

Bearded dragons, geckos, and snakes, oh my! Reptiles as a vector of Salmonella in Canadian enteric zoonoses outbreaks

November 12, 2024 – One Health and
Zoonoses Symposium

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BC Centre for Disease Control
Provincial Health Services Authority



Agenda

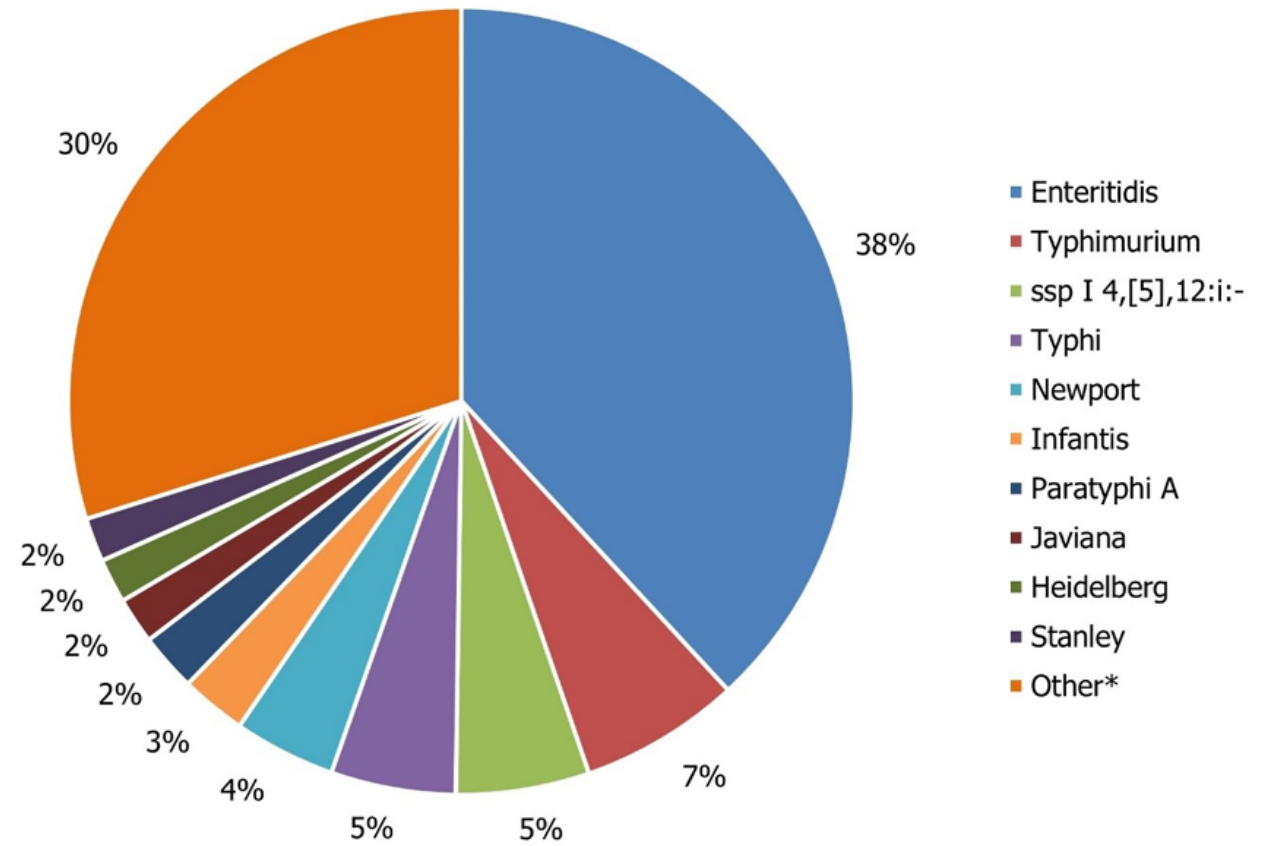
- Background on Salmonella in reptiles
- Case studies of Salmonella outbreaks caused by reptiles



Salmonella

- Salmonella is an enteric disease that causes gastrointestinal symptoms including nausea, vomiting, diarrhea, and abdominal cramping, as well as fever, fatigue and other symptoms
- According to the National Enteric Surveillance Program (NESP), Salmonella is the most commonly identified organism nationally

Figure 1. Proportion of *Salmonella* serotypes causing human illness as reported to NESP, 2022 (n=4,826)



*Other serotypes (1,440 isolates) were divided among 207 serotypes or incomplete antigenic profiles, and 22 isolates were reported as unspecified *Salmonella* species.

