

LOCAL CLUSTER DETECTION WORK GROUP UPDATE

Chairs:

Madhu Anand, New York State Department of Health

Lisha Constantine-Renna, Tennessee Department of Health

Slides:

June Bancroft, Oregon Department of Health

Presenters:

Laura Cronquist, North Dakota Department of Health

Carlota Medus, Minnesota Department of Health

LOCAL CLUSTER DETECTION WORK GROUP



Alaska



Hawaii

Chairs:
Madhu, NYS
Lisha, TN



- **Current WGS Capacity**
- **Current Cluster Detection Activities**
- **Roles of Laboratory and Epi staff**



STATE TOOLS & APPROACHES

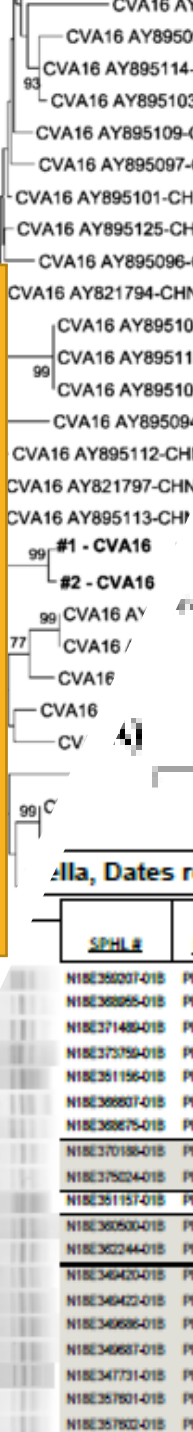
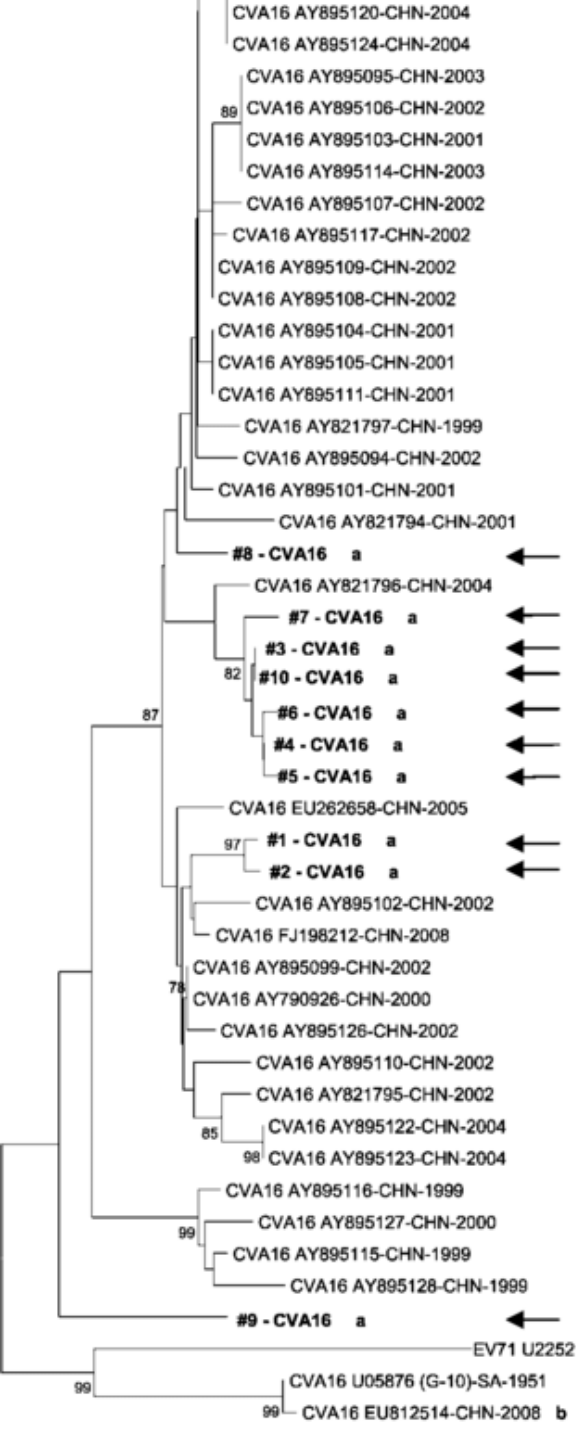
- **Software/automated applications**
 - SaTScan
 - BioNumerics
 - NCBI pipelines
 - Cloud computing
- **Practical Epi scenarios**
 - Rare *Salmonella* serotype alert
 - O157 over non-O157
 - **Building Identification Number (BIN) Analysis – identifying clusters of cases in the same building or single cases who resides in a high risk setting**



