Centers for Disease Control and Prevention (CDC)
Office of Financial Resources

Instructions for Preparing Annual Performance Report (APR)/Continuation Application

Catalog of Federal Domestic Assistance (CFDA): 93.323, 93.521, 93.815
Funding Opportunity Announcement (FOA) Number: CK14-140104PPHF17

Epidemiology and Laboratory Capacity for Infectious Diseases (ELC)
National Center for Emerging & Zoonotic Infectious Diseases

Eligibility:
This award will be a continuation of funds intended only for grantees previously awarded under CK14-1401

This continuation guidance supports issuance of a Notice of Award (NOA) that acknowledges funding from multiple sources to each grantee. The revised NOA consolidates funding previously awarded through individual NOA’s that obligated funds from emergency appropriations and Prevention and Public Health Funds. Emergency appropriations are those that are awarded in response to a declared emergency or public health crisis. This new award document maintains the integrity of individual funding sources through the use of sub accounts, and document numbers.

Funding for this continuation may be provided from the following source:
- FY 2017 annual HHS annual appropriations (base year)
- Prevention and Public Health Fund

Your Notice of Award will show:
- the sum of the amounts for all of the funding sources
- the individual budgets and activities related to each source
- Restrictions and/or requirements that are imposed by the language of the legislation or appropriation.

Application Submission:
If you encounter any difficulties submitting your annual performance report/application through www.grantsolutions.gov, please contact the GrantSolutions helpdesk at 866-577-0771 or email help@grantsolutions.gov prior to the submission deadline. If you need further information regarding the annual performance report process, please contact Shirley Byrd, Grants Management Officer, at yuo6@cdc.gov. For programmatic information, please contact Alvin Shultz, ELC Program Coordinator, at AShultz@cdc.gov.

Applications must be submitted by 5/16/2017, 11:59pm Eastern Standard Time on www.grantsolutions.gov for the Budget Period 3. Late or incomplete reports could result in an enforcement action such as a delay in the award or a reduction in funds. CDC will accept requests for a deadline extension on rare occasions and after adequate justification has been provided.
Annual Federal Financial Report Submission
The Annual Federal Financial report (FFR) SF-425 is required and must be submitted to www.grantsolutions.gov no later than 90 days after the end of the budget period. The FFR for this Budget Period 8/1/2016 – 7/31/2017 is due by 10/31/2017. To submit your FFR, login to www.grantsolutions.gov, select “Reports” from the menu bar and then click on Federal Financial Reports.

General Application Packet Tips:
• Properly label each item of the application packet
  o suggested naming convention: <insert jurisdiction two-letter abbreviation>_<Project Template>
  o Example: XX_Overview or XX_K2
• Utilize the ELC Application and Budget Templates for your application submission

Checklist of required contents of application packet:
1. SF-424 Application for Federal Domestic Assistance Version 2 (online form)
2. SF-424A Budget Information-Non-Construction (online form)
3. Budget Justification (ELC Budget Template)
4. Indirect Cost Rate Agreement (miscellaneous attachment)
5. Project Application/APR for previously-funded activities (ELC Application Templates)
6. SF424B Assurances-Non-Construction (online form)
7. Certifications and Assurances (miscellaneous attachment)
8. SF-LLL Disclosure of Lobbying Activities (online form)
10. Governance Team Letter (miscellaneous attachment)

Instructions for accessing and completing required contents of the application package:
a) Go to: www.grantsolutions.gov
b) Access: My Grants List Screen
c) Select: Manage Amendments under the “Actions” column.
d) Click the “New” button to create a new amendment action.
e) Select the "Special Funding" radio button and click “Create Amendment”.
f) Under “Enclosure(s)”, click “Enter Online” for the SF-424 and SF-424A to enter the appropriate information on the standard forms.
g) Click on “Uploaded Files” under the “Attachment(s)” column and next to “Application Upload” to upload any miscellaneous attachments.
h) Click on “Verify Submission” and then “Final Submission”.

SF-424 Application for Federal Domestic Assistance-Short Organizational Form:
Complete all sections:
A. In addition to inserting the legal name of your organization in Block #5a, insert the CDC Award Number provided in the CDC Notice of Award. Failure to provide your award number could cause delay in processing your application.
B. Please insert your organization’s Financial Official information in Block #8.
**SF-424A Budget Information and Justification:**

A. Complete all applicable sections.

B. Analysis of Remaining Time and Funds

1. Based on the current rate of obligation, if it appears there will be un-obligated funds at the end of the current budget period, provide detailed actions that will be taken to obligate this amount or use the process below to get access to unused funds.

2. If it appears there will be insufficient funds
   - Provide detailed justification of the shortfall
   - List the actions taken to bring the obligations in line with the authorized funding level.

3. Awardees may request up to 75% of anticipated unobligated funds at the end of the current budget period. These funds are estimated because the budget year has not closed and a final FFR cannot be prepared. For budget years that have closed, grantees may request carry over based on the final FFR for that budget period.

   - The estimated un-obligated balance should be realistic in order to be consistent with the annual FFR to be submitted following the end of the budget period.
   - Prevention and Public Health funds and Emergency Ebola funds are tracked by subaccount and budget year and may not be comingled. To access funds from a prior year subaccount that have been authorized for use, grantees should request an extension of time for that budget period. This request should include a detailed line item budget justification.

**Required ELC Governance Team Letter of Commitment:**

Applicants must also submit a letter signed by all Governance Team members with descriptions of:

A. how often the Team meets and in what format (teleconference, in-person, etc.)

B. how strategic decisions impacting the ELC portfolio of activities are made and disagreements resolved

C. how information regarding the application and funding decisions are disseminated to program staff
Responding to this Continuation Guidance

Each project for which your jurisdiction was funded for in FY 2016 must include a progress report regardless of whether you are applying for FY 2017 funding. Applicants may apply for funding for projects for which they were not funded in FY 2016; in these cases their applications will not include a progress report but applicants should address any existing capacity. **Applicants must utilize the ELC application templates provided by the ELC program and sent directly to ELC Governance Team members.** In addition to progress reports and third budget period funding requests, all applications must include budgets and interim reporting on financial obligations as described in this Continuation Guidance. **Applications are due NLT 11:59PM EST, May 16, 2017 via Grant Solutions.**

**Budgets:**
In addition to the 424 and 424a, **applicants must utilize the ELC budget template provided by the ELC to detail the budget request and provide Budget Narrative details. These forms will be sent directly to ELC Governance Team members.** Budgets must be clearly broken out into the line-item categories specified in the ELC Budget Template; the level of detail in the Budget Narrative portion of the template should be adequate to satisfy OGS requirements. An example budget with the requisite detail may be found at CDC’s internet at: [http://www.cdc.gov/grants/applying/application-resources.html](http://www.cdc.gov/grants/applying/application-resources.html).

The budget must be consistent with stated program objectives and planned activities outlined in the associated work plans. Be sure to consider and include requests for travel that may be necessary for proposed activities, including traveling up to four persons to a possible CDC-sponsored ELC grantee meeting tentatively planned for Spring 2018. In addition, please include a travel request for 3 travelers to attend ICEID 2018 (details from ICEID coordinators will be forthcoming). Travel that is approved and funded by CDC will be considered a required activity.

Limited opportunities for Direct Assistance (DA) may be available through this award. A state, local or territorial government applicant may request that CDC provide Direct Assistance (DA) in the form of federal personnel as a part of the support provided under this cooperative agreement. If your request for DA is approved as a part of your award, CDC will reduce the funding amount provided directly to you as a part of your overall award. The amount by which your award is reduced will be used to provide DA; the funding shall be deemed part of the award and as having been paid to you, the awardee. The ELC-supplied budget templates will allow grantees to designate positions requested to be supported through DA.

Please note that the ELC does not have statute authority to support DA with Prevention and Public Health Funds which are the funding source ELC’s Cross-Cutting Epidemiology, Laboratory and Health Information Systems projects (Projects A-C).
Executive Summary

This Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) Continuation Guidance solicits applications for fiscal year 2017 funding for current ELC grantees under Funding Opportunity Number CK14-1401PPHF. Additionally, existing grantees will respond to this solicitation with progress reports based upon their FY 2016 activities, including progress on activities funded under the 2016 ELC-Ebola Associated Supplement (ELC-EAS) and Zika supplemental funds awarded in January 2017.

The 2017 ELC program continues to build upon the program initiated in 1995 as one of the first key activities under CDC’s plan to address emerging infectious disease threats. The ELC program started out as limited funding for a small number of states; the program has grown to become one of CDC’s key nationwide cooperative agreements for supporting state and local capacity for: 1) cross-cutting and flexible epidemiology, laboratory and health information systems capacity addressing infectious diseases, as well as 2) infectious disease-area specific activities (e.g., foodborne diseases, influenza, antimicrobial resistance, etc.).

The ELC program currently covers more than 20 specific categorical disease areas, approximately 40 discrete projects, and receives funding from a variety of programs at CDC. Beginning in FY 2010, in addition to regularly appropriated funds, the ELC began to award funding from the Affordable Care Act’s Prevention and Public Health Fund (PPHF). In spring of 2015, the ELC program also awarded one-time Ebola-Associated Supplemental funding through CK14-1401PPHF and in 2016 and 2017, emergency funding was provided for grantees to address the growing concern of Zika-virus.

ELC Grantees are required to collaborate with technical programs across CDC, including Division of Healthcare Quality Promotion, Division of State and Local Readiness, and EIP and LRN program offices to ensure that activities and funding are complementary and not duplicative. Applicants are encouraged to collaborate with their jurisdictional laboratory, surveillance, and epidemiology leads, maternal-child health programs, immunization programs, environmental health programs, legal counsel, health care providers, blood safety organizations, and emergency management partners.

For the FY 2017 project year, PPHF funds were awarded to jurisdictions in February 2017 with a start date of August 1, 2017. However, the PPHF funded-project details (i.e. progress reports and continuation plans for projects A, B, C, and R) should be included in this application, which will undergo technical reviews and potential budget additions on schedule with the remaining funds to be awarded for the August 1 start date. Any additional funding for FY 2017 will be from non-PPHF sources.

The following are some important items to note for FY 2017

- Cross-Cutting Outbreak Section
  - 2016’s Section H will be expanded in 2017 to include multiple outbreaks as separate projects. Grantees are encouraged to apply to these sections to allow for ELC funding to be awarded for multiple outbreak needs during the 2017 budget period.
• **Foodborne Diseases:** The foodborne disease activities have undergone a few changes since 2016:
  o 2017 applicants for any foodborne component (I1-I6) are requested to include an executive summary of your jurisdiction’s enteric disease detection, investigation, control, and reporting program to greatly reduce the need to repeat this background information in each subcomponent. Collaboration across enteric disease organizational units is strongly encouraged to prepare this summary. This overview should be submitted using the I0 – *Enteric Disease Detection, Investigation, Control, and Reporting Program Overview* application template.
  o 2017’s I1: *Enteric Disease Outbreak Surveillance, Response, and Reporting Capacity* has been broadened to include OutbreakNet, NORS, OutbreakNet Enhanced, and FoodCORE Programs. This project now includes the elements from 2016’s I1 and I2 projects.
  o 2017’s I2: *National Antimicrobial Resistance Monitoring System: Surveillance Activities - Submission of Enteric Bacterial Isolates to CDC* is the continuation of 2016’s I8 NARMS Surveillance Activities project
  o 2016’s I7 *NARMS: Retail Meat Surveillance* project was transitioned to grant managed by FDA as of 2016 and is no longer included in the ELC Guidance. This was previously included in 2016’s guidance as project I7.

• **Antimicrobial Resistance:**
  o The Healthcare-Associated Infection/Antimicrobial Resistance projects have been restructured in the 2017 Continuation Guidance. All projects will be continued, but the section in which Grantees will report 2016 progress and apply for new funding will be different from 2016. Please review table below for guidance on how the projects have been restructured for Grantee reports and applications:

<table>
<thead>
<tr>
<th>Last Year’s (ELC Year-3;FY 2016) Project Name</th>
<th>This Year’s (ELC Year-4;FY 2017) Project Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>J Educational Efforts to Promote Appropriate Antibiotics Use = K2 Coordinated Prevention and Stewardship</td>
<td></td>
</tr>
<tr>
<td>K1 Detection and Response Infrastructure = K1 Detection Containment, and Prevention</td>
<td></td>
</tr>
<tr>
<td>K2 Coordinated Prevention = K2 Coordinated Prevention and Stewardship</td>
<td></td>
</tr>
<tr>
<td>K3 Data Validation = K1 External Data Validation (Optional)</td>
<td></td>
</tr>
<tr>
<td>K4 Hemodialysis BSI = K1 Hemodialysis BSI (Optional)</td>
<td></td>
</tr>
<tr>
<td>K5 Injection Safety = K1 Injection Safety (Optional)</td>
<td></td>
</tr>
<tr>
<td>K6 State CRE Laboratory Capacity = K1 Detection Containment, and Prevention</td>
<td></td>
</tr>
<tr>
<td>K7 Antimicrobial Resistance Regional Laboratory Network = K3 Antimicrobial Resistance Regional Laboratory Network</td>
<td></td>
</tr>
</tbody>
</table>
• **Sexually Transmitted Diseases:**
  o This Continuation Guidance includes several projects not included previously, and one continuing project related to STDs. The *Antibiotic-Resistant Gonorrhea* project (formerly K8) will be continuing as J1, and eligible Grantees are encouraged to apply for these STD-related projects. The new “J” section will consist of:

<table>
<thead>
<tr>
<th>ELC Year 4 (FY 2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1 Threat of Antibiotic-Resistant Gonorrhea: Rapid Detection and Response Capacity</td>
</tr>
<tr>
<td>J2 Enhanced Gonococcal Isolate Surveillance Project (eGISP)</td>
</tr>
<tr>
<td>J3 Combined HIV and STD Prevention and Care for Vulnerable Men who Have Sex with Men and Transgender Women via Network Methods</td>
</tr>
</tbody>
</table>

• **Tickborne Lyme and non-Lyme**
  o The Tickborne Lyme and non-Lyme projects are contained within section “N” listed as N1 and N2 respectively. 2016’s Y: *Tickborne Non-Lyme* will be continued as 2017 N2: Tickborne Non-Lyme.

• **Legionella**
  o The 2016 AA: *Legionella* project will be continued as 2017 Section Y: *Legionella*.

**Projects either discontinued in 2017 or with no opportunity for additional funds:**

• **Ebola-related projects**
  o The 2016 projects related to Ebola and biosafety will not receive new funding in 2017. Progress reports should be submitted via prescribed template for activities that were funded in 2016, these include:
    ▪ 2016 Project E: *Laboratory Biosafety*
    ▪ 2016 Project L: *Ebola Healthcare Infection Control and Prevention*
    ▪ 2016 Project V: *Ebola Ports of Entry/Global Migration*

• 2016’s I7: *NARMS Retail Meat Surveillance project* was transitioned to a grant managed by FDA as of 2016 and is no longer included in the ELC Guidance. This was previously included in 2016’s guidance as project I7.

• 2016’s R2: *Enhanced surveillance for Neisseria meningitis Urogenital Disease* will not be funded in 2017. Progress reports should be submitted via prescribed template for the R2 activities funded in 2016.
Table of Contents

Executive Summary ........................................................................................................................................ 5
Table of Contents ....................................................................................................................................... 8
Background Information .......................................................................................................................... 10
  ELC Logic Model Overview ..................................................................................................................... 12
  ELC Project Components ......................................................................................................................... 13
  Responding to this Continuation Guidance .......................................................................................... 4
Section 1: Cross-cutting (non-categorical) ELC projects ........................................................................ 19
  A: Cross-Cutting Epidemiology Capacity ............................................................................................ 19
  B: Cross-Cutting Laboratory Capacity ................................................................................................. 23
  C: Health Information Systems Capacity ............................................................................................. 27
  D: Advanced Molecular Detection (AMD) .......................................................................................... 33
  F: Public Health Laboratory Sustainability: Regional Networks for Service Sharing .................... 38
  G: Enhanced Evaluation Capacity ....................................................................................................... 42
  H1: Cross-Cutting Outbreak Investigation Response and Reporting ................................................. 45
  H2: Cross-Cutting Outbreak Investigation Response and Reporting: ................................................. 47
Section 2: Disease-specific ELC activities (Projects I-Z) ..................................................................... 49
  Foodborne Disease Activities (I1-I6) ................................................................................................. 49
    I1: Enteric Disease Outbreak Surveillance, Response, and Reporting Capacity ....................... 49
    I3: Integrated Food Safety Centers of Excellence (CoE) ............................................................... 67
    I4: PulseNet USA ........................................................................................................................... 72
    I5: NoroSTAT ................................................................................................................................. 82
    I6: CaliciNet ................................................................................................................................... 85
  Sexually Transmitted Disease Activities (J1-J3) ................................................................................. 88
    J1: Threat of Antibiotic-Resistant Gonorrhea: Rapid Detection and Response Capacity ............. 88
    J2: Enhanced Gonococcal Isolate Surveillance Project (eGISP) .................................................... 95
    J3: Combined HIV and STD Prevention and Care ........................................................................ 101
  Healthcare-Associated Infection/Antimicrobial Resistance Activities (K1-K3) ................................. 108
    K1: Detection, Containment, and Prevention ............................................................................. 108
    K2: Coordinated Prevention and Stewardship ........................................................................... 123
    K3: Antimicrobial Resistance Regional Laboratory Network ...................................................... 131
  M1: West Nile Virus and Other Arboviral Diseases .......................................................................... 142
  M2: US Zika Pregnancy Registry ....................................................................................................... 148
  N1: Tickborne - Lyme Disease ........................................................................................................... 153
  N2: Tickborne - Non-Lyme Disease ................................................................................................. 156
  O: Improved Detection of Parasitic Diseases .................................................................................... 160
  P1: Influenza Surveillance and Diagnostic Testing ........................................................................... 163
  P2: Influenza Outbreak Response ..................................................................................................... 167
  Q1: Non-Influenza Respiratory Diseases - Diagnostics, Reporting, and Surveillance .................... 169
Q2: Non-Influenza Respiratory Diseases - Outbreak Response ........................................................ 173
R: Vaccine-Preventable Disease Surveillance ................................................................................... 175
S: Enhanced Prion Surveillance ......................................................................................................... 187
T: Binational Border Infectious Disease Surveillance (BIDS) Program ............................................. 191
U: Global Migration, Border Interventions and Migrant Health ...................................................... 196
W1: Rabies - Improving Case Management for Potential Rabies Exposures .................................... 199
W2: Rabies - Laboratory Capacity for National Rabies Surveillance ................................................ 201
X: Mycotics - Improving Capacity to Detect and Respond ............................................................... 203
Y: Legionella Prevention ................................................................................................................... 207
Z: Waterborne Disease Detection, Investigation, Reporting, and Prevention ................................. 213
Background Information

Background and Problem Statement

In 1994, CDC developed a nationwide prevention strategy (hereinafter referred to as “Infectious Disease Strategy”) to improve the public health system, its program design and infrastructure, to effectively detect and prevent emerging infectious diseases. This was in response to an influential report published in 1992 entitled ‘Emerging Infections: Microbial Threats to Health in the United States’ by the National Academy of Sciences’ Institute of Medicine (IOM). The report was critical in raising awareness of infectious diseases in the U.S. as much of the conventional wisdom of the day was that infectious diseases were all but defeated domestically after the development of antibiotics, vaccines, and improved sanitation. The Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) Cooperative Agreement was implemented as a response to the 1992 IOM report. Goal IV of the Infectious Disease Strategy sought to “strengthen local, state and federal public health infrastructures to support surveillance and implement prevention and control programs.” The public health infrastructure for addressing infectious diseases at the time was determined to be inadequate for a variety of reasons including the curtailment of infectious disease prevention programs, insufficient staffing levels of trained personnel (e.g., epidemiologists, laboratory scientists), and inadequate disease surveillance methodologies, reference laboratory support, and health information capacity. In response to this need, the ELC has become a critical and important component to address emerging infectious disease threats at the state and local level.

Since the establishment of the ELC, infectious diseases have continued to threaten the nation. During the years since ELC was initiated, the United States experienced outbreaks related to coccidioidomycosis, waterborne Cryptosporidium, drug-resistant Streptococcus pneumoniae, Escherichia coli O157:H7, and Hantavirus Pulmonary Syndrome. Furthermore, a 2012 IOM review of the two decades since the original IOM report by the National Academy of Sciences noted that previously unrecognized infectious diseases have continued to emerge and highlighted West Nile virus, Methicillin-resistant Staphylococcus aureus (MRSA), Severe Acute Respiratory Syndrome (SARS), and H1N1 Influenza, as generating a renewed need in improving public health surveillance, laboratory detection, and response. Finally, cementing the case for continued vigilance against infectious disease are the high-profile 2014/2015 Ebola Virus and 2015/2016 Zika virus outbreaks. The burden of infectious diseases was then, and still remains, a major public health threat to society and the health care system. The variety of social, demographic, and environmental factors, as well as the nature of microbial evolution and adaptation, all contribute to the need for ongoing public health system readiness.

Purpose

The purpose of the ELC Cooperative Agreement (and therefore this continuation guidance) is to protect the public health and safety of the American people by enhancing the capacity of public health agencies to effectively detect, respond, prevent and control known and emerging (or re-emerging) infectious diseases. Capacity is defined as the ability to conduct work; a stronger infrastructure leads to increased capacity. This is accomplished by providing financial and technical resources to (1) strengthen epidemiologic capacity; (2) enhance laboratory capacity; (3) improve information systems; and (4) enhance collaboration among epidemiology, laboratory, and information systems components of public health departments. While discrete areas of emphasis, they are inter-related. The first three are the cornerstones of the ELC and independent areas for building capacity while the fourth is
fundamental to the approach work in all these areas of emphasis. As such, while ELC resources may support each of these individually (e.g., dedicated funding for microbiologists, epidemiologists, lab supplies, informatics hardware/software, etc.), it is only through integration that these complementary cornerstones are optimized. For example, public health labs play an indispensable role in infectious disease public health work by determining and providing essential information for epidemiology surveillance and outbreak activities. Therefore, ELC strives to build and strengthen public health laboratories that are equipped with the latest diagnostic technologies, highly trained staff, and systems that can efficiently transmit, receive and digest electronic data.

ELC Program Logic Model Representation

The ELC program currently covers more than 20 specific categorical disease areas, approximately 40 discrete projects, and receives funding from a variety of programs at CDC. The ELC Logic Model Overview is a graphic depiction of the ELC program’s general approach; it describes the strategies associated with the three core ELC components of Epidemiology, Laboratory and Health Information Systems and the intended outcomes that result from implementing the strategies. It shows “if-then” relationships between the program’s strategies/activities and outcomes. That is, “if” an activity is completed, “then” the following outcome is expected.

The strategies and outcomes of the ELC Logic Model Overview are stated broadly to capture the variety of activities and outcomes that are associated with ELC’s approximately 40 discrete projects. Activities listed in each of the discrete projects are associated with one or more of the strategies described in the Logic Model.

As reflected in the ELC Logic Model Overview, awardees are expected to show measurable progress made toward the short-term/proximal and mid-term outcomes for this five-year project period. Each of ELC’s discrete projects focuses on one or more of these outcomes; these are specified in the ‘Outcomes’ section of each project attachment. As such, the specific outcomes awardees are expected to demonstrate progress for will depend on the projects funded. On a general level, ELC will achieve the following short-term/proximal outcomes: (1) A trained workforce that is better prepared to respond to infectious diseases; (2) Better coordination and exchange of data across jurisdictions, agencies, and partners; (3) Improved surveillance for driving public health action; (4) Improved completeness and timeliness of reporting to appropriate surveillance networks; and (5) More timely and efficient efforts in the detection, response, investigation, and implementation of control measures for infectious disease outbreaks.

The mid-term outcomes will also be achieved during this project period: (1) More data used for improving public health response and control, improving public health practice, informing clinical medicine/treatment, setting priorities, and informing program and policy development; (2) Development and implementation of strong public health interventions and prevention guidelines; (3) Increased awareness of emerging infectious disease (EID) risks and protective actions among the public; (4) Increased awareness of EID appropriate actions among providers; and (5) Earlier detection of EIDs.

Long term, ELC will contribute to the: (1) Improved treatment and prevention of EIDs; (2) Minimized transmission of EIDs; (3) Prevention of future outbreaks; (4) Reduction in incidence and prevalence of EIDs; (5) Decreased morbidity and mortality from EIDs; (6) Restrained growth of health care costs, and (7) Improved overall health outcomes and quality of life among the American public.
### ELC Logic Model Overview

<table>
<thead>
<tr>
<th>Core Areas/Strategies</th>
<th>Short-term/Proximal Outcomes</th>
<th>Mid-term Outcomes</th>
<th>Long-term/Distal Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Strengthen Epidemiological Capacity</strong></td>
<td>• Trained workforce better prepared to respond</td>
<td>Data used to:</td>
<td>• Improved treatment and prevention of infectious diseases</td>
</tr>
<tr>
<td>• Strategy 1a: Enhance investigation response and reporting</td>
<td>• Better coordination and exchange of data</td>
<td>• Improve PH response and control</td>
<td>• Minimized transmission of infectious diseases</td>
</tr>
<tr>
<td>• Strategy 1b: Improve surveillance to drive public health action</td>
<td>• Improved surveillance</td>
<td>• Improve public health practice</td>
<td>• Future outbreaks prevented</td>
</tr>
<tr>
<td>• Strategy 1c: Implement and evaluate public health practice, and prevention and control strategies</td>
<td>• Improved completeness and timeliness of reporting</td>
<td>• Inform clinical medicine/treatment</td>
<td>• Reduction in incidence/prevalence of preventable infectious diseases</td>
</tr>
<tr>
<td>• Strategy 1d: Coordinate and collaborate</td>
<td>• More timely and efficient efforts:</td>
<td>• Set priorities</td>
<td>• Decreased morbidity/mortality</td>
</tr>
<tr>
<td>2. Enhance Laboratory Capacity</td>
<td>o Detection of outbreaks</td>
<td>• Inform program and policy development</td>
<td>• Restrained growth of health care costs</td>
</tr>
<tr>
<td>• Strategy 2a: Sustain and enhance laboratory diagnostic capacity</td>
<td>o Response to outbreaks</td>
<td>Development and implementation of strong:</td>
<td>• Improved health outcomes, quality, and equity</td>
</tr>
<tr>
<td>• Strategy 2b: Improve laboratory coordination and outreach/information flow</td>
<td>o Investigation of outbreaks</td>
<td>• Public health interventions</td>
<td></td>
</tr>
<tr>
<td>• Strategy 3a: Enhance Health Information Systems Workforce</td>
<td>o Implementation of control measures</td>
<td>• Prevention guidelines</td>
<td></td>
</tr>
<tr>
<td>3. Improve Health Information Systems</td>
<td></td>
<td>Earlier detection of EIDs</td>
<td></td>
</tr>
<tr>
<td>• Strategy 3b: Advance Electronic Information Exchange Implementation</td>
<td></td>
<td>Increased awareness of:</td>
<td></td>
</tr>
<tr>
<td>• Strategy 3c: Sustain and enhance integrated surveillance information systems</td>
<td></td>
<td>• Public regarding EID risks and protective action</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Providers regarding appropriate action</td>
<td></td>
</tr>
</tbody>
</table>
ELC Project Components

The ELC is a complex program with many different funding streams and discrete projects; the three ELC cornerstones of epidemiology, laboratory and health information systems each focus on several key strategies (see Logic Model). The strategies and the activities associated with these strategies are described in project attachments within this Continuation Guidance. Below you will find an overview of these projects.

The ELC program categorizes projects categorized into two main sections:

Section 1: Cross-cutting (non-categorical) ELC projects (Overview, Projects A-H)
Section 2: Disease-specific ELC projects (Activities I-Z)

Note that each Project has a separate attachment (identified below) which details sub-activities and other key criteria. Furthermore, the planning and preparation of your response to this continuation guidance, and implementation and monitoring/evaluation of all ELC projects must be coordinated via your established ELC Governance Team.

Section 1: Cross-cutting (non-categorical) ELC projects

Project A: Epidemiology Capacity (See Attachment A)
Purpose: Ensure health departments are well equipped with staff, surveillance systems and other tools to identify, characterize, and provide rapid, effective, and flexible response to infectious disease threats.
Estimated Award Information: $12,600,000 total available; 64 awards; Average award ~$197,000

Project B: Laboratory Capacity (See Attachment B)
Purpose: Develop modern and well-equipped public health laboratories, with well-trained staff, employing high quality laboratory processes and systems that foster communication and appropriate integration between laboratory and epidemiology functions.
Estimated Award Information: $8,800,000 total available; 64 awards; Average award ~ $138,000

Project C: Health Information Systems (See Attachment C)
Purpose: Develop and enhance health information systems infrastructure in public health agencies, focusing on standards-based electronic data exchange, information systems interoperability, and the sustainability of NEDSS-compatible integrated surveillance information systems.
Estimated Award Information: $27,000,000 total available; 64 awards; Average award ~ $400,000

Project D: Advanced Molecular Detection (See Attachment D)
Purpose: Modernize infectious disease laboratories, including training staff, and expanding the application of Next Generation Sequencing (NGS) technologies to ensure that Americans have the strongest protection against infectious disease threats.
Estimated Award Information: $2,000,000 total available
- Workforce training (training lead); 5-10 awards; award range ~$20,000-$150,000
- Workforce training (participant); 20-40 awards; award range ~$5,000-$20,000
• Bioinformatics Resource Support; 2-5 awards; award range ~$50,000-$150,000
• AMD Capacity (technologies); 5-15 awards; award range ~$20,000-$100,000

Former Project E: Ebola-Associated Supplement Laboratory Biosafety (Report Template only)
$0 Funds anticipated via the ELC. Project status report for work in 2016 should be submitted via template with application.

Project F: Public Health Laboratory Sustainability (See Attachment F)
Purpose: Develop and enhance PHL capacity to share testing, training and other services across states through the formation of multistate PHL testing networks.
Estimated Award Information: $180,000 total available; 7 awards; Average award ~$20,000-$30,000

Project G: Enhanced Evaluation Capacity (See Attachment G)
Purpose: Conduct evaluation project(s) that focus on a specific ELC project or encompass a range of ELC projects to demonstrate the impact of ELC funding.
Estimated Award Information: $500,000 total available; 5 awards; Average award ~$100,000

Project H: Cross-Cutting Outbreak Capacity (See Attachments H1 and H2)
Purpose: Provide surge capacity for an effective response to an outbreak emergency. Projects H1 and H2 are offered to meet needs for multiple outbreak responses.
Estimated Award Information: No funding set aside; funds may materialize under nationwide outbreak conditions.

Section 2: Disease-specific ELC activities (Projects I-Z)

Foodborne Disease Projects (See Attachments I1 – I6)
Purpose: Enhance capacity for investigation, control, and reporting of foodborne disease outbreaks and improve laboratory-based surveillance for emerging foodborne pathogens.
• Enteric Disease Detection, Investigation, Control, and Reporting Program Overview (Report Template Only)
  • OutbreakNet/NORS/FoodCORE (See Attachment I1)
    o OutbreakNet/NORS: $2,900,000 total estimate available; 54 awards; average award ~$58,000
    o OutbreakNet Enhanced: $2,900,000-$3,500,000 total estimate available; ~25 awards; average award ~$150,000-$225,000 in addition to the OutbreakNet/NORS funding above.
    o FoodCORE: ~$3,000,000 total estimate available; 10 awards; average award ~$400,000
  • NARMS Surveillance (See Attachment I2)
    o Isolate shipping: $230,000 total estimate available; approximately 54 awards, average award range $1,000-$18,000
    o WGS: $8,400,000 total estimate available; approximately 54 awards, average award ~$50,000-$400,000
    o Expanded data collection FoodNet: $930,000 total estimate available; approximately 10 awards; average award ~$93,000
• Integrated Food Safety Centers of Excellence (CoE) (See Attachment I3)
  ~$2,700,000 total estimate available; 6 awards; average award range ~$350,000-$550,000
• PulseNet (See Attachment I4)
  $4,000,000 total estimate available; 50 awards; average award ~$80,000
• NoroSTAT (See Attachment I5)
  $425,000 total estimate available; 9 awards; average award $50,000 (range $2,500-$70,000)
• CaliciNet (See Attachment I6)
  $600,000 total estimate available; 25-32 awards; average award ~$10,000 (range $2,500-$70,000)
• NARMS Retail Meat (Discontinued through ELC)
  $0 Funds anticipated via the ELC. Please note that NARMS Retail Meat activities transitioned to a grant managed by the FDA.

**Sexually Transmitted Disease Projects** (See Attachments J1-J3)

*Purpose:* Strengthen epidemiology, surveillance and case investigations around sexually transmitted diseases, reduce the rate of STDs, and address the threat of antibiotic-resistant STDs.

- AR GC Response Capacity (See Attachment J1)
  $5,940,000 total estimate available; up to 9 awards; average award ~$660,000
- Enhanced GC Isolate Surveillance (See Attachment J2)
  $600,000 total estimate available; ~10 awards; average award ~$60,000
- Combined HIV and STD Prevention (See Attachment J3)
  $1,600,000 total estimate available; up to 2 awards; average award ~$800,000

**Healthcare-Associated Infection/Antimicrobial Resistance Activities** (See Attachments K1-K3)

*Purpose:* Support, maintain, and enhance efforts to prevent antimicrobial resistance, to reach healthcare-associated infection prevention goals, and to build and sustain state programs to prevent healthcare-associated infections.

*Estimated award information:*

- Detection, Containment and Prevention- *core* (See Attachment K1)
  $23,000,000 total estimate available; 57 awards; average award ~$400,000
- Data Validation- *optional* (See Attachment K1)
  $500,000 total estimate available; up to 10 awards; average award $50,000 to $500,000 range
- Hemodialysis BSI – *optional* (See Attachment K1)
  $525,000 total estimate available; up to 8; average award $50,000 to $250,000 range
- Injection Safety – *optional* (See Attachment K1)
  $540,000 total estimate available; up to 8 awards; average award $40,000 to $80,000 range
- Coordinated Prevention and Stewardship (See Attachment K2)
  $17,600,000 total estimate available; up to 30 awards; average award ~$590,000
- AR Regional Lab Networks (See Attachment K3)
  $17,000,000 total estimate available
Core ARLN CRE and reference lab capacity: $10,500,000 total estimate available; up to 7 awards; average award $1,500,000.

Susceptibility testing for *Neisseria gonorrhoeae*: $2,000,000 total estimate available; up to 4 awards; average award ~$500,000

Antimicrobial susceptibility testing and serotyping of MDR-*Streptococcus pneumoniae*: $300,000 total estimate available; 2 awards, average award ~$150,000

Increase laboratory capacity for *Clostridium difficile*: $500,000 total estimate available; 1 award, award $500,000

Implement molecular Mtb testing: $1,440,000 total estimate available; up to 2 awards

**Former** Project L. Ebola-Associated Supplement Healthcare Infection Control Assessment and Response (Report Template Only)

$0 Funds anticipated via the ELC. Project status report for work in 2016 should be submitted via template with application.

**Project M1. West Nile Virus and other Arboviral** (See Attachment M1)

*Purpose:* Develop and implement effective surveillance, prevention, and control of arboviruses that occur or are imported into the United States.

*Continuation Arboviral Activities - Estimated Award Information:* $9,000,000 total estimate available; ~60 awards; average award ~$150,000

**Project M2. U.S. Zika Pregnancy Registry** (See Attachment M2)

*Purpose:* To provide eligible States and Territories financial support for collaborative participation in the US Zika Pregnancy Registry including identification of pregnant and infant cases and completion of follow up on pregnant women and the exposed fetuses and infants who meet the registry inclusion criteria.

*Estimated Award Information:* $15,500,000 total estimate available; 61 awards; $260,000 average award (with range $22,000 - $1,090,000)

**Project N. Tickborne Diseases** (See Attachments N1 and N2)

*Purpose:* Effective surveillance for diagnosis, prevention, and control of human infections of Lyme disease caused by *Borrelia burgdorferi* bacterium. Epidemiology, laboratory and/or informatics support for projects designed to improve the detection, investigation, reporting, and response to public health issues related to tickborne diseases.

- **Tickborne Lyme** (See Attachment N1)
  $960,000 total estimate available; 16 awards; average award ~$60,000

- **Tickborne Non-Lyme** (See attachment N2)
  $400,000 total estimate available; 12 awards; average award ~$30,000

**Project O. Parasitic Diseases** (See Attachment O)

*Purpose:* Develop and maintain capacity for accurate and rapid diagnosis of parasitic infections allowing for enhanced response and treatment.

*Estimated award information:*
• Telediagnosis: $80,000 total estimate available; ~10 awards, average award ~$8,000
• Enhanced laboratory capacity for cyclosporiasis: $130,000 total estimate available; ~4 awards, average award ~$32,500

Project P. Influenza (See Attachments P1 and P2)
*Purpose:* Implement enhanced capacity for surveillance and diagnostic testing of respiratory viruses. Provide laboratory and epidemiologic surge capacity necessary for an effective response to a respiratory virus-related emergency.

• Influenza Surveillance and Diagnostic Testing (See Attachment P1)
  $7,550,000 total estimate available; 57 awards; average award ~$132,000

• Influenza Outbreak Response (See Attachment P2)
  No funding set aside; funds may materialize under nationwide outbreak conditions.

Project Q. Non-Influenza Respiratory Viruses (See Attachments Q1 and Q2)
*Purpose:* Strengthen laboratory capacity to identify non-influenza respiratory viruses essential for case finding of non-influenza respiratory diseases, including MERS-CoV. Provide laboratory and epidemiologic surge capacity necessary for an effective response to a respiratory virus-related emergency.

• Diagnostic, Reporting, and Surveillance (See Attachment Q1)
  $750,000 total estimate available; 10-12 awards; average award ~$70,000

• Non-Influenza Outbreak Response (See Attachment Q2)
  No funding set aside; funds may materialize under nationwide outbreak conditions.

Project R. Vaccine Preventable Diseases (See Attachment R)
*Purpose:* Conduct NNDSS surveillance, outbreak response and vaccine effectiveness activities for Immunization Preventable Diseases.

*Estimated award information:* $6,400,000 total estimate available; 52 awards; average award $100,000

**Former** Project R2. Neisseria meningitidis Urogenital Disease (Report Template Only)
$0 Funds anticipated via the ELC. Project status report for work in 2016 should be submitted via template with application.

Project S. Prion Disease (See Attachment S)
*Purpose:* Maintain and enhance surveillance for Creutzfeldt Jakob Disease (CJD) and the possible emergence of new variant forms of CJD.

*Estimated award information:* $402,000 total estimate available; 6 awards; average award ~$67,000

Project T. Border Infectious Disease Surveillance (BIDS) (See Attachment T)
*Purpose:* Enhance epidemiology and laboratory capacity for the U.S.-Mexico border region for improved disease detection, reporting, and prevention.

*Estimated award information:* $525,000 total estimate available; 1-4 awards; average award range ~$50,000 to $250,000
Project U. Global Migration, Border Interventions, and Migrant Health (See Attachment U)

**Purpose:** Enhance epidemiology and laboratory capacity for surveillance, case management and response to risks related to the movement of pathogens across borders.

*Estimated award information:* $250,000 total estimate available; 3-5 awards; average award ~$50,000 (with range ~$15,000 to $100,000)

**Former Project V. Ebola-Associated Supplement for Global Migration, Border Interventions and Migrant Health (Report Template Only)**

$0 Funds anticipated via the ELC. Project status report for work in 2016 should be submitted via template with application.

Project W. Rabies (See Attachments W1 and W2)

**Purpose:** Epidemiology, laboratory and/or informatics support for projects designed to improve management of potential rabies exposure cases and those to improve capacity through training in rabies diagnosis.

- Improving Case Management for Potential Rabies Exposures (See Attachment W1)
  $130,000 total estimate available; 3-5 awards; average award range $35,000 to $50,000

- Laboratory Capacity (See Attachment W2)
  $70,000 total estimate available; 20 awards; average award ~$3,500

Project X. Mycotics (See Attachment X)

**Purpose:** Epidemiology, laboratory and/or informatics support for projects designed to improve the detection, investigation, reporting and response to public health issues related to fungal diseases.

*Estimated award information:* $850,000 total estimate available; 13 awards; average award ~$65,000

Project Y. Legionella Prevention (See Attachment Y)

**Purpose:** Build capacity among state and local epidemiologists, environmental health specialists, and public health laboratorians regarding the understanding, implementation, evaluation and regulation of industry standards for primary prevention of *Legionella*.

*Estimated award information:* $1,200,000 total estimate available; 2-3 awards; average award ~$100,000 - $800,000 (proposed projects should be scalable)

Project Z. Waterborne (See Attachment Z)

**Purpose:** Epidemiology, laboratory and/or informatics support projects designed to improve the detection, investigation, reporting, and response to public health issues related to waterborne diseases.

*Estimated award information:* $450,000 total estimate available; 20 awards; average award ~$23,000
Section 1: Cross-cutting (non-categorical) ELC projects

ATTACHMENT
A: Cross-Cutting Epidemiology Capacity

Program Activity Contact Information
Alvin Shultz, ELC Program Coordinator, (404) 639-7028

Funding Opportunity Description

Background

a. Healthy People 2020:
Public Health Infrastructure Objective 13: Increase the proportion of Tribal, State, and local public health agencies that provide or assure comprehensive epidemiology services to support essential public health services

b. Other National Public Health Priorities and Strategies:
Not applicable.

CDC Project Description

i. Problem Statement:
Resources provided for infectious diseases are often prescriptive, both in terms of the activities they fund and the pathogens they target. Yet, state public health agencies across the U.S. each have unique infectious disease public health needs and priorities due to the diverse challenges they face, their organizational capacity, geography and populations. Often, there are unanticipated events that may require the diversion of resources to a specific emerging or re-emerging disease. In order to better meet each jurisdiction’s specific needs and lessen the delays in responsiveness during unanticipated events, resources need to be used in a multi-categorical and flexible way so that agencies may be able to better address planned-for and unanticipated infectious disease public health needs.

ii. Purpose:
The purpose of Cross-Cutting Epidemiology Capacity is to provide support to maintain and strengthen infectious disease epidemiology so that state public health agencies can effectively respond, prevent and control known and emerging (or re-emerging) infectious diseases. This is intended to address activities for needs that do not clearly fall under specific disease components and/or are cross-cutting.

iii. Outcomes:
By the end of the project period, awardees are expected to show measurable progress toward the following outcomes:

- Epidemiologists better prepared to respond to emerging and re-emerging infectious disease threats
- Improved timeliness and completeness of reporting to appropriate surveillance systems
- More timely and efficient detection, investigation and response and of outbreaks and implementation of control measures
- Development and/or implementation of interventions, guidelines or toolkits
- Increased public awareness of emerging and re-emerging infectious disease risks and protective action
- Improved surveillance data quality (e.g., completeness, accuracy, etc.)
• Better coordination and exchange of surveillance data across jurisdictions and partners
• Improved use of public health data for public health response and control; public health practice; setting public health priorities; and/or program and policy development

iv. Funding Strategy:
For the FY 2017 project year, PPHF funds were awarded to jurisdictions in February 2017 with a start date of August 1, 2017. However, the PPHF funded-project details (i.e. progress reports and continuation plans for projects A, B, C, and R) should be included in this application, which will undergo technical reviews and potential budget additions on schedule with the remaining funds to be awarded for the August 1 start date. Any additional funding for FY 2017 will be from non-PPHF sources.

Funds should be used for personnel (i.e., multi-disease purpose ‘ELC Flexible Epidemiologist’), supplies, travel, administration, statistical software and other requisite support to build and/or maintain epidemiological capacity within the jurisdiction.

• Total availability of funds: $12,600,000
• Approximate number of awards given: 64
• Approximate average per award: $197,000

v. Strategies and Activities:
Applicants can select one or more of the following strategies to apply for; however, activities defined below are examples. Applicants should select strategies and implement activities that expand and sustain current epidemiological capacity based on the priorities and public health needs of their jurisdiction, and will make progress toward the outcomes defined from the ELC Logic Model Overview. While some disease-specific activities may be supported, Cross-Cutting Epidemiology Capacity is envisioned for supporting multi-categorical epidemiological activities.

1) Enhance investigation response and reporting (1a)
   a. Enhance epidemiology skills by participating in trainings or creating training opportunities
      • Travel to 2018 ELC Annual Meeting: Travel a member of your epidemiology ELC Governance Team (or their designee) to an ELC Grantee Meeting that is tentatively being planned for the Spring-Summer of 2018. Travel that is approved and funded by CDC will be considered a required activity.
      • Visit another ELC grantee and participate in public health activities and knowledge sharing: Travel and train a member(s) of your epidemiology staff by visiting and participating in public health activities with another ELC grantee. Specifics are to be negotiated between the participating ELC grantees and may involve reciprocal arrangements where host grantees would later be hosted (however, such an arrangement is not a requirement). The ELC program will try to facilitate match-making between grantees. Travel that is approved and funded by CDC will be considered a required activity.
   b. Increase the use of standardized questionnaires across investigative jurisdictions (e.g., reference standard questionnaires1)

---
2) **Improve surveillance to drive public health action (1b)**
   a. Develop, maintain and/or enhance systems for infectious diseases, including emerging and re-emerging diseases
   b. Evaluate existing surveillance systems
   c. Improve review/use of surveillance data (e.g., more robust and varied analyses of data)
   d. Improve coordination and exchange of surveillance data with other jurisdictions and partners
   e. Manage/advance electronic reporting

3) **Implement and evaluate public health practice, and prevention and control strategies (1c)**
   a. Implement and evaluate tools and interventions (e.g., education and outreach programs) for disease reduction
   b. Develop and advance policies for the prevention, detection, and control of infectious diseases

4) **Improve coordination and collaboration for outbreak response and management (1d)**
   a. Develop and/or maintain the use of communication protocols or Standard Operating Protocols (SOPs) for outbreak response and management
   b. Foster collaboration among city, county, state and federal partners (e.g., workgroups) and other external partners for the purpose of improving outbreak response and management
   c. Improve integration of infectious disease epidemiology, laboratory, and health information systems activities
   d. Coordinate infection control and epidemiology services throughout the jurisdiction

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<thead>
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<th>1. Collaborations –</th>
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<td>a. With CDC funded programs:</td>
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<td>b. With organizations external to CDC:</td>
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Not applicable.

2. **Target Populations:**

Not applicable

a. **Evaluation and Performance Measurement:**

i. **CDC Evaluation and Performance Measurement Strategy:**

Awardees are required to show that measurable progress is being made throughout the project period. Progress will be monitored on a quarterly basis through phone calls and reported on an annual basis. There are three required measures that all awardees will report on (listed below). Additional measure guidance will be provided following the publication of this Continuation Guidance.

1) Outbreaks investigated by ELC-funded personnel by proportion and type (*required*)
2) Percentage of reports of ELC-selected reportable diseases received by a public health agency within the awardee-required timeframe (*required*)
   - *E. coli, STEC (confirmed)*
   - *Measles (confirmed)*
- Meningococcal disease (*N. meningitides*) (confirmed)
- Salmonellosis (confirmed) (optional)
- Shigella (optional)
- Pertussis (optional)

3) Percentage of reports of ELC-selected reportable diseases for which initial public health control measure(s) were initiated within appropriate timeframe (*required*):
   - *E. coli*, STEC (confirmed)
   - Measles (confirmed)
   - Meningococcal disease (*N. meningitides*) (confirmed)
   - Salmonellosis (confirmed) (optional)
   - Shigella (optional)
   - Pertussis (optional)

*Data will be collected via the Public Health Emergency Preparedness Cooperative Agreement for dates July 1, 2016-June 30, 2017. Awardees may be expected to verify these data for the measures through the ELC but will not be expected to report on these data.*
# ATTACHMENT

## B: Cross-Cutting Laboratory Capacity

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<th>Program Activity Contact Information</th>
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<tbody>
<tr>
<td>Alvin Shultz, ELC Program Coordinator, (404) 639-7028</td>
</tr>
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## Funding Opportunity Description

### Background

#### a. Healthy People 2020:

Public Health Infrastructure Objective 11: Increase the proportion of Tribal and State public health agencies that provide or assure comprehensive laboratory services to support essential public health services

#### b. Other National Public Health Priorities and Strategies:

Not applicable.

## CDC Project Description

### i. Problem Statement:

Resources provided for infectious diseases are often prescriptive, both in terms of the activities they fund and the pathogens they target. Yet, state public health agencies across the U.S. each have unique infectious disease public health needs and priorities due to the diverse challenges they face, their organizational capacity, geography and populations. Often, there are unanticipated events that may require the diversion of resources to a specific emerging or re-emerging disease. In order to better meet each jurisdiction’s specific needs and lessen the delays in responsiveness during unanticipated events, resources need to be used in a multi-categorical and flexible way so that agencies may be able to better address planned-for and unanticipated infectious disease public health needs.

### ii. Purpose:

The purpose of Cross-Cutting Laboratory Capacity is to provide support to maintain and strengthen public health laboratories so that state public health agencies can effectively respond, prevent and control known and emerging (or re-emerging) infectious diseases. Cross-Cutting Laboratory Capacity is intended to help agencies achieve modern and well-equipped public health laboratories with well-trained staff, high quality laboratory processes, and systems that foster communication and appropriate integration between laboratory and epidemiology functions.

### iii. Outcomes:

By the end of the project period, awardees are expected to show measurable progress toward the following outcomes:

- Increased/maintained laboratory proficiency through training and adoption of new techniques.
- Better coordination and data management
- Improved completeness and timeliness of reporting
- More timely and efficient detection

### iv. Funding Strategy:

For the FY 2017 project year, PPHF funds were awarded to jurisdictions in February 2017 with a start date of August 1, 2017. However, the PPHF funded-project details (i.e. progress reports and continuation plans for projects A, B, C, and R) should be included in this application, which will undergo technical reviews and potential budget additions on schedule with the remaining
funds to be awarded for the August 1 start date. Any additional funding for FY 2017 will be from non-PPHF sources. Funds should be used for personnel (i.e., multi-disease purpose ‘ELC Flexible Laboratorian,’ Laboratory ‘Connector’ or liaison responsible for collaboration and coordination between state, clinical and hospital labs both within state/local jurisdiction and across jurisdictions), personnel training, maintenance agreements for laboratory equipment, courier service, supplies, travel, administration, and other requisite support to build and/or maintain laboratory capacity within the jurisdiction. ELR activities related to the laboratory should be requested in ‘Cross-Cutting Health Information Systems: 2d Fully implement standards-based ELR with/within the public health department.’

- Total availability of funds: $8,800,000
- Approximate number of awards given: 64
- Approximate average per award: $137,500

v. Strategies and Activities:

Applicants can select one or more of the following strategies to apply for; however, activities defined below are examples. Applicants should select strategies and implement activities that expand and sustain current laboratory capacity based on the priorities and public health needs of their jurisdiction, and will make progress toward the outcomes defined above from the ELC Logic Model (Figure 1). While some disease-specific activities may be supported, Cross-Cutting Laboratory Capacity is envisioned for supporting multi-categorical laboratory activities.

1) Sustain and enhance laboratory diagnostic capacity (2a)
   a. Enhance skills and maintain pace with novel laboratory techniques by participating in trainings or creating training opportunities (e.g., forums, seminars, workshops) for laboratory staff
      - Travel to 2018 ELC Annual Meeting: Travel your laboratory ELC Governance Team member (or their designee) to an ELC Grantee Meeting that is tentatively being planned for the Spring-Summer of 2018. Travel that is approved and funded by CDC will be considered a required activity.
      - Visit another ELC grantee and participate in public health activities and knowledge sharing: Travel and train a member(s) of your laboratory staff by visiting and participating in public health activities with another ELC grantee. Specifics are to be negotiated between the participating ELC grantees and may involve reciprocal arrangements where host grantees would later be hosted (however, such an arrangement is not a requirement). The ELC program will try to facilitate match-making between grantees. Travel that is approved and funded by CDC will be considered a required activity.
   b. Incorporate the use of novel techniques for diagnosis to expand capabilities and improve laboratory throughput, efficiency and proficiency.
   c. Develop, implement, and maintain a plan or strategy for the optimal use of supplies and equipment that addresses flexible, changing, and multi-disease purpose needs

2) Improve laboratory coordination and outreach (2b)
a. Strengthen relationships, coordination and collaboration among/between stakeholders in epidemiology, laboratory, and health information systems functions, at the national, state and local level (e.g., SOPs for coordination and communication)
   - Laboratory staff leads engagement with epidemiologists and health informaticians to conduct the PHL Informatics Self-Assessment to gauge informatics capabilities and gaps, prioritize the use of existing resources, and to document and communicate informatics priorities to policy makers.

b. Implement electronic mechanisms for tracking, reporting, and exchange of public health information (e.g., LIMS, ELR, Public Health Laboratory System Database (PHLSD))

1. Collaborations –
   a. With CDC funded programs:

b. With organizations external to CDC:
   Not applicable.

2. Target Populations:
   Not applicable.

a. Evaluation and Performance Measurement:
   i. CDC Evaluation and Performance Measurement Strategy:

   Awardees are required to show that measurable progress is being made throughout the project period. Progress will be monitored on a quarterly basis through phone calls and reported on an annual basis. There is one required measure that all awardees will report on (listed below). Additional measure guidance will be provided following the publication of this Continuation Guidance.

1. Turnaround time from specimen collection to reporting (required)
   a. Number of tests conducted
      - Salmonella (PFGE)
      - Listeria (PFGE)
      - Listeria (WGS)
      - West Nile Virus (Serology)
      - Bordetella pertussis (NAAT)
      - Zika virus (NAAT)*
      - Dengue virus (NAAT)
   b. Median number of days from specimen collection to receipt of specimen or sample in the laboratory (pre-analytical phase);
      - Salmonella (PFGE)
      - Listeria (PFGE)
      - Listeria (WGS)
      - West Nile Virus (Serology)
      - Bordetella pertussis (NAAT)
      - Zika virus (NAAT)*
      - Dengue virus (NAAT)
   c. Median number of days from receipt of specimen or sample to obtaining lab test results (analytical phase);
      - Salmonella (PFGE)
- Listeria (PFGE)
- Listeria (WGS)
- West Nile Virus (Serology)
- Bordetella pertussis (NAAT)
- Zika virus (NAAT)*
- Dengue virus (NAAT)

d. Median number of days from obtaining lab test results to report to appropriate surveillance network (post-analytical phase)
- Salmonella (PFGE)
- Listeria (PFGE)
- Listeria (WGS)
- West Nile Virus (Serology)
- Bordetella pertussis (NAAT)
- Zika virus (NAAT)*
- Dengue virus (NAAT)

e. Reason for opt out (if applicable)
f. Challenges, barriers and/or explanations for not meeting target(s) (if applicable)

*These data points are currently being reported via Project M1: West Nile Virus and Other Arboviral Diseases. It will not be reported via Project B: Cross-Cutting Laboratory Capacity.
**ATTACHMENT**

*C: Health Information Systems Capacity*

**Program Activity Contact Information**

Jason Hall, ELC Informatics Subject Matter Expert (404) 639-7884
Michele Hoover, Public Health Advisor (404) 498-2705

**Funding Opportunity Description**

**Background**

**c. Healthy People 2020:**
Healthy People 2020 Health Communication and Health Information Technology topic area

**d. Other National Public Health Priorities and Strategies:**
These activities complement the Centers for Medicare & Medicaid Services Electronic Health Record Incentive Program's "meaningful use" requirements, and the associated health outcome “Improve population and public health” ([http://www.cdc.gov/elr/elr-meaningful-use.html](http://www.cdc.gov/elr/elr-meaningful-use.html) and [https://www.cdc.gov/ehrmeaningfuluse/](https://www.cdc.gov/ehrmeaningfuluse/))

**CDC Project Description**

**j. Problem Statement:**
The availability of timely, high quality data is critical to public health functions at state and local public health agencies. Clinical and laboratory partners often send data that are not standardized using paper-based methods, which are labor-intensive to use. Many systems in jurisdictions that support the analysis and sharing of these data are stand-alone, outdated, or functionally deficient. Enabling jurisdictions to implement and support standards-based electronic data exchanges and a modern, integrated surveillance information system that is interoperable is imperative. In an environment of diminishing resources, jurisdictions need help updating to a more efficient health information systems infrastructure and building a well-trained workforce to use and manage it.

