

CDC Health Information Innovation Consortium  
2016 Annual Report



# 2016 ANNUAL REPORT

CDC Health Information Innovation Consortium

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Centers for Disease Control and Prevention

Office of Public Health Scientific Services



## CDC Health Information Innovation Consortium 2016 Annual Report

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### Message from the Office of Public Health Scientific Services' Chief Public Health Informatics Officer

We are pleased to release the 2016 CDC Health Information Innovation Consortium (CHIIC) Report. The report reflects progress in accomplishing goals 1 and 2 as outlined in the [CDC Surveillance Strategy](#). These goals are: 1) to foster and promote creative solutions to surveillance challenges within CDC and states, territory, local, and tribal agencies, and 2) accelerate the utilization of emerging tools and approaches to improve surveillance data. The surveillance innovation project awards are a direct means of sponsoring small activities independent of the major initiatives going on within the agency.

Since 2014, CHIIC funded a total of 16 innovative projects: 9 projects in 2014, 5 projects in 2015 and 2 in 2016. We look forward to another annual portfolio of projects in 2017. In 2016, 6 completed projects from the CDC Surveillance Strategy Innovation Project Awards and 2 additional projects shared their results during a CHIIC quarterly forum. These projects demonstrated an increased rate of adoption of new informatics and IT approaches within CDC systems and an increased efficiency of existing systems and faster time to market for new systems, and the emergence of reused shared services (i.e. business and IT).

CDC is moving toward a culture of innovation that enables partnership and improvement in public health surveillance. Since its inception, CHIIC funding has enabled projects that have improved timeliness and accuracy of data collection through the use of electronic versus manual data entry, reduced the collection burden on healthcare providers to deliver surveillance data, enhanced an existing web service by providing a standards-based, configurable, re-useable and secure interoperable solution, and provided insights and tools that can be reused or extended to other surveillance systems or activities.

With CHIIC funding, programs were able to create, share, and use innovation to improve public health surveillance. This small investment yielded great returns in the form of an increased application and experimentation with using innovation within the agency and in partnership with state health departments and other stakeholders.

Thank you for your support of the innovation consortium and the CDC Surveillance Strategy. We look forward to another year of project ideas that serve as opportunity areas for innovation with CDC and public health partners.



Brian Lee  
Chief Public Health Informatics Officer





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### 2016 Awarded Projects

In 2016, 22 diverse proposals from across the agency addressing HealthIT and non-HealthIT challenges were received. Out of 22 submitted proposals, CHIIC sponsored 2 projects from its \$100,000 project portfolio budget. The awarded projects were:

1. [A SMART App To Track And Report Stroke Cases To Reduce Readmissions \(NCCDPHP\)](#)  
The Office of Informatics and Information Resource Management (OIIRM) in collaboration with DHDSP is applying for a grant to test a standards-based approach towards collecting and reporting data from/to EHR, including in-patient and post-discharge data. This would provide a flexible, and effective alternative to the Quintiles solution, solve the double-data-entry problem, and provide a scalable solution to support future Coverdell surveillance across a wider population of hospitals within each grantee jurisdiction.
2. [Innovative Surveillance and Assessment Techniques to Inform STD and HIV Prevention Action \(NCHHSTP\)](#)  
The goal of this proposed project is to assess whether insights can be gathered from Reddit to help inform relevant policies and interventions. Such insights pertaining to PrEP attitudes, experiences, and behaviors, collected from Reddit, could provide an expedited, innovative, cost-effective approach as compared to traditional surveys. This project will be a collaboration between The CDC's National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP) and Epidemico Inc.

### CHIIC Quarterly Forums

This year, 6 projects from the 2014-2015 project portfolio presented at the CHIIC quarterly forum. The representing Centers were: National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), National Center for Health Statistics (NCHS) and National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP).

During the forum, presenters described a specific surveillance challenge or question and proposed a small, short method to build, test, or experiment to create validated learning toward helping their immediate challenge as well as connecting to other activities across CDC.

The forum is open to the public health community, and the intended audience includes: informaticians, public health analysts, epidemiologists, health scientists, statisticians, information technology specialists, and anyone interested in innovative ways to help public health practice.





