



## Multistate Salmonellosis Outbreaks in 2018

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USAHA Committee on *Salmonella*

## Multistate Salmonellosis Outbreaks in 2018: A Busy Year

- Two linked to chicken consumption (I 4,[5]),12:i:- and Infantis)
  - Two linked to shell egg consumption (Braenderup and Enteritidis)
  - Two linked to coconut products (one dried and frozen, shredded)
  - Pasta salad sold at a single grocery chain (Sandiego and IIIb)
  - Chicken salad sold at a single grocery chain (Typhimurium)
  - Pre-cut melon sold at grocery stores (Adelaide)
  - Multiple turkey products including ground, whole, and raw pet food (Reading)
  - Ground beef (Newport)
  - Raw sprouts (Montevideo)
  - Breakfast cereal (Mbandaka)
  - Kratom (multiple serotypes)
  - Contact with backyard poultry (multiple serotypes)
  - Contact with guinea pigs (Enteritidis)
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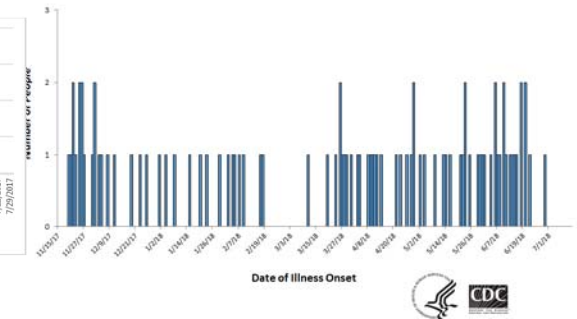
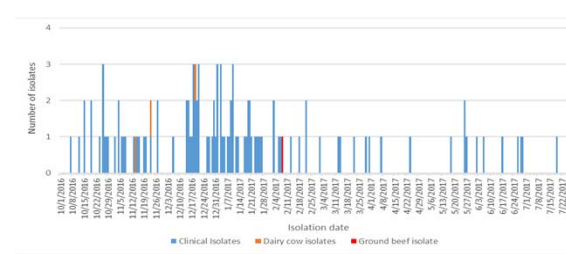
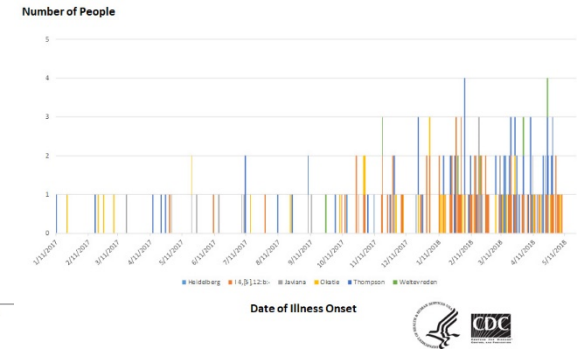
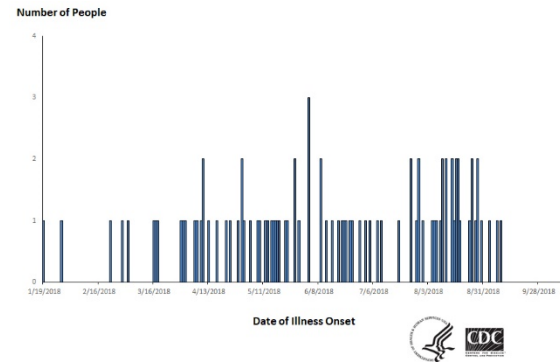
# Theme 1: Numerous Outbreaks Linked to Meat and Poultry Products

- **Examples:**
  - Chicken consumption (I 4,[5]),12:i:- and Infantis)
  - Multiple turkey products including ground, whole, and raw pet food (Reading)
  - Ground beef (Newport)
- **Unclear whether this is a trend or just an unusual year**
  - Several of these leveraged WGS



