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## Multistate Outbreak of *Salmonella* Poona Infections Linked to Imported Cucumbers (Final Update)

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Posted March 18, 2016 2:30 PM ET

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### Highlights

- This outbreak appears to be over. However, *Salmonella* remains an important cause of human illness in the United States. For more information about *Salmonella* and steps that people can take to reduce their risk of infection, visit CDC's *Salmonella* webpage.
- CDC, multiple states, and the U.S. Food and Drug Administration (<http://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm461317.htm>) (FDA) investigated a multistate outbreak of *Salmonella* Poona infections.
  - A total of 907 people infected with the outbreak strains of *Salmonella* Poona were reported from 40 states.
  - A total of 204 ill people were hospitalized, and six deaths were reported from Arizona (1), California (3), Oklahoma (1), and Texas (1). *Salmonella* infection was not considered to be a contributing factor in two of the three deaths in California.
- Epidemiologic, laboratory, and traceback investigations identified cucumbers imported from Mexico and distributed by Andrew & Williamson Fresh Produce as the likely source of the infections in this outbreak.
- Two recalls of cucumbers that may be contaminated with *Salmonella* were announced in September 2015 as a result of this investigation: Andrew & Williamson Fresh Produce (<http://www.fda.gov/Safety/Recalls/ucm461382.htm>) and Custom Produce Sales (<http://www.fda.gov/Safety/Recalls/ucm462154.htm>).
- Investigation of illnesses that were reported after the peak of the outbreak in August and September 2015 did not identify an additional food linked to illness. The source of contamination for the cucumbers distributed by Andrew & Williamson Fresh Produce has not been identified.

## Outbreak Summary

### Introduction

CDC collaborated with public health officials in many states and the U.S. Food and Drug Administration (<http://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm461317.htm>) (FDA) to investigate a multistate outbreak of *Salmonella* Poona infections.

Public health investigators used the PulseNet system to identify illnesses that were part of this outbreak. PulseNet, coordinated by CDC, is the national subtyping network of public health and food regulatory agency laboratories. PulseNet performs DNA fingerprinting on *Salmonella* bacteria isolated from ill people by using techniques called pulsed-field gel electrophoresis (PFGE) and whole genome sequencing (WGS). CDC PulseNet manages a national database of these DNA fingerprints to identify possible outbreaks.

A total of 907 people infected with the outbreak strains of *Salmonella* Poona were reported from 40 states. A list of states and the number of cases in each can be found on the Case Count Map page.

Among people for whom information was available, illnesses started on dates ranging from July 3, 2015 to February 29, 2016. Ill people ranged in age from less than 1 year to 99, with a median age of 18. Forty-nine percent of ill people were children younger than 18 years. Fifty-six percent of ill people were female. Among 720 people with available information, 204 (28%) were hospitalized. Six deaths were reported from Arizona (1), California (3), Oklahoma (1), and Texas (1). According to the California Department of Public Health, *Salmonella* infection was not considered to be a contributing factor in two of the three deaths in California.

WGS showed that isolates from ill people were closely related genetically. These results also included isolates from people who became ill in October, November and January after the outbreak's peak. This close genetic relationship means that people in this outbreak were more likely to share a common source of infection, such as a contaminated food.

### Investigation of the Outbreak

Epidemiologic, laboratory, and traceback investigations identified imported cucumbers from Mexico and distributed by Andrew & Williamson Fresh Produce as the likely source of the infections in this outbreak.

#### *Epidemiologic Investigation*

State and local public health officials interviewed ill people to obtain information about foods they might have eaten and other exposures in the week before their illness began. In interviews, 391 (75%) of 519 people reported eating cucumbers. This proportion was significantly higher than results from a [survey of healthy people](http://www.cdc.gov/foodnet/surveys/FNExpAtI03022011.pdf) [PDF - 29 pages] (<http://www.cdc.gov/foodnet/surveys/FNExpAtI03022011.pdf>) in which 47% reported eating cucumbers in the week before they were interviewed.