**vi. Purpose:**
The purpose of this program is to develop and improve health information systems infrastructure in public health agencies that advances standards-based electronic data exchange, increases information systems interoperability, and sustains and enhances integrated surveillance information systems. Enhancing electronic exchange of information between public health agencies and clinical care entities will make a critical contribution to health reform in the U.S.

**vii. Outcomes:**

- **Better trained health informatics/IT workforce**
  - Ability to establish new and maintain existing electronic data exchange transmissions with public health partners, e.g. hospitals, labs, providers

- **Better coordination and exchange of data**
  - Interoperable systems

- **Improved surveillance**
  - Enhanced integrated surveillance information systems used for multiple conditions, including automating the use of ELR, eCR and other electronic data exchanges for all programs
  - Improved completeness and timeliness of reporting from public health partners

**viii. Funding Strategy:**

For the FY 2017 project year, PPHF funds were awarded to jurisdictions in February 2017 with a start date of August 1, 2017. However, the PPHF funded-project details (i.e. progress reports and
continuation plans for projects A, B, C, and R) should be included in this application, which will undergo technical reviews and potential budget additions on schedule with the remaining funds to be awarded for the August 1 start date. Any additional funding for FY 2017 will be from non-PPHF sources.

Funds should be used for personnel, contracts, supplies, travel, and other support to build and/or maintain health information systems/informatics capacity, integrated surveillance information systems, and electronic data exchange in public health departments and their public health labs.
- Total availability of funds: up to $27,000,000
- Approximate number of awards given: 64
- Approximate average per award: $400,000

### ix. Strategies and Activities:

1. **Enhance Health Information Systems Workforce (3a)**
   a. Designate a public health information systems specialist with flexible responsibilities, including responsibilities for oversight of Electronic Laboratory Reporting (ELR) and Electronic Case Reporting (eCR) implementation and integrated surveillance information systems
   b. Develop and sustain core personnel needed to support the implementation, enhancement, and maintenance of an integrated surveillance information system
   c. Develop and sustain personnel resources to support and advance electronic data exchange, especially ELR and eCR implementation, in IT, public health informatics, surveillance, and public health laboratories
   d. Increase public health informatics and information technology skills to support electronic data exchange, especially ELR and eCR implementation efforts, and integrated surveillance information systems by participating in training or creating new training opportunities

2. **Advance Electronic Information Exchange Implementation (3b)**
   *Note: Please use the Jurisdiction ELR Profile, created using data contributed during the ELR Implementation Support and Monitoring effort, to determine the “% of Volume Received via ELR” for your jurisdiction. All jurisdictions are required to do recipient activities 2ci, 2e, and 2f. Jurisdictions below 75% ELR are required to do recipient activity 2a (applicable part).*
   a. Increase the percentage of lab reports received through ELR
      - If “% of Volume Received via ELR” <75%, propose and execute a plan to increase the volume of ELR over the next year such that either your jurisdiction moves to the next quartile, with a minimum increase of 10 percentage points, or reaches at least 75%. Refer to the Jurisdiction ELR Profile, or another tool, to select laboratories to establish new ELR feeds with or increase reporting for existing ELR feeds that will enable this goal to be reached.
      - If “% of Volume Received via ELR” >=75%, continue establishing ELR feeds with new laboratories.
   b. Automate the use of all ELR: Data provided as part of the ELC HIS Implementation Support and Monitoring effort suggest that nationally only 30% of ELR arriving at health departments make their way into one or more surveillance information systems in an automated way; the remainder are either manually uploaded, keyed in, or not used at all.
      Use an integration engine or other tools to enhance the processing of ELR so the data can be used in the appropriate surveillance information system in an automated way (also see
c. Increase ELR based on Meaningful Use (MU) standards
   i. Where acceptable to the eligible hospitals and public health agency, transition to
      the use of ONC MU standards\(^2\) for existing ELR feeds.
   ii. Add specific capacity to process and use ELR from labs that send messages that
       adhere to the ONC MU implementation guide.

d. Increase public health laboratory capacity for electronic data exchange
   i. Create and send ELR based on MU standards for all reportable conditions to or
      within the public health department by upgrading or enhancing LIMS systems.
      Funding for all development or acquisition costs may not be available through ELC.
      Request EDX Technical Assistance at EDX@cdc.gov, if needed.
   ii. Map local test, result, and specimen source codes to LOINC and SNOMED.
      Request EDX Technical Assistance at EDX@cdc.gov, if needed.
   iii. Otherwise add capacity at public health laboratories, e.g. use integration engine,
        such as Rhapsody, to fully implement ELR with/within public health departments
   iv. Build upon current ELR infrastructure to explore electronic test ordering and
       reporting (ETOR) with another public health lab or a hospital.

e. Participate in the ELC Health Information Systems Implementation Support and
   Monitoring effort as part of the cooperative agreement with CDC to advance and monitor
   electronic data exchange implementation and integrated surveillance information systems
   nationally. This includes scheduling requested calls in a timely manner, having all
   requested participants on calls, filling out data templates according to instructions, and
   returning them in a timely manner. Participation is intended to be a collaborative process
   and may include site visits, calls, and data collection and validation efforts.

f. Implement New NNDSS Case Notification Messages
   Request EDX Technical Assistance at EDX@cdc.gov or use existing resources to create and
   send case notifications to CDC that are formatted and populated based on the Nationally
   Notifiable Condition Case Notification Message Structure
   (http://wwwn.cdc.gov/nndss/message-mapping-guides.html) and retire the
   corresponding legacy formatted transmissions. *Note: Messages should only be developed
   for conditions in Final Case Notification Message Mapping Guides.
   NNDSS case notifications must be approved through the CDC NNDSS onboarding process
   before production transmissions are initiated or legacy transmissions are retired. For
   additional information please see technical assistance and training at
   http://www.cdc.gov/nmi.

g. Implement Electronic Case Reporting (eCR): the automated generation and transmission
   of case reports from the EHR to public health agencies for review and action using the
   Reportable Conditions Trigger Codes (RCTC available
   at https://phinvads.cdc.gov/vads/SearchVocab.action) and the HL7 C-CDA standard for
   the electronic initial case report (eICR)
   at https://www.hl7.org/implement/standards/product_brief.cfm?product_id=436 *Note:
   Activity only for jurisdictions with “% of Volume Received via ELR” >=75%

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\(^2\) Funding for these enhancements should not interrupt existing ELR transmissions. For example, while a plan to transition
transmission/receipt of ELR from 2.3.1 to 2.5.1 is appropriate, this opportunity should not be interpreted as justification for
stopping 2.3.1 without a plan for a reasonably seamless transition to the MU standard
i. Participate in national efforts to define, develop, and maintain the data and technical standards, reporting criteria, and triggers that will be used in the implementation of eCR using C-CDA. Specifically, engage in the: 1) development of eCR standards for an electronic Initial Case Report (eICR) and Reportability Response (RR) using C-CDA by participating in the HL7 Public Health and Emergency Response Working Group; and 2) development and updates to default reporting specifications and trigger codes by participating in CSTE RCKMS Vetting Calls.

ii. Participate in the Reportable Conditions Knowledge Management System (RCKMS) by:
   - Identifying a Jurisdiction Administrator who will lead the authoring of reporting specification in RCKMS
   - Supporting other authors in your jurisdiction in the use of RCKMS, as needed
   - Attending training for the authoring of reporting specifications in RCKMS
   - Authoring disease specific reporting specifications in the RCKMS tool and updating them when reporting rules are added or changed.

iii. Develop a project plan and begin implementation of eCR with one or more clinical partners and their EHR vendors for conditions published in the Reportable Conditions Trigger Tables (available at https://phinvads.cdc.gov/vads/SearchVocab.action) and use RCKMS for public health reporting decision support.

h. Create the capacity to transfer ELR messages and eCR messages between jurisdictions. These transfers refer to the electronic sending of ELR and case data between two jurisdictions for a lab report or a case that was reported to one jurisdiction but belongs to another jurisdiction.

   i. Enhance current electronic data exchange infrastructure to transfer or forward ELR to other state or local health departments

   ii. Enhance current electronic data exchange infrastructure to transfer or forward eICR to other state or local health departments.

3. Sustain and/or enhance integrated surveillance information systems (3c)
   *Note: Recipient activity 3a is required for all jurisdictions

a. Maintain existing integrated surveillance information system.

b. Implement (if appropriate) a new/replacement integrated surveillance information system. Funding for all development or acquisition costs may not be available through ELC.

c. Enhance existing integrated surveillance information system(s) by adding or improving functionality and/or updating the operating environment/supporting software. Prioritize enhancements to enable the automated use of ELR and eCR, as applicable (also see activity 2b and 2g.)

d. Move, or explore the efficiencies of moving, an existing or new integrated surveillance information system to a cloud-based/hosted environment.

e. STD surveillance
   i. Transition STD surveillance into the existing integrated surveillance information system as appropriate.
ii. For states who use the CDC-provided STD*MIS and who have not identified a replacement system, upgrade to the most current version of STD*MIS (5.x) and implement the Advantage Database Server.

iii. Implement the NEDSS Base System (NBS)

### 3. Collaborations –

**c. With CDC funded programs:**

Recipients are expected to coordinate with others across their agency with the planning, execution, and management of activities under this ELC program with related efforts funded through the Public Health Emergency Preparedness (PHEP) cooperative agreement and through categorical cooperative agreements (e.g., STD, HIV/AIDS, TB).

**d. With organizations external to CDC:**

Recipients are encouraged to participate with CDC and its partners in planning, development, implementation, and assessment efforts related to electronic data exchange and integrated surveillance systems. These partners include, among others, the Association of State and Territorial Health Officials (ASTHO), Council of State and Territorial Epidemiologists (CSTE), Association of Public Health Laboratories (APHL), the National Association of County and City Health Officials (NACCHO), the Public Health Informatics Institute (PHII), and the International Society for Disease Surveillance (ISDS).

### 4. Target Populations:

Not applicable

**b. Evaluation and Performance Measurement:**

**ii. CDC Evaluation and Performance Measurement Strategy:**

Required and recommended performance measures for the project period are listed below. Data will be measured and reported quarterly on the ELC Health Information Systems Implementation Support and Monitoring calls, where progress made on recipient activities and toward program outcomes will be discussed and documented.

**Better trained health informatics/IT workforce**

*Recommended* for all jurisdictions:

- Number of public health informatics trainings attended, including CDC-developed trainings.

**Better coordination and exchange of data**

*Required* for Jurisdictions that have < 75% of Volume Received via ELR

- Percent of lab report volume received through ELR (target increase ≥ 10 percentage points)
- Number of new ELR feeds established (target ≥ 2)

*Recommended* for all jurisdictions:

- Number of new MU-compliant ELR feeds with hospitals (target ≥ 2)
- Number of hospital ELR feeds converted to be MU-compliant (target ≥ 2)
- Standards-based ELR being sent for all reportable conditions at public health lab(s) (Y/N)

**Improved surveillance**

*Required* for all reporting jurisdictions:

- Number of conditions that are both state and nationally notifiable
- Number of conditions that are both state and nationally notifiable for which notifications are being sent using the new Case Notification Message Structure Specification (see Nationally Notifiable Condition Case Notification Message Structure)
Recommended for all jurisdictions:

- Percent of ELR for chlamydia and gonorrhea being processed in an automated way, i.e. not being manually entered/transcribed (target = 100%)
- All ELR being received are processed in an automated way into one or more surveillance information systems (Y/N)
- ELR that properly adheres to the MU implementation guide can be processed in an automated way into one or more surveillance information systems (Y/N)
- STD ELR processing allows for automated case report creation and notification (Y/N)
- PHA has declared readiness for automated case reporting (Y/N)
- eICRs can be processed in an automated way into one or more surveillance information systems (Y/N)
- Reporting rules for have been authored into RCKMS to support eCR (Y/N)
ATTACHMENT
D: Advanced Molecular Detection (AMD)

Program Activity Contact Information
Nathelia Barnes 404.639.3682

Funding Opportunity Description

Background

a. Healthy People 2020:
Not applicable.

b. Other National Public Health Priorities and Strategies:
Not applicable.

CDC Project Description

i. Problem Statement:
Advanced Molecular Detection (AMD) technologies, particularly next-generation sequencing (NGS) and bioinformatics, are revolutionizing our approach to many infectious diseases, enabling faster, more accurate and more cost-effective ways of preventing, detecting and responding to known, emerging and resistant pathogens. Implementation of these technologies has the potential to upend workforce needs and workflows in public health laboratories. In the face of these changes, there is a need to ensure basic levels of AMD laboratory, informatics and workforce capacity in state and local health departments and laboratories and to better define the opportunities that these technologies present at the state and local level.

ii. Purpose:
The Advanced Molecular Detection (AMD, http://www.cdc.gov/amd) program is developing applications to protect America’s health and building capacity in national, state and local public health laboratories. Modernizing infectious disease laboratories, training staff, and expanding the application of these new technologies will ensure that Americans have the strongest protection against infectious disease threats. The purpose of this announcement is to support training in microbial genomics and bioinformatics as well as to further the development of AMD capacity in local health departments.

iii. Outcomes:
Short-term Outcomes:
• Improved workforce knowledge and skills regarding next-generation sequencing (NGS), bioinformatics, and other AMD technologies.
• Improved NGS capacity in state and local health departments.
Long-term Outcomes:
• Increased bioinformatics analytic capacity in state and local health departments.
• Increased use of AMD technologies to support public health.

iv. Funding Strategy:
Total funding of $2,000,000 to support: (1) AMD-related workforce development through training at the state and local level, (2) Bioinformatics support, and (3) support state and local health department initiatives to extend the use of AMD technologies.

(1) Workforce Development Component:
Applicants applying should apply either to be a training “lead” or “participant”:
(1) Workforce Development Component:

This section of the announcement supports training for next-generation sequencing, bioinformatics, and/or other related skills necessary for the implementation of AMD. The program strongly encourages states and localities to make use of existing regional training networks, the program will also consider proposals that are not regional (i.e., that focus on a single state or locality).

(2) Bioinformatics Resource Support Component:

Funds should be requested for: staff time (if the half-time bioinformatician is on staff), or, if the health department is contracting with a university for half of a bioinformatician’s time, the costs of acquiring those services (i.e., the costs of the contract or whatever mechanism is being used); travel costs for work around the region; other costs associated with performing this function.

- Approximate number of awards: 2 to 5
- Approximate average per award: $50,000 to $150,000

(3) AMD Capacity Component (i.e., extending the application of AMD technologies):

- Approximate number of awards: 5 to 15
- Approximate average per award: $20,000 to 100,000

v. Strategies and Activities:

The largest portion of CDC support for AMD implementation in state and local health departments is currently through specific programs, including PulseNet, Tuberculosis, Hepatitis C, Influenza, Combating Antibiotic Resistant Bacteria (CARB), and others. Applicants seeking funding in those areas should apply directly to the relevant sections of the ELC program (rather than through this section) or to other specific funding opportunity announcements (FOAs) sponsored by those programs.

Applicants to this section of ELC may apply for the (1) “Workforce Development”, (2) “Bioinformatics Resource Support” or (3) “AMD Capacity” components, or a combination of the three. When applying for the workforce development component, applicants should indicate whether they are proposing to be a training lead or training participant.

(1) Workforce Development Component:

This section of the announcement supports training for next-generation sequencing, bioinformatics, and/or other related skills necessary for the implementation of AMD. The program strongly encourages states and localities to make use of existing regional training networks.
networks or, where necessary, to identify and develop new networks. Applicants should apply to be either a training “lead” or “participant”, and indicate which.

a) Training lead. States and localities are encouraged to work with others in their region to develop discrete local or regional training networks (see note below [*] about regions), with one laboratory taking the lead. Existing training networks (*) are encouraged to apply and are also encouraged to incorporate local or regional resources where possible. For example: working with universities or other public or private institutions with NGS and bioinformatics capacity to develop trainings and foster collaborations. Training leads should solicit funds to engage in activities such as:

- Hosting new and existing trainings, collaborating with local or regional partners where possible.
- Conducting training evaluations to measure impact of course(s) and perform continuous improvement of training program.

Training leads should reach out to participants within their network to coordinate training efforts and indicate in their applications that they have done so.

b) Training participant. States and localities who will be sending staff to participate in regional trainings should apply for this section. Participant states and localities should solicit funds to engage in activities such as:

- Sending staff to be trained at in-person courses and workshops on NGS, bioinformatics, and/or other AMD-related activities.
- Enabling staff to participate in webinars and other structured online content.
- Participating in needs assessment of AMD workforce as requested by training labs.
- Providing evaluation and feedback on training materials and content delivery.

Training participants should indicate that they have been in contact with the “lead” of the training network and are coordinating with that lead.

The training can be in any form (classroom training, online training, etc.) appropriate to the setting. A compendium of existing training opportunities, including online training opportunities, is posted on CDC’s Web site (http://www.cdc.gov/amd/pdf/environmental-scan-08-04-15.pdf) to assist in developing proposals, but applicants are not limited to opportunities on that list. The AMD program will also make available a sample AMD training curriculum based on experience at CDC to aide in the development and delivery of training. Applicants are encouraged to make training materials (i.e. Presentations, webinars, exercises, etc.) available to the broader public health community.

(2) Bioinformatics Resource Support Component:

With this component, the AMD program aims to begin supporting a network of regional bioinformaticians (see note below [*] about regions) to foster the development of bioinformatics capacity at the state and local level. The regions supported in this component (*) should be consistent with the seven PulseNet regions (https://www.cdc.gov/pulsenet/participants/index.html); the lab supporting the bioinformatician for this component may be the same as or may be different from the PulseNet Area Lab servicing the region. For the current fiscal year, the AMD program will support these
bioinformaticians half-time. The program anticipates that some applicants will choose to use this component to support a new or existing bioinformatics staff member to perform this activity half-time while other applicants may wish to enter into a contract or other arrangement with an affiliated academic institution to support a bioinformatician to perform these duties. This bioinformatician’s responsibilities could include such activities as the following:

- Working with states and large localities in the region to assist with trainings such as those supported in the “workforce development” component or to organize additional trainings—either regional or within-state.
- Assisting states and large localities in the region in bioinformatics analysis, either by assisting staff in those organizations or by performing the analysis themselves.
- Consulting with state and local health agency IT departments on IT policy necessary to support AMD implementation.
- Collaborating with other regional bioinformaticians and CDC to create web-based training modules tailored to the needs of US public health microbiologists.
- Working with state labs and CDC to find sustainable, affordable solutions to state and local health department AMD-related informatics needs such as storage and cloud computing.
- Where needed and appropriate, work with state and local health departments to promote data sharing.

The AMD program will likely not support all regions in the first year (FY2017) of the program but will plan to expand to all regions in the future.

(3) AMD Capacity Component (i.e., extending the application of AMD technologies):

This component of the announcement will support a limited number of laboratories to introduce or extend AMD capacity within their laboratories or affiliated laboratories. These proposals may include equipment, supplies, services (such as cloud computing services) or personnel costs to cover AMD activities that are a priority to the state or locality and that are not covered elsewhere by the AMD program and not supported by other funding opportunity announcements (as noted above). Applicants should include justification for these activities (i.e., why developing capacity in this area is a priority for the state), including specific objectives and near-term (1 to 2 year) priorities. Funding for these activities will be considered on a year-to-year basis.

* Note on “regions” in this announcement: In promoting AMD capacity in state and local health departments, the AMD program does not intend to create a separate “AMD Network”, but rather to support existing networks, such as those that exist around foodborne disease (PulseNet), TB, or influenza, and to promote the adoption of AMD technology within those networks. However, the program recognizes a limitation of that approach: that it doesn’t address a cross-cutting need for workforce development—to provide microbiologists with an opportunity to get up-to-date on basic microbial genomics and to learn some basics of NGS and bioinformatics. Last year (FY2016), the AMD ELC announcement encouraged states to self-organize into “regional networks” for training, and for each network to partner with an academic institution. CDC imposed no requirements on the structure of those networks, allowing states to propose whatever groupings made the most sense in the local context. For
this year (FY2017), CDC is encouraging networks established in FY2016 to continue, and where appropriate, to expand. CDC and APHL are available to help in organizing these regions where needed.

The approach to developing bioinformatics in health departments is different. The approach recognizes: (1) that bioinformatics is a completely new discipline in almost all health departments; (2) that bioinformatics is very different from most of microbiology in that it is intensively quantitative and often dependent on specialized computational resources; and (3) that the current marketplace for bioinformaticians is highly competitive. The approach here is different from that of “workforce development” described above. CDC is starting by designating a small number (seven) of regions and developing regional bioinformatics resources in those regions. OAMD has chosen to use the PulseNet regions for this, since these regions are already being used for two AMD-related projects: PulseNet WGS and the Antibiotic Resistance Laboratory Network. For this year (FY2017), the program is hoping to pilot this in a few of the seven regions, and to expand on this in upcoming years.

Thus, here, in the AMD section of the ELC announcement, “regions” is used in 2 contexts: the ad-hoc, self-organized training regions for the “workforce development component” (component 1), and the PulseNet regions for the long-term development of bioinformatics in the “bioinformatics resource support component” (component 2).

### 1. Collaborations –
  a. With CDC funded programs:
  
  Collaboration and exchange of data, materials and resources with CDC programs implementing AMD activities

  b. With organizations external to CDC:
  
  Collaboration and exchange of data, materials and resources with other state health departments implementing AMD activities

### 2. Target Populations:

Not applicable

a. Evaluation and Performance Measurement:

i. CDC Evaluation and Performance Measurement Strategy:

<table>
<thead>
<tr>
<th>1. Workforce development component</th>
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<tbody>
<tr>
<td>a. Needs assessment completed</td>
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<tr>
<td>b. Number of staff who complete trainings</td>
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<tr>
<td>c. Number of staff trained to perform bioinformatics/data analysis techniques</td>
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<tr>
<td>d. Number of training curricula developed</td>
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<td>e. Number of trainings held</td>
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<td>f. Number of training evaluations completed</td>
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<tr>
<th>2. Bioinformatics resource support component</th>
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<tbody>
<tr>
<td>a. Number of phone consultations with states in the region</td>
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<tr>
<td>b. Number of in-person consultations with states in the region</td>
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<td>c. Number of trainings held</td>
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<th>3. AMD capacity</th>
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<tbody>
<tr>
<td>a. Applicants should propose at least one performance measure based on the activity they plan to carry out; and the applicant should coordinate with OAMD upon receipt of funding to develop appropriate performance measures.</td>
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# ATTACHMENT

## F: Public Health Laboratory Sustainability: Regional Networks for Service Sharing

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Public Health Laboratory Sustainability: Regional Networks for Service Sharing</th>
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<tbody>
<tr>
<td><strong>Program Activity Contact Information</strong></td>
<td>John Ridderhof 404-498-0469</td>
</tr>
<tr>
<td><strong>Funding Opportunity Description</strong></td>
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<tr>
<td><strong>Background</strong></td>
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<tr>
<td>a. <strong>Healthy People 2020:</strong></td>
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<tr>
<td>Public Health Infrastructure Objective 11: Increase the proportion of Tribal and State public health agencies that provide or assure comprehensive laboratory services to support essential public health services.</td>
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<tr>
<td>b. <strong>Other National Public Health Priorities and Strategies:</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>CDC Project Description</strong></td>
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<tr>
<td>i. <strong>Problem Statement:</strong></td>
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<td>State and other public health laboratories (PHLs) perform an important and indispensable role in rapidly and accurately determining the exact causes of emerging infectious disease (EID) outbreaks and other public health threats. But their capacity to fulfill that role is constantly challenged by funding and staffing and by the technical challenges posed by rapidly evolving informatics needs and testing technologies. Many PHLs have decreased the testing services offered or have been unable to adopt new tests that may benefit their population. Consequently, there is uneven access to testing services for public health programs in the different states and territories. In addition, outside of the formal referral center models and other network structures directed by CDC, state/local PHLs tend to operate independently. Thus, PHLs each struggle with developing their own solutions to challenges encountered with trying to provide various services to their health departments and jurisdictions.</td>
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<tr>
<td>ii. <strong>Purpose:</strong></td>
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| APHL and CDC have developed a number of stakeholder-driven strategies to increase the ability to sustain quality testing services, ensure flexibility in the adoption of new services and technologies, and ensure a well-trained workforce. One of these strategies is encouraging multistate regional networks that: 1) share information, training, and testing services between states; 2) have the infrastructure, relationships, and flexibility to assist member PHLs with surge needs and in outbreaks and emergencies; and 3) ensure access to new specialized testing services that might not be immediately available in every state.  
**Therefore, the purpose of this ELC component is to support PHL service sharing through forming and sustaining of regional networks or consortia between state PHLs (which may also include territorial and local PHLs). The intent is to support self-sustaining networks that address multiple activities and not those that focus on a single topic or testing service.** |

CDC commissioned pilot projects as part of the Laboratory Efficiencies Initiative (LEI) in 2011 to evaluate regional networks as a strategy to sustain PHL testing systems and services in an environment of reduced government funding and evolving services. Preliminary information
from two pilot projects demonstrated that state and local laboratories in regional networks tend to gain, rather than lose, additional services through local partnerships. The continuing goal is to support and expand the number of states that chose to participate in regional networks as a strategy to help ensure that the PHL system maintains the capacity to perform essential test services by improving its effectiveness, efficiency, and long-term sustainability. The multistate networks supported by this ELC component are intended to:

- Enable network members to make state-directed decisions across multiple testing areas and other services based on local needs
- Encourage peer-to-peer sharing of information, resources, and best practices to help identify practical solutions to address shared challenges (e.g., regarding billing, procurement, informatics, staff training and development).
- Nurture relationships and infrastructure that support surge, Continuity of Operations Planning, and other needs.
- Allow PHLs to gain services through the enhanced partnerships and activities of the network

### iii. Outcomes:

#### Short-Term Outcomes

- Availability of information on laboratory testing capacities and capabilities within jurisdictions and across the multistate network/consortia.
- Increased logistical, legal, and informatics capacity to refer or receive testing with other PHLs within the network.
- More efficient testing (or gain of a testing service) for specialized or low-volume EID tests.
- Increased regional access to training and/or other services and information within the network/consortium.
- Strengthened preparedness for surge and other events.

#### Mid-Term Outcomes

- Improved surveillance, investigation, and response to public health threats, due to heightened joint capacity and coordination.
- Improved coordination with, and support for, public health programs and health care providers through increased access to specialized testing services that may not be available in each state.
- Improved sustainability due to the sharing of information, training, and other resources that support staff professional development and laboratory management practices.

### iv. Funding Strategy:

Support will be provided to existing regional networks and for the formation of new PHL service sharing networks/consortia. Funds can be used for: 1) travel and supplies for meeting participation/planning and 2) delivery of shared training and other staff professional development activities. Applicants noted as a ‘designated lead’ for a network or consortium will be eligible for a higher level of funding commensurate with the additional responsibilities.
• Total Availability of funds: Approximately $180,000
• Approximate number of awards given: 7
• Approximate range of award: $20,000-$30,000

v. Strategies and Activities:

1) Improve laboratory coordination and outreach/information flow (2b)
   • Share information and data on the test services and informatics capabilities of each PHL participating in a regional network through use of the Public Health Laboratory System Database (URL to follow) and the Informatics Self-Assessment Tool for Public Health Laboratories (Available at https://www.aphl.org/programs/informatics/Pages/Informatics-Self-Assessment-Tool.aspx) [Required]
   • Assess the legal and operational/logistical capacity to share tests with other PHLs within the network. [Required]
   • With network partners, formulate a shared plan and support for developing regional testing capability, including, for example:
     ▪ Identification of shared tests and other services between PHLs in the network [Required]
     ▪ Achievement of HL7-compliant electronic test ordering and results reporting or web portal solutions between PHLs within the network [Optional]
     ▪ Development of supportive MOUs or other agreements [Optional]
     ▪ Development of capability to support region-wide surge and COOP plans as demonstrated by active test sharing and plans for additional sharing in emergencies [Optional]
     ▪ Sharing of training and other resources (e.g., clinical lab survey instruments, IQCP strategies) that support any of the many functions of PHLs, including quality management systems, testing capabilities and capacity [Optional]
   • Implement test service sharing plans with network PHLs [Required]
   • Evaluate the impact that test service sharing has on surveillance, investigation, and response to public health threats such as EID events. [Optional]

1. Collaborations –
   a. With CDC funded programs:
      Not applicable.
   b. With organizations external to CDC:
      Each PHL must have engaged in preliminary discussions with potential network partners and received tentative commitments from each to either further explore creating a multistate network or to continue participation in an existing network. Each proposed or established network should include at least 4 U.S. state or territorial PHLs. Local PHLs may be included in an existing or proposed network/consortium, but they do not count toward the minimum of 4 state or territorial PHLs. For proposed networks, priority will be given to those that use
existing PulseNet/Antimicrobial Resistance (AR) regions so as to help unify regional network structure across the U.S.

Each participating PHL must coordinate its application with those of the other PHLs with which it proposes to participate in a network. Each application should contain a common, shared plan for the network. For existing or proposed networks, PHLs not submitting an application because they are not individually requesting funds should still submit letters of support, agreement, or intent concerning participation in the existing or proposed network. Each PHL is required to coordinate closely with the other PHLs that propose to participate in a network in all the project implementation activities.

### 2. Target Populations:

Not applicable

<table>
<thead>
<tr>
<th>a. Evaluation and Performance Measurement:</th>
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<tr>
<td>i. CDC Evaluation and Performance Measurement Strategy:</td>
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Required performance measures for the project period are listed below. Data will be reported on an annual basis and will be used to indicate progress toward the specific program outcomes:

1) Process measures:
   - Formulation or updating of a shared, multistate PHL network plan
   - Sharing of test service and informatics capabilities data with other network members
   - Progress reports on planning for, and implementation of, multistate test and other service sharing from each network member

2) Outcome measures:
   - Number of network member PHLs that complete or update their information in the Public Health Laboratory System Database
   - Number of network member PHLs that complete a baseline or updated Informatics Self-assessment
   - Development or updating of MOUs (or other agreements) that support shared testing and other services
   - Number of newly shared testing services, including improved electronic test ordering and results reporting capabilities and specimen transportation
   - Number of new technology/testing platforms to which network/consortium members have access
   - Number of additional services and resources (e.g., training materials, IQCP strategies, QMS protocols) to which network/consortium members have access
**ATTACHMENT**

**G: Enhanced Evaluation Capacity**

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christina Chung, (404) 639-3988</td>
</tr>
</tbody>
</table>

**Funding Opportunity Description**

**Background**

<table>
<thead>
<tr>
<th>a. Healthy People 2020:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public Health Infrastructure Goal</strong>: To ensure that Federal, State, Tribal, and local health agencies have the necessary infrastructure to effectively provide essential public health services.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. Other National Public Health Priorities and Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

**CDC Project Description**

<table>
<thead>
<tr>
<th>i. Problem Statement:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program evaluation is a valuable tool for improving the way public health actions are conducted. Across jurisdictions, public health agencies often lack the capacity to perform evaluation activities, with resources notably absent in the area of infectious diseases. Data from CSTE’s Epidemiology Capacity Assessments suggests that among epidemiologists working at state health departments, the ability to ensure and assist in evaluation of programs, as well as develop program logic models and theories of action, are low. Limited evaluation capacity across jurisdictions in infectious disease programs limits CDC’s and awardees' ability to understand the effectiveness of and opportunities to improve the implementation of ELC activities and strategies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ii. Purpose:</th>
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</thead>
<tbody>
<tr>
<td>The main purpose of this funding will go towards conducting an in-depth evaluation project that seeks to collect information to improve the practice and demonstrate the effectiveness of ELC-funded strategies and activities towards ELC project-specific outcomes. Project must clearly link to an ELC-funded project component (e.g., Cross-Cutting Epidemiology, Health Information Systems, Waterborne, HAI, etc.). More specifically, projects may focus on, but are not limited to, ELC strategies and activities such as: educational and outreach programs, prevention programs, implementation of public health policies, public health surveillance activities and systems (e.g., reportable infectious disease surveillance, sentinel surveillance, syndromic surveillance), economic evaluations (i.e., cost benefit and cost effectiveness analyses), etc. The secondary aim of this funding is to address evaluation capacity within the awardees’ jurisdictions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>iii. Outcomes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>This project will contribute to the overall strengthening of evaluation capacity within awardees’ jurisdictions. Awardees will implement a project that will help contribute to a better understanding of the effectiveness of ELC strategies and activities, develop an evidence base for strategies and activities, and understand how to improve the development and implementation of ELC program strategies and activities. Awardees will also strengthen evaluation capacity in their jurisdiction by providing evaluation assistance to other projects, as needed. Ultimately, this will help make better informed decisions on how to improve the practice and effectiveness of public health infectious disease activities within ELC jurisdictions and the ELC program.</td>
</tr>
</tbody>
</table>

| iv. Funding Strategy: |
Funds should be used for personnel (i.e., full or part-time program evaluator), trainings, supplies, contracts, travel, and other requisite support to implement an evaluation project and build evaluation capacity within the jurisdiction.

- Total availability of funds: $500,000
- Approximate number of awards given: 5
- Approximate average per award: $100,000

v. Strategies and Activities:

All applicants should incorporate the steps and activities identified in the CDC Framework for Program Evaluation (www.cdc.gov/eval/framework/index.htm) to conduct their program evaluation. Activities below are all required and should be incorporated into your proposed work plan (i.e., activities, milestones). Project must clearly link to an ELC-funded project component (e.g., Cross-Cutting Epidemiology, Health Information Systems, Waterborne, HAI, etc.).

1) Implement and evaluate public health practice, and prevention and control strategies (1c)
   a. Identify a group of stakeholders and partners (e.g., program staff in the health department, leaders, clients, academic institutions) who will be involved in phases of the evaluation. Different stakeholders may be engaged in different phases and the specific roles and activities for each should be clearly established. Continually engage, communicate and collaborate with stakeholders throughout all phases of the evaluation.
   b. Finalize an evaluation plan that includes an introduction describing the program or activity being evaluated (i.e., major goals/objectives, logic model); evaluation focus (i.e., purpose of evaluation, need for the collection of information, and evaluation questions); description of the planned evaluation methods and evidence to be collected (e.g., data collection plan, instruments, data analysis procedures); a timeline incorporating major activities of the implementation of the evaluation plan; and a description of how results will be shared and used.
   c. Identify and collect qualitative and quantitative data from appropriate sources to address evaluation questions. Awardees are responsible for the management and analysis of the data collected. Data collection methods will vary depending on the type of project to be implemented.
   d. Disseminate and share interim progress reports and final findings and recommendations to stakeholders, members of the ELC governance team and intended users of the results. Share findings that are learned from the evaluation throughout the process (not just the end of the evaluation) on a regular basis through staff meetings, ELC grantee meetings, conference calls, presentations, manuscripts, and/or reports. Help ensure and guide the use of findings with intended users.
   e. Provide support for general monitoring and evaluation activities for other ELC-funded projects (i.e., development, monitoring and reporting of performance measures). In addition to the implementation of a clearly defined ELC evaluation project, awardees may use this funding to support required and other evaluation activities for ELC.
   f. Enhance program evaluation skills by participating in trainings and presenting findings at meetings (e.g., workshops, meetings, conferences, webinars, etc.) Awardees may also
apply for funding to attend the 2018 ELC Annual Meeting tentatively planned for the Spring-Summer of 2018. Travel that is approved and funded by CDC will be considered a required activity.

1. Collaborations –
   a. With CDC funded programs:

   CDC’s expectation is that the awardee will continually engage and work with CDC during the implementation of the project. The awardee will participate on quarterly, at the minimum, group check-in calls and discussions with other awardees. When appropriate, collaboration on evaluation activities with other CDC programs is highly encouraged.

   b. With organizations external to CDC:

   Optional. When appropriate, grantees are encouraged to collaborate with others to conduct evaluation activities. Possible partners could be located within health departments, academia, or agencies within the community. If chosen, applicant must provide evidence of prior collaborations with such groups and describe the organization’s role in achieving project outcomes, and how the applicant will interact with the program in specific terms. Prior achievements and evidence may be provided as an MOU, MOA, or letters of support.

2. Target Populations:

   Not applicable

   a. Evaluation and Performance Measurement:

      i. CDC Evaluation and Performance Measurement Strategy:

      CDC expects awardees to report on progress made toward activities on at least a quarterly basis through phone calls, emails and annual progress reports. Final evaluation report(s) summarizing results and findings will be due at the end of the project period but if you are a current awardee applying for continued funding please submit drafts of evaluation reports and findings along with your application for continuation funding. This should be attached in the appendix.

      If you are a new applicant applying for funding, you should submit an application, as well as an evaluation proposal attached in the appendix that includes the following elements:

      a. Written description of activity, intervention, or program that is evaluated, including major objectives/goals of the activity, intervention, or program
      b. Logic model of activity, intervention, or program that is evaluated
      c. Description that justifies importance for evaluating the project, including need for information and purpose
      d. Major evaluation questions
      e. Description of planned evaluation methods and evidence to be collected (e.g., data sources, data collection instruments, data analysis procedures)
      f. Timeline describing implementation of projec
ATTACHMENT

H1: Cross-Cutting Outbreak Investigation Response and Reporting:
Epidemiology and Laboratory Outbreak #1

Program Activity Contact Information
Alvin Shultz, ELC Program Coordinator (404) 639-7028

Funding Opportunity Description

Background

a. Healthy People 2020:
Not applicable.

b. Other National Public Health Priorities and Strategies:
Not applicable.

CDC Project Description

i. Problem Statement:
If the factors giving rise to outbreaks could be predicted, then those associated outbreaks might never occur. Nonetheless, the world of public health is in some state of preparedness or preparation for a variety of outbreaks such as threats related to novel influenza A, expanding arboviral disease vectors, foodborne pathogens, etc. Other types of outbreaks (e.g., SARS in 2002/2003 and fungal meningitis in 2012) may be far less anticipated. However, one commonality between most outbreaks is resources available to mitigate them often only become available after the outbreak event occurs and becomes a public health emergency. Due to the unpredictable nature of outbreaks and the lag in resources, jurisdictions need a ready mechanism to provide support for a range of infectious disease threats.

ii. Purpose:
This potential funding is envisioned to provide additional laboratory, epidemiologic and/or health information systems surge capacity necessary for an effective response to an outbreak emergency.

iii. Outcomes:
State and local health departments better prepared to respond to outbreaks including more timely and efficient efforts for detection, investigation and implementation of control measures.

iv. Funding Strategy:
Funding may be requested to support (depending on baseline capacity) temporary personnel, additional laboratory or office supplies, specimen shipping costs, and any other supplies needed for an effective response to an outbreak-related emergency. Funds may be available on the condition of a local or national outbreak. Please request and have a plan for approximately $500,000 per jurisdiction (small jurisdictions may request less while very large jurisdictions may request more). Activities in this section will only be funded should outbreak conditions warrant. Applicants should limit their response to no more than one page.

v. Strategies and Activities:
1) Enhance outbreak investigation response and reporting (1a)
a. Depending upon current baseline capacity, conduct specimen collection, shipping, case/contact/control interviews and medical record review, and transmit results to CDC to enhance the ability to rapidly respond to outbreaks.

2) Improve laboratory coordination and outreach/information flow and maintain and enhance integrated surveillance information (2b, 3c)
   a. Depending upon current baseline capacity, enhance the ability of the laboratory/health information system to rapidly respond to outbreaks.

<table>
<thead>
<tr>
<th>1. Collaborations –</th>
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<tbody>
<tr>
<td>a. With CDC funded programs:</td>
<td></td>
</tr>
<tr>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>b. With organizations external to CDC:</td>
<td></td>
</tr>
<tr>
<td>Not applicable</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Target Populations:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>a. Evaluation and Performance Measurement:</td>
<td></td>
</tr>
<tr>
<td>i. CDC Evaluation and Performance Measurement Strategy:</td>
<td></td>
</tr>
<tr>
<td>• Report describing how resources awarded were used during the outbreak, including activities that were conducted that otherwise would not have been (or conducted faster/more completely).</td>
<td></td>
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</table>
### ATTACHMENT

**H2: Cross-Cutting Outbreak Investigation Response and Reporting:**

**Epidemiology and Laboratory Outbreak #2**

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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</thead>
<tbody>
<tr>
<td>Alvin Shultz, ELC Program Coordinator (404) 639-7028</td>
</tr>
</tbody>
</table>

#### Funding Opportunity Description

**Background**

- **a. Healthy People 2020:**
  
  Not applicable.

- **b. Other National Public Health Priorities and Strategies:**
  
  Not applicable.

#### CDC Project Description

- **i. Problem Statement:**
  
  If the factors giving rise to outbreaks could be predicted, then those associated outbreaks might never occur. Nonetheless, the world of public health is in some state of preparedness or preparation for a variety of outbreaks such as threats related to novel influenza A, expanding arboviral disease vectors, foodborne pathogens, etc. Other types of outbreaks (e.g., SARS in 2002/2003 and fungal meningitis in 2012) may be far less anticipated. However, one commonality between most outbreaks is resources available to mitigate them often only become available after the outbreak event occurs and becomes a public health emergency. Due to the unpredictable nature of outbreaks and the lag in resources, jurisdictions need a ready mechanism to provide support for a range of infectious disease threats.

- **ii. Purpose:**
  
  This potential funding is envisioned to provide additional laboratory, epidemiologic and/or health information systems surge capacity necessary for an effective response to an outbreak emergency.

- **iii. Outcomes:**
  
  State and local health departments better prepared to respond to outbreaks including more timely and efficient efforts for detection, investigation and implementation of control measures.

- **iv. Funding Strategy:**
  
  Funding may be requested to support (depending on baseline capacity) temporary personnel, additional laboratory or office supplies, specimen shipping costs, and any other supplies needed for an effective response to an outbreak-related emergency. Funds may be available on the condition of a local or national outbreak. Please request and have a plan for approximately $500,000 per jurisdiction (small jurisdictions may request less while very large jurisdictions may request more). **Activities in this section will only be funded should outbreak conditions warrant.** Applicants should limit their response to no more than one page.

- **v. Strategies and Activities:**
  
  3) **Enhance outbreak investigation response and reporting (1a)**
b. Depending upon current baseline capacity, conduct specimen collection, shipping, case/contact/control interviews and medical record review, and transmit results to CDC to enhance the ability to rapidly respond to outbreaks.

4) Improve laboratory coordination and outreach/information flow and maintain and enhance integrated surveillance information (2b, 3c)

3) Depending upon current baseline capacity, enhance the ability of the laboratory/health information system to rapidly respond to outbreaks.

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<th>1. Collaborations –</th>
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</thead>
<tbody>
<tr>
<td>a. With CDC funded programs:</td>
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<tr>
<td>Not applicable</td>
</tr>
<tr>
<td>b. With organizations external to CDC:</td>
</tr>
<tr>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Target Populations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
</tr>
<tr>
<td>a. Evaluation and Performance Measurement:</td>
</tr>
<tr>
<td>i. CDC Evaluation and Performance Measurement Strategy:</td>
</tr>
<tr>
<td>• Report describing how resources awarded were used during the outbreak, including activities that were conducted that otherwise would not have been (or conducted faster/more completely).</td>
</tr>
</tbody>
</table>
Section 2: Disease-specific ELC activities (Projects I-Z)

Foodborne Disease Activities (I1-I6)

ATTACHMENT

I1: Enteric Disease Outbreak Surveillance, Response, and Reporting Capacity
(OutbreakNet, NORS, OutbreakNet Enhanced, and FoodCORE Programs)

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>OutbreakNet/OutbreakNet Enhanced/FoodCORE: Gwen Biggerstaff (<a href="mailto:fke8@cdc.gov">fke8@cdc.gov</a>; 404-639-4814) and Anna Newton (<a href="mailto:ivz9@cdc.gov">ivz9@cdc.gov</a> 404-639-2839); NORS: Sam Crowe (<a href="mailto:yeo2@cdc.gov">yeo2@cdc.gov</a> 404-639-0195) and Karunya Manikonda (<a href="mailto:hum6@cdc.gov">hum6@cdc.gov</a> 404-639-3530).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Funding Opportunity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td>a. <strong>Healthy People 2020:</strong></td>
</tr>
<tr>
<td>Healthy People 2020 Goals for Food Safety include reducing the number of infections caused by key pathogens transmitted commonly through food, and reducing the number of outbreak-associated infections due to Shiga toxin-producing <em>E. coli</em> O157, <em>Campylobacter</em>, <em>Listeria</em>, or <em>Salmonella</em> associated with five food commodity groups.</td>
</tr>
</tbody>
</table>

| **b. Other National Public Health Priorities and Strategies:** |
| Food Safety is one of CDC’s Winnable Battles. |

<table>
<thead>
<tr>
<th>CDC Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. <strong>Problem Statement:</strong></td>
</tr>
<tr>
<td>Enteric disease outbreak investigations are an essential public health function. Investigations require close collaboration between state, local, and federal agencies. Prompt and effective outbreak investigations and reporting of outbreak data are necessary to identify and remove contaminated food from the market, prevent further illnesses, and focus prevention strategies on critical contamination points in the path from farm to table.</td>
</tr>
</tbody>
</table>

| ii. **Purpose:** |
| Enhance capacity for detection, investigation, control, and reporting of enteric disease outbreaks. |

| iii. **Outcomes:** |
| • Improved enteric disease outbreak detection and response |
| • Improved capacity of state and local health officials to fully investigate and respond to enteric disease outbreaks |
| • Improved routine surveillance of enteric illness |
| • Improved timeliness of patient interviews |
| • Improved completeness of foodborne disease and animal contact outbreak reporting |

| iv. **Funding Strategy:** |
| Recommended use of funds: |
| • At least one MPH-level epidemiologist dedicated to the investigation and reporting of enteric disease outbreaks. |
• Training of local and state workers in enteric disease outbreak investigation methodology, including equipment and educational material for training sessions, travel to and from training sessions, and refresher courses.
• Attendance and travel of one epidemiologist to the annual InFORM Conference or Joint PulseNet/OutbreakNet regional meeting (failure to use funding to support this travel may influence funding in future years).
• Supplies, computer equipment, and data entry personnel necessary for sites to maintain and enhance outbreak reporting.
• (For Section C. OutbreakNet Enhanced or Section D. FoodCORE, below) Dedicated personnel such as student teams or regional interviewers or other approaches to support capacity to conduct rapid interviews of cases of enteric disease.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Funds Available</th>
<th>Number of Awards</th>
<th>Average Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>OutbreakNet/NORS</td>
<td>$2,900,000 - $3,500,000</td>
<td>up to 54</td>
<td>$58,000</td>
</tr>
<tr>
<td>OutbreakNet Enhanced</td>
<td>$2,900,000 - $3,500,000</td>
<td>approximately 25</td>
<td>$150,000 - $225,000</td>
</tr>
<tr>
<td>FoodCORE</td>
<td>approximately $3,000,000</td>
<td>10</td>
<td>$400,000</td>
</tr>
</tbody>
</table>

v. Strategies and Activities:
In addition to responding to the strategies and activities related to this attachment, applicants for any foodborne component (I1-I6) of the Epidemiology and Laboratory Capacity cooperative agreement are requested to include an executive summary of your jurisdiction’s enteric disease detection, investigation, control, and reporting program to greatly reduce the need to repeat this background information in each subcomponent. The executive summary should not exceed two pages and should include the following:

• A clear and succinct description of your overarching programmatic approach to detect, investigate, control, and report enteric disease cases and outbreaks (including those transmitted by food, water, or other routes). This summary should be provided in Report Template I0, and describe the comprehensive foodborne disease program (not limited to the portion which is federally funded). Inclusion of waterborne disease, environmental health and other programs (e.g., EHS-Net, norovirus, and legionellosis, etc.) when applicable is strongly encouraged.
• The organizational structure of all enteric disease programs (i.e., organizational charts).
Additionally, to enhance and complement states’ foodborne disease and food safety efforts, it is expected that applicants develop and foster close programmatic relationships with all organizational units whose overarching goals and objectives include detection, investigation, control, and reporting enteric disease cases and outbreaks. Applicants should also describe the following:

- Current or planned efforts to work across programmatic units (e.g., OutbreakNet, NARMS, PulseNet, FoodCORE, NORS, etc.) to encourage participation, cooperation, and reduce duplicative efforts.
- Current or planned efforts to access available resources (e.g., CDC technical assistance, Integrated Food Safety Centers of Excellence, Peer-to-peer mentorship/assistance, etc.) to enhance jurisdictional food safety capacity.

The following activities in Sections A and B are required for OutbreakNet and NORS funding recipients.

A. OutbreakNet

1. Improve outbreak investigation response and reporting (1a)
   a. Ensure personnel responding to outbreaks have sufficient training to conduct the analysis of epidemiologic data related to clusters detected through PulseNet, the ability to use Line List Editor in SEDRIC (System for Enteric Disease Response, Investigation, and Coordination) to submit epidemiologic data to CDC during multistate investigations (https://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/sedric.html)

2. Implement model practices to enhance the timeliness and efficiency of outbreak investigations (1a). Model practices include but are not limited to:
   a. Conduct rapid interviews of cases of enteric disease using standard questionnaires or data elements that are specified in pathogen-specific Council of State and Territorial Epidemiologists positions statements
   b. Conduct rapid interviews and additional/focused investigation activities during multistate enteric disease cluster and outbreak investigations
      i. All cases of *Salmonella* infection identified as part of a multistate investigation using the data elements specified in the “Standardized National Hypothesis Generating Questionnaire” (OMB. 0920-0997) which can be accessed here: http://www.cifor.us/clearinghouse/uploads/NationalHoQues_Fillable_OMB09200997.pdf?CFID=21919678&CFTOKEN=16531536&jsessionid=0E4990498FC752278DC283B8D8C39AC7.cf fusion
ii. All cases of Salmonella, STEC, and Listeria infection using outbreak-specific questionnaires when they are developed by CDC during specific multistate investigations.
   1. Collect the date of notification to epidemiology staff for cases of Salmonella, STEC, and Listeria that are part of a multistate investigation
   2. Collect the date of interview completion for outbreak-specific questionnaires developed by CDC as part of a multistate investigation.

iii. Conduct additional/follow-up investigations prompted by detection of a cluster or local outbreak, including participating fully in CDC-led multistate outbreak investigations, and in assessment of cases with patterns matching isolates from foods or other sources
   1. Collect information from well persons as part of analytic epidemiologic studies for multistate outbreak investigations.
   2. Obtain product information from persons infected with a strain of bacteria that matches by PFGE (or other subtyping) a strain identified in a product.
   3. Conduct hypothesis-generating interviews (open-ended and using hypothesis-generating questionnaires) as needed during investigations.

c. Travel at least one epidemiologist to attend the annual InFORM Conference or Joint PulseNet/OutbreakNet regional meeting.

B. NORS
1. 
   a. 
   b. 
2. Improve foodborne disease and animal contact outbreak report data completeness (1b and 1d)
   a. Work with the CDC NARMS team to submit isolates from every outbreak caused by diarrheagenic Escherichia coli, Salmonella, and Shigella.
   b. Work with the CDC NORS team and the Outbreak Response Team to report multistate exposure and multistate residency outbreaks.
   c. Work with the CDC NORS team to validate and to clean foodborne disease and animal contact outbreak data contained in NORS reports (Form 52.13) during annual data cleaning.

The following activities in Section C are for grantees applying for OutbreakNet Enhanced funding. If applying for these additional funds, grantees should submit a work plan that
addresses all the activities under OutbreakNet/NORS (Sections A and B, above) and all the activities under OutbreakNet Enhanced (Section C, below). For grantees applying for OutbreakNet Enhanced funding, a single budget should be submitted that covers section A, B, and C activities.

C. OutbreakNet Enhanced

1. Work with Integrated Food Safety Centers of Excellence
   a. Identify and implement at least one specific project or training that engages an Integrated Food Safety Center of Excellence (CoE); this could be a hands-on project or application of existing CoE-developed tools

2. Report performance metrics
   a. Report data from the selected set of metrics to CDC program staff annually (see Evaluation section C below)

3. Implement centralized (at state-wide or state-based regions level) rapid interviewing
   a. Collect demographic, clinical, risk factor, and other information using a standard form, ideally as soon as the case is identified, without waiting for the results of subtyping. All Listeria and STEC cases should be interviewed. Interviews should be attempted for all cases infected with a pathogen that have WGS/NARMS testing results, including Salmonella, Shigella, Campylobacter, and other pathogens. Attempts to interview as many Salmonella cases as possible should be made, in addition to all cases that are associated with multistate clusters or investigations, ideally as soon as the case is identified.

4. Implement improvements in conducting real-time review of subtyping results of Salmonella, STEC, and Listeria
   a. Evaluate interviews of possible cluster-associated cases to identify common exposures

5. Provide interview data to CDC during multistate investigations
   a. Provide data from routine interviews that may have already been conducted and from any outbreak-specific questionnaires used during an investigation

6. NORSDirect Participation
   a. In the first year, explore the use of NORSDirect for outbreak reporting to determine feasibility of implementation (https://www.cdc.gov/nors/norsdirect.html)
   b. If feasible, develop plan for participation in NORSDirect

7. National Environmental Assessment Reporting System (NEARS) Participation
   a. In the first year, explore completion of the NEARS free e-Learning on Environmental Assessment of Foodborne Illness Outbreaks course (http://www.cdc.gov/nceh/ehs/elearn/ea_fio/index.htm).
   b. If feasible, develop plan for participation in NEARS

8. Participate in monthly program conference calls with the CDC OutbreakNet Enhanced Team
The following activities in Section D are for grantees applying for continued FoodCORE funding. If applying for these additional funds, grantees should submit a work plan that addresses all the activities under OutbreakNet/NORS (Sections A and B, above) and all the activities under FoodCORE (Section D, below). For grantees applying for FoodCORE funding, a single budget should be submitted that covers section A, B, and D activities.

D. FoodCORE
Applicants must respond to all three core areas outlined below: 1) enhancement of public health laboratory surveillance, 2) epidemiological interviews and investigations, and 3) environmental health assessment. Applicants should describe plans to include all activities listed under each core area, as well as plans for the implementation and reporting of the established measurable performance indicators and metrics applicable to each core area. Applicants with existing federal infrastructure provided to conduct enteric disease surveillance and response activities should describe how programmatic activities in each core area will be synergized with the relevant programs.

1. Enhancement of public health laboratory surveillance, including but not limited to (Strategies: 1d, 2a, 2b, 3c):
   a. Ensure routine transportation of bacterial, viral or parasitic specimens from clinical labs to the public health laboratory.
   b. Conduct real time serotyping and PFGE subtyping of all strains of *Salmonella*, *Shiga* toxin-producing *E. coli* (STEC) and *Listeria* (completed within 4 working days of receipt at the public health laboratory).
   c. Use PulseNet to link by subtype and pulsed-field gel electrophoresis (PFGE) any pathogens identified from testing the implicated or suspect products to persons infected with the same strain of bacteria.
   d. Ensure transport of specimens from outbreak victims to the public health laboratories under conditions of uncertain diagnosis.
   e. Have a system to provide transport of Shiga toxin positive broths to state public health labs for real time isolation and subtyping of STEC.
   f. Have software links permitting rapid sharing of PulseNet information with epidemiology offices to facilitate interview and investigation.
   g. Conduct real-time video microscopy for submission to DPDx (a website for laboratory identification of parasites of public health concern).
   h. Conduct real time laboratory testing to characterize calicivirus strains that are linked to foodborne disease outbreaks and submit this data to CaliciNet (a network of public health laboratories that uses DNA sequence analysis for "fingerprinting" of foodborne viruses).
   i. Collect serologic samples from persons with hepatitis A virus infection linked to foodborne disease outbreaks for further molecular characterization.
2. Epidemiologic interviews and investigations, including but not limited to (Strategies: 1a, 1b, 1c, 1d, 3c):
   a. Conduct centralized (at state or regional level) rapid interviews to collect demographic, clinical, risk factor, and other information using a standard form for all diagnosed cases of infection with *Salmonella*, STEC, and *Listeria*, ideally as soon as the case is identified (without waiting for the results of subtyping). Additionally, interviews should be attempted for all cases infected with a pathogen that have WGS/NARMS testing results, including *Salmonella*, *Shigella*, *Campylobacter*, and other pathogens.
   b. Conduct real-time review of subtyping results of *Salmonella*, STEC, and *Listeria*, so that interviews of possible cluster-associated cases are evaluated together.
   c. Obtain product information from persons infected with a strain of bacteria that matches by PFGE a strain identified in a product.
   d. Participate in team training of local health department staff in methods of outbreak investigation.
   e. Explore the use of NORSDirect for outbreak reporting to determine feasibility of implementation (https://www.cdc.gov/nors/norsdirect.html)
      i. If feasible, develop plan for participation in NORSDirect

3. Environmental Health (EH) Activities, including but not limited to (Strategies: 1a, 1b, 1c, 1d, 3c):
   a. Conduct local environmental assessments during clusters, outbreaks, and complaints; gather information for tracing food sources as part of investigative team.
   b. Obtain implicated and suspect products for laboratory testing, as well as information (i.e., sell by dates, lot numbers) related to these products. The major focus is on products that may be shipped interstate and cause multi-state outbreaks.
   c. Provide, as part of the team, training of local environmental health specialists in methods of basic outbreak investigation.
   d. Participate in the National Environmental Assessment Reporting System (NEARS)
      i. In the first year, explore completion of the NEARS free e-Learning on Environmental Assessment of Foodborne Illness Outbreaks course (http://www.cdc.gov/nceh/ehs/elearn/ea_fio/index.htm).
      ii. If feasible, develop plan for participation in NEARS

Recipients should participate in monthly program conference calls and CDC FoodCORE Team site visits, and attend the annual FoodCORE Vision Meeting (location, date TBD).

