

BACKGROUND

- Melioidosis is a severe, potentially life-threatening infection caused by *Burkholderia pseudomallei*
- Nearly all U.S. melioidosis cases are due to travel to endemic areas outside of the continental U.S., such as northern Australia and Southeast Asia, where patients had contact with water or soil contaminated with *B. pseudomallei*
- In September 2019, a patient in Maryland developed melioidosis and analysis of whole genome sequencing (WGS) of the patient's clinical isolate showed it clustered most closely with isolates from Southeast Asia; however, the patient had never traveled outside of the continental U.S.
- CDC and the Maryland Department of Health investigated possible sources of *B. pseudomallei* exposure to identify the source and route of transmission and to evaluate risk to others

METHODS

- The patient and household members were interviewed during October–December 2019
- The team conducted environmental sampling of the patient's home including drains, faucets, potted and ground soil, imported products, and two freshwater aquariums
- Samples were tested for *B. pseudomallei* at CDC by PCR and culture
- *B. pseudomallei* isolates underwent WGS and were analyzed along with a reference panel of geographically diverse, publicly available genomes

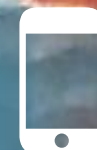
RESULTS

- Three environmental samples, all from aquarium #2, were positive for *B. pseudomallei*
- These isolates matched the patient's clinical isolate by whole genome sequencing, suggesting the aquarium was the source of exposure
- According to interviews, the patient set up both aquariums in July 2019 with imported tropical fish and all the fish in aquarium #2 died in August 2019
- The patient recalled reaching their bare hands and arms into the aquarium in August 2019 while cleaning the aquarium, one month prior to illness onset

CONCLUSIONS

- This investigation led to the first documented transmission of *B. pseudomallei* from a freshwater aquarium to a human
- Clinicians in the U.S. are urged to consider melioidosis in patients with clinically compatible symptoms and exposure to tropical ornamental fish and freshwater aquariums, particularly if patients are immunocompromised
- Public health investigators should consider inquiring about pet freshwater fish exposure in patients diagnosed with melioidosis who have not traveled to an endemic area or have only traveled to locations inconsistent with the geographic profile of their isolate's genome

Contact with freshwater aquariums containing imported tropical fish is a newly recognized melioidosis risk.



SCAN HERE FOR
MORE INFORMATION

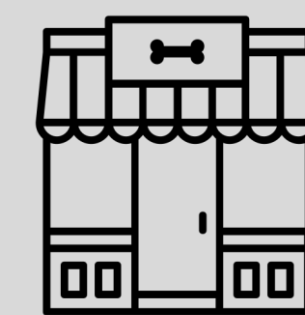
Hypothesized introduction of *B. pseudomallei* into home aquarium



Producers in parts of SE Asia, where *B. pseudomallei* is endemic, farm freshwater ornamental fish and ship to vendors in the U.S.



Vendors in the U.S. directly import freshwater ornamental fish from producers, and shipment water may be contaminated with *B. pseudomallei*



Freshwater ornamental fish and accompanying aquarium water, which may be contaminated, are distributed to pet retailers across the U.S.



Consumers purchase fish and accompanying aquarium water, which may be contaminated, and put into a home aquarium

CONTACT INFO

Patrick Dawson, PhD, MPH
wpb7@cdc.gov

