

# Typhus in Texas

[Announcer] This program is presented by the Centers for Disease Control and Prevention.

[Sarah Gregory] Today I'm talking with Dr. Kristy Murray, an associate Professor in pediatrics and assistant dean of the National School of Tropical Medicine at Baylor College of Medicine and Texas Children's Hospital. We'll be talking about typhus group rickettsiosis. Welcome Dr. Murray.

[Kristy Murray] Thank you for the invitation to be here.

[Sarah Gregory] What is typhus group rickettsiosis?

[Kristy Murray] Typhus group rickettsiosis, or TGR for short, is a disease caused by a small group of related bacteria in the genus *Rickettsia*. Symptoms of typhus can include fever, headaches, and rash.

[Sarah Gregory] What kinds are in Texas?

[Kristy Murray] In Texas, almost all cases are caused by *Rickettsia typhi*. *Rickettsia prowazekii* is another species that can cause disease, but it is incredibly rare.

[Sarah Gregory] And what are the vectors and the hosts?

[Kristy Murray] *Rickettsia typhi* is spread by fleas, specifically cat and rodent fleas. Traditionally, we think of rats as the main host for this infection, which is why the common name of the disease is murine typhus. The word "murine" actually means relating to rodents. However, there's growing evidence that other hosts can be involved, particularly opossums. Dogs and cats also likely play a role, mainly because they can bring infected fleas into the home environment, and that can increase the risk of infection to people in the home. It's actually the fecal material from the fleas (which is also commonly known as "flea dirt") that's considered infectious. The fleas often defecate when they're feeding, and a person can rub that infectious material into the bite wound when they scratch it.

[Sarah Gregory] Tell us about the objective of your study.

[Kristy Murray] Well, we began hearing about new cases of murine typhus that were locally acquired in the Houston area, and that was really unusual considering the last reported case was several decades ago. Normally cases are only reported from the very southern part of the state. In talking with the Texas state health department, their zoonosis control unit, they said they had noticed a general trend of both increasing numbers of reported cases and expanding geographic range. We decided to team up and analyze all reported cases over the course of the past decade to see if these trends were true.

[Sarah Gregory] I understand Texas mandates reporting of rickettsial diseases. What kinds of data are kept?

[Kristy Murray] Yes, thankfully Texas does mandate reporting of this disease, otherwise we never would have been able to see there was a growing problem. When a case is identified, the

medical provider reports very useful information to the state. That information includes age of the patient, when they became sick, symptoms they experienced, their laboratory results, and whether or not they had any contact with fleas or animals. These data give us a wealth of information to understand many different things, such as who's highest risk, how sick the patient became, where we're seeing these infections occurring, and what is contributing to the increased risk of exposure.

[Sarah Gregory] How did you go about your study?

[Kristy Murray] Well, when a case is reported, the data from each case is entered into a main reportable disease database. So we went through and analyzed these data over a ten year period to better understand the "when, where, and who" of murine typhus across the state.

[Sarah Gregory] And what did you find?

[Kristy Murray] We found there was a real increase in reported cases and we also saw there was a real increase in the geographic range, like we had suspected. Over the course of 10 years, more than 1700 cases were reported. Now in the first year of the study, only 23 cases were reported, and all these were from south Texas. By the end of the year of the study in 2013, we saw that 222 cases were reported in that year alone, and 41 counties were affected, including ones in central and southeastern Texas. Almost all this emergence was evident after 2007, that's when we started to see this increase in range in cases.

[Sarah Gregory] So how severe is TGR? Do people get very sick from it or is it more of an annoyance?

[Kristy Murray] In this study, 60 percent of the cases were hospitalized for their infection, and four cases were fatal. So it can be really severe. We also found a higher attack rate among children between the ages of five and 19 compared to the rest of the population. So they appear to be at much higher risk for infection. Illness can be severe and prolonged if not quickly and appropriately treated with the right kind of antibiotic.

[Sarah Gregory] Are there any limitations in the reporting system in Texas?

[Kristy Murray] All cases are passively reported, so we rely first on the patient to present for medical care, then for the medical community to actually suspect a case of murine typhus, request the right kind of diagnostic tests, and then report the case to the local health department if the results come back positive. When a patient is hospitalized, oftentimes multiple people are responsible for that patient's care, so it's very easy for cases to not get reported, particularly when results come back after the patient has improved and been discharged.

[Sarah Gregory] Do you know the reasons for this increase in patient cases?

[Kristy Murray] We're really not sure, but we do believe it's a true increase as opposed to just better recognition of disease or just improvements in our surveillance.

[Sarah Gregory] What's needed to curb this growing public health problem?

[Kristy Murray] Well, there're several things we can do. First, this paper will raise the awareness of the disease among medical providers, so they'll be more likely to think about rickettsial

infections in their patients if they present with compatible signs and symptoms. Second, we can educate the public on the importance of flea prevention. There are many effective flea prevention products available for pets, which would dramatically reduce the chance for fleas to enter the home. Homes can also be treated, if fleas are present. I feel like if there's better awareness of this disease, then multiple measures can be taken to prevent people from getting sick.

[Sarah Gregory] Thank you, Dr. Murray. I've been talking with Dr. Kristy Murray about her April 2017 article, Typhus Group Rickettsiosis, Texas, USA, 2003-2013, online at [cdc.gov/eid](http://cdc.gov/eid).

I'm Sarah Gregory for *Emerging Infectious Diseases*.

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