

CDC Organizational Update and Status of Foodborne Illness Trends

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Environmental Diseases**

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AFDO Healthy People 2030 Workgroup



CDC Organizational Updates

- New Division: Coronavirus and Other Respiratory Viruses Division (CORVD)
- National Wastewater Surveillance System → Division for Infectious Disease Readiness & Innovation (DIDRI)
- Division of Parasitic Diseases and Malaria → National Center for Emerging and Zoonotic Infectious Diseases

DFWED Staffing Updates

- New leadership in Enteric Diseases Epidemiology Branch
 - Jennifer Cope
 - Kristina Angelo
- Beau Bruce has transitioned to the Center for Forecasting and Outbreak Analytics, and Patricia Griffin has retired
- Megin Nichols (Deputy Director) has returned from her detail to the Office of Tribal Affairs and Strategic Alliances (OTASA)

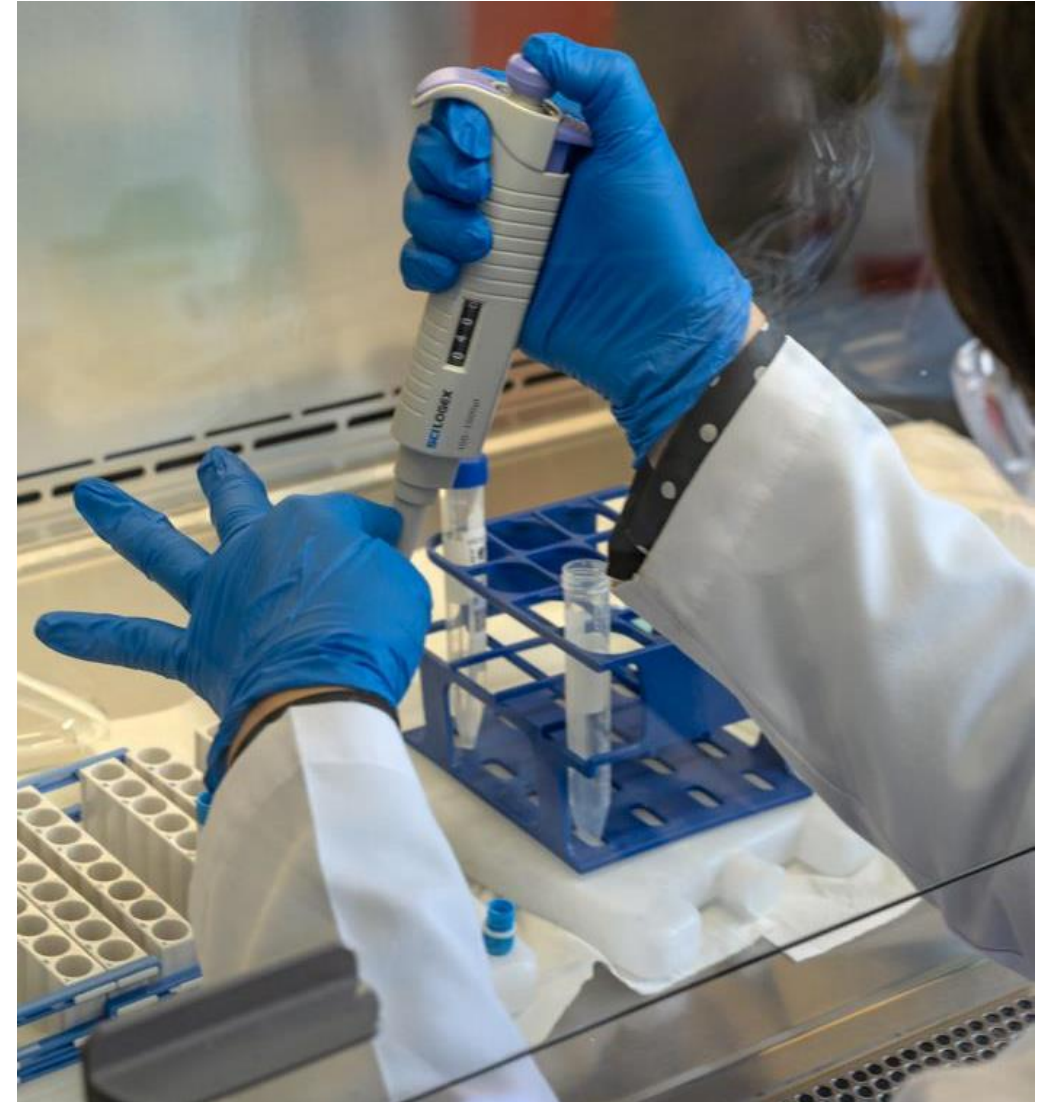


Cronobacter

- Summer 2023: Invasive infant infections with *Cronobacter* was added to list of nationally notifiable diseases in collaboration with the Council of State and Territorial Epidemiologists
- Effective on January 1, 2024, with state-by-state action to add to their process
- Waiting for final OMB approval to collect this information

