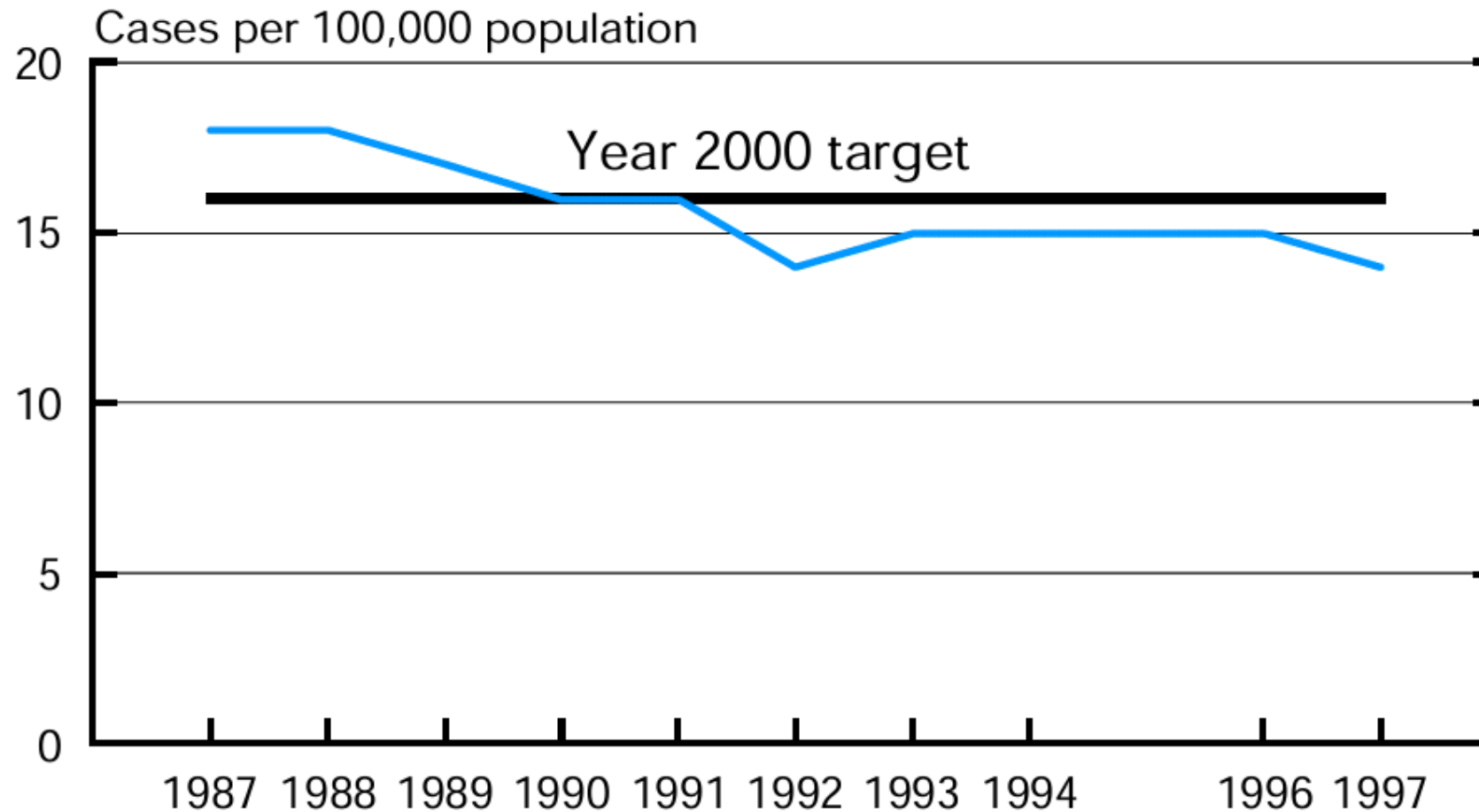# Salmonella/Poultry Workgroup Success Story and Lessons Learned

Craig Hedberg

University of Minnesota

Foodborne infections: *Salmonella* species
Healthy People 2000 objective 12.1

https://www.cdc.gov/nchs/healthy_people/hp2000/reviews/food_safety.htm

# *Salmonella* infections by year; 1996-2022

Incidence per 100,000 population – FoodNet sites; all test methods
* Culture-confirmed includes those infections confirmed by culture only or by culture following a positive CIDT.
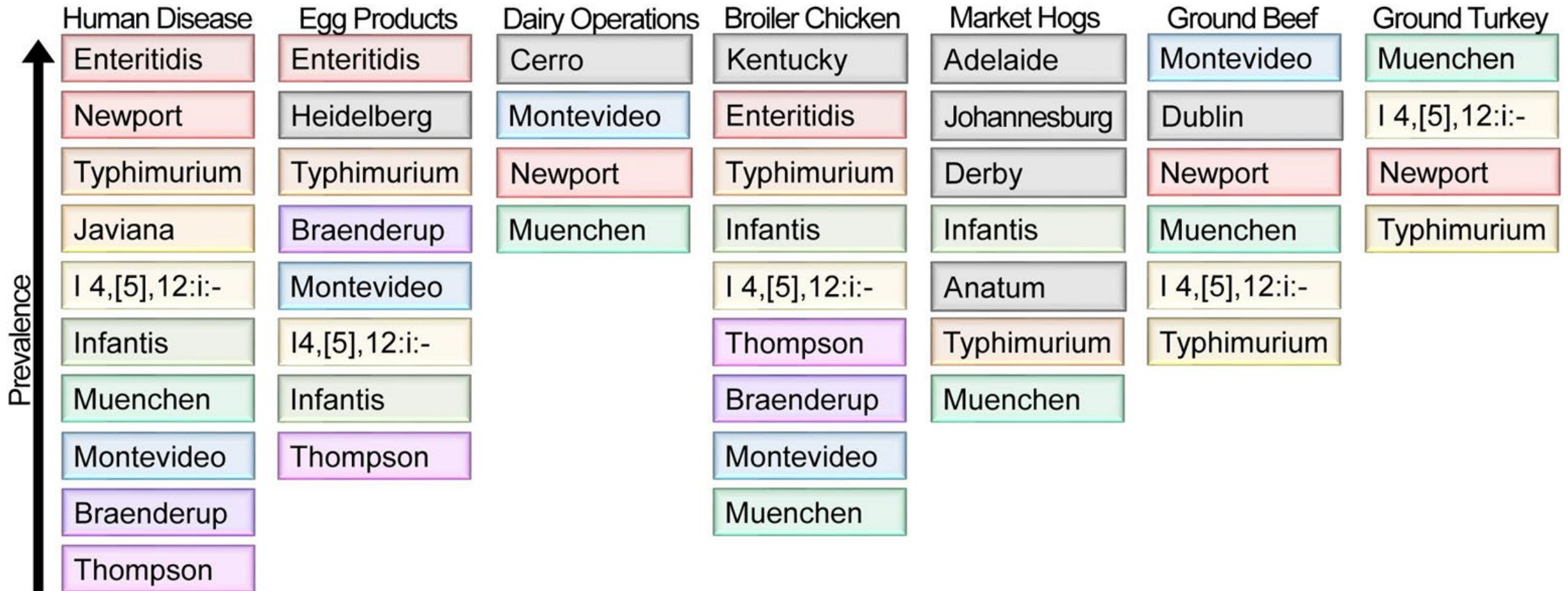*Source: FoodNet, Centers for Disease Control and Prevention*