1. Collaborations –
   a. With CDC funded programs:

   Includes but not limited to Integrated Food Safety Centers of Excellence, Foodborne Diseases Centers for Outbreak Response Enhancement (FoodCORE), PulseNet, Environmental Health Specialists Network (EHS-Net), FoodNet, NARMS, CaliciNet, and NoroSTAT. Applicants with existing federal infrastructure provided to conduct enteric disease surveillance and response
activities should describe how programmatic activities in each core area will be synergized with the relevant programs.

b. With organizations external to CDC:

Association of Public Health Laboratories, U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS), and the U.S. Food and Drug Administration (FDA).

2. Target Populations:

Not applicable

a. Evaluation and Performance Measurement:

i. CDC Evaluation and Performance Measurement Strategy:

Required performance measures for the project period are listed below; all measures listed are required. Data will be reported annually and are used to indicate progress made toward program outcomes. If data cannot be provided, describe for each measure the plan to collect this information; if data are available for a subset of this time period, describe existing data indicating the appropriate dates.

A. OutbreakNet

1. Exposure histories on all cases
   a. Listeria
      i. Total number of laboratory-confirmed listeriosis cases reported to National Notifiable Diseases Surveillance System (NNDSS) in the last calendar year (denominator).
      ii. Total number of laboratory-confirmed listeriosis cases interviewed with the current standard Listeria Initiative (LI) questionnaire in the last calendar year (numerator).
      iii. Proportion of reports using the current standard LI questionnaire in the last calendar year (ii/iii)

   b. STEC
      i. Total number of cases of laboratory-confirmed STEC reported to NNDSS in the last calendar year (denominator).
      iii. Proportion of reports using the standard list of data elements (see link in ii.) in the last calendar year (ii/iii).

Table. 1 Required Measures

| Exposure histories on all cases | i. Total number of laboratory-confirmed cases reported to National Notifiable Diseases Surveillance System (NNDSS) | ii. Total number of laboratory-confirmed cases interviewed with current standard questionnaire | iii. Proportion of laboratory-confirmed cases interviewed using current standard questionnaire |
2. Outbreak Response
   a. *Salmonella*
      i. Total number of *Salmonella* cases that were part of a multistate outbreak in which an outbreak-specific questionnaire developed by CDC for the investigation was used.
      ii. Total number of *Salmonella* cases interviewed with a CDC-developed outbreak-specific questionnaire as part of a multistate outbreak.
      iii. Proportion of *Salmonella* cases interviewed with a CDC-developed outbreak-specific questionnaires as part of a multistate outbreak.
      iv. Median time (in days) from date of notification to completion of *Salmonella* interview using an outbreak-specific questionnaire disseminated by CDC (based on the number of cases in ii.).

   b. *STEC*
      i. Total number of STEC cases that were part of a multistate outbreak in which an outbreak-specific questionnaire developed by CDC for the investigation was used.
      ii. Total number of STEC cases interviewed with a CDC-developed outbreak-specific questionnaire as part of a multistate outbreak.
      iii. Proportion of STEC cases interviewed with a CDC-developed outbreak-specific questionnaires as part of a multistate outbreak.
      iv. Median time (in days) from date of notification to completion of STEC interview using an outbreak-specific questionnaire disseminated by CDC (based on the number of cases in ii.).

   c. *Listeria*
      i. Total number of *Listeria* cases that were part of a multistate outbreak where an outbreak-specific questionnaire developed by CDC for the investigation was used.
      ii. Total number of *Listeria* cases interviewed with a CDC-developed outbreak-specific questionnaire as part of a multistate outbreak.
      iii. Proportion of *Listeria* cases interviewed with a CDC-developed outbreak-specific questionnaires as part of a multistate outbreak.
iv. Median time (in days) from date of notification to completion of *Listeria* interview using an outbreak-specific questionnaire disseminated by CDC (based on the number of cases in ii.).

Table. 2  **Required Measures**

<table>
<thead>
<tr>
<th>Outbreak Response</th>
<th>i. Total number of cases that were part of a multistate outbreak where an outbreak-specific questionnaire developed by CDC for the investigation was used (denominator)</th>
<th>ii. Total number of cases interviewed with a CDC-developed outbreak-specific questionnaire (numerator)*</th>
<th>iii. Proportion of outbreak-specific questionnaires returned to CDC</th>
<th>iv. Median time (in days) from date of notification to completion using an outbreak-specific questionnaire disseminated by CDC</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Salmonella</em></td>
<td>Ex: 70 cases</td>
<td>Ex: 20 interviewed</td>
<td>Ex: 28.5%</td>
<td>Ex: 2 days</td>
</tr>
<tr>
<td>STEC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Listeria</em></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

*outbreak-specific questionnaires disseminated by CDC during a multistate outbreak where a standard questionnaire was developed and used

**B. NORS**

NORS staff will calculate the following measures using 2017 foodborne and animal contact outbreak data. The staff will provide a summary to each NORS reporting site that describes and assesses site-specific performance. The summary also will include performance data aggregated from all of the reporting sites in order to give sites a sense of their relative performance. The NORS reporting form is available at [www.cdc.gov/nors](http://www.cdc.gov/nors).

1. Number of finalized foodborne disease outbreaks reported to NORS per 1,000,000 persons per year. Target: At least 2 outbreaks per million population per year.
2. Percentage of foodborne disease and animal contact outbreak reports first finalized within 60 days of the start of annual data cleaning. Target: At least 85%.
3. Percentage of foodborne disease and animal contact outbreak reports with each of the following fields completed when data are available. Target: 100%.
   a. Number of laboratory-confirmed cases (Primary Cases in the General Section on NORS form 52.13).
   b. Age groups of cases (Primary Cases in the General Section of NORS form 52.13).
   c. Sex of cases (Primary Cases in the General Section of NORS form 52.13).
   d. Number of hospitalizations and number of hospitalizations with information available (Primary Cases in the General Section of NORS 52.13).
   e. Number of deaths and number of deaths with information available (Primary Cases in the General Section of NORS form 52.13).
   f. Answer for “Is there at least one confirmed or suspected outbreak etiology(s)?” (Etiology Section of NORS form 52.13).
   g. Completion of etiology table, i.e., genus, species, etc. (Etiology in the Etiology Section of NORS form 52.13).
4. Percentage of foodborne disease and animal contact outbreak reports with a type of evidence selected for undetermined, suspected, and confirmed outbreak vehicles. (Reason(s) in the Food and Animal Contact sections of NORS form 52.13). Target: 100%.

5. Percentage of animal contact outbreak reports with vehicle data when a vehicle was identified. Target: 100% for each of the following fields.
   a. Type of animal (Animal Contact Section of NORS form 52.13)
   b. Pet food or animal feed implicated (Animal Contact Section of NORS form 52.13)
   c. Setting of exposure (Animal Contact Section of NORS form 52.13)
   d. Prevention measures or recommendations used (Animal Contact Section of NORS form 52.13)

6. Percentage of foodborne disease outbreak reports with vehicle data when a vehicle was identified. Target: 100% for each of the following fields.
   a. Name of food (Food Section of NORS form 52.13)
   b. Ingredients (Food Section of NORS form 52.13)
   c. Contaminated ingredients (Food Section of NORS form 52.13)
   d. Location where food was prepared (Food Section of NORS form 52.13)
   e. Location of exposure (Food Section of NORS form 52.13)

7. Percentage of outbreak reports with PulseNet cluster code for multistate outbreaks of Listeria, Salmonella, and STEC infections (Isolates/Strains in the Etiology Section of NORS form 52.13). Target: 100%.

8. Percentage of foodborne disease outbreak reports caused by diarrheagenic Escherichia coli, Salmonella, and Shigella that include three isolates when isolates were submitted to NARMS. If the outbreak strain was isolated from source, one of the three submissions should be for the isolate from the source; the other two should be from patients known to be part of the outbreak. Target: 100%.

C. OutbreakNet Enhanced
OutbreakNet Enhanced centers, in collaboration with CDC, have selected a set of performance metrics that cover diverse aspects of outbreak response. These activities span from outbreak surveillance and detection through investigation, response, control, and prevention measures. Using the metrics, each center provides data about the burden, timeliness, and completeness of enteric disease activities related to the key areas of activity.

Applicants who are currently funded OutbreakNet Enhanced sites do not need to resubmit metrics data that were previously submitted in annual reports. All other applicants should provide the following indicators for your jurisdiction for the period of 01/01/2016 to 12/31/2016 (if data cannot be provided, describe for each measure the plan to collect this information under this program; if data are available for a subset of this time period, describe existing data with appropriate date limits). A description of the core metrics and relevant definitions for applying the metrics are available at: https://www.cdc.gov/foodsafety/outbreaknetenhanced/metrics.html

The OutbreakNet Enhanced metrics data are reported annually to the CDC OutbreakNet Enhanced Team. These indicators will help state and local public health officials in the
OutbreakNet Enhanced catchment areas provide effective standardized surveillance and response for enteric disease outbreaks, document successful models, and hone response methodology.

**D. FoodCORE**
The FoodCORE performance metrics are a list of measurable activities covering diverse aspects of outbreak response. These activities span from outbreak surveillance and detection through investigation, response, control, and prevention measures. Using the metrics, each center provides data about the burden, timeliness, and completeness of enteric disease activities related to the key areas of activity.

Two sets of metrics were developed, tested, and are fully implemented in existing FoodCORE centers. Additional information for all the metrics and relevant definitions can be accessed at: [http://www.cdc.gov/foodcore/metrics.html](http://www.cdc.gov/foodcore/metrics.html).

Applicants who are currently funded FoodCORE centers do not need to resubmit metrics data that were previously submitted in biannual reports. All other applicants should provide the following indicators for your program catchment area for the period of 01/01/2016 to 12/31/2016 (if data cannot be provided, describe for each measure the plan to collect this information under this program; if data are available for a subset of this time period, describe existing data with appropriate date limits). A description of the core metrics and relevant definitions for applying the metrics are available at: [http://www.cdc.gov/foodcore/ssl-metrics.html](http://www.cdc.gov/foodcore/ssl-metrics.html).

The FoodCORE metrics data are reported biannually to the CDC FoodCORE Team. These indicators will help state and local public health officials in the FoodCORE catchment areas provide effective standardized surveillance and response for enteric disease outbreaks, document successful models, and hone response methodology.
ATTACHMENT

I2: National Antimicrobial Resistance Monitoring System: Surveillance Activities – Submission of Enteric Bacterial Isolates to CDC

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jared Reynolds, <a href="mailto:uvz6@cdc.gov">uvz6@cdc.gov</a>, 404-639-3519</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Funding Opportunity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
</tr>
<tr>
<td>a. Healthy People 2020</td>
</tr>
<tr>
<td>Prevent an increase in the proportion of non-typhoidal <em>Salmonella</em> and <em>Campylobacter jejuni</em> isolates from humans that are resistant to antimicrobial drugs.</td>
</tr>
<tr>
<td>b. Other National Public Health Priorities and Strategies:</td>
</tr>
<tr>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CDC Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Problem Statement:</td>
</tr>
<tr>
<td>Antimicrobial resistance is one of our most serious health threats. Infections from resistant bacteria are now too common, and some pathogens have even become resistant to multiple types or classes of antibiotics (antimicrobials used to treat bacterial infections). The loss of effective antibiotics will undermine our ability to fight infectious diseases and manage the infectious complications common in vulnerable patients.</td>
</tr>
<tr>
<td>ii. Purpose:</td>
</tr>
<tr>
<td>This project is a continuation of 2016’s I8: NARMS – Submission of Enteric Bacterial Isolates. The primary objective of NARMS routine surveillance is to improve detection of and surveillance for antimicrobial resistance among <em>Salmonella</em> (typhoidal and non-typhoidal serotypes), <em>Escherichia coli</em> O157, <em>Vibrio</em> species other than <em>V. cholerae</em>, and <em>Shigella</em> isolated from humans. Because data have been collected systematically since 1996, NARMS is able to monitor emerging patterns of resistance. In addition to performing susceptibility testing on NARMS isolates submitted for routine surveillance, NARMS also performs susceptibility testing on isolates from outbreaks in order to better understand sources of antimicrobial resistant infections.</td>
</tr>
<tr>
<td>NARMS funds activities to improve laboratory-based surveillance for emerging enteric bacterial pathogens, with a focus on antimicrobial resistant enteric pathogens. NARMS funding to states supports the submission and transport of bacterial pathogens isolated from ill persons to CDC. In addition to routine and outbreak isolate submission to NARMS, 2017 NARMS funds will continue to be available for whole genome sequencing (WGS) equipment and infrastructure for sequencing of <em>Salmonella</em> and other enteric bacterial pathogens that aren’t currently being sequenced and submitted to PulseNet. All sequencing data (whether funded by NARMS or PulseNet) would be submitted through PulseNet so that they can be analyzed for known resistance genes and, in some cases upon request by CDC, physically submitted to CDC NARMS for additional characterization.</td>
</tr>
<tr>
<td>For NARMS sites conducting active, population-based surveillance for <em>Salmonella</em>, <em>Shigella</em>, <em>Campylobacter</em>, and other infections transmitted commonly through food as part of the</td>
</tr>
</tbody>
</table>
Foodborne Diseases Active Surveillance Network (FoodNet), 2017 NARMS funding will be available to support the collection and reporting of expanded exposure and outcome information associated with antimicrobial resistance. Data would be collected as part of enhanced case exposure ascertainment (eCEA) and submitted electronically to CDC on a monthly basis.

### iii. Outcomes:

- Better coordination and exchange of data between CDC NARMS and state partners
- Improved completeness and quality of NARMS surveillance data
- Improved timeliness of isolate level demographic data submission
- Improved outbreak investigation coordination
- Data used to increase provider and public awareness

### iv. Funding Strategy:

All participating NARMS sites are asked to submit both routine human isolates to NARMS and isolates from outbreaks to the Enteric Diseases Laboratory Branch at CDC. NARMS requires that routine surveillance isolates be submitted on a quarterly basis and by the end of year deadline in April. NARMS sites are asked to submit log sheets using the CDC NARMS electronic database for routine surveillance. Sites are asked to submit outbreak isolates via CDC Form 50.34 using the outbreak submission protocol guidelines. Funding is available to support the submission of both routine and outbreak isolates. Proposal to cover preparation and shipment of both routine and outbreak isolates should range from approximately

- Total approximate funding for isolate shipping: $230,000
- Approximate number of awards: 54
- Approximate average per award: $1,000 to $18,000

Funding is also available to complement WGS of enteric pathogens described in the PulseNet Attachment I4. Funding will be made available for states to maintain sequencing equipment and infrastructure and purchase supplies that will help achieve the goal of performing WGS (using PulseNet methods) of all the *Salmonella* from humans they receive that are not already sequenced through PulseNet. Additionally, *Campylobacter* and *Shigella* isolated from humans should also be sequenced if funds are available. Sequencing data (whether funded through NARMS or PulseNet) will be submitted through PulseNet so they can be analyzed for known antimicrobial resistance genes. In some cases, CDC may request isolates be shipped to CDC NARMS to further characterize interesting resistance genes and subtypes.

- Total approximate of funding to support sequencing activities: $8,400,000
- Approximate number of awards: 54
- Approximate average per award: $50,000 to $400,000

For sites conducting active, population-based surveillance for infections transmitted commonly through food as part of the Foodborne Diseases Active Surveillance Network (FoodNet), funding will be available to support the collection and reporting of expanded exposure and outcome information associated with antimicrobial resistance. Applying sites must conduct active, population-based surveillance for *Salmonella*, *Shigella*, *Campylobacter*, *Listeria*, *Yersinia*, Shiga toxin-producing *E. coli* (STEC), *Vibrio*, *Cryptosporidium*, and *Cyclospora* infections. Sites must
obtain complete information on all FoodNet variables for all cases diagnosed by culture or by culture-independent methods. Variables may include (but are not limited to) demographics, clinical symptoms, hospitalizations, outcome, travel history, and laboratory subtyping information. Sites must submit data electronically to CDC in the format requested monthly by the specified deadline and upon CDC request. Sites must have capability to conduct whole genome sequencing on *Salmonella* isolates.

Funded sites will be required to obtain expanded information on all or a subset of cases caused by bacterial FoodNet pathogens (sample size to be determined by CDC) to include exposures and outcomes associated with antimicrobial resistance.

a) Collect required variables on the expanded case exposure ascertainment (eCEA) variable list determined by the FoodNet Steering Committee as part of routine surveillance. Information collected includes exposures associated with antimicrobial resistance, and food, water, animal, and environmental exposures. Sites may use existing state-based questions if they can be mapped with a high degree of concordance to eCEA data elements. However, if states have not been using another questionnaire for several years, they must use the questions as written by the committee. Include in the proposal detailed descriptions of the following:

i. Plan for obtaining eCEA data.

ii. Data collection methods (i.e., interview at local level or state level).

b) Place emphasis on interviewing cases for which isolates are available and at the state public health laboratory or CDC.

i. Prioritize interviews of cases for which isolates are available and whole genome sequencing (WGS) is being performed.

ii. Prioritize the collection of information about foreign travel, e.g., last country visited, length of stay in each location, and antibiotics taken.

c) Store all isolates with eCEA information for future characterization.

d) Extract and merge eCEA data into the routine active surveillance data transmitted to CDC. All available data should be sent monthly.

e) Begin updating state system to allow for transfer of data to CDC by HL7.

- Total approximate of funding to support expanded data collection/transfer: $930,000
- Approximate number of awards: 10
- Approximate average per award: $93,000

v. Strategies and Activities:

In addition to responding to the strategies and activities related to this attachment, applicants for any foodborne component (I1-I6) of the Epidemiology and Laboratory Capacity cooperative agreement are requested to include an executive summary of your jurisdiction’s enteric disease detection, investigation, control, and reporting program to greatly reduce the need to repeat this background information in each subcomponent. The executive summary should not exceed two pages and should include the following:

- A clear and succinct description of your overarching programmatic approach to detect, investigate, control, and report enteric disease cases and outbreaks (including those
transmitted by food, water, or other routes). This summary should be provided in Report Template 10, and describe the comprehensive foodborne disease program (not limited to the portion which is federally funded). Inclusion of waterborne disease, environmental health and other programs (e.g., EHS-Net, norovirus, and legionellosis, etc.) when applicable is strongly encouraged.

- The organizational structure of all enteric disease programs (i.e., organizational charts).

Additionally, to enhance and complement states’ foodborne disease and food safety efforts, it is expected that applicants develop and foster close programmatic relationships with all organizational units whose overarching goals and objectives include detection, investigation, control, and reporting enteric disease cases and outbreaks. Applicants should also describe the following:

- Current or planned efforts to work across programmatic units (e.g., OutbreakNet, NARMS, PulseNet, FoodCORE, NORS, etc.) to encourage participation, cooperation, and reduce duplicative efforts.
- Current or planned efforts to access available resources (e.g., CDC technical assistance, Integrated Food Safety Centers of Excellence, Peer-to-peer mentorship/assistance, etc.) to enhance jurisdictional food safety capacity.

<table>
<thead>
<tr>
<th>1) Enhance outbreak investigation response and reporting (1a)</th>
<th>2) Improve surveillance to drive public health action (1b)</th>
<th>3) Improve laboratory coordination and outreach/information flow (2b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Designate an epidemiologist and laboratorian to serve as the primary contact for outbreak response and other program communications</td>
<td>a. Implement and maintain NARMS electronic surveillance system for routine surveillance isolate submissions</td>
<td>a. Coordinate connections between epidemiology and laboratory functions, at state and local levels to strengthen the information flow and response to program inquires</td>
</tr>
<tr>
<td>b. Submit outbreak isolates using outbreak submission protocol guidelines</td>
<td>b. Collect and report routine surveillance isolate details and patient demographic and epidemiological data using the NARMS electronic database</td>
<td>b. Collect and report outbreak isolate details and patient demographic and epidemiological data using CDC Form 50.34</td>
</tr>
<tr>
<td></td>
<td>c. Collect and report outbreak isolate details and patient demographic and epidemiological data using CDC Form 50.34</td>
<td>d. Improve sensitivity of NARMS surveillance by screening majority of <em>Salmonella</em> and representative numbers of other enteric pathogens for known antibiotic resistance genes.</td>
</tr>
</tbody>
</table>

1. **Collaborations** –
   a. **With CDC funded programs:**
   - PulseNet, FoodCORE, OutbreakNet Enhanced, NORS, FoodNet
   b. **With organizations external to CDC:**
   - Not applicable
2. **Target Populations:**
Not applicable

a. Evaluation and Performance Measurement:
   i. CDC Evaluation and Performance Measurement Strategy:

   Required performance measures for the project period are listed below. Data will be reported on an annual basis, and are used to indicate progress made toward program outcomes.

   **NARMS Routine Human Isolates Surveillance Metrics:**

   1. Attendance at all quarterly calls with CDC (report number of calls attended; target = 4)
   2. Percentage of isolates received by state laboratory shipped to NARMS for the previous calendar year (Table 1 below)
      a. Target is 5% for non-typhoidal *Salmonella*, *Shigella*, and *E. coli* O157
      b. Target is 100% for *Salmonella* serotypes Typhi, Paratyphi A, and Paratyphi C
      c. Target varies by site for *Campylobacter*

   Table 1. Routine human isolates submitted to by NARMS by pathogen

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Total # of NARMS routine surveillance isolates from humans submitted to NARMS in CY 2016</th>
<th>Total # of isolates from humans received by site laboratory in CY 2016</th>
<th>Percentage of isolates shipped to NARMS in CY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-typhoidal <em>Salmonella</em> example</td>
<td>25</td>
<td>500</td>
<td>5%</td>
</tr>
<tr>
<td><em>Salmonella</em> Paratyphi A and C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Salmonella</em> Typhi</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><em>Shigella</em></td>
<td></td>
<td></td>
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<tr>
<td><em>E. coli</em> O157</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Vibrio</em> species other than <em>V. cholerae</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Campylobacter</em> (FoodNet sites only)</td>
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</tbody>
</table>

   **NARMS Outbreak Isolates Surveillance Metrics:**

   1. Number and percent of single state outbreaks of *Salmonella*, *Shigella*, and *E. coli* reported to The National Outbreak Reporting System (NORS) having three representative isolates submitted to the appropriate contact person/laboratory unit within the Enteric Diseases Laboratory Branch at CDC. If <3 isolates are available, sites should send as many isolates as are available. If available, the CDC-assigned report identification number from NORS should
be included in the “Previous Laboratory Results/Comments” section of the CDC 50.34 Form for each isolate submitted to CDC for antimicrobial susceptibility testing. Furthermore, the state lab identification number for each outbreak isolate submitted to CDC for antimicrobial susceptibility testing should be included in the “Isolates/Strains” section of the NORS Form (CDC 52.13 Form) for the reported outbreak.

Table 2. Outbreak reports submitted to NORS and outbreak isolates submitted to NARMS

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Number of single state outbreaks reported to NORS in CY 2016</th>
<th>Number of single state outbreak isolates submitted to NARMS in CY 2016</th>
<th>Number of single state outbreaks for which outbreak isolates were submitted to NARMS in CY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonella</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shigella</td>
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<td></td>
<td></td>
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<tr>
<td>E. coli</td>
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</table>

**NARMS Whole Genome Sequencing Metrics:**

1. Percentage of isolates for which whole genome sequencing data was successfully uploaded to PulseNet (whether funded by NARMS or PulseNet) for the previous calendar year, to be recorded on Table 1 of PulseNet USA Attachment I4.
   a. *Salmonella* (target is 100%)
   b. *Campylobacter* (funding dependent)
   c. *Shigella* (funding dependent)
# ATTACHMENT

## I3: Integrated Food Safety Centers of Excellence (CoE)

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donald Sharp, Food Safety Office, DFWED, NCEZID, (<a href="mailto:das8@cdc.gov">das8@cdc.gov</a> 404-639-3845) and Elizabeth Pace, Food Safety Office, DFWED, NCEZID, (<a href="mailto:yis9@cdc.gov">yis9@cdc.gov</a> 404-639-1541).</td>
</tr>
</tbody>
</table>

## Funding Opportunity Description

### Background

#### a. Healthy People 2020:

The CoEs address the Healthy People 2020 objectives under the Food Safety topic area and the goal to improve food safety and reduce foodborne illnesses.

#### b. Other National Public Health Priorities and Strategies:

- **Food Safety Modernization Act (FSMA):** Recognizing the importance of robust foodborne illness surveillance and rapid and effective outbreak detection and response, FSMA was signed into law on January 4, 2011. FSMA directed CDC to designate CoEs headquartered at state health departments and partnered with one or more academic centers to assist other health departments. [https://www.cdc.gov/foodsafety/fsma/](https://www.cdc.gov/foodsafety/fsma/)

- **CDC Winnable Battles:** Food Safety was named by the Director of CDC as one of CDC's Winnable Battles, which are public health priorities with large-scale impact on health and with known, effective strategies to address them. [https://www.cdc.gov/winnablebattles/](https://www.cdc.gov/winnablebattles/)

### CDC Project Description

#### i. Problem Statement:

Foodborne illness is caused by a variety of agents including bacteria, viruses, parasites, and chemicals. CDC estimates that each year 48 million Americans develop foodborne illness, 128,000 are hospitalized, and 3,000 die. Most of the more than 1,000 outbreaks reported to CDC annually are detected and investigated by local and/or state health departments. Additionally, local and state capacity to detect and investigate large multistate outbreaks is critical even when CDC coordinates the investigation. Local and state health departments have been under economic stress in the past several years which has had a negative effect on local and state capacity for surveillance of foodborne illness and investigation of outbreaks.

#### ii. Purpose:

The overall purpose of the CoEs is to serve as resources for public health professionals who conduct surveillance for foodborne illnesses and investigate outbreaks. The CoEs develop tools, deliver trainings, and provide consultation to assist state and local health departments. The CoEs can provide consultation during ongoing outbreaks. Information and experience gained during outbreak investigations can strengthen efforts to prevent future illnesses and outbreaks.

#### iii. Outcomes:

- Outbreak detection and investigation for foodborne illness is improved at local and state health departments through identification of new or more effective methods
- Local and state health departments have increased access to quality training courses and materials and are better prepared to respond to foodborne illnesses and outbreaks
• Outbreak detection and investigation at local and state health departments is improved including earlier detection of outbreaks, implementation of strong public health interventions, and improved completeness and timeliness of response activities
• Health departments use standardized performance indicators to measure their activities
• Data are used to improve foodborne illness investigation practices, to set priorities and inform program and policy development, and to help prevent future outbreaks
• Academic courses on foodborne illness are developed and conducted
• Local and state health departments have robust outbreak detection and investigation systems including foodborne illness complaint systems
• Health departments and other stakeholders are aware of and use the products and services of the CoEs

iv. Funding Strategy:

Funds should be requested to support personnel, travel, supplies, equipment, and/or contractual support for proposed activities. Applicants should request travel funds to conduct CoE activities in other states, to attend the CoE Vision Meeting, to attend InFORM, and to attend other relevant training and professional meetings to present CoE work. A substantive portion of the budget should be allocated to the academic partner to complete proposed activities.

- Total availability of funds: ~$2,700,000 (additional supplemental funding may become available for one-time projects)
- Approximate number of awards given: 6
- Approximate average per award: $450,000 (with a range of $350,000 to $550,000)
- Because activities are intended to build on existing capacity, eligible applicants are limited to only the existing CoE sites

v. Strategies and Activities:

In addition to responding to the strategies and activities related to this attachment, applicants for any foodborne component (I1-I6) of the Epidemiology and Laboratory Capacity cooperative agreement are requested to include an executive summary of your jurisdiction’s enteric disease detection, investigation, control, and reporting program to greatly reduce the need to repeat this background information in each subcomponent. The executive summary should not exceed two pages and should include the following:

- A clear and succinct description of your overarching programmatic approach to detect, investigate, control, and report enteric disease cases and outbreaks (including those transmitted by food, water, or other routes). This summary should be provided in Report Template 10, and describe the comprehensive foodborne disease program (not limited to the portion which is federally funded). Inclusion of waterborne disease, environmental health and other programs (e.g., EHS-Net, norovirus, and legionellosis, etc.) when applicable is strongly encouraged.
The organizational structure of all enteric disease programs (i.e., organizational charts).

Additionally, to enhance and complement states’ foodborne disease and food safety efforts, it is expected that applicants develop and foster close programmatic relationships with all organizational units whose overarching goals and objectives include detection, investigation, control, and reporting enteric disease cases and outbreaks. Applicants should also describe the following:

- Current or planned efforts to work across programmatic units (e.g., OutbreakNet, NARMS, PulseNet, FoodCORE, NORS, etc.) to encourage participation, cooperation, and reduce duplicative efforts.
- Current or planned efforts to access available resources (e.g., CDC technical assistance, Integrated Food Safety Centers of Excellence, Peer-to-peer mentorship/assistance, etc.) to enhance jurisdictional food safety capacity.

Activities should be reported by Strategies A, B, C, and D. Applicants are expected to have activities within each of these Strategies, but there is flexibility in specific activities proposed. Completed and proposed activities should be compatible with program goals and build on current capacity and public health needs.

Funds allocated to CoEs through ELC may not be used for research; however, CoEs are encouraged to seek out opportunities to conduct complementary research activities with non-ELC funding.

Contact CDC program staff with questions and for assistance determining under which section a particular activity should be reported.

**A. Strategy A - Strengthen** foodborne illness surveillance and outbreak investigations outside of your state by providing consultations, developing tools/resources, offering general assistance (**Activity Area 1**), and **improving** capacity of information systems (**Activity Area 5**)

- Examples of projects within these activity areas that the CoEs may complete:
  - i. Provide consultation to other jurisdictions during outbreak investigations
  - ii. Mentor jurisdictions including OutbreakNet Enhanced sites
  - iii. CoEs are encouraged to propose other appropriate projects (e.g. CIFOR projects, illness complaint systems, improvements in NORS/NEARS, etc.)

**B. Strategy B - Evaluate and analyze** the timeliness and effectiveness of foodborne illness surveillance and outbreak response (**Activity Area 2**) and perform program evaluation, quality improvement, and/or other special projects (**Activity Area 6**)

- Examples of projects within these activity areas that the CoEs may complete:
  - i. Review and evaluate your own and other’s performance using well-defined metrics and tools (e.g. CIFOR metrics and Toolkit, etc.)
  - ii. Evaluate existing foodborne illness performance metrics (e.g. FoodCORE metrics, CIFOR metrics, etc.)
iii. Analyze foodborne illness and outbreak data in collaboration with CDC and others
iv. Conduct needs assessments to determine needed tools and resources
v. CoEs are encouraged to propose other appropriate projects (e.g. attribution, AR, CIFOR projects, etc.)

C. **Strategy C - Train and educate** students and public health personnel in laboratory, epidemiological, and environmental investigation of foodborne illness **(Activity Areas 3 & 4)**
   - Examples of projects within these activity areas that the CoEs may complete:
     i. Conduct classroom courses for students and professionals (e.g. academic courses, Epi Ready or related workshops, etc.)
     ii. Develop online trainings and courses (may include topics such as WGS, AR including materials for veterinarians, etc.)
     iii. Establish internships and fellowships for foodborne illness activities
     iv. CoEs are encouraged to propose other appropriate projects

D. **Strategy D – Disseminate and communicate** information through outreach/marketing activities to local, state and federal public health officials and other stakeholders to increase awareness of available tools and resources for food safety and foodborne illness surveillance and outbreak response **(Activity Area 6)**
   - Examples of projects within this activity area that the CoEs may complete:
     i. Promote the CoEs through websites, social media, and presentations
     ii. Track website usage
     iii. Maintain communication with regional and national partners
     iv. CoEs are encouraged to propose other appropriate projects

1. Collaborations –
   a. **With CDC funded programs:**

To enhance and complement CoE funded activities, the centers are expected to work closely with other CDC foodborne illness-related programs including FoodCORE, PulseNet, EHS-Net, CaliciNet, NoroSTAT and FoodNet. CoEs are encouraged to mentor other states participating in capacity building programs and activities, especially with OutbreakNet Enhanced sites for which CoEs are a required mentor.

   b. **With organizations external to CDC:**

CoEs are expected to collaborate extensively with other local and state health departments. The CoEs should also collaborate with the FDA’s Rapid Response Teams, and any other FDA or USDA programs that might be related to a completed or proposed CoE activity. CoEs are encouraged to collaborate with any/all CIFOR member organizations (eight national associations and three federal agencies).

2. Target Populations:
a. Evaluation and Performance Measurement:

<table>
<thead>
<tr>
<th>i. CDC Evaluation and Performance Measurement Strategy:</th>
</tr>
</thead>
</table>

All CoE activities should be fully described in the progress report. This is only a subset of activities where specific performance measures should be reported. Measures should be reported for the previous grant year.

**Strategy A.** *(Activity Areas 1 & 5)*
- List of all of the jurisdictions assisted
- List of jurisdictions that your CoE visited
- List of jurisdictions that visited your CoE
- List of online materials completed and posted to CoEFoodSafetyTools.org

**Strategy B.** *(Activity Area 2 & 6)*
- List of jurisdictions provided assistance using performance metrics and/or evaluation tools
- List of reports, manuscripts, and presentations completed using data from foodborne disease and outbreak surveillance systems
- List of research and analysis projects funded by non-ELC sources

**Strategy C.** *(Activity Areas 3 & 4)*
- Number of in-person courses delivered
- Number of students who completed in-person courses
- Number of students who completed online courses
- Number of students who completed a food safety or foodborne illness certificate program
- Number of stipends/scholarships awarded
- List of students and projects completed through internships/field placements

**Strategy D.** *(Activity Area 6)*
- Number of unique visitors to your CoE website
- Number who viewed and/or downloaded online materials (including online trainings, videos, and tools)
- Number of CoE web pages maintained
- Number of completed social posts about the CoEs and foodborne disease
- List of meetings attended to present/promote the CoEs
ATTACHMENT
I4: PulseNet USA

Program Activity Contact Information
Al Project Coordinator: Peter Gerner-Smidt, M.D., Ph.D. (plg5@cdc.gov 404-639 3322)
Back-up Contact/Phone: Efrain M. Ribot, Ph.D. (eyr4@cdc.gov 404-639 3521)
Kelley Hise, MPH (kpb6@cdc.gov 404-639-0704)

Funding Opportunity Description

Background

a. Healthy People 2020:
The grant relates to Healthy People 2020 objectives: FS-1, FS-2 and FS-3

b. Other National Public Health Priorities and Strategies:
Food Safety is a CDC Winnable Battle

CDC Project Description

i. Problem Statement:
It has been estimated that there are approximately 48 million foodborne illnesses resulting in 128,000 hospitalizations and 3,000 deaths in the U.S. annually. Foodborne disease surveillance and outbreak investigations continue to face many challenges brought by changes in food processing and distribution practices such as the increase in the number of large centralized food processing and production facilities, the globalization of the food supply, changes in the dietary habits of the population and increases in the percentage of the population at higher risk (children, elderly and immunocompromised, etc.). All these factors contribute to the “new outbreak scenario” that is often characterized by foodborne illnesses dispersed across a large region or even multiple states, in contrast to the previously dominant scenario where illnesses were focused in a smaller area. Because of this, many local and multi-locality outbreaks are not detected early enough or detected at all to lead to the successful implementation of control or preventive measures which highlights the need to continue maintaining and improving laboratory-based surveillance capacity in the public health laboratories.

ii. Purpose:
Since 1996, PulseNet has connected foodborne illness cases together, using DNA "fingerprinting" of the bacteria making people sick, in order to detect and define outbreaks. PulseNet has detected thousands of local and multi-state outbreaks since its inception, leading to prevention opportunities and continuous improvements in our food safety systems. Because there are always new challenges, including emergence of new molecular technologies, we must strive to improve the capacity to rapidly detect and control clusters of foodborne illness and identify the source of the infections in the public health laboratories. PulseNet’s main objective is to provide real-time laboratory-based surveillance to assist in the rapid detection and control of outbreaks caused by the most important bacterial foodborne pathogens in the U.S. PulseNet achieves this by relying on molecular surveillance activities that are carried out “locally” in state and local public health laboratories across the country. PulseNet works with real-time communication systems (phone, web, and email) to rapidly disseminate relevant cluster and outbreak information and provide training and assistance to all network members to ensure that participating laboratories are performing molecular subtyping according to established protocols and procedures.

iii. Outcomes:
The goals of PulseNet are supported by the program outcomes listed below:

- Trained workforce to prepare for and respond to outbreaks of foodborne infections
- Better coordination and exchange of data between actors in the food safety arena
- Improved surveillance of and response to bacterial foodborne pathogens
  - Improved completeness and timeliness of reporting
  - Maintain completeness of information uploaded to the national databases
  - Improved turnaround time
  - Faster and more efficient detection of clusters/outbreaks
    - Local clusters detected more rapidly
  - Validation and Implementation of whole genome sequencing (WGS) and other new methods as appropriate
- Investigation of outbreaks
- Improved outbreak investigation coordination

### iv. Funding Strategy:

This year’s requests for funding must include both PulseNet standard (e.g. PFGE, InFORM and/or regional conference attendance) and Advanced Molecular Detection (AMD) next generation sequencing/whole genome sequencing (NGS/WGS) activities. Laboratories planning to request sequencing equipment must do so in the NARMS section (Attachment I2) of this FOA; PulseNet will only support the procurement of supplies and reagents for AMD related activities. Please make sure this is reflected in the proper PulseNet sections, including the budget, of this project.

**NOTE**: If funding is or becomes available but laboratories have not requested support for such activities, the CDC ELC office will not be able to allocate the funds to support them.

1. **Recommended use of funds:**
   - Procurement of the necessary reagents and supplies, PFGE related equipment, essential software upgrades, and contractual support (may include contractual personnel or courier services) to perform all PulseNet related activities including PFGE, MLVA, WGS and expected culturing of primary specimens (e.g. submitted broths or stools)
   - PulseNet will not be funding sequencers through this project in 2016. Please refer to the NARMS project to request that support.
   - Hire/retain personnel that conduct PFGE, MLVA, WGS, culturing of primary specimens (e.g. submitted broths or stools), and/or the analysis of results
   - Attendance and travel of at least one PulseNet laboratorian to PulseNet Meetings (to include regional meetings and the InFORM conference)
   - Attendance and travel of at least one PulseNet laboratorian to PulseNet “wet lab” and software-based trainings
   - Implementation of PulseNet next generation subtyping methods (including WGS)
   - Laboratories planning on performing MLVA must clearly state the need for resources based on the volume of testing performed in recent years
• For laboratories planning on performing MLVA for other laboratories, we recommend funding requests for anticipated testing of out-of-state isolates or specimens
• Laboratories may request funds to isolate PulseNet pathogens (e.g. STEC, *Salmonella*) from culture-independent diagnostic test (CIDT) positive specimens submitted by clinical laboratories that are not conducting reflex culture. Requests should be based on historical information (using last year’s test volume as an estimate) and anticipated increases in overall CIDT testing in their jurisdictions during the funding period.

2. WGS Strategy: The following describes the PulseNet WGS funding strategy to be used in the assessment of both general PulseNet Laboratories and PulseNet Area Laboratories

• Support for WGS activities for this funding cycle will be based on the average number of isolates received in the laboratory per year. The general “volume” category breakdown is as follows: New PulseNet Laboratory, Low Volume Laboratory, Mid Volume Laboratory, High Volume Laboratory:
  o New (to WGS) or Low volume laboratories (<600 isolates/year) will be expected to sequence 200 to 400 isolates during the funding cycle
  o Middle volume laboratories (600-1200 isolates / year) are expected to sequence 400-800 isolates during the funding cycle
  o High volume labs (>1200 isolates/year) are expected to sequence ≥600 isolates during the funding cycle
  o Area laboratories are expected to sequence ≥800 (100 over number expected for high volume laboratories) during the funding cycle including isolates submitted by laboratories in the respective region.

*Important Reminder: This year’s AMD requests for funds to support implementation of WGS laboratory and analysis tools for PulseNet must be included in the PulseNet section of this FOA (not the AMD section).*

**NOTE**: Expectations on the number of isolates to be analyzed by WGS will be commensurate with the amount of funds provided to carry out this activity.

  **PulseNet Laboratories**: Awards for support of general PulseNet activities will vary from laboratory to laboratory. Laboratories are encouraged to request the necessary support for all of the proposed activities to be carried out during the 2017 performance cycle.

  **PulseNet Area Laboratories**: *Additional* funds may be available to those laboratories designated as PulseNet Area Laboratories. This may include funding for anticipated testing of out-of-state isolates or specimens (e.g. PFGE, MLVA, WGS, and surveillance activities) or for other Area Laboratory functions.

v. Strategies and Activities:

In addition to responding to the strategies and activities related to this attachment, applicants for any foodborne component (I1-I6) of the Epidemiology and Laboratory Capacity cooperative agreement are requested to include an executive summary of your jurisdiction’s enteric disease detection, investigation, control, and reporting program to greatly reduce the
need to repeat this background information in each subcomponent. The executive summary should not exceed two pages and should include the following:

- A clear and succinct description of your overarching programmatic approach to detect, investigate, control, and report enteric disease cases and outbreaks (including those transmitted by food, water, or other routes). This summary should be provided in Report Template I0, and describe the comprehensive foodborne disease program (not limited to the portion which is federally funded). Inclusion of waterborne disease, environmental health and other programs (e.g., EHS-Net, norovirus, and legionellosis, etc.) when applicable is strongly encouraged.
- The organizational structure of all enteric disease programs (i.e., organizational charts).

Additionally, to enhance and complement states’ foodborne disease and food safety efforts, it is expected that applicants develop and foster close programmatic relationships with all organizational units whose overarching goals and objectives include detection, investigation, control, and reporting enteric disease cases and outbreaks. Applicants should also describe the following:

- Current or planned efforts to work across programmatic units (e.g., OutbreakNet, NARMS, PulseNet, FoodCORE, NORS, etc.) to encourage participation, cooperation, and reduce duplicative efforts.
- Current or planned efforts to access available resources (e.g., CDC technical assistance, Integrated Food Safety Centers of Excellence, Peer-to-peer mentorship/assistance, etc.) to enhance jurisdictional food safety capacity.

1) Enhance outbreak investigation response and reporting (1a)
   a. Participate in local and multi-jurisdictional outbreak investigations
   b. Enhance or maintain information and data sharing tools to communicate relevant laboratory findings with epidemiologists
2) Improve surveillance to drive public health action (1b)
   a. Collect, analyze and disseminate data accordingly and in real-time
3) Sustain and enhance laboratory diagnostic/subtyping capacity (2a)
   a. Perform subtyping of the foodborne pathogens tracked by PulseNet using approved standard procedures including WGS
   b. Designate laboratory staff to carry out PulseNet activities
   c. When the need arises, participate in scheduled PulseNet-related workshops
      i. PulseNet participating laboratories are expected to contact the Area Laboratory or CDC with their training needs
   d. Obtain cultures for subtyping in PulseNet by isolating the organisms from patient specimens/broths tested positive by a CIDT method in the clinical laboratories when the primary clinical laboratory is not performing this task
   e. Participate in CDC-led studies focused on the recovery and characterization of isolates from CIDT-positive specimens
4) **Improve laboratory coordination and information flow (2b)**
   
a. Maintain/implement electronic mechanisms for exchange of data and public health information
   
i. Upload subtyping data and accompanying information to the PulseNet national databases in a timely manner
   
ii. Share clinical sequence data in real-time with CDC
   
iii. Communicate data analysis findings (clusters/outbreaks) via the PulseNet/OutbreakNet SharePoint site
   
iv. Communicate information regarding subtyping data and troubleshooting issues with CDC and/or the appropriate PulseNet area laboratory

b. Coordinate data flow between the laboratory and epidemiology functions
   
i. Share data interpretation reports and other relevant information with epidemiologists and other appropriate public health staff in real-time

**Strategies and Activities Specific to PulseNet Area Laboratories**

In addition to the activities outlined above, PulseNet Area Laboratories are expected to carry out the following:

1. **Enhance outbreak investigation response and reporting (1a)**
   
a. Provide recommendations and guidance to laboratories within the appropriate region on issues related to laboratory testing or programmatic changes (i.e. WGS and non-culture based methods)
   
b. Serve as a resource for surge capacity testing and reference capabilities in response to large foodborne outbreaks or potential threats of bioterrorism that may occur locally or nationally

2. **Improve surveillance to drive public health action (1b)**
   
a. Provide laboratory bench training, technical guidance and scientific expertise to PulseNet participating laboratories within their designated area

3. **Sustain and enhance laboratory diagnostic/subtyping capacity (2a)**
   
a. Actively participate in evaluation and/or validation of new methods, testing of new software modules and scripts, adopt improvements to laboratory, analysis, communications processes in a timely fashion

4. **Improve laboratory coordination and information flow (2b)**
   
a. Coordinate and host PulseNet regional and training meetings
   
Serve as representative of laboratories within areas/region on the PulseNet Steering Committee and planning committees, such as the InFORM conference Agenda Committee and/or Regional meetings

1. **Collaborations** –
   
a. **With CDC funded programs:**
      
Close collaboration with programs such as OutbreakNet, FoodCORE, PHEP, and NARMS is strongly recommended.

b. **With organizations external to CDC:**
Collaborations with organizations such as APHL, FDA, USDA, CSTE, WHO INFOSAN, PulseNet International, and others may be required during investigations of national and international outbreaks and other public health activities. Participation in such collaborations is strongly recommended.

2. Target Populations:
Not applicable

a. Evaluation and Performance Measurement:

i. CDC Evaluation and Performance Measurement Strategy:

A list of required performance measures are included in Table 1 below. Data provided on these measures are used to describe progress made toward achievement of program goals and outcomes.

See tables below for required measures:

<table>
<thead>
<tr>
<th>PFGE and MLVA Measures – Reporting for CY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PFGE</strong></td>
</tr>
<tr>
<td>• PFGE all <em>Listeria</em>, <em>E. coli</em> O157 and Non-O157 (STEC) by two enzymes</td>
</tr>
<tr>
<td>o If unable to PFGE these organisms, should send within 48 hours to representative Area Laboratory or CDC</td>
</tr>
<tr>
<td>• PFGE other PulseNet tracked organisms with the primary enzyme as close to real-time as possible</td>
</tr>
<tr>
<td><strong>MLVA</strong></td>
</tr>
<tr>
<td>• If MLVA certified for STEC O157:H7 and <em>Salmonella</em> serotype Typhimurium subtype all isolates requested by CDC. If unable to perform this, send the CDC-requested isolates to the Area Laboratory or CDC within 48 hours of the CDC request</td>
</tr>
<tr>
<td><strong>For Area Laboratories Only:</strong></td>
</tr>
<tr>
<td>• Keep track of all activities (subtyping, surge capacity, training, troubleshooting, etc.) resulting from support provided to other laboratories including those in their respective area</td>
</tr>
<tr>
<td>o Include the following information, if available, when uploading subtyping data on behalf of states that requested assistance:</td>
</tr>
<tr>
<td>▪ State the isolates originated from</td>
</tr>
<tr>
<td>▪ Date the isolate was collected in the state of origin</td>
</tr>
<tr>
<td>▪ Date the isolate was submitted to the Area Laboratory</td>
</tr>
<tr>
<td>▪ Date PFGE, MLVA, and/or WGS was performed in the Area Laboratory</td>
</tr>
<tr>
<td>▪ Date data was uploaded to PulseNet national database and/or submitted to CDC</td>
</tr>
</tbody>
</table>
*If calculated percentage for human *E. coli* O157:H7 and/or *Listeria* (determined by CDC PulseNet) is <90 percent, please describe barriers or challenges to meeting this target (90 percent of subtyping results submitted to PulseNet within four working days of receipt at PFGE laboratory).

<table>
<thead>
<tr>
<th>E. coli O157:H7</th>
<th>Describe barriers/challenges here:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listeria</td>
<td>Describe barriers/challenges here:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total # of isolates received in the Public Health lab CY 2016</th>
<th>Total # of isolates sent to another lab for PFGE</th>
<th># Isolates run by primary enzyme</th>
<th># Isolates run by secondary enzyme</th>
<th>% PFGE of Human isolates submitted within 4 working days*</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>E. coli O157:H7</th>
<th>Non-O157 STEC</th>
<th>Listeria</th>
<th>Salmonella</th>
<th>Shigella</th>
<th>Campylobacter</th>
<th>Vibrio cholerae</th>
<th>Vibrio parahaemolyticus</th>
</tr>
</thead>
<tbody>
<tr>
<td>% PFGE of Human isolates submitted within 4 working days*</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Whole Genome Sequencing (WGS) Measures (for CY 2017)**

Laboratories certified for WGS must sequence all isolates (see below) in real time or as close to real time as possible. If unable to perform WGS in real time, laboratories are expected to send the isolates to their Area Laboratory or CDC within 48 hours of receiving the isolate in the subtyping laboratory.

- Perform WGS on all *Listeria*
- Perform sequencing of all *Salmonella* isolates from humans and non-human isolates as requested by CDC
- Perform WGS on all STEC as requested by CDC

| Whole Genome Sequencing (WGS) Measures (for CY 2017) | Laboratories certified for WGS must sequence all isolates (see below) in real time or as close to real time as possible. If unable to perform WGS in real time, laboratories are expected to send the isolates to their Area Laboratory or CDC within 48 hours of receiving the isolate in the subtyping laboratory. |  |
|---------------------------------------------------|--------------------------------------------------------------------------------| |
|                                                 | • Perform WGS on all *Listeria*                                                 | |
|                                                 | • Perform sequencing of all *Salmonella* isolates from humans and non-human isolates as requested by CDC | |
|                                                 | • Perform WGS on all STEC as requested by CDC                                  | |

78
- Perform WGS of all *Campylobacter* and *Shigella* isolates that have been analyzed by PFGE in the laboratory or as requested by CDC
- Keep track of turn-around times, in working days, from the date the isolate was:
  - received in the PulseNet laboratory and analysis was completed or
  - request was received in the PulseNet laboratory to the date of submission to CDC
- Perform additional WGS, if necessary, to meet the criteria detailed in “iv” the Funding Strategy section (section “iv” bullet number “2”).

<table>
<thead>
<tr>
<th></th>
<th>Date NGS/WGS equipment was installed in the laboratory?</th>
<th>Number of staff certified in NGWS/GS</th>
<th>Number of isolates sequence in the in CY 2016</th>
<th>*Propose d # of isolates to be sequence d in the Public Health laboratory CY 2017</th>
<th>Actual # of isolates sequence d in the Public Health laboratory CY 2017</th>
<th>Total # of isolates sent to another lab for WGS</th>
<th>% of proposed number of Human isolates sequence d in the Public Health laboratory CY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listeria</td>
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<td></td>
</tr>
<tr>
<td>E. coli O157:H7</td>
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<td></td>
</tr>
<tr>
<td>Non-O157 STEC</td>
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<td></td>
</tr>
<tr>
<td>Salmonella**</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Campylobacter**</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Shigella**</td>
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</table>

**NOTE4**: laboratories are to calculate estimate the proposed number of isolates to be sequenced utilizing the guidance provided in section “iv” above.

**NOTE5**: entries should reflect combination of what is achieved with funding from PulseNet and NARMS (Attachment I8), and targets for NARMS are 100% of *Salmonella* and a representative number of *Campylobacter* and *Shigella*.

**Culture Independent Diagnostics: STEC and Salmonella Surveillance** *(required for PulseNet participating laboratories)*
Isolate and identify all *Salmonella* spp. and STEC from all broths/stools submitted by clinical laboratories from positive culture-independent diagnostic tests (CIDTs).

### STEC General Statistics:

<table>
<thead>
<tr>
<th></th>
<th>CY16 Numbers Received in PHL</th>
<th>CY16 Numbers sent to CDC for Isolation and/or Serotyping</th>
<th>CY17 Projected Numbers to be Received in PHL*</th>
<th>Number of STECs Identified in CY16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultures/Isolates</td>
<td></td>
<td></td>
<td></td>
<td>O157</td>
</tr>
<tr>
<td>Specimens/Broths</td>
<td></td>
<td></td>
<td></td>
<td>Non-O157</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>Negatives/Repeats Tests Total</td>
</tr>
</tbody>
</table>

### Salmonella General Statistics:

<table>
<thead>
<tr>
<th></th>
<th>CY16 Numbers Received in PHL</th>
<th>CY16 Numbers sent to CDC for Isolation and/or Serotyping</th>
<th>Number of <em>Salmonella</em> isolates Identified in CY16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultures/Isolates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specimens/Broths</td>
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<tr>
<td>Total</td>
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<td></td>
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</tr>
</tbody>
</table>

CY16 = 01/01/2016 – 12/31/2016; CY17 = 01/01/2017 – 12/31/2017; PHL = public health laboratory

*The information provided should be based on historical numbers (i.e. 2016) plus knowledge of CIDT trends in your jurisdiction. CDC recognizes that the extent to which CIDTs will be adopted in CY17 and the willingness of clinical labs to conduct reflex culture on CIDT-positive specimens cannot be precisely determined.

### PulseNet Area Laboratory Statistics: Activities and Support Provided to Laboratories in Your Area

(for PulseNet Area Laboratories only)
- Describe all activities (subtyping, surge capacity, training, troubleshooting, communications, etc.) resulting from support provided to other laboratories in your area

<table>
<thead>
<tr>
<th>Area Lab Measure</th>
<th>Area Lab Results</th>
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</thead>
<tbody>
<tr>
<td>Number of individuals your lab trained from other laboratories in your area</td>
<td></td>
</tr>
<tr>
<td>Number of isolates for which testing was done from other laboratories in your area</td>
<td></td>
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<tr>
<td>Number of group phone calls with all laboratories in your area</td>
<td></td>
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<tr>
<td>Number of communications with individual laboratorians in your area (i.e. troubleshooting)</td>
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</table>
## ATTACHMENT
### I5: NoroSTAT

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aron Hall, (<a href="mailto:esg3@cdc.gov">esg3@cdc.gov</a>) 404-639-1869</td>
</tr>
</tbody>
</table>

### Funding Opportunity Description

#### Background

- **a. Healthy People 2020:** Not applicable
- **b. Other National Public Health Priorities and Strategies:** Not applicable

#### CDC Project Description

- **i. Problem Statement:**

  Norovirus is the most common cause of outbreaks of acute gastroenteritis and foodborne disease in the United States. Norovirus outbreaks demonstrate pronounced winter seasonality and can increase in frequency during years in which new norovirus strains emerge. National surveillance for norovirus outbreaks is performed through the National Outbreak Reporting System (NORS) and CaliciNet for epidemiologic and laboratory data, respectively. However, reporting through these systems typically lags by weeks to months relative to onset of illness within the outbreaks. As such, NORS and CaliciNet do not generally provide sufficiently timely information to assess current norovirus activity. Additionally, these systems are not currently integrated to enable real-time data exchange between them.

- **ii. Purpose:**

  Initiated in August 2012, NoroSTAT (norovirus sentinel testing and tracking) is a network of sentinel states established to improve the timeliness of reporting norovirus outbreaks due to all modes of transmission through NORS and CaliciNet and thereby allow near real-time assessment of norovirus activity. Additionally, NoroSTAT reporting requires a minimum set of data elements, including consistent outbreak identifiers in both NORS and CaliciNet, allowing norovirus strain data to be rapidly linked with epidemiologic characteristics. These linked outbreak records will be used for improved attribution analyses, specifically, assessment of strain-specific outbreak and patient characteristics. This section supports activities to enhance capacity for timely investigation, reporting, and control of norovirus outbreaks.

