Investigation of Kansas Cases in a Multistate Outbreak of *Salmonella* Infections Associated with Live Poultry—Kansas, 2017

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Kansas Department of Health and Environment
Division of Public Health

Background

On May 12, 2017, routine surveillance by the Kansas Department of Health and Environment's Infectious Disease Epidemiology and Response section (KDHE) identified a cluster of three persons with salmonellosis with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns, all of whom reported exposure to baby poultry. An outbreak investigation was initiated by KDHE that day. On May 19, 2017, the Centers for Disease Control and Prevention (CDC) notified KDHE that these illnesses were associated with a larger cluster of live poultry-associated salmonellosis cases throughout the United States. KDHE, along with the Kansas OutbreakNet Enhanced (KS-OBNE) program and local health departments, worked to investigate all Kansas cases of salmonellosis associated with the outbreak.

Key Investigation Findings

- A case was defined as laboratory evidence of *Salmonella* with a pulsed-field gel electrophoresis (PFGE) pattern indistinguishable from the outbreak strains of *Salmonella*.
- Kansas Investigation:
  - 17 persons residing in 15 Kansas counties had illness meeting the outbreak case definition [Figure 1]
  - 8 (47%) persons were hospitalized; no deaths were reported
  - Illness onset dates ranged from March 24 to August 14, 2017 [Figure 2]
  - 10 (58%) ill persons were male
  - Ill persons ranged in age from less than 1 to 95 years of age (median age: 34)
  - Diarrhea (17 persons, 100%) was the most commonly reported symptom among ill persons, followed by fever (11, 65%), vomiting (7, 41%), and urinary tract infection (3, 18%)
- Multistate Investigation[1]:
  - 1,120 persons residing in 48 states had illness meeting the outbreak case definition [Figure 3]
  - 249 persons were hospitalized; 1 death was reported
  - Illness onset dates ranged from January 4 to September 22, 2017

Figure 1. Number of Outbreak Cases by Kansas County, 2017

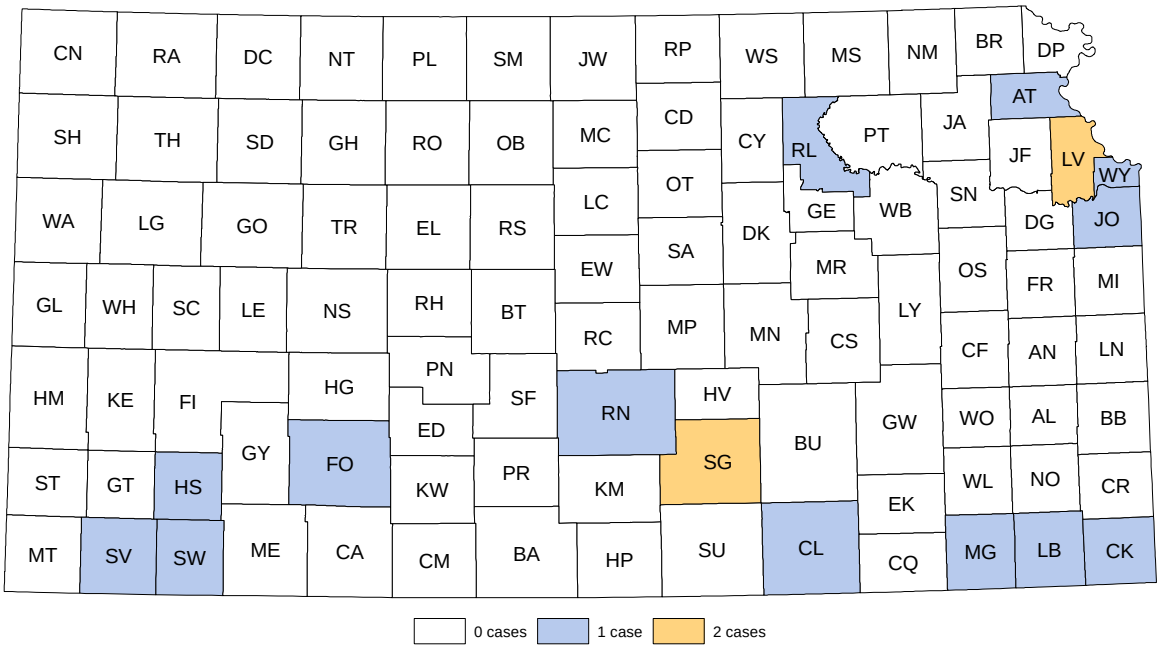
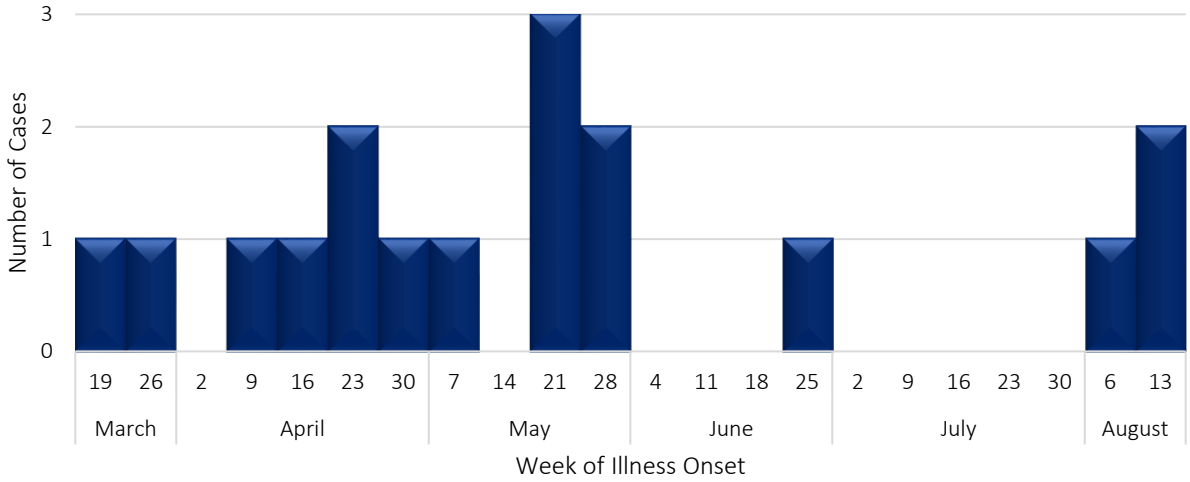