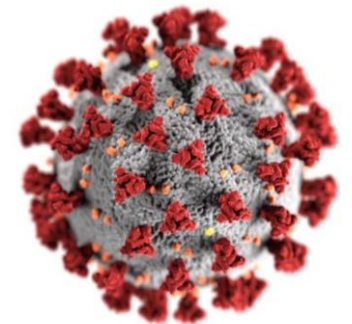
National Notifiable Diseases Surveillance System and Collaboration for Prevention

- Accurate estimates of the yearly number of U.S. cases
- Information on where diseases occur, how they are transmitted, common risk factors, and opportunities for prevention
- CDC will continue working with partners on all aspects of *Cronobacter* surveillance



Impact of COVID-19 on Surveillance and Reporting

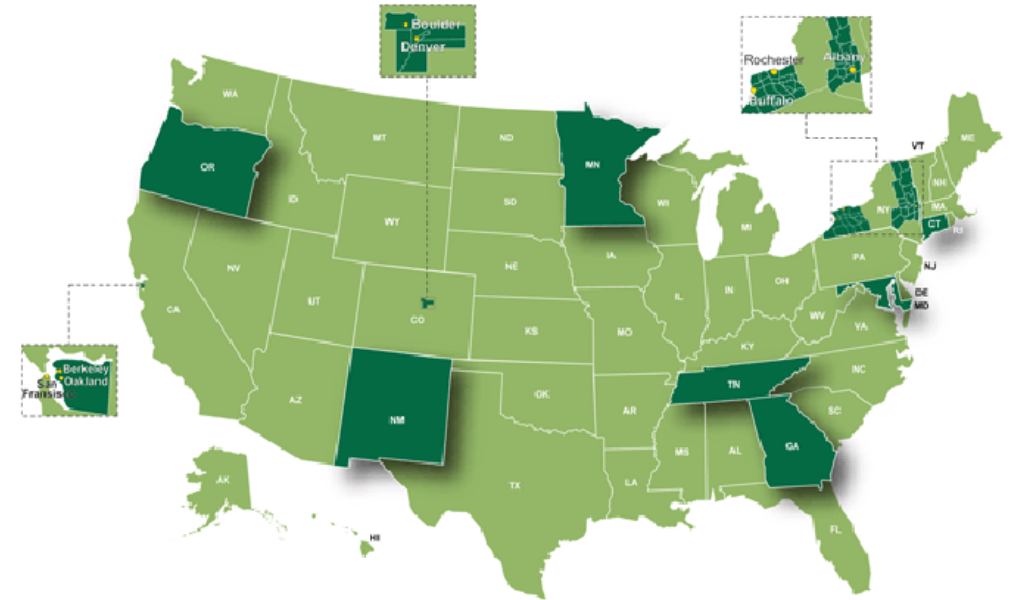
- COVID-19 was a major stress on the system
- Factors connected to COVID-19 influencing transmission, detection, and reporting:
 - Interventions to limit the spread of COVID-19
 - Decreases in international travel
 - Changes in healthcare-seeking behaviors and diagnostic testing practices
 - Reduced capacity for health department staff to investigate illnesses and collect, clean, and transmit data
- Surveillance rebounding to pre-pandemic levels of reporting



FoodNet









- Active population-based surveillance
- Collaboration among CDC, 10 FoodNet sites, FDA, USDA/FSIS
- 8 pathogens commonly spread through food and pediatric hemolytic uremic syndrome
- Reliable and up-to-date data on illness trends online for 1996 – 2022

FoodNet Surveillance Area



2022 FoodNet Annual Report

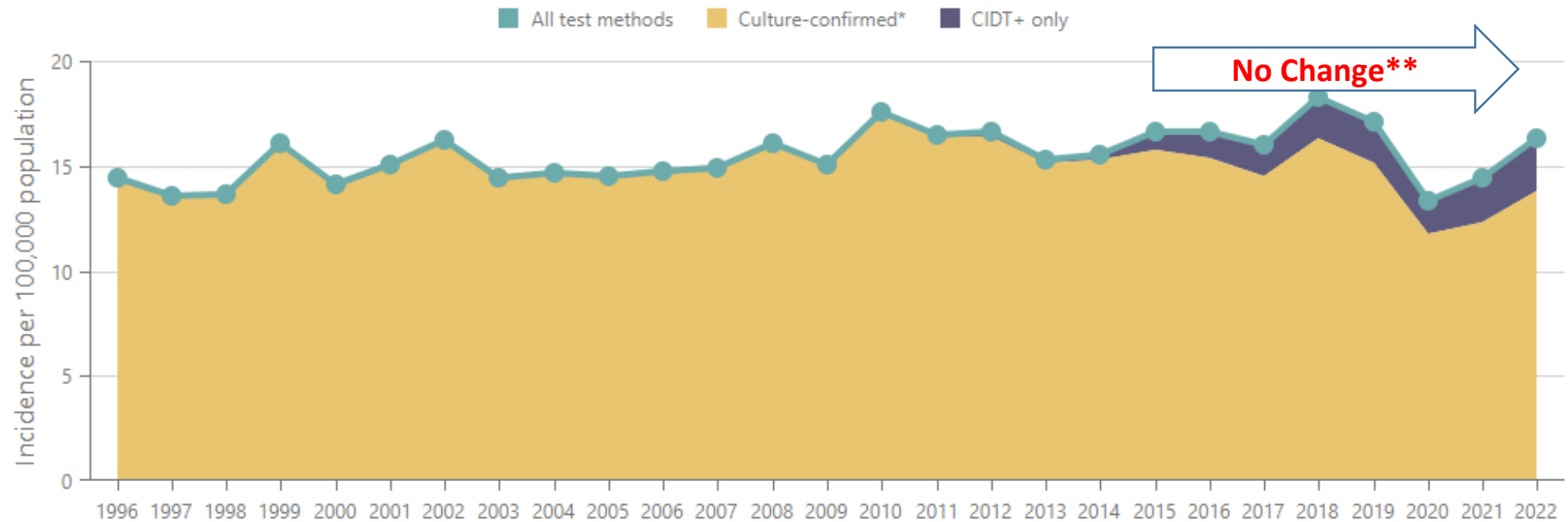
Measuring progress toward foodborne illness prevention

