Overview Information

Issuing Organization
Council of State and Territorial Epidemiologists (CSTE) at www.cste.org/

Participating Organizations
Centers for Disease Control and Prevention (CDC), at http://www.cdc.gov/

Components of Participating Organizations
Influenza Division, National Center for Immunization and Respiratory Diseases (NCIRD/CDC), at http://www.cdc.gov/ncird/flu.html

Title: Influenza Population-Based Hospitalization Surveillance Project (IHSP)
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Section I. Funding Renewal Description

1. Background

The development of supplemental surveillance methods is a joint project of CSTE and CDC based on CSTE Position Statements (All position statements, including 06-ID-04, available at www.cste.org).

The Emerging Infections Program (EIP) influenza hospitalization surveillance project, a population- and case-based surveillance system, began in 2004, amid a severe pediatric influenza season, to collect information on children (<18 years of age) hospitalized with laboratory-confirmed influenza. In early 2006, surveillance activities expanded to include adults so that all-age hospitalization surveillance was being conducted in 11 metropolitan areas in 10 EIP states. In spring 2009 a novel influenza A (H1N1) virus emerged and infected people in North America. The first human cases of novel influenza A virus infection identified in the US occurred in areas outside the current EIP catchment counties. To be able to monitor the spread of pandemic influenza and future seasonal influenza hospitalizations, a greater geographic and demographic representation of population-based influenza hospitalization surveillance was desired. Thus, to enhance influenza hospitalization surveillance in the US during the 2009 H1N1 pandemic, the Influenza Hospitalization Surveillance Project (IHSP) was initiated. IHSP sites included counties within IA, ID, MI, OK and SD during 2009-2010 season; ID, MI, OH, OK, RI, and UT during the 2010-2011 season; MI, OH, RI, and UT during the 2011-2012 season; IA, MI, OH, RI and UT during the 2012-13 season, and MI, OH, and UT during the 2013-2017 seasons. Together, EIP and IHSP sites comprise the Influenza Surveillance Network (FluSurv-NET). FluSurv-NET represents approximately 9% of the US population (~28 million people).

FluSurv-NET uses information from hospital laboratory, admissions, infection control practitioner databases/logs, and review of reportable conditions databases to identify cases. Cases are residents of pre-identified catchment areas (counties or cities) with either community-acquired or healthcare facility-associated laboratory confirmed influenza virus infection who are hospitalized during influenza season. Medical chart reviews of all cases are conducted to collect clinical and epidemiologic information. Influenza vaccination status is obtained through a hierarchical review of sources: medical chart, vaccination registries, primary care provider records, and interview of patient, proxy or parents.

The purpose of this funding opportunity is to fund up to 3 currently participating sites to participate in laboratory-confirmed, population-based, all ages, influenza hospitalization surveillance for the 2017-2018 influenza season.

Eligible jurisdictions are those that have participated in the IHSP project for the 2016-2017 project year. The goal is that funded states will join the FluSurv-NET to allow for monitoring of influenza hospitalizations across a larger geographic and diverse US population using a standardized methodology.
2. Objectives

The objectives of the Influenza Hospitalization Surveillance Project (IHSP) are to:

1. Calculate laboratory-confirmed hospitalization rates that can be examined by race/ethnicity, sex, and age group in a timely manner.
2. Describe the temporal trends of laboratory-confirmed influenza hospitalization by influenza type and subtype.
3. Collect clinical and epidemiologic information, including co-morbid conditions and antiviral usage, for each laboratory-confirmed case in order to describe the course of influenza disease (e.g., severe illness and influenza-associated complications) among persons hospitalized with influenza.
4. Assess patient specific vaccination status.
5. Examine etiologic agents associated with severe bacterial illness, including pneumonia among influenza-infected patients.
6. Assess the completeness of case ascertainment of this population-based hospitalization surveillance system.

3. Methods

Project Period.
This renewal application refers to surveillance activities to be conducted from October 1, 2017 through April 30, 2018. Awards will be made on or after September 1, 2017, with the funding period from July 1, 2017 – June 30, 2018. Reporting will be required as per the FluSurv-NET protocol and may be adjusted accordingly depending on the severity of the season.