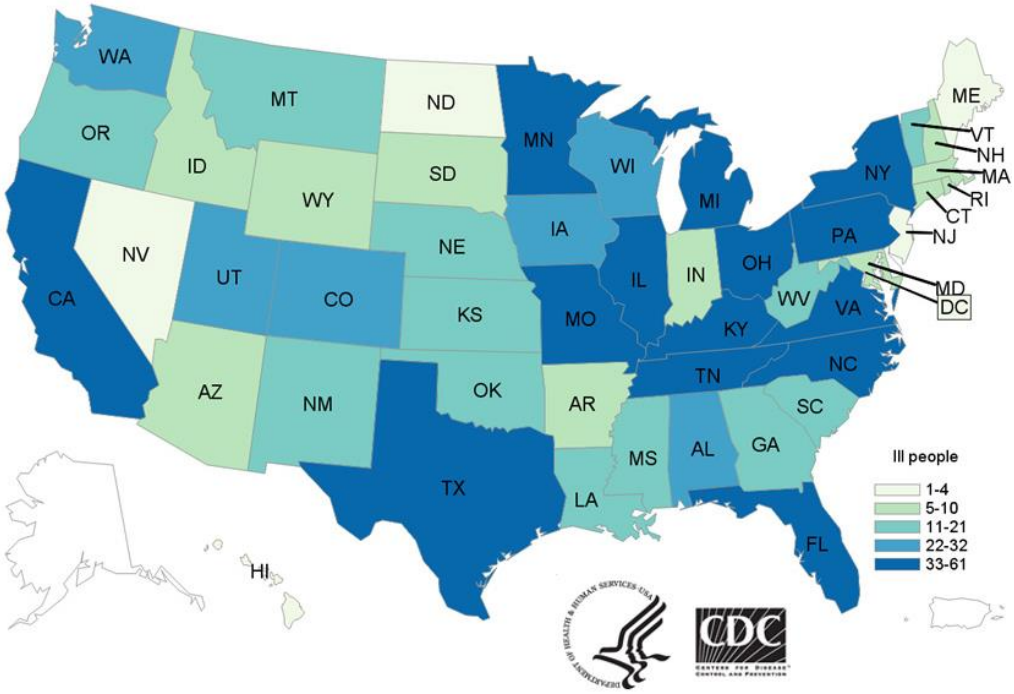
Figure 2. Number of Kansas Outbreak Cases by Week of Illness Onset, 2017



Conclusions

This multistate outbreak of salmonellosis began in January 2017 and continued for eleven months, affecting more than 1,100 persons across the country. Investigators from the CDC, the United States Department of Agriculture (USDA), and state and local health departments worked cooperatively to identify the cause and determine the scope of outbreak-related illnesses. The investigation linked these illnesses to contact with live chicks, ducklings, and other baby poultry from multiple hatcheries, in the largest such outbreak ever recorded in the United States[1].