Salmonella Transmission

Salmonella transmission routes

- Foodborne (63%)
- **Animal contact (13%)**
- Person to person contact (10%)
- Water

Animal contact

- Farm animal contact (53%)
- **Household pets (40%)**
- Wildlife (8%)

Salmonella caused by reptiles

- Snakes (56%)
- Lizards (36.9%)
- Tortoises (34.2%)
- Other reptiles associated with human cases of Salmonella: bearded dragons, chameleons, geckos, and iguanas

Reptiles as a reservoir of Salmonella

Domestic reptiles

- Snakes (56%)
- Lizards (36.9%)
- Tortoises (34.2%)
- Other reptiles associated with human cases of Salmonella: bearded dragons, chameleons, geckos, and iguanas

Reptile-associated Salmonella is suspected to account for at least ~6% of all human Salmonella cases

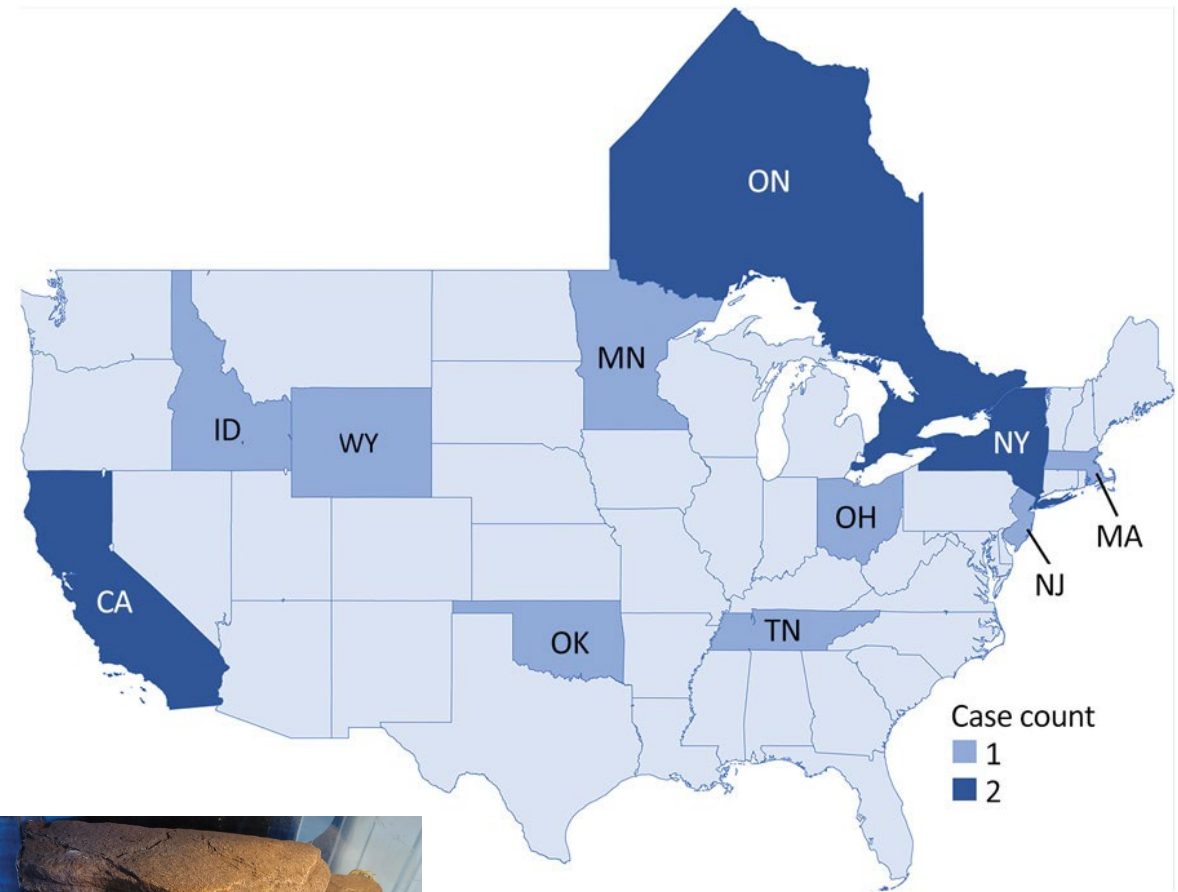
- Most reptiles carry Salmonella naturally in their digestive tract
- Reptiles can be infected with multiple Salmonella serovars at once, without any symptoms
- Travel and new habitats can increase stress, which can in turn cause increased fecal shedding
- Reptile-associated Salmonella has been associated with more severe disease outcomes, including hospitalization and death
 - Children are particularly at risk

