



Salmonella

Multistate Outbreak of Human *Salmonella* Infections Linked to Live Poultry (Final Update)

Posted November 8, 2013 2:30 PM ET

This outbreak appears to be over. However, live poultry, including those kept in backyard flocks, are an important cause of human *Salmonella* infections in the United States. More information about *Salmonella* from live poultry and the steps people can take to reduce their risk of infection is **available** (</Features/SalmonellaBabyBirds/>).

At a Glance:

- **Case Count: 158** (</salmonella/live-poultry-04-13/epi.html>)
- **States: 30** (</salmonella/live-poultry-04-13/map.html>)
- **Deaths: 0**
- **Hospitalizations: 29**
- **Recall: No**

More Information:

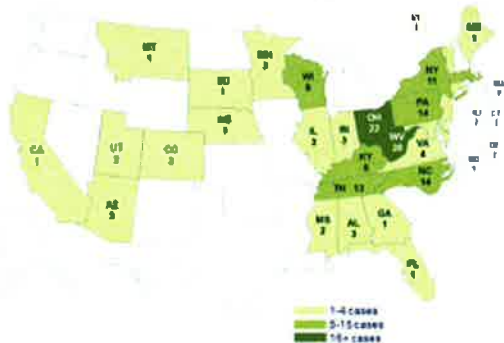
- [Advice to Consumers \(/salmonella/live-poultry-04-13/advice-consumers.html\)](/salmonella/live-poultry-04-13/advice-consumers.html)
- [Signs & Symptoms \(/salmonella/live-poultry-04-13/signs-symptoms.html\)](/salmonella/live-poultry-04-13/signs-symptoms.html)
- [Key Resources \(/salmonella/live-poultry-04-13/key-resources.html\)](/salmonella/live-poultry-04-13/key-resources.html)

Highlights

- **[Read the Advice to Consumers » \(/salmonella/live-poultry-04-13/advice-consumers.html\)](/salmonella/live-poultry-04-13/advice-consumers.html)**
- A total of 158 persons infected with the outbreak strains of *Salmonella* Infantis, *Salmonella* Lille, *Salmonella* Newport, or *Salmonella* Mbandaka were reported from 30 states.
 - Among 103 ill persons for whom information was available, 29 (28%) were hospitalized.
 - 41% of ill persons were children 10 years of age or younger.
 - 86% of ill people reported contact with live poultry in the week before their illness began.
- Epidemiologic, laboratory, and traceback findings linked this outbreak of human *Salmonella* Infantis, *Salmonella* Lille, *Salmonella* Newport, and *Salmonella* Mbandaka infections to contact with chicks, ducklings, and other live baby poultry sourced from Mt. Healthy Hatcheries in Ohio.
 - 95% of ill persons with available purchase information reported buying chicks and ducklings that were sourced from a single mail-order hatchery in Ohio, Mt. Healthy Hatcheries.
- Mail-order hatcheries, agricultural feed stores, and others that sell or display chicks, ducklings, and other live poultry should continue to **[provide health-related information \(/healthypets/resources/posters.htm#poultry\)](/healthypets/resources/posters.htm#poultry)** to owners and potential purchasers of these birds prior to the point of purchase. This should include information about the risk of acquiring a *Salmonella* infection from contact with live poultry.

- [Read the advice to mail-order hatcheries, feed stores, and others that sell or display live poultry.](/salmonella/live-typhimurium-poultry-04-13/advice-consumers.html) (</salmonella/live-typhimurium-poultry-04-13/advice-consumers.html>)
- This outbreak appears to be over. However, live poultry, including those kept in backyard flocks, are an important cause of human *Salmonella* infections in the United States.
 - Always wash hands thoroughly with soap and water right after touching any live poultry or anything in the area where they live and roam. Do not let live poultry inside the house.
 - These recommendations are important and apply to all live poultry regardless of the age of the birds or where they were purchased.
 - More information about *Salmonella* from live poultry and the simple steps people can take to reduce their risk of infection is [available](/Features/SalmonellaBabyBirds/) (</Features/SalmonellaBabyBirds/>).

