

Appendix E: Informatics

Focus Area Name

Informatics

Focus Area Contact Information

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Approximate Average Annual Award: \$9,000,000

Funding Opportunity Description

1. Background

Laboratory data are critical to patient care and for informing the decisions public health agencies make for the prevention, detection, and response to health threats. Laboratory data are also ubiquitous, with a growing volume and variety of data sources from both within and outside of traditional partners. Public health laboratories (PHLs) and agencies have the unique opportunity to harness this data in a collaborative way to make more timely and insight-driven decisions to inform public health programs, policies, and investments. To fully use laboratory data requires a robust health information systems infrastructure.

PHLs and other laboratories that serve public health face increasing challenges to their ability to enhance, develop, and sustain the laboratory informatics capabilities they need to meet existing and emerging public health challenges. For instance, some clinical and laboratory partners are still exchanging data that are not standardized or via labor-intensive, paper-based methods. Additionally, the linking of epidemiological data with laboratory results remains a challenge for public health response. Furthermore, laboratory staff have taken on more responsibilities for maintaining informatics without any formal training.

Healthy People 2020

This focus area supports the following Healthy People 2020 objective:

Health Communication and Health Information Technology, Objective 11:

(Developmental) Increase the proportion of meaningful users of health information technology (HIT) (Developmental)

Other National Public Health Priorities and Strategies

- CDC's public health data strategy and IT transformation efforts: <https://www.cdc.gov/surveillance/surveillance-data-strategies/data-IT-transformation.html>
- Centers for Medicare & Medicaid Services Promoting Interoperability (PI) Programs: <https://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/index.html>
- LRN Public Health Emergency Preparedness and Response Capabilities: National Standards for State Local, Tribal, and Territorial Public Health <https://www.cdc.gov/cpr/readiness/capabilities.htm>

2. CDC Project Description

a. Approach

I. Purpose

The purpose of this program is to maximize PHL adoption and use of interoperable, standards-based data exchange and information systems to communicate test orders and results and provide electronic reporting to public health. This program will strengthen PHL's ability to benefit from and contribute to the CDC data strategy drafted in 2018. Within this overarching purpose, the program will help improve coordination within and among jurisdictions; advance electronic data exchange; and promote the reuse of existing data systems rather than creating new solutions.

II. Outcomes

Activities in this focus area should achieve or contribute to the following proximal and intermediate outcomes (refer to section ii, "Outcomes" under Part II, A-2-a or the overall logic model in this NOFO for a full list of outcomes of this cooperative agreement):

PO-8. Improved understanding of data-related challenges and data-informatics solutions among laboratory professionals and other stakeholders


IO-5. Improved data exchange and interoperability among public health laboratories and their partners

- Data are increasingly available to CDC and states for case investigations and surveillance through improved integration of epidemiologic and laboratory data.
- Public health networks and systems function better to provide surge capacity or reference testing.
 - Improve laboratory operations and functionality for data collection and transmission to states and CDC.
- Interoperability between information systems and entities is increased; quality of data is improved; more timely data are collected and reported; existing resources are better leveraged.
 - Improved and increased standards-based data exchange.
 - Increased use of resources.
- Data are used for public health practice, policy, program, surveillance, and response.

III. Funding Strategy

CDC funding strategy for this focus area is described in section iv, "Funding Strategy" under Part II, A-2 (CDC Project Description; a. Approach) in this NOFO.

Funds should be used for program activities, which could include: personnel, travel, supplies, equipment, contractual and consultant support for proposed activities.



Funded recipient is expected to adhere to the requirements of the cooperative agreement. This may include:

- Identifying a designated person with overall responsibility for all activities as well as personnel responsible for each activity;
- Participating in implementation, support, and monitoring efforts at least quarterly.

Budgets should be submitted with sufficient level of detail so that the technical monitor, project officer, or the grants management officer can determine the necessity, reasonableness, and allocability of costs relative to the proposed grant activities, and their allowability pursuant to the applicable federal cost principles and requirements.

IV. Strategies and Activities

Activities under this focus area should be guided by strategies in the following categories: Policy, Partnership, and Communication (S2) and Laboratory Quality, Safety, Preparedness, and Informatics for Public Health Testing Services, Surveillance, and Response (S4). Specific training and workforce development activities are detailed in Appendix I: Workforce Development.

S2. Policy, Partnership, and Communication

S2.2. Collaborate and build relationships among laboratory professionals and other stakeholders in public health, healthcare and beyond:

- Enhance coordination within a jurisdiction across laboratory, epidemiology and health information technology personnel and practices.
 - Continue to create and maintain relationships with epidemiologists, Health Information Technology (HIT), clinical care, and laboratory staff.
 - Participate in laboratory-epidemiology collaboration efforts to identify and implement a universal case identifiers (or similar linking variables) to include with laboratory and case data transmission (e.g., patient identifier that links data from health systems; identifier to link PulseNet data to case reports).
- Strengthen laboratory coordination among state health departments
 - Help develop policies that advance PHL capabilities through adoption and use of informatics and interoperable information technology.
 - Continue to expand, coordinate, and support communities of practice around laboratory information management systems and public health informatics.
 - Use existing state consortiums and CDC-defined laboratory networks to promote policies and best practices for improved data collection and transmission.