Hospitalization is defined as an admission to an inpatient ward of the hospital or observation for at least 24 hours. Patients who are admitted to and discharged from the hospital on the same day are considered hospitalized. An overnight stay is not required. Emergency room and outpatient visits are not hospitalizations. However, if the person is admitted to an inpatient ward directly following an emergency room or outpatient visit then he/she should be considered hospitalized.

A. Community-acquired influenza infection case definition

For the purposes of this surveillance system, a case patient is defined as a person who is/has:

1. A resident of a pre-identified surveillance geographic area (i.e., county or city) during the influenza season of interest (i.e., October 1, 2017 – April 30, 2018).
2. Admitted between October 1, 2017 and April 30, 2018 to a hospital where catchment area residents are likely to receive care (the hospital may be located outside the catchment area but catchment area residents are known to travel for hospitalization to such hospitals)
3. Admission date: 14 days or less after a positive influenza test
   or
   3 days or less before a positive influenza test
4. Evidence (i.e., a laboratory report in the current hospital record, a written note in the admission H&P of an influenza positive test before admission, a laboratory report from another hospital, report from infection control practitioner, or a verbal report from a primary care provider’s office) of a positive influenza test by at least one of the following methods:
a. Viral culture
b. Immunofluorescence antibody staining (Direct [DFA] or indirect [IFA])
c. Reverse transcriptase polymerase chain reaction (RT-PCR)
d. A commercially available rapid diagnostic test for influenza

OR
e. A positive, unspecified influenza test noted in the medical chart (e.g., a written note in the admission H&P or discharge summary)

*PCR testing is the preferred test method. Sites that can support this type of testing should indicate it in their application.*

**B. Nosocomial-acquired influenza infection case definition**

1. A resident of a pre-identified geographic area (i.e., county or city) during the influenza season of interest (i.e., October 1, 2017 – April 30, 2018).
2. Admitted between October 1, 2017 and April 30, 2018 to a hospital where catchment area residents receive care.
3. Patients who are admitted for a non-respiratory illness who subsequently develop respiratory symptoms at least 3 days after hospital admission and test flu positive more than 3 days after admission using any of the following tests:
   a. Viral culture
   b. Immunofluorescence antibody staining (Direct [DFA] or indirect [IFA])
   c. Reverse transcriptase polymerase chain reaction (RT-PCR)
   d. A commercially available rapid diagnostic test for influenza

**C. Exclusion criteria**
Initial hospital admission more than 14 days after positive influenza test

**4. Optional Activities:** Interested sites may propose one or more of these enhancements to influenza surveillance activities

For all special surveillance projects, the protocol, data collection instruments, data dictionary, and data entry software will be developed in collaboration with CDC and participating sites so that they may be standardized. Special projects may require IRB approval.

1. Determine acute respiratory illness (ARI) market share for each hospital within catchment area: Identify all hospitals within the catchment area. Estimate the number of acute respiratory illness (ARI)-coded hospitalizations that occur at each hospital within the catchment area and calculate the hospital market share by age group (percent of catchment area residents hospitalized with ARI at each hospital within the catchment area). CDC to provide technical assistance as needed.

2. Monitor influenza testing practices among majority of hospitals that fall within catchment area by:
   a. Determining the number of influenza cases submitted by each hospital each year
   b. Determining the number of ARI-coded hospitalizations by age group during each influenza season (same as 1. above)
   c. The ratio of influenza testing to ARI hospitalizations can be estimated each year for each hospital (number of influenza positive cases/number of ARI hospitalizations)
      i. Influenza testing of patients hospitalized with ARI at participating hospitals should be encouraged.
      ii. Hospitals with a relatively low ratio of influenza positive cases to ARI hospitalizations can be identified so that corrective steps can be taken to improve surveillance
d. Participation in the influenza disease burden project every 1-3 years as determined by discussions with CDC