Legend: All test methods | Culture-confirmed* | CIDT+ only

Y-axis: Incidence per 100,000 population

HP 2000, 16.0
HP 2010, 6.8
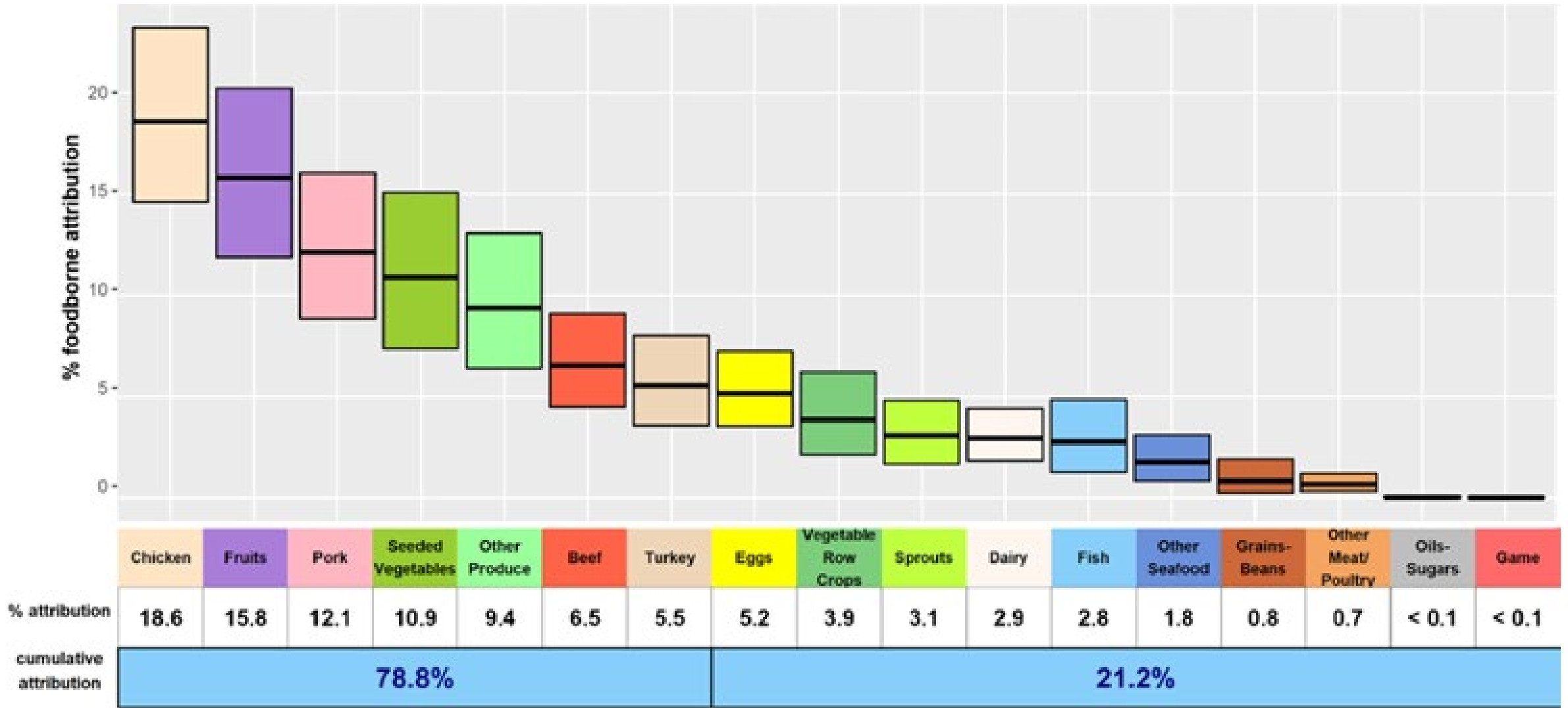HP 2020, 11.4
HP 2030, 11.5
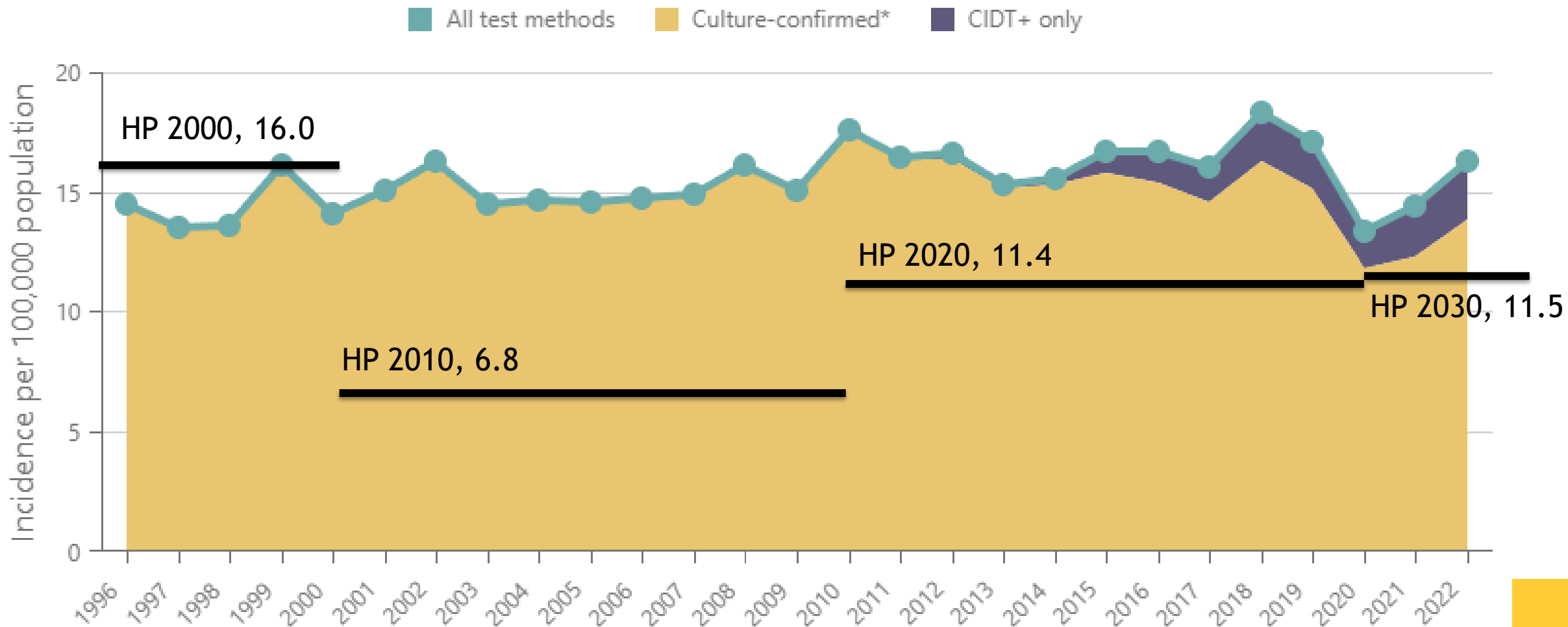
