, identification of infected individuals, and

effective epidemiological surveillance are essential for the prevention and control of tuberculosis (Azərbaycan Milli Ensiklopediyası 2009; Ələsgərov 2016).

Brucellosis

Brucellosis is a predominantly chronic zoonotic infectious disease that affects both humans and animals. It is caused by small, pleomorphic bacteria belonging to the genus *Brucella*. The main source of infection is infected animals, and the pathogen can spread into the environment, particularly through milk and other bodily secretions. Humans are mainly infected through contact with infected animals and consumption of raw milk, dairy products, or contaminated meat. The pathogen can also enter the body through damaged skin and mucous membranes. The risk of infection is particularly high among people who have close contact with sheep and goats. Common symptoms include high fever, headaches, muscle and joint pain, night sweats, weakness, weight loss, and other systemic manifestations (Figure 2).

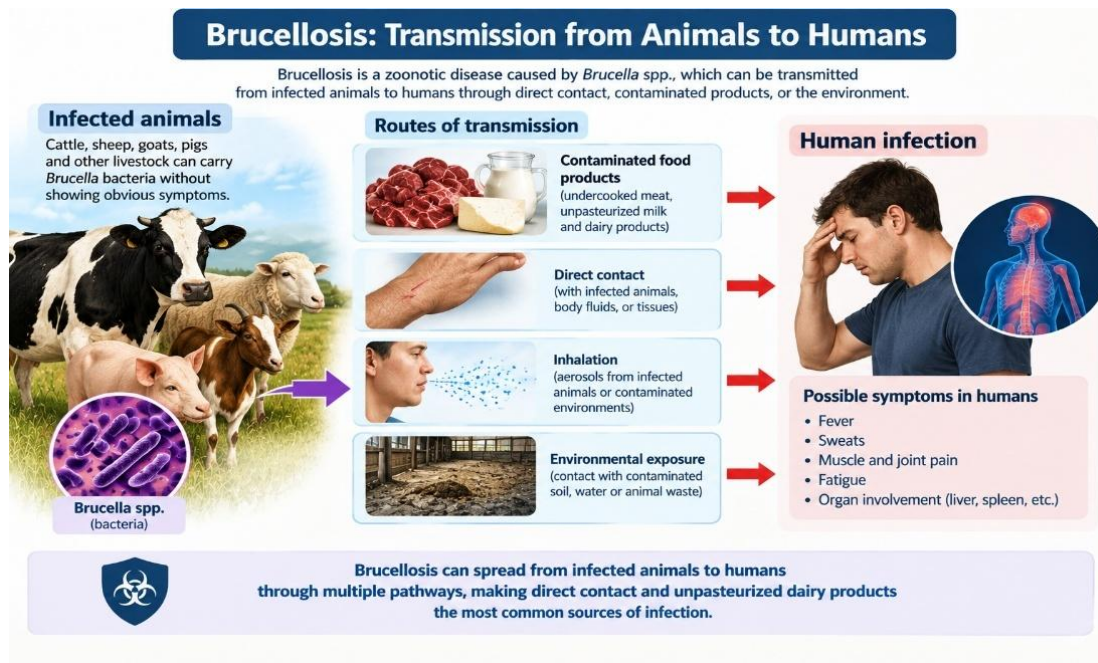


Figure 2. Infectious period of Brucellosis.



Diagnosis of brucellosis is based on epidemiological and clinical findings, as well as bacteriological, serological, and allergic diagnostic methods. Prevention includes veterinary monitoring of animals, vaccination, maintaining good personal hygiene, and avoiding the consumption of raw animal products. Brucellosis is an important zoonotic disease that can have significant epidemiological and economic effects on both human health and livestock production (Di Pierdomenico et al. 2011).

Tularemia

Tularemia is a naturally occurring, acute anthropozoonotic infectious disease. It is caused by the bacterium *Francisella tularensis*. Humans can become infected mainly through tick and other blood-sucking insect bites, contact with infected animals, or consumption of contaminated water and food. The pathogen can also enter the body through damaged skin, the respiratory tract, and the digestive tract. The incubation period usually lasts 3–7 days. The main clinical symptoms include high fever, chills, headache, muscle pain, weakness, loss of appetite, and enlarged lymph nodes. Depending on the route of infection, the lymph nodes, pharynx, bronchi, and lungs may be affected. Diagnosis is based on epidemiological and clinical findings, together with bacteriological, serological, and allergy-based tests. Treatment involves appropriate antibiotic therapy, while prevention focuses on reducing exposure to sources of infection and disease vectors (Azərbaycan Milli Ensiklopediyası 2009; Ələsgərov 2016).

Conflict of Interest

The authors declare that there is no conflict of interest.

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