Pathogen	Change from baseline (2016–2018)	Rate in 2022 per 100,000 people	Target rate based on Healthy People 2030 goals
<i>Campylobacter</i>	 7%	17.4	10.9
<i>Cyclospora</i>	 430%	0.6	None
<i>Listeria</i>	 No change	0.26	0.22
<i>Salmonella</i>	 No change	14.5	11.5
<i>Shigella</i>	 No Change	3.9	None
STEC Shiga toxin-producing <i>E. coli</i>	 No change	4.6	3.7
<i>Vibrio</i>	 54%	0.9	None
<i>Yersinia</i>	 144%	1.9	None

Rates & targets are numbers of infections per 100,000 people per year. They include domestically acquired infections detected by culture or culture-independent methods. Targets based on **Healthy People 2030 goals**, which were set using average annual incidences during 2016–2018. No change indicates that the 95% credible interval of the percentage change included zero. **For more information, visit [cdc.gov/FoodNet](https://www.cdc.gov/FoodNet).**

Salmonella Infections

- HP 2030 target of 11.5 infections per 100,000 population (incidence rate, or IR)
- Relative to the 2016-2018 baseline used for measuring progress toward HP 2030, in 2022 there was:
 - No change in the total number of infections (IR=16.3)
 - No change in the number of domestically acquired infections (IR=14.5)

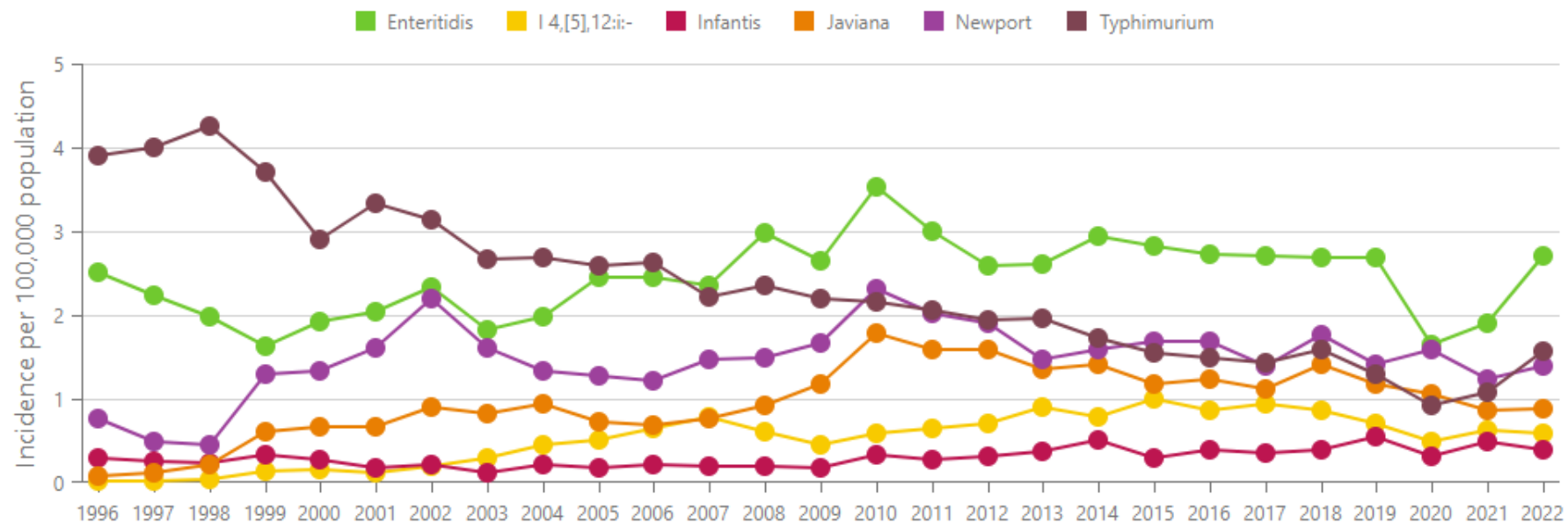


* Culture-confirmed includes those infections confirmed by culture only or by culture following a positive CIDT.