Also, many ill people were identified as part of illness clusters. An illness cluster is defined as two or more people who do not live in the same household who report eating at the same restaurant location, attending a common event, or shopping at the same location of a grocery store in the week before becoming ill. Investigating illness clusters can provide critical clues about the source of an outbreak. If several unrelated ill persons ate or shopped at the same location of a restaurant or store within several days of each other, it suggests that the contaminated food item was served or sold there. Eleven illness clusters were identified in seven states. In all of these clusters, interviews found that cucumbers were a common item eaten by ill people. Epidemiologic studies that compare foods eaten by both ill and well people were conducted in two of these clusters. Results of these studies indicated that a food item containing cucumbers was associated with illness.

CDC's [National Antimicrobial Resistance Monitoring System](#) (NARMS) laboratory conducted antibiotic resistance testing on clinical isolates collected from 30 ill people infected with one of the outbreak strains. Of the 30 isolates tested, 2 (7%) were drug resistant (resistance to one or more antibiotics), and the other 28 (93%) isolates were not resistant to any of the antibiotics tested by NARMS. One drug-resistant isolate was resistant to tetracycline. The other isolate was resistant to nalidixic acid and nonsusceptible to ciprofloxacin. Nonsusceptible means an antibiotic cannot completely kill bacteria or stop their growth. Ciprofloxacin is commonly used to treat serious *Salmonella* infections in adults but is not routinely used in children. Antibiotic resistance may be associated with increased risk of hospitalization, development of a bloodstream infection, or treatment failure.

### *Laboratory Investigation*

Several state health and agriculture departments collected and tested cucumbers from retail locations and isolated the outbreak strains of *Salmonella* Poona. Information indicated that these cucumbers were distributed by Andrew & Williamson Fresh Produce. Additionally, testing of cucumbers collected from the Andrew & Williamson Fresh Produce facility isolated the outbreak strains of *Salmonella* Poona.

WGS of *Salmonella* Poona isolates from ill people and from contaminated cucumbers distributed by Andrew & Williamson Fresh Produce showed that the strains were closely related genetically. This close genetic relationship provided additional evidence that ill people in this outbreak became ill from consuming cucumbers distributed by Andrew & Williamson.

### *Traceback and Regulatory Investigation*

Early in an outbreak investigation, consultation with independent industry experts can provide important clues to help focus the investigation on certain suspected foods. An industry consultation was held on August 26, 2015, with four independent experts from the produce industry to obtain information regarding fresh produce harvesting and distribution in the areas where ill people were being reported. The consultants provided information regarding crop production and distribution practices that helped assess the plausibility of cucumbers and other produce items as possible outbreak sources.

Traceback information collected from the 11 illness clusters indicated that cucumbers eaten by ill people were imported from Mexico and distributed by Andrew & Williamson Fresh Produce.

Two recalls of garden variety cucumbers distributed by Andrew & Williamson Fresh Produce were announced because the cucumbers were likely contaminated with *Salmonella*. Recalled cucumbers were grown in Baja California, Mexico and distributed to many U.S. states. On September 4, 2015, Andrew & Williamson Fresh Produce voluntarily recalled (<http://www.fda.gov/Safety/Recalls/ucm461382.htm>) all cucumbers sold under the Limited Edition brand label from August 1, 2015 through September 3, 2015. On September 11, 2015, Custom Produce Sales voluntarily recalled (<http://www.fda.gov/Safety/Recalls/ucm462154.htm>) all cucumbers sold under the Fat Boy brand label starting August 1, 2015. These cucumbers were sent to Custom Produce Sales from Andrew & Williamson Fresh Produce.