- **iii. Outcomes:**

  - Improved timeliness of norovirus outbreak reporting through NORS and CaliciNet
  - Improved completeness and data quality of norovirus outbreak reports submitted through NORS and CaliciNet
  - Use of consistent outbreak identifiers to enable integration of data between NORS and CaliciNet

- **iv. Funding Strategy:**

  Funds should be utilized primarily for epidemiology and laboratory personnel, but may also be used for travel, supplies and equipment related to norovirus outbreak investigations and reporting, or contractual support for proposed activities.
• Total availability of funds: $425,000
• Approximate number of awards given: 9
• Approximate average per award: $50,000

Applicants should demonstrate high rates of norovirus outbreak reporting through NORS and CaliciNet, as well as consistency in surveillance practices over several years to allow appropriate comparisons of current activities with an historical baseline. As such, applicants must already be CaliciNet-certified.

v. Strategies and Activities:

In addition to responding to the strategies and activities related to this attachment, applicants for any foodborne component (I1-I6) of the Epidemiology and Laboratory Capacity cooperative agreement are requested to include an executive summary of your jurisdiction’s enteric disease detection, investigation, control, and reporting program to greatly reduce the need to repeat this background information in each subcomponent. The executive summary should not exceed two pages and should include the following:

• A clear and succinct description of your overarching programmatic approach to detect, investigate, control, and report enteric disease cases and outbreaks (including those transmitted by food, water, or other routes). This summary should be provided in Report Template 10, and describe the comprehensive foodborne disease program (not limited to the portion which is federally funded). Inclusion of waterborne disease, environmental health and other programs (e.g., EHS-Net, norovirus, and legionellosis, etc.) when applicable is strongly encouraged.
• The organizational structure of all enteric disease programs (i.e., organizational charts).

Additionally, to enhance and complement states’ foodborne disease and food safety efforts, it is expected that applicants develop and foster close programmatic relationships with all organizational units whose overarching goals and objectives include detection, investigation, control, and reporting enteric disease cases and outbreaks. Applicants should also describe the following:

• Current or planned efforts to work across programmatic units (e.g., OutbreakNet, NARMS, PulseNet, FoodCORE, NORS, etc.) to encourage participation, cooperation, and reduce duplicative efforts.
• Current or planned efforts to access available resources (e.g., CDC technical assistance, Integrated Food Safety Centers of Excellence, Peer-to-peer mentorship/assistance, etc.) to enhance jurisdictional food safety capacity.

1) Enhance epidemiologic and laboratory capacity to improve norovirus outbreak surveillance and reporting (1b, 2b):
   a. Report suspected norovirus outbreaks due to any mode of transmission through NORS and CaliciNet within 7 business days of notification of the outbreak to the state health department (required)
b. Provide a minimum set of data elements in the norovirus outbreak reports submitted to NORS and CaliciNet (required)
c. Include a unique outbreak identifier in both NORS and CaliciNet reports enabling linkage of those records and integration of the data from both systems (required)

1. Collaborations –
   a. With CDC funded programs:

   NORS and CaliciNet

   b. With organizations external to CDC:

   Not applicable

2. Target Populations:

   Not applicable

   a. Evaluation and Performance Measurement:

   i. CDC Evaluation and Performance Measurement Strategy:

   1) Number (percent) of suspected and confirmed norovirus outbreaks due to any mode of transmission reported to NORS within 7 business days of initial report to state health department.

   2) Number (percent) of confirmed norovirus outbreaks (typically 2 specimens required by the state for confirmation) due to any mode of transmission reported to CaliciNet within 7 business days of receipt at the state laboratory.

   3) Number (percent) of norovirus outbreaks reported to NORS with the minimum data elements completed (state, date of outbreak, number ill, etiology, and setting).

   4) Number (percent) of norovirus outbreaks reported to CaliciNet that can be linked with a corresponding NORS report.
ATTACHMENT
16: CaliciNet

Program Activity Contact Information
Jan Vinjé  (ahx8@cdc.gov  404-639-3721)

Funding Opportunity Description

Background

a. Healthy People 2020:
Food Safety goal to Improve food safety and reduce foodborne illnesses

b. Other National Public Health Priorities and Strategies:
Food Safety is one of CDC’s Winnable Battles

CDC Project Description

i. Problem Statement:
Norovirus is the most common cause of outbreaks of acute gastroenteritis and foodborne disease in the United States. Different norovirus genotypes have a different epidemiology with new GII.4 viruses emerging every 3-4 years and several other non-GII.4 genotypes that have been more frequently associated with foodborne disease. There is a need for standardized typing and laboratory surveillance of norovirus and continued support allows detection of newly emerging strains and linking outbreaks with a common (food or water) source.

ii. Purpose:
CaliciNet (http://www.cdc.gov/norovirus/reporting/calicinet/index.html) is used to link norovirus outbreaks that may be caused by common sources (such as food), monitor genotype trends, and identify emerging norovirus strains.

iii. Outcomes:
• Harmonized surveillance of norovirus outbreaks
• Better coordination and exchange of data between epidemiology and laboratory staff within each health department
• Improved surveillance data for norovirus
  o Improved completeness and timeliness of reporting
  o Improve and maintain completeness of information uploaded to the national databases
  o Faster and more efficient detection of local and multistate clusters/outbreaks

iv. Funding Strategy:
Funds may be utilized for personnel, travel, supplies and equipment, or contractual support for proposed activities.

• Total availability of funds: ~$600,000
• Approximate number of awards given: 25-32
• Range of awards: $2,500 - $70,000

v. Strategies and Activities:
In addition to responding to the strategies and activities related to this attachment, applicants for any foodborne component (I1-I6) of the Epidemiology and Laboratory Capacity
cooperative agreement are requested to include an executive summary of your jurisdiction’s enteric disease detection, investigation, control, and reporting program to greatly reduce the need to repeat this background information in each subcomponent. The executive summary should not exceed two pages and should include the following:

- A clear and succinct description of your overarching programmatic approach to detect, investigate, control, and report enteric disease cases and outbreaks (including those transmitted by food, water, or other routes). This summary should be provided in Report Template I0, and describe the comprehensive foodborne disease program (not limited to the portion which is federally funded). Inclusion of waterborne disease, environmental health and other programs (e.g., EHS-Net, norovirus, and legionellosis, etc.) when applicable is strongly encouraged.
- The organizational structure of all enteric disease programs (i.e., organizational charts).

Additionally, to enhance and complement states’ foodborne disease and food safety efforts, it is expected that applicants develop and foster close programmatic relationships with all organizational units whose overarching goals and objectives include detection, investigation, control, and reporting enteric disease cases and outbreaks. Applicants should also describe the following:

- Current or planned efforts to work across programmatic units (e.g., OutbreakNet, NARMS, PulseNet, FoodCORE, NORS, etc.) to encourage participation, cooperation, and reduce duplicative efforts.
- Current or planned efforts to access available resources (e.g., CDC technical assistance, Integrated Food Safety Centers of Excellence, Peer-to-peer mentorship/assistance, etc.) to enhance jurisdictional food safety capacity.

1. Sustain and enhance laboratory capacity (2a)
   a. Conduct norovirus testing and sequence-based typing using standardized laboratory protocols
   b. Document and store stool samples of norovirus negative outbreaks for further testing at 1 of the 3 Unexplained Diarrhea CaliciNet laboratories.
   c. Participate in annual CaliciNet User meeting

2. Improve laboratory coordination and outreach/information flow (2b)
   a. Better coordinate data exchange between epidemiology and laboratory staff within each health department

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<thead>
<tr>
<th>1. Collaborations –</th>
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<tr>
<td><strong>a.</strong> With CDC funded programs:</td>
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<td>NoroSTAT</td>
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<td><strong>b.</strong> With organizations external to CDC:</td>
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<tr>
<td>Not applicable</td>
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2. Target Populations:

Not applicable
| Table 1: Evaluation and Performance Measurement Strategy for Norovirus Outbreaks and Sequencing

1. CDC Evaluation and Performance Measurement Strategy:
   - Outbreaks (≥ 2 specimens) tested for norovirus:
     - a. total number
     - b. number with likely foodborne transmission
     - c. percentage with likely foodborne transmission
   - Outbreaks (≥ 2 specimens) sequenced for norovirus:
     - a. total number
     - b. number with likely foodborne transmission
     - c. percentage with likely foodborne transmission
   - Number of norovirus sequences that were submitted/uploaded to CaliciNet within 2 weeks after receiving samples in the laboratory
   - Norovirus sequences submitted/uploaded to CaliciNet within 2 weeks after receiving samples in the laboratory:
     - a. total number
     - b. percentage
   - Mandatory attendance of at least one laboratorian per CaliciNet-certified laboratory to the annual CaliciNet User meeting
   - Frequency (e.g., weekly, monthly, quarterly) of meetings between epidemiology and laboratory staff on norovirus outbreaks
Sexually Transmitted Disease Activities (J1-J3)

ATTACHMENT

J1: Threat of Antibiotic-Resistant Gonorrhea: Rapid Detection and Response Capacity

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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<tbody>
<tr>
<td>Karen Schlanger, Epidemiologist, 404-718-5660, <a href="mailto:khs4@cdc.gov">khs4@cdc.gov</a></td>
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<tr>
<th>Funding Opportunity Description</th>
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<tbody>
<tr>
<td>Background</td>
</tr>
<tr>
<td>a. Healthy People 2020:</td>
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<tr>
<td>This project supports Healthy People 2020 objectives to: reduce gonorrhea rates among men and women ages 15-44 (Objectives STD-6.1 and STD-6.2), as well as to strengthen public health laboratory services to support diagnosing and investigating health hazards in the community; support emergency response; support disease control and surveillance, and; support specialized testing (Objectives PHI-11.1–PHI-11.3; PHI-12.2–PHI-12.4; and PHI-12.6–PHI-12.7). This work will also support objectives to assure comprehensive epidemiology services (Objective PHI-13.4).</td>
</tr>
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b. Other National Public Health Priorities and Strategies: |
| This projects supports two goals of the National Strategy for Combating Antibiotic-Resistant Bacteria (CARB): (1) Slow the emergence of resistant bacteria and prevent the spread of resistant infections (Objective 1.1); and (2) Advance development and use of rapid and innovative diagnostic tests for identification and characterization of resistant bacteria (Objective 3.2). |

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<th>CDC Project Description</th>
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<tr>
<td>i. Approach</td>
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<tr>
<td>This project is a continuation of 2016’s K8: Threat of Antibiotic-resistant Gonorrhea.</td>
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</table>

Three strategies are employed to achieve the mid-term and long terms outcomes for this supplemental project. The first strategy (continuation from Project Year 1) is to **strengthen local resistant gonorrhea (GC) threat coordination and epidemiological capacity**. Building on project year 1 activities, which included hiring or designating an epidemiologist coordinator, project year 2 activities include continuing to develop and implement local protocols and work flows, and hiring and training staff. The mid-term outcomes influenced by this strategy include a trained state and local health care workforce better prepared to respond to emerging resistant GC threats, and improved coordination of laboratory and rapid response activities designed to quickly identify, treat, and interrupt transmission of resistant GC.

The second strategy (continuation from Project Year 1) is to **enhance timely surveillance for detection of resistant GC threats**. For this strategy, activities include use of Etest and other diagnostic tools to increase laboratory capacity and the speed at which resistant GC infections are diagnosed and reported to the local health department for action, as well as bolstering surveillance, health information systems capacity, and epidemiologic infrastructure. This strategy is critical for addressing the mid-term outcomes of expanded sharing of data between laboratory, clinicians, and field epidemiologists, and improved surveillance of GC in local
jurisdictions aimed at better targeting of interventions and more rapid detection of resistant GC threats.

The third strategy (continuation from Project Year 1) is to enhance GC case investigations to better understand network structure and epidemiological characteristics of cases and those in the network of cases, and assess transmission dynamics of GC and emerging resistant GC threats. Activities related to this include epidemiologic investigation of selected cases, elicitation of recent sexual partners, and epidemiological investigation of their sexual partners and those in the sexual and social network. The mid-term outcomes influenced by this strategy include improved implementation of laboratory and rapid response activities designed to quickly identify, fully investigate, treat, and interrupt transmission of GC and resistant GC threats, and improved understanding of gonorrhea epidemiology in local jurisdictions. The long-term outcome includes development of novel data-driven control strategies for gonorrhea and resistant gonorrhea, informed by data sources such as network and epidemiologic analyses, and potentially data from genomic analyses, social media technology, rapid laboratory diagnostics, and other sources.

The long-term outcomes influenced by these three strategies include: modernization of approaches for GC and resistant GC detection and rapid response; improved treatment and prevention of GC and resistant GC threats; minimized transmission of GC and resistant GC; prevention of new outbreaks of GC and resistant GC; reduction in GC morbidity; and overall improvement in the population’s health.

i. Problem Statement

GC is the second most commonly reported communicable disease in the United States with over 300,000 cases reported annually. Untreated GC can lead to pelvic inflammatory disease, ectopic pregnancy and infertility in women, epididymitis in men, serious disseminated infection in both females and males, and can facilitate HIV acquisition and transmission. Timely and effective treatment for GC prevents these severe adverse health outcomes and onward transmission in the community. However, *N. gonorrhoeae* has progressively acquired resistance to each of the antimicrobial agents that have been recommended for treatment over the past 70 years. In the past several years, the gonococcus has rapidly become less susceptible to the third-generation cephalosporins and macrolides, the components of currently recommended dual therapy. Particularly as the antibiotic pipeline has dwindled, the threat of untreatable GC is increasing. Development and spread of cephalosporin-resistant strains will severely complicate control and prevention of GC. Because GC is primarily diagnosed through nucleic acid amplification testing (NAAT) technologies, rather than culture, few clinicians have ready access to gonococcal susceptibility testing. While the Gonococcal Isolate Surveillance Project is critically important for monitoring trends in gonococcal susceptibility to inform treatment guidelines, the results are not available quickly enough to allow for rapid local responses to resistant strains. Developing local and state public health capacity for timely detection of and rapid response to emerging resistant GC threats is urgently needed to mitigate the spread of resistant GC.

ii. Purpose
Activities funded as a part of this project will strengthen state and local GC public health infrastructure and build capacity in high-risk local jurisdictions to support rapid detection of and response to threats of antibiotic resistant GC. This includes geographic areas at elevated risk of experiencing emergence of resistant GC based on the historical epidemiologic factors associated with the development of penicillin and fluoroquinolone resistance in the United States, such as geographic location in the western part of the U.S., local GC epidemics that include large percentages of gay, bisexual, or other men who have sex with men, or are geographic areas with high gonorrhea rates.

### iii. Outcomes

By the end of the project period, awardees are expected to show measurable progress toward the following outcomes:

- Trained state and local public health workforce better prepared to respond to GC and emerging resistant GC threats.
- Improved capacity and coordination of clinical, laboratory and rapid response activities designed to quickly identify, fully investigate, treat, and interrupt transmission of resistant GC threats.
- Expanded data sharing between clinicians, laboratory, and field epidemiologists.
- Increased specimen collection for GC culture at STD clinics and community partner locations (as identified in year 1) for antibiotic susceptibility testing across gender and anatomic sites.
- Improved surveillance of GC and resistant GC that supports rapid detection of resistant gonococcal infections and informs targeting of prevention and control interventions.
- Increased capacity to collect and analyze epidemiological data, to inform effective and efficient prevention and control interventions to mitigate the spread of GC and resistant GC threats.

### iv. Funding Strategy

Anticipated funding of $5,940,000 to support the increased capacity of resistant GC rapid detection and response at the state and local level. Up to 9 applicants will be funded with an estimated average award of $660,000. Eligibility is limited to state and local health departments that received K8 ELC funding in fiscal year 2016. Funding should be used to support costs for personnel, travel, training, laboratory supplies, local specimen transport, IT equipment, contractual support for surveillance or public health information systems enhancements, and approved innovative GC prevention activities. Direct assistance will be available if needed.

Funding should be used to support attendance and travel of at least the epidemiologist coordinator, an epidemiologist, and a laboratorian to an annual resistant GC rapid detection and response capacity meeting (to be held in Atlanta in 2017).

- Total (approximate) availability of funds: $5,940,000
- Approximate number of awards: 9
- Approximate average per award: $660,000
State and independently-funded city health departments that received K8 ELC funding in FY16 are eligible to receive this J1 funding in FY17. State health departments are expected to continue to collaborate with the local health department partner (selected during Year 1 activities); activities will be implemented at the local (city or county) level. The local health department must in-turn collaborate with at least two community-based sites to collect additional specimens for gonococcal culture and antimicrobial susceptibility testing (AST) by Etest. All project activities should directly relate to improvements in GC-related laboratory, surveillance, epidemiology, and clinical capacity, as well as informing innovative GC control efforts in the designated local jurisdiction. An appropriate local health department should have features that make it valuable from both a GC-control perspective and an antibiotic-resistance perspective, including:

1) STD Prevention Program capacity, including a) the proximity of a laboratory (state or local) that has systematic experience culturing GC specimens and conducting Etest AST and b) the presence of a categorical STD clinic that diagnoses at least 200 cases of GC per year;
2) A high GC case-count in the local health department jurisdiction;
3) Access to a diverse population, including groups that are known to experience higher rates of reduced antibiotic susceptibility, including gay, bisexual, and other men who have sex with men (MSM) and racial/ethnic minorities.
4) Agreement with at least two community partner sites that serve groups known to experience high rates of GC and/or reduced antibiotic susceptibility GC to collect GC isolates for culture and AST.
5) The capacity to conduct AST testing on at least 15% of GC cases in the jurisdiction per year, or 1,000 cases, whichever is less. This includes isolates collected at STD clinics and community partner sites.

State and local STD Directors must work collaboratively and play an active role in planning and applying for this funding. Progress towards Year 1 project activities and outcomes will be considered during application review.

v. Strategies and Activities

Applicants will address the following core strategies, all of which are required, unless otherwise stated as optional activities. Applicants should focus on those that build and sustain current capacity based on the local jurisdiction and align to the outcomes described above.

1) Strengthen local resistant GC threat coordination and epidemiological capacity
   a) Ensure appropriate staffing are in place, including an epidemiologist coordinator responsible for coordinating local resistant GC activities, an epidemiologist with capacity to conduct epidemiologic and network analyses, laboratorians, case investigators, and others to support local detection and response activities and capacity.
   b) Maintain and update, as needed, program protocols, including flow charts and definitions detailing data and specimen collection protocols and processes, case reporting, laboratory testing, and epidemiologic investigation and analysis
   c) Advance workforce development and training related to rapid response for resistant GC (optional)
2) Enhance timely surveillance for detection of resistant GC threats

a) Develop and maintain local lab capacity and protocols for implementing Etest for timely AST.

b) Develop, implement, and maintain electronic systems and processes for rapid communication of Etest results to ordering clinicians, the epidemiology coordinator, and surveillance, epidemiology, and programmatic staff. Results from all isolates identified as having reduced antibiotic susceptibility by Etest should be reported to the local epidemiology coordinator, state or independently-funded city health department, and CDC within 24 hours of testing.

c) Improve timeliness of reporting and complete capture of data relevant to antibiotic-resistant GC surveillance and epidemiology in electronic surveillance systems (required). These include (but are not limited to): census tract, treatment date and regimen, anatomic site of infection, sex of sexual partners, symptoms, Etest results, and treatment.

d) Implement and monitor success of a plan (developed during project year 1) for expanded collection of specimens for gonococcal culture and performance of AST on GC isolates. The plan should include collection of specimens from: at least two partnering community-based sites, women with GC, and extragenital anatomic sites. **During this project period, AST via Etest must be conducted on isolates from at least 15% of GC cases in the jurisdiction per year, or 1,000 unique isolates, whichever is less. This includes isolates collected at STD clinics and partnering community-based sites.**

e) Pilot novel approaches to detect resistance in non-STD clinic settings, including but not limited to public health detailing to distribute culture media plates or appropriate transport media (such as, but not limited to InTray GC™) to high-volume providers that do not routinely perform culture-based testing due to clinic or lab capacity issues.

f) Follow established protocols for labeling, packaging, and shipping of isolates to the assigned Antibiotic-Resistant Lab Network (ARLN) laboratory for confirmatory agar dilution AST and molecular characterization, such as whole genome sequencing.

g) Electronically submit required data and specimen identifiers (associated with each shipped isolate) to the assigned ARLN laboratory.

h) Enhance local health department capacity to appropriately collect, store, and analyze AST data (e.g., date of test, test type, and Etest MIC results by drug tested) in the state/local information system.

i) Evaluate routinely collected programmatic data related to test-of-cure among persons tested and treated for GC who return for a test-of-cure visits (optional).

3) Enhance GC case investigations

a) Rapidly (within 24 hours) initiate case investigations (in-person if possible) of all GC cases found through laboratory diagnostics or clinical presentation (e.g. unsuccessful treatment) to be infected with a gonococcal strain of reduced-susceptibility to cefixime, ceftriaxone, or azithromycin.

b) Initiate case investigations on an additional subset of jurisdiction GC cases (Subset/sampling strategy to be defined, but applicants can propose local populations of interest in the application).

c) Conduct investigations of two generations of sexual and social contacts of cases, and develop methods for describing social and sexual networks of interviewed cases.

d) Analyze network, epidemiologic (including sociodemographic, risk behavior, and healthcare seeking behavior), phenotypic susceptibility testing data, and when available, genomic
data, concurrently to improve understanding of local GC epidemiology and transmission dynamics of GC and emerging resistant GC threats.

e) On a monthly bases (once OMB approval has been granted) report awardee required variables for: 1) all GC cases identified in the STD clinics, 2) for all patients for whom a specimen was collected for GC culture, and 3) any GC case investigations (including data on 1st and 2nd generation sexual and social contacts) conducted.

### 1. Collaborations –

**a. With CDC funded programs:**

Programs will be expected to work with the ARLN laboratories, who will be serving as reference labs, performing confirmatory resistance testing and advanced molecular characterization of locally tested specimens. Programs will also be expected to work with state and local STD prevention programs funded through Assessment, Assurance, Policy and Prevention Strategies (AAPPS).

**b. With organizations external to CDC:**

Awardees are expected to work with the Council of State and Territorial Epidemiologists to improve resistant GC surveillance and the Association of Public Health Laboratories to implement best laboratory practices pertaining to resistant GC in order to achieve outcomes put forth in this supplement. Awardees are also expected to work with clinical providers, health care organizations, and medical associations in the selected jurisdiction.

### 2. Target Populations:

All persons diagnosed with or at risk for GC will represent the target population.

**a. Evaluation and Performance Measurement:**

**i. CDC Evaluation and Performance Measurement Strategy:**

Evaluation and performance measures will be reported to CDC on a monthly and annual basis.

**Strategy 1) Strengthen local resistant GC threat coordination and epidemiological capacity**

1) List of qualified personnel hired or retained to support activities.

2) Number of trained personnel who can perform GC culture using Etest.

**Strategy 2) Enhance timely surveillance for detection of resistant GC threats**

1) Name and number of health center partner participants (i.e. health center partners that submit GC specimens for antimicrobial resistance testing).

2) Number and percentage of GC isolates tested for antimicrobial resistance (by sex/gender identity, anatomic site, and sex of sex partner) among all cases diagnosed at each participating health center.

3) Number of GC NAATS and cultures performed and positivity rate at each participating health center, by anatomic site.

4) Number of GC cases reported in the jurisdiction, and at participating STD and non-STD health center partner locations.

5) Median and range of field investigations with 2nd generation sexual partners and close contacts of RSGC cases and non-RSGC cases: #/% initiated, #/% tested for GC (NAAT), #/% treated for GC, #/% of newly identified number of days from specimen collection to receipt
at laboratory, from receipt at laboratory to Etest completion, and from Etest completion to report to clinician and local health department within the awardee-required timeframe.

6) Number and proportion of isolates found to have reduced susceptibility or resistance to antibiotics tested.

7) Number and percentage of isolates Etested for antibiotic susceptibility at the local public health lab shipped to the ARLN for agar dilution testing.

8) Number of viable, non-viable, and contaminated GC specimens received by the ARLN (from the local PH laboratory).

**Strategy 3) Enhance GC case investigations to identify transmission dynamics of GC and emerging resistant GC threats**

1) Number and percentage of GC cases found to be resistant to or have reduced susceptibility to tested antibiotics for whom epi field investigations were initiated within 48 hours of AST results.

2) Outcomes of field investigations with resistant GC cases (RSGC cases) and non-RSGC cases: Number and percentage completed; number and percentage where sufficient information on ≥ 1 sexual partner was provided; number of contacts named.

3) Outcomes of field investigations with sexual partners and close contacts of RSGC cases and non-RSGC cases: #/% initiated, #/% where contact information for ≥ 1 sexual partner was provided; number of contacts named, #/% tested for GC (NAAT), #/% treated for GC, #/% of newly identified cases for whom AST was conducted, #/% of RSGC cases detected.

4) Outcomes cases for whom AST was conducted, #/% of RS GC detected.

5) Number of emerging GC threat sexual and social networks identified.
ATTACHMENT
J2: Enhanced Gonococcal Isolate Surveillance Project (eGISP)

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<thead>
<tr>
<th>Program Activity Contact Information</th>
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<tr>
<td>Elizabeth Torrone, Epidemiologist, 404-639-8948</td>
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<tr>
<th>Funding Opportunity Description</th>
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<tr>
<td>Background</td>
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<tr>
<td>c. Healthy People 2020:</td>
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<tr>
<td>This project addresses the Healthy People 2020 focus area of Sexually Transmitted Diseases (STDs) and the goal of reducing gonorrhea rates in males and females aged 15–44 years (STD-6). This project supports the focus area of Lesbian, Gay, Bisexual, and Transgender Health and goal of increasing the number of population-based data systems used to monitor HP2020 objectives that include in their core a standardized set of questions that identify lesbian, gay, bisexual, and transgender populations (LGBT-1). This project also addresses the focus area of Immunization and Infectious Diseases and goals to reduce, eliminate, or maintain elimination of cases of vaccine-preventable diseases (IID-1) and reduce meningococcal disease (IID-3).</td>
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<tr>
<td>d. Other National Public Health Priorities and Strategies:</td>
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<td>This project supports implementation of the National Strategy for Combating Antibiotic-Resistant Bacteria and supports CDC’s Antibiotic Resistance Solutions Initiative. This project addresses the CDC Health Protection Goals of healthy people in every stage of life, and healthy people in healthy places. This project supports CDC’s strategic priorities of: (1) excellence in surveillance, epidemiology, and laboratory services and (2) strengthening support for state, tribal, local, and territorial public health. This project aligns with the priorities of the National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention (NCHHSTP) to reduce the rate of non-HIV STDs. This project addresses the strategic goals of the Division of STD Prevention (DSTDP) strategic plan, which includes addressing the threat of antibiotic-resistant ( N.\ gonorrhoeae ) and building capacity to respond to emerging STD threats.</td>
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<th>CDC Project Description</th>
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<tbody>
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<td>j. Approach</td>
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<tr>
<td>This project will increase the ability of state and local jurisdictions to detect resistant ( N.\ gonorrhoeae ) in their jurisdiction through enhanced surveillance and laboratory capacity.</td>
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</tbody>
</table>

Two strategies are employed to achieve the outcomes for this project. The first strategy is to *enhance surveillance of gonococcal resistance in sexually transmitted disease (STD) clinics*. Its activities include collection of pharyngeal, urethral, and rectal isolates from patients reporting sexual exposure at those sites and the collection of cervical isolates from women undergoing pelvic examinations. Isolates will be sent to an assigned *regional laboratory* for antimicrobial susceptibility testing (AST). AST results will be provided to the jurisdiction to allow jurisdictions to better understand the epidemiology of resistant \( N.\ gonorrhoeae \) in their jurisdiction to help inform patient management and local public health response.

The secondary strategy is to *improve specificity of local surveillance for gonococcal resistance*. \( Neisseria meningitidis \) can cause urethritis and local laboratory testing may show Gram-negative intracellular diplococci (GNID) and/or the culture may be positive suggesting that the infection is \( N.\ gonorrhoeae \). As \( N.\ meningitidis \) has different resistant profiles than \( N.\ meningitidis \).
**Problem Statement**

*N. gonorrhoeae* has been designated an urgent antibiotic resistance threat in the United States by CDC and is a priority of both the National Strategy for Combating Antibiotic-Resistant Bacteria and CDC’s Antibiotic Resistance Solutions Initiative. A fundamental component of the National Strategy is strengthening of surveillance. Many jurisdictions participate in the Gonococcal Isolate Surveillance Project (GISP) which conducts surveillance on male urethral isolates; however, some experts have speculated that the pharynx and/or rectum may be anatomic niches that select for or foster resistance. Expanding local capacity to conduct *N. gonorrhoeae* surveillance on non-urethral isolates (i.e., pharyngeal, rectal, and cervical isolates), will strengthen local surveillance and may improve the ability to detect changes in susceptibility patterns sooner.

Additionally, many jurisdictions only conduct Gram stain and culture of urethral specimens; this leaves open the possibility that isolates of non-gonococcal *Neisseriaceae* (such as *N. meningitidis*) may be included in surveillance for resistant *N. gonorrhoeae*. Although believed to be infrequent, urethritis associated with *N. meningitidis* has recently been identified with increasing frequency in at least 2 current GISP sites. Because of the presence of other commensal *Neisseria* spp in the pharynx, such as *N. lactamica*, the possibility of misidentification of *Neisseria* spp might be compounded when specimens from extra-genital anatomic sites are included in surveillance of gonococcal susceptibility.

Increasing the sampling of gonococcal isolates from different anatomical sites including pharyngeal and rectal isolates will enhance the ability to detect resistant infections. Evaluating the burden of urethritis associated with *N. meningitidis* will inform efforts to maximize specificity of surveillance. Timely detection and maximal specificity of surveillance efforts will support effective local response to the threat of resistant *N. gonorrhoeae*.

**Purpose**

The purpose of this project is to enhance surveillance of resistant *N. gonorrhoeae* in the United States and increase state and local capacity to detect and monitor resistant gonorrhea, including among important populations, such as gay, bisexual, and other men who have sex with men (MSM) (in whom gonococcal resistance has often initially emerged) and women, a population from whom specimens have not been previously systemically collected for surveillance of resistance in the United States.

This project will expand and enhance current surveillance by increasing the number of jurisdictions with the capacity to collect gonococcal isolates and through coordinated
susceptibility testing at regional and CDC laboratories, provide jurisdictions with information critical to understanding the epidemiology of resistant *N. gonorrhoeae* in their area.

At the national level, data from jurisdictions participating in these activities will be combined with susceptibility data from GISP better describe *N. gonorrhoeae* susceptibility patterns in the United States and inform the national response to the threat of resistant *N. gonorrhoeae*.

<table>
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<tr>
<th>viii. Outcomes</th>
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<tbody>
<tr>
<td>By the end of the project period, the following outcomes will be achieved:</td>
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<tr>
<td>• Increased state and local capacity to detect and monitor resistant <em>N. gonorrhoeae</em>.</td>
</tr>
<tr>
<td>• Improved understanding of the epidemiology of resistant <em>N. gonorrhoeae</em> at the state and local level.</td>
</tr>
<tr>
<td>• Improved specificity of gonococcal antibiotic resistance surveillance by distinguishing <em>N. gonorrhoeae</em> from <em>N. meningitidis</em> in specimens from the urethra and other anatomic sites.</td>
</tr>
<tr>
<td>• Improved understanding of the epidemiology of <em>N. meningitidis</em> in urethral, pharyngeal, rectal and cervical isolates.</td>
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<tr>
<td>• Increased collaboration between state and local jurisdictions and regional ARLN laboratories and CDC laboratories.</td>
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<tr>
<th>ix. Funding Strategy</th>
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<tr>
<td>This funding is open to all jurisdictions who have identified at least one STD clinic in their jurisdiction with the capacity to collect cultures for <em>N. gonorrhoeae</em> at multiple anatomic sites (i.e., urethral, cervix, rectum, and oropharynx).</td>
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<tr>
<td>Applicants who are currently funded through GISP to collect male urethral isolates in one or more STD clinic(s) are encouraged to apply; these expanded and enhanced activities can be completed in those STD clinic(s). Applicants who are currently funded to perform similar activities in selected STD clinic(s) in their jurisdiction through ELC J1 (formerly K8): Threat of Antibiotic-Resistant Gonorrhea: Rapid Detection and Response Capacity are eligible to apply, but must identify at least one different STD clinic(s) in different geographic location(s) in their jurisdiction for activities funded through this project.</td>
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<tr>
<td>• Total funding available: $600,000</td>
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<td>• Approximate Number of Awards: 10</td>
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<tr>
<td>• Approximate Average per Award: $60,000</td>
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Funding should be used to support costs for personnel, training, laboratory supplies, specimen shipping, IT equipment, and contractual support for surveillance or public health information systems enhancements. Grantee must demonstrate data management and epidemiologic capacity to review local data to inform public health action and prepare data for transmission to CDC; funds may be used to support FTE who is trained in epidemiology/data management.

Applicants must have the statutory authority to conduct state- or project-area-wide communicable disease or infectious disease surveillance and the organizational structure and capacity to execute the program approach and strategies and meet the project period outcomes, including the organizational capacity to support and/or operate an STD specialty care clinic and a public health laboratory in a local jurisdiction with high gonorrhea morbidity,
over the course of the project period. The anticipated level of specific organizational capacity needed to execute the approach successfully includes capacity in:

- Organizational structure and management that supports the activities
- Clinic and public health laboratory staffing structure and expertise that support the activities, including having validated the use NAAT for pharyngeal and rectal specimens
- Surveillance, information technology, data management, and epidemiology
- Human resource management and financial management to support the activities

x. Strategies and Activities

Applicants will address the following two required core strategies:

1) Enhanced capacity to conduct surveillance of gonococcal resistance

   a) Applicants will identify one or more categorical STD clinics in their jurisdiction and a local public health laboratory who will execute the program strategies and meet the project period outcomes.

   b) Urethral swabs for Gram stain, gonococcal culture and urethral/urine specimens for NAAT will be collected from all men presenting to the participating STD clinic(s) with symptomatic urethritis. Pharyngeal and/or rectal swabs for culture and NAAT will be collected from men seen in the participating STD clinic(s) reporting pharyngeal and/or rectal exposure (i.e., men reporting oral sex or receptive anal sex). The local public health lab will isolate and ship the gonococcal isolates to the assigned laboratory in the CDC-supported Antibiotic Resistance Laboratory Network (ARLN).

   c) Pharyngeal and/or rectal swabs for culture and NAAT will be collected from women seen in the participating STD clinic(s) reporting pharyngeal and/or rectal exposure (i.e., women reporting oral sex or receptive anal sex). Cervical swabs for gonococcal culture and NAAT will be collected from women undergoing pelvic examinations in the participating STD clinic(s). A urine specimen for NAAT (rather than a swab) is acceptable. The local public health lab will isolate and ship the gonococcal isolates to the assigned ARLN laboratory.

   d) Specimens for culture will be inoculated onto selective media at the STD clinic(s). Gonococcal isolates will be sub-cultured from the selective primary medium to a non-inhibitory medium in the local public health laboratory. Isolates will be assigned sequential identifiers and frozen. Participants should maintain adequate specimen handling quality control to maximize isolate viability. Isolates associated with positive gonorrhea NAAT results will be shipped monthly to the assigned ARLN laboratory for antimicrobial susceptibility testing by agar dilution and possible molecular characterization (including whole genome sequencing). CDC may request that selected specimens of interest be shipped from the ARLN to CDC for additional laboratory investigation and archival storage. Isolates from a sample of isolates with negative gonorrhea NAATs will be shipped to the CDC Meningitis Branch laboratory (see below).

   e) The ARLN will provide the jurisdiction AST results. Jurisdictions will review results to describe the epidemiology of resistant *N. gonorrhoeae* in their jurisdiction and to help inform patient management and local public health response.

   f) Line-listed de-identified demographic and clinical data elements associated with each isolate will be collected by the grantee and electronically submitted to CDC following standardized protocols. Grantees will collect and transmit standardized data elements for domains such as anatomic site (from which the specimen was collected), gender of
recent sex partners, recent sex with anonymous partners, HIV status (including results from HIV testing at the clinic visit when the specimen was collected), travel history, recent sexual practices (such as insertive oral sex or receptive anal sex), and NAAT results of the specimen. Grantees will assign a unique identifier to the patient, so as to enable identification of multiple isolates that were collected from the same patient, and include this identifier with the line-listed transmitted data.

2) Improved specificity of local surveillance for gonococcal resistance.
   a) Applicants will identify and maintain records of all urethral, pharyngeal, rectal, and cervical isolates that demonstrate bacterial growth by culture consistent with *N. gonorrhoeae* (positive culture) and, in the case of urethral specimens, GNID by microscopy, but *negative* gonorrhea NAAT results (“discordant results”). Such isolates will be considered presumed *N. meningitidis*.
   b) When identified, these presumed *N. meningitidis* isolates will be shipped monthly to the CDC Meningitis Branch Laboratory in Atlanta, Georgia for antibiotic susceptibility testing, confirmatory identification, and molecular characterization (including whole genome sequencing). Participants should maintain adequate specimen handling quality control to maximize isolate viability.
   c) The CDC Meningitis Branch Laboratory will provide results to the jurisdiction. Jurisdictions will review results to describe the epidemiology of *N. meningitidis* in urethral, pharyngeal, rectal and cervical isolates in their jurisdiction to help inform patient management and local public health response.
   d) Line-listed de-identified demographic and clinical data elements associated with each isolate will be collected by the grantee and electronically submitted to CDC following standardized protocols. In addition to the epidemiological variables described above for the first activity, data collection for these isolates will include some additional but limited epidemiological data such as meningococcal vaccination status.

3. Collaborations –
   c. With CDC funded programs:

Awardees will be assigned an ARLN laboratory who will serve as the reference laboratory for their clinical site and perform the antimicrobial susceptibility testing. Programs will also be expected to work with State and local STD prevention programs funded through CDC’s Improving Sexually Transmitted Disease Programs through Assessment, Assurance, Policy Development, and Prevention Strategies (STD AAPPS).

   d. With organizations external to CDC:

Awardees are also expected to work with clinical providers in the participating STD clinic(s) in their jurisdiction.

4. Target Populations:

Applicants are expected to identify persons with urethral, pharyngeal, rectal, or cervical gonococcal infections, including racial, ethnic, and sexual minorities, for the purposes of surveillance of gonococcal resistance.

   b. Evaluation and Performance Measurement:

   ii. CDC Evaluation and Performance Measurement Strategy:
At a minimum, awardees are expected to monitor and report annually on the following measures:

1) Enhanced capacity to conduct surveillance of gonococcal resistance
For each participating STD clinic:
1. Number of men who presented to the affiliated STD clinic(s) with urethritis or who reported sexual exposure at the oropharynx or rectum. Of these men:
   a. By anatomic site: number/proportion of men that 1) had specimens collected and 2) specimens tested by Gram stain, culture and/or NAAT
   b. By anatomic site: number/percentage of specimens that demonstrated typical growth by culture (i.e., were positive cultures)
2. Number of women undergoing a pelvic examination at the affiliated STD specialty clinic(s) or who reported sexual exposure at the oropharynx or rectum. Of these:
   a. By anatomic site: number/proportion of women that 1) had specimens collected and 2) specimens tested by Gram stain, culture and/or NAAT
   b. By anatomic site: number/percentage of specimens that demonstrated typical growth by culture (i.e., were positive cultures)
3. Number/percentage of collected isolates for which complete epidemiological data were reported to CDC

2) Improved specificity of local surveillance for gonococcal resistance.
For each participating STD clinic:
By gender and anatomic site (i.e., urethral, oropharynx, rectum, and cervix):
1. Number/percentage isolates that demonstrated typical growth by culture (i.e., were positive cultures).
2. Number/percentage of isolates identified with discordant laboratory results (i.e., GNID by Gram stain/positive cultures and negative gonorrhea NAAT).
3. Number/percentage of isolates for which requested epidemiological data were reported to CDC.
ATTACHMENT

J3: Combined HIV and STD Prevention and Care for Vulnerable Men who Have Sex with Men and Transgender Women via Network Methods

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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<tbody>
<tr>
<td>Matthew Hogben, Health Scientist, 404-639-1833</td>
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<table>
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<tr>
<th>Funding Opportunity Description</th>
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<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td>e. <strong>Healthy People 2020:</strong></td>
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<tr>
<td>This project supports Healthy People 2020 objectives (which cohere closely with the National HIV/AIDS Strategy objectives) HIV-2, <em>Reduce the number of new HIV infections among adolescents and adults</em>, and HIV-3, <em>Reduce the rate of HIV transmission among adolescents and adults</em>. The project also supports HIV-13, <em>Increase the proportion of persons living with HIV who know their serostatus</em>, and HIV-14.2, <em>Increase the proportion of men who have sex with men who report having been tested for HIV in the past 12 months</em>. With respect to STD, this project supports HP 2020 objective STD 7.2, <em>Reduce domestic transmission of primary and secondary syphilis among males</em>.</td>
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<tr>
<td>f. <strong>Other National Public Health Priorities and Strategies:</strong></td>
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<td>This project supports two of the goals of the National HIV/AIDS Strategy: (1) Reduce the number of people who become infected with HIV; and (2) Increase access to care and improve health outcomes for people living with HIV. The Secretary’s Minority AIDS Initiative Fund also derives goals from NHAS. The most clearly relevant high-priority goal is D(1): <em>Innovative strategies to promote access to comprehensive PrEP services for high-risk racial/ethnic minorities for whom it is appropriate and desired, especially MSM and transgender persons</em>.</td>
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<tr>
<td>With respect to ELC core areas and strategies, this project is directly relevant to 1a, 1c and 1d under <em>Strengthen Epidemiological Capacity</em>. Depending on the precise nature of recipient activities, this project could also address 2a under <em>Enhance Laboratory Capacity</em>.</td>
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<tr>
<th>CDC Project Description</th>
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<tr>
<td>k. <strong>Approach</strong></td>
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<tr>
<td>Recipients will describe and use social, sexual and phylogenetic networks to improve management of STDs, particularly syphilis, and to identify MSM and transgender women who are either HIV-infected or at risk of HIV and STDs for high-impact prevention interventions. The activities are based on expansion and extension of existing disease control activities enumerated in current guidance and program funding cooperative agreements.</td>
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<tr>
<td>Recipients will use municipal STD clinics as the beginning points for generating networks and assuring appropriate interventions to provide prevention and reduce the burden of disease. STD clinics see substantial racial and ethnic minority populations, including MSM and, increasingly, transgender persons, who are both HIV-infected and uninfected.</td>
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<tr>
<td>The first activity required of recipients is to build networks of at-risk individuals, starting by interviewing MSM or transgender women seen at STD clinics for their sex partners and social acquaintances. These MSM and transgender women comprise the “seed” population for</td>
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</table>
generating networks. The seed members will also have a current or recent history of HIV or syphilis.

Second, recipients will find and interview the sexual and social contacts of the seeds (the first wave of contacts). Recipients will (a) interview the first wave for their sexual and social contacts (i.e., the second wave). Recipients will also (b) link members of these networks to HIV care if infected with HIV and to high-quality prevention services – especially PrEP – if not infected with HIV and at risk. Finally, recipients will (c) assure syphilis testing for network members and treatment for any network members diagnosed with syphilis.

Recipients may design and test varying network generation algorithms; we anticipate that they will find and interview people out to three waves of contacts. As part of the social component of networks, recipients should collect information on venues (health care and social venues) to facilitate understanding networks of places as well as people.

The short-term outputs of these activities are that (a) a larger proportion of vulnerable individuals in a jurisdiction receiving testing, treatment, and linkage to care and (b) the recipient organization and partners will have a more closely and efficiently linked portfolio of care and prevention services. The longer-term outcomes include reduced proportions of people who do not know their HIV status and who are infected, but not in care. Those outcomes also include reduced duration of syphilis at the community level, leading to reduced transmission of both syphilis and HIV infection.

Recipient organizations using this overall approach should be able to strengthen epidemiological capacity (1a, 1b, 1d) with more timely and efficient investigation of outbreaks and implementation of control measures (proximal outcomes), leading to the improved treatment and prevention of infectious diseases, minimized transmission and decreased morbidity (distal outcomes).

Problem Statement

The underlying problem addressed in this task is based on three overlapping points. First, the United States is currently experiencing steep rises in syphilis rates, and the majority of syphilis cases are among MSM, many of whom are MSM of color. Second, syphilis and HIV are intertwined epidemics among MSM and transgender women – essentially part of the same constellation of sexual health needs. Third, STD incidence (especially syphilis) among HIV-uninfected MSM is a marker for extremely high vulnerability to HIV infection among this population. Remediation of infectious disease requires treatment or care for current disease and prevention for vulnerable persons. Case detection enables both treatment and prevention: the former because case detection identifies morbidity, and the latter because those exposed to cases are by definition at high risk and thus priority candidates for prevention. Network methods enable more productive and more efficient case detection. Because HIV and syphilis are intertwined and highly concentrated among MSM and transgender women, there is a good case for basing networks on members of these two groups.

In 2015, 23,872 primary and secondary (P&S) syphilis cases were reported, a 19% increase from the previous year, and the national P&S syphilis rate was 7.5 cases per 100,000 population, the highest rate reported in over two decades. The national rate of reported P&S syphilis cases
increased 40% from 2000 to 2015. Data show this rise in the P&S syphilis rate is primarily attributable to increasing numbers of cases among men and, specifically MSM. For example, MSM accounted for the majority of P&S syphilis cases nationally through 2015; among male cases with information on gender of sex partner, 82% occurred among MSM. Over half of these cases (56.4%) were among Black or Hispanic MSM.

Surveillance data also show that P&S syphilis infections often co-occur with HIV infection, particularly among MSM. Data from 31 states in 2015 show approximately 50% of P&S syphilis cases among MSM with known HIV status were HIV-positive. In addition, if left untreated, syphilis is associated with significant clinical complications, such as ocular syphilis and neurosyphilis. The recent resurgence of syphilis in the United States has been accompanied by increased reports of visual impairment and blindness due to ocular syphilis. In short, serious health threats due to complications of syphilis for MSM are meaningful risks.

STD diagnoses among HIV-uninfected MSM are markers for subsequent HIV infection (6-9). Two cohort studies conducted among MSM showed that rectal infections were associated with subsequent HIV infection. Hazard ratios (HR) ranged from 2.7 to 8.9 for rectal infections in the two cohorts, and an early syphilis diagnosis was associated with subsequent infection in the cohort that measured this factor (HR = 4.0). New York City STD clinic data show that 1 in 20 MSM diagnosed with syphilis were then diagnosed with HIV within 1 year of syphilis diagnosis. In sum, MSM (and transgender women) seen in STD clinic settings comprise high-priority populations for HIV prevention services.

xii. Purpose

Activities funded as a part of this project will strengthen state and local STD program public health infrastructure and build capacity in high-risk local jurisdictions to support the improved HIV and syphilis case detection, detection of people highly vulnerable to infection (and transmission), and subsequent treatment and management of care. This includes geographic areas with elevated burden of morbidity and rates of infection for both syphilis and HIV.

Recipient benefit falls mostly under strengthening epidemiological capacity (1a, 1c, 1d) to detect, respond and investigate outbreaks and implement control measures; improve public health response, control and practice; develop prevention guidelines; and improve treatment and prevention of HIV and syphilis.

xiii. Outcomes

The two major outcomes expected from the approach are to:
(1) Increase the number and proportion of members of networks linked to HIV care if infected with HIV and to high-quality prevention services – especially PrEP – if not infected with HIV and at risk, and
(2) Reduce duration of infection for syphilis in these networks in order to reduce transmission of both syphilis and HIV infection.

The outcomes that show if developing networks of people seeded on the basis of recent syphilis or HIV infection or repeat syphilis infection improve case detection and linkage to treatment (or other care) and reduce duration of infection fall into 4 areas.
First, recipients will need to show that they have developed adequate networks. That is, they will need to use interview techniques and collect data to show how those they interview are connected sexually, socially (this includes through venues). Second, recipients will have to show that these networks identify candidates for syphilis treatment, PrEP, ART, behavioral health counseling, and social services. The figure shows a section of a network that demonstrates an appropriate outcome for the first and second task.

Third, recipients will have to show that they can either provide the necessary services or assure linkage of candidates to services. The process measure for this task would be a set of MOUs or equivalent documents showing that the recipient has the requisite community partners, and the outcome measure would be evidence that candidates for services within networks received services. Existing CDC indicators outlined in Section 2a(i) below provide the basis for measures. These three categories of outcome are indicative of ELC strategies related to strengthening epidemiological capacity (and potentially enhancing lab capacity with phylogenetic network testing) through outbreak detection and management, improved response and practice.

Fourth, recipients will have to show evidence that they have reduced duration of syphilis infection (especially P&S syphilis). Recipients may discuss comparison metrics, such as historical standards or duration of infection among those not in networks, with CDC. This outcome, along with HIV management, is indicative of the distal outcomes of minimized transmission and decreased morbidity.

Funding Strategy

Anticipated funding is $1.6 million to support the increased capacity of STD programs to find and manage HIV and syphilis among MSM and transgender women. Up to 2 applicants will funded with an estimated average award of $800,000. Funding should be used to support program labor costs (including coordination and staffing for extended outreach needs for network construction), design and analytic support for network construction, cost-effectiveness evaluations, and other evaluation designs, equipment costs such as network specialized software, phylogenetic testing, partnership costs such as linkage protocol development, and travel.
Recipients must assure unrestricted access to a setting in which activities will be implemented (i.e., an STD clinic). All project related activities should directly contribute to improvements in epidemiology and program service delivery capacity in the designated local jurisdiction. An appropriate setting should have:

6) STD Prevention Program capacity, meaning a categorical STD clinic or clinic system.
7) Sufficient numbers of the target population and sufficient burden of infections, such that the clinic sees:
   a. At least 100 racial or ethnic minority MSM patients in the previous 12 months
   b. At least 50 cases of primary or secondary syphilis diagnosed in the previous 12 months
8) Collaborative arrangements that facilitate ability to provide prevention and care as warranted. We further expect recipients to collaborate on data collection elements across funded sites.

State and local STD Directors must work collaboratively and play an active role in planning and applying for this funding.

xv. Strategies and Activities

All activities are required, except phylogenetic testing. Recipients will have flexibility in choosing how to accomplish these activities, which are the core of the project and likely to vary in form among recipients.

Recipients will:
Strengthen epidemiological capacity (1a, 1b, 1d)
   1) Engage in formative assessment of MSM populations and transgender women with particular attention to local epidemiology and behaviors, social context, service availability, and disease.
   2) Use network methodological techniques to describe networks seeded from STD clinic patients who are MSM or transgender women who have a recent history of HIV infection or syphilis, or who have a history of repeated syphilis infection.
      a. Network links should be based on sexual and social links (mandatory), and phylogenetic testing (optional)
   3) Assure the provision of interventions to identify candidates for PrEP/ART and assure linkage to PrEP services, as well as interventions to assure treatment for syphilis.
   4) Evaluate outcomes and adjust the intervention mix as needed with attention to maximizing synergies and efficiencies among interventions. Continuous quality improvement techniques are expected here.
   5) Measure all costs related to identification of networks and implementation of network level interventions, including collection of time-motion data.

These five activities will allow recipients to improve program capacity to prevent and control syphilis and HIV, as per STD and HIV program missions. We also expect that recipients will:
   6) Participate in discussions about common protocols and common data elements
   7) Contribute data to inform models of transmission dynamics.
These last two activities will enhance the overall value of the data from the project to STD/HIV program-based prevention and control and contribute further to increasing overall program epidemiologic capacity.

As noted under outcomes and previous sections, these strategies cohere with ELC goals of strengthening epidemiological (and potentially lab) capacity, leading to distal outcomes in improved treatment and prevention, decreased transmission and decreased morbidity. Recipient activities re cooperation and collaboration across sites might also address areas related to better coordination and exchange of data and development of prevention guidelines.

5. Collaborations –
   e. With CDC funded programs:

Recipients will be expected to work with State and local STD prevention programs funded through Assessment, Assurance, Policy and Prevention Strategies (AAPPS), especially as the evaluation sites will be STD clinics.

f. With organizations external to CDC:

Recipients are expected to work as needed with clinical providers, health care organizations, medical associations, other local government entities, social services organizations, and other community-based organizations in the selected jurisdiction.

6. Target Populations:

Network seeds must be racial or ethnic minority MSM or transgender women who have evidence of early syphilis, a recent history of an early syphilis diagnosis, or recent HIV. Specifically, they will be STD clinic patients who meet at least one of the following criteria:
- Current early syphilis diagnosis: this means P&S diagnosis or early latent diagnosis
- A history of recent early syphilis infection: i.e., within the past 12 months
- A history of more than one syphilis infection in the prior 24 months
- A history of recent HIV infection

c. Evaluation and Performance Measurement:

iii. CDC Evaluation and Performance Measurement Strategy:

All evaluation and performance measures will be reported to CDC on an annual basis. CDC has established monitoring and evaluation indicators for HIV and STD prevention that address the goals of this project. Moreover, CDC will cooperate with recipients to establish additional specialized measures and evaluation approaches to monitor performance and progress.

Topics and Indicators (drawn from existing monitoring indicators and measured within networks) include:

**Screening/testing and treatment**
- Percentage of MSM of color at risk for/living with HIV who were screened for syphilis
- Percentage of MSM at risk for/living with HIV acquisition who were diagnosed with syphilis and appropriately treated for syphilis
- Number of MSM of color who were screened with a lab-based 4th generation HIV test over 12 months
- Percentage of MSM of color with newly diagnosed HIV infections that were in the acute phase of infection
<table>
<thead>
<tr>
<th><strong>Linkage and Retention in care</strong></th>
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<tbody>
<tr>
<td>• Percentage of MSM of color diagnosed with acute HIV infection who were linked to care within 7 days of diagnosis</td>
</tr>
<tr>
<td>• Percentage of MSM of color diagnosed with acute HIV infection who were initiated on ARVs within 14/30 days of diagnosis</td>
</tr>
<tr>
<td>• Percentage of MSM of color living with HIV who received retention interventions and who subsequently had at least 1 medical visit in each 6 month period of a 12 month follow up with a minimum of 60 days between visits.</td>
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<tr>
<th><strong>HIV/STD Prevention</strong></th>
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<td>• Number of MSM of color with a risk event who presented within 72 hours of the event and were linked to an nPEP provider for clinical evaluation on the same day they presented</td>
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<tr>
<td>• Number of MSM of color with a negative HIV test and at substantial risk for HIV who were linked to a PrEP provider for clinical evaluation</td>
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<tr>
<td>• Percentage of MSM of color at risk for/living with HIV who received risk reduction interventions</td>
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<th><strong>Other services (engagement or linkage)</strong></th>
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<tr>
<td>• Percentage of MSM of color at risk for/living with HIV who were screened for behavioral health and social services needs</td>
</tr>
<tr>
<td>• Percentage of MSM of color at risk for/living with HIV acquisition who needed any specified behavior and social service and were linked to the service</td>
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Healthcare-Associated Infection/Antimicrobial Resistance Activities (K1-K3)

ATTACHMENT

K1: Detection, Containment, and Prevention

Program Activity Contact Information

HAIAR@cdc.gov

Funding Opportunity Description

Background

a. Healthy People 2020:
Healthcare-Associated Infection (HAI)/Antimicrobial Resistance (AR) objectives have been established for Healthy People 2020, which reflects the commitment of the U.S. Department of Health and Human Services (HHS) to prevent and reduce HAI/AR. Specifically, these high-priority objectives address reducing central line-associated bloodstream infections (CLABSI) by 50% and invasive methicillin-resistant *Staphylococcus aureus* (MRSA) infections by 75%.

b. Other National Public Health Priorities and Strategies:
Detecting and preventing HAI/AR is a cross-cutting federal priority. The [National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination (HAI Action Plan)](https://www.cdc.gov/hai/action-plan/) sets goals and priorities for reduction of HAIs across healthcare settings, while the [National Strategy for Combating Antibiotic-Resistant Bacteria](https://www.cste.org/Content/View/693c9ae6-5a53-483c-a2be-ac0c001f2ed2) and companion [National Action Plan](https://www.cste.org/Content/View/693c9ae6-5a53-483c-a2be-ac0c001f2ed2) articulate national goals, priorities, objectives, milestones, and reduction targets that provide an overarching framework for federal investments aimed at combating antibiotic-resistant bacteria. CDC focuses on three key strategies to prevent and reduce HAI/AR: promoting the use of National Healthcare Safety Network (NHSN) data, promoting and expanding collaborations at state and local levels, and developing innovative approaches for prevention. CDC will continue to collaborate with critical state, city/county, public health, and healthcare partners to build on the infrastructure and capacity that has been developed and supported by recent public health responses to emerging threats like carbapenem-resistant Enterobacteriaceae (CRE), carbapenem-resistant *Pseudomonas aeruginosa* (CRPA), and Ebola. Strategies and recommendations (as available) from the CDC/CSTE Antibiotic Resistance Task Force ([CSTE Position Statement 13-SI-01](https://www.cste.org/Content/View/693c9ae6-5a53-483c-a2be-ac0c001f2ed2)) and the Council for Outbreak Response for HAIs and Antimicrobial Resistance ([CORHA](https://www.cdc.gov/corha/)) should be supported by grantees activities.

