sedric

System for Enteric Disease, Response, Investigation, and Coordination

What is SEDRIC?

- The System for Enteric Disease Response, Investigation, and Coordination
  - Web-based platform (in the cloud) developed by CDC and Palantir Technologies
  - Facilitates collaborative multistate outbreak investigations of enteric disease
- SEDRIC is a customized, off-the-shelf web-based software system with four major capabilities
  - Integrate multiple surveillance data sources in real time

Who uses SEDRIC?

- SEDRIC facilitates secure electronic data-sharing among partners during outbreak investigations
- Partners currently using SEDRIC are epidemiologists, laboratorians, and regulators from
  - State and local health departments
  - CDC

How does SEDRIC work?

- CDC partners have access to SEDRIC for free

- Data Visualizations
  - Manage and visualize clusters under investigation
  - Visualize trends in time and space
  - Visualize relationships
- Data Management

How does this happ

National surveillance data

PulseNet USA
The National Molecular Subtyping Network for Foodborne Disease Surveillance
CDC

NARMS
National Antimicrobial Resistance Monitoring System
FDA CDC USDA

NORS
National Outbreak Reporting System

OMS

EDMI

epiinfo™

Investigation data from labs, epidemiologists, environmental health, regulatory agencies from state, federal partners

Ingests surveillance and investigation data

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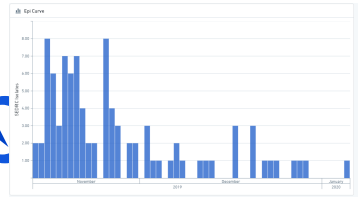
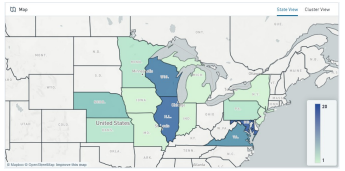
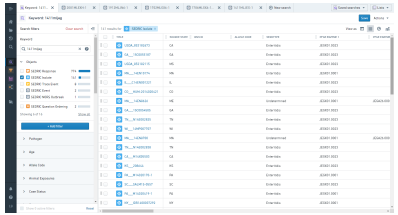




Data exploration, secure sharing, and visualization



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How does this happen?

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Highlights and Limitations

- Highlights
  - Intuitive GUI design, easy to learn
  - No software to download, entirely web-based
  - Surveillance data available in almost real-time
  - Multiple surveillance sources available under a single platform (and more being added!)
  - Fast (and pretty!) graphics
  - Secure, real-time data sharing
- Limitations
  - Not an analytical platform
  - Uni-directional data flow

Tool Comparison

	Web Portal	CIFOR Epi-Lab Software	SEDRIC
Cluster detection	Y (sophisticated)	Y (basic)	Y (basic)
Cluster detection speed	Slower	Faster	Manual
Exposure information	N	Y	Y
Mapping	Y	Y	Y
Ad hoc queries	Y	N	Y
Joining lab and epi data	N	Y (single state data only)	Y (share multistate data)
Automated	Y (once/day)	Y (low, but improving?)	Y (every hour)
Range of	PulseNet only	PulseNet only	PulseNet *and* other

Important Web Links

- **https://sedric.cdc.gov**
- **https://www.cdc.gov/foodsafety/outbreaks/inve**
  - Information about SEDRIC
  - Library of Training Documents
  - Link to login

NEW UPGRADE, FEATURES, AND DATA!

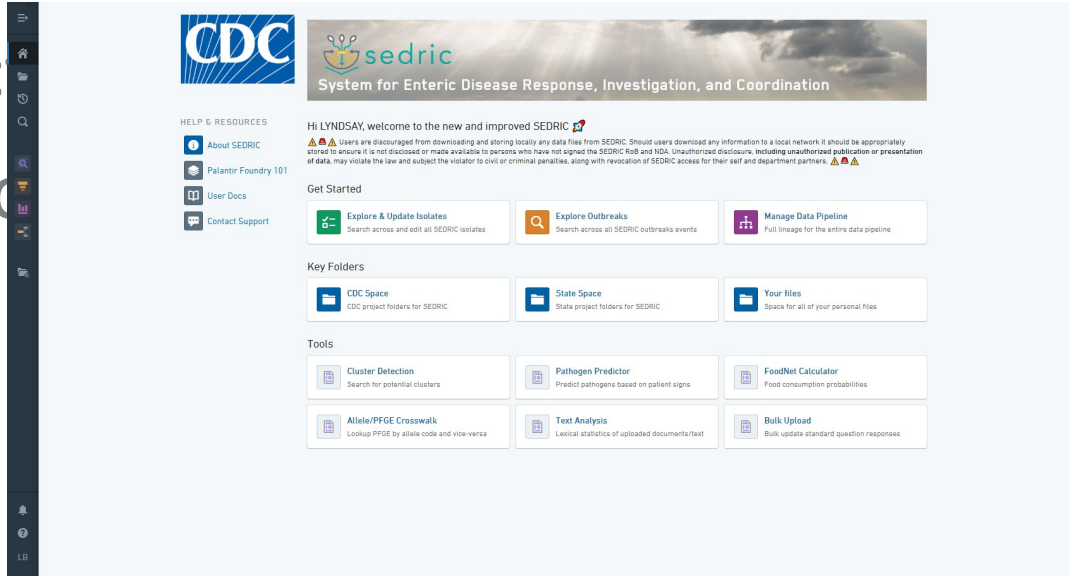
- As of March 12, 2020:
  - SEDRIC upgraded platforms, no longer needing access to Java
  - Added integrations from Epi Info for our National Hypothesis Generating Questionnaire
  - Bulk uploading epidemiological updates has returned
  - Cluster detection
  - Allele Code/PFGE Pattern Crosswalk
  - … and much, much more!