Case Studies

Salmonella outbreaks linked to reptile exposure in Canada

Salmonella Vitkin

- Illness onset from March 2021 – Sep. 2022
- 12 cases in the USA, 2 cases in Canada
- 5 out of 13 patients with available info were hospitalized (38.5%)
- Traceback identified a potential common supplier in SE Asia
- Additional investigation lab samples: environmental, from the reptile itself



Salmonella I 4,[5],12:i:-/Typhimurium

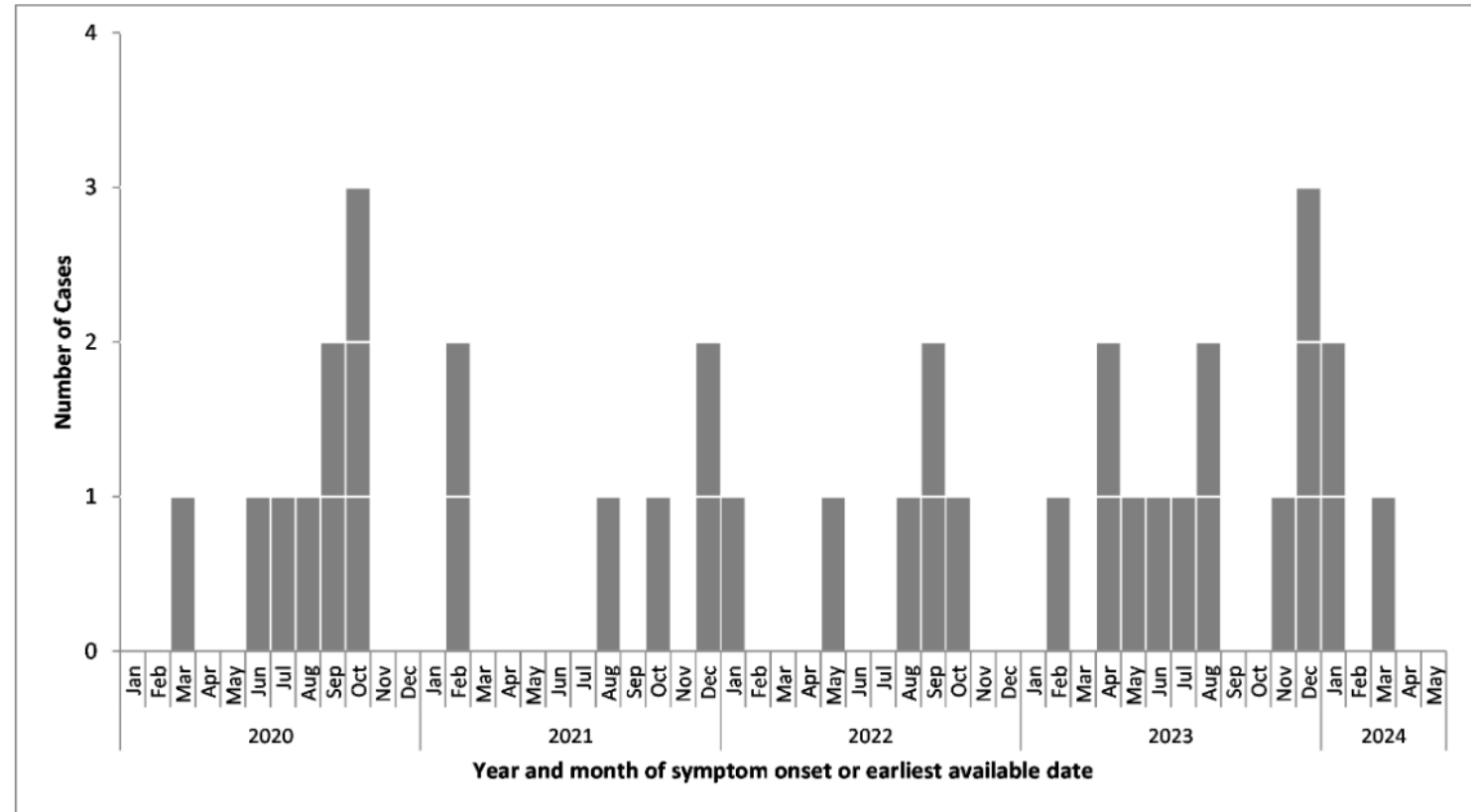
- 76 confirmed cases of *Salmonella* I 4,[5],12:i:- and *Salmonella* Typhimurium illness
- Onset dates: Feb. 2022 – April 2024
- There were 3 BC cases, and the BCCDC assisted PHAC-OMD with traceback
- One person died as a direct result of contracting Salmonella