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### CHIIC Reach

During the year, CHIIC hosted 4 quarterly forums with a total of 293 people attending in person or via webinar. Fifteen people requested to be added to the CHIIC Listserv, for a total of 68 Listserv members. [For more information on CHIIC events, follow the instructions on the CHIIC web site to subscribe to the listserv for updates.](#)

Date	Attendance	New to CHIIC Listserv
<a href="#">Thursday, February 25, 2016 @ 10 am</a>	73 participants	2
<a href="#">Tuesday, May 17, 2016 @ 10 am</a>	90 participants	3
<a href="#">Tuesday, August 16, 2016 @ 10 am</a>	73 participants	9
<a href="#">Tuesday, November 8, 2016 @ 10am</a>	57 participants	1
	293 participants	15

There were 30 CDC centers, offices, and divisions that participated in the forums as well as 1 federal agency, 8 organizations, and 9 health departments. A breakdown of each entity is provided:

### *CDC Centers, Institutes and Offices*

#### **CDC OD**

- Office of the Associate Director for Policy (OADP)
- Office of the Associate Director for Science (OADS)
- Office of the Chief Operating Officer (OCOO)
- Office of the Chief Information Officer (OCIO)
  - Information Technology Services Office (ITSO)

#### **Office of Infectious Diseases (OID)**

- National Center for Immunization and Respiratory Diseases (NCIRD)
- National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)
  - Division of Healthcare Quality Promotion (DHQP)
- National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP)

#### **Office of Noncommunicable Diseases, Injury, and Environmental Health (ONDIEH)**

- National Center for Environmental Health / Agency for Toxic Substances and Disease Registry (NCEH/ATSDR)
  - Division of Community Health Investigations (DCHI)
- National Center on Birth Defects and Developmental Disabilities (NCBDDD)
- National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP)
- National Center for Injury Prevention and Control (NCIPC)

#### **Office for State, Tribal, Local, and Territorial Support (OSTLTS)**

#### **National Institute for Occupational Safety and Health (NIOSH)**

- Division of Respiratory Disease Studies
- Division of Surveillance, Hazard Evaluations, and Field Studies (DSHEFS)

#### **Center for Global Health (CGH)**

- Division of Global HIV/AIDS (DGHA)
- Division of Global Health Protection (DGHP)



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- Division of Parasitic Diseases and Malaria (DPDM)

### Office of Public Health Preparedness and Response (OPHPR)

- Division of Emergency Operations (DEO)

### Office of Public Health Scientific Services (OPHSS)

- Center for Surveillance, Epidemiology, and Laboratory Services (CSELS)
- National Center for Health Statistics (NCHS)

### Organizations

- Bicoastal Hills Consulting
- Booz Allen
- CACI
- Dare Global Innovations
- L-3-Stratis
- Leidos
- Northrop Grumman
- Public Health Informatics Institute (PHII)

### State Health Departments

- California
- Georgia
- Indiana
- Louisiana
- Maryland
- Oregon
- Tennessee
- Utah
- Virginia

### Federal Government

- HHS IDEA Lab

## Project Presentations

6 completed projects from the Surveillance Strategy Innovation Project Portfolio presented project findings during 2016 quarterly forums:

1. U.S.- Mexico Border Early Warning Disease Surveillance for Dengue and Chikungunya (NCEZID)
2. STD Visualization Tool (SAViT) (NCHHSTP)
3. Proof of Concept and Technology for Hosting Bio-Surveillance Systems in the Amazon Infrastructure Cloud (NCHHSTP)
4. Exploring Practice-Level Analytic Solutions for Smaller Health Care Practices that Support Population-Level Analytics (NCCDPHP)
5. Development of Data Technical Standards and Gap Analysis and for the Paul Coverdell National Acute Stroke Registry 30 Day Follow-Up Data (NCCDPHP)
6. Dietary Supplement Imaging in the National Health and Nutrition Examination Survey (NCHS)

### 1. U.S.- Mexico Border Early Warning Disease Surveillance for Dengue and Chikungunya (NCEZID)

Presenter: Stephen Waterman, MD, MPH

Purpose: To create a mobile participatory syndromic surveillance app to detect individuals with symptoms suggestive of Dengue, Zika, and Chikungunya and to track activity of the vectors, *Ae. aegypti* and *Ae. albopictus*.



