

FAQ

Classical Borna Disease Virus Borna Disease Virus 1 BoDV-1



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Where are BoDV-1 risk areas?

The natural occurrence of BoDV-1 is limited to certain regions in Germany, Austria, Switzerland, and Liechtenstein, where its natural host (reservoir host), the bicolored white-toothed shrew (*Crocidura leucodon*), occurs. In Germany, these risk areas are mainly located in Bavaria, Thuringia, Saxony, Saxony-Anhalt, and parts of their neighbouring federal states.

The bicolored white-toothed shrew is not a rodent, but a protected insectivore and is as such related with the mole and the hedgehog. As a rule, it does not tend to change its territory, so that an exchange of animals between more distant populations seems to be rare. As a consequence, the virus spreads only slowly and is restricted to a limited area, although populations of bicolored shrews exist outside this so-called endemic area.

What is the difference between the reservoir host of BoDV-1 and the so-called dead-end hosts?

BoDV-1 is optimally adapted to its reservoir host, the bicolored white-toothed shrew. It can replicate and spread in this host, and can establish life-long infection without causing disease. The bicolored white-toothed shrew excretes the virus most likely via saliva, feces, and urine, and can thus transmit it to other susceptible animals.

In addition to its reservoir host, BoDV-1 can also infect other species. It has been known to cause infections in horses and sheep for more than 100 years. In animal experiments, it was possible to infect mice and rats. Human infections were first detected in 2018.

As the virus is not adapted to these hosts, it cannot escape their immune system - unlike in its reservoir host. This prevents the virus from spreading through

the organism, from replicating and being excreted, while at the same time the activity of the immune system is harmful to the host. Since in dead-end hosts the virus mainly retreats to the central nervous system, it particularly causes severe inflammation of the brain (encephalitis), which is in many cases fatal.

How do humans and animals become infected with BoDV-1?

So far, the exact transmission route is unknown. It is assumed that the virus is transmitted by direct or indirect contact with infected bicolored white-toothed shrews or their virus-contaminated excretions.

According to current knowledge, contact with bicolored white-toothed shrews and their excretions is necessary to become infected.

Do horses suffering from Borna disease represent a risk for other horses or humans?

No, there is no indication for an infection risk. As dead-end hosts (see above), they do not excrete the virus according to current knowledge. The same applies to other infected dead-end hosts such as e.g. sheep, alpacas or humans.

My cat regularly catches bicolored white-toothed shrews and brings them home. How should I handle dead shrews?

Do not touch them with bare hands, always wear gloves or cover your hands with a plastic bag serving as „glove“. Dispose of the dead shrew in a plastic bag in your household garbage.

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Can my cat become infected when it catches bi-colored white-toothed shrews? Can it transmit the virus to me or other persons?

In principle, cats can become infected with BoDV-1, however, only a small number of cases have been reported so far. As they are dead-end hosts, cats do not excrete the virus according to current knowledge and therefore cannot actively transmit it to humans.

I live in a BoDV-1 risk area. What should I be aware of?

Please refer to the information sheet „Informationen zur Vermeidung von Infektionen mit dem Borna Disease Virus 1“ (in German language) published jointly by the Friedrich-Loeffler-Institut, Robert Koch Institute und Bernhard Nocht Institute for Tropical Medicine.

A link to the information sheet can e.g. be found on the [website of the Friedrich-Loeffler-Institut on bornaviruses](#).

What is the difference between the recently confirmed human BoDV-1 infections and earlier reports on BoDV-1 in humans?

In the 1990s, BoDV-1 was discussed controversially as a possible cause of psychiatric diseases in humans worldwide; however, this could not be confirmed scientifically and is today considered to have been disproved. The first confirmed human BoDV-1 infections have been described in 2018 in Germany, but it is likely that cases have occurred for a long time in the dispersal area of the virus in Central Europe. In contrast to what has been suspected in the 1990s, BoDV-1 infections in humans are not widespread; they represent rare individual cases that manifest as severe, usually fatal, acute encephalitis.