Salmonella Lome

- 36 confirmed cases of Salmonella Lome were reported from Mar. 2020 – Mar. 2024
- 22% of cases were in children 5 years or younger
- 5 individuals were hospitalized
- Another outbreak of Salmonella Muenchen was also caused by this reptile in 2024

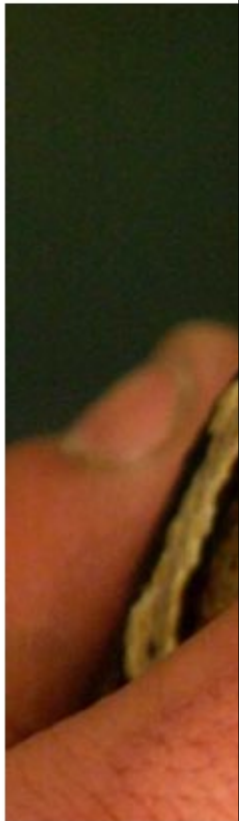
Figure 1: Number of people infected with *Salmonella* Lome



Salmonella infections across Canada linked to snakes and bearded dragons

Good hand hygiene
environment

CBC News · Posted



People

ENTERTAINMENT

CRIME

HUMAN INTEREST

LIFESTYLE

ROYALS

CROSSWORDS

SHOPPING

People with Bearded Dragons as Pets May Be Exposed to a Rare Strain of Salmonella: Report

The infection has been identified in infants in the U.S. and Canada

By [Escher Walcott](#) | Updated on January 29, 2024 02:41PM EST



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Bearded dragon. PHOTO: GETTY

Salmonella outbreak
Public Health Agency



Never kiss a pet rodent and other tips

The outbreak investigation started last spring.

Summary and Key Messages

- There has been a number of multi-jurisdictional Salmonella outbreaks in Canada associated with reptile exposure in the last 5 years
- Outbreaks and reptile-associated Salmonella cases are expected to continue occurring in Canada unless risks can be adequately mitigated
- An enteric zoonoses outbreak guidance document has been published outlining the roles and responsibilities of FPT partners
- Communication about the specific risks of reptile-associated Salmonella should be communicated at the point of sale to reptile owners

Thank you! Questions?

HEALTHY ANIMALS, HEALTHY PEOPLE

Pets can be a great addition to any home. They make us happy and provide many health benefits, but even healthy animals can carry germs that can make people sick. Follow these simple rules to share the love and not the germs.



 Public Health
Agency of Canada

Agence de la santé
publique du Canada

Canada



WASH

Make sure to immediately wash your hands after touching reptiles or amphibians, or anything in the area where they live, play, or touch.



DISINFECT

Thoroughly clean any surfaces or objects your reptile or amphibian touches with soapy water followed by a household sanitizer.



SEPARATE

Reptiles and amphibians should be kept in habitats specifically designed for them. Bathe your pet in a dedicated plastic bin, not in a household sink or tub. Keep pets and all their supplies (e.g. food, containers, toys) away from the kitchen and other places where food is made or eaten.



SUPERVISE

Always watch children when they touch or play with reptiles and amphibians. Do not let them put pets or pet supplies near their face or share their food or drinks with pets.



PROTECT

Reptiles and amphibians can be great pets, but aren't the right choice for everyone. Families that include these groups should choose a different pet: children under 5 years of age, people with a weakened immune system, pregnant women, or adults 65 years of age and older. Talk to your health care provider or veterinarian.

For more information visit:
www.canada.ca/health

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