S2.5. Promote and provide information about the tools and resources available to public health laboratories and other stakeholders

- Conduct annual assessments and develop action plans for improvement of a tool that can be used by PHLs to self-assess their informatics capabilities and maturity.

S4. Laboratory Quality, Safety, Preparedness, and Informatics for Public Health Testing Services, Surveillance, and Response

S4.1. Develop and implement informatics-related solutions and standards to improve data exchange and interoperability:

- Advance and modernize electronic information exchange:
 - Develop a vision and recommendations for PHL informatics, information systems, and integration with partner organizations that aligns with CDC Data Strategy.
 - Provide technical assistance and technical solutions to support public health agencies implementations of standards-based data exchange such as electronic laboratory reporting (ELR), electronic test orders and results reporting (ETOR), electronic case reports (eCR), and surveillance, referrals and survey data.
 - Participate in and support national standards development efforts and efforts to standardize data transmissions.
 - Assess and provide recommendations for current information systems to support data exchange with partners like CDC with increasingly large data exchange needs (e.g., WGS).
- Reuse existing data systems, services and software solutions:
 - Create, maintain and provide a catalog of shared services, technical solutions, and software as a service (SaaS) available through recipient to public health agencies.
 - Maintain and enhance data transport capacity that serves as cloud-based public health infrastructure, including transport protocols and software, message validators, dashboards and tools for monitoring data transmissions, and web access to data files.
 - Enhance and modernize cloud-based public health infrastructure as a service (IaaS) to improve performance and efficiency for the projects that use it.
 - Maintain and enhance a laboratory web portal to support test ordering from submitter and reporting from PHLs.
 - Contribute code for software solutions to CDC's open code repository.
- Provide quantitative measures and metrics, showcasing the economies of scale through year-over-year comparisons.
- Maintain and enhance core services and functions on cloud-based public health infrastructure, including help desk services and tools to support all projects, security, liability protection, and legal services, agreements, and documentation.
- Consult with CDC on architecture, function and evolution (e.g. capacity planning) of public health informatics infrastructure and activities.
- Maintain up to date documentation of public health informatics infrastructure and processes following CDC and/or industry templates for these artifacts (e.g., architecture diagrams)



- Make code base of software solutions, apps and other tools developed as part of funded projects available through agreed upon mechanisms. Include build and deployment instructions for the software solutions and components.

b. Evaluation and Performance Measurement

I. CDC Evaluation and Performance Measurement Strategy

The CDC Evaluation and Performance Measurement Strategy for this focus area uses the guidance from the overall CDC Evaluation and Performance Measurement Strategy described in this NOFO (Part II, A-2-b-i. CDC Evaluation and Performance Measurement Strategy), to address the following specific performance measures (including process measures and outcome measures) for this focus area.

Process measures for each of the activities in this focus area may include:

Strategy and Activity	Process Measure
<p>S2.2. Collaborate and build relationships among laboratory professionals and other stakeholders in public health, healthcare and beyond</p> <ul style="list-style-type: none"> • Enhance coordination within a jurisdiction across laboratory, epidemiology and clinical care. • Strengthen laboratory coordination among state health departments. 	<ul style="list-style-type: none"> • Number of partnerships formed to improve integration/linking of epidemiological and laboratory data in health departments.
<p>S2.5. Promote and provide information about the tools and resources available to public health laboratories and other stakeholders</p> <ul style="list-style-type: none"> • Conduct annual assessments and develop action plans for improvement of a tool that can be used by PHLs to self-assess their informatics capabilities and maturity. 	<ul style="list-style-type: none"> • Number of PHLs that have completed entering or updating data into a tool to assess informatics capabilities and maturity. • Number of PHLs that have used a tool to assess informatics capabilities and obtain additional resources or implement informatics modernization activities.
<p>S4.1 Develop and implement informatics-related solutions and standards to improve data exchange and interoperability:</p> <ul style="list-style-type: none"> • Advance and modernize electronic information exchange. • Reuse existing data systems, services and software solutions. 	<ul style="list-style-type: none"> • Number of laboratories that use common dashboard to monitor transmission of data. • Gather level-of-effort (LOE) estimates across offerings (example: TA, solution development etc.) and actuals to build a knowledge repository for capacity planning and optimization. • Number of CDC programs and projects using common, modernized components of the cloud-based public health infrastructure (e.g., data lake, containers, native cloud functionality).



