

***Salmonella* Typhimurium Infections Associated with Hedgehog Contact**

July – October

Multiple counties/Multiple states

On July 30, 2020, Minnesota Department of Health (MDH) epidemiologists received notification from Centers for Disease Control and Prevention (CDC) epidemiologists that a clinical isolate of *Salmonella* Typhimurium from a Minnesota resident was highly related by whole genome sequencing (WGS) to isolates in a multi-state cluster of 17 cases (cluster code 2007MLJPX-1) associated with hedgehog contact. These isolates were highly related by WGS to isolates from prior multi-state outbreaks linked to contact with pet hedgehogs that occurred during 2011-2013 and in 2018 (in Minnesota, isolates in these historic outbreaks were designated pulsed-field gel electrophoresis subtype TM1083). An investigation was initiated.

A case was defined as a Minnesota resident with either a culture-confirmed infection with the outbreak strain of *S. Typhimurium* as defined by WGS, or who reported both fever and diarrhea (≥ 3 loose stools in a 24-hour period) or diarrhea of ≥ 3 days duration, and who reported hedgehog contact in the 7 days prior to illness onset. All *Salmonella* cases in Minnesota are reportable to MDH, and are interviewed about food consumption, animal contact, and other potential exposures as part of routine enteric disease surveillance. Cases who indicated a hedgehog exposure prior to illness were asked to complete a detailed supplemental questionnaire regarding their contact with the hedgehog. These questions included when and where the hedgehog was purchased, where it was housed, food type, details of routine handling, and cage cleaning practices prior to illness, as well as whether the case would be interested in having their hedgehog's stool tested for *Salmonella* at the MDH Public Health Laboratory (PHL). Stool kits were offered and sent to cases willing to test their hedgehogs.

The index Minnesota case was identified through routine surveillance and had been interviewed by MDH staff on July 20. During the interview, the case reported owning a hedgehog purchased from a Minnesota hedgehog breeder 6 weeks prior. On August 11, a second *S. Typhimurium* outbreak case was interviewed and reported recently purchasing a hedgehog from the same Minnesota breeder. Stool kits were sent to both cases for animal testing; none were returned to the PHL for testing.

A third *S. Typhimurium* outbreak case interviewed on October 31 and reported buying a hedgehog from the same breeder at the end of August. One other case identified in October had *S. Typhimurium* that matched by WGS, but was unable to be interviewed.

In total, there were four laboratory-confirmed *S. Typhimurium* outbreak cases in Minnesota. Illness onset dates ranged from July 15 to October 8, 2020. The median case age was 27 years (range, 10 to 61 years), and all were female. All three interviewed cases reported diarrhea (one with bloody stool), fever, and vomiting. Two cases who had fully recovered at the time of interview both reported illness durations of 7 days. One case with ongoing diarrhea at the time of interview reported a minimum duration of 7 days. One case was hospitalized for 5 days.

All three interviewed cases reported direct contact with hedgehogs in the 7 days prior to their illness onset. Hedgehog purchase dates for the three interviewed cases ranged from mid-June to August 21, 2020; these hedgehogs were owned for a median of 6 weeks prior to illness onset of the cases (range, 38 days to 2 months). One hedgehog was reported to have been ill or have loose stools, but not in the 7 days prior to the human illness onset. Two cases reported prior knowledge that hedgehogs could be a source of illnesses, such as salmonellosis.

The multi-state outbreak concluded on January 13, 2021. There were 49 cases from 25 states infected with the outbreak strain of *S. Typhimurium*. Illness onset dates ranged from April 12 to November 24. Cases were 57% female, and ages ranged from 1 to 61 years (median age, 11 years). There were 11 hospitalizations and no deaths reported. Ill people reported buying hedgehogs from various sources, including pet stores, breeders, or online, with no common breeder or source identified.

This was a multi-state outbreak of *Salmonella Typhimurium* infections associated with hedgehog contact, with four laboratory-confirmed cases in Minnesota. The outbreak strain was also identified in previous outbreaks associated with hedgehogs. Efforts to engage the pet industry in national level discussions to control this pathogen in breeding hedgehogs were made but were largely unsuccessful.