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A CASE REPORT OF ANTHRAX ZONOTIC TRANSMISSION IN IASI COUNTY

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Abstract: Anthrax is a zoonotic occupational disease caused by *Bacillus anthracis*, rod-shaped immobile aerobic, sporulated gram-positive bacteria. Most cases of anthrax are acquired through contact with infected animals or contaminated animal products. Depending on the transmission method of the disease, clinical manifestations occur in three classes: cutaneous, respiratory, and gastrointestinal anthrax. The cutaneous form is considered the benign and most frequent form. In this case, we present the transmission of cutaneous anthrax acquired by direct contact with an infected animal in a non-endemic area. Despite the long and well-known evolution of anthrax in our country and of the prevention in animals, cases of zoonotic transmission were reported in 2023. We consider that a sustained campaign of public awareness will help people to better understand the risks of *Bacillus anthracis* transmission.

Keywords: *Bacillus anthracis*, zoonoses, cattle, cutaneous form

• Introduction

Anthrax is a zoonotic occupational disease caused by *Bacillus anthracis*, rod-shaped immobile aerobic, sporulated gram-positive bacteria. Anthrax occurs in humans randomly and with low frequency. No known cases of direct transmission of its causative agent, *B. anthracis*, from human to human has been reported, but the infection is acquired through contact with infected animals or contaminated animal products. The three main types of anthrax in humans and animals are cutaneous anthrax, respiratory anthrax and gastrointestinal anthrax.

The cutaneous form is the most common form of anthrax and occurs when the bacterium enters the body through a cut or abrasion on the skin. It causes a skin infection characterized by a raised, itchy sore that eventually forms an ulcer with a black center. Anthrax can be treated with antibiotics if diagnosed early, but it can be fatal if left untreated, especially in its more severe forms like inhalation anthrax.

This disease has been known for a long period so efficient preventive measures can be taken. Unfortunately, there are still areas in the world where anthrax is endemic and therefore, measures of prevention and a strict control should be applied.

When talking about Romania, the country is reporting a low number of outbreaks and cases in humans and animals but unfortunately the cases are still registered yearly. However, at the beginning of the 2023 summer the Iași County reported a cases of zoonotic transmission in which both the veterinary and the public health authorities had to intervene.

• Material and method

For this study, we took into consideration the official data reported by the veterinarian - State Veterinary Agencies, the World Organization for Animal Health (WOAH) and human official health control institutions (ECDC, Iași Public Health Directorate).

• Results and discussions

The data regarding the anthrax outbreak in animals and the zoonotic transmission to humans have been reported at the beginning of July 2023, when the outbreak occurred and the official authorities offered the first information. As for the anthrax cases reported in humans, even with a low number of outbreaks the zoonotic transmission occurred (fig.2). This was also the situation on 2023. On the 7th of July, there was an alert at a cattle farm in the Iepureni Locality, located 30 kilometers away from Iași.