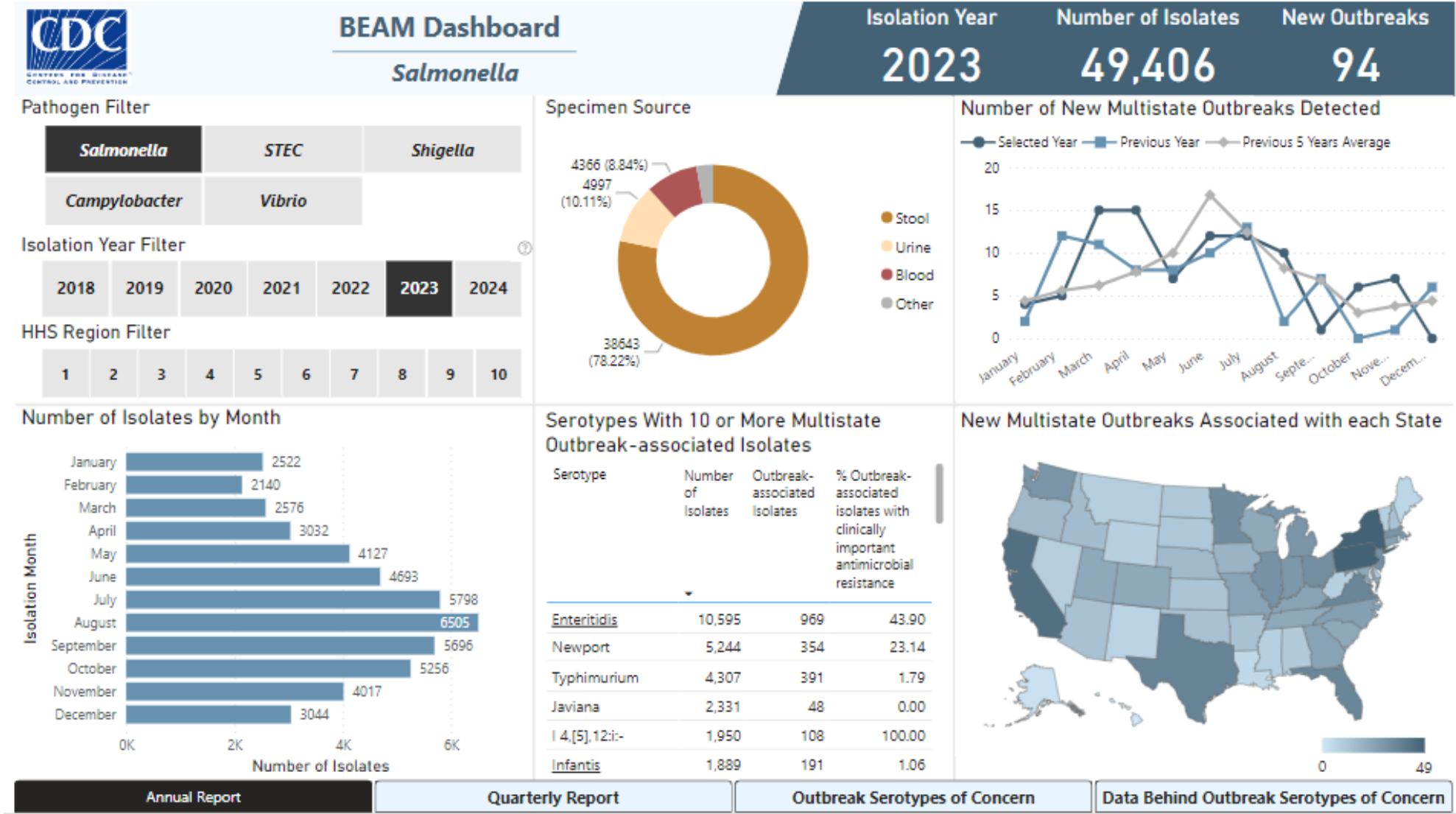
** This graph shows data for domestically-acquired and international-associated infections. When subset to only domestically-acquired infections, we still see no change in incidence in 2022 relative to the 2016-2018 baseline.