Latest Case Count Map

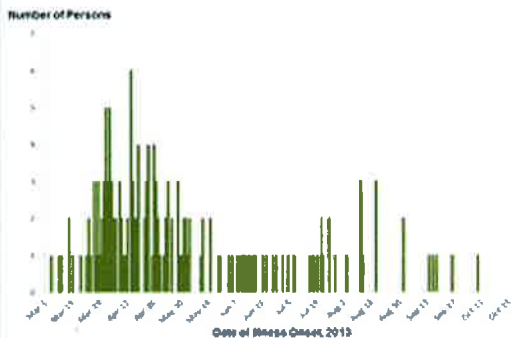


[\(/salmonella/live-poultry-04-13/map.html\)](/salmonella/live-poultry-04-13/map.html)

[\(/salmonella/live-poultry-04-13/map.html\)](/salmonella/live-poultry-04-13/map.html)

Click map to view updated & previous case count maps. (</salmonella/live-poultry-04-13/map.html>)

Latest Epi Curve



[\(/salmonella/live-poultry-04-13/epi.html\)](/salmonella/live-poultry-04-13/epi.html)

Click graph to view updated & previous epi curve graphs. (</salmonella/live-poultry-04-13/epi.html>)

Outbreak Summary

Introduction

CDC collaborated with public health and agriculture officials in many states and the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service, National Poultry Improvement Plan, and Veterinary Services to investigate an outbreak of human *Salmonella* *Infantis*, *Salmonella* *Lille*, *Salmonella* *Newport*, and *Salmonella* *Mbandaka* infections linked to contact with chicks, ducklings, and other live baby poultry sourced from Mt. Healthy Hatcheries in Ohio. Public health investigators used the [PulseNet](/pulsenet/) (</pulsenet/>) system to identify cases of illness that were part of this outbreak. In PulseNet, the national subtyping network of public health and food regulatory agency laboratories coordinated by CDC, DNA "fingerprints" of *Salmonella* bacteria are obtained through diagnostic testing with

pulsed-field gel electrophoresis, or PFGE, to identify cases of illness that were part of this outbreak. This outbreak of human *Salmonella* Infantis, Lille, Newport, and Mbandaka infections was not related to the [outbreak of human *Salmonella* Typhimurium infections linked to live poultry \(/salmonella/typhimurium-live-poultry-04-13/index.html\)](/salmonella/typhimurium-live-poultry-04-13/index.html).

A total of 158 persons infected with the outbreak strains of *Salmonella* Infantis, *Salmonella* Lille, *Salmonella* Newport, or *Salmonella* Mbandaka were reported from 30 states: Alabama (3), Arizona (3), California (1), Colorado (3), Connecticut (3), Delaware (2), Florida (1), Georgia (1), Illinois (3), Indiana (3), Kentucky (5), Maine (1), Maryland (1), Massachusetts (8), Minnesota (3), Mississippi (2), Montana (1), Nebraska (1), New Jersey (2), New York (11), North Carolina (14), Ohio (22), Pennsylvania (14), South Dakota (1), Tennessee (13), Utah (2), Vermont (2), Virginia (4), West Virginia (20), and Wisconsin (8).

Among 157 persons for whom information was available, illness onset dates ranged from March 4, 2013 to October 9, 2013. Ill persons ranged in age from less than 1 year to 91 years, with a median age of 17 years. Forty-one percent of ill persons were children 10 years of age or younger. Fifty-three percent of ill persons were female. Among 103 persons with available information, 29 (28%) reported being hospitalized, and no deaths were reported.

Investigation of the Outbreak

Epidemiologic, laboratory, and traceback investigations conducted by officials in local, state, and federal public health, agriculture, and regulatory agencies linked this outbreak to contact with chicks, ducklings, and other live baby poultry sourced from Mt. Healthy Hatcheries in Ohio.

