



FOCUS ON



Teschovirus encephalomyelitis in the Republic of Haiti (previously enterovirus encephalomyelitis or Teschen/Talfan disease)

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1. BACKGROUND

Enterovirus encephalomyelitis is an acute disease that affects pigs of all ages and causes disorders in the central nervous system (CNS). The infectious agent that causes this disease belongs to the family Picornaviridae, genus *Teschovirus*¹, and classified into 11 different antigenic serotypes (PTV-1 to PTV-11). Most of these serotypes are found world wide and are more often asymptomatic, but the PTV-1 serotype can be more virulent and is able to cause encephalomyelitis in swine.

This disease was described for the first time in Czechoslovakia in 1929, in the city of Teschen (where it was once known as "Teschen Disease"). During the 1940s and 1950s it spread across Europe, followed by the United States, Canada, Australia and finally into Uganda and Madagascar, causing huge losses to the pig industry. The clinical signs of the disease are uncommon, although there is serological evidence that variants of viruses of low virulence are circulating in pig populations.

Teschovirus encephalomyelitis has not been reported in Western Europe since 1980 (Austria) and the disease is now considered rare. In the last 12 years (since 1996) disease was reported to the OIE by the following countries: Belarus (1996, 1999 and 2005), Japan (2002), Latvia (1997 and 2000–2002), Madagascar (1996–2000, 2002 and 2004–2005), Moldavia (2002–2004), Romania (2002), Russia (2004), Uganda (2001) and Ukraine (1996–2005).

The first clinical signs caused by this disease usually appear after an incubation period of 10-20 days. It starts with fever, anorexia, uncoordinated movements and locomotive disorders. This phase continues with tremours, nystagmus, opisthotonos, general deterioration and convulsions, and ends with paralysis of the hindquarters and the animals' inability to stand up. It affects pigs of all ages, with a 40-60 percent rate of morbidity and a 40-to 50 percent rate of mortality.

Teschovirus encephalomyelitis is not a zoonotic disease and only affects swine herds. Although it is not considered a reportable disease by OIE because it is rarely observed, its occurrence needs always to be reported immediately when a significant epidemiological event occurs. The virus is excreted in faeces and urine for several weeks and the main

route of transmission is fecal-oral, directly or indirectly, from contaminated sources of food or water. Teschovirus infection causes a lasting immune response. However, since it has been considered a rare disease in the past few decades, today it is very difficult to find commercial vaccines available.

Diagnosis must be based on the observed clinical signs, although it is also necessary to do a differential diagnosis with other diseases that cause similar signs, such as classical swine fever, Aujeszky's disease, Japanese encephalitis, lead or pesticide intoxication, water deprivation, diseases caused by porcine enterovirus type 8, bacterial meningoencephalitis or porcine reproductive and respiratory syndrome (PRRS). A laboratory diagnosis, done by performing histological examination of the brain and spinal cord, virus isolation, reverse-transcription polymerase chain reaction (RT-PCR) and serological tests, is necessary to confirm the disease. In the latter tests, cross-reaction may occur with other Teschovirus serotypes and are not conclusive unless paired sera are taken (the first when clinical signs are initially observed and the second three weeks later) and show a fourfold increase in the specific antibody title.



Credit: National Veterinary Laboratory of Haiti and Drs. David Pyburn and Ming Deng of USDA/APHIS/VS

¹ Previous classification: Genus *Enterovirus*

Teschoviruses are highly resistant in the environment. Under favourable conditions, they can survive for up to five months in an external environment. They are resistant to heat, lipid solvents and some disinfectants. However, they can be inactivated by sodium hypochlorite, 70 percent ethanol or an environment with pH>9.5 or <2.5. Viruses in manure can be inactivated by aeration, ionizing radiation, or anaerobic digestion.

2. SITUATION IN HAITI IN 2009

In February 2009, some cases of a disease in pigs that caused high mortality and neurological clinical signs, e.g. anorexia, locomotive disorders, nystagmus, opisthotonos and paralysis of the hindquarters, appeared in the Republic of Haiti (Grande Salinas, Artibonite Department). These cases were confirmed after rumours that had been circulating since January 2009.