Salmonella Serotypes

- Relative to the 2016-2018 baseline used for measuring progress toward HP 2030, in 2022 there was:
 - 18% decrease in the incidence of *S. Typhimurium* infections
 - 34% decrease in the incidence of *S. I 4,[5],12:i:-* infections
 - No change in the incidence of *S. Infantis*, *S. Newport* or *S. Enteritidis* infections

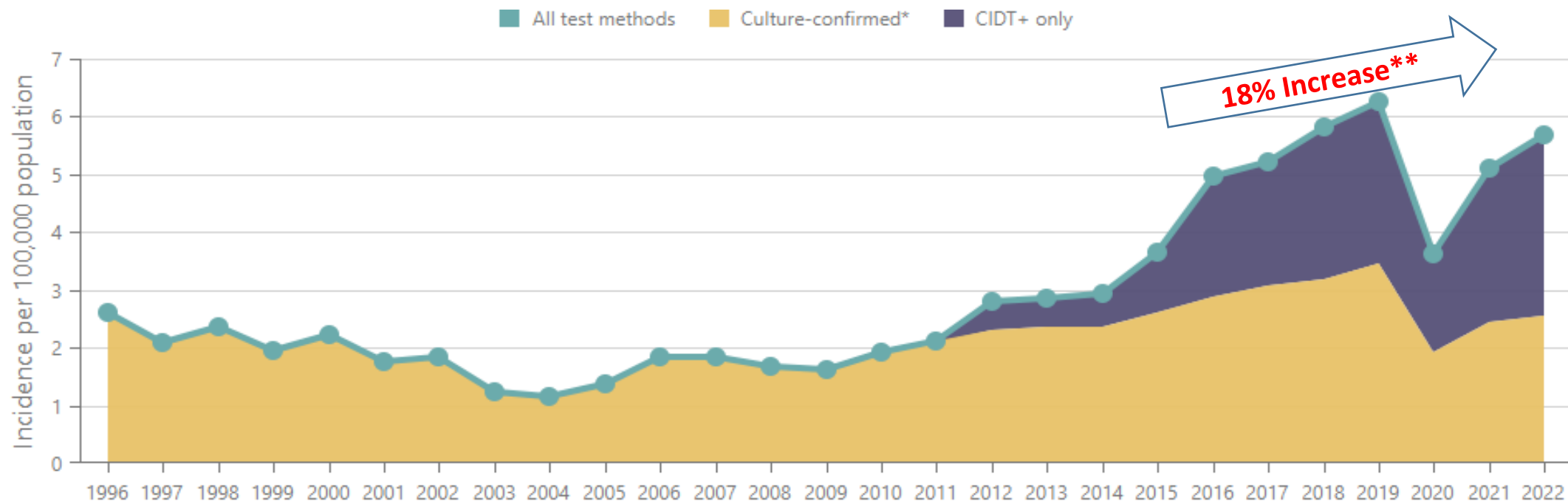


BEAM Dashboard: *Salmonella* 2023



Shiga-toxin Producing *E.coli* Infections

- HP 2030 target of 3.7 infections per 100,000
- Relative to the 2016-2018 baseline used for measuring progress toward HP 2030, in 2022 there was:
 - 18% increase in the total number of infections (IR=5.7)
 - No change in the number of domestically acquired infections (IR=4.6)

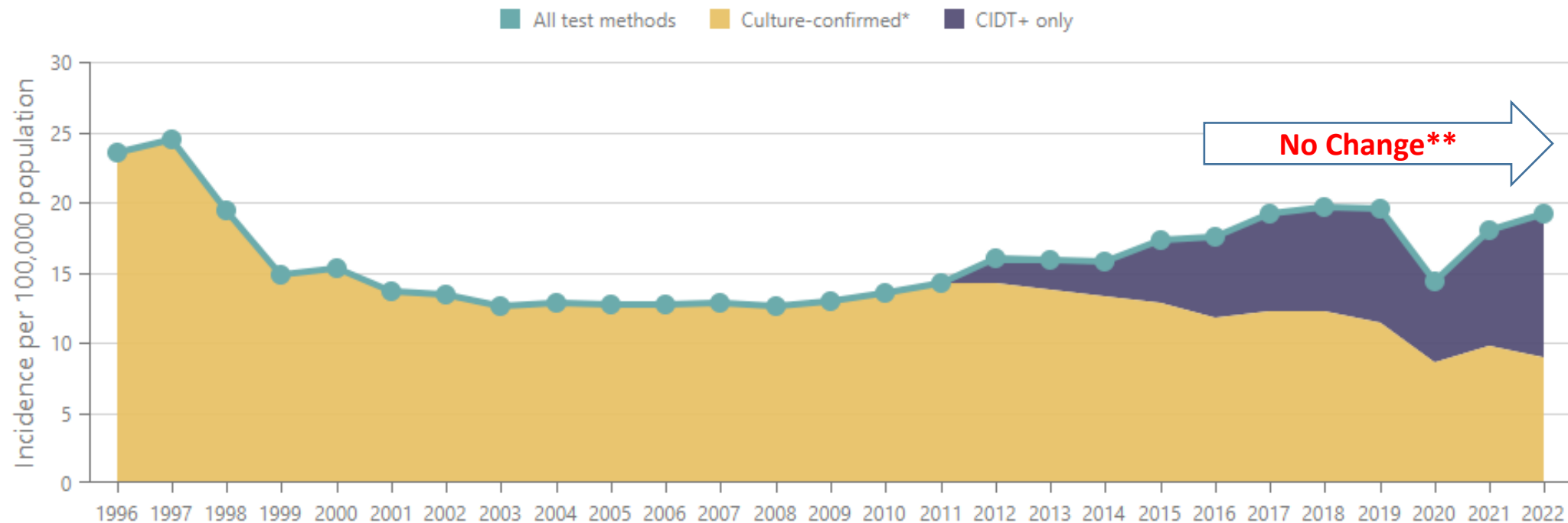


* Culture-confirmed includes those infections confirmed by culture only or by culture following a positive CIDT.