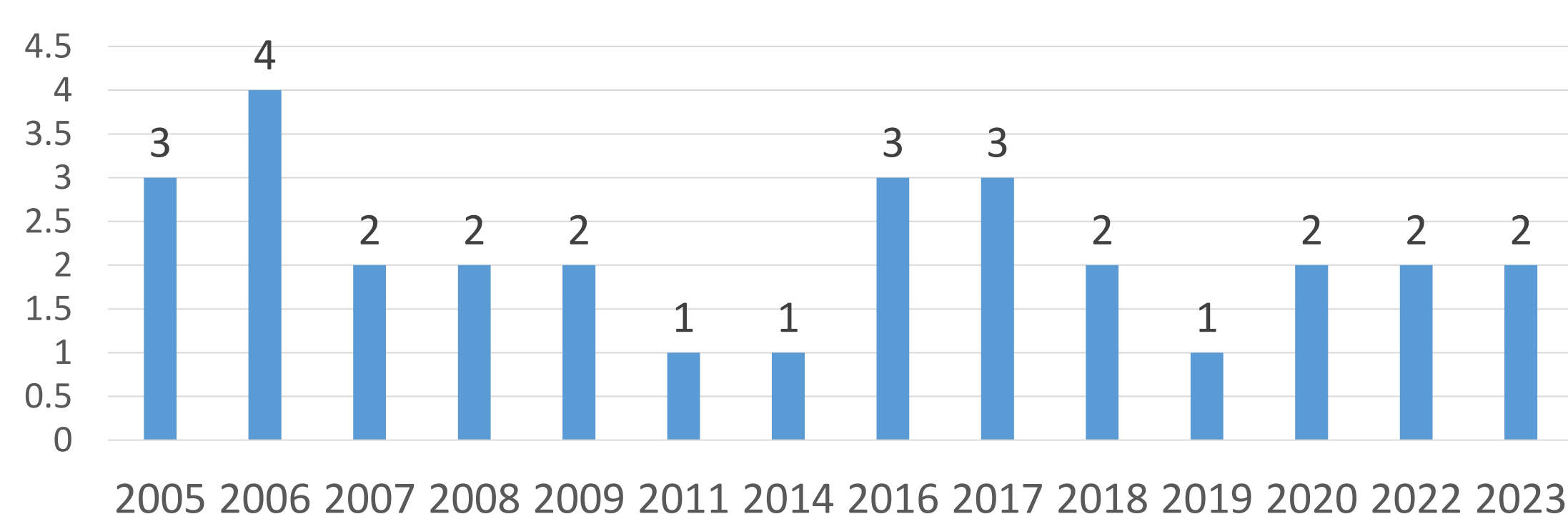


Fig.1 Official anthrax status – New outbreaks of anthrax in animals 2005-2023 (WOAH)

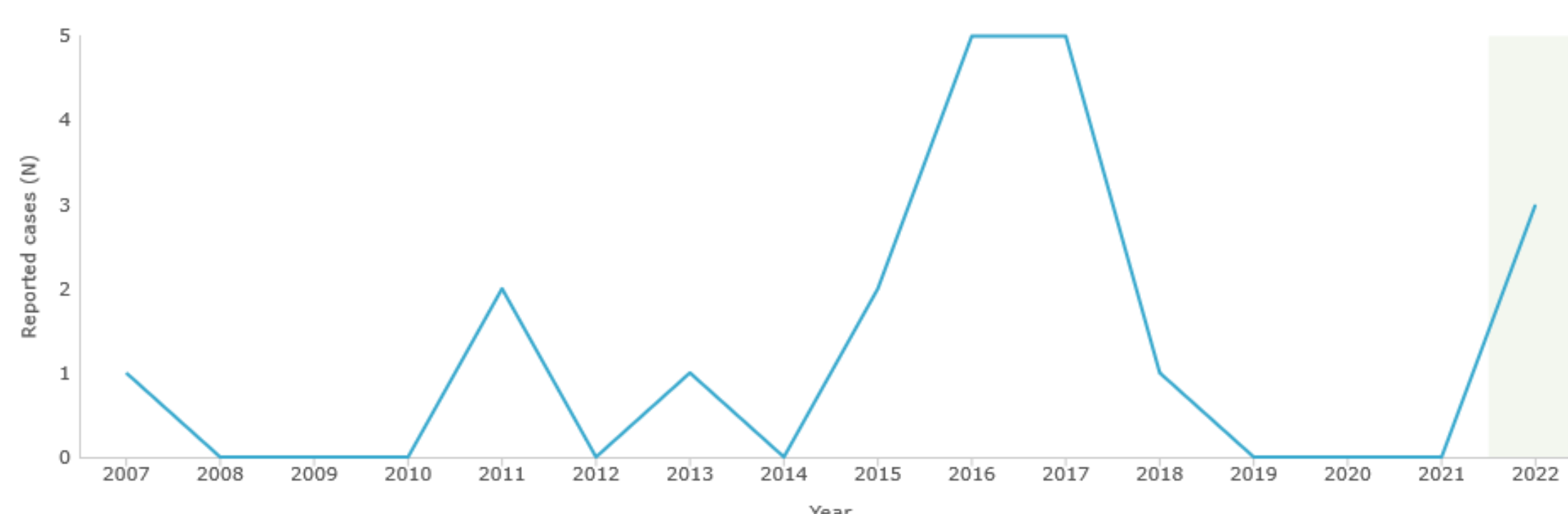


Fig.2 Reported cases of anthrax in humans Romania 2007-2012 (ECDC)

The owner of the livestock farm and two local workers arrived at the County infectious diseases hospital with symptoms specific to anthrax, particularly the cutaneous form. Alerted by the human health authorities, the veterinary authorities started an investigation and the Inspectors of the Veterinary Sanitary Institute found nine corpses of cattle buried or burned. Moreover, the investigation revealed the fact that there were suspicions that some of the meat from diseased cattle had been further sold to people. The laboratory results for the samples taken from those in the hospital, but also from the animals found dead, were analyzed and the anthrax was confirmed. As for the human cases the doctors communicated that the patients were evaluated, hospitalized and the specific treatment was initiated, and one of them, the owner of the farm required surgical intervention.

