NEWS

US probes first apparent non-sexual person-to-person Zika transmission and first domestic outbreak

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A Utah man who cared for an elderly male relative infected with Zika virus has tested positive for the disease, despite not traveling to any known Zika zone. The case has raised new questions about how the disease may spread. It came in a week when the first apparent US case from local mosquito bite appeared in Florida, and a week after the first report of female-to-male sexual transmission in New York.

In the Utah case the original patient, who contracted the disease abroad, has now died, the first death in a person with Zika virus in continental United States. The exact cause of death has not been attributed, as he had comorbid conditions. His death was preceded by severe thrombocytopenia. Thrombocytopenia was also present in a man with Zika virus who died in Puerto Rico last week.

The younger Utah patient recovered after a brief fever with rash. Health officials were unsure how transmission occurred. Zika virus has been found in people's blood, semen, urine, saliva, cervical mucus, breast milk, and the vitreous humor of the eye. But no case has ever been documented of human-to-human transmission except through the sexual route, and the Centers for Disease Control and Prevention confirmed that this was not a possibility in this case. The *Wall Street Journal* reported that the infected carer was the elderly patient's son.

Michael Bell, a CDC physician and expert in hospital infection control, told reporters that the older patient's blood had the highest viral count ever measured in a Zika patient, at 100 000 times higher than average.

He said, "A high viral load is something we take very seriously, and it is not something about which we have a very long experience." Bell continued, "Someone who is extremely ill and debilitated from another disease process could have a diminished immune system that doesn't fight the virus as well. On the other hand, someone with a high viral load could be more sick as a result of the actual viral infection."

It was initially thought that a live mosquito might have come to the US in the older man's suitcase and bitten the carer (a small malaria outbreak in New York was once traced to such an event). But health officials in Utah have been catching local mosquitoes around the site and found no evidence of Zika.

The CDC physician Satish Pillai said, "We don't have evidence right now that Zika can be passed by sneezing or coughing, routine touching, kissing, hugging, or sharing utensils. While we still don't know exactly how this family contact became sick, what we do know is the primary mechanism of

transmission is mosquito-borne. So we feel that should provide reassurance to the public."

The case comes days after New York health authorities recorded the first ever case of female-to-male sexual transmission. Alternative routes of transmission were largely ruled out, said the New York health department. Both patients experienced typical Zika symptoms, including fever, rash, and arthralgia. There was no evident wound on the man's genitalia to have facilitated transmission.

Also this week, Florida's health department announced it was investigating two cases that indicated the first US mosquito-borne transmission. The first case, the 88th case of Zika in Miami-Dade County and the 1306th in the US, was the first to occur in a person with no recent travel history in a known Zika transmission area nor sexual history that would explain the disease. Another case in which there was no recent travel nor explanatory sexual history occurred in Broward County. Officials were trapping local mosquitoes to discover whether any were infected.

The new cases came a week after Congress broke for summer recess without voting through \$1.9bn (£1.4bn; €1.7bn) in funds to tackle Zika, which President Obama's administration had been seeking for six months. Republicans opposed the funding bill.

Speaking to *National Geographic*, CDC's director, Tom Frieden, said, "It is remarkable how surprising Zika has been. This is the first time we have had a mosquito-borne infection that can cause a devastating birth defect. It is the first time we have had a mosquito-borne infection that can be sexually transmitted. And if the Utah investigation confirms person-to-person spread, it will be the first [time] we have had person-to-person transmission of a virus of this type."

Vaccine developers as well as public health authorities would be hamstrung by congressional inaction, noted Frieden. He said, "Mosquitoes don't go on summer break. This is no way to fight an epidemic. The only winner from the failure of the supplemental is the Zika virus."

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