Data Views and Tools

- **Home Screen**
  - Navigate to multiple search features or select a tool to use
- **Explore Outbreaks**
  - Searchable information for events, from outbreak codes to NORS outbreaks to Outbreak Management System entries
- **Explore and Update Isolates**
  - Line list views, searchable isolate information, dashboards, and mapping
- **Object Explorer**
  - All searchable data for filtering, viewing, sorting, and summary statistics
- **NHGQ**
  - Overall views of NHGQ data, along with analyzable charts for each outbreak
- **Test Results (NARMS)**
  - Provides antimicrobial susceptibility results for both phenotypic and genotypic testing
- **NORS Outbreak**
  - Provides read-only information on NORS reports and allows searching across the NORS dataset
- **Tools**
  - Cluster detection
  - Allele code/PFGE pattern crosswalk
  - Pathogen predictor

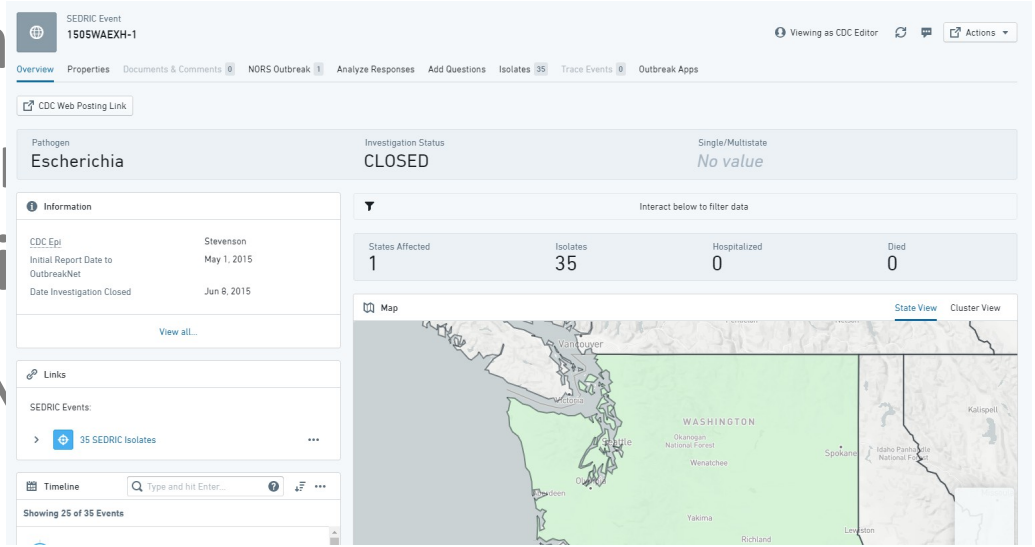
Home Screen

- Welcome screen where buttons for views and tools can be found
- Contac
- User do



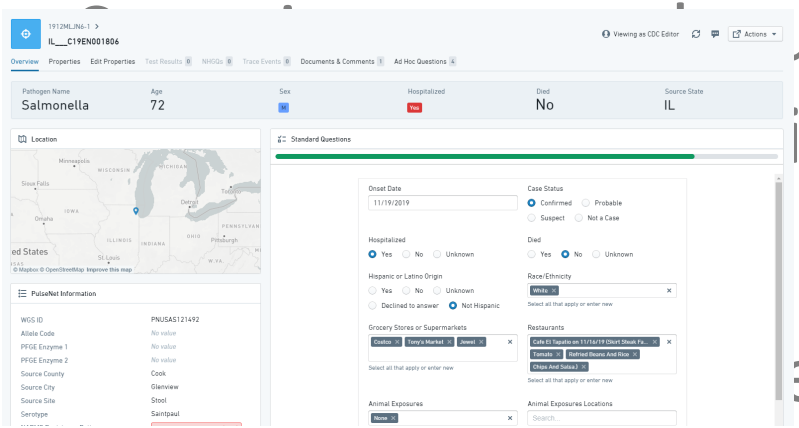
Explore and Update Outbreaks

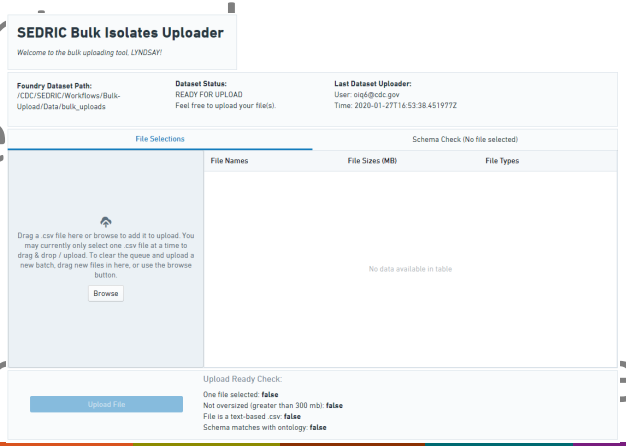
- Look at lists and dashboards of information on events
- Search a
- Importa ires housed i
- Link to N