### *Illnesses Occurring after September 24, 2015*

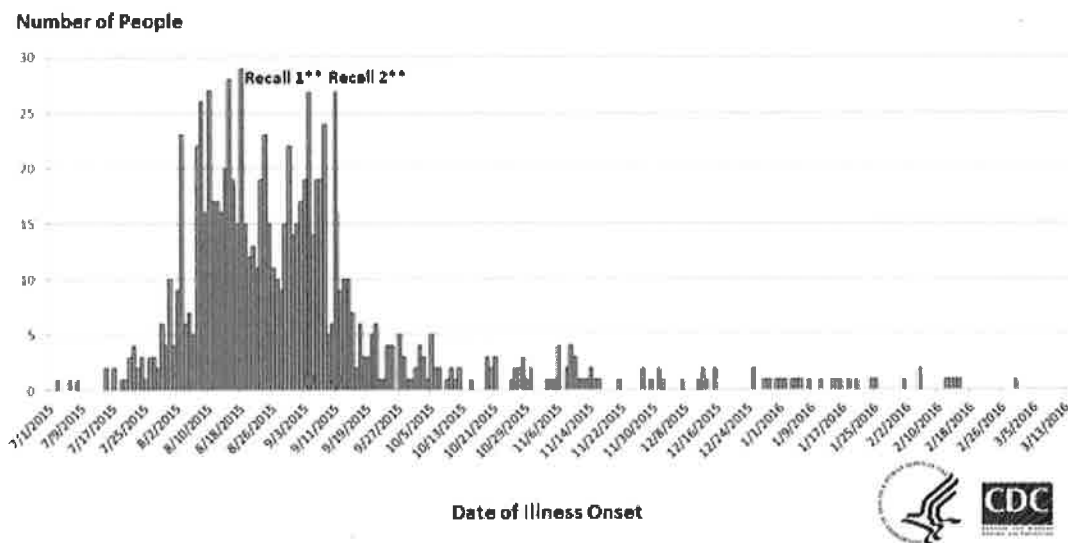
The number of reported illnesses declined substantially after the peak of illnesses in August and September; however, illnesses did not return to the expected number for several months afterwards for this DNA fingerprint (typically, about one illness is expected every month from November through January). Instead, 127 illnesses started after September 24, 2015, when recalled cucumbers should have no longer been available in stores or restaurants. If any of the recalled cucumbers were still available, they would have spoiled by that time.

WGS results from illnesses which occurred after the end of September 2015 suggested they shared a common source with the illnesses during the peak of the outbreak in August and September. State and local public health officials interviewed 46 of these ill people. Of that group, 29 (63%) reported eating cucumbers in the week before their illness started. Interviews did not identify any additional food items potentially linked with illness. Investigations were unable to determine if the illnesses could be explained by cross-contamination within the distribution chain for the recalled cucumbers, such as in shipping containers or at retail locations. This outbreak appears to be over.

