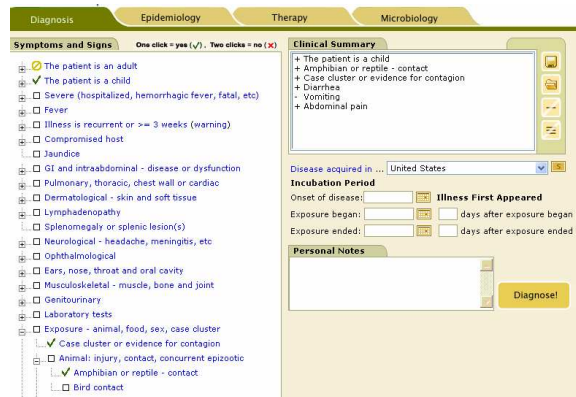


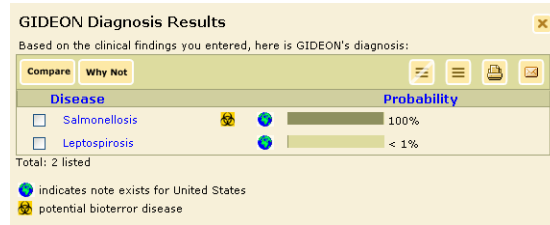
"Kids, Iguanas and Tummy Aches" Exploration of GIDEON's Diagnosis Module and Outbreak feature

One day, Raymond brings Pedro – his pet iguana – to show-and-Tell. Two days later, five of Raymond's classmates complain of fever, abdominal pain and diarrhea. What happened? Is Pedro involved?

Raymond's doctor asked GIDEON. First, the signs and symptoms are entered into the Diagnosis module.



The differential diagnosis in this case is generated by pressing the "Diagnosis" button



Usually, the differential diagnosis for a diarrhea outbreak contains a long list of diseases – but Raymond's doctor specified that this particular outbreak was related to contact with Pedro. Just to be sure, the doctor selects both diseases by clicking on the check boxes on the left hand side, and then selects "Compare." The resulting list offers him several additional clues which might be helpful in ruling out one of the two disease possibilities.

Clinical Findings	Salmonellosis	Leptospirosis
Cultures positive	+	+
Neurological - headache, meningitis, etc	-	+
Headache	-	+
Musculoskeletal - muscle, bone and joint	-	+
Ingestion	-	+
Myalgia; or muscular mass or swelling	-	+
Eggs or poultry	V	-
The patient is an adult	V	+
Hepatic dysfunction	-	V
Neutrophilia	-	+
Marine or aquatic contact	V	+
Fever	V	+
Less than two years old	V	-
Ophthalmological	-	V
Conjunctivitis	-	V
Severe (hospitalized, hemorrhagic fever, fatal, etc)	-	V
Animal: injury, contact, concurrent epizootic	-	V
Neutropenia	-	V
	+	> 80%
	V	20% - 80%
	-	< 20%

Disease Info
Salmonellosis: Fever, chills & watery diarrhea 12 to 24 hours after ingestion of eggs, meat, poultry; fecal leukocytes present; fever resolves in 2 days; but diarrhea persists for up to 7 days (occasionally weeks).
Leptospirosis: "Sterile" meningitis, nephritis, hepatitis, myositis and conjunctivitis; often follows recent skin contact with fresh water in rural or rodent-infested areas; case-fatality rates of 5% to 40% are reported.



How unique is this outbreak?

Let's access a list of all Salmonellosis outbreaks reported, worldwide. In the Epidemiology module scroll to Salmonellosis, click on the Distribution tab, and click on the Outbreaks icon. A chronology of over 470 such outbreaks appears in the lower right hand box.

Clicking the country of interest in this cases, United States, access an exhaustively researched and referenced discussion of the epidemiology of Salmonellosis in America – including outbreaks associated with iguanas and other reptiles.

Animals and pets:

Reptiles are found in approximately 3% of American households.⁵⁸ As of 2001, reptiles are found in 1.7 million households. The number of imported iguanas increased from 27,806 in 1986 to 798,405 in 1993.^{59 60}

Pet turtles were an important source for salmonellosis in the United States, until commercial distribution of turtles under 4 inches in length was banned in 1975. Approximately 93,000 cases yearly (7% of total) of salmonellosis are associated with reptile and amphibian contact - most patients are young children, who account for 24% of reptile-associated serotypes (1989 to 1998).

During 1996 to 1998, 16 state health departments reported salmonellosis among persons having contact with reptiles; 12 states during 1998 to 2002.

Sporadic cases of Salmonella poona infection in California, Utah and Maryland have been acquired from monitor lizards (*Varanus exanthematicus*).

1991 - An outbreak of Salmonella hadar infections in Connecticut, Maryland, and Pennsylvania was linked to pet ducklings.⁶¹

1995 to 1996 - Outbreaks of Salmonella enterica serotype Montevideo infection in Idaho, Washington, and Oregon were associated with chicks.⁶²

1996 - An outbreak (65 cases identified, 380 estimated) of Salmonella enteritidis infection occurred among children attending a Komodo dragon exhibit.⁶³

1999 - Outbreaks of multidrug-resistant S. typhimurium infection associated with veterinary facilities in Idaho (10 cases), Minnesota (7 cases) and Washington (3 cases) were reported.

2001 - An outbreak (55 cases) of Salmonella javiana infection associated with amphibian contact was reported in Mississippi.

2004 - An outbreak (4 cases) of Salmonella enterica serotype pomona infection in Wisconsin was associated with pet turtles.⁶⁴

2004 - An outbreak (10 cases) in Washington and Oregon was related to the handling of chicks.⁶⁵

2005 - Outbreaks were associated with handling Easter chicks (9 cases)⁶⁶; and pet rodents (Salmonella enterica serotype typhimurium from mice, rats, hamsters - 28 cases in 19 states).⁶⁷

2005 - An outbreak (12 cases) at a county fair in Wisconsin was associated with pig contact.⁶⁸

Fish and shellfish:

Fish and shellfish are implicated in 7.42% of salmonellosis outbreaks.

7.2% of imported and 1.3% of domestic seafood inspected during 1990 to 1998 was found to be contaminated. Highest rates of contamination were found in seafood from Vietnam (30%); and lowest in seafood from Korea (0.7%).

7.4% of domestic oysters are contaminated (2002 to 2003).⁶⁹

Other and unspecified:

1970 to 1971 - An outbreak (7 cases) of Salmonella cholerae-suis septicemia was caused by contaminated platelet transfusions at NIH.

1973 to 1974 - An outbreak (80 cases in the U.S. and 39 in Canada) of Salmonella eastborne infection was caused by contaminated chocolate.⁷⁰