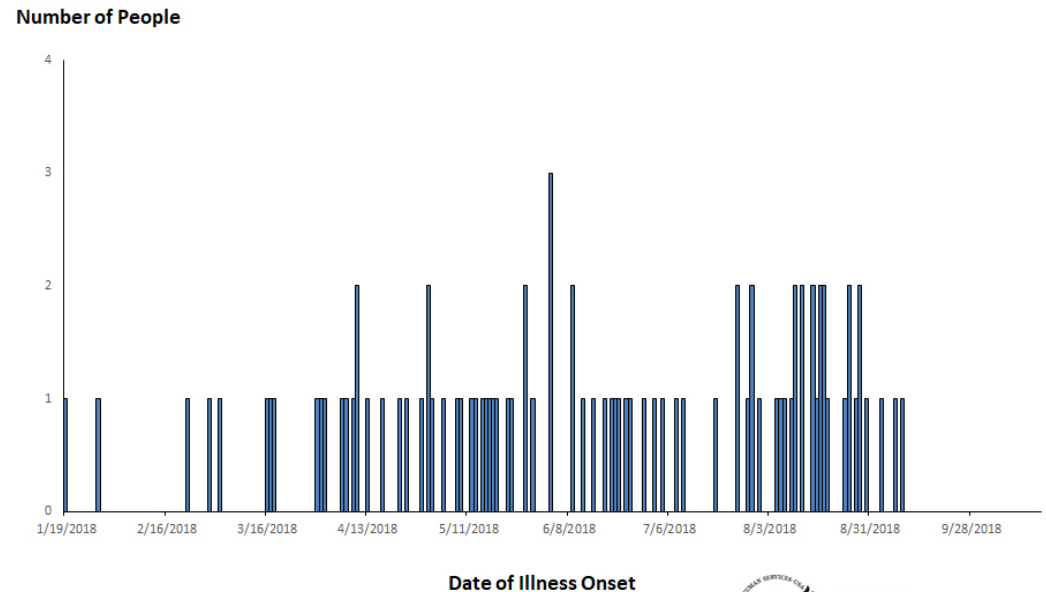
# Theme 2: Atypical “Outbreaks”

- **Examples:**
  - Chicken/Infantis
  - Turkey/Reading
  - Ground beef/Newport
  - Kratom/multiple serotypes



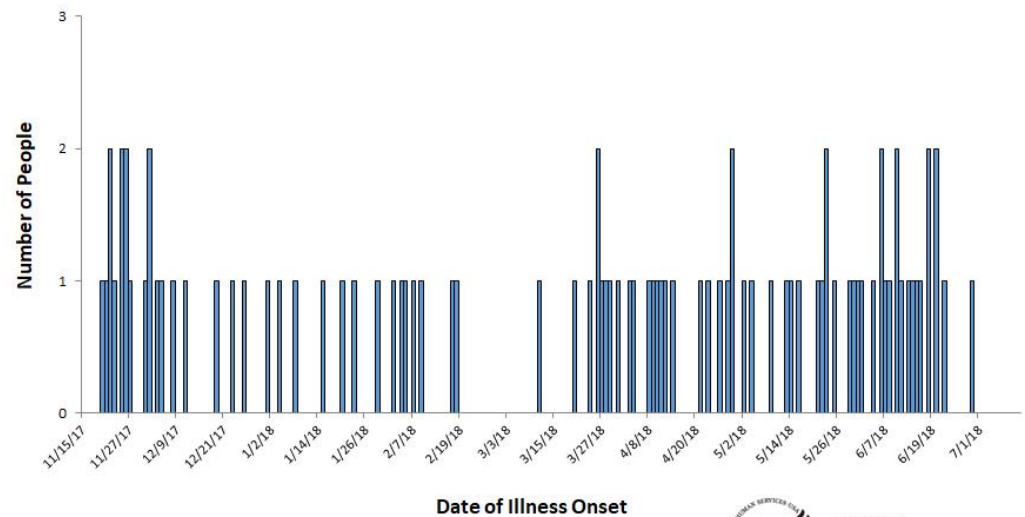
## Theme 2: *Salmonella* Infantis Linked to Chicken Products

- Illnesses over an 8-month period
- Linked to numerous chicken products, including raw chicken pet food
- Outbreak strain isolated from people, chicken meat, chicken pet food, and live chickens
- Exhibited multidrug resistance