** This graph shows data for domestically-acquired and international-associated infections. When subset to only domestically-acquired infections we see no change in incidence in 2022 relative to the 2016-2018 baseline as opposed to an increase

Campylobacter Infections

- HP 2030 target of 10.9 infections per 100,000
- Relative to the 2016-2018 baseline used for measuring progress toward HP 2030, in 2022 there was:
 - No change in the total number of infections (IR=19.2)
 - 7% increase in the number of domestically acquired infections (IR=17.4)

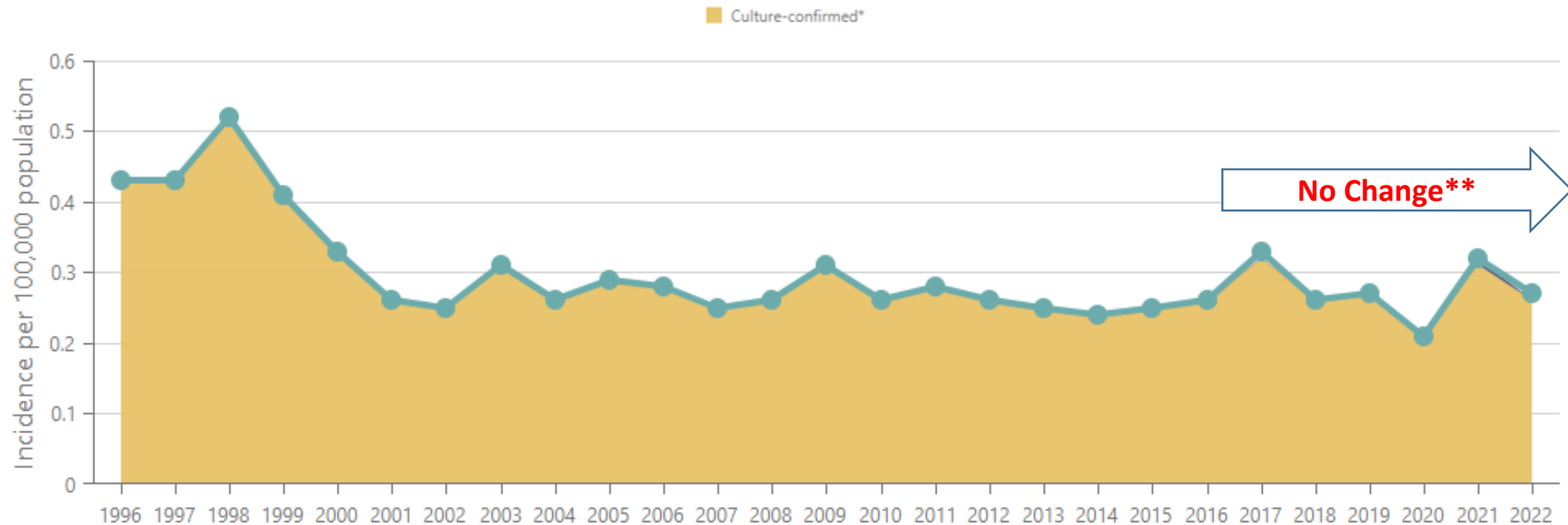


* Culture-confirmed includes those infections confirmed by culture only or by culture following a positive CIDT.

** This graph shows data for domestically-acquired and international-associated infections. When subset to only domestically-acquired infections we see a 7% change in incidence in 2022 relative to the 2016-2018 baseline

