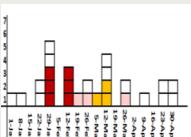




COEs CONDUCT ONLINE WGS TRAINING SERIES FOR EPIS.....1



ONLINE LEARNING COMMUNITIES FOR WGS APPLICATION1



PARTNER SPOTLIGHT: NACCHO FOOD SAFETY WORKGROUP2

WGS USE IN OUTBREAKS HIGHLIGHTED AT CSTE2

Centered on Food Safety

FALL | 2017



Integrated Food Safety
Centers of Excellence

HIGHLIGHTING PRODUCTS AND ACTIVITIES OF THE INTEGRATED FOOD SAFETY CENTERS OF EXCELLENCE

CDC has designated six Integrated Food Safety Centers of Excellence (CoEs) each comprising a state health department and affiliated university partners. The Centers are Colorado, Florida, Minnesota, New York, Oregon, and Tennessee.

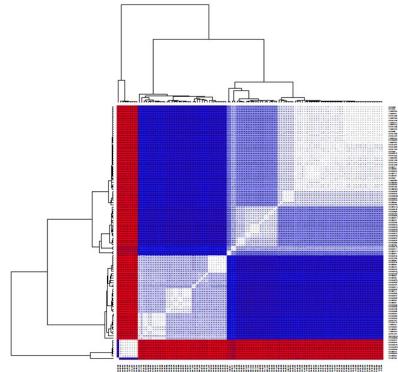
The Centers work together to identify model practices in foodborne disease surveillance and outbreak response and to serve as resources to assist other state and local public health professionals in implementing these practices.

CoE tools and resources can be accessed at <http://www.CoEFoodSafetyTools.org>.

Whole Genome Sequencing Training for Epidemiologists

CoE training in the application of WGS to foodborne disease outbreak investigation available online

Over the last year, the Integrated Food Safety Centers of Excellence, led by the New York CoE, have provided training on the application of whole genome sequencing (WGS) in foodborne disease outbreak investigation. A need for epidemiology-focused training in this area was identified in the regional needs assessment performed by the NY CoE in 2015 (see http://bit.ly/NYCoE_TrainingNeeds_JPHMP). To address this key training need, the CoEs collaborated with CDC to develop four short online modules on the basics of WGS, which are available at http://bit.ly/NYCoE_MolecEpi_Modules. These modules provide an overview of topics ranging from Genetics and Evolution to Introduction to Sequence Analyses. More in-depth training was subsequently provided by a series of four webinars which are available at http://bit.ly/NYCoE_MolecEpi_webinars. The webinar sessions attracted nearly 900 attendees from 49 U.S. states, in addition to Washington D.C. and every Canadian province. These resources provide a valuable training set that can be tailored to the needs of investigators seeking information on advanced molecular methods for outbreaks. Although primarily geared toward epidemiologists, the material will also be of interest to some laboratorians and environmental health specialists who work closely with their local epidemiology section. Additional modules are being developed to provide pathogen-specific training on the use of advanced molecular methods for outbreak investigation. The modules will be posted to the NY CoE website as they become available.



Live Learning Communities Offer Tailored WGS Training

Online communities hosted by CoEs help build learning networks around WGS application

The CoEs have hosted multiple interactive and targeted trainings using online learning communities to further understanding of WGS applications. The New York CoE's online learning community, Operation GNome, employs case studies to facilitate discussion on the use of WGS, both in combination with PFGE and as a stand-alone characterization tool. The Colorado CoE has also developed an Applied WGS for Epidemiologists live learning course, which launched in September 2017 and will be offered again in Spring 2018 (more on live learning opportunities at http://bit.ly/CO_CoE_LiveLearning).

The CoEs also provide individualized support to partner agencies on the implementation and use of WGS for foodborne disease surveillance. Centers will continue to offer both general and tailored learning opportunities as needs are identified. Individual states and public health partners are encouraged to contact their regional CoE with any training or support needs.

PARTNER SPOTLIGHT: NACCHO Food Safety Workgroup



The National Association of County and City Health Officials ([NACCHO](#)) Food Safety Workgroup provides leadership and guidance to NACCHO, local health departments and partner organizations regarding food safety efforts, health outcomes, and implications at the local level. Members include local health department officials, sanitarians, environmental health professionals, and environmental health directors.