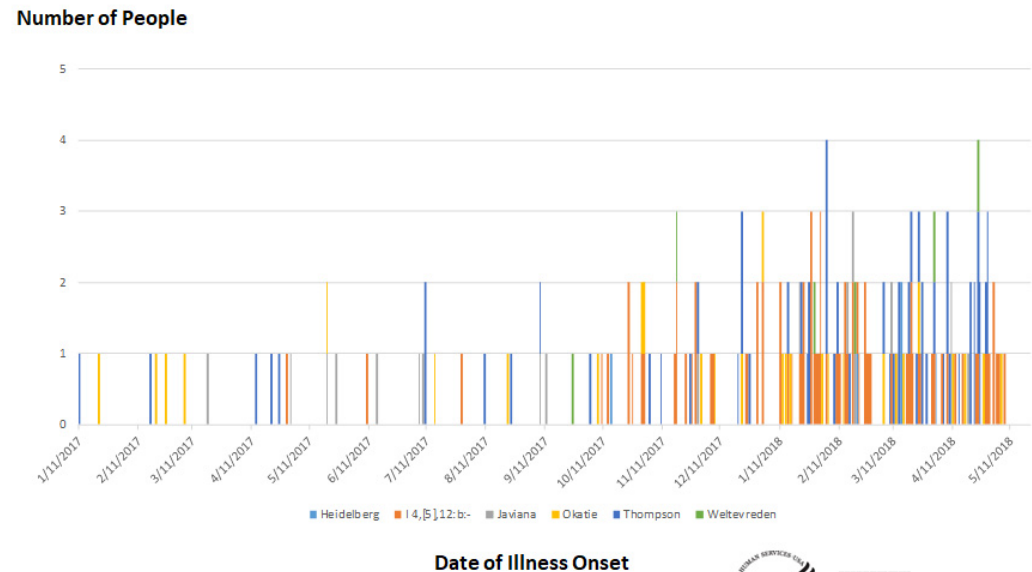
## Theme 2: *Salmonella* Reading Linked to Turkey Products

- Illnesses over an 9-month period
- Linked to numerous turkey products, including raw turkey pet food
- Outbreak strain isolated from people, turkey meat, turkey pet food, and live turkeys
- Exhibited multidrug resistance

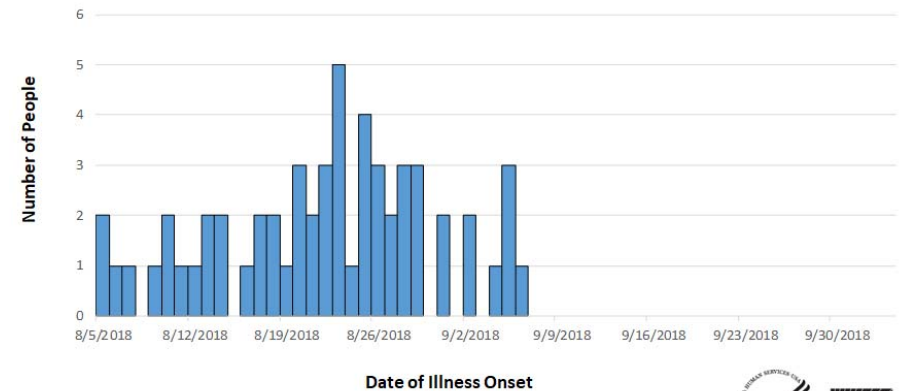
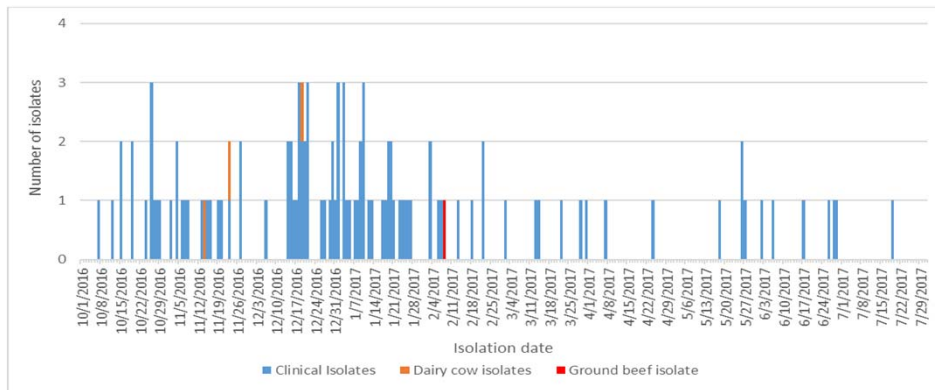


## Theme 2: Multiple *Salmonella* Serotypes Linked to Kratom

- Illnesses over an 18 month period
- Multiple serotypes... the more testing the more was found
  - Highly contaminated