CDC Project Description

i. Problem Statement
HAI and AR have been growing public health threats for many years. HAIs are the most common complications of healthcare services. AR infections, including *Clostridium difficile* (CDI), add considerable and avoidable costs to the overburdened U.S. healthcare system. State, local and territorial health departments have an important role in coordinating, implementing, and leveraging local and regional HAI/AR prevention efforts. It is critical to support state HAI/AR programs to collaborate with city/county, public health, and healthcare partners, and to provide strategic guidance to achieve goals prevention activities.

Combating AR bacteria requires rapid detection of new resistance mechanisms and robust prevention efforts. Some threats like CRE are resistant to nearly all possible therapeutic agents.
Isolates harboring a carbapenemase are considered a greater public health threat because they are a potential reservoir for transmission and amplification of a broad-spectrum resistance mechanism. For these reasons, enhancing state-based capacity to detect CRE and CRPA will improve the ability to implement timely local prevention efforts and to develop national strategies that limit transmission of resistant pathogens and prevent infections.

ii. Purpose

This project consists of one core activity (A. Detection, Containment, and Prevention) and three optional activities (B. External Data Validation, C. Hemodialysis Bloodstream Infection (BSI), and D. Injection Safety). Applicants must apply for the core activity, and can choose to apply for any, all, or none of the optional activities.

In this Budget Period 4, some of the projects from Budget Period 3 and been re-branded as specific activities under this broader K1 Detection, Containment and Prevention project. The corresponding activities from the ELC Year 3 (2016-2017) Continuation are as follows:

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>K1 Infrastructure, K6 State CRE Lab</td>
<td>K1 Detection Containment, and Prevention (Core)</td>
</tr>
<tr>
<td>K3 Data Validation</td>
<td>K1 External Data Validation (Optional)</td>
</tr>
<tr>
<td>K4 Hemodialysis BSI</td>
<td>K1 Hemodialysis BSI (Optional)</td>
</tr>
<tr>
<td>K5 Injection Safety</td>
<td>K1 Injection Safety (Optional)</td>
</tr>
</tbody>
</table>

The purpose of the Detection, Containment, and Prevention Activity (core) is to allow state/local/territorial health departments to continue making progress toward HHS HAI/AR Prevention targets (http://health.gov/hcq/prevent-hai.asp), and to detect and characterize CRE and CRPA from healthcare facilities within their jurisdictions and contain their spread. Note: Additional testing capacity for CRE, i.e., characterization of unusual isolates and CRE colonization testing is described for the AR regional laboratories (K3).

The purpose of the External Data Validation Activity (optional) is to enhance health departments’ ability to ensure the quality of healthcare-associated infection data reported to NHSN beyond their capacity for internal data quality checks. Grantees should conduct HAI external data validation using the NHSN External Data Validation Guidance Toolkit developed by CDC.

The purpose of the Hemodialysis BSI Activity (optional) is to improve infection control practices and reduce infections in outpatient hemodialysis centers.

The purpose of the Injection Safety Activity (optional) is to drive implementation of safe injection practices among healthcare providers through education, training, and other means. The CDC-led Safe Injection Practices Coalition (SIPC) collaborates with health departments and other partners to achieve this goal. Through this funding opportunity, and using the SIPC Health Department Toolkit as a guide, awardees will work with SIPC to target key clinical audiences in their states through education, training, and potential oversight mechanisms.

iii. Outcomes
A) Detection, Containment, and Prevention Activity (core/required)
- Increased health department capacity to respond to HAI/AR threats
- Faster response by health departments to HAI/AR threats
- Increased capacity in healthcare workforce to address HAI/AR prevention
- Increased access to and improved use of HAI/AR data
- Accelerated detection of targeted AR threats
- Improved coordination and implementation of HAI/AR prevention efforts across state, city, county, and other public health-healthcare partners
- Improved tracking of antibiotic use and antibiotic stewardship (AS) activities across the spectrum of healthcare
- Established state or regional AR leadership
- Increased state and local public health laboratory capacity to confirm resistance and detect known and unknown resistance mechanisms for CRE and CRPA using CDC-recommended methods
- Communication within 48 hours of test results to local public health authorities and CDC of resistance profiles and mechanisms requiring urgent response (e.g., novel resistance mechanism suspected) and rapid response to these threats

B) External Data Validation Activity (optional)
- Improved validation of HAI surveillance data
- Build and foster data validation collaborations
- Improved information on time required to conduct validation activities
- Public health workers trained to work with reporting facilities for data validation
- Improved use of surveillance data to enable assessment of prevention activities
- Improved recognition of surveillance and reporting problems
- Improved ability to identify problems with data transfer between facilities and health department

C) Hemodialysis BSI Activity (optional)
- Reduction of BSIs in outpatient dialysis settings
- Implementation of CDC-developed, evidence-based, dialysis-related infection prevention guidelines to prevent BSIs
- Partnership-building between dialysis facilities and public health
- Qualified personnel in health department and healthcare facilities better prepared to identify and address gaps in infection control to prevent HAIs and to identify, report, and respond to HAIs and outbreaks

D) Injection Safety Activity (optional)
- Improved awareness of and adherence to safe injection practices and basic infection control among healthcare providers
- Increased awareness about reporting of unsafe injection practices and possible infections/outbreaks to the health department among healthcare providers
- Increased implementation of prevention guidelines and policies to assure safe injection practices across outpatient and other healthcare settings
- Trained workforce better prepared to respond to HAI
- Improved completeness and timeliness of HAI surveillance data reporting
- Increased NHSN data use to target HAI prevention efforts
- Implementation of formal educational curriculum and in-person infection prevention certificate training program
- Improved outbreak detection and reporting to public health

<table>
<thead>
<tr>
<th>iv. Funding Strategy</th>
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<tbody>
<tr>
<td>As a condition of funding for all activities (core or optional) under this project, grantees must attach a letter of commitment from state leadership (e.g., state epidemiologist, state health official) to support the HAI/AR prevention program and goals. Funds can be used for personnel, travel, supplies, and equipment to support proposed activities. Mechanisms to acquire personnel could include direct hires by awardee, CDC staff working in the state (e.g., CDC-sponsored fellows or trainees), and contracts with local experts. Funding under the Detection, Containment, and Prevention Activity will be used to support an HAI Coordinator, an AR/AS expert, an AR laboratory subject matter expert, and corresponding infection control and prevention work. The funding for External Data Validation Activity (optional) should include support to achieve the standard goals described in the validation guidance for selected HAIs. The budget for inpatient facility-based validation should be proposed separately from the budget for Dialysis Event validation. Applicants are strongly encouraged to submit at least one proposal for Dialysis Event validation for the remaining two years of the cooperative agreement cycle. Preference will be given to awardees of ELC Year 3 (2016-2017) Project K3, and to applicants that will conduct their own validation rather than contracting for services. For Hemodialysis BSI Activity (optional), applicants may select Strategy 1, 2, and/or 3. For Strategies 1 and 2, preference will be given to previous awardees of ELC K4 (2014-2016). For Strategy 3, only health departments not previously funded for Ebola Supplement Project A, Strategy B.1, and not previously funded for ELC K4 (2014-2016) can apply. The budget for each strategy should be proposed separately. For Strategy 1, applicants should specify the number of facilities that will be enrolled in the project and how they would be selected. Applicants must demonstrate a working relationship with the appropriate End Stage Renal Disease (ESRD) networks or QIOs and the ability to gain access to the data to develop a measurement strategy. For Strategy 2, applicants must be able to incorporate a new requirement or demonstrate an existing legislative requirement for select dialysis staff to complete the training activity described. For Strategy 3, grantees should specify the number of facilities that will be assessed during the funding year and how they would be selected. An implementation plan should also be included to ensure successful access to, and engagement of, dialysis facilities.</td>
</tr>
</tbody>
</table>
Health departments may engage in the **Injection Safety Activity (optional)** in one of two ways:

- Receive funding for a part- or full-time injection safety coordinator, who will liaise with the HAI program coordinator, to maintain a comprehensive and ongoing program.
- Receive a smaller amount of funding for an HAI coordinator (or designee) to conduct injection safety work on a more time-limited basis.

Preference will be given to grantees that received funding and established base-capacity by way of support from Budget Period 3, K5 activities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Total Availability of Funds</th>
<th>Approximate Number of Awards</th>
<th>Approximate Average per Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection, Containment, and Prevention (Core)</td>
<td>$23,000,000</td>
<td>57</td>
<td>$400,000</td>
</tr>
<tr>
<td>External Data Validation (Optional)</td>
<td>$500,000</td>
<td>Up to 10</td>
<td>$50,000 - $500,000</td>
</tr>
<tr>
<td>Hemodialysis BSI (Optional)</td>
<td>$525,000</td>
<td>Up to 8</td>
<td>$50,000 - $250,000</td>
</tr>
<tr>
<td>Injection Safety (Optional)</td>
<td>$540,000</td>
<td>Up to 8</td>
<td>$40,000 - $80,000</td>
</tr>
</tbody>
</table>

v. **Strategies and Activities**

A) **Detection, Containment, and Prevention Activities (core)**

1. **Coordinate and Collaborate (ELC Logic Model Strategy 1d)**
   a. Establish or maintain the following workforce and/or expertise:
      i. HAI Coordinator: Assures HAI prevention coordination throughout the jurisdiction and use of the Targeted Assessment for Prevention (TAP) strategy
      ii. AR/AS Expert: Senior-level expertise (e.g., doctoral level or equivalent experience) in epidemiology and infection prevention with proficiency in AR/AS and data for action
      iii. AR Laboratory Subject-Matter Expert
      iv. Steering & Advisory Committee: Defines activities and priorities for the HAI/AR prevention program in the jurisdiction; includes local stakeholders and representatives from the state and/or regional public health laboratories and patients
   b. Promote antibiotic stewardship activities to improve antibiotic prescribing and use, and to encourage facilities to implement antimicrobial stewardship programs or collaboratives.
   c. Provide HAI/AR training and technical support to identified priority needs.
   d. Work with other federal partners, such as the Centers for Medicare & Medicaid Services (CMS).
   e. Attend annual HAI/AR Grantees’ meeting in Atlanta, GA. Attendance is mandatory for each grantees’ HAI Coordinator, AR/AS expert, and AR laboratory subject matter expert. It is anticipated that travel will be provided
to grantees through a mechanism outside of the ELC.

2. **Enhance Investigation Response, Containment, and Reporting (ELC Logic Model Strategy 1a)**
   a. Implement timely detection, reporting, investigation, response, and containment of novel emerging AR threats.
   b. Track HAI/AR outbreak response actions and response times.
   c. Develop plans to address infection control gaps identified during HAI/AR outbreak investigations.

3. **Improve Surveillance to Drive Public Health Action (ELC Logic Model Strategy 1b)**
   a. Conduct NHSN data quality checks on two or more HAI/AR metrics. (Enhance with applications for optional External Data Validation Activity.)
   b. Use TAP to identify facilities with high HAI rates.
   c. Target facilities with high HAI infection rates for prevention efforts until infections decrease.

4. **Sustain and Enhance Laboratory Testing (ELC Logic Model Strategy 2a)**
   a. Train and educate laboratorians to perform CRE and CRPA testing.
   b. Increase laboratory capacity to perform routine confirmatory CLIA-compliant antibiotic susceptibility testing.
   c. Increase laboratory capacity to perform carbapenem-resistance mechanism testing for the most common and important resistance mechanisms as recommended and updated annually by CDC.
   d. Report results to submitting clinical laboratory within two working days of testing.
   e. Implement bacterial isolate storage for at least two years. Transport isolates of interest (as defined or specifically requested by CDC) to AR regional laboratories and/or to CDC for further characterization or to CDC for deposit in the FDA-CDC AR Isolate Bank.
   f. Adopt and validate new CRE and CRPA testing methods when new methods are recommended by CDC.

5. **Improve Laboratory Coordination and Outreach/Information Flow (ELC Logic Model Strategy 2b)**
   a. Coordinate connections between epidemiology and laboratory functions at state, city, county, and local levels.
   b. Coordinate connections with the state HAI/AR prevention programs to improve outbreak response capacity for carbapenemase-producing CRE and CRPA.
   c. Coordinate connections with clinical laboratories in the state to solicit CRE and CRPA isolates from healthcare facilities (including short- and long-term acute care facilities).
   d. Coordinate connections with clinical laboratories in the state to solicit isolates requested from the regional AR laboratory for targeted surveillance activities (K3, Activity 2).
   e. Alert local public health authorities and CDC of resistance profiles and mechanisms requiring urgent response (e.g., novel resistance mechanism suspected) and rapidly respond to these threats when notified.
f. If your state conducts EIP surveillance for CRE and/or CRPA, develop and describe the plan to make clinical laboratory participation and isolate submission that ensures EIP and ELC activities are complementary and minimizes burden on clinical laboratories.

g. Develop testing and communication protocols, reporting processes, and IT infrastructure to ensure timely testing and reporting of results to submitting laboratories, state prevention epidemiologists, jurisdictional public health laboratories, and regional laboratories.

h. Develop testing and communication protocols, reporting processes, and IT infrastructure to ensure timely testing and reporting of results to CDC using the Association of Public Health Laboratories (APHL) Informatics Messaging Services (AIMS) portal.

i. Maintain a database of CRE colonization testing results reported by the AR Regional Laboratory for any patient from within the CRE laboratory’s jurisdiction.

j. Coordinate connections with clinical laboratories in the state to receive isolates from a variety of healthcare facilities, including short- and long-term acute care facilities.

B) External Data Validation Activity (optional)

1. Enhance Health Information Systems Workforce (ELC Logic Model Strategy 3a)
   a. Conduct health department validator training to enhance workforce capacity for HAI validation.
   b. Assure competency in data validation and NHSN methods and definitions via certificates of completion of in-person or online training.

2. Improve Surveillance to Drive Public Health Action (ELC Logic Model Strategy 1b)
   a. Prior to data validation, conduct an analysis of jurisdiction’s data to target the HAIs, facilities, and records to be validated.
   b. During validation, assess local surveillance data quality, HAI surveillance data completeness, timeliness, sensitivity and specificity and identify reporter training needs.
   c. After validating, prepare a report describing the exposed-population sampling frame, the validated sample, the accuracy measures (sensitivity, specificity, positive- and negative-predictive values) derived from the validated sample, and actionable recommendations for reporter or validator error.
   d. After validating, produce a HAI validation report, an assessment of each guidance component, quantitative information, and recommended modifications.
   e. Identify ongoing barriers among healthcare facilities to produce required line-listing information linking laboratory and admissions data. Provide recommendations for reducing barriers.

3. Advance Electronic Information Exchange Implementation (ELC Logic Model Strategy 3a)
a. Identify ways to ensure secure transmission of spreadsheet data from healthcare systems to health department.

b. Health departments overseeing widespread geographic areas, gain remote access to complete Electronic Medical Record (EMR) data for audits.

4. Sustain and Enhance Integrated Surveillance Information Systems (ELC Logic Model Strategy 3c)
   a. Conduct improvements in existing health information systems to facilitate compliance with data validation requirements.

5. Coordinate and Collaborate (ELC Logic Model Strategy 1d)
   a. Build and foster data validation collaborations for improving upon tools and guidance. Strengthen partnerships with healthcare facilities by demonstrating transparency of validation processes. Pursue collaboration with other CDC-funded HAI validation projects if applicable (e.g., Emerging Infections Program [EIP] Point Prevalence Survey and other states funded for data validation under this award).

C) Hemodialysis BSI Activity (optional)

1. Prevent bloodstream infections in outpatient hemodialysis centers using CDC’s recommended approach and prevention tools (Logic Model Strategy 1c)

2. Increase infection control capacity in outpatient hemodialysis centers by training one or more nurses at each facility (Logic Model Strategy 1c)

3. Infection Prevention and Control Assessments for Hemodialysis Facilities (Logic Model Strategy 1c) (i.e., ICAR; only applicants not currently receiving Ebola-supplement funding can participate)

See below for activities for these Hemodialysis BSI strategies [with corresponding strategy or strategies referenced in brackets for each activity]

   a. Using NHSN data, survey data, and other facility characteristics, identify a group of outpatient hemodialysis facilities to target for ELC Year 4 (2017-2018) practice improvement. For continuing awardees, expand number of facilities participating. [Strategy 1]
   b. Assist new facilities to confer appropriate rights to the NHSN group. [Strategy 1]
   c. Promote CDC prevention tools/recommended interventions. [Strategy 1,3]
   d. Perform targeted infection prevention (IP) assessments. Encourage NHSN Prevention Process Measures (PPM) Module use to track audit data. [Strategy 1,3]
   e. Identify gaps and facilitate program/policy change in IP performance. [Strategy 1,3]
   f. Perform follow-up assessments to assess mitigation of gaps. [Strategy 1,3]
   g. Provide feedback reports on improvements (in process and/or outcome measures). Encourage NHSN data review use of NHSN analytic reports. [Strategy 1]
   h. Provide ongoing communication and support (e.g., in-person meetings, webinars, conference calls) allowing facility interaction (e.g., discuss lessons
learned, best practices, barriers to project implementation). [Strategy 1]

i. Partner with CDC in the Making Dialysis Safer for Patients Coalition. [Strategy 1,2,3]

j. Expand course implementation, perform outreach, and promote training requirements. [Strategy 2]

k. Engage partners to facilitate participation. [Strategy 1,2,3]

l. Explore making course/certificate repeatable and required. Consider legislative requirement. [Strategy 2]

D) Injection Safety Activities (optional)

1. Foster collaboration and coordinated activities related to injection safety issues among city, county, state and federal partners (e.g., working groups) and other external partners (Logic Model Strategy 1d)
   a. Establish and maintain involvement with the SIPC, including participation in work groups and creation of a state-specific website linked to the One & Only Campaign.
   b. Establish/improve connections between the HAI program, state HAI Steering committee, and partners such as the state survey agency, medical/nursing/professional boards, quality improvement organizations, insurance providers, liability carriers, and health care provider professional associations, to support injection safety activities.
   c. Promote implementation of injection safety and general outpatient infection control with the aid of CDC tools/materials (e.g. Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care; Basic Infection Control and Prevention Plan for Outpatient Oncology Settings; Outpatient Settings Policy Options: Four Key Policy Elements for Best Practices).

2. Promote awareness and implementation of safe injection practices among healthcare providers through education, training, and other means (Logic Model Strategy 1c)
   a. Provide injection safety education and training, including dissemination of SIPC materials and outbreak reporting requirements, at organized events and meetings, on-line or by other means.
   b. Promote membership in the One & Only Campaign among healthcare providers/clinics/systems, professional associations and other potential partner organizations.
   c. Include injection safety and related infection control messaging in newsletters, press, social media and other communications directed to healthcare providers/consumers.
   d. Incorporate injection safety and basic infection control into credentialing and/or continuing education requirements for healthcare providers and licensing/accreditation requirements for healthcare facilities.
   e. Train healthcare facility surveyors, state/local health department investigators, and other partners, including guidance on recognizing and responding to unsafe injection practices and related infections/risks.

1. Collaborations –
b. **With CDC funded programs:**

Collaborate and ensure alignment with other funded programs and initiatives (e.g., state and regional AR laboratories for detection and response, Emerging Infections Program [EIP], Ebola-funded activities, Office for State, Tribal, Local, and Territorial Support, Office of Public Health Preparedness and Response) to maximize effectiveness and reduce duplication.

Additionally, for the **Detection, Containment, and Prevention Activity (core)**, laboratories should collaborate with core HAI/AR detection and prevention programs, Antimicrobial Resistance Regional Laboratory Network programs (K3), the Emerging Infections Program (if applicable), and other initiatives.

For the **External Data Validation Activity (optional)**, grantees should collaborate with other CDC-funded HAI validation activities (e.g., EIP Point Prevalence Survey) where available.

Grantees funded for the **Hemodialysis BSI Activity (optional)** should provide evidence of current and future planned collaborations.

c. **With organizations external to CDC:**

Collaborate with other health agencies, hospitals, state, city, county, local health partners, and external HAI/AR partners (i.e., Centers for Medicare & Medicaid Services-funded networks like QIN-QIOs HIINs and Hospital Preparedness Program, city and county health departments, hospital associations, academic partners) to maximize detection and prevention efforts, make progress toward national targets, and reduce duplication. Applicants should provide evidence (e.g., letter of intent or memorandum of understanding) of collaboration with key groups.

Additionally, **Detection, Containment, and Prevention Activity (core)** grantees should collaborate with other state or local public health laboratories, medical and/or public health academic centers (including those involved in EIP surveillance for AR bacteria or *C. difficile*, and those that are part of the CDC Prevention EpiCenters), and partnering collaborations such as the Health Research and Educational Trust (HRET)’s project States Targeting Reduction in Infections via Engagement (STRIVE).

Applicants for the **Hemodialysis BSI Activity (optional)** are required to provide evidence (e.g., letter of intent or memorandum of understanding) of collaboration with key groups, such as End Stage Renal Disease Networks, dialysis providers, and/or professional organizations.

Applicants for the **Injection Safety Activity (optional)** should provide evidence of current and future planned collaborations with federal, state and local external partners whose work focuses on the prevention of healthcare associated infections and other infectious diseases. Examples of these entities include hospitals and other healthcare institutions, healthcare accreditation bodies, quality improvement organizations, and healthcare provider professional associations.

**2. Target Populations:**
Detection, Containment, and Prevention Activity (core) and External Data Validation Activity (optional): N/A

Hemodialysis BSI Activity (optional): Patients receiving hemodialysis in outpatient hemodialysis centers.

Injection Safety Activity (optional): Healthcare providers are the primary target population, particularly physician office practices and other outpatient settings which fall outside direct CMS oversight (e.g., survey and certification) as highlighted in the 2012 GAO Report, “HHS Has Taken Steps to Address Unsafe Injection Practices, But More Action Is Needed.” (http://www.gao.gov/products/GAO-12-712)

<table>
<thead>
<tr>
<th>a. Evaluation and Performance Measurement:</th>
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<tbody>
<tr>
<td>i. CDC Evaluation and Performance Measurement Strategy:</td>
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</table>

Grantees are required to complete a reporting tool for the core activities and funded optional activities twice per funding year. These tools will be tailored to each activity and will serve as a mechanism for tracking performance measures, updating awardee activity status, requesting technical assistance, and noting participation in HAI prevention collaboratives/partnerships. The second and final submission will function as the year-end progress report during the continuation application process. Additionally, grantees will provide a final report for all activities at the end of the 5-year cooperative agreement.

For performance measures that use the following terminology, please use the associated guidance/definition:

**Proportion:** Include both the numerator and denominator. For example, the proportion of clinical laboratories in the jurisdiction submitting isolates of CRE and CRPA for testing would be reported as: (Number of clinical laboratories submitting the isolates)/(Total number of clinical laboratories in the jurisdiction).

**Target:** The desired number or relevant measurement if all work goes as planned in the upcoming year (2017-2018).

**Actual:** The final number or relevant measurement at the end of the upcoming year (2017-2018). This may be greater than, less than, or equal to the target.

### Detection, Containment, and Prevention Activity

**Performance Measures**

1) Number of HAI/AR outbreaks in jurisdiction by organism, facility type, and HAI category (CLABSI/CAUTI) [Activity 2a]
   - a. Number of those outbreaks where health department provided assistance
   - b. Number of those outbreaks that received state, local, or territorial public health laboratory support.

2) For states with access to patient-level NHSN data, as described in the guidance, number of NHSN data quality checks performed on each of the two selected HAIIs. [Activity 3a]
   - a. Identify which HAI metrics were selected
   - b. Number of errors identified
c. Number of errors for which health department followed up with reporting healthcare facility

3) **Report separately for CLABSI and CAUTI:** Number of facilities identified as having high infection rates using TAP reports [Activity 3.b. and 3c]
   a. Proportion of those facilities for which TAP Facility Assessments were conducted
   b. Proportion of those facilities for which the health department provided a completed TAP Feedback Report summarizing TAP Facility Assessment results and identifying potential gaps in infection prevention efforts
   c. Proportion of those facilities for which evidence-based infection prevention methods were implemented to address gaps identified in the Facility Assessment

4) Number of laboratory personnel trained and proficient (i.e., able to perform independently and without supervision) in performing all phenotypic testing for CRE and CRPA in their test directory [Activity 4a]

5) Number of laboratory personnel trained and proficient in performing all molecular testing for CRE and CRPA in their test directory [Activity 4a]

6) Proportion of clinical laboratories in the jurisdiction submitting isolates of CRE and CRPA for testing [Activities 5a and 5b]
   a. Number of each type of healthcare facility associated with participating clinical laboratories (e.g., acute care, long-term acute care, long-term care, etc.)

7) Proportion of acute care and long-term acute care facilities represented by participating clinical laboratories. [Activities 5c-5e]

8) Number of isolates received from participating clinical laboratories [Activities 5c-5e]
   a. Number of isolates tested
   b. Number of carbapenem-resistant isolates that initiated colonization testing in collaboration with HAI coordinator(s) and ARLN regional laboratory
   c. Number of isolates stored
   d. Number of isolates transported, upon request, to CDC for the FDA-CDC AR Isolate Bank

Additional Information to be Reported (Narrative)

9) Describe your health department’s legal or regulatory authority to intervene or assist facilities (without invitation) when either TAP reports have identified high HAI rates or outbreaks have been identified. If relevant, include description of barriers and actions initiated to address them. [Activities 1a and 2a]

10) Provide a summary description of each CLABSI AND CAUTI TAP intervention implemented, per facility, to address gaps identified from the TAP Facility Assessments and Feedback Report. [Activity 3c]

11) How have your laboratory and your health department’s HAI coordinator engaged with each other, as well as other prevention partners, to provide and discuss timely updates on CRE/CRPA initiatives, test results, and resulting activities? [Activities 5a and 5b]

12) How have your public health laboratory and HAI coordinator/program worked together to engage your CRE/CRPA network of participating clinical laboratories and associated healthcare facilities for reasons not directly related to reporting test results? [Activities 5c and 5d]

13) Describe any challenges you’ve faced with reporting CRE/CRPA results back to clinical laboratories within 2 working days of testing. [Activity 4d]
14) Describe any challenges you’ve faced with reporting results identified as an “alert” value (e.g., new or emerging resistance) to state HAI coordinator and CDC within 1 working day of testing. [Activity 5e]

**External Data Validation Activity (Optional)**

**Performance Measures**

1) Number of medical records audited, stratified by facility for each HAI metric [Activity 2b]

2) Average time (minutes) required for each medical record audit, stratified by HAI metric [Activity 2b]

3) Estimated cost of validation, including travel, time, and manpower [Activity 2b]

4) Proportion of facilities for which access to remote EMRs is available [Activity 3b]
   a. Number of facilities for which access to remote EMRs was used to conduct audits
   b. Number of planned facilities that state could not audit due to lack of EMR access and travel constraints.

**Additional Information to be Reported (Narrative)**

5) For each validated HAI: Characterize the exposed population (sampling frame) and methods of facility and medical record selection. Assess representativeness of validation sample. Measure aggregate sensitivity, specificity, and positive and negative predictive values for each HAI sample. [Activity 2c]

6) For each validated HAI: Provide a description of common reporting errors and distribution/clustering by facility, and plans to address them. [Activity 2c]

7) Specify validation tools used. Provide qualitative assessment of validation tools and suggestions for improvement in tools. [Activity 2b]

**Hemodialysis BSI Activity (Optional)**

**Performance Measures**

1) Total number of facilities conferring rights to health department NHSN group [Activity 1b]
   a. Target and actual number of new ELC Year 4 (2017-2018) facilities conferring rights

2) Target and actual number of ELC Year 4 (2017-2018) facilities where targeted infection prevention (IP) assessments were performed [Activity 1d]

3) Number of facilities demonstrating, via audit data, adherence to each of the following CDC-recommended interventions, reported for each year from baseline (i.e., the baseline in the Dialysis Prevention Process Measures module in NHSN): [Activity 1c]
   a. Hand Hygiene
   b. Catheter Connection/Disconnection
   c. Catheter Exit Site Care
   d. AVF/AVG Cannulation/Decannulation
   e. Station Routine Disinfection
   f. Injection Safety
4) For each year, starting at baseline (i.e., the baseline in the Dialysis Prevention Process Measures module in NHSN): Number of NHSN Dialysis Event outcomes (minimally include BSI and ARBSI) [Activity 1g]

5) Proportion of jurisdiction’s unique dialysis centers for which staff completed training course in ELC Year 4 (2017-2018) [Activity 2j]
   a. Total number of staff that completed course in ELC Year 4 (2017-2018)

Additional Information to be Reported (Narrative)

6) Provide the number, description, and characteristics of participating facilities (% catchment) [Activity 1a]

7) Provide a brief description of facility selection strategies, including key partnerships [Activities 1a, 1k, and 3k]

8) Please describe the process for targeted infection prevention (IP) assessments, including:
   [Activities 1d and 1f]
   a. Commonly identified IP gaps
   b. Your role in facilitating program/policy change in IP performance
   c. How follow up assessments assessing IP gap mitigation were performed

9) Describe your greatest barriers to success and solutions identified for improvement. [All Activities]

10) For trainings/courses please describe [Activity 2j]:
    a. Basic attendee/facility characteristics (representativeness)
    b. Training format/materials, including changes made from previous years
    c. If applicable, describe how gaps identified through ICAR Assessments for Hemodialysis Facilities informed educational content
    d. Evidence-Based Training Guidance used
    e. Strategies used to expand outreach, implementation, and sustainability

11) Provide a brief summary of training evaluation data/attendee feedback [Activity 2j]
    a. Describe how feedback is used to improve future trainings

12) Describe key collaborations/partnerships that advanced your trainings [Activity 2k]

13) What were the greatest IP capacity improvements that occurred as a result of the trainings? [Activities 1f and 2j]

14) What progress has been made with regard to sustainability? [All Activities]

Injection Safety Activity (Optional):

Performance Measures

1) Proportion of providers who report improved injection safety knowledge and/or behaviors. Include information about the types of providers targeted by education and training events [Activity 2a, 2e]

2) Target and actual number of new One & Only Campaign members. Include information about organizations/provider-types who became members. [Activity 2b]
3) Describe the number and types of activities incorporating injection safety and basic infection control standards into provider credentialing/CEU requirements or facility licensing/accreditation. [Activity 2d]

Additional Information to be Reported (Narrative)

4) Provide information on the organizations represented, including types of members, at workgroup meetings. [Activity 1b]

5) Describe activities promoting implementation of injection safety and general outpatient infection control [Activity 1c]
ATTACHMENT
K2: Coordinated Prevention and Stewardship

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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<td><a href="mailto:HAIAR@cdc.gov">HAIAR@cdc.gov</a></td>
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<th>Funding Opportunity Description</th>
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<tr>
<td><strong>Background</strong></td>
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<tr>
<td><strong>a. Healthy People 2020:</strong></td>
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<td>Healthcare-Associated Infections (HAI)/Antimicrobial Resistance (AR) objectives have been established for Healthy People 2020 that reflect the commitment of the U.S. Department of Health and Human Services (HHS) to prevent and reduce HAI/AR. Specifically, these high-priority objectives address reducing invasive methicillin-resistant <em>Staphylococcus aureus</em> (MRSA) infections by 75%, and reducing facility-onset <em>Clostridium difficile</em> infections (CDI) by 30%.</td>
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| **b. Other National Public Health Priorities and Strategies:** |
| National Strategy for Combating Antibiotic-Resistant Bacteria (CARB): |
| The National Strategy for Combating Antibiotic-Resistant Bacteria and companion National Action Plan articulate national goals, priorities, objectives, milestones, and reduction targets that provide an overarching framework for federal investments aimed at combating antibiotic resistant bacteria and CDI. These national goals include: preventing the spread of resistant bacteria including the promotion of antibiotic stewardship across all healthcare settings; strengthening national efforts to identify instances of antibiotic resistance; working to develop new antibiotics, therapies, and vaccines; and improving international collaboration on this issue. |
| CDC has identified HAIs as a priority target based on the scope of the burden and our ability to make significant progress in improving outcomes. CDC focuses on three key strategies to advance HAI/AR fight: promoting the use of National Healthcare Safety Network (NHSN) data, promoting and expanding collaborations at state and local levels, and developing innovative approaches for prevention. CDC will continue to collaborate with critical state, city/county, public health, and healthcare partners to build on the infrastructure and capacity that has been developed and supported by recent public health responses to emerging threats like carbapenem-resistant Enterobacteriaceae (CRE), carbapenem-resistant *Pseudomonas aeruginosa* (CRPA), and Ebola. |

<table>
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<th>CDC Project Description</th>
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<tr>
<td><strong>i. Problem Statement:</strong></td>
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<td>Antibiotic-resistant (AR) bacteria, including <em>Clostridium difficile</em>, are a rapidly growing threat to the health of Americans. The loss of effective antibiotic treatments would be devastating to patients and increase the burden imposed on the healthcare system. CDC estimates that more than 2 million infections are caused by resistant pathogens annually. AR pathogens include the serious and urgent threats outlined in the CDC Antimicrobial Resistance Threat assessment (e.g., CRE, MRSA, and CDI). A key, modifiable factor contributing to AR is inappropriate antibiotic use. Inappropriate antibiotic use, both unnecessary and misuse (wrong drug, dose or duration) is very common across the spectrum of health care.</td>
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</table>
Historically, efforts to interrupt transmission of AR bacteria within healthcare settings have occurred at the facility-level. However, this facility-specific approach does not optimally address the fact that patients colonized or infected with resistant bacteria often move between healthcare facilities, serving as a source for regional transmission. Facilities may lack the resources, expertise, and influence to facilitate prevention outside of their individual programs. Furthermore, attempts at improving inpatient antibiotic prescribing often occur in isolation from neighboring facilities.

In light of this, coordinated prevention efforts among facilities that share patients have the potential to lead to more substantial impact on the emergence, transmission and spread of resistant pathogens.

The complexity of issues surrounding coordinated prevention approaches (e.g., access to surveillance data) requires state and local health-department-based programs to have core programmatic capacity to carry out such efforts. State and local health departments are uniquely positioned to lead these regional programs.

ii. Purpose:

Creating and sustaining HAI/AR prevention and antibiotic stewardship programs are a critical step in reducing the incidence of AR infections in the U.S. and containing their transmission across healthcare settings.

This work will expand upon the HAI/AR prevention activities funded in K1, allowing CDC to support state and local health departments in building additional capacity for tracking antibiotic use and resistance, expanding coordinated prevention within HAI/AR prevention programs (http://www.cdc.gov/vitalsigns/stop-spread/), and implementing health communication programs and behavioral interventions to promote antibiotic stewardship. Coordinated prevention activities in this FY17 ELC guidance should align with, complement, and not duplicate activities funded by the FY15 Ebola Infection Control Assessment and Response (ICAR) supplement.

iii. Outcomes:

- Improved containment of emerging HAI/AR pathogens
- Improved control of the spread of MDRO, MRSA, CDI and other HAI/AR pathogens across healthcare settings
- Increased collaboration among healthcare facilities that share patients
- Increased collaboration and engagement with city and/or county health departments (e.g., may include funding from state grantee to city/county health departments)
- Reductions in reported HAIs and AR infections or pathogens, with emphasis on CDI, moving towards national targets established in the National Strategy for Combating Antibiotic-Resistant Bacteria and The National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination
- Improved expertise in both health department and healthcare facilities in responding to AR pathogens (including interrupting cross transmission and improving inpatient antibiotic use)
- Increased access to and improved analytic capacity and use of HAI/AR surveillance data from facilities in grantee jurisdiction, allowing grantee health department to better direct and inform actions and response
- More rapid and effective response to emerging AR threats
- Improved tracking of antimicrobial use across the spectrum of healthcare to aid the grantee health department in stewardship efforts
- Improved adherence to CDC-recommended infection control best practices among facilities in grantee jurisdiction
- Increased adoption of CDC's Core Elements of antibiotic stewardship across all healthcare settings
- Increased adherence to appropriate prescribing practices (e.g., increased use of first-line therapies per established practice guidelines and avoidance of antibiotics to treat conditions for which they are not recommended) among healthcare providers
- Improved collection and use of antibiotic prescribing data to guide, design, and evaluate interventions to improve appropriate antibiotic use

iv.  Funding Strategy:

Funds should be used for personnel, travel, supplies and equipment, or contractual support (e.g., hospital, healthcare association, city/county public health) for proposed activities. ELC Awardees having received funds to perform CDI, CRE, and/or antibiotic stewardship projects in FY16 (ELC Year 3) are encouraged to apply. Priority for this funding will be given to current awardees of FY16 Projects J and K2 that are showing progress in developing their HAI/AR prevention and stewardship programs, or to applicants with credible justification of unaddressed AR public health threat.

As clarification, desired personnel will possess knowledge and expertise in: infection control (e.g., investigating outbreaks of AR pathogens in healthcare facilities, use of tiered isolation strategies, and/or decolonization strategies to interrupt transmission between patients), antibiotic stewardship, clinical microbiology (e.g., expertise in antimicrobial susceptibility testing platforms, familiarity with Clinical and Laboratory Standards Institute standards, and techniques to efficiently process swabs used to detect asymptomatic carriage), and analysis of available surveillance data.

Total availability of funds: $17,600,000
Approximate number of awards: Up to 30
Approximate average per award: $590,000

v.  Strategies and Activities:

Applications for this project must include all four numbered strategies and their associated activities listed below. Grantees should use available data (e.g., NHSN data, NHSN Antimicrobial Use [AU] and Antimicrobial Resistance [AR] data, Nationally Notifiable Disease Surveillance System [NNDSS] data, laboratory data, Patient Safety Atlas, National HAI Progress Report) to determine AR prevention priorities. All prevention efforts must include antimicrobial
stewardship activities. Coordinated prevention activities in this FY17 ELC guidance must expand upon K1 (Detection, Containment, and Prevention) activities.

1) **Improving Surveillance to Drive Public Health Action (Logic Model Strategy 1b)**

   a. Promote the use of National Healthcare Safety Network (NHSN) Antimicrobial Use and Antimicrobial Resistance (AUR) module (both components) among facilities in your jurisdiction.

   b. Integrate and enhance the use of AR data systems (e.g., NHSN, NNDSS, Electronic Laboratory Reporting [ELR]) by consolidating available expertise, resources, and technologies in ways that add efficiencies and effectiveness to surveillance processes and produce added benefits for analysis and prevention.

   c. Provide technical assistance to facilities in your state/region regarding the system requirements and application of NHSN AUR Module, as well as laboratory-identified (LabID) event reporting to the NHSN MDRO and CDI module.

   d. Establish access to NHSN infection data and both AU and AR data (e.g., Data Use Agreement [DUA] or other mechanism), and other relevant data (e.g., electronic laboratory reporting data from NNDSS) for at least one multidrug-resistant organism (MDRO) and CDI. Previous K2 grantees (i.e., those funded during FY16) must focus on at least 2 MDROs and CDI.

   e. Identify and utilize state/local data sources to better understand where to target interventions. Examples include use of all payer and all claims databases, Medicaid, National Healthcare Safety Network (NHSN) data, third party vendor data or other prescribing data to evaluate prescribing practices at a state or county level.

   f. Utilize surveillance data to accomplish the following. ELC FY16 (Year 3) K2 grantees must maintain progress from the previous year, must describe any barriers to progress, and must describe where solutions to those barriers have been identified:

      i. Use data to identify healthcare facilities and networks (e.g., acute care, long-term acute care, and nursing homes) with high prevalence of HAI/AR infections, and to prioritize recruitment of facilities to participate in HAI/AR prevention initiatives that use CDC-recommended infection control and antibiotic stewardship strategies.

      ii. Work with partners to establish grantee access to NHSN data from nursing homes in your jurisdiction.

      iii. Identify healthcare facilities that regularly share patients to target prevention and control of MDROs and CDI, in coordination with state and regional AR laboratories, as appropriate.

      iv. Utilize the Targeted Assessment for Prevention (TAP) Report Function in NHSN for CDI to prioritize prevention efforts, to include deployment of the TAP CDI Facility Assessment Tool in selected facilities to identify gaps.
v. Verify existing stewardship practices/programs across the healthcare spectrum in a state/region by geography and facility characteristics (e.g., using NHSN survey data).

vi. Develop mechanisms to identify emerging MDROs within your jurisdiction.

2) Implement and Evaluate Public Health Practice, and Prevention and Control Strategies: HAI/AR Infections (Logic Model Strategy 1c)

a. Implement HAI/AR prevention and stewardship initiatives:
   o Focus on CDI, CRE, CRPA, and/or MRSA.
   o Include nursing homes, long-term acute care, and acute care facilities in evaluation, recruitment, and prevention efforts.
   o Include state-level interventions that increase adherence to appropriate antibiotic prescribing practices.

b. Use or promote evidence-based antibiotic stewardship interventions to increase adherence to appropriate antibiotic prescribing practices, including avoidance of antibiotics to treat conditions for which they are not recommended, and more frequent use of first-line therapies (rather than alternative agents) per established clinical practice guidelines.

c. Develop (where necessary) and disseminate existing continuing education curricula, clinical decision making tools, or patient education materials related to AR, including the Core Elements of Hospital Antibiotic Stewardship Programs, The Core Elements of Antibiotic Stewardship for Nursing Homes, and the Core Elements of Outpatient Antibiotic Stewardship.

d. Evaluate the effectiveness of HAI/AR interventions toward achieving prevention goals for reducing incidence and prevalence of AR infections and pathogens and improving antibiotic use among healthcare providers.

e. Grantees can choose to dedicate a small amount of their funds (<10%) for innovative prevention activities to support the control of HAI/AR pathogens, including CDI, and specify exactly how those funds would be utilized and the expected benefit.

3) Coordinate and Collaborate: State, City, and County Partners (Logic Model Strategy 1d)

a. Identify and coordinate existing HAI/AR prevention activities, programs, and tools in the state or region by collaborating with State Hospital Association, Quality Innovation Network-Quality Improvement Organizations (QIN-QIOs), Hospital Improvement Innovation Networks (HIINs), and other state, city/county, and regional health departments.

b. Coordinate efforts with city and county health departments using available HAI/AR data (e.g., Targeted Assessment for Prevention [TAP] Strategy, or another appropriate strategy) to inform facilities and direct them to specific prevention activities.

c. Ensure ongoing collaboration with state and local laboratories and regional AR laboratories.
4) **Enhance Investigation Response and Reporting: Prevent the Spread of MDROs and CDI (Logic Model Strategies 1a)**

   a. Provide outreach and technical assistance to clinical microbiology laboratories and infection prevention networks to improve case reporting and response (include acute care, long-term acute care, and nursing homes).

   b. Provide on-site technical assistance to facilities in investigating and mitigating transmission of MDROs and CDI.

   c. Develop the capacity to rapidly respond to the detection of emerging MDROs to contain transmission.

   d. Communicate and share data, regionally and among interconnected facilities, during outbreaks that provide situational awareness and helps control the spread of the pathogen(s).

1. **Collaborations**
   a. **With CDC funded programs:**
      
      Awardees must collaborate with other funded programs and initiatives (e.g., state and regional AR laboratories for detection and response, Ebola-funded activities, Office for State, Tribal, Local, and Territorial Support, Office of Public Health Preparedness and Response), as relevant, to ensure that coordinated prevention and stewardship efforts are being maximized and directed appropriately to show progress toward national AR targets, while reducing duplication of efforts. Awardee must collaborate with other CDC-funded programs in their jurisdiction, such as Emerging Infections Program (EIP), and Prevention Epicenters (PE) Program’s academic partners.

   b. **With organizations external to CDC:**
      
      Awardees must collaborate with other health agencies, hospitals, state, city, county, and local health partners, and external HAI partners (e.g., Centers for Medicare & Medicaid Services-funded networks like Quality Innovation Networks-Quality Improvement Organizations [QIN-QIOs], Hospital Improvement Innovation Networks [HIINs], Hospital Engagement Networks, and Hospital Preparedness Programs) to ensure that efforts are being maximized, while reducing duplication of efforts. Applicants must provide evidence (e.g., letter of intent or memorandum of understanding, letter of support from Advisory group) of collaboration with key groups, such as hospital associations, healthcare systems/facilities, and/or other relevant entities.

2. **Target Populations:**

   N/A

   a. **Evaluation and Performance Measurement:**
      
      i. **CDC Evaluation and Performance Measurement Strategy:**
      
      Grantees will complete the K2 Feedback Template reporting tool twice per funding year. This tool will serve as a mechanism for updating awardee activity status, requesting technical assistance, and noting participation in HAI prevention collaboratives/partnerships. Performance Measures will also be reported in the K2 Feedback Template. The second K2 Feedback Template submission will function as the year-end progress report during the continuation application process.
For performance measures that use the following terminology, please use the associated guidance/definition:

**Proportion**: Include both the numerator and denominator. For example, the proportion of clinical laboratories in the jurisdiction submitting isolates of CRE and CRPA for testing would be reported as: (Number of clinical laboratories submitting the isolates)/ (Total number of clinical laboratories in the jurisdiction).

**Target**: The desired number or relevant measurement if all work goes as planned in the upcoming year (2017-2018).

**Actual**: The final number or relevant measurement at the end of the upcoming year (2017-2018). This may be greater than, less than, or equal to the target.

**Performance Measures**

1) Number of facilities tracking antibiotic use through implementing the AU option of the NHSN AUR module, including [Activity 1a]:
   a. Total number of facilities at end of ELC Year 3 (2016-2017) (baseline)
   b. Target number of new participating facilities in ELC Year 4 (2017-2018)
   c. Total number of facilities at the end of ELC Year 4 (2016-2017)

2) Number of facilities tracking antibiotic resistance through implementing the AR option of the NHSN AUR module, including [Activity 1a]:
   a. Total number of facilities at end of ELC Year 3 (2016-2017) (baseline)
   b. Target number of new participating facilities in ELC Year 4 (2017-2018)
   c. Total number of facilities at the end of ELC Year 4 (2016-2017)

3) Provide list of responses to the identification of novel MDROs (e.g., non-KPC carbapenemase-producing CRE, *Candida auris* [C. auris]) that the health department actively participated in. Include the organism, the time (in days) between the first positive culture of the organism and health department notification, and the number of screening cultures performed during the response. [Activity 4d]

4) Target and actual number of facilities enrolled in prevention and stewardship initiatives (e.g., collaboratives) [Activity 2a]

5) For prevention initiatives targeting changes in outpatient antibiotic prescribing among healthcare providers, please provide baseline (end of ELC Year 3 [2016-2017], target for ELC Year 4 [2017-2018], and actual data at end of ELC Year 4 for the following; data sources should include prescribing data) [Activity 2d]:
   a. Number of antibiotic prescriptions for conditions for which antibiotics are not indicated (e.g. acute bronchitis, nonspecific URI, or common cold)
   b. Number of antibiotic prescriptions for conditions for which antibiotics are not always indicated (e.g. acute rhinosinusitis, acute pharyngitis, acute otitis media)
   c. Number of antibiotic prescriptions using first-line agents for treatment of common bacterial infections (e.g. amoxicillin for acute otitis media).
   d. Regional (e.g. county or state-level) per-capita antibiotic prescribing for outpatient antibiotics
6) Proportion of hospitals within the jurisdiction that have stewardship programs meeting all of CDC’s Core Elements for antibiotic stewardship [Activity 1f].

7) *Reported for CDI*: Number of facilities identified as having high CDI infection rates using TAP reports [Activities 1f and 3b]
   - i. Proportion of those facilities for which TAP Facility Assessments were conducted
   - ii. Proportion of those facilities for which the health department provided a completed TAP Feedback Report summarizing TAP Facility Assessment results and identifying potential gaps in infection prevention efforts
   - iii. Proportion of those facilities for which evidence-based infection prevention methods were implemented to address gaps identified in the Facility Assessment

**Additional Information to be Reported (Narrative)**

1) Describe each prevention initiative implemented, including [Activity 2a]:
   - a. Number and types of facilities reached
   - b. Types and description of interventions used within the initiative
   - c. Whether antibiotic stewardship core elements were included, and if so, which set(s) (hospital, outpatient, nursing home).
   - d. Barriers to implementation
   - e. Any changes to the initiative’s process measures
   - f. Reductions in rates (as measured by NHSN) attributed to the initiative
   - g. Any other outcome changes

2) Provide a summary description of each CDI TAP intervention implemented, per facility, to address gaps identified from CDI TAP Facility Assessments and Feedback Report [Activity 1f].
ATTACHMENT
K3: Antimicrobial Resistance Regional Laboratory Network

Program Activity Contact Information
Jean B. Patel, Health Scientist, 404-639-0361

CDC Project Description

i. Problem Statement

Antibiotic resistance (AR) annually causes more than 2 million illnesses and 23,000 deaths in the United States. Combating AR bacteria requires early detection of new resistance and robust prevention efforts, including early outbreak detection and response. Creating regional capacity to detect AR bacteria and Candida will improve the ability to implement timely local prevention efforts and to develop national strategies that limit transmission of resistant pathogens and preventing infections.

Some AR threats like carbapenem-resistant Enterobacteriaceae (CRE) are resistant to nearly all possible therapeutic agents and require enhanced detection and infection control measures to prevent the spread of infections. For other pathogens, like resistant Neisseria gonorrhoeae, and Candida species, detection of resistance is challenging because antimicrobial susceptibility testing is not routinely performed in hospital or other laboratories. In these cases, resistance data are needed to identify outbreaks, prevention measures, and to develop treatment guidelines. Streptococcus pneumoniae infections are decreasing because of an effective vaccine, but new resistant strains may emerge that are not protected by the vaccine. Early detection of these serotypes will help to keep the vaccine up-to-date. Detecting resistance in slow-growing bacteria, like Mycobacterium tuberculosis (Mtb), requires implementing new rapid methods, like whole genome sequencing (WGS), to identify critical resistance and to provide molecular typing data for tracking transmissions during outbreaks and ongoing surveillance.

ii. Purpose

This project will allow CDC to support up to 9 laboratories: 7 AR Regional Laboratories that provide testing to support Antibiotic Resistance Laboratory Network (ARLN) regions (https://www.cdc.gov/drugresistance/solutions-initiative/ar-lab-networks.html#about) and 1 or 2 additional laboratories to provide Mtb molecular testing that will characterize isolates from all culture-confirmed patients in the United States for surveillance of resistance determinants and molecular typing to detect and track transmission.

Candidates for AR regional laboratory funding are not limited to laboratories that previously received funding for AR regional laboratory testing.

An AR regional lab provides cutting-edge laboratory support, including specialized reference testing needs for confirmation and characterization of unusual or emerging resistance in bacteria and Candida isolates submitted from state public health within the region. The ARLN will also support state HAI/AR and other AR prevention programs by providing laboratory testing to support outbreak response and characterize emerging resistance patterns. Response to outbreaks of infectious disease will be improved by the ARLN’s ability to speed up the identification of the most concerning resistant threats. In coordination with CDC,
regional laboratories also test nationally representative isolates (i.e., isolates from all or multiple regions) to help identify new types of resistance or new resistant trends and implement appropriate prevention interventions in response to findings. The ARLN will increase susceptibility testing for high-priority bacteria like CRE and *Neisseria gonorrhoeae*, keep pace with rapidly mutating bacteria so laboratories are ready to respond to new threats, and provide capacity to do surveillance testing or screening. Drug-resistant organisms that are candidates for new diagnostics and antibiotics will be identified by the ARLN. The ARLN will also provide a platform for testing newer technology that not only increases the amount of testing, but also shortens the turn-around time for generating public health data for preventing AR infections. The proposed strategies and activities will help achieve these goals.

The Mtb molecular testing laboratories will implement universal whole genome sequencing (WGS) and 24 loci MIRU-VNTR typing for surveillance of resistance determinants and molecular typing to track transmission of Mtb isolates from all 50 states and U.S. territories. This testing expands the current molecular surveillance system for Mtb implemented by the Division of Tuberculosis Elimination in 2004, which relies upon spoligotyping and MIRU-VNTR. Testing in the Mtb molecular laboratories will include parallel testing of all isolates by WGS and 24-loci MIRU-VNTR with a long term goal of replacing MIRU-VNTR with WGS following a 3-year transitional period. The replacement of conventional genotyping methods with WGS will provide higher resolution molecular typing for better detection and tracking of transmission and for the molecular surveillance of antimicrobial resistance markers.

### iii. Outcomes

Implementation of AR Regional Laboratory activities will:

1. **Provide sustained and enhanced laboratory testing to detect antimicrobial resistance**
   
   a. Staff are trained to perform AR testing and maintain technical competency and provide subject matter expertise
   
   b. Increased laboratory capacity is developed which includes reference susceptibility testing, molecular testing for resistance mechanisms, other specialized tests including screening and surveillance cultures to detect CRE colonization, and WGS of pathogens for which resistance detection analysis protocols are available
   
   c. Labs are able to adopt and validate new AR testing methods as described by CDC
   
   d. Bacterial and fungal isolates are stored and transported to CDC for deposit in the FDA-CDC AR Isolate Bank or other CDC specimen repository (e.g., *Neisseria gonorrhoeae*) on request.
   
   e. Data is generated for CDC-directed targeted surveillance of emerging AR threats as part of national network of regional laboratories

2. **Improve laboratory coordination, outreach, and information flow**
   
   a. Connections between epidemiology and laboratory functions within the lab’s jurisdictional public health department (state, territory, or local department) are improved.
b. An affiliate network of clinical laboratories is established within the lab’s jurisdiction that can be utilized for isolate collection and special evaluations.
c. Within the region served by the laboratory testing, protocols for isolate or specimen submission from regional public health laboratories are established.
d. Work with APHL partners to establish testing communication capacities and protocols for timely testing and reporting of AR results to submitting laboratories, state AR prevention staff and other relevant state or local health department staff (e.g., STD programs), and state or local public health laboratories.
e. Testing and communication protocols are in place to ensure timely testing and reporting of AR results to CDC.

3. Enhance outbreak investigation response and reporting
   a. State HAI/AR prevention programs are able to leverage AR regional lab capacity to support local, state and regional outbreak investigations.
   b. Data for outbreak response are generated in a timely manner and shared with epidemiologists, submitting facilities, and AR prevention partners, including CDC upon request.

4. Coordinate and collaborate with epidemiology, laboratory, and prevention partners
   a. Support for AR outbreaks, efforts, and projects is coordinated with epidemiologists and other AR prevention staff and partners within the region.
   b. A communication protocol is in place for timely reporting of laboratory results to state epidemiologist, laboratorians and other relevant state and local health department staff (e.g., STD clinic staff) and CDC
   c. State epidemiologists have increased situational awareness of antimicrobial resistance threats because of laboratory testing and communication of results.
   d. The laboratory is able to provide expert consultation and results interpretation about AR cases or clusters and other pathogens in the test directory as needed
   e. The laboratory is able to provide training to increase state epidemiologists’ and laboratory partners’ awareness of AR testing and limitations of test results
   f. Collaboration among all ARLN laboratories is fostered

5. Implementation of Mtb molecular testing (Activity 11) will result in
   b. Enhanced capacity for detection of outbreaks and transmission of Mtb.

   iv. Funding Strategy

   CDC will fund up to 9 laboratories: 7 AR Regional Laboratories that provide testing to support Antibiotic Resistance Laboratory Network (ARLN) regions
   (https://www.cdc.gov/drugresistance/solutions-initiative/ar-lab-networks.html#about) and up to two additional laboratories to provide WGS and 24-loci MIRU-VNTR for all Mtb isolates
from culture-confirmed cases of TB in the United States for surveillance of resistance
determinants and transmission.

Candidates for AR regional laboratory funding are not limited to laboratories that previously
received funding for AR regional laboratory testing.