In interviews, ill persons answered questions about contact with animals and foods consumed during the week before becoming ill. Eighty-two (86%) of 95 ill persons interviewed reported contact with live poultry (e.g., chicks, chickens, ducklings, ducks, turkeys, and goslings) before becoming ill. Sixty-five (94%) of 69 ill persons reported purchasing live poultry from various locations of a single chain of agricultural feed stores in multiple states. Sixty-three (95%) of 66 ill persons with available purchase information reported buying chicks and ducklings that were sourced from a single mail-order hatchery in Ohio, Mt. Healthy Hatcheries. Fifty-five ill persons reported purchasing live poultry for one or more of the following reasons: eggs (60%), pets (18%), fun/hobby (18%), meat (7%), Easter present (5%), to release to a lake or pond (5%), fair/exhibition (4%), and pest control (2%).

State health departments tested samples collected from live poultry and the environments where the live poultry live and roam from ill persons' homes. Birds from these homes were sourced from Mt. Healthy Hatcheries in Ohio. Thirty-nine samples from different homes in Minnesota, Ohio, New York, and Vermont yielded the outbreak strains of *Salmonella* Infantis and *Salmonella* Mbandaka.

This is the same mail-order hatchery that was associated with the [2012 outbreak of *Salmonella* Infantis, *Salmonella* Newport, and *Salmonella* Lille infections \(/salmonella/live-poultry-05-12/index.html\)](/salmonella/live-poultry-05-12/index.html). Moreover, the strain of *Salmonella* Infantis identified in this outbreak is the same strain seen in the 2012 outbreak. Public health and agriculture officials continue to work with this hatchery and have made recommendations for improvement. This hatchery uses multiple source flocks to obtain eggs and chicks, so it is unclear where the contamination originated. Mt. Healthy Hatcheries is a participant in the USDA National Poultry Improvement Plan (NPIP) program. The NPIP program is intended to eliminate certain strains of *Salmonella* that cause illness in poultry breeding flocks and hatcheries, but this program currently does not certify that these poultry are free from other strains of *Salmonella* that may cause human illness.

Contact with live poultry can be a source of human *Salmonella* infections. Poultry typically appear healthy and clean but can be carrying *Salmonella* germs that can make people sick. Many ill persons in this outbreak reported bringing live poultry into their homes or reported kissing or cuddling with the birds. These behaviors increase a person's risk of a *Salmonella* infection from contact with live poultry. Always wash hands thoroughly with soap and water right after touching live poultry or anything in the area where they live and roam. Adults should supervise hand washing for young children. [Additional recommendations are available \(/Features/SalmonellaBabyBirds/\)](/Features/SalmonellaBabyBirds/). These recommendations are important and apply to all live poultry regardless of the age of the birds or where they were purchased.

Mail-order hatcheries, agricultural feed stores, and others who sell or display chicks, ducklings, and other live poultry should provide [health-related information \(/healthypets/resources/posters.htm#poultry\)](/healthypets/resources/posters.htm#poultry) to owners and potential purchasers of these birds prior to the point of purchase. This should include information about the risk of acquiring a *Salmonella* infection from contact with live poultry. Agricultural feed store staff should clean and disinfect live poultry display areas routinely, especially before new live poultry are added to the display. [Additional recommendations are available \(/Features/SalmonellaBabyBirds/\)](/Features/SalmonellaBabyBirds/).

Progression of the Outbreak Investigation

November 8, 2013

Final Case Count Update

A total of 158 persons infected with the outbreak strains of *Salmonella* Infantis, *Salmonella* Lille, *Salmonella* Newport, or *Salmonella* Mbandaka were reported from 30 states. Since the last update on July 18, 2013, 34 new ill persons were reported from Colorado (1), Delaware (1), Florida (1), Indiana (2), Kentucky (1), Massachusetts (1), Montana (1), New York (1), North Carolina (4), Ohio (3), Pennsylvania (6), South Dakota (1), Tennessee (1), Utah (2), Virginia (1), West Virginia (5), and Wisconsin (2).