3. Use FluSurv-NET data for estimation of influenza vaccine effectiveness among pregnant women using a test negative design (cases: RT-PCR influenza positive vs. comparison group: RT-PCR influenza negative)
   a. Using data from one hospital (or a small number of hospitals), identify influenza PCR test negative cases among pregnant women
   b. After appropriate human subjects criteria are met, collect core information (vaccination status, underlying medical conditions, ICD 10 discharge diagnosis codes, and outcomes) on patients with a negative influenza PCR test.
   c. Estimate vaccine effectiveness among pregnant women hospitalized with and without influenza based on influenza test results in collaboration with CDC
   d. To assess for biases that may be introduced if clinician testing is based on vaccination status, obtain aggregate data to compare the proportion of ARI hospitalizations with self-reported influenza vaccination who did and did not receive influenza testing.

4. Participates in projects to better assess clinical outcomes among patients hospitalized with influenza through enhanced chart review for complications including sepsis, pneumonia (review of chest radiology, ICU course (need for pressor support, renal dialysis, etc.), cardiac and other non-respiratory complications (acute myocardial infarction, congestive heart failure, stroke)

5. Participate in projects to better assess severity of influenza disease at admission through collection of vital signs and other data. These data can be used to help account for biases in admission practices related to the presence of underlying conditions.

6. During a season with circulation of oseltamivir-resistant viruses, collect a sample of specimens from patients for antiviral resistance testing (using high through-put assays such as pyrosequencing). Specimens can be sent to CDC, or a CDC identified laboratory, for testing.

7. RSV Projects: To assess the use of the FluSurv-NET platform for long-term RSV surveillance, potential activities include, but are not limited to, the following:
   a. Among laboratories at participating surveillance sites, conduct a laboratory survey to gather information on RSV diagnostic testing, including use of RT-PCR, antigen detection, rapid diagnostic assays (usually available commercially), viral culture, etc.
   b. Examine RSV testing practices among adult and pediatric physicians at participating surveillance hospitals. Data would include which patients are tested, specimen type, and which laboratory tests are ordered (including for other respiratory viruses in addition to influenza and RSV).
   c. Use electronic data to evaluate the use of RSV testing among persons hospitalized with acute respiratory illness (ARI) among different age groups and clinical syndromes.
   d. Evaluate hospital-associated RSV coded deaths among all age groups. This could be done through linking RSV-positive patients with death certificate data. If there are additional sources of mortality information, other methods like capture-recapture, could be used to estimate mortality. Implement active, laboratory-based RSV surveillance among adults (e.g., elderly, immunocompromised, underlying medical conditions, pregnant women, etc.) and evaluate feasibility of such surveillance to establish burden and evaluate vaccine impact.
e. Implement active, laboratory-based RSV surveillance among children <5 years of age and evaluate feasibility of such surveillance to establish burden and evaluate vaccine impact.

Section II. Award Information

1. Mechanism(s) of Support

CSTE will manage all matters related to financial support for this project. CSTE will fund states by distributing 25% of the contract amount upon contract initiation. The remainder of the funds (75%) will be distributed at three time points during the contract period upon receipt of invoice from the awardee. Funds will be distributed upon contract initiation (25%) and on November 1, 2017 (25%); March 1, 2018 (25%); and June 30, 2018 (25%). In all cases, funds will only be reimbursed upon receipt of invoice from the applicant as well as sufficient progress as determined by CSTE made toward the activities of the IHSP project as outlined in this application and contract agreement with CSTE. Recipients are responsible for allocating appropriate amounts to support activities related to the successful implementation of project, including any compensation for participating hospitals or supplemental funds to the state public health laboratories if appropriate for the duration of the project.

2. Funds Available

The CDC and CSTE intend to support up to 3 state or local health agencies. Award sizes may vary by applicant based on site-specific factors including population size under surveillance and existing local infrastructure. Although the financial plans provide support for this program, awards pursuant to this funding opportunity are contingent upon the availability of funds and the number of applications received.