Explore and Update Isolates

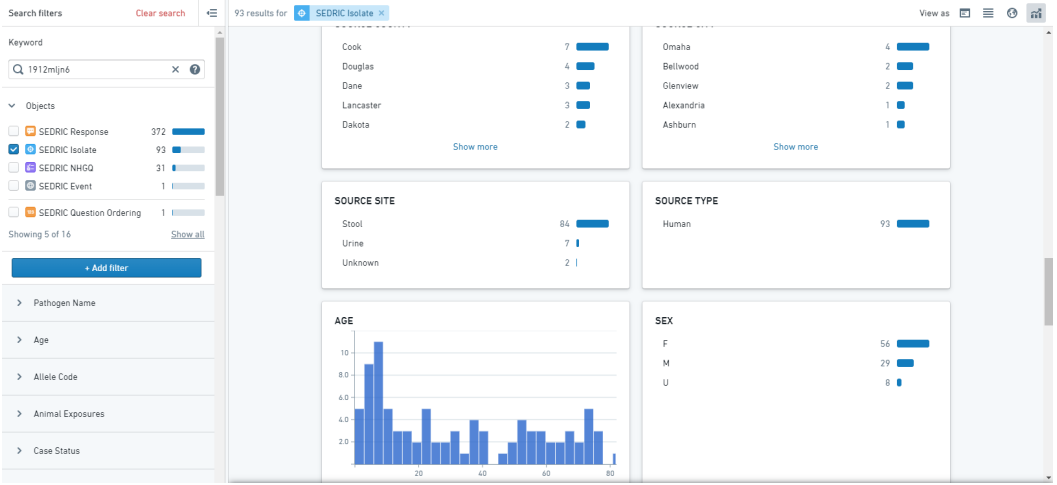
- Look at line list views and dashboards of isolate information
- Answer standard and ad hoc questions

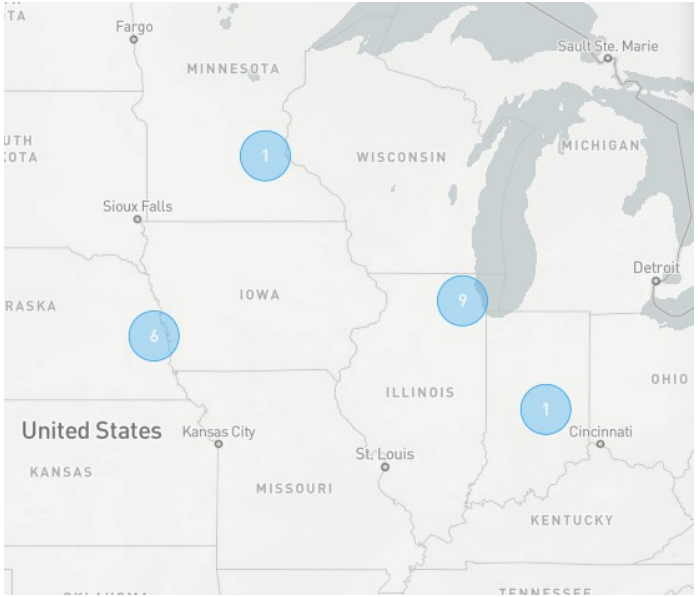




Object Explorer

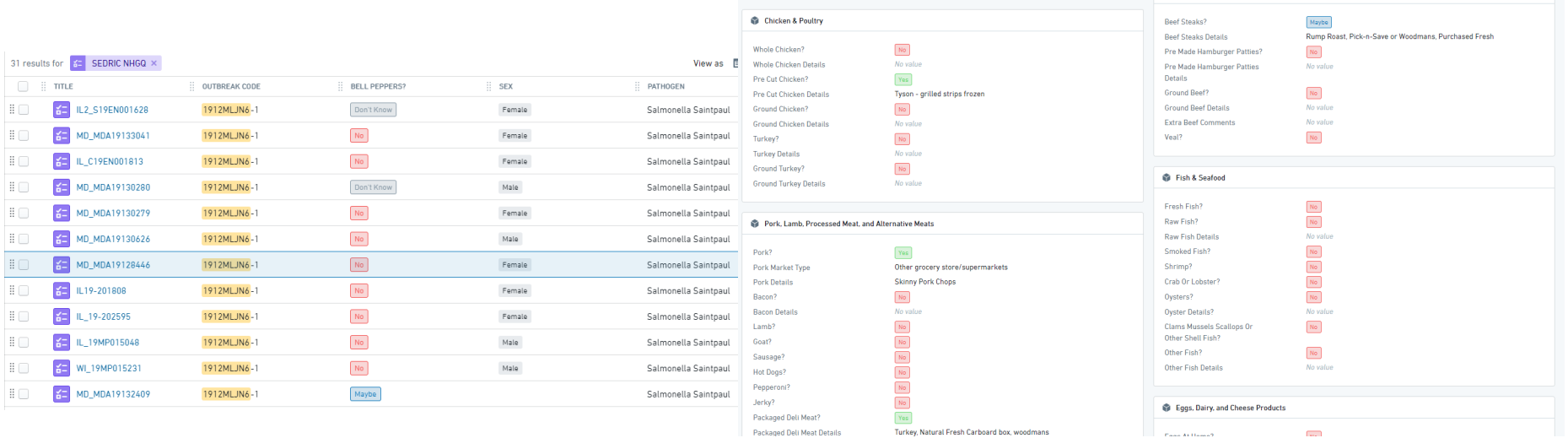
- Search for anything available in the system
- Filter, map, sort, dashboards