Among the persons who reported the date they became ill, illnesses began between March 4, 2013 and October 9, 2013. Ill persons ranged in age from less than one year to 91 years, with a median age of 17 years. Forty-one percent of ill persons were 10 years of age or younger. Fifty-three percent of ill persons were female. Among 103 ill persons with available information, 29 (28%) were hospitalized. No deaths were reported.

This outbreak appears to be over. However, live poultry, including those kept in backyard flocks, are an important cause of human *Salmonella* infections in the United States.

July 18, 2013

Case Count Update

A total of 125 persons infected with the outbreak strains of *Salmonella* Infantis, *Salmonella* Lille, *Salmonella* Newport, or *Salmonella* Mbandaka have been reported from 26 states. Since the last update, 28 new ill persons have been reported from Arizona (3), Colorado (2), Delaware (1), Georgia (1), Illinois (2), Indiana (1), Massachusetts (2), New York (2), North Carolina (5), Ohio (2), Pennsylvania (1), Tennessee (3), West Virginia (2), and Wisconsin (1). This outbreak of human *Salmonella* Infantis, Lille, Newport, and Mbandaka infections is not related to the current [outbreak of human *Salmonella* Typhimurium infections linked to live poultry \(/salmonella/typhimurium-live-poultry-04-13/index.html\)](/salmonella/typhimurium-live-poultry-04-13/index.html).

Among the persons who reported the date they became ill, illnesses began between and March 4, 2013 and July 5, 2013. Ill persons range in age from less than one year to 91 years, and 41%

of ill persons are 10 years of age or younger. Fifty-four percent of ill persons are female. Among 78 ill persons with available information, 23 (15%) have been hospitalized. No deaths have been reported.

Illnesses that occurred after June 23, 2013 might not yet be reported due to the time it takes between when a person becomes ill and when the illness is reported. This takes an average of 2 to 3 weeks.

June 4, 2013

Case Count Update

A total of 98 persons infected with the outbreak strains of *Salmonella* Infantis, *Salmonella* Lille, *Salmonella* Newport, or *Salmonella* Mbandaka have been reported from 21 states. Since the last update, 37 new ill persons have been reported from Alabama (3), California (2), Connecticut (3), Illinois (2), Kentucky (4), Maine (1), Maryland (1), Massachusetts (5), Minnesota (3), Mississippi (2), Nebraska (1), New Jersey (2), New York (8), North Carolina (5), Ohio (17), Pennsylvania (7), Tennessee (9), Virginia (3), Vermont (2), West Virginia (13), and Wisconsin (5).

Based on ongoing epidemiologic investigations, additional ill persons infected with *Salmonella* serotypes Lille and Newport reported contact with chicks, ducklings, and other live baby poultry from Mt. Healthy Hatchery in Ohio, and these strains have been added to the outbreak. The strains of *Salmonella* identified in the current outbreak were also seen during the [2012 outbreak of *Salmonella* Infantis, *Salmonella* Newport, and *Salmonella* Lille infections linked to Mt. Healthy Hatchery in Ohio \(/salmonella/live-poultry-05-12/index.html\)](/salmonella/live-poultry-05-12/index.html). This outbreak of human *Salmonella* Infantis, Lille, Newport, and Mbandaka infections is not related to the current [outbreak of human *Salmonella* Typhimurium infections linked to live poultry \(/salmonella/typhimurium-live-poultry-04-13/index.html\)](/salmonella/typhimurium-live-poultry-04-13/index.html).

Among the persons who reported the date they became ill, illnesses began between and March 8, 2013 and May 15, 2013. Ill persons range in age from less than one year to 91 years, and 44% of ill persons are 10 years of age or younger. Fifty-four percent of ill persons are female. Among 60 ill persons with available information, 16 (27%) have been hospitalized. No deaths have been reported.