CSTE receives funding for this project through the Centers for Disease Control and Prevention (CDC) cooperative agreement number 5U38OT00143. Funds awarded to contractors under this announcement are subject to the laws, regulations and policies governing the U.S. Public Health Service grant awards. All estimated funding amounts are subject to availability of funds.

Section III. Eligibility Information

1. Eligible Applicants

Applicants should clearly describe their ability to meet the objectives listed in Section 1 and demonstrate the following capabilities:

CSTE intends to support up to 3 currently participating sites to participate in laboratory-confirmed, population-based, all ages, influenza hospitalization surveillance for the 2017-2018 influenza season.

- Conduct active, population-based surveillance for laboratory-confirmed influenza-associated hospitalizations among children and adults during the influenza season in precisely pre-defined geographic area (typically beginning on October 1, and ending on April 30 of the following year).
Identify a surveillance catchment area (i.e., counties or cities from which population estimates can be obtained for rate calculations), including number of residents (i.e., population) and all hospitals in that surveillance area that could potentially admit patients with influenza. All hospitals within the surveillance catchment area that might admit catchment area residents with acute respiratory illnesses should be included.

- Clearly identify all hospitals in which residents of the catchment areas are hospitalized so that population estimates can be obtained for rate calculations on an annual basis.
- Estimate the proportion of catchment population hospitalizations that occur outside of the catchment area.
- Utilize hospital laboratories, admission/discharge information, infection control practitioner logs/databases, and review of reportable conditions databases to identify all laboratory-confirmed influenza hospitalizations in a timely manner.
- Conduct periodic (at least annual) audits of all clinical, reference, commercial, and public health laboratories within the FluSurv-NET surveillance area to verify completeness of influenza case ascertainment. Submit a plan, including the methods, for evaluation of case ascertainment completeness.
- Complete a standardized case report form for all identified cases using data obtained from laboratory records and medical chart review.
  - Enter case data into a standardized data collection database provided by CDC or send de-identified data extracts that match the format of the standardized database.
    - Submit data electronically to CDC (in an agreed upon secure format) by the specified deadline and upon CDC request.
    - Provide timely responses to reports and requests for information to assist in preliminary & final analyses, reports, and data close-outs.
- Conduct laboratory surveys to describe diagnostic tests used at participating laboratories every 1-3 years as needed.
- Determine influenza A subtype and influenza B lineage on at least 20% of surveillance specimens each year. Although determination of influenza subtype is not required for all cases, it is highly desirable and recommended.
  - Methods for obtaining subtype information or for obtaining specimens to send to public health laboratories for subtype/lineage determination should be described.
  - Description of a sampling method used to obtain subtype/lineage information on specimens should be submitted to CDC in writing and updated if changes are made.
    - Sampling only from hospitals with a large market share or hospitals with full influenza subtyping capabilities is acceptable.
    - Convenience samples are discouraged; however, if only convenience samples are available, this should be clearly indicated. In this instance, other methods to estimate subtype-specific rates will be determined in collaboration with CDC.
  - Sites should ensure that subtype information is linked to patient clinical records.
- Early in the season, due to poor specificity of rapid influenza diagnostic tests (RIDT), confirmation of RIDT test results with RT-PCR should be encouraged.
- Perform geocoding and linkage to US Census data using standardized methods for all cases identified as part of surveillance activity.
- Ascertaining influenza-associated deaths that may have been missed during hospitalization and/or occurred within the first 30 days of hospital discharge. Strategies for ascertaining death after hospital discharge should include:
  - Matching the dataset of hospitalized patients captured through regular surveillance with that from the U.S. Social Security Death Index (SSDI) online database to identify death-cases missed by surveillance and/or deaths occurring after hospital discharge.
Based on the local Vital Statistics/Death certificates available, obtain information about place of death and cause-of-death among those identified through SSDI data match.

2. Cost Sharing or Matching

Cost sharing, matching, or cost participation is not required for this project.

Section IV. Renewal Application and Submission Information

State or large local health departments interested in participating in the Influenza Population-Based Hospitalization Surveillance Project should submit an application addressing the objectives and eligibility requirements stated in Section I and Section III respectively. Applications should be submitted by the State Epidemiologist (or local agency equivalent) in collaboration with appropriate staff from the state health department and state public health laboratory, if appropriate.