## Theme 2: *Salmonella* Newport Linked to Ground Beef



- **Identical strain (by WGS) that caused at 2016-2017 outbreak**
  - Illnesses over a 10-month period linked to ground beef
  - Outbreak strain found in 4 dairy cattle from a single state and ground beef collected from an ill person's home
  - Traceback of ground beef did not go to a single slaughter facility
  - Root cause not identified

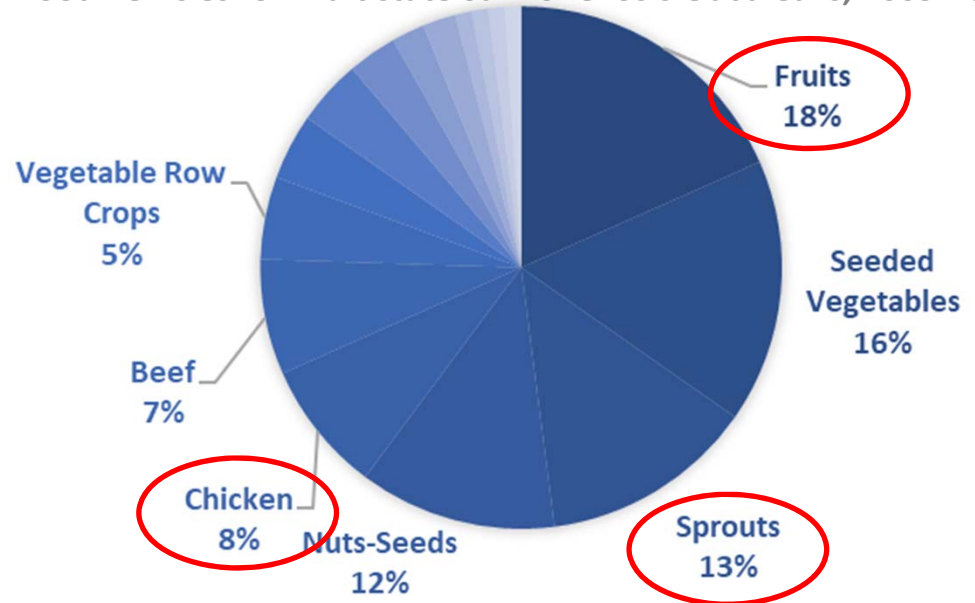


## Theme 3: Several “Repeat Offender” Outbreaks

### ■ Examples:

- Two linked to chicken consumption (I 4,[5]),12:i:- and Infantis)
- Raw sprouts (Montevideo)
- Pre-cut melon sold at grocery stores (Adelaide)
- Contact with backyard poultry (multiple serotypes)

Food Vehicles for Multistate Salmonellosis Outbreaks, 2009-2016



# Theme 4: Pre-Made Items Sold at Grocery Stores with Multiple Ingredients

- **Examples:**
  - Pre-cut melon sold at grocery stores (Adelaide)
  - Pasta salad sold at a single grocery chain (San Diego and Illb)
  - Chicken salad sold at a single grocery chain (Typhimurium)
- **Very difficult to determine the source of contamination**
  - Ingredient?
  - Contamination in the processing facility?