Total availability of funds for ARLN: $17,000,000

1. Approximate number of awards for AR Regional Laboratories:
   Up to 7 awards for activities described in activities 1-9. Approximate average award:
   $1,500,000. Funds should be used for personnel, supplies and equipment, training,
   travel, or contractual support (e.g., academic centers) for purposed activities.
   • Of the 7 awards, laboratories may be awarded funding for additional testing as
described in activity 10 and detailed below:
     a. Antimicrobial susceptibility testing of *Neisseria gonorrhoeae* isolates (up to 4
        awards, approximate average per award: $500,000)
     b. Antimicrobial susceptibility testing and serotyping of MDR-*Streptococcus
        pneumoniae* (2 award, approximate award: $150,000)
     c. Increase laboratory capacity to implement special studies of *Clostridium
difficile* (1 award, approximate award: $500,000)

2. Up to two awards will be made to implement molecular Mtb testing, activity 11. The
total available funds for this work is $1,440,000. Funds can be used for personnel and
supplies. No funds should be used for procurement of equipment. Awardee(s) will be
able to procure some of the equipment required to establish a high throughput WGS
workflow after consultation with CDC using an alternative funding mechanism.

v. Strategies and Activities

Seven AR regional laboratories in the ARLN shall engage in strategies & activities 1-9 and can
choose to participate in any of the optional testing listed in activity 10 (a through c).
In addition, up to two laboratories will be funded for activity 11 (molecular Mtb testing). A
laboratory can apply for only activity 11 or a laboratory can apply for activities 1 to 9,
optional activities in 10, and activity 11.

Funded labs should continue testing activities from year 1 and be able to stand up new
capacities within 1 year of receiving funds:

1. **Activity 1**: Implement laboratory capacity that includes the state public health
   laboratory CRE testing activities described in K1 and activities listed below:
      a. In collaboration with CDC, provide antimicrobial susceptibility testing and molecular
detection of resistance mechanisms for new, unusual or emerging AR threats
         including isolates suspected of carrying novel resistance mechanisms sent from K1
         laboratories within the region.
b. In collaboration with CDC, provide antimicrobial susceptibility testing of new antimicrobial agents for multi-drug resistant bacteria when FDA-approved testing is not available. Testing should be done using frozen broth microdilution or dried broth microdilution panels that have been verified as sufficiently equivalent to frozen panels by CDC or a manufacturer.

c. Provide regional laboratory support for state-led outbreak investigations and HAI/AR prevention efforts focused on CRE by performing molecular tests to detect CRE colonization for common CRE types and using CDC-recommended culture-based methods to detect CRE colonization for unusual CRE. Testing will be timely (e.g., ≤ 2 working days’ time to reporting molecular results). Note: The region served should be consistent with the regions identified by the PulseNet program.

d. In collaboration with state epidemiologists or HAI/AR detection prevention programs (K1), facilitate collection and transportation of rectal swab specimens to ensure timely testing of specimens for carbapenemase colonization. AR regional labs should (1) work with state HAI/AR detection and prevention programs (K1) to transport swabs to healthcare facilities where swabbing for colonization testing will take place, (2) provide advice to healthcare facility laboratories in the collection and transportation of specimens, (3) have specimens collected at healthcare facilities sent directly from healthcare facilities to the regional lab, and (4) report results to the jurisdictional public health department and submitting healthcare facility, and (5) provide a monthly summary of testing to jurisdictional health department and CDC.

f. Establish or increase laboratory capacity to conduct reference identification and susceptibility testing of *Candida* spp. Funded labs will use MALDI-TOF or DNA-based methods for identification and CDC-recommended antifungal susceptibility testing methods to characterize 1,000 to 2,000 *Candida* spp. isolates annually. Laboratories will collect isolates from the majority of hospitals in their region to ensure wide surveillance coverage and will provide CDC-directed laboratory testing to support outbreaks of *C. auris* if investigations occur within the region.

g. Develop education sessions for state HAI/AR prevention programs and public health laboratories within the region served by the AR Regional Laboratory.

h. Submit regular reports (monthly) to CDC summarizing key findings about emerging or changing AR trends, key resistance mechanisms, outbreak response investigations. For any results identified as an “alert” result by CDC (e.g., new or emerging resistance), communicate results within one business day of the result.

- **Activity 2:** ARLN labs will provide reference lab testing to better prevent an emerging or changing AR threat. As such, labs perform CDC-directed and coordinated public health assessments for pathogens such as, but not limited to, those listed below.
These assessments will involve CDC-directed collections of representative isolates, swabs or waste clinical specimens from a network of collaborating clinical laboratories in the jurisdiction, with monthly results and specified isolates shared with submitting laboratories and CDC. Techniques used in studies may include isolation of bacterial isolates from swabs or other clinical specimens, bacterial identification, antimicrobial susceptibility testing and molecular characterization (e.g., PCR or whole genome sequencing).

- **MDR Pseudomonas**
- **MDR Enterobacteriaceae**, including enteric pathogens
- **MDR Acinetobacter**
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-resistant Enterococcus (VRE)
- Vancomycin-resistant *Staphylococcus aureus* (VRSA)
- perform surveillance for emerging AR threats as part of a coordinated national program directed by CDC

**Activity 3:** Develop reporting process and IT infrastructure for timely reporting to facilities, state or local public health laboratories, epidemiologists, regional AR prevention partners, and CDC

- Clinical isolates requiring specialized testing (e.g., CRE, carbapenem-resistant *Pseudomonas aeruginosa*, and *Candida* spp.)
- Outbreak detection requested through state or local health authorities (CRE, *C. auris*, and other pathogens as needed and resources permit)
- Representative sets of isolates to describe estimate of scope and magnitude of specific AR threats and mechanisms for resistance (*Neisseria gonorrhoeae*, *Candida* spp., MDR-*Streptococcus pneumoniae* for AR regional laboratories conducting this testing, see Activity 9)

**Activity 4:** Implement specimen storage and isolate transport per CDC guidance (e.g., isolates which harbor new or unusual resistance, a subset of representative isolates including representative isolates from outbreaks) for additional characterization and potential repository in the FDA-CDC AR Isolate Bank or other CDC specimen repositories (e.g., the CDC *Neisseria gonorrhoeae* repository) to help support diagnostic and drug development.

**Activity 5:** Laboratories can consider increasing their capacity to detect and characterize antibiotic resistant bacteria using whole genome sequencing by purchasing an automated library preparation system and the NextSeq high capacity sequencer. Laboratories requesting this instrumentation should provide a written justification in their application. Funded laboratories will work with CDC subject
matter experts to identify instruments and sequence chemistries that will produce data of sufficient quality for the specific public health application and data needs.

- **Activity 6**: Implement AR-related consultations and results interpretation for facilities, designated outbreak and prevention program staff, and partners, and other network laboratories. AR regional laboratories offer yearly training for laboratory personnel conducting AR testing in state public health laboratories.

- **Activity 7**: Conduct regular coordination meetings (monthly) with CDC to discuss AR concerns, emerging issues, protocol plans, etc. Submit regular reports (monthly) to CDC summarizing key findings about emerging or changing AR trends, key resistance mechanisms, outbreak response investigations. For any results identified as an “alert” result by CDC (e.g., new or emerging resistance), communicate results within one business day of the result.

- **Activity 8**: Train laboratory personnel to demonstrate competency and proficiency for performing all AR tests (e.g., antimicrobial susceptibility testing, detection of resistance mechanisms, and advanced molecular diagnostics, such as whole genome sequencing, to detect resistance and addressing the genetic relatedness of bacterial isolates) available in their test directory. Staff participate in periodic (yearly or biannual) training programs offered by partners in collaboration with CDC. Proficiency is measured by laboratory performance on external or CDC-provided proficiency tests (i.e., testing of unknown isolates or specimens).

- **Activity 9**: In collaboration with CDC programs, establish a project plan and protocol for collection of specimens or isolates from hospital, other clinical microbiology laboratories, or other settings like sexually-transmitted disease clinics, for:
  a. Clinical isolates requiring specialized testing (e.g., CRE, and carbapenem-resistant *Pseudomonas aeruginosa*, and *Candida* spp.)
  b. Outbreak detection requested through state or local health authorities (CRE, *C. auris*, and other pathogens as needed and resources permit)
  c. Representative sets of isolates to describe estimate of scope and magnitude of specific AR threats and mechanisms for resistance (Neisseria gonorrhoeae, MDR-Streptococcus pneumoniae for AR regional laboratories conducting this testing, see Activity 10)

**Additional Laboratory Capacity (some AR regional laboratories)**
- **Activity 10**: Some laboratories will be supported to provide testing of nationally representative isolates to help identify new types of resistance or new resistant trends and implement appropriate prevention interventions in response to findings by implementing one or more of the following activities:
a. Establish or sustain laboratory capacity for *N. gonorrhoeae* resistance surveillance by testing approximately 5,000 isolates annually per laboratory. Preference will be given to laboratories that have demonstrated proficiency in antimicrobial susceptibility testing of *N. gonorrhoeae* using agar dilution and β-lactamase testing in accordance with methods recommended by CDC’s Division of STD Prevention (http://www.cdc.gov/std/gisp/gisp-protocol-feb-2015_v3.pdf). Funded labs should comply with GC AR surveillance data reporting, quality management, and specimen submission protocols. Testing will be done on isolates sent from STD surveillance clinic sites and from state public health laboratories funded for the rapid detection and response program (K8). K3 funded laboratories should communicate antimicrobial susceptibility testing results back to submitters or designates as directed by CDC within two weeks of submission. K3 funded laboratories will also perform whole genome sequencing (WGS) for at least 800 and up to 1,500 isolates per funded laboratory annually. These sequence data will be used to detect and characterize isolates with unique antimicrobial susceptibility patterns and to strengthen epidemiologic investigations through sexual network analysis. ARLN laboratory staff will participate in semi-annual proficiency assessments administered by CDC.

b. Antimicrobial susceptibility testing and serotyping of MDR-*Streptococcus pneumoniae* (up to 500 isolates per year)

c. Perform CDC-directed and coordinated public health assessments of emerging or changing epidemiology of *Clostridium difficile* by implementing culture capacity for clinical specimens and environmental specimens. As directed by CDC, apply advanced molecular detection testing to type isolated bacteria and to assess *C. difficile* transmission.

- **Activity 11**: Up to two laboratories will be supported to provide molecular testing of *M. tuberculosis* isolates from all 50 states and U.S. territories. The funded laboratories should comply with genotyping surveillance data reporting, quality management, and specimen submission protocols. Specifically the laboratory will implement the following activities:
  
  a. Establish or sustain laboratory capacity for Mtb 24 loci MIRU-VNTR typing by testing approximately 9,000 isolates in total annually. Preference will be given to laboratories that have demonstrated proficiency in 24 loci MIRU-VNTR testing in accordance with methods recommended by CDC’s Division of TB Elimination (protocol attached). Testing will be done on isolates submitted from public health laboratories. The laboratories should upload the 24 loci MIRU-VNTR result into the web based TB Genotyping Information
Management System within two weeks of submission. The funded laboratory will be expected to initiate routine testing on December 1, 2017. NOTE: The delayed start date will result in the testing a total of 7,500 isolates during year 1.

b. Establish or sustain whole genome sequencing (WGS) of Mtb by sequencing approximately 9,000 isolates in total annually. The Nextseq 500 sequencer is the preferred platform for this work. These sequence data will be used to conduct molecular surveillance of antimicrobial susceptibility patterns and to strengthen epidemiologic investigations through transmission network analysis. Preference will be given to laboratories that have demonstrated proficiency in WGS testing of *M. tuberculosis* in accordance with methods recommended by CDC’s Division of TB Elimination (protocol attached). WGS testing will be done in parallel with 24 loci MIRU-VNTR testing on isolates submitted from public health laboratories. The laboratory should transmit the WGS fastq file and run report to CDC within one month of submission. CDC will assist with the implementation and validation of the high throughput WGS workflow by providing validation samples and technical assistance. The funded laboratory will be expected to initiate routine testing by February 1, 2018. NOTE: The delayed start date will result in the testing of 6,000 isolates in total during year 1.

c. Implement sample inventory storage system; prepare subcultures of all submitted isolates and provide transport to CDC within three months of submission for long term storage. All DNA extracts prepared for MIRU-VNTR typing should be transported to CDC within 7 days of submission until routine WGS typing is initiated.

1. **Collaborations** –
   a. **With CDC funded programs:**

   Collaboration with CDC programs is expected to ensure implementation of approved or recommended methods and protocols that support national data needs. To assure that efforts and activities are complimentary and minimize the burden on clinical laboratories, sites should coordinate their activities with:
   - other funded Antimicrobial Resistance Regional Laboratory Network programs and initiatives,
   - core HAI/AR detection and prevention programs (K1),
   - state public health laboratories, including CRE testing (K1) and Salmonella WGS (I2) testing,
   - state HAI/AR prevention programs (K2),
   - EIP programs, if present in their state or jurisdiction
   - APHL AIMS program implementation team
**b. With organizations external to CDC:**

Collaboration with other state or local public health laboratories and medical and/or public health academic centers is expected to assure that efforts are being maximized while reducing duplication of efforts.

### 2. Target Populations:

N/A

### a. Evaluation and Performance Measurement

#### i. CDC Evaluation and Performance Measurement Strategy

Required performance measures for the project period are listed below. Data will be reported on an annual basis and are used to indicate progress made toward program outcomes and identify areas for technical assistance or improvement.

1. Number of laboratory personnel trained and proficient in performing all phenotypic testing available in their ARLN test directory (*Outcome 1*)
2. Number of laboratory personnel trained and proficient in performing all molecular testing available in their ARLN test directory (*Outcome 1*)
3. Describe effort to connect epidemiology, laboratory and prevention partners within the region. This should include the partners you connected with, topics discussed, and any challenges to coordination. (*Outcomes 2, 4*)
4. Number of isolates tested for antimicrobial resistance by state of origin, pathogen and test type (*Outcome 1*)
   - Number of isolates tested by WGS.
5. Number of colonization screening requests conducted per state (*Outcomes 1,3*)
6. Total number of colonization swabs tested (*Outcomes 1,3*)
   - Describe any challenges with reporting colonization testing results back to facilities within 1 working day of testing
7. Number of resistant isolates transported upon request to CDC for the FDA-CDC AR Isolate Bank or other CDC repository. List genus, species, isolate ID, and resistance mechanism, if applicable. (*Outcome 1*)
8. Number of education or training sessions for the designated AR outbreak and prevention collaborative partners and other network laboratories (*Outcomes 3, 4*)
   - Number of regional education sessions
   - Number of state-specific education sessions - list by state
9. Describe type of consultations provided to designated AR outbreak and prevention collaborative partners and other network laboratories in your region (*Outcomes 3, 4*)
10. Number and type of participating clinical laboratories (*Outcome 2*)
11. For laboratories conducting *N. gonorrhoeae* testing: Number of viable, non-viable, and contaminated isolates received from each referring site (*Outcome 1*)
<table>
<thead>
<tr>
<th>12. For laboratories conducting molecular Mtb testing <em>(Outcome 5)</em>:</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Number and percentage of isolates successfully tested by 24-loci MIRU-VNTR within two weeks of submission.</td>
</tr>
<tr>
<td>o Number and percentage of isolates successfully tested by WGS within one month of submission.</td>
</tr>
</tbody>
</table>
ATTACHMENT
M1: West Nile Virus and Other Arboviral Diseases

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christopher Gregory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Funding Opportunity Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td>a. Healthy People 2020:</td>
</tr>
<tr>
<td>Not applicable</td>
</tr>
<tr>
<td>b. Other National Public Health Priorities and Strategies:</td>
</tr>
<tr>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CDC Project Description</th>
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</thead>
<tbody>
<tr>
<td><strong>i. Problem Statement:</strong></td>
</tr>
<tr>
<td>Arboviruses are transmitted to humans primarily through the bites of infected mosquitoes and ticks. West Nile virus is the leading cause of domestically-acquired arboviral disease in the United States. Several other domestic arboviruses also cause seasonal outbreaks and sporadic disease, often in limited geographic areas or unique ecosystems (e.g., Colorado tick fever, Eastern equine encephalitis, La Crosse, and Powassan viruses). Other exotic arboviruses are persistent threats for introduction into the U.S. (e.g., Chikungunya, Yellow fever, Japanese encephalitis, and Zika viruses). In the past year, local transmission of Zika virus has occurred in several areas in the continental United States and thousands of returning travelers have been diagnosed with Zika virus infection. The presence of competent mosquito vectors for the transmission of these exotic arboviruses means that jurisdictions have to be continuously prepared to detect and respond to virus introduction. Different vectors, animal hosts, and tissue tropisms contribute to variations in geographic distribution, disease incidence, clinical manifestations, and outcomes for the over 200 known arboviruses. Defining the epidemiology and burden of arboviral disease is essential to maintaining and improving public health prevention and control efforts.</td>
</tr>
<tr>
<td><strong>ii. Purpose:</strong></td>
</tr>
<tr>
<td>The purpose of this funding is to support state and local health departments to implement and maintain effective surveillance and prevention efforts, to include case detection and reporting, laboratory diagnosis, environmental monitoring, risk prediction, vector surveillance, insecticide resistance monitoring and control, and implementation of other interventions to reduce human infections due to West Nile virus, Zika virus, and other arboviruses of public health importance.</td>
</tr>
<tr>
<td><strong>iii. Outcomes:</strong></td>
</tr>
<tr>
<td>- Trained workforce better prepared to respond to arboviral disease cases and outbreaks</td>
</tr>
<tr>
<td>- Improved human surveillance and laboratory capacity to monitor the epidemiology, incidence, and geographic distribution of nationally notifiable arboviral diseases</td>
</tr>
<tr>
<td>- Improved environmental surveillance to detect and monitor vector distribution and arbovirus activity, and to direct mosquito control and other public health response</td>
</tr>
<tr>
<td>- Improved mosquito control and monitoring of insecticide resistance</td>
</tr>
<tr>
<td>- Improved completeness and timeliness of reporting of arboviral surveillance data, including clinical, exposure, and laboratory data, to state health departments and CDC</td>
</tr>
<tr>
<td>- More rapid and complete identification of arboviral disease outbreaks to facilitate timely and effective control measures and prevent arboviral disease introduction.</td>
</tr>
</tbody>
</table>
- Timely and accurate information on arboviral disease activity provided to healthcare providers, researchers, political leaders, and general public
- Participate in proposed national arboviral diseases meeting

### iv. Funding Strategy:
Funds should be utilized for personnel, travel, supplies and equipment, or contractual support for proposed activities. Mosquito control activities may be considered pending funding availability. Available funds for August 2017–July 2018 are estimated to be around $9 million.

- Total Funding available: ~ $9,000,000
- Approximate number of awards: 60
- Approximate Average per Award: $150,000

Funding decisions are based on:
- Quality of application
- Arboviral disease burden
- Completeness of reporting
- Laboratory testing capacity
- Environmental surveillance reporting
- Surveillance, monitoring, and mapping of vector abundance, infection, and insecticide resistance
- Participation in enhanced surveillance activities
- Successful implementation of activities in previous funding cycles
- Presence of long-term WNV and Arboviral positons

### v. Strategies and Activities:
Proposals do/do not need to address all of the potential activities listed below; they should be tailored to the specific needs of the applicant program. However all proposals must include core surveillance activities 1a-c, 2a-b, 3 and 4a-b below.

**Core surveillance**

All jurisdictions are required to submit progress reports for August 2016–July 2017 and work plans for August 2017–July 2018 for the following activities:

#### 1. Enhance outbreak investigation response and reporting (1a)

- a. Investigate and report arboviral disease outbreaks, cases of transfusion- and transplant-associated arboviral disease, sexually transmitted cases and imported arboviral diseases
- b. Investigate and report to ArboNET Zika virus disease cases in selected groups of interest, particularly those with severe clinical manifestations (e.g., congenital infection with microcephaly or other birth defects, Guillain-Barré syndrome, other neurologic syndromes, deaths, children)
- c. Investigate and report Zika virus in pregnant women or suspected in utero or intrapartum transmission

#### 2. Improve surveillance to drive public health action (1b)

- a. Identify and report arboviral disease cases to ArboNET using standard CSTE case definitions
b. Identify and report West Nile and Zika virus viremic blood donors to ArboNET

c. Conduct or coordinate environmental arboviral surveillance to direct control activities and report data to ArboNET, including positive findings (i.e., veterinary cases, and infected mosquitoes, dead birds, and sentinel animals) and denominator data (i.e., numbers of mosquito pools and dead birds tested)

d. Annually define and report the types of ecologic surveillance activities performed in each county or surveillance area

e. Systematically collect data on the presence and abundance of Aedes aegypti and Aedes albopictus mosquitoes and report this to MosquitoNet

f. Perform insecticide resistance testing of Aedes species mosquitoes via CDC recommended methodology and report results through MosquitoNet

g. Analyze, interpret, and disseminate arboviral human and environmental surveillance data

h. Conduct outreach and educational activities to increase awareness of healthcare providers and public health personnel regarding the risks, clinical manifestations, laboratory diagnosis, and prevention of arboviral diseases

i. Update existing surveillance system platforms to capture and report new data elements in the revised message mapping guide

3. Sustain and enhance laboratory diagnostic capacity (2a)

   a. Maintain laboratory capacity and participate in annual proficiency testing for arboviral disease diagnostics

4. Coordination and collaboration

   a. Establish collaborations between state or territorial health departments and mosquito control jurisdictions to improve local mosquito surveillance and control

   b. Participate in a national arboviral diseases meeting for state and local health departments

5. Implement and evaluate public health practice and prevention and control strategies

   a. Educate healthcare providers and public regarding the risk, clinical manifestations, laboratory diagnosis and prevention of arboviral infections

   b. Develop and implement local mosquito control capacity

Enhanced surveillance activities

Jurisdictions that participated in enhanced surveillance activities during the August 2016–July 2017 funding cycle are requested to submit progress reports and plans to complete any remaining work.

<table>
<thead>
<tr>
<th>1. Collaborations –</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. With CDC funded programs:</td>
</tr>
<tr>
<td>Not applicable</td>
</tr>
<tr>
<td>b. With organizations external to CDC:</td>
</tr>
</tbody>
</table>

Work with local vector control districts to implement mosquito surveillance, mapping, and control activities. Work with ASTHO, CSTE and NACCHO to develop comprehensive plans for long-term
structure and support to build and sustain capacity for disease and vector surveillance for arboviruses of public health significance and vector control efforts nationally. Work with relevant CDC-funded regional Centers of Excellence for Vector-borne Diseases.

2. Target Populations:

Not applicable

<table>
<thead>
<tr>
<th>a. Evaluation and Performance Measurement:</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. CDC Evaluation and Performance Measurement Strategy:</td>
</tr>
<tr>
<td>Measurable goals and evaluation criteria for receipt of these funds are as follows:</td>
</tr>
<tr>
<td>1) Human arboviral disease burden and completeness of reporting for 2012–2016</td>
</tr>
<tr>
<td>a. Number of probable or confirmed locally-transmitted arboviral disease cases reported to ArboNET</td>
</tr>
<tr>
<td>b. Incidence of probable or confirmed locally-transmitted neuroinvasive arboviral disease cases reported to ArboNET</td>
</tr>
<tr>
<td>c. Number of probable or confirmed imported arboviral disease cases reported to ArboNET</td>
</tr>
<tr>
<td>d. Proportion of reported human disease cases reported to ArboNET with complete data for the following categories: age, sex, clinical syndrome, clinical signs/symptoms, pregnancy status, hospitalization, death, and laboratory confirmation</td>
</tr>
<tr>
<td>e. Number of West Nile and Zika virus presumptive viremic blood donors reported to ArboNET</td>
</tr>
<tr>
<td>2) Arboviral laboratory diagnostic capacity and participation in proficiency testing</td>
</tr>
<tr>
<td>a. Participation in 2016-2017 proficiency evaluation for West Nile and Zika virus IgM antibody and PCR testing</td>
</tr>
<tr>
<td>b. Reported capacity to perform clinical diagnostic testing for arboviruses other than West Nile and Zika virus in 2016-2017</td>
</tr>
<tr>
<td>c. Number of arbovirus tests requested and performed on clinical specimens received from other states or territories through regional collaboration</td>
</tr>
<tr>
<td>3) Arboviral ecologic surveillance data reported to ArboNET</td>
</tr>
<tr>
<td>a. Proportion of total jurisdiction population that live in an area with environmental surveillance data reported to ArboNET in 2016</td>
</tr>
<tr>
<td>b. Number of veterinary disease cases reported to ArboNET from 2012-2016</td>
</tr>
<tr>
<td>4) Mosquito surveillance and control data</td>
</tr>
<tr>
<td>a. Completeness of monthly mosquito vector monitoring and insecticide resistance data (where applicable) reported to MosquitoNet</td>
</tr>
<tr>
<td>b. Vector control activity capacities and enhancements reported to CDC in annual report</td>
</tr>
<tr>
<td>5) Participation in a national arboviral diseases meeting for state and local health departments</td>
</tr>
<tr>
<td>6) Participation in enhanced arboviral surveillance activities</td>
</tr>
<tr>
<td>7) Zika-specific measures</td>
</tr>
</tbody>
</table>
a. Time from specimen collection to time reported to appropriate surveillance network reporting for all Zika virus tests

b. Number and proportion of reports of Zika virus cases with investigation initiated within 48 hours of report

c. Number and proportion of reports of Zika virus cases for which initial public health control measures were initiated within 48 hours of report

Data for items 1a through 1e, 2a, 3a, and 3b, 4a will be derived from ArboNET and MosquitoNet submissions or results of the annual proficiency evaluation, and need not be included in detail in the progress report. Responses to 2b should be provided in Table 3 (see below). Activities related to vector control capacity improvements (item 4b) and enhanced arboviral surveillance activities (item 6) should be described in the progress report narrative. Measures 2c, 7a-7c will be reported via REDCap.

Applicants are requested to complete the following tables:

1. **Table 1.** Estimated proportion of West Nile virus and other arboviral diseases ELC funds spent by program activity for August 2015–July 2016

2. **Table 2.** Current arboviral laboratory diagnostic testing capacity

<table>
<thead>
<tr>
<th>Program activity</th>
<th>% spent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human/epidemiologic surveillance*</td>
<td></td>
</tr>
<tr>
<td>Environmental surveillance†</td>
<td></td>
</tr>
<tr>
<td>Vector control and insecticide resistance‡</td>
<td></td>
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<tr>
<td>Education/ community outreach</td>
<td></td>
</tr>
</tbody>
</table>

*Estimated proportion of funds used from August 2016–July 2017 to support human or epidemiologic surveillance activities including 1) laboratory diagnosis, 2) identification, investigation, and reporting of human disease cases, and 3) testing, investigation, and reporting of presumptive viremic blood donors.

†Estimated proportion of ELC funds used from August 2016–July 2017 to support environmental surveillance activities including 1) dead bird collection and testing, 2) maintaining and testing sentinel animals, and 3) identification, testing, and reporting of veterinary cases. ‡ Estimated proportion of funds used from August 2016-July 2017 to support vector surveillance and control activities, including mosquito trapping, insecticide resistance and vector management.
<table>
<thead>
<tr>
<th>Virus</th>
<th>ELISA</th>
<th>MIA</th>
<th>IFA</th>
<th>PRNT</th>
<th>PCR</th>
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<tr>
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<td>St. Louis encephalitis</td>
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<tr>
<td>Zika</td>
<td>no</td>
<td>no</td>
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</tr>
</tbody>
</table>

*Please check boxes for assays that your laboratory currently has the capacity to perform, including trained staff and necessary equipment and supplies.

†Such as La Crosse or Jamestown Canyon viruses

ELISA = Enzyme-linked immunosorbant assay
MIA = Microsphere immunoassay
IFA = Indirect immunoflourescent assay
PRNT = Plaque reduction neutralization test
PCR = Polymerase chain reaction
IgM = Immunoglobulin M
IgG = Immunoglobulin G
ATTACHMENT
M2: US Zika Pregnancy Registry

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="mailto:ZikaPregnancy@cdc.gov">ZikaPregnancy@cdc.gov</a></td>
</tr>
<tr>
<td>Nicole Fehrenbach  <a href="mailto:ekk5@cdc.gov">ekk5@cdc.gov</a>; 404-498-2416</td>
</tr>
<tr>
<td>Dana Meaney-Delman  <a href="mailto:vmo0@cdc.gov">vmo0@cdc.gov</a>; 404-639-2115</td>
</tr>
</tbody>
</table>

Funding Opportunity Description

Background

d. Healthy People 2020:
This funding addresses the Healthy People 2020 goal of improving the health and well-being of women, infants, children, and families, including the following specific objectives:
- MICH-1: Reduce the rate of fetal and infant deaths
- MICH-1.6: Reduce the rate of infant deaths related to birth defects (all birth defects)
- MICH-3: Reduce the rate of child deaths
- MICH-6: Reduce maternal illness and complications due to pregnancy (complications during hospitalized labor and delivery)
- MICH-10: Increase the proportion of pregnant women who receive early and adequate prenatal care
- MICH-16: Increase the proportion of women delivering a live birth who received preconception care services and practiced key recommended preconception health behaviors
e. Other National Public Health Priorities and Strategies:

CDC Project Description

j. Problem Statement:
On January 22, 2016, CDC activated its Emergency Operations Center (EOC) to respond to outbreaks of Zika virus occurring in the Americas and increased reports of birth defects in areas affected by Zika.

As of March 2017, local transmission has been identified in over 50 countries or territories in the Americas. Zika virus infections have been reported in travelers returning to the United States from areas with active Zika virus transmission. Additionally, Zika virus infection also has occurred through sexual transmission, which may pose an exposure risk to non-traveling pregnant women whose partners may have traveled to areas at high risk for Zika virus acquisition. With the ongoing outbreak in the Americas, the number of Zika virus disease cases among travelers returning to the United States likely will increase, and sexual transmission from male travelers to their female sex partners in the United States will likely continue to occur. In addition, mosquito-borne local transmission has occurred in some US states and may continue to occur in states where Aedes species mosquitoes are present.

Zika virus infection has been confirmed among several infants with microcephaly and in fetal losses in women infected during pregnancy. In addition to microcephaly, a range of other problems have been detected among fetuses and infants infected with Zika virus before birth and are being described as congenital Zika syndrome.
Zika virus disease and Zika virus congenital infection are nationally notifiable conditions for which the Council of State and Territorial Epidemiologists (CSTE) has established interim case definitions. ELC grantees participate in reporting of arboviral diseases through ArboNET. However, ArboNET does not capture all the information needed to provide timely situational awareness in the context of the ongoing public health response, nor does it provide the level of emerging data required to inform public recommendations and action. ArboNET collects limited data on pregnancy status, pregnancy and birth outcomes, and congenital infections, all of which are critical for informing ongoing response efforts.

As part of the public health response to the Zika virus disease outbreak, CDC has established a standard case definition to conduct supplemental surveillance of pregnant women with possible Zika virus infection; periconceptionally, prenatally, or perinatally exposed infants born to these women; and Infants with laboratory evidence* of possible congenital Zika virus infection and their mothers.

This enhanced surveillance includes the collection of information about antenatal diagnostic testing, and clinical outcomes among pregnant women and their infants through the first year of life. The Registry has already provided critical information that has informed CDC clinical recommendations and will continue to serve as part of the evidence that will direct CDC clinical recommendations and public health guidance and messages. This information collection is authorized by Section 301 of the Public Health Service Act (42 U.S.C. 241).

**vi. Purpose:**

**Purpose of Zika Pregnancy Registry funding:**

The purpose of Zika Pregnancy Registry funds are to provide eligible jurisdictions financial support for collaborative participation in the US Zika Pregnancy Registry including identification of pregnant and infant cases and completion of follow up on pregnant women and the exposed fetuses and infants who meet the registry inclusion criteria. CDC encourages all US jurisdictions to participate in order to have full monitoring of pregnant women with Zika virus infection and their infants. All collaborating jurisdictions who request funding should confirm that they plan to submit all variables requested by the US Zika Pregnancy Registry, with redaction only of variables that cannot be submitted due to specific state laws or regulations. The data forms and electronic databases have been distributed to ELC grantees and are available upon request.

Funding will provide jurisdictions support to obtain a Registry Coordinator to conduct these activities and to perform data management. The Registry Coordinator will serve as the primary contact and is expected to collaborate with CDC Registry points of contact as well as other CDC-funded efforts including Active Birth Defects Surveillance (in states where applicable). The US Zika Pregnancy Registry is collecting critical data to update recommendations for clinical care for pregnant women with Zika virus disease and infants with congenital Zika virus infections, to plan for services for pregnant women and families affected by Zika virus, and to improve prevention of Zika virus infection during pregnancy.

**vii. Outcomes:**

- Improve human surveillance and laboratory capacity to monitor the epidemiology, incidence, and geographic distribution of women and infants who meet the US Zika Pregnancy Registry case definition.
This includes reporting to the US Zika Pregnancy Registry for the following:

- Pregnant women with laboratory evidence of possible congenital Zika virus infection and periconceptionally, prenatally, or perinatally exposed infants born to these women
- Infants with laboratory evidence of possible congenital Zika virus infection and their/mothers
- Cases that are not otherwise monitored by other systems such as ArboNET.

As a surveillance activity, no additional tests or follow up visits are required for the sole purpose of the registry.

- Improve completeness and timeliness of reporting of US Zika Pregnancy Registry data (including all data on the US Zika Pregnancy Registry surveillance forms where reporting is allowable by state laws/regulations) to state health departments and CDC in alignment with CDC established timelines. This includes the following:
  - Rapid and complete identification of women and infants who meet the US Zika Pregnancy Registry case definition
  - Timely and accurate information on women and infants who meet the US Zika Pregnancy Registry case definition
- Improve prenatal care and follow-up of pregnant women with laboratory evidence of possible Zika virus infection and their infants to assess fetal and infant outcomes
- Translation of public health data in real time into clinical and public health recommendations, particularly in the realm of prenatal diagnosis and early detection of developmental delays in infants

**Funding Strategy:**

Funds should be utilized for personnel, travel, supplies and equipment, or contractual support for proposed activities. Available funds for August 2017–July 2018 are expected to range from approximately $22,000 -- $1.09M per grantee.

- Total funding Available: $15.5M
- Approximate number of awards: 61
- Approximate Average per Award: $260,000

Zika Pregnancy Registry funds should be utilized for personnel (contractual or full time staff) to support a Zika Pregnancy Registry Coordinator who will track and report all cases of pregnant women with laboratory evidence of possible Zika virus infection and their periconceptionally, prenatally or perinatally exposed infants, including infants with possible congenital Zika virus infection, to the US Zika Pregnancy Registry, and collect follow up data on fetal and infant outcomes. Grantees provide justification for using a percentage of current staff for this activity, hiring new full time staff, or using contractual mechanisms. This funding is dependent upon continued appropriations for Zika-related efforts.

**Funding decisions:**

In determining the level of Zika Pregnancy Registry funds for each jurisdiction, we anticipate a range of funding with higher levels of funding to those jurisdictions currently expected to have *Aedes* species mosquitoes and/or anticipated high volume of travelers from Zika-affected areas. Jurisdictions which have a high cost of living or which may otherwise
experience difficulties hiring a Coordinator may request additional funds above the base amount for this activity.

- We expect the Zika Pregnancy Registry funding for individual jurisdictions to range from $22,000 -- $1.09M. Jurisdictions must provide strong justification for their requests to support the US Zika Pregnancy Registry and the use of these funds.

**Zika Pregnancy Registry funding decisions will be based on:**

- Quality of application
- Potential for local transmission, based on distribution of *Aedes* species mosquitoes and experience with other diseases transmitted by the same vectors
- Disease burden related to anticipated high volume of travelers from Zika-affected areas
- Number of births per year

### ix. Strategies and Activities:

All jurisdictions are invited to submit work plans for August 2017–July 2018 for the following activities:

1. Enhance outbreak investigation response and reporting (1a):
   - Coordinate with birth defects surveillance efforts, the investigation and reporting of possible congenital Zika virus infection cases with severe clinical manifestations (e.g., congenital infection with microcephaly or other birth defects). (See M1 for additional information regarding Zika virus investigation and reporting)

2. Improve surveillance to drive public health action (1b):
   - Identify and report all eligible cases that meet US Zika Pregnancy Registry case definition within 30 days of case identification. The Registry case definition includes pregnant women in the US with laboratory evidence of possible Zika virus infection (regardless of whether symptoms were present) and periconceptionally, prenatally or perinatally exposed infants born to these women. In addition, for cases not identified prenatally, the registry definition includes infants with laboratory evidence of possible congenital Zika virus infection (regardless of whether symptoms were present) and the retrospective inclusion of their mothers in the registry.
   - Participate in the US Zika Pregnancy Registry by collecting follow-up clinical data at designated time points for Registry-eligible pregnant women and infants, including at case identification, the second and third trimesters of pregnancy, at delivery, and for infants, at 2, 6 and 12 months. Data completeness and timeliness will be measured, and for each reporting milestone, data collection and reporting is expected within 30 days of the event of interest.

3. In collaboration with Registry staff, complete and transmit securely and in a timely manner US Zika Pregnancy Registry forms or electronic data for maternal and infant follow up (NOTE: while variables of local interest can be added to forms or existing databases, reporting to the registry is expected to include registry data elements in the format required for the registry unless state law forbids transmission of certain Registry data elements):
a. Reporting (in accordance with CDC-case definitions) of information on eligible pregnant women and infants including adverse pregnancy and birth outcomes will occur on a twice monthly basis to US Zika Pregnancy Registry

b. Recipients must also work with CDC to ensure that data entered into Zika Pregnancy Registries is timely, accurate and complies with the approved protocol for the Registries.

3. Collaborations –
   c. With CDC funded programs:

Collaboration is strongly encouraged with birth defect surveillance efforts in state health departments including grantees supported by the National Center on Birth Defects and Developmental Disabilities (NCBDDD). For states receiving both ELC support for the US Zika Pregnancy Registry and NCBDDD support for birth defects surveillances, efforts should be coordinated and not duplicative.

d. With organizations external to CDC:

Grantees are encouraged to collaborate with national and local professional organizations such as American Academy of Pediatrics, American College of Obstetricians and Gynecologists, American Board of Obstetrics and Gynecology, Society for Maternal Fetal Medicine, American Nurses Association, Association of Clinical Nurse Midwives, and other professional groups as appropriate to increase provider support and collaboration with the registry.

e. With local health departments:

Coordinate and support local health departments with conducting outbreak and investigation of potential cases of Zika virus infections among pregnant women and their infants.

4. Target Populations:

Pregnant women and infants.

b. Evaluation and Performance Measurement:
   ii. CDC Evaluation and Performance Measurement Strategy:

Measurable goals and evaluation criteria for receipt of these funds are as follows:
   a. Number of eligible pregnant women reported to the US Zika Pregnancy Registry
   b. Number of eligible infants reported to the US Zika Pregnancy Registry
   c. Proportion of cases among pregnant women reported to the US Zika Pregnancy Registry with complete follow-up data reported for all timepoints.
   d. Proportion of cases among infants reported to the US Zika Pregnancy Registry with complete follow-up data reported for all timepoints.
   e. Completeness of reporting of variables requested by the US Zika Pregnancy Registry.
## Program Activity Contact Information

Alison Hinckley, PhD (970) 266-3558; Kiersten Kugeler, PhD, (970) 225-4245

## Funding Opportunity Description

### Background

**a. Healthy People 2020:** Not applicable.

**b. Other National Public Health Priorities and Strategies:** Not applicable

### CDC Project Description

#### i. Problem Statement:

Over the last decade, reported Lyme disease (LD) cases have increased substantially in the United States (Bacon et al., 2008). This increase has strained the resources of many state and local health departments. The hardest hit states are in the Northeast and Midwest (Connecticut, Delaware, Maryland, Massachusetts, Minnesota, New Jersey, New York, Pennsylvania, Rhode Island, and Wisconsin) where Lyme disease is considered highly endemic. The growing burden of LD coupled with the growing burden on surveillance resources threatens to compromise the quality of the information obtained, including data needed to guide and evaluate prevention campaigns for LD.

#### ii. Purpose:

This project aims to sustain and enhance surveillance and epidemiological investigations of Lyme disease by state health departments. The priorities of this project are: 1) support for the routine collection and processing of surveillance data, 2) support of educational activities to increase healthcare provider and/or community knowledge, and 3) support for entomologic activities that enhance knowledge of disease risk -- and thereby detection and reporting of cases -- in areas of possible disease expansion.

#### iii. Outcomes:

**Short-term outcomes:**
- Better coordination and distribution of surveillance data to public health partners
- More robust/varied analyses of human, tick, and/or pathogen surveillance data
- More efficient use of surveillance resources and methods, while maintaining quality of surveillance data

**Mid-term outcomes:**
- More data used to inform clinical practice, and program and policy development
- Increased awareness of the public regarding LD risks and prevention
- Increased awareness of providers regarding appropriate action for LD (e.g., diagnosis, treatment, secondary prevention, etc.)

#### iv. Funding Strategy:

Anticipated funding of $960,000 to support up to 16 states (average award of $60,000 per state). Funds are intended for staff and to support activities, hardware, and/or software. States
may request funding for any combination of activities described below; however, priority will be given to activities related to core surveillance functions, followed by educational activities (with required evaluation component), followed by entomologic activities.

For FY 2017, eligible grantees will include those states with an average Lyme disease incidence of at least 10 confirmed cases/100,000 for the previous three reporting years.

If additional funding is available, consideration for eligibility will also be given to states that border the high incidence states, as defined above, or states with special needs.

- Total availability of funds: $960,000
- Approximate number of awards given: 16
- Approximate average per award: $60,000

v. Strategies and Activities:

Applicants may select one or more of the following strategies for which to apply; however, activities listed below the strategies are examples. Applicants should select strategies and implement activities that build and sustain current capacity based on the priorities and public health needs of their jurisdiction and which align to the outcomes defined above.

1) Enhance LD response and reporting (1a)
   a. Designate an epidemiologist or coordinator to be responsible for LD activities
   b. Use standard investigative questionnaires, data sharing tools, and methods
   c. For high incidence states, implement or maintain surveillance methods that estimate case burden and trend; if applicable, validate and communicate results
   d. Advance workforce development and training to sustain and strengthen public health practice for LD

2) Improve LD surveillance to drive public health action (1b)
   a. Develop, refine, or evaluate surveillance capacity (e.g., perform systematic reviews of data quality and completeness) and activities to create a more sustainable and informative LD surveillance system
   b. Analyze, prepare summaries of LD data (e.g., reports, maps, manuscripts, and presentations), and distribute to medical providers, public health partners, policy makers, and the public
   c. Perform entomologic activities (e.g., tick prevalence or infectivity investigations that help to define at-risk areas) in states/jurisdictions where Lyme disease may be emerging.

3) Implement and evaluate public health practice and prevention strategies for LD (1c)
   a. Perform and evaluate educational outreach to healthcare providers (e.g., provider education via webinars to improve LD recognition, diagnosis, test interpretation, reporting, and completeness of reporting), especially in areas of Lyme disease
emergence (Please note: this activity requires an evaluation component to demonstrate effectiveness).

b. Perform and evaluate LD educational outreach to communities, especially in areas of emergence (Please note: this activity requires an evaluation component to demonstrate effectiveness).

1. **Collaborations** –
   a. **With CDC funded programs:**

   Collaborations are optional. CDC recommends collaborating with the Division of Vector-Borne Diseases’ Bacterial Diseases Branch for any community or provider educational activities. CDC has many existing educational resources that may aid the grantee such as a Tick-borne Diseases Handbook for providers and webinars aimed at increasing providers’ knowledge of LD and other TBDs. Many of these resources may be tailored to your state’s specific needs. Tick pathogen testing may also be available upon request to states/jurisdictions with areas of potential *I. scapularis* emergence.

   b. **With organizations external to CDC:**

   You may consider collaborating with other states that are funded by CDC through the ELC grant to address LD and other TBD issues (e.g., regional collaboration, sharing resources).

2. **Target Populations:**

   Not applicable.

   a. **Evaluation and Performance Measurement:**

      i. **CDC Evaluation and Performance Measurement Strategy:**

      **ELC Core Areas 1a and 1b:**

      1) Number of reports (webpage, annual reports) disseminated having summary data (human or entomologic data)

      2) Number of confirmed, probable, and suspect cases collected through traditional case-based surveillance and/or number of estimated cases, if using estimation procedures. For grantees bordering high-incidence states, provide also the number of confirmed, probable, and suspect cases if the previous surveillance case definition were applied to 2017 data.

      3) Number and proportion of counties that include entomologic or ecologic investigations for Lyme disease

      **ELC Core Areas 1c:**

      1) Number of presentations/outreach activities to targeted groups (e.g., physicians, nurses, nurse practitioners, physician assistants, public, etc.) and estimated number of attendees
### Program Activity Contact Information

Elizabeth Gray, MPH (404) 718-4725; Kristen Nichols Heitman, MPH (404) 718-4670; Kiersten Kugeler, PhD (970) 225-4245

### Funding Opportunity Description

#### Background

**a. Healthy People 2020:**
Not applicable.

**b. Other National Public Health Priorities and Strategies:**
Not applicable.

#### CDC Project Description

**i. Problem Statement:**
In the United States, there are ten commonly recognized tick-associated human illnesses: babesiosis, Colorado tick fever, Lyme disease (LD), human granulocytic anaplasmosis (HGA), human ehrlichiosis (HE), Powassan encephalitis, spotted fever rickettsioses including Rocky Mountain spotted fever (RMSF), Southern tick-associated rash illness (STARI), tick-borne relapsing fever (TBRF), and tularemia. Many of these tickborne diseases (TBDs) can cause severe morbidity and even death. Additional public health concern has been raised following: (1) transmission of *Babesia* through blood transfusions; (2) discovery of *R. rickettsii*, the agent of RMSF, in a new tick vector, and; (3) identification of numerous emerging species (e.g., *Babesia duncanii* [formerly WA1-type parasite], *Borrelia miyamotoi*, *Rickettsia parkeri*, *Rickettsia 364D*, and the *Ehrlichia muris*-like agent). At present, seven TBDs are nationally notifiable. Over the last decade, reported cases of these diseases have increased substantially.

**ii. Purpose:**
CDC aims to sustain or enhance surveillance and laboratory capacity of state health departments in order to improve detection and response to public health issues related to TBDs.

**iii. Outcomes:**
- Trained state and local workforce better prepared to respond to emerging TBD threats
- Better coordination and exchange of data through use of more standardized questionnaires and tools
- Better coordination and dissemination of surveillance data to public health partners
- Improved surveillance for TBDs: Increased capacity to measure burden, trends, and to track emergence of (non-Lyme) TBDs, including: babesiosis, *Borrelia miyamotoi* infection, human granulocytic anaplasmosis (HGA), human ehrlichiosis (HE), spotted fever rickettsioses including Rocky Mountain spotted fever (RMSF), Southern tick-associated rash illness (STARI), tick-borne relapsing fever (TBRF), and tularemia
- Improved surveillance data quality (e.g., completeness of clinical and demographic data)
- Improved laboratory capacity to detect emerging TBDs
• More robust/varied analyses of human, tick, and/or pathogen surveillance data
• Increased timeliness of reviewing incoming notifiable disease surveillance data

iv. Funding Strategy:

Funds may be made available for projects that justify substantial need and are likely to lead to important and cost-effective public health benefits. This includes support primarily for personnel, supplies, in-state travel for outreach and education, and contracts, according to need as justified in your application. Please see Project Attachment M1: West Nile virus and other arboviral diseases, for guidance involving Heartland virus, Bourbon virus, Colorado tick fever and Powassan encephalitis.

• Total availability of funds: $400,000
• Approximate number of awards given: 12
• Approximate average per award: $30,000

v. Strategies and Activities:

Applicants may select one or more of the following strategies for which to apply; however, activities listed below the strategies are examples. Applicants should select strategies and implement activities that build and sustain current capacity based on the priorities and public health needs of their jurisdiction and which align with the outcomes defined above.

1) Enhance non-Lyme TBD investigation response and reporting (ELC Core Area 1a)
   a. Designate an epidemiologist, coordinator, etc., to be responsible for non-Lyme TBD activities
   b. Create and implement standard investigative questionnaires, data sharing tools, and methods across your jurisdiction
   c. Support field response for recognized outbreaks
   d. Advance workforce development and training to enhance capacity for TBDs
   e. Measure trends and track emergence of (non-Lyme) TBDs in humans

2) Improve non-Lyme TBD surveillance to drive public health action (ELC Core Area 1b)
   a. Develop, implement, or maintain surveillance systems for TBDs
   b. Analyze data and prepare summaries of data (e.g., reports, manuscripts, and presentations)
   c. Facilitate coordination/exchange of TBD surveillance data with other jurisdictions

3) Implement and evaluate public health practice and prevention and control strategies (ELC Core Area 1c)
   a. Identify, implement, and evaluate validated, high-impact interventions for disease reduction (e.g., provider or community education, tick identification program)

4) Sustain and enhance diagnostic capacity (ELC Core Area 2a)
   a. Improve capacity to detect emerging tickborne pathogens in clinical specimens or ticks related to suspect cases

5) Improve laboratory coordination and outreach/information flow (ELC Core Area 2b)
a. Coordinate connections between epidemiology and laboratory functions at state and local levels (e.g., implementing an integrated software system for enhanced communications)

### 1. Collaborations –
#### a. With CDC funded programs:
Collaborations are optional. CDC recommends collaborating with the Division of Vector-Borne Diseases’ Bacterial Diseases Branch and Rickettsial Zoonoses Branch as well as the Division of Parasitic Diseases and Malaria for any community or provider educational activities. CDC has many existing educational resources that may aid the grantee, such as a Tickborne Diseases Handbook for providers and webinars aimed to increase provider knowledge on LD and other TBDs that may be tailored to your state’s needs.

#### b. With organizations external to CDC:
You may consider collaborating with other states who are funded by CDC through the ELC grant to address LD and other TBD issues (e.g., regional collaboration, sharing resources)

### 2. Target Populations:
Not applicable.

#### a. Evaluation and Performance Measurement:

##### i. CDC Evaluation and Performance Measurement Strategy:

**Tickborne - Non-Lyme Disease Activities 1–5:**
1) Number of activities maintained and increased

**Tickborne - Non-Lyme Disease Activities 1a, 1b, 1c, 2b:**
1) Median number of days from detection to reporting for **confirmed cases** of nationally notifiable TBDs
2) Median number of days from detection to reporting for **probable cases** of nationally notifiable TBDs
3) Number and proportion of cases receiving confirmatory laboratory testing instead of only supportive laboratory evidence
4) Number of informal reports regarding quality and coverage of surveillance data disseminated to public health partners
5) Number of reports (e.g., webpage, annual reports, etc.) disseminated to appropriate stakeholders having summary entomologic data
6) Number and proportion of ELR related to non-Lyme TBDs
7) Number of non-Lyme TBD trainings attended by state and local workforce (e.g., webinars, Clinician Outreach and Communication Activity (COCA) calls, Zoonotic Diseases Working Group calls)

**Tickborne - Non-Lyme Disease Activities 1c, 2a:**
1) Development or maintenance of projects designed to better understand the incidence of TBDs or pathogens in a defined area:
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<tbody>
<tr>
<td>i.</td>
<td>Number and proportion of counties that conduct human surveillance for TBDs (please specify which TBDs)</td>
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<td>ii.</td>
<td>Number and proportion of counties that include entomologic or environmental components as part of investigations into suspected cases of TBD</td>
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</table>
### Program Activity Contact Information
Yvonne Qvarnstrom (404) 718-4123

**Funding Opportunity Description**

#### Background
- **a. Healthy People 2020:** Not applicable
- **b. Other National Public Health Priorities and Strategies:** Not applicable

#### CDC Project Description

**i. Problem Statement:**
Several parasitic infections are transmitted in the United States and can cause serious health problems, including babesiosis, Chagas disease, neurocysticercosis, toxocariasis, toxoplasmosis, and trichomoniasis. *Cyclospora cayetanensis* has caused food-borne outbreaks of diarrheal disease almost every year since the mid-1990s. *Angiostrongylus cantonensis*, present in Hawaii and parts of the southern continental states, can cause eosinophilic meningitis. Many of these infections are treatable but are often not correctly diagnosed in a timely manner. Thus, fast and accurate diagnosis is vital to effective treatment and improved clinical outcome.

**ii. Purpose:**
This project consists of two activities aimed at strengthening the capacity and capability of public health laboratories to respond to sporadic cases as well as outbreaks of parasitic infections.

**Activity 1 focuses on support for the implementation of and training in the use of a variety of diagnostic parasitology tools by public health staff.** Although microscopy remains the gold standard for diagnosis of many parasitic diseases, molecular methods are becoming more commonly used. PCR-based methods can be more sensitive and specific and are sometimes necessary for a species-specific diagnosis, e.g. for babesiosis. Furthermore, multiplex platforms can be helpful to detect cases of parasitic infections that would otherwise be missed. Public health laboratories will be supported to use capacity-building services offered by CDC’s DPDx program, specifically the telediagnosis service, and to send public health laboratory staff to participate in CDC’s hands-on workshops in diagnostic best practices for parasitic diseases. CDC provides support to public health laboratories to continue using or to implement PCR-based or serologic testing for parasitic diseases, preferentially for babesiosis, Chagas disease, neurocysticercosis, toxocariasis, toxoplasmosis, trichomoniasis and angiostrongyliasis.

**Activity 2 focuses on enhancing public health laboratory capacity for outbreak investigations of cyclosporiasis.** The latest trend in molecular methods is the use of next generation/whole genome sequencing that has tremendous power to identify and characterize pathogens in various types of samples. As applications based on these recent technologies become available for parasitology, it is important that the public health laboratories are able to use these tools to improve diagnostic and outbreak investigation capacity. Using these technologies, CDC is
working to enhance public health capacity for cyclosporiasis outbreak investigations by partnering with state public health laboratories to improve capacity for case investigation and laboratory diagnosis.

<table>
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<th>iii. Outcomes:</th>
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<tbody>
<tr>
<td>• A public health laboratory workforce with higher proficiency in identifying parasitic infections.</td>
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<tr>
<td>• Public health laboratories with improved molecular diagnostic capabilities that will enhance capacity for surveillance of parasitic diseases.</td>
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<tr>
<td>• Improved identification of parasites to the species level, which will help to manage cases of infections more efficiently (e.g., accurate identification of <em>T. cruzi</em> in cases of acute infection).</td>
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<tr>
<td>• Improved identification of parasites that are associated with disease and/or foodborne outbreaks (e.g., <em>Angiostrongylus cantonensis</em>, <em>Cyclospora cayetanensis</em>)</td>
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<tr>
<th>iv. Funding Strategy:</th>
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<tbody>
<tr>
<td>1. Funding for implementation and training in use of diagnostic parasitology tools including hands on workshops, telediagnosis, and molecular diagnostic detection of parasites.</td>
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<tr>
<td>• Total availability of funds: $80,000</td>
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<tr>
<td>• Approximate number of awards given: 10</td>
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<td>• Approximate average per award: $8,000</td>
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<tr>
<td>2. Funding for enhanced laboratory investigation of isolated cases and outbreaks of cyclosporiasis (Preference will be given to states that have actively investigated at least one cluster or outbreak of cyclosporiasis cases during the past 3 years.):</td>
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<td>• Total availability of funds: $130,000</td>
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<td>• Approximate number of awards given: 4</td>
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<td>• Approximate average per award: $32,500</td>
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<th>v. Strategies and Activities:</th>
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<tr>
<td><strong>Sustain and enhance laboratory diagnostic capacity (Strategy 2a)</strong></td>
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<tr>
<td>Grantees can apply for either 1 or 2 or both:</td>
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<tr>
<td>1. Implementation and training in use of diagnostic parasitology tools</td>
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<tr>
<td>Grantees must conduct activities addressing at least one of the following:</td>
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<tr>
<td>• Implement or maintain internet-based telediagnosis, which involves exchange of images captured from diagnostic specimens in which confirmation of any parasitic disease is needed.</td>
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<td>• Participate in CDC-sponsored DPDx workshops.</td>
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<tr>
<td>• Implement or maintain molecular and/or serological diagnosis of parasitic diseases that are transmitted in the United States, cause severe disease, and represent a public health burden in the grantee’s jurisdiction, preferentially babesiosis, Chagas disease, neurocysticercosis, toxocariasis, toxoplasmosis, trichomoniasis and angiostrongyliasis.</td>
</tr>
<tr>
<td>2. Enhanced laboratory investigation of cyclosporiasis cases and outbreaks</td>
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Mandatory activities:
- Implement or maintain laboratory capability to detect cyclosporiasis
- Increase the number of *Cyclospora*-positive stool samples that are forwarded to the state public health laboratory for confirmatory diagnosis and subsequent genotyping analysis at CDC or other laboratory with this capacity.