1. Content and Form of Renewal Application Submission
Applications should include the following headings in the order listed and should address the issues included under each heading. Contents that exceed the designated page limits may not be reviewed:
• **Contact information:**
  o Applicants should indicate who will function as the projects’ Principle Investigator (PI) and Surveillance Officer(s) (SO). The PI will serve as the primary contact for this project and may be the State Epidemiologist (or equivalent), influenza surveillance coordinator, or other appropriate personnel.
  o Contact information: email, mailing address (no PO boxes), and telephone number should be provided for all FluSurv-NET project contributors.
  o All correspondence will be sent to the primary contact listed.
  o ½ page limit

• **Methods:**
  o Applicant should describe their proposed surveillance methods according to those described in the objectives outlined in Section I.
  o Applicants should include at least the following:
    • Catchment Area: Include a description of catchment area (e.g., population and general demographics, geographic distribution, description and number of hospitals and laboratories that will participate in the identification of lab-confirmed influenza hospitalizations). All hospitals within the catchment area that might admit catchment area residents with acute respiratory illnesses should be included in the network.
    • Case Identification: Provide a strategy to identify all cases hospitalized with laboratory-confirmed influenza
    • Medical Records Access: Describe logistics/plans to access medical records and ICD9 discharge diagnoses among hospitals in catchment area
    • Partnerships: Describe applicant’s partnership(s) with local and state public health departments, laboratories (e.g., state, public health and private laboratories) and hospitals in catchment area. Applicants should also indicate how these partnerships will contribute to the identification of laboratory-confirmed influenza hospitalizations and assist with RT-PCR testing and/or viral culture for influenza diagnoses
    • Personnel: Indicate the personnel that will be involved with the project to ensure timely case identification, chart abstraction, data entry and reporting
    • Experience: Describe applicant’s experience with influenza hospitalization surveillance
  o 2 page limit.

• **IRB:**
  o Indicate if human subject review process for the state is necessary, and if so estimate the length of the process.
  o ½ page limit.

• **Budget:** Proposed budget should be reasonable and include the amount of funding needed and how it will be appropriated to:
  o Recruit hospitals
  o Stimulate active surveillance among participating hospitals
  o Collect hospital information (chart reviews and access to ICD10 discharge codes)
  o Facilitate transport of specimens for testing at the state public health laboratory
- Purchase geocoding software (if applicable)
- Cover personnel time
- Provide appropriate site representation at the 2017-2018 Principle Investigator meeting and 2017-2018 Surveillance Officer meeting
- Other supplemental costs needed to successfully implement this project (if any)
- 2 page limit.

For further assistance, technical questions, or inquiries about the application, contact Monica Schroeder at CSTE (770-458-3811 or mschroeder@cste.org). CSTE and CDC will be available to speak to potential applicants to discuss technical or administrative questions. All questions and answers will be made available to all potential applicants upon request.

2. Submission Dates and Times

2. A. Submission, Review and Anticipated Award Dates

Letter of Intent Receipt Date: May 12, 2017 *(required)*

Application Submission Receipt Date: June 23, 2017

Award Notification Date: July 21, 2017

Anticipated Award Date: September 1, 2017

2. B. Submitting an Application

A completed letter of intent should be sent by email to the Council of State and Territorial Epidemiologists by May 12, 2017

Monica Schroeder  
Associate Research Analyst  
Council of State and Territorial Epidemiologists  
Atlanta, GA 30341  
770-458-3811 (phone)  
770-458-8516 (fax)  
mschroeder@cste.org

Completed renewal applications should be sent to the Council of State and Territorial Epidemiologists at the above email address by 11:59pm Eastern on June 23, 2017.

**The receipt deadline for all application components is 11:59pm Eastern on June 23, 2017.**

Submitted appendices should be kept at a minimum and may not be reviewed as part of the renewal application process. CSTE will only notify applicants who have requested by email (to mschroeder@cste.org) a confirmation of their application submissions.