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### Results:

- Increased individual participation in core Kidenga mobile application.
- Education and public health messaging tool for community health worker and local populations.
- Collaborative effort between University of Arizona and state and local health departments in Arizona, Texas and Florida

### More Info:

- [View Full Project Description.](#)
- [View Project Presentation from November 8 Forum](#)

## 2. **STD Visualization Tool (SAViT) (NCHHSTP)**

Presenters: Rodney Presley, Massimo Mirabito

Purpose: This project will serve to modernize the main internal system used by CDC staff for visualization and analysis of STD case surveillance data. Innovative tools develop as part of this project could also be used for public facing systems that display STD data – like the NCHHSTP Atlas or WONDER – as well as for other diseases.

### Results:

- High-level assessment of 12 visualization libraries and business intelligence platforms using STD data evaluation criteria
- Detailed assessment of Qlik, SAS Visual Analytics and Tableau with key criteria
- User assessment of tools by both data managers and non-data manager users

### More Info:

- [View Full Project Description.](#)
- [View Project Presentation from November 8 Forum.](#)

## 3. **Proof of Concept and Technology for Hosting Bio-Surveillance Systems in the Amazon Infrastructure Cloud**

Presenters: Seth Sims, Yury Khudyakov

Purpose: Migration and adaptation of Advanced Molecular Detection (AMD) of hepatitis C outbreaks pipeline to the Amazon Web Services (AWS) cloud. This would make it available to public health laboratories, enabling them to identify outbreaks by uploading viral sequences using an online tool provided by CDC. Pathogen outbreaks usually occur in bursts, with calm periods of inactivity followed by frantic emergencies with sudden needs of great Laboratory and computational capabilities. This behavior fits perfectly the cloud capabilities, where a fast response to public health laboratories could be achieved by applying the pipeline in parallel, while reducing infrastructure and maintenance costs.

### Results:

- Improves CDC capability to efficiently detect outbreaks of hepatitis C using Next Generation Sequencing (NGS) and novel computational tools and rapidly respond to outbreaks, enabling fast identification of transmission clusters and coordination among public health laboratories.
- Global Hepatitis Outbreak Surveillance Technology (GHOST) software tools scaled to use AWS elastic compute cloud, simple queueing service, simple storage service, and grid engine.

### More Info:



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- [View Full Project Description.](#)
- [View Project Presentation from August 16 Forum.](#)

#### **4. Exploring Practice-Level Analytic Solutions for Smaller Health Care Practices that Support Population Level Analytics (NCCDPHP)**

Presenters: Hilary Wall, MPH, Jim Jellison

Purpose: Through this initiative, we are actively working with clinicians to implement evidence-based strategies for improving cardiovascular disease prevention. One of those strategies is using regular (i.e. biweekly or monthly) data to drive performance improvement.

Results:

- Inventory 10 population health management software solutions for clinical settings without access to a clinical data warehouse
- Evaluate the solutions against to-be-established criteria that reflect needs of both clinicians and public health (see example software evaluation criteria below), and
- Developed recommendations for future projects that are needed to address gaps in the data flow from patient visit to clinical quality improvement to public health surveillance.

More Info:

- [View Full Project Description.](#)
- [View Project Presentation from May 17 Forum.](#)

#### **5. Development of Data Technical Standards and Gap Analysis and for the Paul Coverdell National Acute Stroke Registry 30 Day Follow-Up Data (NCCDPHP)**

Presenters: Sallyann Coleman King, MD, MSc, Jason Bonander

Purpose: Complete evaluation and gap analysis of the current data collection tools being utilized in several of the Coverdell funded states

Results:

- Facilitate the creation and implementation of useful quality improvement interventions which will directly impact patient readmissions and outcomes.
- Provide language for state grantees that would help ensure accountability of agency funding and improve the quality of our 30 day surveillance data.
- Offer common, inexpensive, easy to use, secure tool that states could adopt to collect post-hospital data through Epi-Info 7
- Assure there are clear and common expectations for data needs as well as provide specifications for the collection of secure patient-level data that can be linked to existing hospital data.

More Info:

- [View Full Project Description.](#)
- [View Project Presentation from February 25 Forum.](#)

#### **6. Dietary Supplement Imaging in the National Health and Nutrition Examination Survey (NCHS)**

Presenters: Jerry Del Rosso, MPH, Jaime Gahche, BSEE



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Purpose: Explore the use of digital imaging technology to capture supplement container information in a set of photographic images for dietary supplement use in the National Health and Nutrition Examination Survey (NHANES).