Trends in *Salmonella*-positive chicken carcass rinse samples from FSIS verification sampling results compared with retail chicken breast data collected by NARMS, FSIS baseline surveys, and privately funded surveys
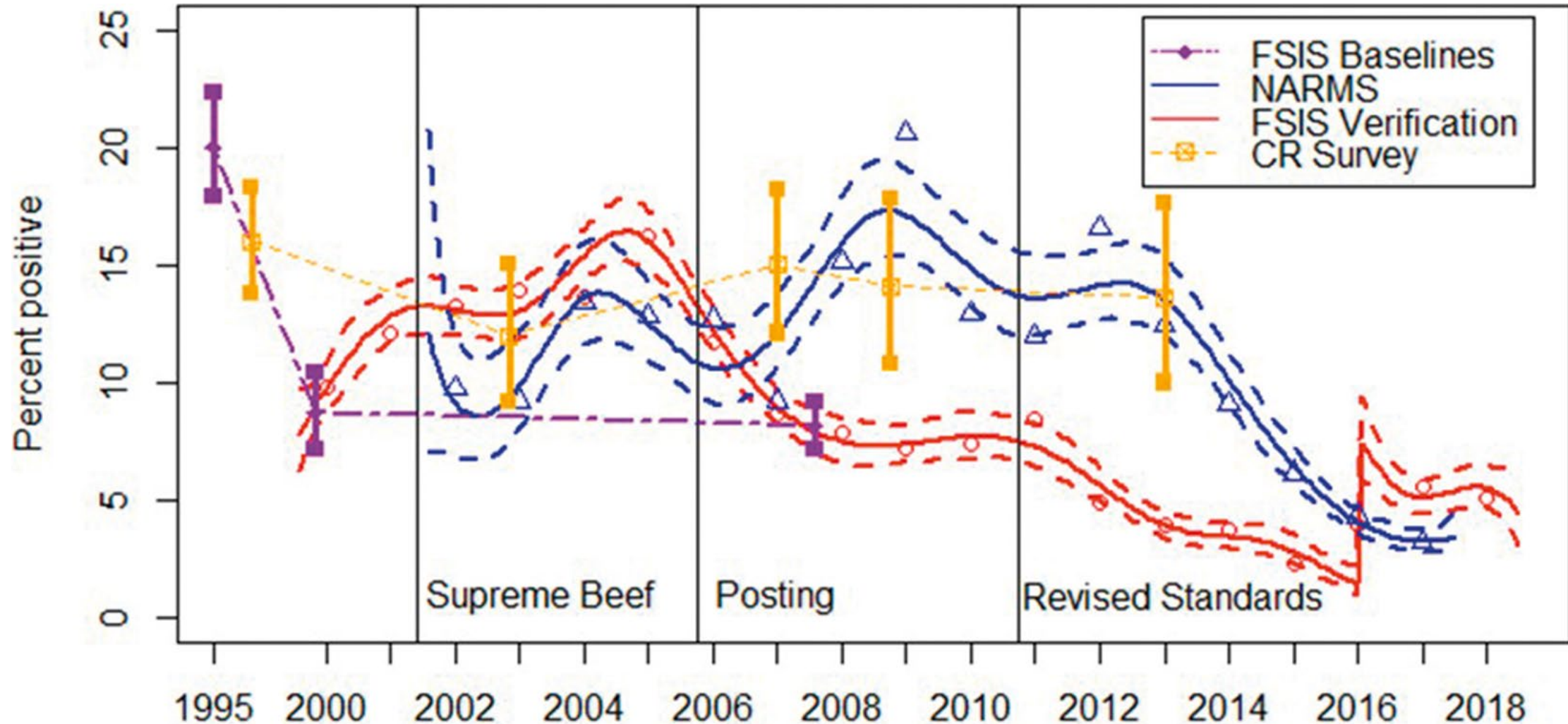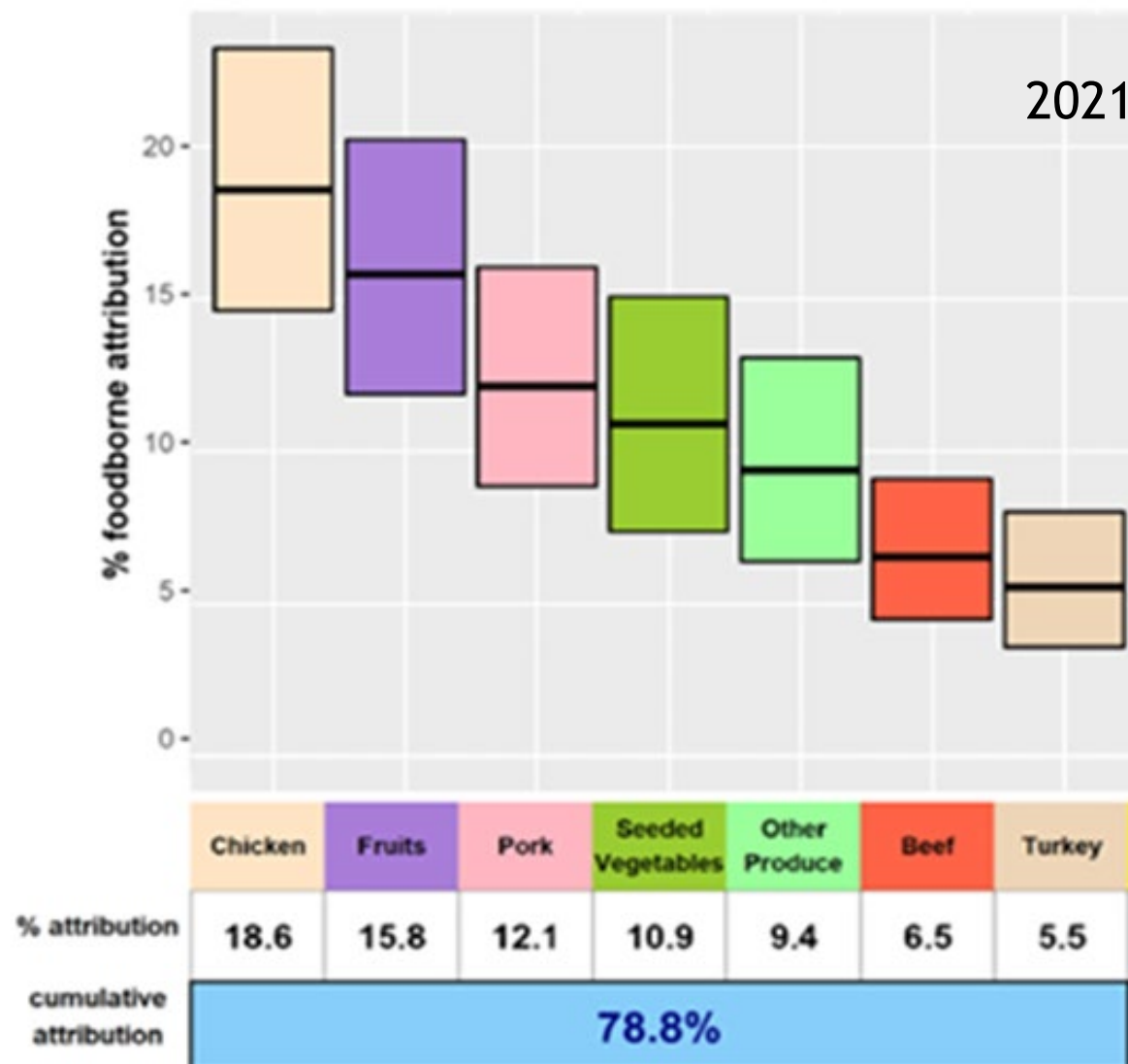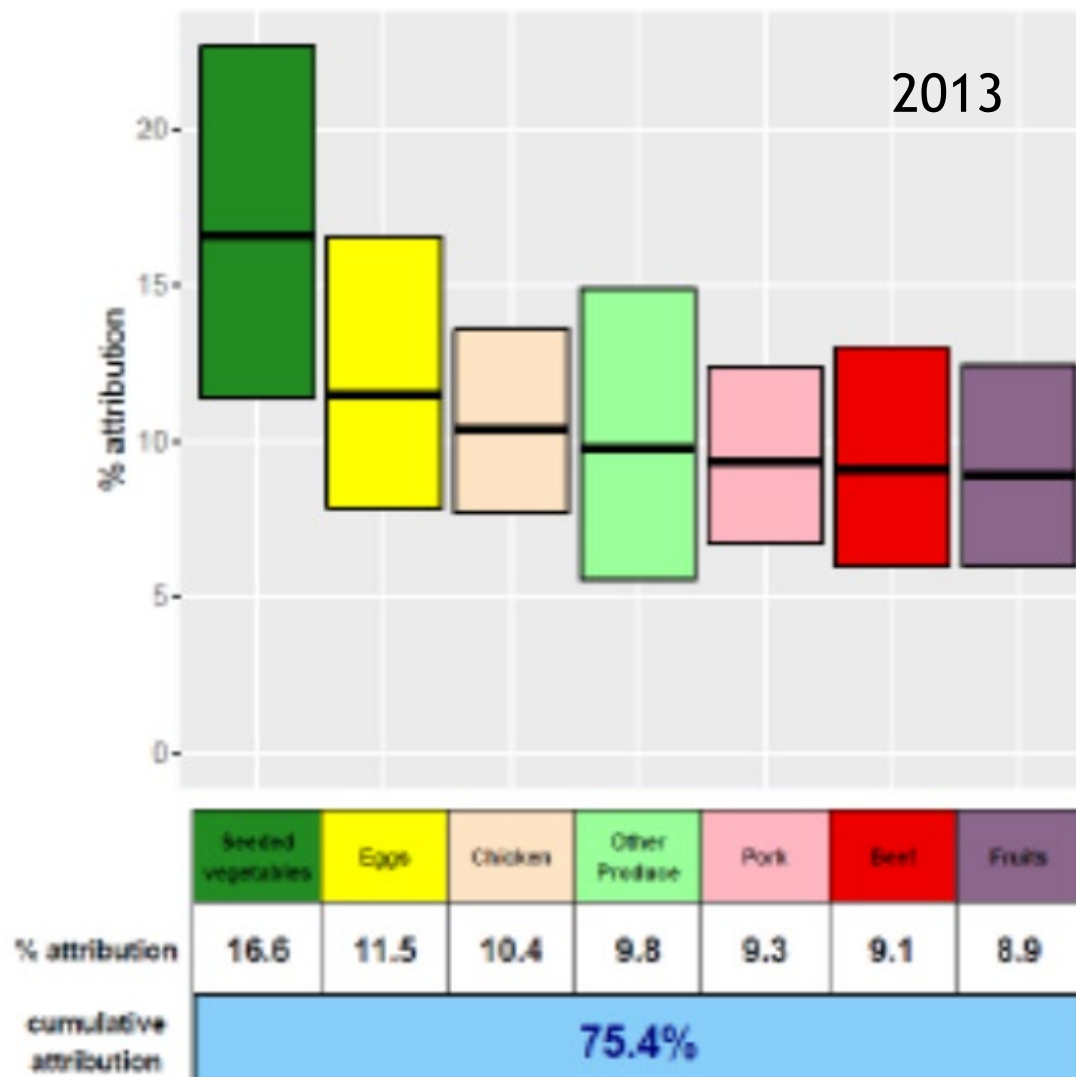
Salmonella serovar prevalence from reported human clinical cases and surveillance of different animal food sources.