NHGQ

- Direct linkage to Epi Info Web Surveys, syncs every 2 hours
- Searchable forms, vehicles, grocery stores
- Easy view form attached to isolates



31 results for SEDRIC NHGQ ×

View as

TITLE	OUTBREAK CODE	BELL PEPPERS?	SEX	PATHOGEN
IL2_S19EN001628	1912MLJN6-1	Don't Know	Female	Salmonella Saintpaul
MD_MDA19133041	1912MLJN6-1	No	Female	Salmonella Saintpaul
IL_C19EN001813	1912MLJN6-1	No	Female	Salmonella Saintpaul
MD_MDA19130280	1912MLJN6-1	Don't Know	Male	Salmonella Saintpaul
MD_MDA19130279	1912MLJN6-1	No	Female	Salmonella Saintpaul
MD_MDA19130626	1912MLJN6-1	No	Male	Salmonella Saintpaul
MD_MDA19128446	1912MLJN6-1	No	Female	Salmonella Saintpaul
IL19-201808	1912MLJN6-1	No	Female	Salmonella Saintpaul
IL_19-202595	1912MLJN6-1	No	Female	Salmonella Saintpaul
IL_19MP015048	1912MLJN6-1	No	Male	Salmonella Saintpaul
WI_19MP015231	1912MLJN6-1	No	Male	Salmonella Saintpaul
MD_MDA19132409	1912MLJN6-1	Maybe		Salmonella Saintpaul

Chicken & Poultry

Whole Chicken?	No
Whole Chicken Details	No value
Pre Cut Chicken?	Yes
Pre Cut Chicken Details	Tyson - grilled strips frozen
Ground Chicken?	No
Ground Chicken Details	No value
Turkey?	No
Turkey Details	No value
Ground Turkey?	No
Ground Turkey Details	No value

Pork, Lamb, Processed Meat, and Alternative Meats

Pork?	Yes
Pork Market Type	Other grocery store/supermarkets
Pork Details	Skinny Pork Chops
Bacon?	No
Bacon Details	No value
Lamb?	No
Goat?	No
Sausage?	No
Hot Dogs?	No
Pepperoni?	No
Jerky?	No
Packaged Deli Meat?	Yes
Packaged Deli Meat Details	Turkey, Natural Fresh Carboard box, woodmans

Beef Steaks?	Maybe
Beef Steaks Details	Rump Roast, Pick-n-Save or Woodmans, Purchased Fresh
Pre Made Hamburger Patties?	No
Pre Made Hamburger Patties Details	No value
Ground Beef?	No
Ground Beef Details	No value
Extra Beef Comments	No value
Veal?	No

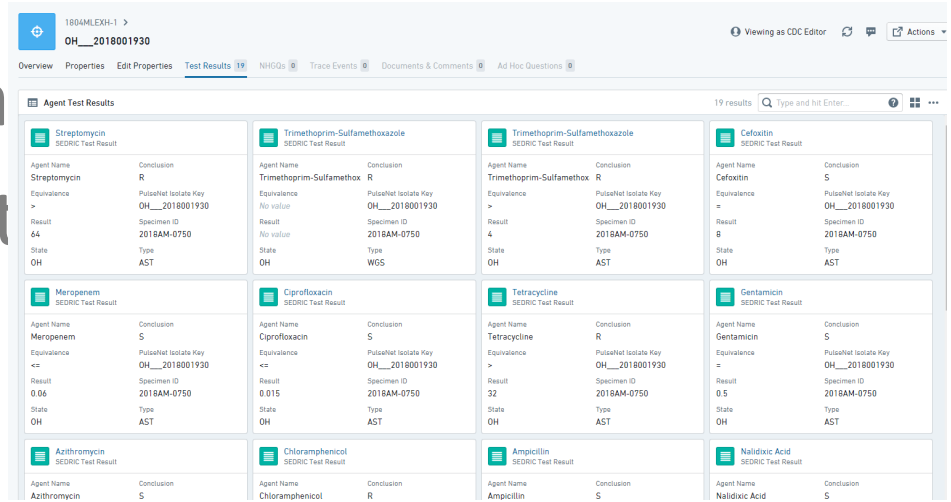
Fish & Seafood

Fresh Fish?	No
Raw Fish?	No
Raw Fish Details	No value
Smoked Fish?	No
Shrimp?	No
Crab Or Lobster?	No
Oysters?	No
Oyster Details?	No value
Clams Mussels Scallops Or Other Shell Fish?	No
Other Fish?	No
Other Fish Details	No value