Optional activities:
- Increase laboratory capacity to detect cases of cyclosporiasis by applying more sensitive methods, such as PCR or UV fluorescence microscopy.
- Provide confirmation at the species level (i.e., confirm that cases are caused by *C. cayetanensis*) or sub-species level (i.e., genotyping).
- Enhance public health capacity to investigate and collect stools from suspected cyclosporiasis cases to increase the proportion of cases that are laboratory-confirmed.

1. Collaborations –
   a. With CDC funded programs:
      Not applicable.
   b. With organizations external to CDC:
      Not applicable

2. Target Populations:
   Not applicable

a. Evaluation and Performance Measurement:
   i. CDC Evaluation and Performance Measurement Strategy:

Sustain and enhance laboratory diagnostic capacity
1. Implementation and training in use of diagnostic parasitology tools
   1. Ratio of microscopic O&P exams that are confirmed via telediagnosis consultations (estimations are acceptable).
   2. Number of telediagnosis inquiries received from local labs if the state functions as a regional reference lab.
   3. Description of activities/tests that were introduced or changed as the result of staff participating in DPDx trainings.
   4. List of molecular and/or serological test currently being used to confirm parasitic diseases.

2. Enhanced laboratory investigation of cyclosporiasis cases and outbreaks
Mandatory measurements:
   1. Number of specimens from suspected cases of cyclosporiasis confirmed at the state laboratory.
   2. Number of *Cyclospora*-positive specimens processed or forwarded to other laboratories (including CDC) for sub-species (genotyping) purposes.

3. Optional measurement:
   1. Number of *Cyclospora*-positive specimens detected at the species level by any laboratory within the jurisdiction and by any method, including multiplex platforms such as BioFire.
ATTACHMENT

P1: Influenza Surveillance and Diagnostic Testing

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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</thead>
<tbody>
<tr>
<td>Lynnette Brammer, MPH, 404-639-1303 or Lenee Blanton, MPH, 404-639-1400</td>
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</table>

<table>
<thead>
<tr>
<th>Funding Opportunity Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td>a. <strong>Healthy People 2020:</strong></td>
</tr>
<tr>
<td>Not applicable</td>
</tr>
<tr>
<td>b. <strong>Other National Public Health Priorities and Strategies:</strong></td>
</tr>
<tr>
<td>Not applicable</td>
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<table>
<thead>
<tr>
<th>CDC Project Description</th>
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</thead>
<tbody>
<tr>
<td>i. <strong>Problem Statement:</strong></td>
</tr>
<tr>
<td>Influenza is an acute respiratory disease caused by infection with influenza viruses. Influenza types A and B viruses are responsible for epidemics of respiratory illness that occur almost every winter in temperate climates and are often associated with increased rates of hospitalization and death. Although the highest rates of illness occur among school-aged children, the highest rates of hospitalizations from influenza-related causes occur among infants and pre-school children, persons of any age with certain chronic medical conditions and among those ≥ 65 years of age. The estimated rates of influenza-associated hospitalizations and influenza-related deaths vary substantially from one influenza season to the next, depending, in part, on the characteristics of the circulating influenza virus strains. Therefore, there is a need for CDC and public health partners to implement and maintain a comprehensive plan for detecting, measuring, and reducing the impact of influenza.</td>
</tr>
<tr>
<td>ii. <strong>Purpose:</strong></td>
</tr>
<tr>
<td>The project will fund influenza surveillance and diagnostic testing strategies. CDC wishes to build capacity for the detection, investigation, and reporting of influenza to enable future prevention initiatives. This requires building and strengthening epidemiologic and laboratory health capacity at the state and local level, which the proposed sub-activities should address. These efforts lead to more timely and efficient efforts to improve turnaround time, detection of outbreaks, response to outbreaks, investigation of outbreaks, and implementation of control measures</td>
</tr>
<tr>
<td>iii. <strong>Outcomes:</strong></td>
</tr>
<tr>
<td>• Comprehensive national influenza surveillance</td>
</tr>
<tr>
<td>• Better coordination and exchange of influenza surveillance data among eight components of influenza surveillance <a href="http://www.cdc.gov/flu/weekly/overview.htm">http://www.cdc.gov/flu/weekly/overview.htm</a> across jurisdictions and to CDC</td>
</tr>
<tr>
<td>• Improved completeness and timeliness of reporting of influenza surveillance data</td>
</tr>
<tr>
<td>• Trained laboratory staff proficient in PCR methods for influenza virus detection, typing, and subtyping.</td>
</tr>
<tr>
<td>iv. <strong>Funding Strategy:</strong></td>
</tr>
<tr>
<td>Funds will support a minimum of 0.5 FTE personnel to conduct influenza surveillance and a minimum of 0.5 FTE personnel to conduct influenza diagnostic testing. Both of these positions</td>
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</table>
serve as the CDC point of contact for influenza surveillance and laboratory diagnostics, respectively. If available, awards will support the purchase of laboratory supplies and reagents not provided through the Influenza Reagent Resource (IRR). Since 2016, IRR will not offer the plastics previously available. Activities related to determining and achieving the optimal volume of laboratory testing for surveillance purposes, such as shipping supplies and transport costs, as outlined in the CDC-Association of Public Health Laboratories (APHL) Influenza Virologic Surveillance Right Size Road Map document distributed in June 2013 may be supported if funds are available.

- Total availabilities of funds: $7.55 million
- Approximate number of awards given: 57
- Approximate average per award: $131,573

v. Strategies and Activities:

Proposals do not need to address all of the potential activities listed below; they should be tailored to the specific needs of the applicant program.

1) Enhance outbreak investigation response and reporting (1a)
   a. Identify and maintain an influenza surveillance coordinator
   b. Recruit, retain and encourage timely reporting from ILINet providers
   c. Use standard investigative tools (i.e. influenza-associated pediatric death and novel influenza A case report forms), data sharing tools, and methods
   d. Participate in influenza outbreak investigations and assist local jurisdictions in large, complex outbreaks

2) Improve surveillance to drive public health action (2b)
   a. Develop, implement and maintain the components of the U.S. Influenza Surveillance System
   b. Collect, analyze, and disseminate influenza surveillance data
   c. Advance meaningful public health use of electronic health records, including exploring the availability and utility of existing sources of electronic influenza morbidity (including influenza hospitalization data) and mortality data
   d. Facilitate the improvement of influenza surveillance as recommended by the Council of State and Territorial Epidemiologists (CSTE)

3) Coordinate and collaborate (1d)
   a. Foster general collaboration and relationship building among city, county, state and federal partners and other external partners (e.g. CSTE, APHL)
   b. Coordinate epidemiologic services throughout the state, including developing a collaborating relationship between ELC and FluSurv-Net staff (if applicable)

4) Sustain and enhance laboratory diagnostic capacity (2a)
   a. Utilize modern techniques for diagnosis (i.e. real-time RT-PCR) for typing and subtyping of influenza viruses, including detection of novel influenza viruses, year-round
b. Identify and maintain a laboratorian who is proficient in influenza diagnostic testing (i.e. PCR methods for influenza virus detection, typing, and subtyping)

5) Improve laboratory coordination and outreach/information flow (2b)

a. Maintain weekly reporting of influenza test results from the U.S. World Health Organization (WHO) collaborating laboratories in your jurisdiction
b. Coordinate connections between epidemiology and laboratory functions, at state and local levels
c. Implement and maintain electronic mechanisms for exchange of public health information, including the Public Health Laboratory Interoperability Project (PHLIP) system to transmit specimen-level data to CDC each week
d. Continue to assess your capacity for achieving the guidance and goals within the Right Size Road Map by evaluating and updating your implementation plans for achieving the Right Size objectives.

1. Collaborations –
   a. With CDC funded programs:

   Not applicable

   b. With organizations external to CDC:

   APHL/Influenza Virologic Surveillance Right Size Project

2. Target Populations:

   Not applicable

a. Evaluation and Performance Measurement:

   i. CDC Evaluation and Performance Measurement Strategy:

   Required performance measures for the project period are listed below. Data will be reported to CDC/Influenza Division in a timely manner, as described below, and are used to indicate progress made toward program outcomes.

   1) ILINet recruitment target: One regularly reporting ILINet provider (a provider who reports ≥17 of the 33 weeks from beginning of October to the end of May or ≥26 weeks per year for year-round surveillance) for every 250,000 residents, or for states with smaller populations, a minimum of 10 regularly reporting ILINet providers.

   2) Percentage of weeks that state and territorial epidemiologists submitted a weekly activity code during the influenza season (weeks 40-20). Target >95%

   3) Percent of influenza-associated pediatric death case report forms submitted to CDC within 2 weeks of the death. Target: > 95%

   4) Percent of completed influenza-associated pediatric death case reports with all available information submitted to CDC within 2 months of the death. Target: >95%

   5) Percent of “Human Infection with Novel Influenza A Virus Case Report Form” submitted to CDC within 3 days after laboratory confirmation of a novel influenza A virus infection in a human. Target: >95%
6) Electronically submitted, specimen-level influenza test results received by CDC from the public health laboratory will be submitted within two weeks of the test date (year-round). Target >90%

7) Per specimen submission guidelines, 6 viruses (i.e. 2 influenza A (H1N1)pdm09, 2 influenza A (H3), and 2 influenza B viruses) (if available) will be submitted to the designated National Influenza Surveillance Reference Center every two weeks, year-round. Target: A minimum of 40 specimens over 10 shipments shipped at two week intervals

8) Jurisdictions will identify the appropriate number of influenza positive specimens calculated for each jurisdiction to achieve the Right Size virologic surveillance novel event detection goals. Target: meet the 1/700 goal for at least one week during the peak of influenza season

9) Laboratory staff maintains competency in diagnostic RT-PCR methods for influenza virus detection, typing, and subtyping as per CLIA regulatory requirements.

10) Percentage of influenza A viruses tested by the public health laboratory that are subtyped. Target: >95%

11) Percent of all un-subtypable influenza A viruses (including those samples with CT values <35) shipped to CDC within 24 hours of detection (unless instructed otherwise). Target >90%
ATTACHMENT
P2: Influenza Outbreak Response

Program Activity Contact Information
Lynnette Brammer, MPH, 404-639-1303 or Lenee Blanton, MPH, 404-639-1400

Funding Opportunity Description

Background
a. Healthy People 2020:
Not applicable

b. Other National Public Health Priorities and Strategies:
Not applicable

CDC Project Description

i. Problem Statement:
Human infections with novel influenza A viruses that can be transmitted from person to person may signal the beginning of an influenza pandemic. Rapid detection and reporting of human infections with novel influenza A viruses – viruses against which there is little to no preexisting immunity – will facilitate prompt detection and characterization of influenza A viruses with pandemic potential and accelerate the implementation of effective public health responses.

ii. Purpose:
These key issues underscore the need for CDC and public health partners to develop a comprehensive plan for detecting, measuring, and reducing the impact of novel influenza viruses. The project will fund efforts aimed at enhancing the ability to rapidly respond, identify, contain, and apply preventive measures for the control of any outbreak of novel influenza A virus or other public health emergency related to influenza virus circulation. CDC wishes to increase the capacity for jurisdictions regarding the detection, investigation, and reporting of novel influenza viruses to enable future prevention initiatives. This requires enhancing epidemiologic and laboratory capacity at the state and local level, which the proposed sub-activities should address.

iii. Outcomes:
State and local health departments respond more rapidly and effectively to a large scale influenza outbreak

iv. Funding Strategy:
Awards will support temporary personnel, additional laboratory or office supplies, specimen shipping costs, and any other supplies needed for an effective response to an influenza-related emergency. Funds may be available on the condition of a local or national influenza outbreak. Please request and have a plan for approximately $500,000 per jurisdiction (small jurisdictions may request less while very large jurisdictions may request more). Activities in this section will only be funded should outbreak conditions warrant. Applicants should limit their response to no more than one page.

v. Strategies and Activities:
1) Implement enhanced surveillance activities and outbreak investigation response and reporting (1a)
Depending upon current baseline capacity, conduct specimen collection, shipping, case/contact/control interviews and medical record review, and transmit results to CDC to
enhance the ability to rapidly respond to novel influenza A virus or other public health emergency related to influenza virus circulation.

2) **Enhance laboratory diagnostic capacity (2a)**

Depending upon current baseline capacity, perform testing and transmit results to CDC to enhance the ability to rapidly respond to outbreaks of novel influenza A virus or other public health emergency related to influenza virus circulation.

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<tr>
<th>1. Collaborations –</th>
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<tbody>
<tr>
<td>a. With CDC funded programs:</td>
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<tr>
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<tr>
<td>b. With organizations external to CDC:</td>
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<tr>
<td>Not applicable</td>
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| 2. Target Populations:                    |
|                                          |
|                                          |

| a. Evaluation and Performance Measurement:|
| i. CDC Evaluation and Performance Measurement Strategy: |

Required performance measures for the project period are listed below. Data will be reported to CDC/Influenza Division in a timely manner, as described below, and are used to indicate progress made toward program outcomes.

1) Notification to CDC of a novel influenza A detection within 24 hours. Target >90%.

2) Respiratory specimens from persons associated with the outbreak will be submitted for testing to the state public health laboratory per current CDC/Influenza Division guidelines.

3) Real-time RT-PCR results of submitted respiratory specimens within 24 hours of arrival at the public health laboratory. Target >95%.

4) Submission of “Human Infection with Novel Influenza A Virus Case Report Form” to CDC within 3 days after laboratory confirmation of a novel influenza A virus infection in a human. Target >95%.
Q1: Non-Influenza Respiratory Diseases - Diagnostics, Reporting, and Surveillance

### Program Activity Contact Information

Susan Gerber, MD (404) 639-3002 or Mila Prill (404) 639-8292

### Funding Opportunity Description

#### Background

- **Healthy People 2020:**
  Not applicable.

- **Other National Public Health Priorities and Strategies:**
  Not applicable.

#### CDC Project Description

**i. Problem Statement:**

Non-influenza respiratory viruses of particular public health importance include known respiratory viruses that circulate seasonally and cause a large burden of severe lower respiratory illness, including respiratory syncytial virus (RSV), human metapneumovirus, parainfluenza viruses, rhinoviruses, enteroviruses, coronaviruses, and adenoviruses, as well as re-emergent and novel viruses such as adenovirus type 14, SARS, Enterovirus-D68, and MERS-CoV. Public health response and infection control measures have been critical in mitigating the spread of novel viruses and other viruses during outbreaks. Surveillance for MERS-CoV and other viruses requires ruling out common viral etiologies of severe pneumonia, and not all states currently have the capacity to detect non-influenza respiratory viruses using RT-PCR, a timely and relatively automated diagnostic method. In order to facilitate robust and effective reporting of detected respiratory viruses, national surveillance systems such as the National Respiratory and Enteric Virus Surveillance System (NREVSS), the Public Health Laboratory Interoperability Project (PHLIP), and the National Enterovirus Surveillance System (NESS) need to be further developed, maintained, and modernized and laboratories with adequate testing capabilities must be recruited to participate in these systems. In addition, it is increasingly important to assess mortality and burden of severe illness due to respiratory viruses as RSV vaccine development progresses.

**ii. Purpose:**

This project will strengthen laboratory capacity at the state and local level to identify non-influenza respiratory virus cases including novel viruses. Additionally, streamlining data collection and transfer of test results and epidemiologic data via national surveillance systems will result in more effective surveillance, higher quality data, and substantial time-saving. Working closely with public health partners to better understand seasonal trends of respiratory viruses and the full burden of morbidity and mortality associated with these pathogens is important for outbreak detection, clinical decision-making, and infection control.

**iii. Outcomes:**

- Trained laboratory and public health workforce better prepared to detect and respond to unusual occurrences of respiratory illness associated with non-influenza respiratory viruses
- Better coordination and exchange of laboratory and epidemiologic data related to non-influenza respiratory virus infections between private, local, state, and federal
stakeholders

- Improved surveillance capacity resulting in more rapid detection of emerging respiratory infectious diseases
- Improved completeness and timeliness of reporting laboratory and epidemiologic data to the CDC via national surveillance systems
- More timely and efficient efforts to improve turnaround time, detection, response, and investigation of outbreaks of non-influenza respiratory viral illness

### iv. Funding Strategy:

Funding may support personnel, laboratory or office supplies, specimen storage and shipping costs, and other supplies needed for capacity building and/or an effective response to a situation involving respiratory viruses. Given the year-to-year nature of funding for this component, requests for new FTE hires will not be funded.

- Total availability of funds: $750,000
- Approximate number of awards given: 10-12
- Approximate average per award: $70,000

### v. Strategies and Activities:

Proposals do not need to address all of the potential activities listed below; they should be tailored to the specific needs of the applicant program.

1) **Enhance outbreak investigation response and reporting (1a)**
   - Participate in respiratory illness outbreak investigations and assist local jurisdictions in outbreaks as needed

2) **Improve surveillance to drive public health action (1b)**
   - Strengthen non-influenza respiratory virus surveillance
   - Increase the number of clinical laboratories that report respiratory virus laboratory results to CDC via the National Respiratory and Enteric Virus Surveillance System (NREVSS), either directly or through local and state public health departments.

3) **Coordinate and collaborate (1d), Coordinate and collaborate (1d)**
   - Assist CDC in investigations of deaths associated with RSV among children less than five years of age
   - Collaborate with CDC on a demonstration project to develop new mechanisms to transmit respiratory virus laboratory results and epidemiologic data such as age, relevant dates, location, severity/outcome measures (e.g., hospitalization, ICU admission, death) from clinical laboratories to CDC.

4) **Sustain and enhance laboratory capacity (2a)**
   - Perform PCR testing for non-influenza respiratory viruses in eligible ELC public health state and city laboratories
5) **Improve laboratory coordination and outreach/information flow and maintain and enhance integrated surveillance information (2b, 3c)**

   a. Improve coordination between epidemiology and laboratory functions, at state and local levels
   b. Transmit laboratory information regarding non-influenza respiratory virus testing from public health laboratories to CDC via the Public Health Laboratory Interoperability Project (PHLIP) system

<table>
<thead>
<tr>
<th>1. <strong>Collaborations</strong> –</th>
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<tr>
<td>a. <strong>With CDC funded programs:</strong></td>
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Depending upon the capacity of applicants, collaborations with CDC programs, including NREVSS, NESS, and PHLIP, may be expected.

<table>
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<tr>
<th>b. <strong>With organizations external to CDC:</strong></th>
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Applicants are expected to work with organizations such as local health departments; academic, clinical, and commercial medical facilities and laboratories; and the public health community, as needed to achieve the FOA outcomes.

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<tr>
<th>2. <strong>Target Populations:</strong></th>
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Not applicable.

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<tr>
<th>a. <strong>Evaluation and Performance Measurement:</strong></th>
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<tr>
<td>i. <strong>CDC Evaluation and Performance Measurement Strategy:</strong></td>
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</table>

Grantees should report on the following measures as relevant to funding:

1) **Ability to test for non-influenza respiratory viruses, including respiratory syncytial virus (RSV), human metapneumovirus, parainfluenza viruses, and adenoviruses.** Some states may also have or work to build the capacity to test for coronaviruses, rhinoviruses, and enteroviruses, including EV-D68. Assays should be acceptable to CDC. **Data Source:** *Documentation of having met this goal, including method of validation for each assay, must be obtained from a qualified laboratory and submitted to CDC; Baseline/target: No progress / some progress / great progress / completed.*

2) **Number of specimens associated with respiratory virus surveillance that were received from clinics, hospitals, coroners, local health departments, or other sources.** Target goal- as circumstances warrant and considering criteria such as frequency of testing, capacity for testing, and representativeness of specimens.

3) **Number of specimens associated with respiratory virus surveillance that were tested for non-influenza respiratory viruses.** Target goal- as circumstances warrant and considering criteria such as frequency of testing, capacity for testing, and representativeness of specimens.

4) **Number of aliquots shipped to CDC for additional or confirmatory non-influenza respiratory virus testing if required.**
5) Proportion of respiratory specimens tested by health department labs for a non-influenza respiratory virus whose test results were transmitted to CDC via PHLIP. Target goal >90% transmitted within 48 hours.

6) Proportion of respiratory specimens tested by health department labs for a non-influenza respiratory virus whose test results were transmitted to CDC via PHLIP with accompanying key data, e.g., dates, age, hospitalization (including ICU admission status) and vital status. Target goal >50%.

7) Number of clinical labs whose test results were transmitted to CDC via NREVSS on a weekly basis either directly or on their behalf by a health department, as tracked by the CDC. Target goal of 25% increase in number of participating labs (when feasible, considering maximum enrollment potential).

8) Number of investigations conducted for pediatric RSV-associated deaths in which key clinical and other data are obtained and transmitted to CDC. Target goal >50% of all RSV-associated deaths from 2014 to the present, ideally within 2 months of death.

9) Number of investigations conducted for respiratory outbreaks.

10) The number of respiratory outbreaks with key clinical and other data transmitted to CDC.

11) Regarding the demonstration project, facilitate reports of clinical laboratory and epidemiologic data from clinical laboratories to CDC for individual respiratory specimens with accompanying key data, including age, relevant dates, location, and severity/outcome measures (e.g., hospitalization, ICU admission, death). Target goal of initiating reporting for at least one new institution.
### ATTACHMENT Q

#### Q2: Non-Influenza Respiratory Diseases - Outbreak Response

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Susan Gerber, MD (404) 639-3002 or Mila Prill (404) 639-8292</td>
</tr>
</tbody>
</table>

#### Funding Opportunity Description

**Background**

- a. **Healthy People 2020:**
  
  Not applicable.

- b. **Other National Public Health Priorities and Strategies:**
  
  Not applicable.

**CDC Project Description**

- i. **Problem Statement:**
  
  It is not possible to predict when or where unusual outbreaks of respiratory illness will occur, the scale of an event, or the precise response measures that will be required to mitigate negative public health outcomes. In addition, funding constraints typically make it impossible for jurisdictions to indefinitely maintain adequate levels of surge capacity for some important response activities. For example, in the event of an outbreak of major public health concern jurisdictions may need to quickly strengthen their laboratory capacity to rule out common viral etiologies of severe pneumonia and to identify non-influenza respiratory viruses essential for case finding of respiratory diseases. Resources available to mitigate outbreaks often only become available after the event has become a public health emergency. Due to the unpredictable nature of outbreaks and the lag in resources, jurisdictions need a ready mechanism to provide support for a range of infectious disease threats.

- ii. **Purpose:**
  
  This potential funding would provide additional laboratory, epidemiologic, and/or health information systems surge capacity necessary for an effective response to a respiratory virus-related outbreak.

- iii. **Outcomes:**
  
  State and local health departments will be better able to respond to respiratory virus outbreaks. Response will include more timely and effective efforts for detection, investigation, and implementation of control measures.

- iv. **Funding Strategy:**
  
  Funding may be requested to support (depending on baseline capacity) temporary personnel, additional laboratory or office supplies, specimen shipping costs, and any other supplies needed for an effective response to an outbreak-related emergency. Funds may be available on the condition of a local or national outbreak. Please request and have a plan for approximately $300,000 per jurisdiction (small jurisdictions may request less while very large jurisdictions may request more). **Activities in this section will only be funded should outbreak conditions warrant.** Applicants should limit their response to no more than one page.

- v. **Strategies and Activities:**
  
  1) Enhance outbreak investigation response and reporting (1a)
1. Depending upon current baseline capacity, conduct specimen collection, shipping, case/contact/control interviews and medical record review, and transmit results to CDC to enhance the ability to rapidly respond to outbreaks of respiratory viruses.

2) Improve laboratory coordination and outreach/information flow and maintain and enhance integrated surveillance information (2b, 3c)

a. Depending upon current baseline capacity, enhance the ability of the laboratory/health information system to rapidly respond to outbreaks of respiratory viruses.

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<td>b. With organizations external to CDC:</td>
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</tbody>
</table>

2. Target Populations:

Not applicable.

a. Evaluation and Performance Measurement:

<table>
<thead>
<tr>
<th>i. CDC Evaluation and Performance Measurement Strategy:</th>
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<tbody>
<tr>
<td>• Report describing how resources awarded were used during the outbreak, including activities that were conducted that otherwise would not have been (or were conducted faster/more completely).</td>
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</table>
# Program Name

Surveillance Coordination for National Notifiable Diseases Surveillance System (NNDSS) Vaccine-Preventable Diseases (VPDs) and Enhanced Surveillance for Meningococcal Disease, Varicella, and Acute Flaccid Myelitis (AFM)

## Program Activity Contact Information

Sandra W. Roush (NNDSS VPD Surveillance Coordination), 404-639-8741; Jessica MacNeil (meningococcal disease), 404-639-1194; Adriana Lopez (varicella and acute flaccid myelitis - AFM), 404-639-8369

## Funding Opportunity Description

### Background

#### a. Healthy People 2020:

The Public Health Infrastructure Objectives 11 and 13 include: increase the proportion of Tribal, State, and local public health agencies that provide or assure comprehensive laboratory and surveillance/epidemiology services, respectively, to support essential public health services. [https://www.healthypeople.gov/2020/topics-objectives/topic/public-health-infrastructure/objectives](https://www.healthypeople.gov/2020/topics-objectives/topic/public-health-infrastructure/objectives)

The Immunization and Infectious Diseases 2020 Objectives include: IID-1 Reduce, eliminate, or maintain elimination of cases of vaccine-preventable diseases, IID-3 Reduce meningococcal disease, and IID-4 Reduce invasive pneumococcal infections. [https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives](https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives)

The Immunization and Infectious Diseases 2020 Objectives specifically call for reducing the number of varicella cases among children <17 years of age (IID-1.10), helping maintain 2-dose varicella vaccination coverage levels above 95% among kindergarteners (IID-10.5), and helping increase 2-dose varicella vaccination levels among adolescents aged 13-15 years (IID-11.2). [https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives](https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives)

The Immunization and Infectious Diseases 2020 Objectives also call for reducing the number of meningococcal disease cases by 10% (IID-3). [https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives](https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives)

#### b. Other National Public Health Priorities and Strategies:

The CDC Surveillance Strategy calls for improving the timeliness and availability, as well as the quality and specificity of surveillance data to CDC programs; state, tribal, local, and territorial (STLT) agencies; and other stakeholders. [https://www.cdc.gov/ophss/docs/CDC-Surveillance-Strategy-Final.pdf](https://www.cdc.gov/ophss/docs/CDC-Surveillance-Strategy-Final.pdf)


## CDC Project Description
Problem Statement:

Surveillance activities are critical to detecting vaccine-preventable diseases and gaining information to help control or address a problem. However, complete and accurate reporting of cases is dependent on many factors, such as reporting source, timeliness of investigation, and completeness of data. In addition, various methods for conducting surveillance are used to collect information, depending on disease incidence, specificity of clinical presentation, available laboratory testing, control strategies, public health goals, and stage of vaccination program. Support for NNDSS VPD surveillance coordination, and enhanced surveillance for meningococcal disease, varicella and acute flaccid myelitis (AFM) will help address these problems. Specific challenges within each of the activity areas are described below:

**NNDSS VPD Surveillance Coordination:** NNDSS is in place to support assessment of epidemiologic trends and programmatic impact. However, NNDSS data has known limitations (e.g., missing data for key variables); in addition, those surveillance data have not been sufficient for fully assessing the impact of vaccines. NNDSS data are collected by states/jurisdictions and are electronically transmitted to CDC. Variations in VPD reporting and notification may be due to disease/condition characteristics (e.g., symptoms, incidence, severity); availability of laboratory diagnostics; patient and provider awareness; jurisdiction attributes (e.g., laws, regulations); disease transmission setting; ability to coordinate across epidemiology, laboratory, immunization, and informatics; and/or capacity for electronic data exchange. However, interpretation of incomplete and untimely data for any of these reasons poses challenges for measuring disease burden and vaccine impact. These challenges negatively impact decision making and public health action.

**Meningococcal disease** is a serious bacterial infection that can lead to death or severe long-term sequelae. Serogroups B, C, and Y are the major causes of meningococcal disease in the United States. Meningococcal conjugate vaccines protect against serogroups C and Y and are routinely recommended for adolescents. Serogroup B meningococcal vaccines have also recently been licensed in the United States. With the incidence of disease at historic lows, surveillance and vaccine evaluations through established systems is challenging. High quality surveillance data and collection of circulating isolates from a broad and representative population are key for following disease trends, making vaccine policy recommendations, and monitoring vaccine impact. Recent outbreaks among special populations (college students, homeless, MSM) reinforces the need for particular emphasis on high quality and complete surveillance.

**Varicella** was added to the list of notifiable conditions in 2003 and is reportable in 40 states as of 2014. In 2007, routine two-dose varicella vaccination was recommended for children, primarily in response to outbreaks of varicella in populations with high 1-dose coverage. Data from the first 5 years of the two-dose varicella vaccination program have demonstrated reductions in the number and size of outbreaks. Varicella outbreak surveillance supports assessment of vaccine impact and informs public health interventions. Case-based surveillance is the only data source currently available to monitor trends in varicella incidence. Improving varicella surveillance by increasing reporting completeness for varicella-specific clinical and epidemiologic variables of reported cases, including severe cases (e.g., hospitalizations), will allow monitoring for impact of the 2-dose varicella vaccine program and for changing varicella epidemiology.
**Acute Flaccid Myelitis (AFM)** is characterized by focal limb weakness and abnormalities of the spinal cord gray matter on MRI. Acute Flaccid Paralysis (AFP) has numerous etiologies including poliomyelitis and can prove diagnostically challenging. Anterior horn cell disease or AFM is a subset of AFP and is caused by poliovirus, West Nile virus, and rarely other viruses including non-polio enteroviruses. Since the widespread implementation of polio vaccination worldwide, the subset of patients suffering from AFP with anterior flaccid myelitis is markedly smaller than the population of patients suffering from other forms of AFP. AFP is not a nationally notifiable syndrome, but may be reportable within specific jurisdictions. Ensuring that imported and indigenously acquired poliomyelitis cases are detected in the U.S. and interpreting any apparent increase in reports of AFM has been challenging in the absence of baseline incidence of AFP with anterior myelitis (https://www.ncbi.nlm.nih.gov/pubmed/27318332).

**ii. Purpose:**

The purpose for providing resources for NNDSS VPD Surveillance Coordination is to support and strengthen VPD outbreak and case-based surveillance, allowing jurisdiction public health agencies to effectively meet the demands for timely and population-specific surveillance information that supports evaluation of vaccine impact and informs prevention guidelines. This cooperative agreement will build on the foundation of established surveillance systems such as NNDSS to provide broader and more representative data for nationally notifiable diseases. This cooperative agreement will also focus specifically on enhancing surveillance for meningococcal and varicella disease and on supporting/establishing surveillance for acute flaccid myelitis (AFM) in special populations — to increase representativeness of cases and testing and to improve data on impact of current and newly licensed vaccines.

Through the cooperative agreement, awardees will support the ELC core areas and strategies, which include:

1) **Strengthen Surveillance/Epidemiologic Capacity**
   - Strategy 1a. Enhance investigation, response, and reporting for VPDs
   - Strategy 1b. Improve surveillance to drive public health action
   - Strategy 1c. Implement and evaluate epidemiologic public health practice, prevention, and control strategies
   - Strategy 1d. Improve coordination and collaboration for VPD surveillance and laboratory activities

2) **Enhance Laboratory Capacity**
   - Strategy 2a. Sustain and enhance laboratory diagnostic capacity for VPDs
   - Strategy 2b. Improve laboratory coordination and outreach/information flow

3) **Improve Health Information Systems**
   - Strategy 3c. Sustain and enhance integrated surveillance information systems

**iii. Outcomes:**

**Outcomes for Required (Tier 1) Activities (NNDSS VPD Surveillance Coordination, Meningococcal Disease, Varicella, and AFM):**

- Improved coordination and exchange of surveillance data across jurisdictions’ programs and partners
- Improved educational awareness to health care providers and other public health partners
- Improved linkages between epidemiology, immunization, and laboratory partners to support surveillance-related activities and resources
• Improved surveillance data quality (e.g., completeness of vaccine history and importation)
• Improved timeliness of:
  o surveillance data assessments and use to inform public health practice
  o reporting to NNDSS and associated surveillance systems
  o detection, investigation and response to cases, outbreaks, and deaths
  o laboratory testing as appropriate for investigation and control
  o response to and implementation of control measures for outbreaks
  o enhancement of standardization and usability of surveillance information systems for jurisdiction and CDC

**Outcomes for Optional (Tier 2) Activities:**

**Varicella:**
• Improved completeness of data collected for severe cases of varicella

**Pertussis:**
• Enhanced monitoring for molecular changes in pertussis through submission of isolates to CDC
• More complete and timely surveillance data for key variables reported to CDC through NNDSS to monitor the incidence and epidemiology of pertussis (e.g., vaccination history, clinical presentation, laboratory results)
• Increased notification of suspected pertussis-related deaths

*Haemophilus influenzae:*
• More complete and timely surveillance data for key variables to monitor the incidence and epidemiology of *H. influenzae*, with particular focus on children < 5 years of age
• Availability of isolates sent to CDC for *H. influenzae* serotyping

**Invasive Pneumococcal Disease (IPD):**
• More complete and timely surveillance data for key variables to monitor the incidence and epidemiology of invasive pneumococcal disease (IPD)
• Enhanced serotype monitoring of changes in IPD through testing of additional sterile site isolates

**Measles:**
• Surveillance data used to identify subpopulations at risk for measles
• Development of interventions to prevent measles in subpopulations at increased risk

**Mumps:**
• Surveillance data used to identify and evaluate risk factors that may be responsible for increasing mumps cases and outbreaks
• Enhanced characterization of mumps cases in the setting of high 2-dose vaccination coverage through the collection of more complete clinical and laboratory data
• Improved completeness of data collected for large mumps outbreaks (20 cases or more)

**Other Vaccine Preventable Diseases:**
- Outcomes for other VPDs should be defined in collaboration with CDC programs and should be based on the current epidemiologic situation, in order to improve surveillance and public health response.

### iv. Funding Strategy:

Funds should be used for personnel (e.g. multi-purpose VPD Surveillance Coordinator, varicella epidemiologist), laboratory supplies, and shipping of isolates.

- Total estimated availability of funds: $6.4 million
- Approximate number of awards: 52
- Approximate average per award: $100,000

Funds to support laboratory and shipping costs to CDC, especially for meningococcal isolates, are not to exceed ~$5,000 per site.

The total funded amount per site is expected to fund approximately one full-time person, with the understanding that if there is already a specified VPD Surveillance Coordinator in the jurisdiction, this funding does not need to be used to support that specific person.

### v. Strategies and Activities:

Applicants must address the four REQUIRED (tier 1) activity areas for this cooperative agreement:

1. Coordinate NNDSS surveillance for selected VPDs, including, but not limited to measles, mumps, rubella, congenital rubella syndrome, varicella, pertussis, *H. influenzae*, meningococcal disease, tetanus, diphtheria, invasive pneumococcal disease, paralytic poliomyelitis, and non-paralytic poliovirus infection
2. Enhance surveillance for meningococcal disease
3. Enhance surveillance for varicella
4. Support/establish surveillance for acute flaccid myelitis

#### 1) FOR NNDSS VPD SURVEILLANCE COORDINATION:

- **Strengthen Surveillance/Epidemiologic Capacity (Strategies 1a, 1b, 1c, 1d – see “purpose” section above)**
  - Establish a VPD surveillance coordinator position that will:
    - serve as a point of contact for selected VPDs for which surveillance is conducted through NNDSS or the ELC R1 FOA, including, but not limited to measles, mumps, rubella, congenital rubella syndrome, varicella, pertussis, *H. influenzae*, meningococcal disease, tetanus, diphtheria, invasive pneumococcal disease, paralytic poliomyelitis, non-paralytic poliovirus infection, and acute flaccid myelitis (understanding that these activities may or may not be a duty of the VPD Surveillance Coordinator) (1a);
    - ensure the use of standard investigative questionnaires, data sharing tools, and methods (1a);
    - lead/assist in the timely investigations of cases, clusters, and outbreaks (1a);
    - engage in ongoing evaluation of ELC R1 FOA program activities (1a).
  - Develop, implement, and maintain surveillance systems (1b).
  - Conduct regular assessment of surveillance data through:
    - review of Surveillance Indicator reports biannually (provisional and final) (1b) and
• Review of surveillance data regularly (e.g. quarterly) to identify areas for improvement (e.g. electronic, programmatic) (1b).
  o Evaluate and enhance surveillance systems based on CDC guidelines (1b).
  o Develop and advance policies for the prevention, detection, and control of VPDs (1c).
  o Participate in evaluations related to vaccination programs (1c).
  o Foster collaboration among city, county, state and federal partners, and other external partners (1d).
  o Support and integrate epidemiology, laboratory, immunization, and health information activities (1d).

• Enhance Laboratory Capacity (Strategies 2a, 2b – see “purpose” section above)
  o Support maintenance of culture, serotyping/serogrouping, and other modern, pathogen-specific diagnostic and surveillance testing capacities within state public health laboratories, and/or available through regional reference centers and/or CDC laboratories (2a).
  o Implement a plan for flexible use and acquisition of laboratory supplies and testing that addresses changing/multi-disease purposes and needs (2a).
  o Ensure linkage of laboratory specimens with available epidemiologic and clinical case-patient data (2a).
  o Coordinate activities to increase access to isolates so that test results can be linked to surveillance activities and data (2b).

• Improve Health Information Systems (Strategy 3c – see “purpose” section above)
  o Support coordination of VPD surveillance with surveillance information systems (e.g. NNDSS, Immunization Information Systems, ELR, HL7 messages) to enhance use and exchange of electronic data files (3c).

2) FOR MENINGOCOCCAL DISEASE:
• Strengthen Surveillance/Epidemiologic Capacity (Strategies 1a, 1b, 1d – see “purpose” section above)
  o Maintain existing surveillance systems (1a).
  o Collect case data on key variables (e.g. serogroup, outcome, vaccination status, outbreak/cluster related, MSM, HIV status, college student, homelessness) (1a).
  o Collect isolates from cases of meningococcal disease for serogroup confirmation (1a).
  o Report data to CDC on key variables (e.g. serogroup, outcome, vaccination status, outbreak/cluster related, MSM, college student) for all confirmed and probable cases (1b).
  o Assure serogroup determination for all cases (1b).
  o Facilitate coordination/exchange of surveillance data with CDC (1b).
  o Ship isolates from all cases of meningococcal disease to CDC for molecular characterization (1b).
  o Integrate vaccine-preventable disease epidemiologist and the immunization program to facilitate access to immunization information systems for assessing meningococcal vaccination status for cases (1d).
  o Eligible sites will participate in case-control evaluation of serogroup B meningococcal (MenB) vaccine effectiveness among adolescents and young adults (1d).
• **Enhance Laboratory Capacity (Strategies 2a, 2b – see “purpose” section above)**
  o Collect isolates from cases of meningococcal disease for serogrouping and additional molecular classification (2a).
  o Ensure routine transportation of clinical isolates to state public health (or other) lab (2b).
  o Ship isolates from cases of meningococcal disease to CDC for molecular characterization (2b).

3) **FOR VARICELLA:**

• **Strengthen Surveillance/Epidemiologic Capacity (Strategies 1a, 1b, 1d – see “purpose” section above)**
  o Disseminate information to reporting sources to notify state/local health departments about the occurrence of varicella outbreaks (1a).
  o Ensure potential reporting sources are informed of the importance of completing the key variables for varicella case-based surveillance (1a).
  o Follow varicella outbreak reporting processes in place in each site to inform state/local health departments of varicella outbreaks. For jurisdictions where varicella is not a reportable condition but outbreaks of all etiologies are reportable, processes should be put into place to facilitate reporting of varicella outbreaks (1b).
  o Facilitate coordination/exchange of surveillance data with CDC (1b).
  o Provide quarterly reports to CDC on the number of varicella outbreaks reported to the jurisdiction, dates of outbreaks, outbreak setting (school [specific type: day care, elementary, middle, or high school], prison, group housing); the number of cases in each outbreak; and the age group of outbreak-associated cases. If feasible, provide additional information including: vaccination status of outbreak-associated cases; severity of varicella disease (categorized by the estimated number of lesions) for outbreak-associated cases; and whether any outbreak-associated cases were laboratory confirmed (1b).
  o In jurisdictions where varicella is a reportable condition and varicella case-based surveillance is in progress:
    ▪ develop processes to improve completeness of varicella-specific data collected for reported cases (e.g., check state registry for vaccination information for cases with missing data; check state databases for varicella-related hospitalizations; follow-up with providers and/or parents regarding clinical presentation) (1b).
    ▪ maintain established reporting processes for reporting case-based varicella data to CDC (1b).
    ▪ provide, at the start of the project period, a report to CDC listing the varicella-related variables collected and the completeness of reporting for those variables in the previous year (1b).
    ▪ provide updated reports annually to CDC on the variables collected and the completeness of reporting for those variables (1b).
  o Foster collaboration among schools, providers, and county/local/state health departments to improve varicella outbreak and case-based reporting (1d).
Foster collaboration between vaccine-preventable disease epidemiology activities and the immunization program to facilitate access to immunization information systems for assessing varicella vaccination status of varicella cases, including cases associated with outbreaks in schools/daycares (1d).

4) FOR ACUTE FLACCID MYELITIS:

- **Strengthen Surveillance/Epidemiologic Capacity (Strategies 1a, 1b – see “purpose” section above)**
  - Ensure that infectious disease specialists, intensive care physicians, pediatricians, neurologists, radiologists/neuroradiologists, infection preventionists, primary care providers, emergency departments, and microbiology laboratories are provided AFM-related clinical, epidemiologic, and laboratory (e.g., early collection of 2 stool specimens at least 24 hours apart to rule out poliovirus infection) information to educate and increase awareness for AFM (1a).
  - In jurisdictions where AFM is a reportable condition, encourage clinicians to report cases of AFM that meet the case definition to their local/state health department and to collect specimens from cases as early in the course of illness as possible (https://www.cdc.gov/acute-flaccid-myelitis/hcp/data.html) (1b).
  - In jurisdictions where AFM is a reportable condition, emphasize to clinicians the importance of collecting 2 stool specimens at least 24 hours apart and as early in the course of illness as possible to rule out poliovirus infection (1b).
  - In jurisdictions where AFM cases are reported to the local/state health department and specimens are submitted, notify/report to CDC the cases of AFM that meet the case definition and submit specimens for those cases (https://www.cdc.gov/acute-flaccid-myelitis/hcp/specimens.html) (1b).

- **Enhance Laboratory Capacity (Strategy 3c – see “purpose” section above)**
  - In jurisdictions where AFM cases are reported to the local/state health department and specimens are submitted, provide awareness of access to laboratory testing of stool, respiratory, serum and whole blood, and cerebrospinal fluid specimens for poliovirus, non-polio enteroviruses, West Nile virus, and other known infectious etiologies, to support surveillance (https://www.cdc.gov/acute-flaccid-myelitis/hcp/specimens.html) (2a).

OPTIONAL (tier 2) strategies/activities:
In addition to the required outcomes and strategies/activities listed above, applicants may select one or more additional pathogen-specific strategies/activities from those listed below. Applicants may select optional (tier 2) activities that a) expand and enhance current surveillance infrastructure based on the priorities and public health needs of their jurisdiction, and b) will make progress toward the outcomes defined from the logic model overview.

**Varicella:**
- Improve completeness of data collected for severe cases of varicella (hospitalizations), including reason for hospitalization and clinical presentation, in sites where varicella is reportable and case-based surveillance is conducted (1a, 1b)
- Report hospitalization data to CDC annually (1b)
Pertussis:
- Collect isolates of *Bordetella pertussis*, when available, and periodically ship to CDC for further laboratory characterization (2a, 2b) *NOTE: collection of isolates is a required component of the optional pertussis activity*
- Collect complete information on clinical course of infection, vaccination history (DTP/DTaP and Tdap), maternal Tdap history for infant cases aged <1 year, laboratory testing, and other epidemiologic information of interest (1a, 1b)
- Utilize state immunization registries to obtain/verify pertussis vaccination history (3c)
- Notify CDC of suspected pertussis-related deaths via e-mail for non-reportable cases or NNDSS for cases meeting the case definition for nationally notifiable conditions (1a, 1b)

*Haemophilus influenzae:*
- Maintain existing surveillance systems (1a, 1b)
- Collect data on key variables (e.g. serotype, outcome, etc.) for cases of *H. influenzae* (1a, 1b)
- Collect isolates from cases of *H. influenzae* for serotype confirmation (2a, 2b)

Invasive Pneumococcal Disease (IPD):
- If not already reportable, state-based ELC sites are encouraged to take necessary steps to make invasive pneumococcal disease among children <5 years old reportable as soon as possible (1b, 1c)
- Sites should identify all clinical microbiology laboratories capable of isolating *S. pneumoniae* within their jurisdictions (2a, 2b)
- Sites should put into place mechanisms to collect key variables from all cases among children <5 years of age. These include, at a minimum, age, race, ethnicity, census tract of residence, and vaccination status, including dates of administration of all doses of 13-valent pneumococcal conjugate vaccine. Note that doses of pneumococcal conjugate vaccine administered before April 1, 2010, represent 7-valent pneumococcal conjugate vaccine (1a, 1b)
- Sites should put into place mechanisms to collect sterile-site isolates of *S. pneumoniae* from children <5 years old and submit those isolates for serotyping to qualified APHL laboratories (e.g., Minnesota Department of Health, Wisconsin Department of Health) (2a, 2b)
- Sites should describe ways in which the completeness of case ascertainment could be evaluated, if not in the first year, then in one or more subsequent years (1b, 1c)
- Sites may also elect to put into place similar mechanisms (i.e., make reportable, identify laboratories, collect isolates, ascertain completeness) for surveillance of invasive pneumococcal disease among adults ≥65 years (1b, 1c)

Measles:
- Use local vaccine data (e.g., registries, not national surveys) to identify and describe populations/communities/cohorts that are potentially at risk for measles outbreaks (1b, 1c)
- Describe specific community data (i.e., specific ethnic groups, specific religious sub-groups, other vaccine objector/hesitancy subgroups, in specific in specific geographic clusters, that would place individuals and population at risk for measles (1a, 1b)
- Develop and apply risk modeling to dissimilar specific situations to 1) assess the potential impact of a measles outbreak in specific communities, 2) help advocate for situation specific interventions, and 3) measure impact of those interventions (1c)

**Mumps:**
- Review current mumps data (e.g. vaccination history, symptoms and complications, laboratory information, transmission and source data), characterize high risk groups, and further define risk factors for infection and modes of transmission (1b)
- Collect clinical data (e.g. symptoms, complications, incubation period) and ensure lab testing and reporting of lab results (1d)
- Provide information on large outbreaks (>20 cases) to CDC and establish mumps outbreak resources (1a, 1b, 1c)

**Other Vaccine Preventable Diseases:**
- Activities for other VPDs should be defined in collaboration with CDC programs and should be based on the current epidemiologic situation, in order to improve surveillance and public health response.

<table>
<thead>
<tr>
<th>1. Collaborations</th>
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<tbody>
<tr>
<td>a. With CDC funded programs:</td>
</tr>
<tr>
<td>Collaboration with ELC, laboratory, and Immunization programs (including Immunization Program Manager) is required.</td>
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<tr>
<td>b. With organizations external to CDC:</td>
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<td>N/A</td>
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<th>2. Target Populations:</th>
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<tbody>
<tr>
<td>For Meningococcal Disease: Monitoring individual cases of meningococcal disease in all ages is important to track progress of the vaccination program. See additional guidance in the Manual for Surveillance of Vaccine-Preventable Diseases <a href="http://www.cdc.gov/vaccines/pubs/surv-manual/chpt08-mening.html">http://www.cdc.gov/vaccines/pubs/surv-manual/chpt08-mening.html</a>.</td>
</tr>
<tr>
<td>For Acute Flaccid Myelitis: Focus should be on patients with acute onset of focal limb weakness, and an MRI showing a spinal cord lesion largely restricted to gray matter. Although AFM has been more commonly reported in children, monitoring reports of cases in all ages will be important for understanding the full spectrum of illness. See additional guidance on the CDC AFM website <a href="https://www.cdc.gov/acute-flaccid-myelitis/hcp/case-definition.html">https://www.cdc.gov/acute-flaccid-myelitis/hcp/case-definition.html</a>.</td>
</tr>
<tr>
<td>i. CDC Evaluation and Performance Measurement Strategy:</td>
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Required performance measures for the cooperative agreement are listed below. NNDSS surveillance data will be submitted electronically to CDC weekly as specified by CSTE and performance measures listed below will be analyzed twice a year, with provisional and then final data. The performance measures listed below will be used to indicate progress toward the specific cooperative agreement outcomes. See footnote below for which measures will supplied to jurisdictions by CDC and which ones will be reported on during the annual ELC application process.

1) For NNDSS VPD Surveillance Coordination:
   • Proportion of cases with complete information on key surveillance variables (surveillance indicators)*
   • Timeliness of reporting of key surveillance variables to CDC*
   • Percentage of reports of selected reportable diseases for which initial public health control measure(s) were initiated within appropriate timeframe (reported through PHEP 13.2)
     o measles (confirmed)
     o meningococcal disease (*N. meningitidis*) (confirmed)
     o pertussis (if applicable)
   • Surveillance assessments:
     o review of Surveillance Indicator Reports twice per year (provisional, final)
       ▪ brief summary on how review of Surveillance Indicator Reports and regular (e.g., quarterly) surveillance data were utilized to improve and/or make changes to current processes in order to improve the quality of surveillance data
   • Use of HL7 messaging to enhance standardization and usability by jurisdiction and CDC

2) For Meningococcal Disease:
   • Proportion of cases with complete information on key surveillance variables (serogroup, vaccination status, outcome, college, MSM, homelessness, etc.); Target: 100%**
   • Proportion of cases with complete information on HIV status; Target: ≥ 50% **
   • Timeliness of reporting of key surveillance variables to CDC*
   • Proportion of meningococcal cases with serogroup reported to CDC*
   • Proportion of meningococcal disease cases with isolates submitted to CDC
   • Timeliness of shipment of isolates to CDC

3) For Varicella:
   • Number of outbreak-associated cases; age distribution and vaccination status of outbreak-associated cases provided to CDC on a quarterly basis
   • For sites where varicella is a reportable condition and case-based varicella surveillance is conducted, number of case reports with complete varicella-specific data as specified by CDC*

4) For Acute Flaccid Myelitis:
   • Jurisdiction reports that AFM education is in place
   • Number of AFM cases investigated
   • Number of AFM cases confirmed
   • Number of AFM cases ruled out

*These data will be provided to jurisdictions via the Surveillance Indicators
**These data will be provided to jurisdictions via meningococcal feedback report
Performance measures for the optional project(s) selected by the awardee should be defined in collaboration with CDC. The surveillance data should be analyzed regularly (e.g., quarterly), with Surveillance Indicator Reports assessed twice a year (provisional and final data). The performance measures will be used to indicate progress toward the specific cooperative agreement outcomes.
# ATTACHMENT
## S: Enhanced Prion Surveillance

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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<tr>
<td>Lawrence Schonberger, MD, Coordinator, 404-639-4435; Teresa Hammett 404-639-4389</td>
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## Funding Opportunity Description

### Background

- **a. Healthy People 2020:** Not applicable

- **b. Other National Public Health Priorities and Strategies:** Not applicable

### CDC Project Description

#### i. Problem Statement:

Prion diseases, or transmissible spongiform encephalopathies (TSEs), are a family of rare progressive neurodegenerative disorders that affect both humans and animals. These diseases are characterized by unusually long incubation periods often measured in years. They are 100% fatal and are caused by unconventional transmissible agents that are highly resistant to usual inactivation methods. Human prion diseases include classic forms of Creutzfeldt-Jakob Disease (CJD), the types most commonly occurring throughout the world, including the United States, and variant Creutzfeldt-Jakob Disease (vCJD), a type of human prion disease that emerged in the United Kingdom in the mid-1990s associated with eating meat products contaminated with the agent of BSE. Prion disease surveillance in the United Kingdom enabled recognition of the emergence of vCJD. Prion disease surveillance in the United States is similarly enabling the monitoring for the emergence of vCJD and other potentially preventable new prion diseases (iatrogenic CJD and possible human CWD) in this country as well as enabling the assessment of the efficacy of ongoing US prevention measures. Many clinicians and public health personnel have little experience dealing with prion diseases; funding of surveillance personnel at state health departments helps these departments to work more closely with CDC in developing and disseminating knowledge about prion diseases and enhancing prion disease surveillance.

#### ii. Purpose:

Human prion disease surveillance serves to provide a better understanding of this illness and the prions that appear to cause it. This purpose of this project is to maintain and enhance surveillance for Creutzfeldt-Jakob Disease (CJD) and the possible emergence of new variant forms of CJD, including possible human chronic wasting disease (CWD). Human prion surveillance is necessary for the early detection of any new prion disease as well as for monitoring the occurrence of previously described rare classic forms of prion disease attributable to medical procedures. A sensitive human prion disease surveillance system can also help to determine whether efforts and expenditures made to reduce and minimize exposures are adequate. For prion diseases, particularly for recognition of new human prion diseases, brain autopsies constitute the “gold standard” for confirmation of diagnoses. Hence, CDC currently pays the NPDPSC to provide to US clinicians and US public health surveillance personnel access to, free-of-charge, state-of-the-art prion disease diagnostic autopsy services.

#### iii. Outcomes:

- Complete investigations for suspected and clinically diagnosed cases of prion disease.
• Effective coordination and exchange of information and data between state health departments and the National Prion Disease Pathology Surveillance Center

• Effective collaborations between pathologists, neurologists, funeral and mortuary directors, and other appropriate professionals within the state dealing with persons diagnosed with human prion disease and provision of education about CJD surveillance and the role of state health departments, CDC and the National Prion Disease Pathology Surveillance Center.

• Expanded awareness of prion disease among stakeholders mentioned above.

• Complete and timely reporting of suspected CJD cases to the state department of health and subsequently to CDC through bi-annual line list of cases.

• Timely reporting to CDC cases of CJD in persons less than 55 years of age and cases for which an unusual transmission circumstance may exist.

• Timely follow-up investigations of suspected CJD cases reported to the state department of health especially for high priority investigations (cases in persons less than 55 years of age, suspected unusual transmission circumstances, cases in hunters of cervids or in consumers of venison from free ranging deer, unusual clinical presentation, etc.)

• Wisconsin only: Effective coordination and exchange of information and data between the state Department of Health and state Department of Natural Resources

iv. Funding Strategy:

• Total availability of funds: $402,000 (level funding)
• Approximate number of awards given: 6
• Approximate average award: $67,000 to be used for example for personnel, travel, supplies, equipment or contractual support for proposed activities.

v. Strategies and Activities:

1. Maintain surveillance to drive public health action (1b)
   a. Maintain regular contact with the National Prion Disease Pathology Surveillance Center at Case Western Reserve University which would include at least twice yearly phone or email contact.
   b. Work collaboratively with pathologists, neurologists, funeral and mortuary directors, and other appropriate professionals within the state including performing autopsies on suspect cases; ensure that these professionals are aware of the state’s prion disease surveillance system as well as the prion disease-related resources available to support them at the National Prion Disease Pathology Surveillance Center, the state health department and the CJD Foundation.
   c. Develop relationships with the CJD Foundation or comparable patient groups to enhance collaborative work with hospitals and other care facilities to educate family members and medical personnel about the importance of of prion diseases surveillance and confirming suspected cases of CJD.
d. Work collaboratively with CDC and other sites funded for enhanced surveillance of CJD and other prion diseases

e. Collect, analyze, and disseminate data (e.g., reports, manuscripts, and presentations)

f. Cross check differential data sources and identify all diagnosed CJD cases in the project area by accessing the Department of Vital Statistics’ death certificate-derived data from any death certificate on which one of the following codes or terms appears anywhere on the death certificate:
   i. ICD-9 046.1 for deaths before 1999
   ii. ICD-10 A81.0 for deaths from 1999 to the present.
   iii. 'jakob', 'jacob ', 'creutz', 'crutz', 'critzfield', 'cjd', 'spongiform', 'spongioform', 'spongeform', 'sponaiform', 'tse', 'prion
   iv. 'gss', 'gerstman', 'gertsman', 'straussler', 'strausler', 'scheinker', 'ffi', 'familial insomnia', 'familial fatal insomnia'

g. Track and report data to CDC

2. Implement and evaluate epidemiologic public health practice, and prevention and control strategies (1c)
   a. Obtain scientific data to support development of evidence based and cost-effective policies
   b. Develop and advance policies regarding prevention, detection, and control of CJD
   c. Increase the number of autopsies performed on suspected and clinically diagnosed cases of prion disease
   d. Wisconsin only: Work collaboratively with the Department of Natural Resources to conduct chronic wasting disease related education and other activities aimed at persons who hunt within the state and those who consume venison provided by hunters

1. Collaborations –
   a. With CDC funded programs:

      Not applicable

   b. With organizations external to CDC:

      1. National Prion Disease Pathology Surveillance Center
      2. CJD Foundation
      3. Westat
      4. Wisconsin only: Effective coordination and exchange of information and data between the state Department of Health and state Department of Natural Resources

2. Target Populations:

   Clinicians who see suspected and diagnosed cases of human prion disease, infection control personnel in hospitals, others in the community who work with patients suspected of having or been diagnosed with a human prion disease and their families.

   a. Evaluation and Performance Measurement:

      i. CDC Evaluation and Performance Measurement Strategy:

      1. Number of investigations conducted based on information received via surveillance systems.
2. Number and percent of suspected and clinically diagnosed cases of prion diseases for which biopsy or autopsy was conducted.