In addition close to Iepureni, in the Țigănași village, the Veterinary Sanitary Authorities reported another anthrax outbreak. Shortly, the official authority started a preliminary investigation and stated that the *B. anthracis* was confirmed, following the analyses, in a carcass of a domestic goat, slaughtered 10 days before. This date coincides with the moment when the cattle from the other outbreak were found. Also, on the 13th of July, a citizen with skin lesions on the forearm was admitted to the University Hospital (fig.4).

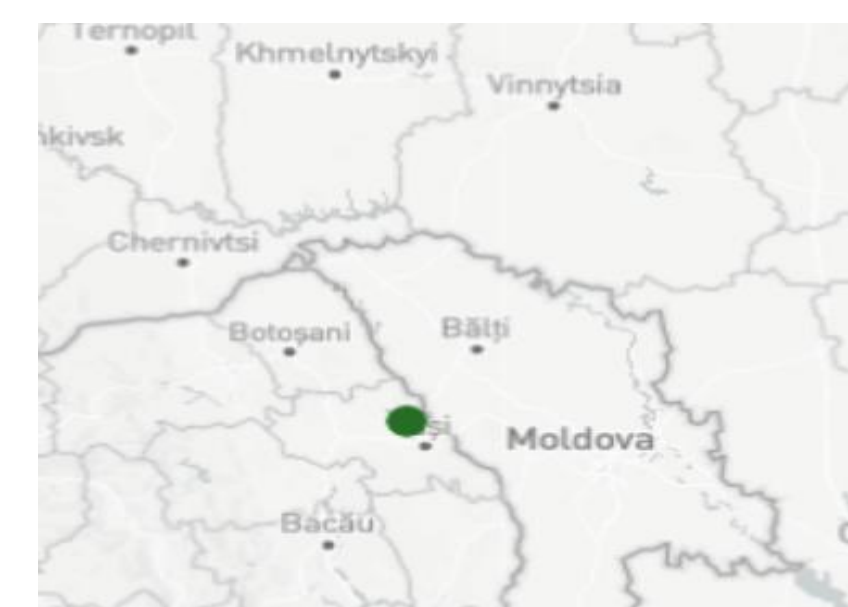


Fig. 3 Location of the anthrax outbreaks in 2023 in Iași County

The epidemiological investigation in his case showed that he was working as a shepherd on a farm in Țigănași. Approximately 10-15 days before the shepherd had slaughtered a goat from the herd and handed it over to the owner of the holding. Furthermore, the authorities identified the carcass in the refrigerator, took it to the Iași Sanitary-Veterinary laboratory and samples were taken. The next week, the anthrax infection was confirmed in the goat meat.

After the confirmation of the anthrax outbreak, a plan of official measures was instituted in that area. The farm was placed under restriction. The inventory and clinical examination of the entire herd of animals was made. Grazing was banned in the respective area. From the investigations, it was found that the susceptible animals: 26 cattle, 83 goats and 585 sheep were vaccinated when the first outbreak in the cattle farm was registered. The affected animal, a goat, was slaughtered before the date of suspicion/confirmation. No further cases were reported in neither humans nor animals to date and the outbreak ended on 3rd of August.



Fig.4 Clinical presentation of the cutaneous form of anthrax- central scar and non-pitting edema

To sum up, such an epidemiological situation could have been avoided if the owners and workers considered preventive measures. The Iași County was free from anthrax and no cases were reported since, it that the infection was introduced from an endemic zone by bringing an affected animal on the pasture. It can be assumed that there have been animals bought and transported in this place and left to graze together with the local healthy animals, creating the perfect transmission context. Moreover, the ill animals contaminated the pasture and many other individuals could have contracted the infection. People most at risk of developing anthrax are those who are in close contact with animals and potentially contaminated animal products. Nevertheless, the workers in the livestock farm found the carcasses and chose to cut them and spread them to others, instead of alerting the official authorities. This is how they contracted the infection.

• Conclusions

This case report is an example of excellent collaboration between the human and animal health specialists in the frame of the ONE HEALTH concept.

We want to put the emphasis on the importance of preventive measures and to alert the fact that there are still workers in the field who do not respect these.

There is still a continuous need for public awareness campaigns to remind to the people about the importance of prevention measures in case of zoonotic pathogens.

Control measures should focus mainly on the appropriate handling of dead animals and animal products including correct disposal of carcasses, decontamination of the environment, and disinfection and decontamination of animal products.

We consider that a sustained campaign of public awareness with the implication of both human and veterinarian specialists will help people to better understand the risks of *Bacillus anthracis* transmission.