Illnesses that occurred after May 8, 2013 might not yet be reported due to the time it takes between when a person becomes ill and when the illness is reported. This takes an average of 2 to 3 weeks.

May 10, 2013

Case Count Update

CDC is collaborating with public health and agriculture officials in many states and the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) to investigate multiple outbreaks of human *Salmonella* infections linked to live poultry. This outbreak of human *Salmonella* Infantis and *Salmonella* Mbandaka infections is not related to the current [outbreak of human *Salmonella* Typhimurium infections linked to live poultry \(/salmonella/typhimurium-live-poultry-04-13/index.html\)](/salmonella/typhimurium-live-poultry-04-13/index.html).

Public health investigators are using the [PulseNet \(/pulsenet/\)](/pulsenet/) system to identify cases of illness that may be part of this outbreak. In PulseNet, the national subtyping network of public health and food regulatory agency laboratories coordinated by CDC, DNA "fingerprints" of *Salmonella* bacteria are obtained through diagnostic testing with pulsed-field gel electrophoresis, or PFGE, to identify cases of illness that may be part of this outbreak.

As of May 7, 2013, a total of 61 persons infected with the outbreak strains of *Salmonella* Infantis and *Salmonella* Mbandaka have been reported from 18 states. The number of ill persons identified in each state is as follows: Alabama (2), Connecticut (3), Illinois (1), Kentucky (2), Massachusetts (3), Minnesota (3), Mississippi (1), Nebraska (1), New Jersey (1), New York (5), North Carolina (5), Ohio (8), Pennsylvania (5), Tennessee (9), Virginia (2), Vermont (1), Wisconsin (2), and West Virginia (7).

Among the persons who reported the date they became ill, illnesses began between and March 8, 2013 and April 22, 2013. Ill persons range in age from less than one year to 88 years, and 48% of ill persons are 10 years of age or younger. Fifty-six percent of ill persons are female. Among 34 ill persons with available information, 12 (35%) have been hospitalized. No deaths have been reported.

This outbreak can be visually described with a chart showing the number of persons who became ill each day. This chart is called an [epidemic curve or epi curve \(/salmonella/live-poultry-04-13/epi.html\)](/salmonella/live-poultry-04-13/epi.html). Illnesses that occurred after April 15, 2013 might not yet be reported due to the time it takes between when a person becomes ill and when the illness is reported. This takes an average of 2 to 3 weeks. Please see the [Salmonella \(/salmonella/outbreaks/reporting_timeline.html\)](/salmonella/outbreaks/reporting_timeline.html) [Outbreak Investigations: Timeline for Reporting Cases \(/salmonella/outbreaks/reporting_timeline.html\)](/salmonella/outbreaks/reporting_timeline.html) for more details.

Investigation Update

In interviews, ill persons answered questions about contact with animals and foods consumed during the week before becoming ill. Thirty-six (100%) of 36 ill persons interviewed reported contact with live poultry (e.g., chicks, chickens, ducks, ducklings) before becoming ill. Thirty-four (97%) of 35 ill persons with available purchase information reported purchasing live baby poultry from various locations of a single chain of agricultural feed stores in multiple states. Ill persons reported purchasing live poultry for backyard flocks to produce eggs or meat, or to keep as pets.

State health departments have tested samples collected from chicks in ill persons' homes and retail locations. Samples collected by Minnesota, Ohio, and Vermont yielded the outbreak strains of *Salmonella* Infantis and *Salmonella* Mbandaka.