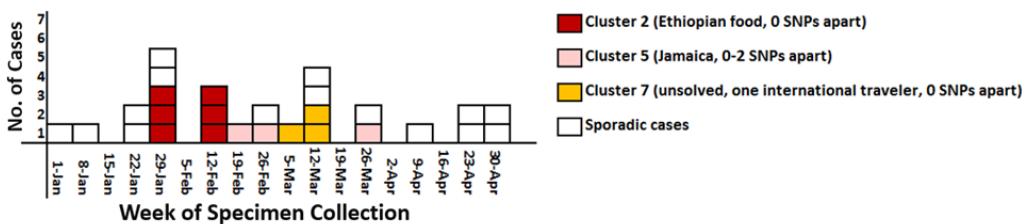
The Colorado CoE and NACCHO's Food Safety Workgroup recently partnered to develop and launch the Environmental Assessment for Foodborne Illness Outbreaks Just-in-Time Training (JITT). This JITT provides immediate access to environmental health strategies and tools for use during a foodborne illness investigation. Core activities were identified and described, including: environmental assessment preparation, interviewing (manager, food worker, case), sampling (clinical, food, environmental), making observations, identifying contributing factors, reviewing records, implementing control measures, excluding ill workers, and concluding the environmental assessment. Each core activity has an individual page within the site which features 3-4 key strategies, as well as downloadable tools (e.g., sample interview form, checklist, decision aids). Unlike traditional trainings, users are not required to take the JIT training sequentially or to completion. For more information, please visit [www.COFoodSafety.org](#).

Applied WGS Highlighted at CSTE

CoEs describe outbreaks in which WGS helped "crack" the case

WGS is being increasingly utilized in outbreak investigations to differentiate associated cases from non-associated cases. A series of case investigations were presented at CSTE this summer in which the application of WGS was decisive in resolving curious cases. The MN Center of Excellence summarized the value of WGS to their investigations, noting that the technology can significantly improve case definition specificity during cluster investigations.

This is clearly demonstrated by the epidemic curve of *Salmonella* Enteritidis PFGE pattern 4 (SE4) isolates from Minnesota below. Because SE4 clonality using PFGE methodology has limited ability to detect outbreaks, conducting WGS on selected isolates of SE can improve identification of truly related cases. In MN, the use of WGS broke the larger group of PFGE-matched isolates into 3 distinct clusters, and 15 unrelated/non-cluster isolates. The first ("Cluster 2") represented an outbreak among persons of Ethiopian origin who consumed a dish made with undercooked ground beef and spices; ground beef for 5 of the 6 cases was purchased at the same small local store. The cases in the second ("Cluster 5") all reported traveling to the same resort in Jamaica. The third cluster ("Cluster 7") was unsolved.



Although WGS will not allow every cluster to be solved, the increased specificity can lead to source identification for smaller clusters with more closely associated cases. Such was the case for a localized 2016 outbreak of SE4 in Tennessee in which eating steak with raw egg Béarnaise sauce was identified as an epidemiologically significant exposure. Environmental assessment of the implicated facility indicated that eggs were sourced from a local producer, so surveillance was enhanced for egg-associated cases using WGS. Two subsequent outbreaks were identified at distinct restaurants during the following months. Both restaurants received shell eggs from the previously implicated farm. Investigators identified SE on the farm (not the outbreak strain) and implemented public health actions to prevent additional illnesses. These outbreaks suggest that real-time sequencing of SE4 significantly increases capacity to identify outbreaks that previously were undetected using PFGE alone.

FIND US ONLINE

CDC	http://www.cdc.gov/foodsafety/centers/
Colorado	http://www.cofoodsafety.org/
Florida	http://foodsafetyflorida.org/
Minnesota	http://mnfoodsafetycoe.umn.edu/
New York	http://nyfoodsafety.cals.cornell.edu/
Oregon	http://www.healthoregon.org/fomes
Tennessee	http://foodsafety.utk.edu/
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