The laboratory analysis, done in March 2009 in the National Laboratory of "Tamarinier" and the "Foreign Animal Disease Diagnostic Laboratory (FADDL)" of Plum Island, New York, USA (serology, histopathology and PCR), excluded other similar diseases and identified a Teschovirus PTV-1 serotype as the agent of encephalomyelitis in pigs. The laboratory continues to work on the characterization of the identified virus, but right now the similarity between the PTV-1 strain responsible for the disease in Europe during the 1940s and 1950s and the viral isolation in the Republic of Haiti is about 82-86 percent.

The presentation of the clinical signs shown in Haiti coincide with the clinical signs described above, with an overall morbidity rate of 30-40 percent and a rate of 40-50 percent of dead animals from the third day of the onset of the first clinical signs. An estimated 30-40 percent of affected animals that survive the disease are left with paralysis and only some of them recover. Because



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encephalomyelitis is not considered a zoonotic disease and because food safety conditions in Haiti are poor, sick and surviving animals are frequently sold or slaughtered for family consumption.

The onset of the disease has a great impact not only in rural zones but also on the country's overall economy; Haiti is one of the world's poorest countries and the appearance of this kind of disease further debilitates its productive capability and social fabric.

In just three months, the disease has spread from the Artibonite Department to the Centre and West Departments and it is currently well established in the area near the border with the Dominican Republic. Although exports and imports have been banned, the lack of economic and logistics resources make control of the movement of animals within the country and along the border very difficult. This problem, combined with an easily transmitted virus and the possibility of other sources of infection, makes the risk of spreading the virus to the Dominican Republic and other Caribbean islands very high. In addition, the difference in prices of pig products between Haiti and the Dominican Republic could lead to the informal or illegal trade of products and pigs to the Dominican Republic, which would significantly increase the risk of introducing this disease in the country.

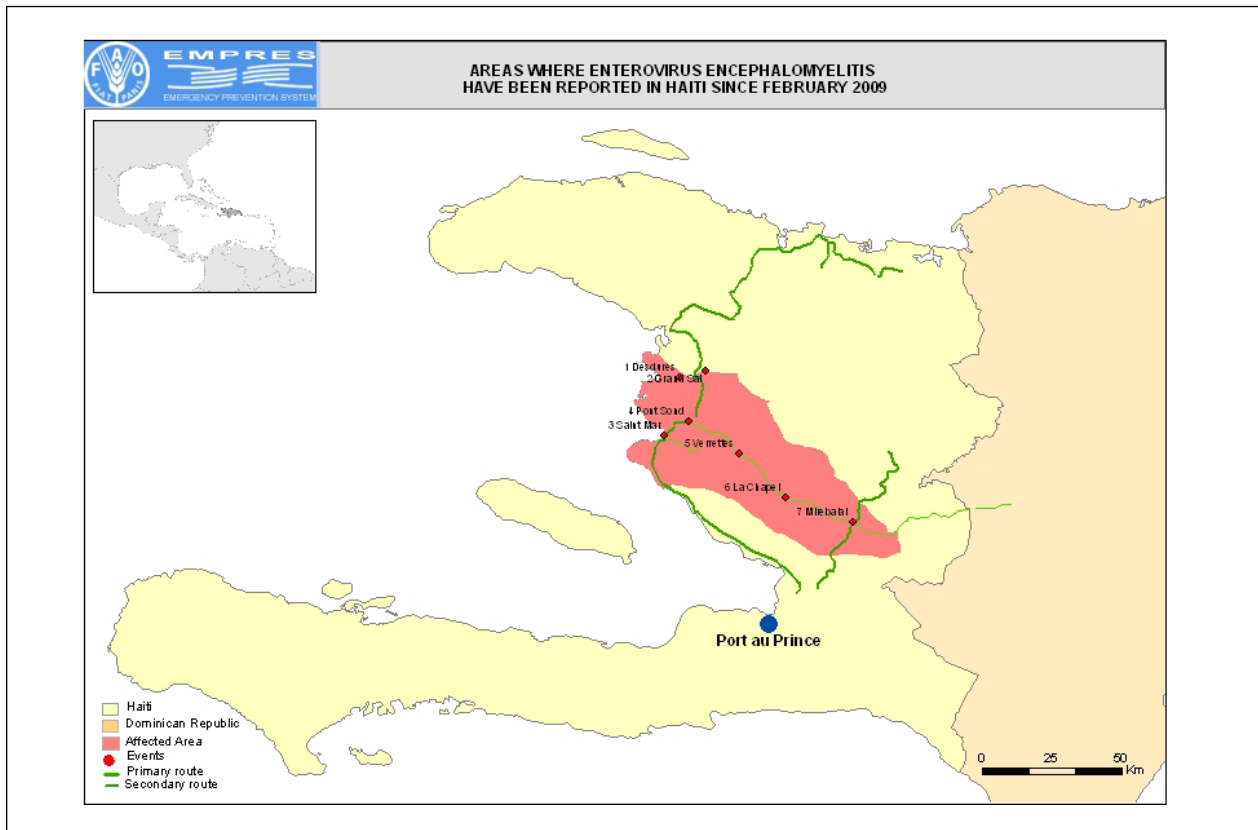
The map represents the spread of the disease in the Republic of Haiti between April and June 2009.