Eggs, Dairy, and Cheese Products

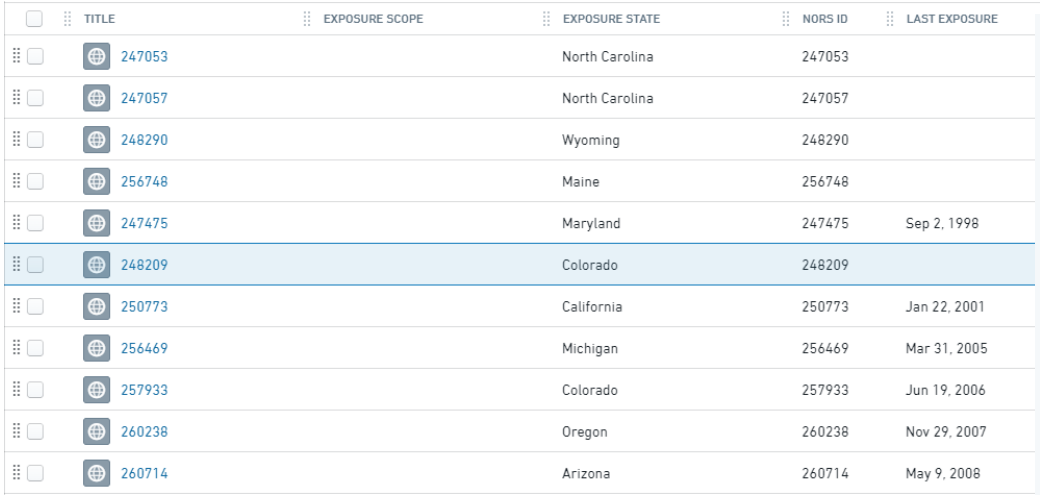
Test Results (NARMS)

- Direct linkage to NARMS, syncs every 2 hours from both phenotypic and predicted genotypic testing
- Se le resista
- Ea form att

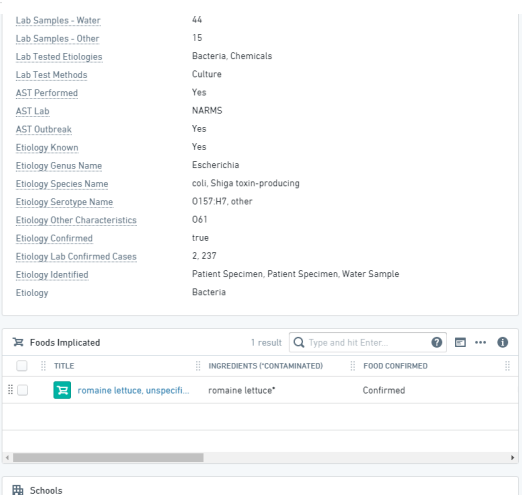


NORS Outbreak

- All finalized reports now available
- Searchable from object explorer



TITLE	EXPOSURE SCOPE	EXPOSURE STATE	NORS ID	LAST EXPOSURE
247053		North Carolina	247053	
247057		North Carolina	247057	
248290		Wyoming	248290	
256748		Maine	256748	
247475		Maryland	247475	Sep 2, 1998
248209		Colorado	248209	
250773		California	250773	Jan 22, 2001
256469		Michigan	256469	Mar 31, 2005
257933		Colorado	257933	Jun 19, 2006
260238		Oregon	260238	Nov 29, 2007
260714		Arizona	260714	May 9, 2008

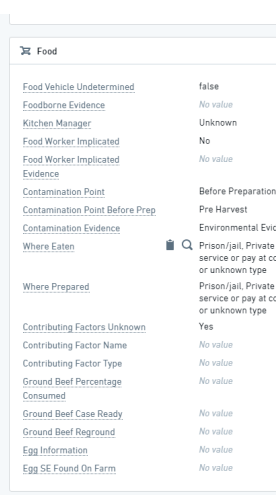


Lab Samples - Water	44
Lab Samples - Other	15
Lab Tested Etiologies	Bacteria, Chemicals
Lab Test Methods	Culture
AST Performed	Yes
AST Lab	NARMS
AST Outbreak	Yes
Etiology Known	Yes
Etiology Genus Name	Escherichia
Etiology Species Name	coli, Shiga toxin-producing
Etiology Serotype Name	0157:H7, other
Etiology Other Characteristics	061
Etiology Confirmed	true
Etiology Lab Confirmed Cases	2, 237
Etiology Identified	Patient Specimen, Patient Specimen, Water Sample
Etiology	Bacteria

Foods Implicated — 1 result — Type and hit Enter...