3. Number of suspected or confirmed case of CJD in a person less than 55 years of age as well as any case of suspected or confirmed CJD that may be the result of iatrogenic transmission reported to CDC within two weeks of the report to the state department of health.

4. Number of pertinent portions of the medical record submitted to CDC for each person less than 55 years of age who is suspected of having or is diagnosed with CJD. Pertinent sections of the medical record includes the admission summary, discharge summary, EEG reports, MRI reports, neurology consultation notes, psychiatry consultation notes, pathology reports from a biopsy, and pathology reports from autopsy.

5. Number of educational sessions provided to pathologists, neurologists, funeral and mortuary directors, and other appropriate professionals within the state to maximize knowledge and reporting of suspected and diagnosed cases of CJD.

6. Number of communications with the CJD Foundation or comparable patient groups, hospitals and funeral homes to educate family members, medical care personnel and funeral home staff about prion diseases.

7. Submission of semi-annual line lists reports of all persons with a suspected or confirmed diagnosis of CJD, indicating which reports your project area accepts as a case (i.e., definitive, probable, possible, neurologist diagnosed) and for those cases, include the following information in the line list: a) Year of death, b) State of residence, c) Sex, d) Age, e) Date of birth, f) CJD Status, g) Was the case diagnosed by a neurologist?, h) Is the case still under investigation and if yes, please explain, i) Was CJD noted on the death certificate?, j) Was an Autopsy performed?, k) Was a Biopsy performed?, l) Were specimens sent to NPDPSC?, m) Were specimens sent to another laboratory?, n) Were clinical data for cases < 55 years of age sent to CDC?, o) Was the CJD Surveillance Report Form completed for cases < 55 years of age?

8. Number of cases of CJD identified through at least annual review of death certificate-data or other data sources; the number of newly identified cases found by this review; when review of death certificates are conducted, the number of cases identified through surveillance that did not indicate CJD on the death certificate; and where possible, for those cases where CJD was not indicted on the death certificate, what was listed as the cause and underlying cause of death.

9. Wisconsin only: Number of meetings with the Department of Natural Resources to conduct CWD related education and other activities aimed at persons who hunt within the state and those who consume venison provided by these hunters.
ATTACHMENT
T: Binational Border Infectious Disease Surveillance (BIDS) Program

Program Activity Contact Information
Alba Phippard, BIDS Program Manager, (619) 206-0461
Pamela Nonnenmacher, DGMQ Coordinator, (404) 639-7112

Funding Opportunity Description
Background
   a. Healthy People 2020:
   Not applicable.
   b. Other National Public Health Priorities and Strategies:
   Not applicable.

CDC Project Description
   i. Problem Statement:
   Numerous binational infectious disease outbreaks, including vector-borne, vaccine-preventable, foodborne, waterborne, mycotic, and mycobacterial diseases, have been documented over the last two decades. Many of these diseases are emerging with higher incidence in the U.S.-Mexico border region compared to other areas of the United States. Optimal investigation and control of binational disease cases and outbreaks requires better surveillance, quantification of disease burden, and epidemiological and laboratory collaboration with both U.S. and Mexico public health (PH) agencies at all levels.

   ii. Purpose:
   The purpose of this funding is to improve disease detection, reporting and prevention of infectious diseases of binational concern in the U.S.-Mexico border region. Infectious diseases of binational concern are those affecting humans that can be introduced or amplified in the other country by virtue of the movement of people, products, or animals between countries; these often require binational coordination to identify, monitor and control.

   iii. Outcomes:
   • Improved surveillance for infectious diseases of binational importance; some examples include Zika, dengue and chikungunya, tuberculosis, HIV, STD, rickettsial diseases, influenza, and enteric diseases.
   • Implementation of the U.S. Mexico Guidelines\(^3\) for infectious disease prevention and control via the Operational Protocol for Binational Communication and Coordination for:
      o Improved coordination and exchange of PH information in the border region and binationally; and
      o Rapid investigation and control of binational outbreaks.
   • Improved completeness and timeliness of reporting of surveillance data, including effective use of binational variable(s).
   • Data used to set priorities within border region.

\(^3\) [http://www.cdc.gov/USMexicoHealth/united-states-mexico-guidelines-cooperation.html](http://www.cdc.gov/USMexicoHealth/united-states-mexico-guidelines-cooperation.html)
- Border region workforce better trained to respond to border and binational infectious disease events.
- Development and implementation of public health interventions addressing disease priorities in the border region.

### iv. Funding Strategy:

U.S.-Mexico border states are eligible to apply for BIDS funding. Funding should be used for personnel, travel, supplies, equipment, or contractual support for proposed activities. Awards will preferentially support integration of binational reporting criteria and related variables into jurisdictions’ investigations and electronic disease surveillance systems, border region surveillance for Zika, with laboratory testing for Zika, dengue and chikungunya; operationalization of the US-Mexico Guidelines, and operational assessment of mobile-phone-app or other participatory surveillance technologies to enable self-report of Zika, dengue, or chikungunya, with subsequent laboratory testing. For projects related to a specific infectious disease or technical area, program planning and funding decisions may be administered by the most appropriate state program or office to manage and implement activities, in consultation with the state ELC principle investigator, ELC, and CDC.

- Estimated availability of funds: $525,000.
- Approximate number of awards given: 1-4
- Anticipated funding range: $50,000 - $525,000

### v. Strategies and Activities:

Applicants should determine which activities are the best fit for their particular circumstance considering the information provided in ‘Funding Strategy’. Applicants are required to implement at least one priority 1 activity and at least one priority 2 activity. Applicants may conduct proposed activities or may designate or pass funds for locally hired personnel to conduct proposed activities.

**Priority 1 Activities.** Applicants are required to work towards the integration of binational variables such as Binational Reporting Criteria, Country of Exposure, Country of Usual Residence and Country of Birth (endorsed by Council of State and Territorial Epidemiologists’ position statement 13-SI-02) into local and state disease surveillance and investigative systems. If the applicant cannot conduct a priority 1 activity, the applicant must provide sufficient justification. Integration activities include:

a. Assessment of current status of the use of the variables by jurisdiction (state and local) and disease (strategy 1c);

b. Integration of the binational variables into local and state disease case investigation forms and electronic reportable disease surveillance systems (strategy 1b);

c. Training of state and local staff on the use of the variables (strategy 1a);

d. Incorporation of binational variables into routine case notifications to CDC, per specifications of the Generic V2 HL7 message mapping guide, or through the existing state processes (strategy 3b); and

e. Ongoing assessment of the completeness and data quality of these variables in state and local systems by jurisdiction (strategy 1c).
Applicants must describe how they plan to collaborate with and/or fund local health departments to conduct proposed activities.

**Priority 2 Activities.** If the applicant cannot propose a priority 2 activity, the applicant must provide sufficient justification.

a. Implement or enhance human surveillance, with laboratory testing, for diseases including Zika, dengue, chikungunya, or other mosquito-borne diseases among BIDS target populations (strategy 1b).

b. Develop, test, and refine binational information sharing protocols with US and Mexican state and local partners in the US-Mexico border region, consistent with International Health Regulations (IHR), US-Mexico Guidelines, and the Operational Protocol for Binational Communication and Coordination; or document the operationalization of the protocol at the local and state levels (strategies 1a, 1b, 1c).

c. Implement and conduct operational assessment of a mobile-phone-app or other participatory surveillance technologies to enable self-report of Zika, dengue, or chikungunya, with laboratory testing to confirm diagnosis and facilitate entry into medical care and more traditional public health surveillance; will require collaboration with the CDC BIDS program, other funded entities and the University of Arizona (strategy 1b).

**Priority 3 Activities.** Priority 3 activities will be considered for funding only if the applicant is addressing at least one priority 1 and one priority 2 activity. Examples of priority 3 activities may include:

1. Implement or enhance human surveillance for infectious diseases of binational concern among BIDS target populations (strategy 1b).
   - If ILI or SARI surveillance is continued, sites should incorporate key epidemiological questions into the standardized BIDS protocol for influenza-like illness (ILI) or severe acute respiratory (SARI) surveillance to direct future public health action. For example, questions to assess vaccine uptake in foreign born or border crossing populations.

2. Facilitate, as feasible, the timely reporting of binational cases and outbreaks, and regular exchange of binational case/disease summaries with border jurisdictions, states, and federal partners, consistent with the Nationally Notifiable Disease Surveillance System, U.S.-Mexico Binational Communication and Collaboration Pathways Protocol and International Health Regulations (strategy 1b, 1d).

3. Assist local health jurisdictions with binational outbreak investigations (strategy 1a).

4. Provide training for epidemiologists/disease investigators in the border region to improve surveillance for and response to border and binational infectious disease events (strategy 1a, 1b).

**Additional Activities Required of Funded Programs**

1. **Program Evaluation.** In addition to reporting progress on the performance measures found in this document, programs are required to conduct an evaluation of one funded activity, new...
or existing, which may span the remaining 2 years of the project period. Sites should prioritize evaluation of their binational reporting program or a major surveillance activity. The proposal should describe the activity to be evaluated, the purpose of the evaluation, and the resources to be dedicated in the first year. Programs are expected to devote at least 10% of FTE effort to evaluation activities, but are encouraged to devote a higher percent effort to evaluation as needed. Evaluation costs could include up to 1 FTE, or other related costs such as hiring an evaluation consultant to lead the activities. Awardees will submit an evaluation implementation plan within 90 days of receiving notification of award and a final evaluation report by the end of the 5 year project period. The plan will follow a CDC template to be provided to the applicant by the CDC BIDS program.

2. **Coordination and Communication.** Program staff are required to participate in regularly scheduled site-specific and border-wide BIDS team calls; as well as regional partner meetings, including the annual BIDS meeting, and any trainings that are organized by the CDC BIDS team. Travel to an annual BIDS border-wide meeting must be included in the budget.

<table>
<thead>
<tr>
<th>1. <strong>Collaborations</strong> –</th>
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<tbody>
<tr>
<td>a. <strong>With CDC funded programs:</strong></td>
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<tr>
<td>Sites should collaborate with NNDSS Program, Emerging Infections Program, ILI-Net, BioSense, PulseNet, and other BIDS programs, as applicable, and provide description of these collaborations in the application. Sites will collaborate closely with the CDC BIDS program. The BIDS program manager will provide technical oversight and assistance, liaise with other CDC subject matter experts, and review protocols and products resulting from activities.</td>
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<tr>
<td>b. <strong>With organizations external to CDC:</strong></td>
</tr>
<tr>
<td>Collaboration with infectious disease offices of local/regional/state health departments is required. Applicants must describe these collaborations in the proposal, and how the proposed activities fit into the state’s broader plans. Collaborations with universities and non-governmental institutions are encouraged, with associated letters of support. States proposing binational collaborations with Mexico should provide documentation of binational agreement to collaborate, such as a letter of support from a Mexican collaborating institution.</td>
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<tr>
<th>2. <strong>Target Populations:</strong></th>
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<tr>
<td>Projects should target U.S.-Mexico border-crossing populations and their networks, and residents of the U.S.-Mexico border region at risk for diseases of binational concern, with an emphasis on Latino foreign-born and Limited English Proficiency populations. Applicants should clearly identify which population(s) will be targeted by the proposed project.</td>
</tr>
<tr>
<td>a. <strong>Evaluation and Performance Measurement:</strong></td>
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<tr>
<td>i. <strong>CDC Evaluation and Performance Measurement Strategy:</strong></td>
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<tr>
<td>Grantees will report progress toward program outcomes using the applicable measures listed below. If not applicable, sites must develop additional performance measures in collaboration with the BIDS project officer.</td>
</tr>
<tr>
<td>• Number and percent of binational cases, clusters and outbreaks reported to appropriate partners, as specified by the Operational Protocol for Binational Communication and Coordination, by disease category (i.e. vector-borne, food/water-borne, respiratory and</td>
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</table>
vaccine-preventable, STD and HIV). Partners include, local, state, and federal public health authorities in the U.S. and Mexico.

- Number and description of binational outbreak investigations conducted collaboratively with Mexico, including disease or syndrome investigated, month of notification (US to MX or MX to US), authorities notified, authorities involved in collaborative response, and the public health response and outcomes.

- Description of evaluations conducted, including the stakeholders engaged, 3-6 specific questions to be answered by the evaluation, evaluation indicators and data sources, and major findings and recommendations from the evaluation (if complete).

- Provide key demographics of cases/population for surveillance or data reporting activities. Data elements at a minimum should include:
  - Number and percent of Latino foreign-born;
  - Number and percent of Latino U.S.-born;
  - Age; and
  - Number and percent with border crossing during timeframe of interest.

- Number of cases for which BIDS supported or facilitated laboratory testing, by surveillance project.
  - For sites continuing ILI surveillance, additionally report the number and % of ILI cases tested for influenza, as well as the % of ILI cases tested that were positive for influenza.
  - For sites continuing SARI surveillance, additionally report the % of cases tested that were positive for influenza.
## Program Activity Contact Information
Pamela Nonnenmacher, DGMQ Coordinator, (404) 639-7112

## Funding Opportunity Description

### Background

#### c. Healthy People 2020:

Not applicable

#### d. Other National Public Health Priorities and Strategies:

Not applicable

### CDC Project Description

#### j. Problem Statement:

Every day close to one million travelers arrive in the United States by air, sea, or land. Some arrive from countries with infectious disease epidemics and limited healthcare access. Due to tight seating space on conveyances and prolonged contact en route, communicable diseases can spread quickly and may result in cases or outbreaks in communities. Additionally, about 70,000 refugees and 400,000 immigrants settle in the United States every year. Refugees are particularly vulnerable because of limited access to healthcare in their country of origin and countries providing temporary asylum. They may have complex health-care issues, such as low baseline vaccination rates and high rates of infectious diseases.

#### vi. Purpose:

The purpose of this funding is 1) to mitigate the public health risks associated with travel, migration, and importation of pathogens; and 2) improve public health surveillance, case management and response.

#### vii. Outcomes:

- Improved surveillance of diseases of public health concern associated with or identified by travel or border crossings
- Improved completeness of travel associated case reports
- Improved timeliness of travel-associated case reports
- Improved coordination and exchange of data (e.g. linkage of overseas vaccination information for refugees to state immunization registries, linking between various databases to allow for long-term follow up of refugees and/or immigrants, etc.)
- More efficient efforts in:
  - Detecting cases and outbreaks of diseases of public health concern
  - Responding to cases and outbreaks of diseases of public health concern (e.g., providing recommendations to health care providers)
  - Investigating cases and outbreaks of diseases of public health concern (e.g., determining risk factors)
  - Implementing disease control measures
- Inform public health treatment approaches for travelers, refugees and/or immigrants (e.g. approaches to address LTBI, hepatitis B, vaccine preventable diseases, and mental health (refugees only))
• Inform program and policy development
• Minimized transmission of infectious diseases in globally mobile populations
• Improved health outcomes, quality, and equity

viii. Funding Strategy:

Funding should be used for personnel, travel, supplies, equipment, or contractual support for proposed activities

- Approximate total availability of funds: $250,000
- Approximate number of awards given: 3 - 5
- Approximate average per award: $50,000
- Approximate range of awards: $15,000 - $100,000

ix. Strategies and Activities:

Strategies and activities are all optional, and applicants should address at least one of the strategies and activities listed below.

1) Enhance investigation response and reporting (1a)
   Example: Develop new investigation materials, processes, procedures, or technology that would more quickly and completely detect cases of immediate public health interest among globally mobile populations

2) Improve surveillance to drive public health action (1b)
   Example: Analyze, report, and share surveillance, epidemiological, or clinical data for globally mobile populations.

3) Implement and evaluate public health practice activities (1c)
   Example: Implement interventions addressing the health needs of refugee and/or immigrant populations at conveyances or at border crossings
   Example: Evaluate the effectiveness of interventions addressing the health needs of refugee and/or immigrant populations

4) Coordinate and collaborate (1d)
   Example: Enhance staff training and education on port of entry International Health Regulations core capacities (http://www.who.int/ihr/procedures/en)

5) Maintain and enhance integrated surveillance information (3c)
   Example: Facilitate coordination/exchange of surveillance, epidemiological, or clinical data for globally mobile populations

3. Collaborations –
   c. With CDC funded programs:

Collaboration with other CDC funded programs is optional. However, if applicant proposes to collaborate with other CDC funded programs to conduct activities, applicant should provide evidence of prior collaborations with these groups and should describe: 1) the work of the collaborating CDC-funded programs in their jurisdiction or community, 2) the programs’ success in achieving Cooperative Agreement outcomes; and 3) the way the applicant will work with the program. Prior evidence may be provided as a MOU, MOA, or letters of support.

   d. With organizations external to CDC:
Collaboration with organizations external to the CDC is optional. However, if applicant proposes to collaborate with organizations external to CDC, applicant must provide evidence of prior collaborations with such groups, describe the organization’s success in achieving the Cooperative Agreement outcomes, and indicate how the applicant will interact with the organization in specific terms. Prior achievements and evidence may be provided as an MOU, MOA, or letters of support.

4. Target Populations:
Projects should target globally mobile populations such as refugees, immigrants, travelers, expatriates, migrants (including Haitian and Cuban migrants), those adjusting to LPR status in the United States (status adjusters), or communities with significant migrants or refugees. Applicants should clearly identify which population(s) will be targeted by the proposed project.

b. Evaluation and Performance Measurement:

ii. CDC Evaluation and Performance Measurement Strategy:
Performance measures and evaluation activities used to monitor and track progress will be specific for each approved and funded project. This is necessary as the number and scope of projects may vary in the area of emphasis, strategy, and activity. As projects are approved and funded, CDC will develop the specific performance measurements that best meet the purpose and objective of that project. The performance measures will be closely tied to the pertinent strategies, activities, and outcomes. There may be both qualitative and quantitative data collected for evaluation purposes. Overall, reports summarizing the progress and short term outcomes of each project will be submitted at a minimum once in a project period but no more than twice in a project period.

For instance, for improved completeness and timeliness of reporting the following performance measures may include:

- Time from detection of case to initial response to public health departments
- Number of reports with 90% of required information completed
- Retrospective review of cases to identify public health risks, areas for improving detection of and/or response to cases
- Measureable outcomes in public health surveillance, including increased numbers of complete screening records reported and increased number of reported records having high data quality
- Number of meetings and/or trainings conducted for planning exercises
- Retrospective review of cases to identify public health risks, areas for improving detection of and/or response to cases
- Number of reports, recommendations, and evidence-based policy change documentation
ATTACHMENT
W1: Rabies - Improving Case Management for Potential Rabies Exposures

Program Activity Contact Information
Ryan Wallace, Rabies Epidemiologist, (404) 639-1050

Funding Opportunity Description

Background

a. Healthy People 2020:

Goal IID-21: Increase the number of States that use electronic data from rabies animal surveillance to inform public health prevention programs.

b. Other National Public Health Priorities and Strategies:
Not applicable

CDC Project Description

i. Problem Statement:
An estimated 35,000 to 55,000 persons receive rabies postexposure prophylaxis (PEP) each year due to potential rabies exposures. Another 90,000 persons each year have a potential rabies exposure which is ruled out by diagnostic testing of the suspect animal and tens of thousands more by public health observation of the suspect animal. Managing a person who has a suspect rabies exposure involves information sharing between public health, health care, laboratory, and veterinary providers to provide timely and appropriate care. Delays or inability to share information while managing a suspect exposure case can result in unnecessary administration of rabies biologics or, more worrisome, failure to provide timely treatment. Electronic management systems can help increase access and accountability of all persons involved in managing rabies exposures, but are not widely available across state health departments.

ii. Purpose:
Funding will support public health partners in developing electronic laboratory reporting or improving modules for the electronic management of potential rabies exposure cases. Such modules should provide a web accessible application combining demographic and exposure information, laboratory data, and animal observation data to aid local case management and follow-up of potential rabies exposure cases. The module will reflect recommendations contained within the Advisory Committee on Immunization Practices – human rabies prevention guidance- to help ensure that national guidance is followed and will ideally capture case management data for evaluation purposes. Preference will be given to applications that can show ready adaptation of a currently available platform.

iii. Outcomes:
- Improve timeliness of the exchange of state laboratory and animal observation data within reporting jurisdictions, for the management of potential rabies exposure cases
- Improve coordination of interstate and national notification for rabies surveillance data sharing
- Improve completeness of data reported to CDC for the national notification of animal rabies cases

iv. Funding Strategy:
Funds should be utilized for workshop travel, supplies, equipment, and contractual support for proposed activities
- Total availability of funds: $130,000
Approximate number of awards given: 3 - 5
Approximate average per award: $35,000 - $50,000
Preference will be given to applications that can show ready adaptation of a currently available platform.

### v. Strategies and Activities:

1. Improve timeliness of the exchange of state laboratory and animal observation data within reporting jurisdictions, for the management of potential rabies exposure cases
   a. Develop or improve electronic systems for appropriately managing potential rabies exposure cases (e.g., tracking bites/exposures, animal observation outcomes, rabies diagnostic results, and post-exposure prophylaxis recommendations).

2. Improve coordination of interstate and national notification rabies surveillance data sharing
   a. Develop, improve, or maintain electronic laboratory reporting of rabies diagnostic activity to CDC using standard message mapping guide

### 1. Collaborations –
   a. With CDC funded programs:
      Not applicable
   b. With organizations external to CDC:
      Not applicable

### 2. Target Populations:
   Not applicable
   a. Evaluation and Performance Measurement:
      i. CDC Evaluation and Performance Measurement Strategy:
      Required performance measures for the project period are listed below. Data will be reported on an annual basis, and are used to indicate progress made toward program outcomes.
      1) Number of state and local staff trained on new case management system
      2) Number and percentage of suspected rabies exposures that were managed using electronic case management system
      3) Average time from rabies suspected exposure reported to end of follow-up (e.g. PEP recommendations)
      4) Proportion of animals tested in state reported to CDC through electronic laboratory reporting platform
**ATTACHMENT**

**W2: Rabies - Laboratory Capacity for National Rabies Surveillance**

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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<tbody>
<tr>
<td>Ryan Wallace, Rabies Epidemiologist, (404) 639-1050</td>
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<th>Funding Opportunity Description</th>
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<th>Background</th>
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<tbody>
<tr>
<td>a. <strong>Healthy People 2020:</strong></td>
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<tr>
<td>Not applicable.</td>
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<tr>
<td>b. <strong>Other National Public Health Priorities and Strategies:</strong></td>
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<td>Not applicable</td>
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<tr>
<th>CDC Project Description</th>
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<tr>
<td>i. <strong>Problem Statement:</strong></td>
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<tr>
<td>Approximately 100,000 to 120,000 animals are tested for rabies each year. Most of these animals are submitted following a potential human or domestic animal exposure. As such, each animal rabies diagnosis has a direct implication on the clinical management of an exposed human or the quarantine status of domestic pets or livestock. Well trained diagnostic laboratory staff as well as functional equipment, within public health, veterinary, and agricultural laboratories, are necessary to ensure that samples are processed and tested appropriately. Inaccurate testing may result in unnecessary treatment (i.e., from false positives) or in a worst case scenario failure to receive life-saving treatment (i.e., from false negatives). Maintaining laboratory equipment such as light microscopes, vacuum hoods, and incubators are critical to ensuring that gold-standard diagnostic testing can occur. Access to reagents for diagnosis and variant typing is likewise critical for state programs. Current guidelines recommend that rabies diagnosticians receive training on the national protocol for rabies direct fluorescent antibody (DFA) testing at least every six years. All of these components (equipment, reagents, and training) are critical to maintain at high-functioning levels for reliable diagnostic testing and appropriate human treatment recommendations and reduce inaccurate testing results and poor treatment outcomes.</td>
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| ii. **Purpose:** |
| Funding will support public health partners to improve laboratory diagnostic capacity through necessary equipment upgrades, procurement of critical reagents for diagnosis and typing, and training of laboratory diagnosticians who have not been trained in the past six years. |

<table>
<thead>
<tr>
<th>iii. <strong>Outcomes:</strong></th>
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<tbody>
<tr>
<td>• Assure infrastructure is maintained within the partner labs to ensure reliable lab diagnostics</td>
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<tr>
<td>• Ensure a well-trained laboratory workforce (e.g., DFA national protocol, rabies virus typing) to meet current national guidelines.</td>
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<tr>
<td>• Improve rabies virus variant typing surveillance</td>
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<tr>
<th>iv. <strong>Funding Strategy:</strong></th>
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<tr>
<td>Funds should be utilized for workshop travel, supplies, equipment, or contractual support for proposed activities</td>
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<tr>
<td>• Total availability of funds: $70,000</td>
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<tr>
<td>• Approximate number of awards given: 20</td>
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<td>• Approximate average per award: $3,500</td>
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</table>
v. Strategies and Activities:

1) Assure infrastructure is maintained within the partner labs to ensure reliable lab diagnostics
   a. Maintain equipment in working condition, procure necessary supplies and reagents, ensure mechanisms for sample transfer are in working order

2) Ensure a well-trained laboratory workforce (e.g., DFA national protocol, rabies virus typing) to meet current national guidelines.
   a. Ensure laboratory staff conducting rabies diagnosis are appropriately trained per national standard protocol (i.e. attended national training course within past 6 years).

3) Improve rabies virus variant typing surveillance
   a. Develop, improve, or maintain capacity to perform antigenic or molecular typing of rabies virus variants

1. Collaborations –
   a. With CDC funded programs:

      Not applicable

   b. With organizations external to CDC:

      Not applicable

2. Target Populations:

   Not applicable
   a. Evaluation and Performance Measurement:
      i. CDC Evaluation and Performance Measurement Strategy:

      Required performance measures for the project period are listed below. Data will be reported on an annual basis, and are used to indicate progress made toward program outcomes.

      1) Number and percentage of rabies diagnosticians attending rabies laboratory diagnostic course training
      2) Average post-course competency score (if available)
      3) Number of samples and percentage that underwent antigenic or molecular variant typing, by species
      4) Number of rabies-positive samples with species identification
**ATTACHMENT**

**X: Mycotics - Improving Capacity to Detect and Respond to Public Health Issues Related to Fungal Infections**

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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<tbody>
<tr>
<td>Tom Chiller  (<a href="mailto:tnc3@cdc.gov">tnc3@cdc.gov</a> 404-639-4753)</td>
</tr>
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<th>Funding Opportunity Description</th>
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<tr>
<td><strong>Background</strong></td>
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<tr>
<td><strong>a. Healthy People 2020:</strong></td>
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</table>

- Supports environmental health objective: Increase the number of states, territories, tribes, and the District of Columbia that monitor diseases or conditions that can be caused by exposure to environmental hazards.

- Supports healthcare-associated infection objective: Reduce central line-associated bloodstream infections (CLABSIs).

**b. Other National Public Health Priorities and Strategies:**

N/A

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<th>CDC Project Description</th>
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<tr>
<td><strong>i. Problem Statement:</strong></td>
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Fungi are environmental pathogens that cause a broad spectrum of illness, including hospital-associated infections, community-acquired respiratory diseases, and opportunistic infections among immune-compromised hosts. They are important causes of disease but are often overlooked and misdiagnosed.

1. The recent emergence of *Candida auris*, a highly drug resistant yeast that has caused healthcare-associated outbreaks of invasive infections, in the United States underscores the need for state capacity to respond to fungal disease threats.

2. Resistant fungal infections in healthcare environments, especially various types of *Candida* (in addition to *C. auris*) but also *Aspergillus*, are increasingly important issues for public health.

3. Other fungal pathogens, such as *Cryptococcus gattii*, a cause of severe pulmonary disease and meningitis in the Pacific Northwest, have also emerged as public health challenges.

4. *Coccidioides*, a common cause of pneumonia in the western United States, are becoming more widely recognized as causes of illness, and endemic regions of some fungal pathogens may be expanding as environments change.

5. Fungal disease outbreaks, like the fungal meningitis outbreak caused by contaminated steroids and numerous mucormycosis outbreaks in hospitals, represent an urgent need to build capacity to detect, respond, and control fungal infections.

**ii. Purpose:**

The purpose of this project is to strengthen state health department laboratory and epidemiological capacity. Core laboratory competencies include the ability to identify fungi from clinical and environmental samples, to diagnose fungal diseases from clinical specimens.
and fluids, and to perform antifungal resistance testing. Improving epidemiological capacity to investigate outbreaks, monitor trends, and track the emergence of these diseases is important to respond to public health issues.

If interested in becoming a regional laboratory for antifungal susceptibility testing, please see the Antimicrobial Resistant Regional Laboratory Network project under Attachment X for available opportunities supported by this cooperative agreement.

### iii. Outcomes:

- Better epidemiological descriptions of fungal diseases, including assessment of trends and emergence of fungal diseases (including resistant fungal pathogens), and description of higher groups and risk factors, particularly for *Cryptococcus*, *Coccidioides*, *Histoplasma*, *Blastomyces*, and *Candida* infections; improved efforts to monitor trends in healthcare-associated aspergillosis and mucormycosis is a secondary objective
- Enhanced response to cases of *Candida auris* to prevent this emerging pathogen from becoming endemic in US healthcare facilities
- Increased public health, healthcare provider, and public awareness of fungal infections, their diagnosis and treatment
- Better laboratory detection of fungi from clinical and environmental sources, particularly those due to *Cryptococcus*, *Coccidioides*, *Histoplasma*, *Blastomyces*, and *Candida*, from other clinical specimens and environmental samples.

### iv. Funding Strategy:

Funding should be used to support cost for personnel, travel, supplies, equipment and/or contractual support for proposed activities.

- Total availability of funds: $850,000
- Approximate number of awards given: 13
- Approximate average per award: $65,385

### v. Strategies and Activities:

Applicants should address at least one of the following activities.

1. Improve surveillance and investigate suspected outbreaks to drive public health action (1a)
   a. Respond rapidly to suspected cases of *Candida auris* infection and other antimicrobial resistant fungal infections to prevent transmission
   b. Improve state and local fungal disease data collection and reporting through activities such as increasing healthcare provider awareness of reportable fungal diseases and the importance of reporting suspected outbreaks of any fungal disease, including non-reportable diseases.
   c. Collect enhanced surveillance data, including demographic, clinical, exposure, travel, and diagnostic factors
   d. Conduct outbreak investigations and analysis of sporadic cases identified through surveillance to describe trends, higher risk groups, and effectiveness of prevention measures
e. Conduct active, population-based surveillance for invasive mold infections, including collection of clinical isolates and pathology specimens; states may consider using a case investigation form used by the Emerging Infections Program

2. Develop infection control plans for fungal diseases

   Increase fungal disease awareness (1b)

   a. Develop health promotion materials for healthcare providers and the public to increase health literacy about fungal disease prevention

   b. Train and educate public health staff about fungal disease to build expertise for investigation of fungal outbreaks

3. Sustain and enhance laboratory diagnostic capacity (2a)

   a. Implement rapid sampling and detection of fungal pathogens in the environment to assist outbreak investigations and facilitate better interpretation of clinical data.

   b. Train and educate staff in fungal identification to build expertise for detection

   c. Conduct sample collection and molecular epidemiologic analysis of clinical, animal, and environmental samples to better understand the epidemiology of fungal pathogens (such as Cryptococcus, Coccidioides, Histoplasma, Blastomyces, and Candida) and provide needed information for developing prevention measures.

<table>
<thead>
<tr>
<th>1. Collaborations –</th>
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<tbody>
<tr>
<td>a. With CDC funded programs:</td>
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<td>N/A</td>
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<tr>
<th>b. With organizations external to CDC:</th>
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<tr>
<td>• Applicants may wish to collaborate with other state health departments that have already developed educational materials to raise awareness of fungal infections (e.g., a Valley fever video produced by the New Mexico state health department or collaborations with the Valley Fever Center for Excellence in Arizona).</td>
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<tr>
<td>• Local healthcare providers may be helpful in facilitating surveillance and providing clinical training</td>
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<tr>
<th>2. Target Populations:</th>
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<td>N/A</td>
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<tr>
<th>a. Evaluation and Performance Measurement:</th>
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<tbody>
<tr>
<td>i. CDC Evaluation and Performance Measurement Strategy:</td>
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</table>

*Based on Mycotics activities selected above, applicants should state which of the following measures they plan to report on during subsequent applications. Applicants funded by Mycotics ELC in previous years should report in the 2017 application on the following measures relevant to funded activities.*

1) Number of responses to suspected Candida auris cases

2) Number of laboratorians able to perform fungal diagnostic testing

3) Number and percentage of reportable fungal cases with enhanced clinical, exposure, and diagnostic information completed
<table>
<thead>
<tr>
<th></th>
<th>Documentation of a completed yearly report outlining epidemiology of reportable fungal diseases <em>(yes/no response)</em></th>
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<tr>
<td>5</td>
<td>Documentation of a completed yearly report that documents information on investigated outbreaks of reportable and non-reportable fungal diseases <em>(yes/no response)</em></td>
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<tr>
<td>6</td>
<td>Number and types of promotional materials developed <em>(please report number of unique materials rather than number of copies distributed)</em></td>
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<tr>
<td>7</td>
<td>At least one state laboratorian successfully completing CDC Mold Identification training course <em>(given annually at CDC)</em> <em>(yes/no response)</em></td>
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**ATTACHMENT**

**Y: Legionella Prevention**

<table>
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<tr>
<th>Program Name</th>
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<tr>
<td><em>Legionella</em> Prevention</td>
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<tr>
<th>Program Activity Contact Information</th>
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<tbody>
<tr>
<td>Candis M. Hunter, MSPH, REHS, (770) 262-1550; <a href="mailto:hlb8@cdc.gov">hlb8@cdc.gov</a></td>
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<tr>
<th>Funding Opportunity Description</th>
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<tbody>
<tr>
<td><strong>Background</strong></td>
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<tr>
<td><strong>c. Healthy People 2020:</strong></td>
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<tr>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>d. Other National Public Health Priorities and Strategies:</strong></td>
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<tr>
<td>Not applicable.</td>
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<tr>
<th>CDC Project Description</th>
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<tr>
<td><strong>i. Problem Statement:</strong></td>
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<tr>
<td>There has been a 286% increase in the incidence of legionellosis in the United States from 2000 to 2014. The burden of Legionnaires’ disease is substantial, with case fatality rates of 5-40% and hospitalization cost estimates &gt; $433 million per year. Legionnaires’ disease outbreaks comprise two-thirds of all reported potable water outbreaks. Transmission of <em>Legionella</em> depends on environmental transmission through inhalation of aerosolized water rather than person-to-person spread. Lapses in routine maintenance of building water systems can almost always be identified in outbreak investigations. An industry standard for the primary prevention of Legionnaires’ disease in building water systems was published in 2015 (<a href="https://www.ashrae.org/resources--publications/bookstore/ansi-ashrae-standard-188-2015-legionellosis-risk-management-for-building-water-systems">https://www.ashrae.org/resources--publications/bookstore/ansi-ashrae-standard-188-2015-legionellosis-risk-management-for-building-water-systems</a>), although awareness, implementation, evaluation, and regulation of these preventive maintenance strategies remains limited. In 2016, CDC published a <em>Legionella</em> Toolkit (<a href="http://www.cdc.gov/legionella/WMPtoolkit">www.cdc.gov/legionella/WMPtoolkit</a>) to translate the industry standard into plain language for the benefit of health departments, building managers, and healthcare facilities. The document serves as a step-by-step guide to creating and implementing a water management program to reduce <em>Legionella</em> growth and spread. State and local health departments need environmental, laboratory, epidemiological, and communication resources to reduce the risk of <em>Legionella</em> growth and spread in their jurisdictions.</td>
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<td><strong>ii. Purpose:</strong></td>
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<tr>
<td>Implementation of maintenance strategies for the primary prevention of Legionnaires’ disease in building water systems can interrupt the amplification, aerosolization, and transmission of <em>Legionella</em>, thereby reducing incidence of disease as well as outbreaks. As such, CDC wishes to build capacity at the state and local levels among epidemiologists, environmental health specialists, and public health laboratorians regarding the understanding, implementation, evaluation, and regulation of industry standards for primary prevention.</td>
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<td><strong>iii. Outcomes:</strong></td>
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207
Short-term:
1. Improved collaboration among epidemiologists, environmental health specialists, and public health laboratorians at the state and local levels with regards to Legionnaires’ disease primary prevention, surveillance, and outbreak response
2. Improved communication among state and local health departments and building owners and managers regarding Water Management Plan development and implementation
3. Increased identification of high risk facilities (e.g., large buildings, hotels, hospitals, long term care facilities) and cooling towers
4. Increased understanding among key stakeholders (e.g. health departments, policy analysts, industry code enforcement partners) of the processes to incorporate Water Management Plan language into building and/or public health code at state and local levels
5. Increased awareness of causes and environmental risk factors for Legionnaires’ disease

Mid-term:
1. Improved public health prevention, surveillance, and response to cases and clusters of Legionnaires’ disease
2. Improved knowledge of Water Management Plan development among building owners and managers
3. Increased targeted outreach to high risk facilities on Legionnaires’ disease prevention
4. Increased Water Management Plan language in building and/or public health code at state and local levels
5. Increased knowledge of causes of and environmental risk factors for Legionnaires’ disease

Long-term:
1. Strong public health guidance and enforcement regarding prevention strategies
2. Improved maintenance of building water systems
3. Reduced growth and transmission of Legionella in high risk facilities
4. Reduced incidence of Legionnaires’ disease and number and size of outbreaks
5. Improved primary prevention informed by understanding of environmental risk factors for Legionnaires’ disease

iv. Funding Strategy:

Funding may support personnel, laboratory or office supplies, communications materials, code/licensing/regulatory expenses, specimen storage and shipping costs, and other supplies needed for capacity building and/or an effective response to a situation involving Legionnaires’ disease or the implementation of preventive maintenance strategies. Future year funding is not guaranteed.

- Total availability of funds: $1,200,000
- Approximate number of awards given: 2-3
- Approximate average per award: $100,000 – $800,000 (proposed projects should be scalable)
v. Strategies and Activities:

The overall objective of all activities listed here is to build capacity among epidemiologists, environmental health specialists, and public health laboratorians to prevent and respond to cases and outbreaks of Legionnaires’ disease. Proposed activities that promote this objective will be considered, within the framework of the suggested strategies and activities listed here. No single activity is required; applicants can propose pursuing one or multiple activities.

1) Implement and evaluate public health practice, and prevention and control strategies (Strategy 1c)
   a. Improve understanding within state and local health departments regarding maintenance strategies for the primary prevention of Legionnaires’ disease in building water systems and cooling towers; activities are flexible but could include the development of educational materials and/or communications plans regarding preventive maintenance strategies
   b. Identify and implement strategies to encourage the implementation of preventive maintenance plans among building owners and operators; activities are flexible but could include the sharing of educational materials and/or communications plans regarding preventive maintenance strategies with the intended audience
   c. Evaluate effectiveness of policies and public health approaches to the implementation of industry standards for primary prevention of legionellosis; evaluation activities are flexible but could include the evaluation of new preventive maintenance regulations or strategies
   d. Identify and implement strategies for leveraging the incorporation of legionellosis preventive maintenance plans into building and public health codes
   e. Identify and implement strategies for leveraging the incorporation of legionellosis preventive maintenance plans into regulatory and licensing activities, with a focus on settings at high risk for *Legionella* transmission (e.g., large buildings, hotels, hospitals, long term care facilities)

2) Coordinate and collaborate (Strategy 1d)
   a. Identify and implement strategies to encourage collaboration among epidemiologists, laboratorians, and environmental health specialists for the purpose of primary prevention of Legionnaires’ disease and outbreak response

3) Sustain and enhance laboratory diagnostic capacity (Strategy 2a)
   a. Improve laboratory capacity to identify *Legionella* and/or markers for *Legionella* in outbreak and/or prevention settings

1. Collaborations –
   a. With CDC funded programs:
Not applicable.

b. With organizations external to CDC:

Not applicable.

2. Target Populations:

Populations at increased risk for developing Legionnaires’ disease include people who are 50 years or older, current or former smokers, have chronic lung disease, and have weakened immune systems. CDC investigations of building-associated outbreaks show the most common places for getting the disease are hotels, long-term care facilities, and hospitals. Health departments, building managers, and healthcare facilities can facilitate implementation of maintenance strategies for the primary prevention of Legionnaires’ disease in building water systems.

a. Evaluation and Performance Measurement:

i. CDC Evaluation and Performance Measurement Strategy:

Awardees are required to demonstrate that measurable progress is being made throughout the project period through workgroup and partner conference calls. Documentation of best practices, lessons learned, and barriers to project implementation should be collected throughout the project period. To indicate progress made toward program outcomes, data will be reported through:

- Bimonthly conference calls
- Bimonthly written updates (based on evaluation and performance plan) to submitted via email prior to conference calls
- Annual progress report (deadline August for previous funding year)

Example performance measures for the project period are listed below. Additional metrics not listed should also be completed based on the applicability of the metrics to the ELC funded activities.

1) Improved collaboration among epidemiologists, environmental health specialists, and public health laboratorians at the state and local levels with regards to Legionnaires’ disease primary prevention, surveillance, and outbreak response

a. Number of staff (and percentage time) dedicated to legionellosis prevention, surveillance, and outbreak response

b. Number of meetings among epidemiologists, laboratorians, environmental health specialists, and health communicators to improve Legionnaires’ disease outbreak prevention, environmental health expertise, detection, investigation, laboratory techniques or reporting

c. Number of trainings among epidemiologists, laboratorians, environmental health specialists, and health communicators to improve Legionnaires’ disease outbreak prevention, environmental health expertise, detection, investigation, laboratory techniques or reporting
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<td>d.</td>
<td>Change in Legionnaires’ disease cases and/or size/number of outbreaks when compared with the time before implementation of new legionellosis preventive maintenance strategies</td>
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<td>e.</td>
<td>Number of outbreak investigations, technical assistance, or consultations provided on Legionnaires’ disease with local jurisdictions.</td>
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<tr>
<td>f.</td>
<td>Documented progress towards CDC Environmental <em>Legionella</em> Isolation Techniques Evaluation (ELITE) Program Certification through completion of ELITE application, protocol development and implementation, and other required certification metrics (for laboratory funded partners only).</td>
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</table>

2) Improved communication among state and local health departments and building owners and managers regarding Water Management Plan development and implementation

a. Number of outreach activities (e.g. trainings, meetings, site visits) with building owners and managers and estimated number of participants

b. Creation and/or implementation of facility Water Management Plan evaluation tools (e.g., pre-post questionnaires, needs assessments, evaluations, and other tools) to determine the facilitators, barriers, and challenges related to water management plan implementation

c. Number (and proportion) of eligible buildings with legionellosis preventive maintenance plans

d. Number (and proportion) of eligible buildings implementing key elements of legionellosis preventive maintenance plans. Key elements include plan adherence, water quality measurements, biological process control indicators, *Legionella* culture testing, etc.

3) Increased identification of high risk facilities (e.g., large buildings, hotels, hospitals, long term care facilities) and cooling towers

a. Number of cooling towers identified in at least 1 county

b. Number of high risk buildings identified in at least 1 county

4) Increased understanding of the process to incorporate Water Management Plan language into building and/or public health code at state and local levels as evidenced by the development of an outline, diagram, or a roadmap of building and public health code processes

5) Increased awareness of causes of and environmental risk factors for Legionnaires’ disease.

a. Development and/or dissemination of public presentations, trainings, and communication efforts related to causes of and environmental risk factors for Legionnaires’ disease

b. Number of educational materials (e.g. local fact sheets, links on website, social media) developed and/or disseminated about legionellosis prevention

c. Estimated number of participants (including individuals and organizations) reached by each type of outreach activity
### Program Activity Contact Information

<table>
<thead>
<tr>
<th>Program Activity Contact Information</th>
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<tbody>
<tr>
<td>Katie Fullerton, Coordinator, (404) 718-4714</td>
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### Funding Opportunity Description

#### Background

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<tr>
<th>a. Healthy People 2020:</th>
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<td>Not applicable.</td>
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<tr>
<th>b. Other National Public Health Priorities and Strategies:</th>
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<tbody>
<tr>
<td>Not applicable.</td>
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</table>

### CDC Project Description

#### i. Problem Statement:

Despite public health interventions to chlorinate municipal and community water systems, an estimated 4-33 million annual GI illnesses from exposure to contaminated municipal drinking water still occur. In addition, waterborne disease in the U.S. has become more complex as the uses for water expanded with U.S. development and industrialization; waterborne disease is now also heavily associated with recreational, industrial, healthcare, agricultural, and medical uses including premise plumbing systems. The cost of 90,000 hospitalizations from just ten primarily and partially waterborne pathogens costs exceeds $1.8 billion in direct healthcare costs and over 7000 deaths (Collier, et al. Epidemiol Infect. 2012 Nov;140(11):2003-13.).

#### ii. Purpose:

These key issues underscore the need for CDC and public health partners to develop a comprehensive plan for detecting, measuring, and reducing the impact of all types of waterborne disease. To build a foundation for this, CDC wishes to build capacity for detection, investigation, reporting, and prevention of all types of waterborne disease to enable future prevention initiatives. This requires building epidemiologic, laboratory, environmental health, and health promotion capacity at the state and local level. The proposed sub-activities should address these issues.

#### iii. Outcomes:

- Increased collaboration of epidemiologists, laboratorians, environmental health specialists, and health communicators within state health departments and between state officials and local health departments on waterborne disease detection and prevention through exchange of data, resources, and expertise.
- Improved timeliness of reporting identified outbreaks, including submission of state investigation reports, to CDC’s NORS-Water module.
- Improved completeness of reporting identified outbreaks, including submission of state investigation reports, to CDC’s NORS-Water module
- Improved understanding of the sources and epidemiology of waterborne disease and outbreaks through integration of surveillance data, environmental health analyses, environmental sample testing, and molecular subtyping analysis of diagnostic, and environmental samples.
- Improved state and local workforce capacity to identify, investigate, respond to, and prevent waterborne disease outbreaks.
• Increased public awareness of waterborne disease and prevention measures.

iv. Funding Strategy:

Funds should be utilized for personnel, travel, supplies, equipment, or contractual support for proposed activities.

- Total availability of funds: $450,000
- Approximate number of awards given: 20
- Approximate average per award: $22,500

v. Strategies and Activities:

Applicants can select one or more of the following Strategies to apply for; however, activities defined below are examples and suggestions unless followed by “(required).” There are three required activities for all applicants (1a.i., if not already completed; 1b.ii.; and 1c.iii.). Each additional activity has required and optional activities listed. Applicants should select strategies and implement activities that build and sustain current capacity based on the priorities and public health needs of their jurisdiction, and align with the outcomes defined above.

1. Enhance outbreak investigation response and reporting (ELC Strategy 1a)

   i. Review paper and electronic data systems for waterborne disease outbreaks (1971 to present) and enter unreported outbreaks in the NORS-Water module. *(required for all applicants if not previously completed)*
   
   ii. Identify a designated waterborne disease coordinator. *(required for all applicants)*
   
   iii. Cross-train and educate staff about waterborne disease to build expertise for detection, investigation, and reporting of waterborne disease outbreaks.
   
   iv. Develop and/or implement standard investigation protocols and tools to facilitate expanded outbreak investigations that include epidemiologic, laboratory, and environmental health staff collaboration.
   
   v. Work with other states on waterborne disease outbreak investigations and reporting or other water-related issues and assist local jurisdictions in large, complex outbreaks.
   
   vi. Work with other states or at the regional or national level to develop standardized outbreak investigation materials and guidance that can be shared broadly.
   
   vii. Provide technical assistance and training to local public health agencies and health departments on waterborne disease prevention issues.

2. Improve surveillance to drive public health action (ELC Strategy 1b)

   i. Coordinate state and local epidemiologic, laboratory, and environmental health data collection and reporting to CDC (NORS-Water or the One Health Harmful Algal Bloom Surveillance (OHHABS), as appropriate).
   
   ii. Manage electronic reporting of case and outbreak data within state and to CDC (NNDSS, CryptoNet, NORS-Water, or OHHABS, as appropriate).
   
   iii. Develop an electronic data system for collecting and analyzing state pool inspection data to report to NAFIS (Network for Aquatic Facility Inspection Surveillance) based on key data elements identified by CDC and in the Model Aquatic Health Code (MAHC).
   
   iv. Participate in CryptoNet, the national molecular subtyping network for Cryptosporidium, to develop integrated epidemiologic and molecular subtyping data
to better understand the epidemiology of *Cryptosporidium*, including participation in monthly coordination calls

v. Improve waterborne disease and outbreak detection
   a. Develop improved methods for the public to report suspected outbreaks and for staff to follow-up these reports.
   b. Develop novel methods to monitor for and detect waterborne outbreaks using traditional and non-traditional surveillance data.

vi. Evaluate waterborne disease surveillance systems based on CDC Evaluation Guidelines.

vii. Analyze data and prepare summaries of waterborne disease and outbreak data (e.g., reports, manuscripts, and presentations).

viii. Facilitate coordination/exchange of data with other jurisdictions.

3. Implement and evaluate public health practice, and prevention and control strategies (ELC Strategy 1c)

i. Develop and maintain a public-facing waterborne disease prevention website and track number of page views on the site.

ii. Develop and disseminate evidence-based health education and promotion materials/messages by a variety of modes to increase health literacy about waterborne disease prevention.

iii. Develop and adopt policies to reduce waterborne disease in state and/or in specific populations (i.e., rural or traditionally underserved populations) based on scientific data.

iv. Designated waterborne disease coordinator attend monthly ELC coordination calls *(required for all applicants)*

v. CDC anticipates being able to award $10K in ELC funds to each Great Lakes state that will have a CDC/CSTE-Water fellow continuing into 2018 (i.e., starting the fellowship or their second year of their program in 2017). These funds would be available to help to support the Fellow and capacity-building work on Great Lakes-related issues (i.e., harmful algal blooms, ambient waterborne disease activities) through CDC’s involvement in the Great Lakes Restoration Initiative *(applies only to Great Lakes States)*

vi. Increase intra- and inter-state communication and collaboration among public health departments and programs and other governmental entities that work on waterborne disease and outbreak prevention, detection, investigation or reporting.

vii. Establish and expand systems or processes to improve multidisciplinary coordination and collaboration on waterborne disease and outbreak prevention, detection, investigation or reporting activities (e.g., routine meetings, working group, listserv, integrated epi, lab, and environmental health data systems).

viii. Increase the number of waterborne disease outbreak investigations that include an environmental health component to identify root causes and preventive measures; include these data in reports to NORS-Water.

4. Sustain and enhance laboratory diagnostic capacity (ELC Strategy 2a)

i. Support participation in CryptoNet by in house subtyping (single gene or WGS) of *Cryptosporidium* specimens or by sending stool specimens to regional CryptoNet
laboratories or the CDC Reference Laboratory; including participation in monthly
CryptoNet coordination calls
ii. Participate in CryptoNet as a regional laboratory; including participation in monthly
CryptoNet coordination calls
iii. Conduct sampling and detection of waterborne pathogens and/or water quality
indicators in the environment to assist outbreak investigations and facilitate better
interpretation of clinical data.
iv. Improve sample collection and analysis of clinical, animal, and environmental
samples
v. Train and educate laboratory staff about waterborne disease to build expertise.

1. Collaborations –
   a. With CDC funded programs:
      As needed, funding can be combined with other CDC funded programs for shared staffing, e.g.,
      FoodCORE, Integrated Food Safety Centers of Excellence, PulseNet, OutbreakNet, CaliciNet,
      EHSNet, NARMS, FoodNet, NCEH Private Well Initiative
   b. With organizations external to CDC:
      Collaboration and exchange of materials and resources with other state health departments

2. Target Populations:
   Not applicable.
   a. Evaluation and Performance Measurement:
      i. CDC Evaluation and Performance Measurement Strategy:
         Required performance measures for the project period are listed below. Additional metrics not
         listed as required should also be completed based on the applicability of the metrics to the ELC
         funded activities. Data will be reported on an annual basis, and are used to indicate progress
         made toward program outcomes.
         1) Increased collaboration of epidemiologists, laboratorians, environmental health specialists,
            and health communicators within state health department and between state officials and
            local health departments on waterborne disease detection and prevention through
            exchange of data, resources, and expertise.
            a. Number of monthly ELC calls attended by waterborne disease coordinator (#/12, not
               a percentage)
            b. Number of monthly CryptoNet calls attended by waterborne disease coordinator
               and laboratory staff (if funded for CryptoNet; #/12, not a percentage)
            c. Number of assisted outbreak investigations, technical assistance, or consultations
               provided on waterborne issues with local jurisdictions.
         2) Improved timeliness and completeness of reporting identified outbreaks, including
            submission of state investigation reports, to CDC’s NORS-Water module.
            a. Number (percent) of previously unreported state and/or local outbreaks (1971-
               present) entered into NORS-Water
            b. Average time (weeks) from date of waterborne disease outbreak identification to
               date of report creation in NORS-Water
            c. Number (percent) of waterborne disease outbreaks reported to NORS-Water that
               are finalized by end of calendar year (# finalized/# entered into NORS-Water)
d. Number (percent) of reported outbreaks that include attachments (e.g., state investigation report, environmental inspection report, water quality data).

e. Number (percent) of outbreaks in NORS-Water that include the following minimum data elements at finalization: State Report ID, Primary mode of transmission, First ill date (at the time of initial report), Date of notification to state health department, Exposure state, Estimated total primary ill (at the time of initial report), Etiology, including genus, species, serotype/genotype (if available), Water exposure type, Water type, and Setting.

3) Improved understanding of the sources and epidemiology of waterborne disease and outbreaks through integration of surveillance data, environmental health analyses, environmental sample testing, and molecular subtyping analysis of diagnostic, and environmental samples.
   a. Number of suspected waterborne disease outbreaks (including harmful algal blooms) detected and investigated (# investigated/# detected)
   b. Number of reports, manuscripts, and presentations completed from analyzed waterborne disease and outbreak surveillance data
   c. Number of outbreak-associated and sporadic Cryptosporidium specimens submitted to CDC for typing (required only if funded for CryptoNet) AND number (percent) of CDC or regional lab submitted specimens with completed CryptoNet forms submitted to CDC CryptoNet (this metric to be collected quarterly)
   d. Number of outbreak-associated and sporadic Cryptosporidium specimens typed in house using gp60 or 18s (required only if funded for CryptoNet) AND number (percent) of in house typed specimens with completed CryptoNet case form submitted to CDC CryptoNet (this metric to be collected quarterly)

4) Improved state and local workforce capacity to identify, investigate, respond to, and prevent waterborne disease and outbreaks.
   a. Number of meetings and/or trainings attended to improve waterborne disease detection, investigation, reporting
   b. Number of meetings and/or trainings developed and conducted by your health department to improve waterborne disease detection, investigation, reporting of local health departments and other partners
   c. Number of meetings and/or trainings attended to improve waterborne disease laboratory expertise
   d. Number of meetings and/or trainings developed and conducted by your health department to improve waterborne disease laboratory expertise of local health departments and other partners

5) Increased public awareness of waterborne disease and outbreak prevention measures
   a. Number of waterborne disease prevention web pages maintained
   b. Number of health promotion materials developed and disseminated about waterborne disease and outbreaks
   c. Number of completed social media or other initiatives and activities (e.g., ‘Twitterfest’, Facebook posts) about waterborne disease and outbreaks.