Findings of multiple traceback investigations of live baby poultry from homes of ill persons have identified Mt. Healthy Hatchery in Ohio as the source of chicks and ducklings. This hatchery uses multiple source flocks to obtain eggs and chicks, so it is unclear at this time where the contamination originated. This is the same mail-order hatchery that was associated with the [2012 outbreak of Salmonella Infantis, Salmonella Newport, and Salmonella Lille infections \(/salmonella/live-poultry-05-12/index.html\)](/salmonella/live-poultry-05-12/index.html). Moreover, the strain of *Salmonella* Infantis identified in the current outbreak is the same strain seen in the 2012 outbreak. Public health and agriculture officials continue to work with this hatchery and have made recommendations for improvement. The hatchery is a member of the USDA National Poultry Improvement Plan, a program that is intended to eliminate certain strains of *Salmonella* that cause illness in poultry breeding flocks and hatcheries, but does not certify that these live poultry are free from other strains of *Salmonella* that may cause human illness.

Contact with live poultry can be a source of human *Salmonella* infections. Some ill persons in this outbreak reported bringing the live poultry into their homes and kissing or cuddling with the live poultry. These behaviors increase the risk a person's risk of a *Salmonella* infection from contact with live poultry. Always wash hands thoroughly with soap and water right after touching live poultry or anything in the area where they live and roam. Adults should supervise hand washing for young children. [Additional recommendations are available](#)

[\(/Features/SalmonellaBabyBirds/\)](/Features/SalmonellaBabyBirds/). These recommendations are important and apply to all live poultry regardless of the age of the birds or where they were purchased.

Mail-order hatcheries, agricultural feed stores, and others who sell or display chicks, ducklings and other live poultry should provide [health-related information \(/healthypets/resources/posters.htm#poultry\)](/healthypets/resources/posters.htm#poultry) to owners and potential purchasers of these birds prior to the point of purchase. This should include information about the risk of acquiring a *Salmonella* infection from contact with live poultry.

Initial Announcement

April 25, 2013

CDC is collaborating with public health and agriculture officials in many states and the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) to investigate multistate outbreaks of human *Salmonella* Infantis, *Salmonella* Mbandaka, and *Salmonella* Typhimurium infections linked to contact with chicks, ducklings, and other live poultry.

Public health investigators are using the [PulseNet \(/pulsenet/\)](/pulsenet/) system to identify cases of illness that may be part of these outbreaks. In PulseNet, the national subtyping network of public health and food regulatory agency laboratories coordinated by CDC, DNA "fingerprints" of *Salmonella* bacteria are obtained through diagnostic testing with pulsed-field gel electrophoresis, or PFGE, to identify cases of illness that may be part of this outbreak. The USDA National Poultry Improvement Plan is a program that is intended to eliminate certain strains of *Salmonella* that cause illness in poultry breeding flocks and hatcheries, but does not certify that these live poultry are free from other strains of *Salmonella* that may cause human illness.

In interviews, ill people reported purchasing live baby poultry (e.g., chicks, ducklings) from multiple feed stores and mail-order hatcheries. Investigations are ongoing to determine the source of the live poultry in these outbreaks.

Contact with live poultry, including baby or adult birds, can be a source of human *Salmonella* infections. These birds typically appear healthy and clean, but can be shedding germs that can make people sick. Always wash hands thoroughly with soap and water right after touching live poultry or anything in the area where they live and roam. Adults should supervise hand washing for young children. [Additional recommendations are available \(/Features/SalmonellaBabyBirds/\)](/Features/SalmonellaBabyBirds/). These recommendations are important and apply to all live poultry regardless of the age of the birds or where they were purchased.

Mail-order hatcheries, agricultural feed stores, and others who sell or display chicks, ducklings and other live poultry should provide [health-related information \(/healthypets/resources/posters.htm#poultry\)](/healthypets/resources/posters.htm#poultry) to owners and potential purchasers of these birds prior to the point of purchase. This should include information about the risk of acquiring *Salmonella* infection from contact with live poultry.

This investigation is ongoing and CDC will update the public when additional information is available.

Page last reviewed: April 25, 2013

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Content source: [Centers for Disease Control and Prevention](#)

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