TITLE	INGREDIENTS ("CONTAMINATED)	FOOD CONFIRMED
romaine lettuce, unspecifi...	romaine lettuce*	Confirmed

Schools

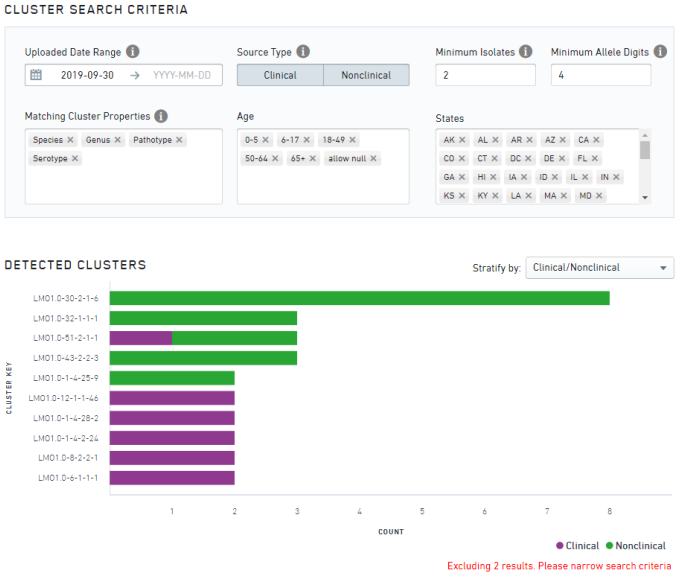


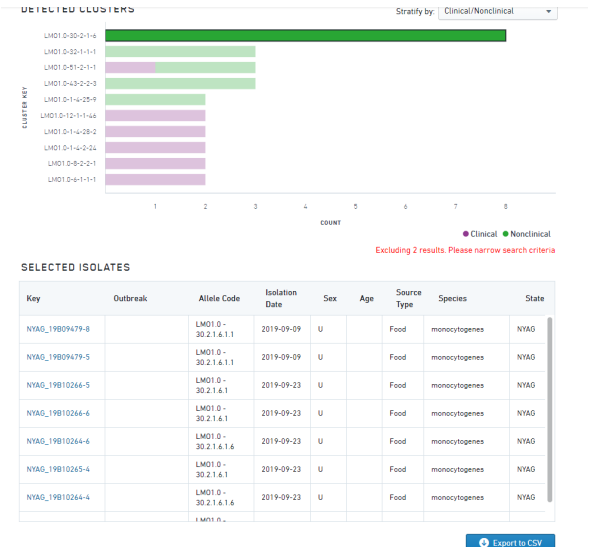
Food

Food Vehicle Undetermined	false
Foodborne Evidence	No value
Kitchen Manager	Unknown
Food Worker Implicated	No
Food Worker Implicated Evidence	No value
Contamination Point	Before Preparation
Contamination Point Before Prep	Pre Harvest
Contamination Evidence	Environmental Evic
Where Eaten	Prison/jail, Private service or pay at cc or unknown type
Where Prepared	Prison/jail, Private service or pay at cc or unknown type
Contributing Factors Unknown	Yes
Contributing Factor Name	No value
Contributing Factor Type	No value
Ground Beef Percentage Consumed	No value
Ground Beef Case Ready	No value
Ground Beef Reground	No value
Egg Information	No value
Egg SE Found On Farm	No value

Tools – Cluster Detection

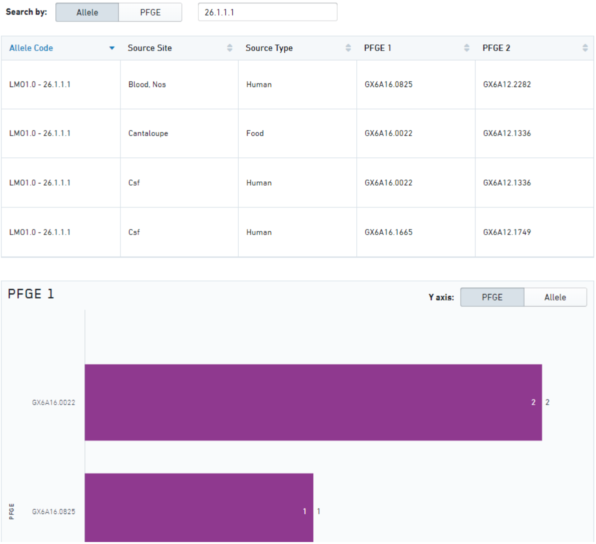
- Enables users to set easy parameters to find clusters of isolates based on allele codes
- Provides exportable listing of isolates for line list generation