Salmonella Attribution to Food Categories, 2021

Chicken	Fruits	Pork	Seeded Vegetables	Other Produce	Beef	Turkey	Eggs	Vegetable Row Crops	Sprouts	Dairy	Fish	Other Seafood	Grains-Beans	Other Meat/ Poultry	Oils-Sugars	Game
% attribution 18.6	15.8	12.1	10.9	9.4	6.5	5.5	5.2	3.9	3.1	2.9	2.8	1.8	0.8	0.7	< 0.1	< 0.1

cumulative attribution	
78.8%	21.2%

https://www.cdc.gov/foodsafety/ifsac/pdf/P19-2021-report-TriAgency-508.pdf

Salmonella Attribution to Food Categories, 2013, 2021

2013

2021

	Seeded vegetables	Eggs	Chicken	Other Produce	Pork	Beef	Fruits
% attribution	16.6	11.5	10.4	9.8	9.3	9.1	8.9
cumulative attribution	75.4%						

	Chicken	Fruits	Pork	Seeded Vegetables	Other Produce	Beef	Turkey
% attribution	18.6	15.8	12.1	10.9	9.4	6.5	5.5
cumulative attribution	78.8%						

https://www.cdc.gov/foodsafety/ifsac/pdf/P19-2021-report-TriAgency-508.pdf
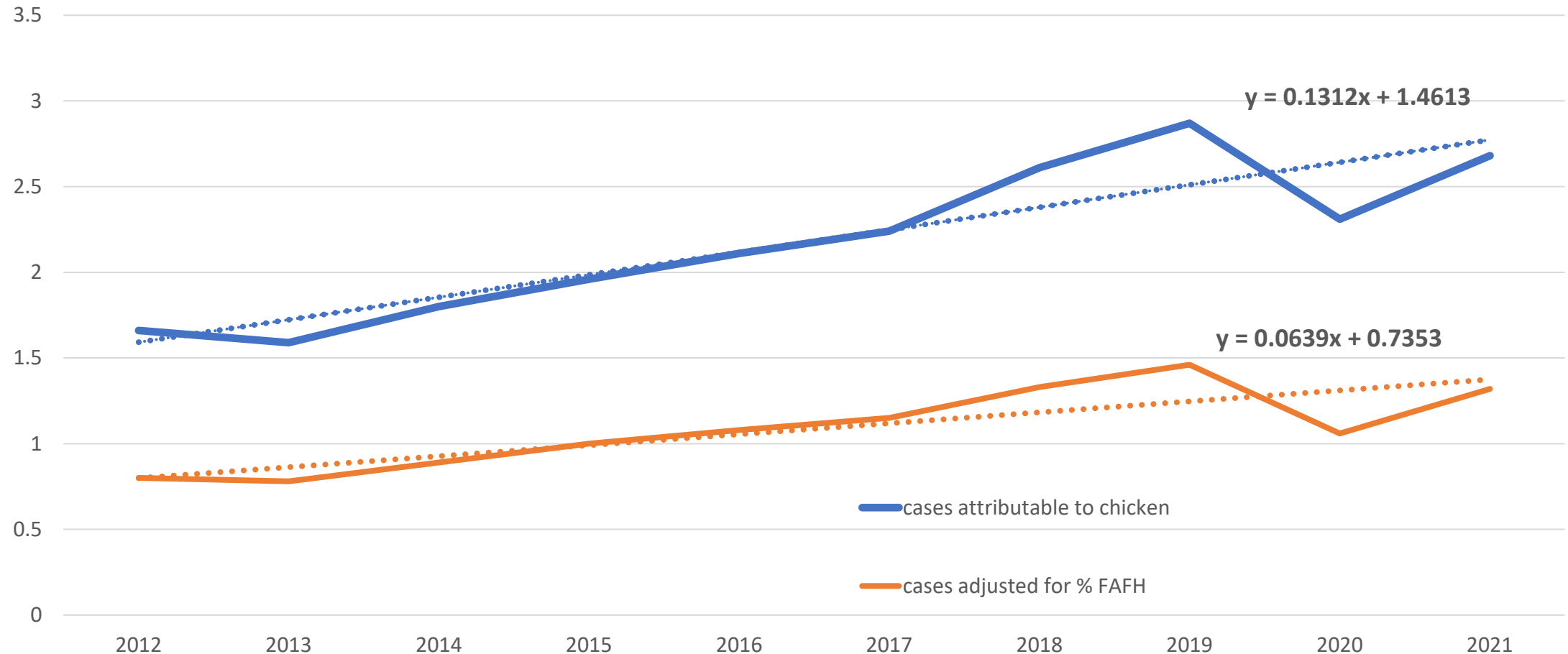
Salmonella infections by year, 2012-2021
Incidence per 100,000 per year, FoodNet data and rates adjusted for IFSAC attribution for chicken.

y = -0.1305x + 16.71

y = -0.265x + 15.273

y = 0.1312x + 1.4613

chicken — other than chicken — FoodNet

Source: CDC FoodNet Fast, IFSAC

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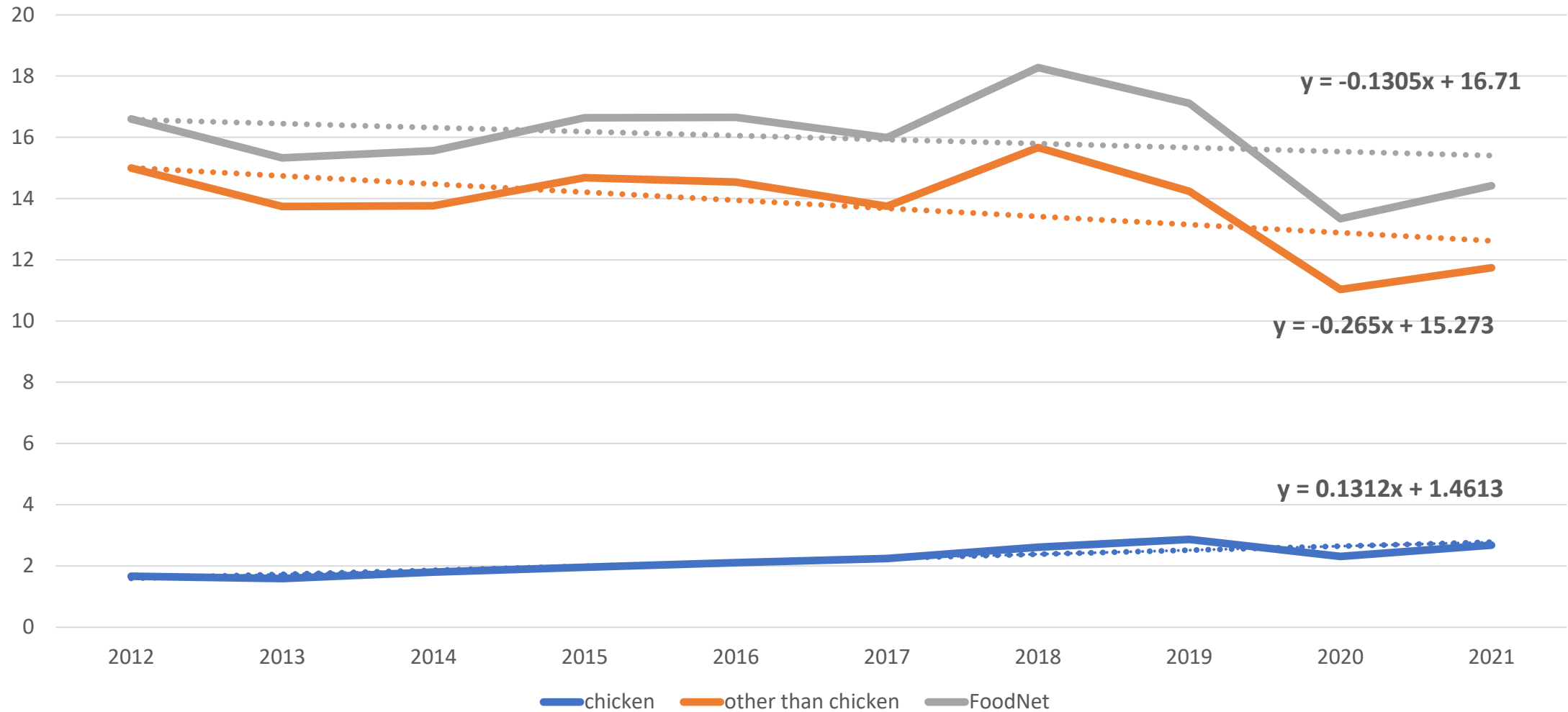
Salmonella infections by year, 2012-2021

Incidence per 100,000 population, FoodNet data adjusted for IFSAC attribution for chicken, and incidence adjusted for expenditures for food consumed away from home.