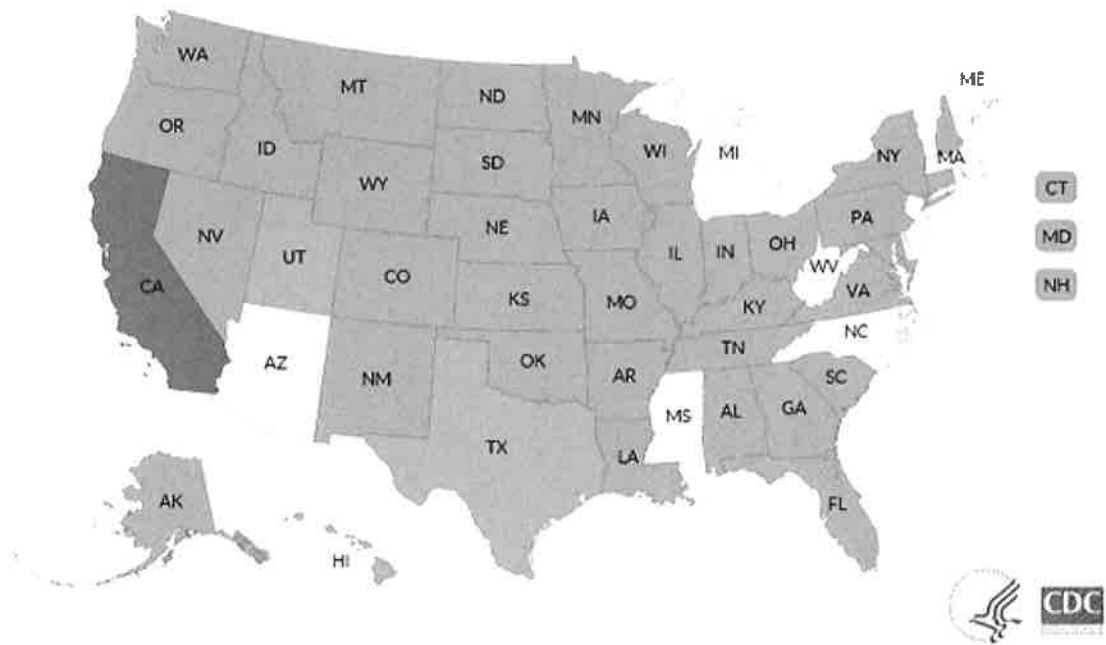
## At A Glance

- Case Count: 907
- States: 40
- Deaths: 6
- Hospitalizations: 204
- Recall: Yes

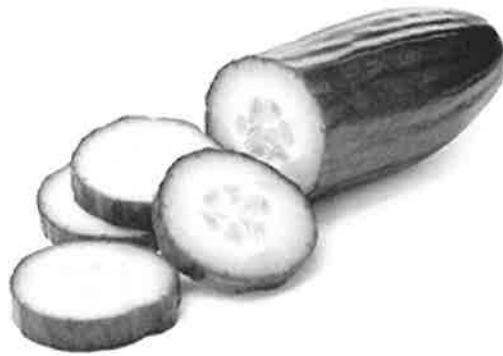
- Advice to Retailers & Consumers
- Signs & Symptoms
- Key Resources



[CLICK TO VIEW EPI CURVE GRAPHS](#)



CLICK TO VIEW CASE COUNT MAPS



Garden cucumber

∨ March 18, 2016

### Final Case Count Update

This outbreak appears to be over. Since the last update on January 26, 2016, 19 more ill people were reported from eight states.

A total of 907 people infected with the outbreak strains of *Salmonella* Poona were reported from 40 states. A list of states and the number of cases in each can be found on the [Case Count Map page](#).

Among people for whom information was available, illnesses started on dates ranging from July 3, 2015 to February 29, 2016. Ill people ranged in age from less than 1 year to 99, with a median age of 18. Forty-nine percent of ill people were children younger than 18 years. Fifty-six percent of ill people were female. Among 720 people with available information, 204 (28%) were hospitalized. Six deaths were reported from Arizona (1), California (3), Oklahoma (1), and Texas (1). According to the California Department of Public Health, *Salmonella* infection was not considered to be a contributing factor in two of the three deaths in California.

- > **January 26, 2016**
  
- > **November 19, 2015**
  
- > **October 14, 2015**
  
- > **October 6, 2015**
  
- > **September 29, 2015**
  
- > **September 22, 2015**
  
- > **September 15, 2015**
  
- > **September 9, 2015**
  
- > **Initial Announcement**

### **File Formats Help:**

How do I view different file formats (PDF, DOC, PPT, MPEG) on this site?

(<http://www.cdc.gov/Other/plugins/>)

(<http://www.cdc.gov/Other/plugins/#pdf>)

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Content source: Centers for Disease Control and Prevention (<http://www.cdc.gov/>)

National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) (</ncezid/index.html>)

Division of Foodborne, Waterborne, and Environmental Diseases (DFWED) (</ncezid/dfwed/index.html>)