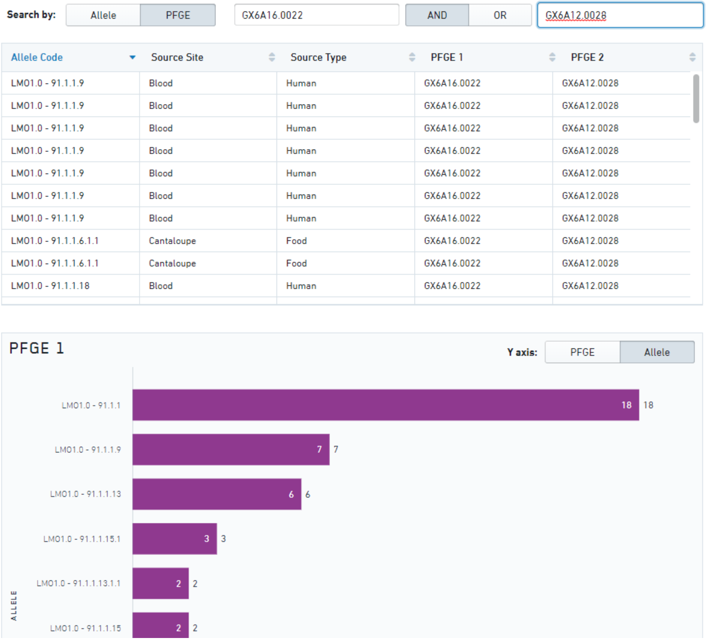


Tools – Allele Code/PFGE Pattern Crosswalk

- Provides a quick comparison of PFGE patterns under an allele code
- Provides a quick comparison of allele codes under a PFGE pattern (or pattern combination)



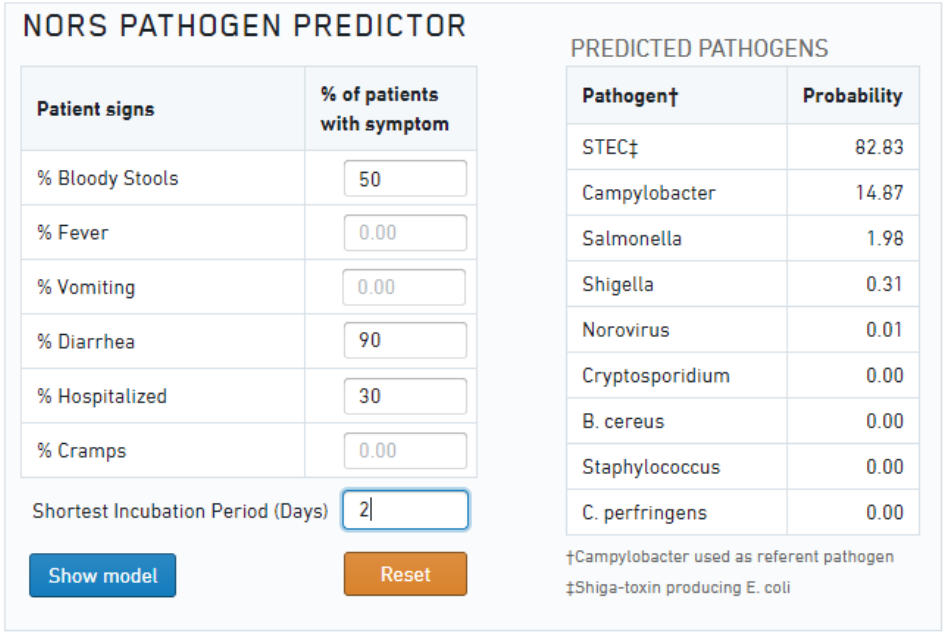
Allele Code	Source Site	Source Type	PFGE 1	PFGE 2
LMO1.0 - 26.1.1.1	Blood, Nos	Human	GX6A16.0825	GX6A12.2282
LMO1.0 - 26.1.1.1	Cantaloupe	Food	GX6A16.0022	GX6A12.1336
LMO1.0 - 26.1.1.1	Csf	Human	GX6A16.0022	GX6A12.1336
LMO1.0 - 26.1.1.1	Csf	Human	GX6A16.1665	GX6A12.1749



Allele Code	Source Site	Source Type	PFGE 1	PFGE 2
LMO1.0 - 91.1.1.9	Blood	Human	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.9	Blood	Human	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.9	Blood	Human	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.9	Blood	Human	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.9	Blood	Human	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.9	Blood	Human	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.9	Blood	Human	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.6.1.1	Cantaloupe	Food	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.6.1.1	Cantaloupe	Food	GX6A16.0022	GX6A12.0028
LMO1.0 - 91.1.1.18	Blood	Human	GX6A16.0022	GX6A12.0028

Tools – Pathogen Predictor

- Enter percentage of patients with certain symptoms, get back predicted pathogens to help figure out what testing may need completed



NORS PATHOGEN PREDICTOR

Patient signs	% of patients with symptom
% Bloody Stools	50
% Fever	0.00
% Vomiting	0.00
% Diarrhea	90
% Hospitalized	30
% Cramps	0.00
Shortest Incubation Period (Days)	2