$y = 0.1312x + 1.4613$

$y = 0.0639x + 0.7353$

cases attributable to chicken

cases adjusted for % FAFH

Source: CDC FoodNet Fast, IFSAC, USDA ERS

THE MEAT AND POULTRY DIALOGUE

- 2011: Stakeholder forum on implementation of the FDA Food Safety Modernization Act (FSMA)Beginning in early 2013.

- 2013: Pew Charitable Trusts (Pew) and Cargill, Inc. (Cargill) discuss feasibility of launching initiative to modernize the United States meat and poultry legislative and regulatory system.

- Positive experience led both to believe most effective approach to kick-starting meat and poultry modernization would be multi-stakeholder dialogue process.

https://merid.org/wp-content/uploads/2019/07/Meat-and-Poultry_Recommendations.pdf

THE MEAT AND POULTRY DIALOGUE

- Recommendations could provide foundation for legislation and changes in applicable regulations and policies developed by U.S. Department of Agriculture's Food Safety and Inspection Service (USDA-FSIS) and relevant policies at state and local level.

- Steering Group members from Pew, Cargill, meat and poultry industry, retail food sector, consumer advocacy community, and academia.

- Key informant interviews: Oct. 2014- Feb. 2015

- Meat and poultry dialogue: Apr. 2015- Dec. 2016

- 2017: Group consensus on recommendations as integrated whole.
  - Individual members differ on particular recommendations.

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Recommendations to Modernize the Meat and Poultry Oversight System in the United States

Developed by the Meat and Poultry Dialogue Group

- Risk-based Oversight System
- Data
- Pre-harvest (Farms and Feedlots)
- Harvest (Slaughter)
- Processing and Further Processing
- Enforcement Authority
- Post-Plant-of-Origin Supply Chain
- Risk Communication
- Health Care and Public Health

Reduce infections caused by Salmonella — FS-04

Healthy People 2030

Status: Improving ⊕

Most Recent Data:
13.3 laboratory-diagnosed, domestically-acquired *Salmonella* infections per 100,000 population (2021)

Target:
11.5 per 100,000 [1]

Desired Direction:
Decrease desired

Baseline:
15.3 laboratory-diagnosed, domestically-acquired *Salmonella* infections per 100,000 population occurred on average annually in 2016-18 [2]

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https://health.gov/healthypeople/objectives-and-data/browse-objectives/foodborne-illness

Goal: "Reduce infections caused by Salmonella" and fulfill FS-04.

| Objectives |
|---|
| Integrated *Salmonella* surveillance system; data reporting and analysis/evaluation |
| Use of postharvest intervention technologies |
| Develop modernized, uniform final product standards |
| Develop & execute an industry vaccine survey |
| Utilize a multi-hurdle approach |
| Comprehensive Risk Assessment |

Salmonella Workgroup

Proposed Regulatory Framework to Reduce Salmonella Illnesses Attributable to Poultry
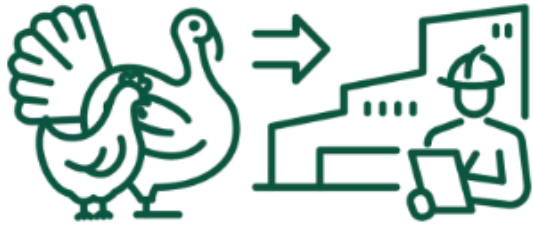
Component 1

Requiring incoming flocks be tested for Salmonella before entering an establishment
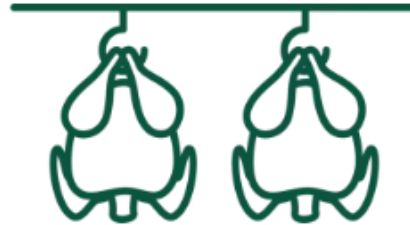
Component 2

Enhancing establishment process control monitoring and FSIS verification

Component 3

Implementing an enforceable final product standard

Members of Coalition for Poultry Safety Reform

Representatives of:

- Consumer groups
- Industry
- Academia
- Former regulators

Coalition for Poultry Safety Reform

Common Goals for Poultry Safety Reform

- **01 -** Current performance standards-based system is not leading to the desired public health outcomes.

- **02 -** Reform efforts should aim to develop new standards that are objective, risk-based, achievable, enforceable, and flexible enough to adapt to emerging evidence and the latest science.

- **03 -** A modernized framework should address risk reduction across the full production process.

- **04 -** USDA must address both *Salmonella* and *Campylobacter* in poultry, but these pathogens are different and require different solutions.

- **05 -** Science has advanced sufficiently to support regulatory improvements today, but ongoing research is also needed.

Recommendations to Modernize the Meat and Poultry Oversight System in the United States

Developed by the Meat and Poultry Dialogue Group

- Industry sectors across production chain
- Consumer advocacy organizations
- Academics/scientists
- Public-health groups
- Trade associations

AFDO — CONNECT · SHARE · IMPACT · PROTECT

Salmonella Workgroup

- Federal, state and local agencies
- Associations
- Private industry
- Academia
- Nonprofit and advocacy groups

Coalition for Poultry Safety Reform

- Consumer groups
- Industry
- Academia
- Former regulators

Proposed Regulatory Framework to Reduce Salmonella Illnesses Attributable to Poultry

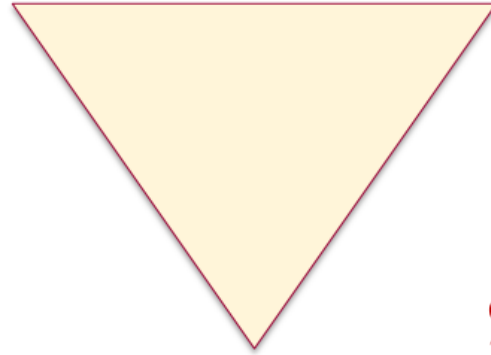**Food Safety and Inspection Service**
U.S. DEPARTMENT OF AGRICULTURE

Salmonella Workgroup
+
Coalition for Poultry Safety Reform

Risk Assessment Models

Top-down models:
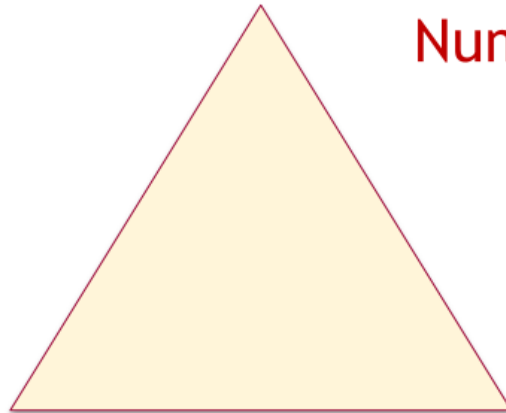
Number of human illnesses