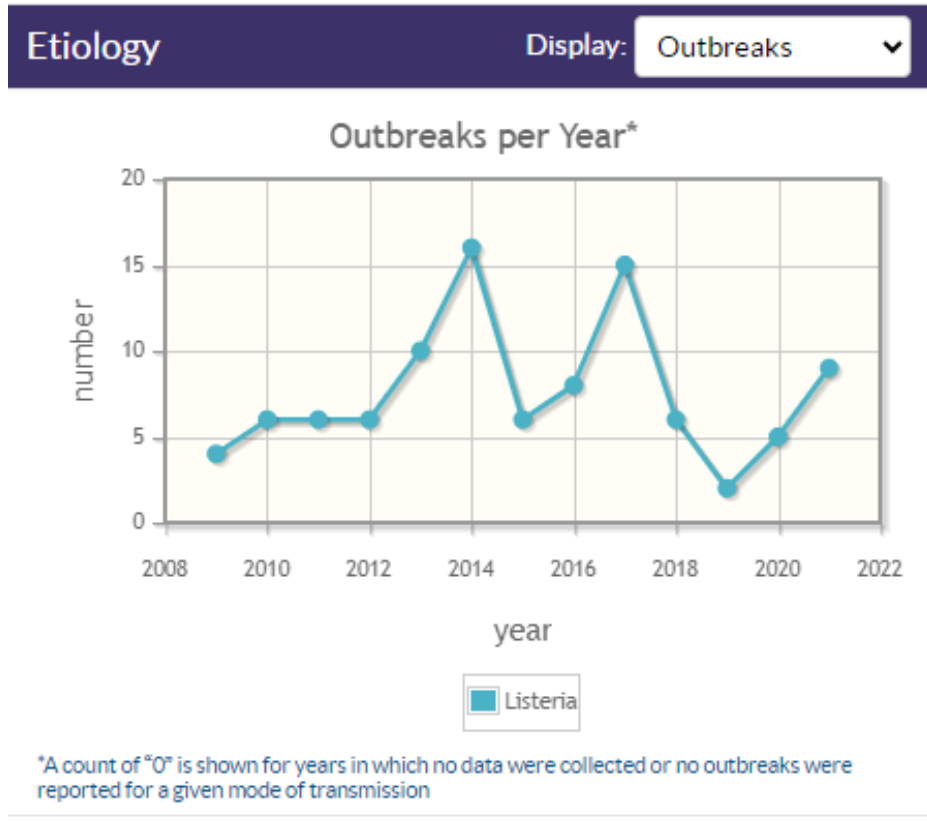
Listeria Infections

- HP 2030 target of 0.22 infections per 100,000
- Relative to the 2016-2018 baseline used for measuring progress toward HP 2030, in 2022 there was:
 - No change in the total number of infections (IR=0.3)
 - No change in the number of domestically acquired infections (IR=0.3)



** This graph shows data for domestically-acquired and international-associated infections. When subset to only domestically-acquired infections, we still see no change in incidence in 2022 relative to the 2016-2018 baseline

National Outbreak Reporting System (NORS) Dashboard: *Listeria monocytogenes*



View: Dashboard [Tabular](#) [Clear All](#)

What types of outbreaks would you like to include?

Foodborne Waterborne Animal Contact Environmental Person to Person Indeterminate/Unknown

Filter By: [Clear All](#) Current Filters: 2009 to 2021 × Listeria ×

- > Year [Clear](#)
- > State
- > Etiology [Clear](#)
 - Select to Add
 - Listeria
- > Setting
- > Food/Ingredient
- > Water Exposure
- > Water Type

Outbreaks per State

Display: **U.S. Map**

Quick Stats - Current Filters

99	Outbreaks
1,042	Illnesses
907	Hospitalizations
165	Deaths

Quick Stats - Overall

59,736	Outbreaks
2,068,586	Illnesses
43,023	Hospitalizations
2,300	Deaths

Year Display: **Outbreaks** Month Display: **Outbreaks**

Outbreaks per Year*

number

year

Outbreaks per Month

number

month

*A count of "0" is shown for years in which no data were collected or no outbreaks were reported for a given mode of transmission

[Available data >](#)

NORS Dashboard does not contain all data fields reported through NORS. If you require additional data - or have questions about how to use or interpret these data - contact NORSDashboard@cdc.gov. These data were last updated 4/17/2023.