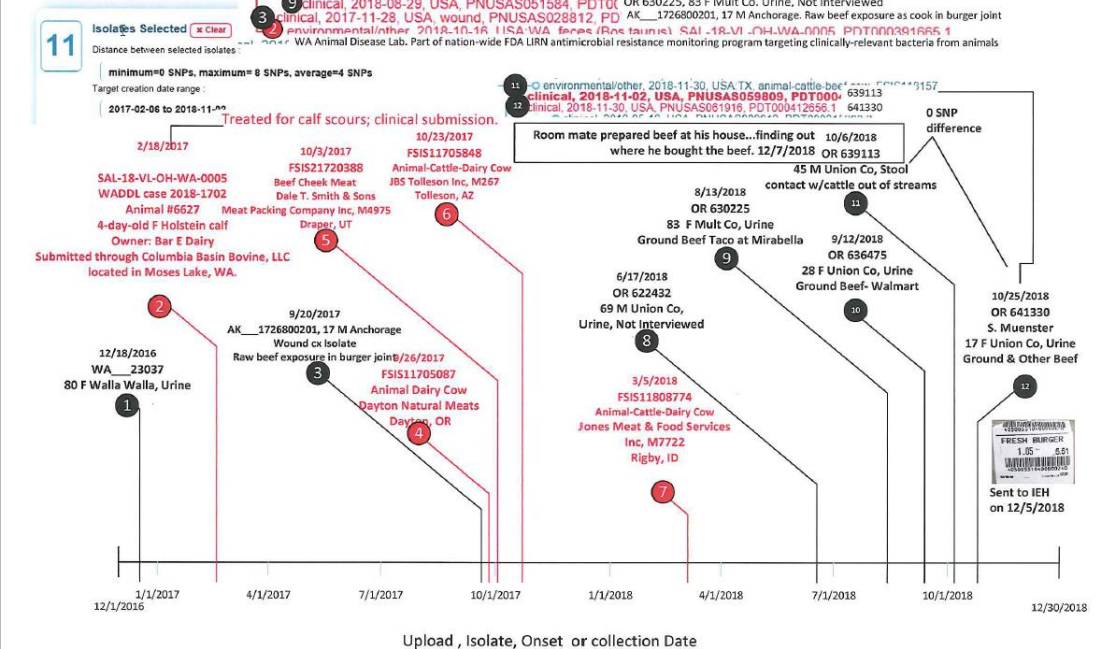
SaTScan: Free software that analyzes spatial, temporal and space-time data



PFGE patterns - Allele Codes - Cluster Names



PFGE-5040
 Salmonella Muenster
 12/18/16 – 10/25/
 2018
 n=12 w/in 8 SNPs



Updated on 12-11-2018 Stephen Ladd-Wilson

Isolate ID	Accession	Strain	Host	Date	Age	Sex	Specimen	Source
N18E36001-015	PNUSA5064034	JF001.1107	Typing	Gibson	2018-11-13	2018-11-30	2	MALE Stool Human
N18E36022-015	PNUSA5064036	JF001.1107	Typing	Gibson	2018-11-20	2018-12-04	3	FEMALE Stool Human
N18E34640-015	PNUSA5062959	JF001.0204	Typing	Carroll	2018-11-06	2018-11-20	62	FEMALE Stool Human
N18E34642-015	PNUSA5062959	JF001.0204	Typing	Carroll	2018-11-06	2018-11-20	12	MALE Stool Human
N18E34686-015	PNUSA5062952	JF001.0204	Typing	Medison	2018-11-03	2018-11-20	74	MALE Stool Human
N18E34687-015	PNUSA5062950	JF001.0204	Typing	Carroll	2018-11-02	2018-11-20	85	FEMALE Stool Human
N18E34771-015	PNUSA5062963	JF001.0204	Typing	Medison	2018-11-03	2018-11-21	74	MALE Stool Human
N18E35780-015	PNUSA5062959	JF001.0204	Typing	Carroll	2018-11-06	2018-11-28	68	MALE Stool Human
N18E35782-015	PNUSA5063510	JF001.0204	Typing	Carroll	2018-11-07	2018-11-28	73	FEMALE Stool Human

L.C.R. / WTR

K.I./S.C.



Sensitivity vs. Specificity



REMAINING QUESTIONS:



- **Ranges of SNP/alleles differences for solved outbreaks?**
 - **Gain understanding of ranges for different pathogens or serotypes.**
- **Genetic relatedness for clinical and environmental isolates.**
 - **Historical matches, retrospectively solved outbreaks.**
- **Epi and Lab Workflows.**
- **How will we identify local outbreaks and links to national ones when a significant proportion are not undergoing typing?**

GOALS = GUIDANCE & TOOLS

- **Cluster detection algorithms/methods in states that plan on sequencing all vs. a portion of *Salmonella***
- **Cluster investigation if isolates match out of state cases**
- **Cluster detection best practices when trying to decide timeframe for case inclusion**
- **Baselines for allele/SNP differences for different pathogens**
- **Using exposure data – requires interviews; time lags?**
- **Effects of rapid molecular testing – culture independent diagnostic tests**



THANK YOU!