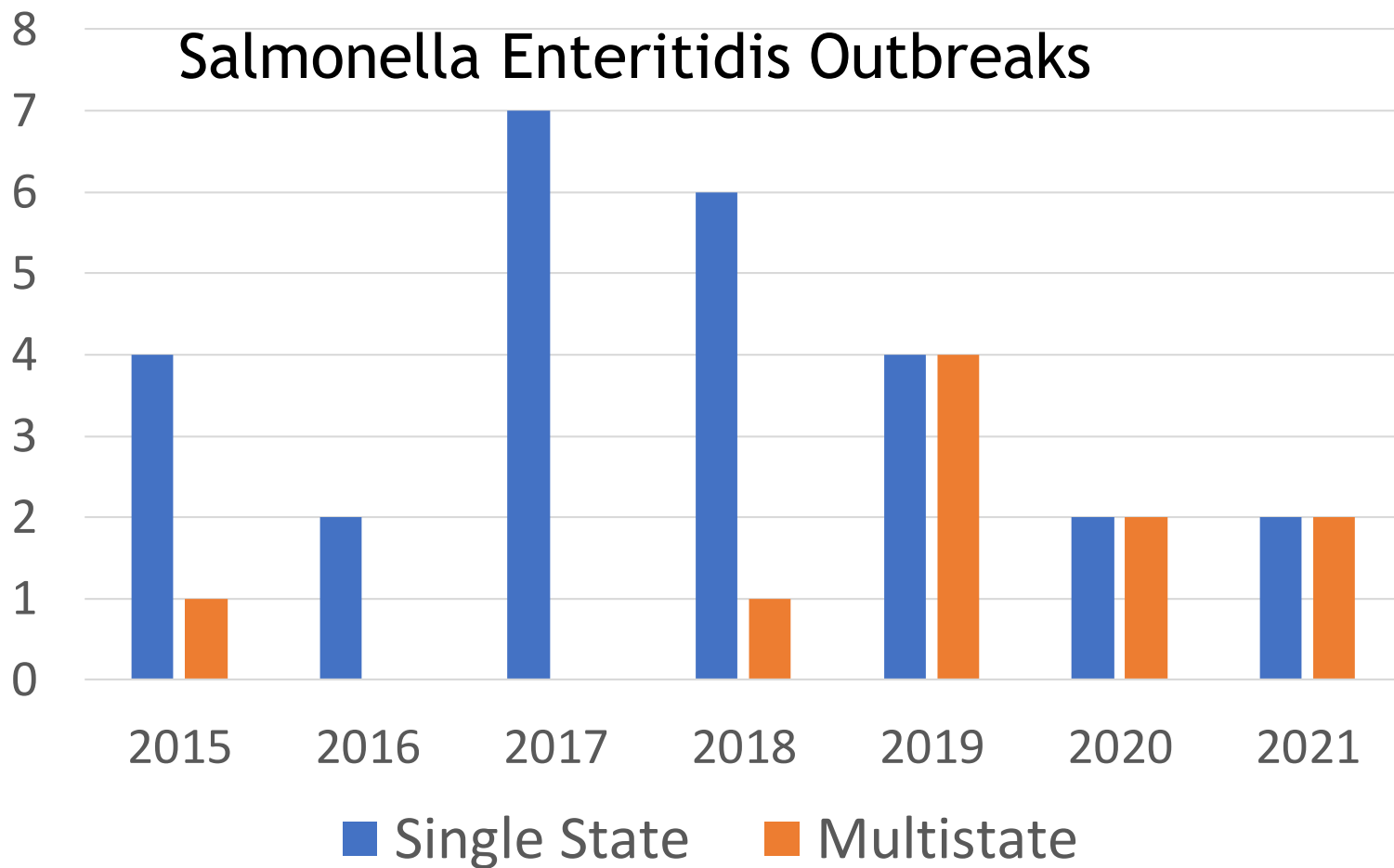↓ Attribution estimates

% human illnesses due to commodity

Number human illnesses due to commodity

↑ Preparation and consumption scenarios

Bottom-up models:

Prevalence of *Salmonella* in commodity

Salmonella Enteritidis Outbreaks Associated with Chicken Reported to FDOSS, 2015-2021