As already stated, the disease has spread to other zones, including areas near the border with the Dominican Republic. The Dominican Republic has a long border of about 300 km and depends on a very intensive pig production system, as well as a large number of family farms with very low levels of biosecurity and feeding practices with little waste. Considering the contagiousness of the virus and the uncontrolled movement of animal products between countries in the region, the risk of spreading the virus to the Dominican Republic, countries of Central America and the nearby islands is significant.

How the disease entered the Republic of Haiti is still unknown and, assuming its high infectivity, there could be a number of sources of infection, including contaminated waste products from ships, people travelling with pig products, smuggling or informal trade.

In the Republic of Haiti the swine populations is between 820,000 and 900,000 heads according to the classical swine fever control campaign and no established commercial movement of pigs at the national level between different areas exists. Animals are usually grown at home and there is little commercial movement between rural areas and the capital, Port-au-Prince, and the country's southern region. However, small pig farmers buy pigs in live animal markets in the towns of their departments and carry them back home to fatten them. This creates an informal movement of animals and people between different locations and rural areas that allows the rapid spread of disease. The disease could be spread by movement or direct contact between pigs for self consumption, or by people, transportation, food or infected material.

Because the risk of spreading the disease is high, it is recommended that the veterinary services of countries in vicinity of Haiti increase their biosecurity measures and border surveillance, especially with regard to ani-



mal products and people travelling from Haiti. It is also important to inform veterinarians and pig producers about the disease, its main clinical signs and routes of transmission, in order to allow early detection and rapid response, including notification, surveillance, control of movement of affected animals and increased biosecurity in farms.

Recommendations for the countries of the region to limit the risk of introduction of this disease in their swine herds:

1. Vaccination is a tool that has been successfully used to control Teschovirus. Live attenuated and inactivated vaccines are effective in controlling the disease. But today (see above) commercial vaccines are difficult to find.
2. Improve the monitoring and surveillance mechanism along the borders on baggage, people and products to avoid entry of contaminated material.
3. Improve internal monitoring of the occurrence of clinical signs in pigs with porcine encephalomyelitis and consider its differential diagnosis. This includes sending samples to international reference laboratories. Samples to be sent are of brain and spinal cord from pigs slaughtered in the clinical phase of the disease. For information on how to submit these samples, contact FAO by email: empres-shipping-service@fao.org
4. Improve the biosecurity of pig production facilities through the implementation of good handling practices by small pig producers and, most importantly, in family concerns: farm isolation and fencing that should prevent the entry of people or domestic and wild animals; isolation of replacement stock in order to detect disease and prevent its spread on the farm; monitoring the source and health of semen, food and water used, avoiding the

use of animal waste as feed; improving the health status of farms by isolating sick animals, controlling pests (rats, mice, birds, flies) and maintaining a good immune status of animals.

5. Improve communication mechanisms and spread of knowledge/information on encephalomyelitis in pigs and its effects on production.

3. REFERENCES

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