### Results:

- Digital imaging with optical character recognition will replace manual data entry by NHANES interviewers, reduce data errors and reduce the time it takes to interview at the point of data collection.
- Completed proof-of-concept user study using new IPEVO Ziggi-HD Plus and Meditory RXLabelReader devices
- This technology could be adapted to other CDC surveys and surveillance activities that collect data from containers (supplements, prescription drug, etc.) and may be useful in other CDC settings and in outbreak investigations. If the project is successful, the application can be pilot tested in NHANES in 2015.

### More Info:

- [View Full Project Description.](#)
- [View Project Presentation from February 25 Forum.](#)

In addition, two innovative projects that did not receive funding shared the results and plans for their projects:

#### 1. **DevOps: The Secret Sauce for Building Forward Looking Software (CSELS\DHIS)**

Presenter: Jim Nasr

Description: To build forward looking software at DHIS utilizing APIs and supporting DevOps as critical success factors. Use of micro-services within public health improves productivity to create interoperable, domain-driven, loosely coupled, test-driven and resilient software

### More Info:

- [View Project Presentation from August 16 Forum.](#)

#### 2. **Cloud Based Scalable Clinical Decision Support (CDS): A Case Study (NCHHSTP)**

Presenter: Ninad Mishra, MD, MS

Description: Presents the cloud computing technical infrastructure of a clinical decision support service and showcases the integration of computerized logic in EMR systems resulting in a CDS intervention.

### More Info:

- [View Project Presentation from May 17 Forum.](#)



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### CHIIC Advisory Group

The advisory group consists of informaticians and public health practitioners from CDC centers, institutes and offices with subject matter expertise in public health surveillance, informatics and cross-cutting policy concern. The advisory group reviews and provides insight for CHIIC focus areas, identify potential projects and review project award criteria and project output. The group composition was selected based on input from the CDC Surveillance Leadership Board (SLB).

Over the past couple of years the advisory group members have contributed to the process of establishing annual priority areas for the CHIIC project portfolio, made recommendations for awarded projects, attended brainstorming sessions with project teams, and much more. We appreciate the dedication of each member. The members include:

**Barry Rhodes, PhD** Computer Scientist, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)

**Tom Savel, MD** Director, Informatics Innovation Unit, Center for Surveillance, Epidemiology and Laboratory Services (CSELS)

**Cyrus Shahpar, MD** Medical Officer, Center for Global Health (CGH)

**Thom Sukalac**, Associate Director for Informatics, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP)

Special thanks to Dr. Rhodes who retired this year from civil service. His insight and guidance as part of the advisory group and mentor to many innovative projects had great impact on the consortium and to public health surveillance.

### Visit the CHIIC web site to

- [Learn more about proposed and awarded projects](#)
- [View upcoming forum dates](#)
- [Join the CHIIC listserv](#)

Internet site: <http://www.cdc.gov/ophs/chiic/>

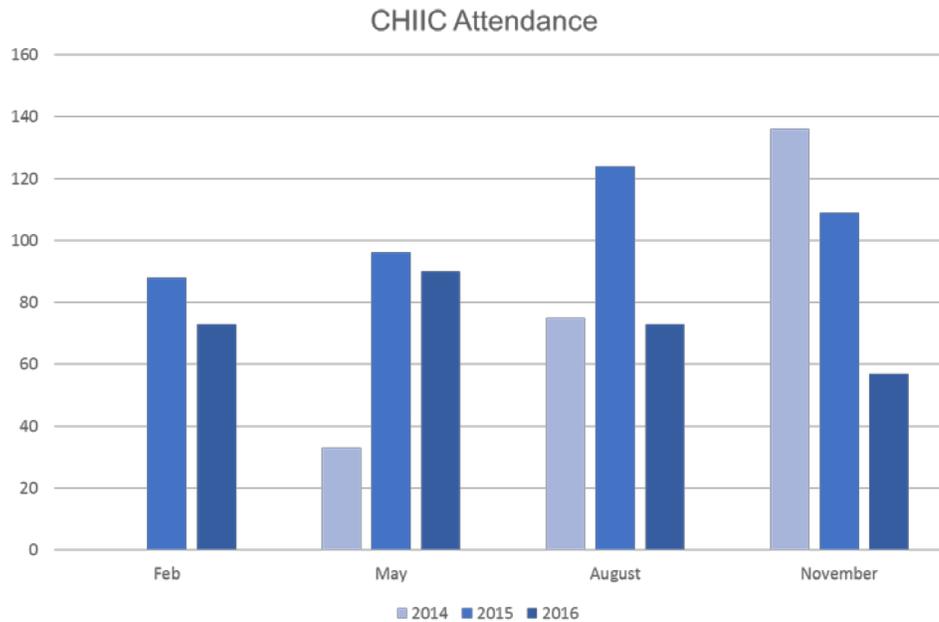


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## Appendix

### *2014- 2016 Attendance*

CHIIC held its kick off forum on May 13, 2014. To date, CHIIC has held 11 forums with a total of 1088 attendees. See graph below for an attendance breakdown.