Outcome measures for this focus area include:

Outcome	Outcome Measure
<p>PO-8. Improved understanding of data-related challenges and data-informatics solutions among laboratory professionals and other stakeholders</p>	<ul style="list-style-type: none"> • Increase the number of public health programs and partners within states that contribute to implementation of informatics solutions.
<p>IO-5. Improved data exchange and interoperability among public health laboratories and their partners</p> <ul style="list-style-type: none"> • Data are increasingly available to CDC and states for case investigations and surveillance through improved integration of epidemiologic and laboratory data. • Public health networks and systems function better to provide surge capacity or reference testing. • Interoperability between information systems and entities is increased; quality of data is improved; more timely data are collected and reported; existing resources are better leveraged. 	<ul style="list-style-type: none"> • Number of new laboratories sending standard cancer reports using HL7 electronic pathology standard to cloud-based public health infrastructure for use by cancer registry jurisdictions. • Number of new laboratories sending Rabies ELR to cloud-based public health infrastructure for use by CDC. • Percent of ARLN laboratory results sent to cloud-based public health infrastructure using HL7. • Number of technical assistance projects with states in progress and completed. • Number of state PHLs that have set up new electronic test orders and results (ETOR) for newborn screening with at least one large hospital system in their state. • Number of CDC programs and projects using common, modernized, components of the cloud-base public health infrastructure (e.g., data lake, containers, native cloud functionality).Number of message senders receiving notifications about transmissions. • Number of clinical care and public health partners in production, testing and queued for sending and receiving eCR (eICRs and RRs). • Reduced cost per message routed through cloud-based public health infrastructure resulting from synergies and optimization <ul style="list-style-type: none"> ○ Provide baseline cost per message routed through cloud-based public health infrastructure.



	<ul style="list-style-type: none">○ Identify incremental costs, if any, for each data exchange scenario / use case.
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II. Applicant Evaluation and Performance Measurement Plan

The recipient will be required to submit a detailed Evaluation and Performance Measurement plan within the first 6 months of award and work with CDC staff to ensure that the evaluation plan is feasible and consistent with proposed focus area activities, the intent of this NOFO, and CDC’s evaluation approach.

c. Collaborations

With CDC funded programs

General guidance for collaborations with CDC funded programs is described in section a, “With other CDC programs and CDC-funded organizations,” under Part II, A-2-iii-1 (Collaborations) in this NOFO. The recipient is expected to strengthen existing informatics-related collaborations with OPHSS/CSELS, CPR, CGH, OID, and the Advanced Molecular Detection (AMD) initiative, the Antimicrobial Resistance initiative, and the TB and vaccine-preventable diseases (VPD) programs, and with non-infectious programs such as cancer and other chronic conditions, newborn screening, among others.

Recipient should also explore opportunities for new collaboration with and across CDC programs and initiatives and develop collaborations to advance public health priorities.

With organizations external to CDC

General guidance for collaborations with organizations external to CDC is described in section b, “With organizations not funded by CDC,” under Part II, A-2-iii-1 (Collaborations) in this NOFO. Recipient is encouraged to participate with public health partners in planning, development, implementation, and assessment efforts related to electronic data exchange and information systems. These partners include, among others, the Association of State and Territorial Health Officials (ASTHO), Council of State and Territorial Epidemiologists (CSTE), the National Association of County and City Health Officials (NACCHO), the Public Health Informatics Institute (PHII), and the Office of the National Coordinator (ONC).

Recipient should also explore opportunities for new collaborations with additional partners and develop collaborations as appropriate to advance public health priorities.

d. Target populations

In addition to PHLs and PHL professionals supporting state, local, tribal, and territorial public health programs, the specific target population of this focus area also includes stakeholders of the PHL system, such as policy makers, clinical laboratories, healthcare organizations, professional organizations, as well as the general public.

e. Organizational Capacity

Refer to section c, “Organizational Capacity of Recipients to Implement the Approach” under Part II, A-2 (CDC Project Description) in this NOFO.



f. Work Plan

The recipient is required to provide a work plan for this focus area that provides both a high-level overview of the entire five-year period of performance and a detailed description of the first year of the award. The work plan should follow the general guidance provided in section d, “Work Plan” under Part II, A-2 (CDC Project Description) in this NOFO, and address the specific strategies, activities, outcomes, and performance measures of this focus area. After the award is made, the proposed work plan (including the evaluation and performance measurement plan) may be adjusted in collaboration with the CDC Technical Monitor(s) to ensure integration of the strategies and activities and achievement of the period of performance outcomes.

g. CDC Program Support to Recipient

CDC’s CSELS, NCEZID, NCIRD, NCEH and NCCDPHP will provide technical monitoring and program support for this focus area as described in section f, “CDC Program Support to Recipients,” under Part II, A-2 (CDC Project Description) in this NOFO. CDC support also includes facilitating a governance workgroup to 1) assist recipient to manage growth of public health informatics infrastructure; 2) advise recipient on architecture, function and evolution of public health informatics infrastructure; and 3) advise recipient on prioritization of funded informatics projects and activities. In addition, CDC may participate in all relevant stakeholder and other meetings, either in-person or by teleconference.