Figure 3. Number of Outbreak Cases by State, 2017



Discussion & Recommendations

Live Poultry-Associated Salmonella

Chickens, ducks, and other poultry are well-known carriers of *Salmonella* bacteria. *Salmonella* naturally lives in the intestines of many animals, including poultry; it does not always cause illness in poultry, but can cause serious illness in humans who have contact with birds or their surroundings. *Salmonella* can be found in fecal matter (droppings) from birds as well as on the outside of their bodies (including on their feathers, feet, and beaks), even when birds appear healthy and clean. *Salmonella* can also be found where live poultry lives or roams, including in and on chicken coops, cages, feed dishes, soil, and plants; *Salmonella* is also commonly found on the hands, shoes, and clothing of people who handle the birds or spend time in places where live poultry has been[2].

People become infected with *Salmonella* when they put their hands or other things that have been in contact with feces in or around their mouth. Young children are especially at risk for illness because their immune systems are still developing and because they are more likely than others to put their fingers or other items into their mouths[2].

Due to the likelihood of environmental contamination in areas where live poultry has been, direct contact with birds is not always necessary to cause illness; cases have been connected with visiting festivals, fairs, or feed stores where baby poultry has been on display.

Reducing the Risk of Live Poultry-Associated Salmonella[2]

- Always wash your hands with soap and water right after touching live poultry or anything in the area where they live and roam.
    - Adults should supervise handwashing by young children.
    - Use hand sanitizer if soap and water are not readily available.
- Don't let live poultry inside the house, especially in areas where food or drink is prepared, served, or stored.
- Set aside a pair of shoes to wear while taking care of poultry and keep those shoes outside of the house.
- Don't let children younger than 5 years, adults older than 65, or people with weakened immune systems from conditions such as cancer treatment, HIV/AIDS or organ transplants, handle or touch chicks, ducklings, or other live poultry.

- Don't eat or drink in the area where the birds live or roam.
- Avoid kissing your birds or snuggling them, then touching your mouth.
- Stay outdoors when cleaning any equipment or materials used to raise or care for live poultry, such as cages or feed or water containers.
- Buy birds from hatcheries that participate in the U.S. Department of Agriculture National Poultry Improvement Plan (USDA-NPIP) U.S. voluntary *Salmonella* monitoring program, which is intended to reduce the incidence of *Salmonella* in baby poultry in the hatchery, which helps prevent the spread of illness among poultry and people[3].

Prevention of Human Salmonella *Infections in Agricultural Feed Stores*[1]

- Source birds from suppliers that have adopted USDA's best management practices to mitigate *Salmonella* contamination[4]
- Source birds from hatcheries that participate in the U.S. Department of Agriculture National Poultry Improvement Plan (USDA-NPIP) U.S. voluntary *Salmonella* monitoring program[3]
- Provide health information to owners and potential purchasers of these birds before purchase (such as this sample flier, attachment 1). This should include information about the risk of acquiring a *Salmonella* infection from contact with live poultry.
- Place health information in clear view where birds are displayed.
- Provide hand washing stations or hand sanitizer next to poultry display areas and tell customers to wash hands right after leaving these areas.
- Display poultry out of reach of customers, especially children, so customers can not easily touch birds.
- Clean the areas where birds are displayed between shipments of new birds.
- Follow recommendations from the 2013 Compendium of Measures to Prevent Diseases Associated with Animals in Public Settings[5]

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[1] Centers for Disease Control and Prevention. Multistate Outbreak of Human *Salmonella* Infections Linked to Live Poultry in Backyard Flocks (Final Update). https://www.cdc.gov/salmonella/live-poultry-06-17/index.html

[2] Centers for Disease Control and Prevention. Keeping Backyard Poultry. https://www.cdc.gov/features/salmonellapoultry/

[3] United States Department of Agriculture. National Poultry Improvement Plan and Auxiliary Provisions. https://www.gpo.gov/fdsys/pkg/FR-2014-07-09/pdf/2014-16037.pdf

[4] United States Department of Agriculture. Best Management Practices Handbook: A Guide to the Mitigation of *Salmonella* Contamination at Poultry Hatcheries http://www.poultryimprovement.org/documents/BestManagementPracticesHatcheries.pdf

[5] National Association of State Public Health Veterinarians. Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2013. https://avmajournals.avma.org/doi/pdfplus/10.2460/javma.243.9.1270