2. C. Application Processing
Applications will be reviewed based on criteria described in Section V.

Section V. Renewal Application Review Information

1. Review and Selection Process

Eligible applications that are complete will be evaluated for scientific and technical merit by CDC/Influenza Division and CSTE in accordance with the review criteria stated above. Funding awards will be made based upon the quality of the submitted proposal and the ability of the applicant to meet the stated objectives.

Section VI. Award Administration Information

1. Award Notices

Applicants will be notified via email or phone no later than July 21, 2017. Any delays in award notification will be shared with all applicants.

2. Recipient Responsibilities
Each recipient public health department and public health laboratory will have primary responsibility for the following:

- Providing scientific and management oversight for the overall project, including project design and conduct, data collection and reporting, quality control, and collaborations with other awardees, CDC, and CSTE.
- Appointing at least one staff member to serve as the surveillance officer(s) for this project.
- Obtaining the appropriate human subjects clearances at local sites if required.
- Working with CDC scientists and other investigators from the FluSurv-NET to refine protocols and data collection instruments.
- Performing laboratory tests and reporting data as specified in the protocols.
- Providing written progress reports and invoices to CSTE as required in the contractual agreement.
- Participate in scheduled Principal Investigator, Surveillance Officer, and working group conference calls.
- Participate in annual Principal Investigator and Surveillance Officer meetings
- Influenza vaccination status should be obtained through medical chart review, verification of state vaccination registries, inquiries to primary care providers or long term care facilities where a case resided prior to hospitalization, or telephone interviews with the case or proxy
- Participate in data quality assurance activities as follows:
  o Correct or address all errors identified in weekly data cleaning reports
  o Validate a subset of cases to ensure that chart reviewers are consistently recording information on case report forms
- Maintain flexibility to rapidly respond to changes in core surveillance in response to a novel influenza A virus epidemic of pandemic potential.
o Sites must have the ability to quickly modify data collection tools and site databases to respond to changes in surveillance.

o Changes may include extensive clinical data collection to assess severity of the new epidemic/pandemic; identification of sentinel hospitals where prospective, systematic testing for influenza can be performed at the emergency department or elsewhere in the hospital unit to identify patients hospitalized with severe novel influenza; monitoring influenza vaccine adverse events; and timely report a set of demographic and clinical data to CDC in order to inform stake holders’ decision making and public health interventions early in the epidemic/pandemic.

3. CSTE Responsibilities
During the established grant period, CSTE is responsible for:

- Monitoring the terms of the contract agreement between the recipient and CSTE.
- Disbursing awarded funds to states.
- Providing information about the progress of the program to the CSTE Executive Board and to CDC.
- Reviewing and distributing progress reports and the final report to CDC.
- Providing technical expertise when requested.
- Providing CSTE staff support of the activities of this project.

4. CDC/Influenza Division Rights and Responsibilities

CDC/Influenza Division will have substantial programmatic involvement as described below:

- If IRB review is deemed necessary at the state level, CDC will assist the state in the development of a protocol that will be acceptable for local site IRB review and approval.
- CDC will provide the reporting case report form database. CDC, CSTE, and the states selected for this project will work together to finalize the forms.
- CDC will provide feedback reports that monitor timeliness and completeness of reporting and interim summary data.
- CDC will work with awarded applicants as needed to determine appropriate methods to define the patient population.
- CDC will ensure appropriate training for personnel from state health departments, as requested by the site.
- CDC will provide technical assistance and guidance to awarded applicants.
- CDC will finalize methods, procedures, and timelines for case completeness evaluation (an assessment of case ascertainment).
- CDC will develop analytic tools to help sites maintain data quality.

5. Collaborative Responsibilities

CSTE and CDC in conjunction with the State Health Department Contacts will:

- Provide guidance to investigators regarding project implementation and sustainability for the duration of the influenza season.
- Evaluate monthly progress of all funded project activities.
- CSTE and CDC will conduct site visits as required to provide guidance and assure that methods followed are consistent among all participating sites and document the findings/recommendations in a site visit report.