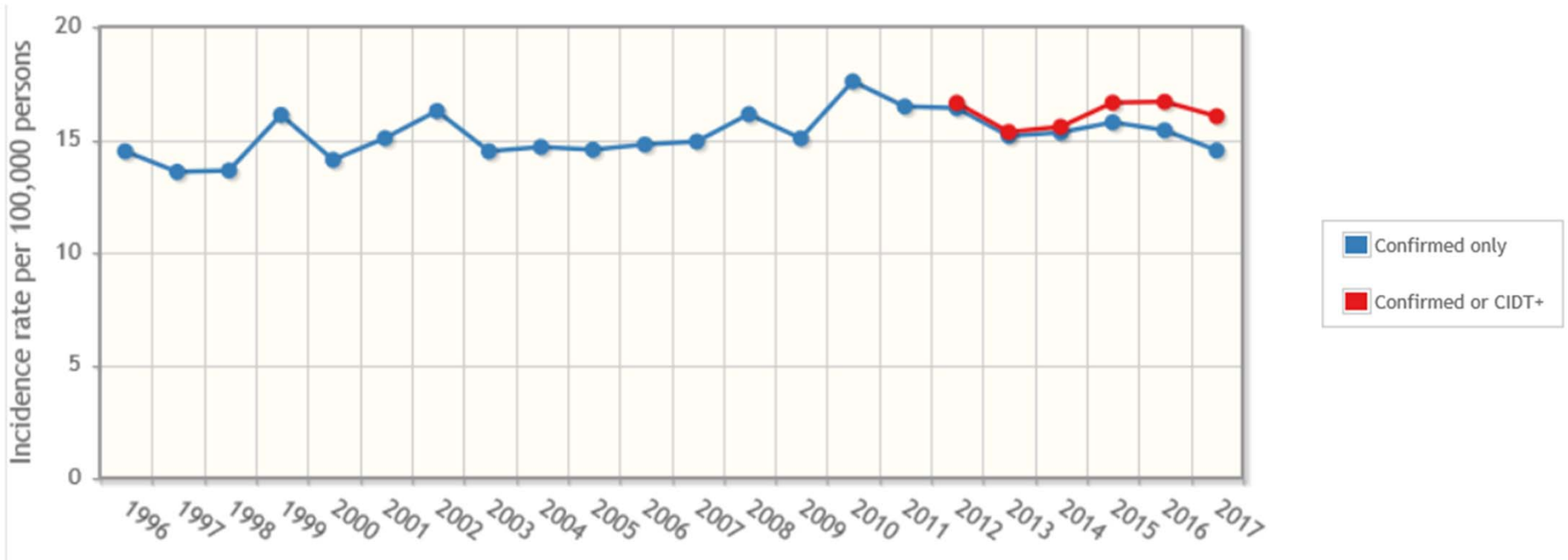
**Looking Ahead**

# Full Implementation of WGS in PulseNet

- **PulseNet switch from PFGE to WGS will occur in early 2019**
  - Nearly all *Salmonella* will be sequenced
  - PFGE will be rapidly phased out
- **This will require shifts in:**
  - How outbreaks are detected, defined, and investigated
  - The current processes for interagency and interdisciplinary collaboration
- **Will likely lead to finding more outbreaks**
  - Many outbreaks may be easier to solve with WGS
  - WGS will also uncover complex connections throughout the food system that may be difficult to explain or understand without more collaboration

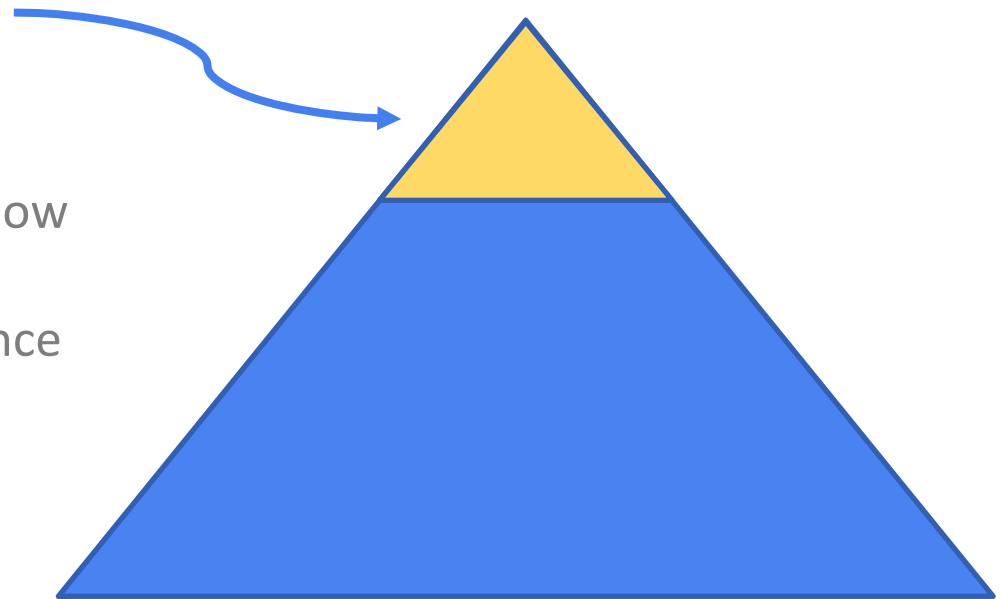


## No Change in Incidence of Salmonellosis Since 1996



# Outbreaks Are a Small Fraction of All Illness

- Only about 12% of illnesses reported to PulseNet are associated with a potential multistate outbreak
- Do the atypical outbreaks we're now seeing provide insights that could help us reduce *Salmonella* incidence overall?



Questions?