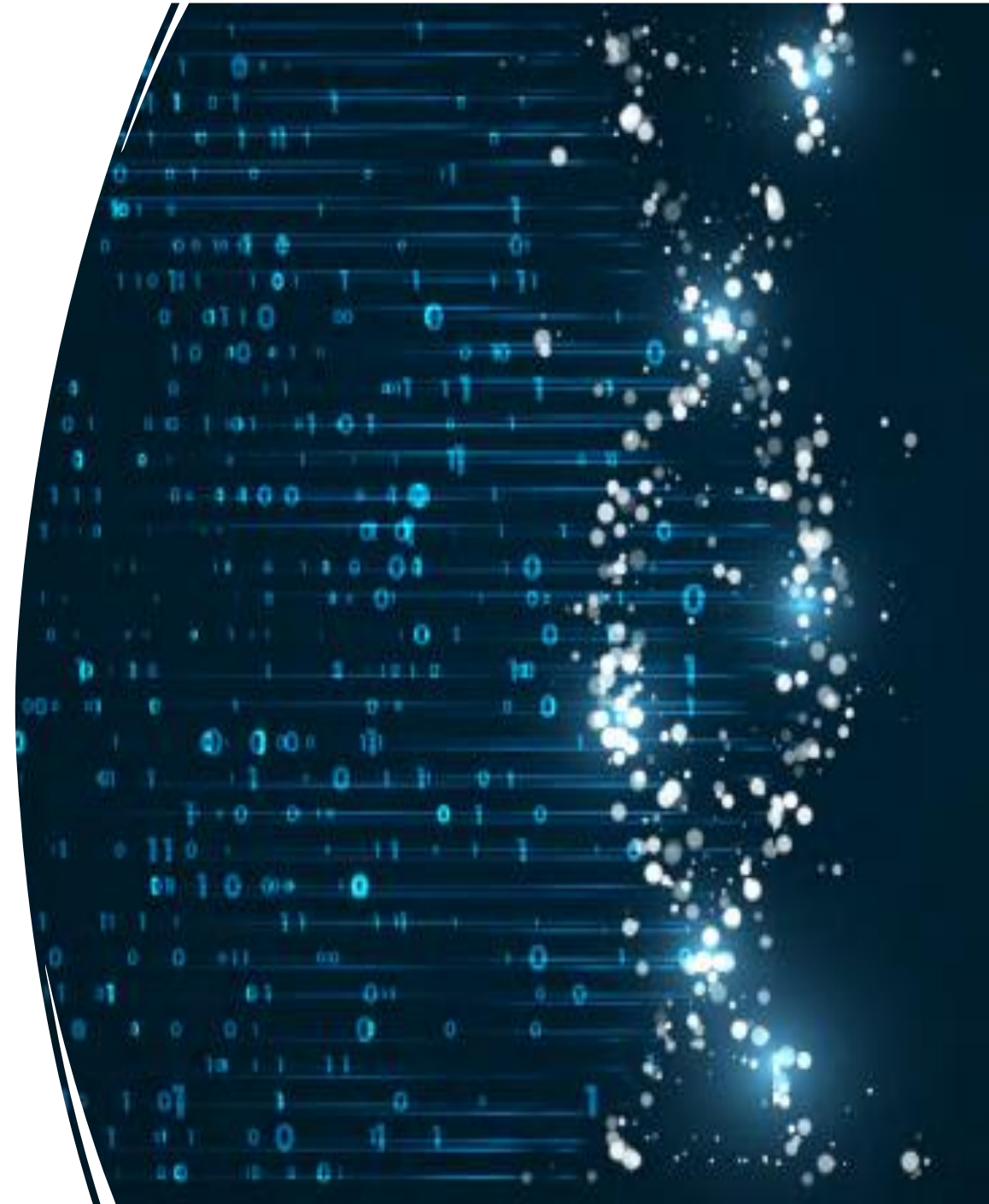
PulseNet 2.0

Modernization of PulseNet's analytical platform:

- PulseNet relies on, BioNumerics, which reaches End of Life December 2024 and needs to be replaced
- A new platform is being developed; no existing system meets all PulseNet needs

PulseNet 2.0 – A Path Forward for Modernization

- New system addresses pain points with previous software
- Takes advantage of Enterprise cloud services at CDC for data storage and data visualization
- Technical solution will take advantage of open-source containerization and workflow management tools
- Highly scalable and adaptable as technology and requirements change



Whole Genome Sequencing in PulseNet Reveals New Patterns

- Better cluster detection in PulseNet than before
- Better observation of patterns in the epidemiological landscape including REP strains
- Focused investigation may identify points of prevention.



Expanding Use of WGS to More Pathogens

- Began with *Listeria monocytogenes*, STEC, and *Salmonella*
- Now expanding to
 - More bacterial pathogens – *Shigella*, *Campylobacter*, *Vibrio*, *Yersinia enterocolitica*, and *Cronobacter*
 - Beyond bacteria
 - Parasitic agents: *Cryptosporidium*, *Cyclospora*, *Giardia*, *Naegleria*
 - Fungal agents: *Candida auris*
- PulseNet International is also moving to WGS

Culture-Independent Diagnostic Tests (CIDTs)

- Drastic increase in use of CIDTs in clinical labs to identify enteric pathogens
- Burden of bacterial culture shifted to public health laboratories
 - Isolates needed for WGS and AR determination methods
- CDC responses
 - Preserve access to isolates by identifying efficient workflows
 - Develop culture independent subtyping methods
 - Monitor and describe CIDT usage trends (FoodNet)
 - Investigate impact of CIDT usage on our understanding of illness epidemiology

Highly Multiplexed Amplicon Sequencing (HMAS)

HMAS allows us to:

- Skip the isolation step
- Sequence only what you need
- Process more samples together

Benefits:

- Applicable to any pathogen if:
 - It can be amplified
 - Subtyping targets identified
 - Specific primers designed
- Backwards compatibility with WGS
- Assay design can support disambiguation of pathogens from gut commensals
- Consumable \$/sample ~\$65 from lib prep-sequencing
- Requires only 1 major new instrument with multiple public health implications



Foodborne Disease Prevention: Evolving Public Health Tools

- We have more work to do in reaching HP 2030 targets
- Whole genome sequence-based surveillance is now improving outbreak detection, investigation, and prevention
- Outbreak investigations point to continuing and novel risks
- Attention on strains that re-occur, emerge or persist may focus prevention
- **Empower public health, regulators, industry, academia, and consumers to drive down incidence of foodborne infections**

Thank you!

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