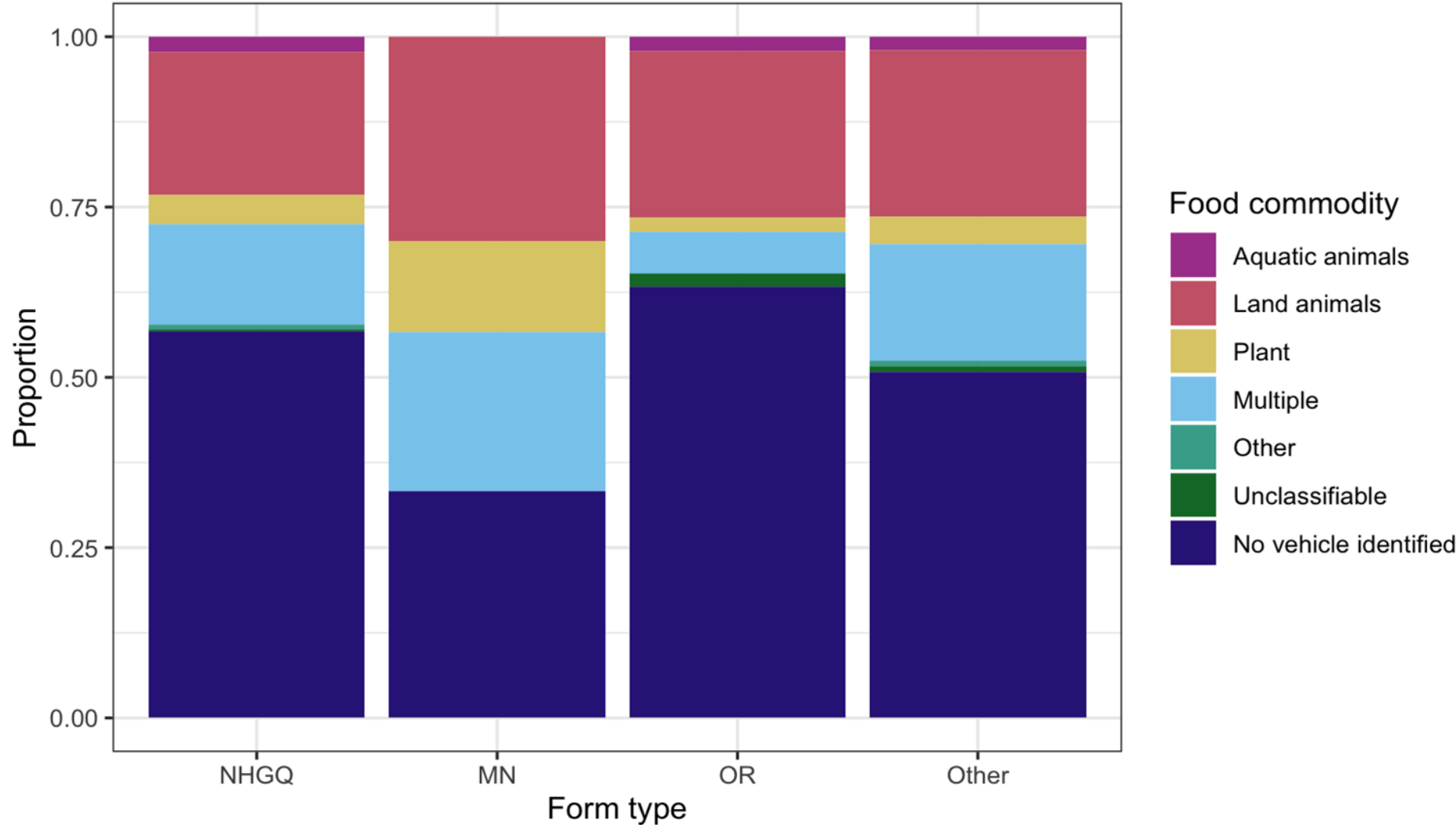## Salmonella Enteritidis Outbreaks

Category	Confirmed Cases (median)
Multistate outbreaks	28
Single State outbreaks	8

Legend: ■ Single State   ■ Multistate

https://www.cdc.gov/norsdashboard

Salmonella Enteritidis Associated with Frozen Raw Breaded Chicken Products, Epidemic Curve and Event Timeline, 2021
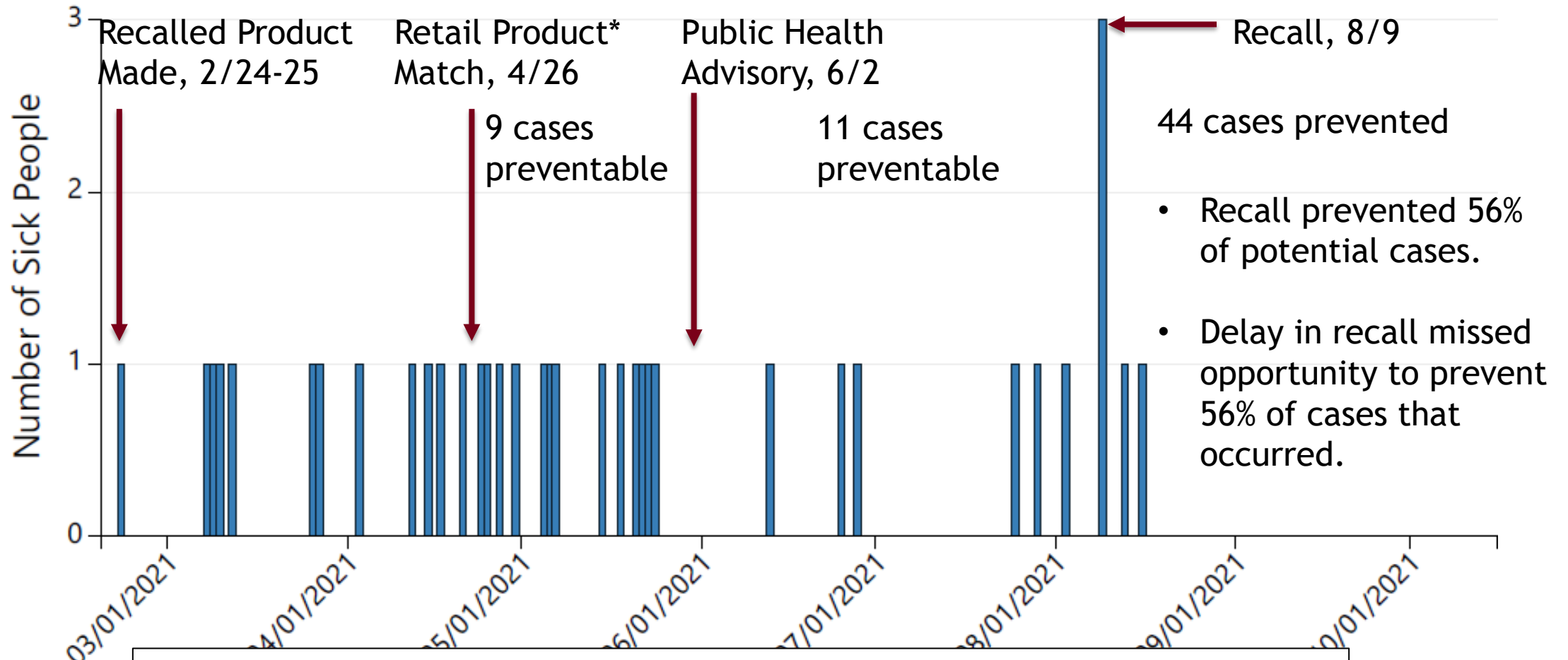
* Product manufactured 12/5/2020; 3-5 alleles different cgMLST, 5-9 SNP

Source: MDH, CDC, FSIS

Major food groups identified via HG interview form types

SUPPLEMENTAL POULTRY QUESTIONNAIRE FOR *SALMONELLA* ENTERITIDIS CLUSTER 2306MLJEG-3

<u>SECTION 7: POULTRY</u>: Now I have a few questions about chicken and other poultry that you (your child) might have eaten in the 7 days before your (your child's) illness began. This does not include canned items, but the poultry could have been fresh, frozen, or could have been eaten as part of dish. You (your child) could have eaten these either in your home or outside the home. As I read each food, please answer as yes, no, may have eaten, or can't remember eating the food in the 7 days before you (your child) got sick.

First, I have questions about CHICKEN & OTHER POULTRY products.

Yes	Maybe	No	Don't Know	Did you (your child) eat any:
☐	☐	☐	☐	1. Whole chicken, including rotisserie/roasted chicken?

Yes	Maybe	No	Don't Know	Did you (your child) eat any:
☐	☐	☐	☐	2. Pre-cut chicken parts or pieces, such as just breasts, drumsticks, thighs, wings?

If eaten at home:

i) How was the chicken purchased?

   Raw, fresh   Raw, frozen   Already cooked   Unknown

ii) What kind of chicken parts/pieces was purchased?:

   Chicken breasts   Thighs   Wings   Drumsticks   Other:_____

iii) Were the parts/pieces boneless or bone-in?   ☐ Boneless   ☐ Bone-in   ☐ Unknown

iv) Which of the following brands was it?:

vi) Place purchased from (names, locations):_____

vii) Purchase date: _____/_____/_____   Unknown

viii) If known, what was the "Best If Used By/Expiration" date on that package:
      Best if used by date: _____/_____/_____
      USDA Establishment # P_____ (the establishment # starts with "P")