Show model | Reset

PREDICTED PATHOGENS

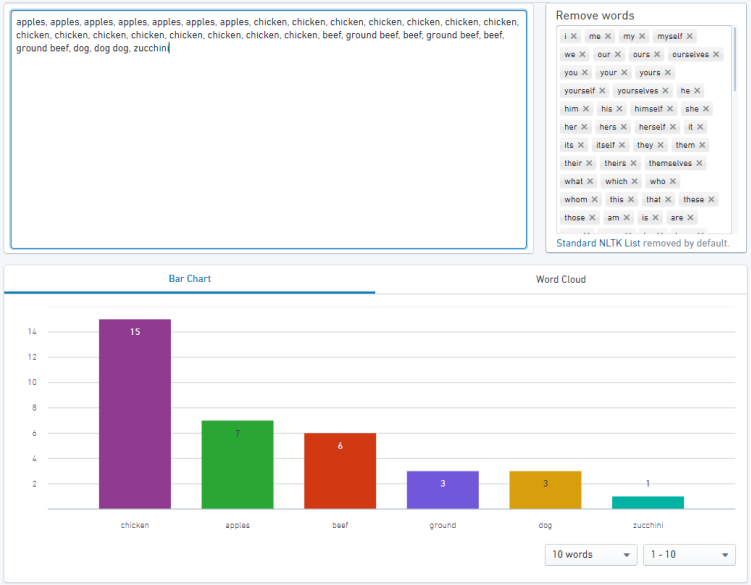
Pathogen†	Probability
STEC‡	82.83
Campylobacter	14.87
Salmonella	1.98
Shigella	0.31
Norovirus	0.01
Cryptosporidium	0.00
B. cereus	0.00
Staphylococcus	0.00
C. perfringens	0.00

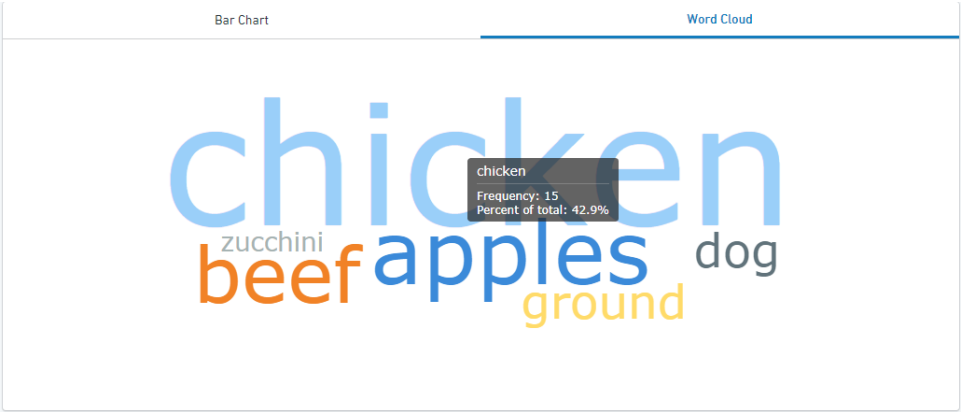
†Campylobacter used as referent pathogen

‡Shiga-toxin producing E. coli

Tools – Text Analysis

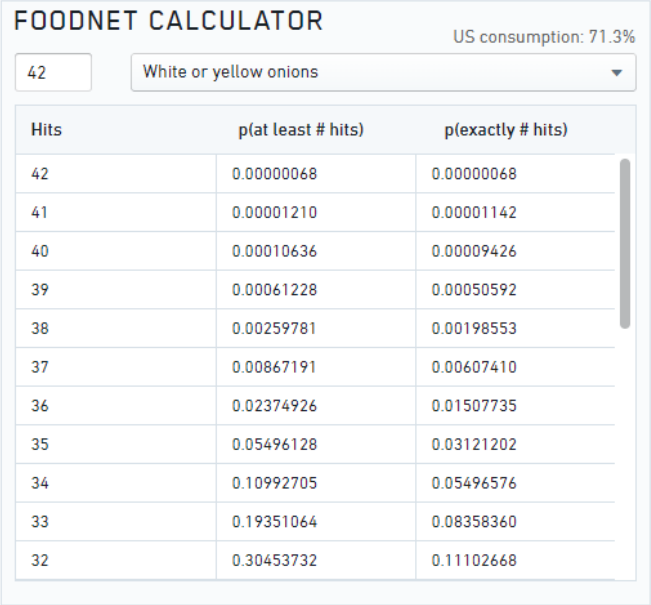
- Copy and paste, or type, text to get bar charts of word counts
- Word clouds also available
- Can remove common words from the analysis





Tools – FoodNet Calculator

- Use the binomial calculation against the static 2006-2007 FoodNet Population Survey dataset to determine statistical significance of a hypothesized vehicle



FOODNET CALCULATOR

US consumption: 71.3%

42

White or yellow onions

Hits	p(at least # hits)	p(exactly # hits)
42	0.00000068	0.00000068
41	0.00001210	0.00001142
40	0.00010636	0.00009426
39	0.00061228	0.00050592
38	0.00259781	0.00198553
37	0.00867191	0.00607410
36	0.02374926	0.01507735
35	0.05496128	0.03121202
34	0.10992705	0.05496576
33	0.19351064	0.08358360
32	0.30453732	0.11102668

Experience

- Increased speed and efficiency in cluster management and triage
  - Easy, ad-hoc queries at our fingertips
  - Search across surveillance sources
  - Meeting times more effectively utilized
  - Increased efficiency in creating summaries and visualizations for meetings, presentations, publications

Looking Ahead for 2020

- Incorporation of allele codes for all pathogens, new analysis widgets
- Integrating COVIS data
- Integrating Shigella NNDSS data for outbreak response
- Connection with NCBI Pathogen Detection Pipeline

For more information, contact:
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https://sedric.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.