### *Proposals*

In 2016, CHIIC received 22 proposals for ideas from across CDC programs and awarded 2 projects:

Center		
CGH	3	
NCEZID	1	
NCHHSTP	3	1
NCIRD	1	
NCBDDD	3	
NCCDPHP	6	1
NCIPC	1	
NCEH/ATSDR	2	
NCHS	2	



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### *Communication channels*

CHIIC's project proposals and quarterly forums are promoted through the following communication channels:

1. CDC Today announcements
2. CHIIC Internet site, <http://www.cdc.gov/ophss/chiic/>
3. CHIIC Intranet site (Internal to CDC only), <http://intranet.cdc.gov/ophss/chiic/>
4. CHIIC Listserv, [CDCL-CHIIC@LISTSERV.CDC.GOV](mailto:CDCL-CHIIC@LISTSERV.CDC.GOV)
5. Connects article (optional, post presentation)
6. Calendar invitation sent out through Outlook
7. OPHSS lobby monitor ( CDC Atlanta, Century Center campus, building 2500)
8. Posters and flyers
9. PhConnect (Note: this site was shut down on December 31, 2016 after 6 years of servicing the public health community. We transitioned the information from this site to the CHIIC Internet site.)

### *CHIIC Staff*



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### *Glossary*

<b>API</b>	Application Programming Interface
<b>CDS</b>	Clinical Decision Support
<b>CGH</b>	Center for Global Health
<b>CHIC</b>	CDC Health Information Innovation Consortium
<b>CIOs</b>	CDC Centers, Institutes, and Offices
<b>CSELS</b>	Center for Surveillance, Epidemiology, and Laboratory Services
<b>DEO</b>	Division of Emergency Operations
<b>DGHA</b>	Division of Global HIV/AIDS
<b>DGHP</b>	Division of Global Health Protection
<b>DHIS</b>	Division of Health Informatics and Surveillance
<b>DHQP</b>	Division of Healthcare Quality Promotion
<b>DPDM</b>	Division of Parasitic Diseases and Malaria
<b>DSHEFS</b>	Division of Surveillance, Hazard Evaluations, and Field Studies
<b>EHDI</b>	Early Hearing Detection & Intervention Interoperability
<b>EMR</b>	Electronic Medical Record
<b>EHR</b>	Electronic Health Record
<b>EIP WS</b>	Emerging Infection Program Web Service
<b>FOOD</b>	Foodborne Outbreak Online Database
<b>HAIs</b>	Healthcare-Associated Infections
<b>HHS</b>	Health and Human Services
<b>ITSO</b>	Information Technology Services Office
<b>NARMS</b>	National Antimicrobial Resistance Monitoring System



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<b>NCBDDD</b>	National Center on Birth Defects and Developmental Disabilities
<b>NCCDPHP</b>	National Center for Chronic Disease Prevention and Health Promotion
<b>NCEH/ATSDR</b>	National Center for Environmental Health / Agency for Toxic Substances and Disease Registry
<b>NCEZID</b>	National Center for Emerging and Zoonotic Infectious Diseases
<b>NCHHSTP</b>	National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
<b>NCHS</b>	National Center for Health Statistics
<b>NCIPC</b>	National Center for Injury Prevention and Control
<b>NCIRD</b>	National Center for Immunization and Respiratory Diseases
<b>NIOSH</b>	National Institute for Occupational Safety and Health
<b>OADP</b>	Office of the Associate Director for Policy
<b>OADS</b>	Office of the Associate Director for Science
<b>OCIO</b>	Office of the Chief Information Officer
<b>OCOO</b>	Office of the Chief Operating Officer
<b>OID</b>	Office of Infectious Diseases
<b>ONDIEH</b>	Office of Noncommunicable Diseases, Injury, and Environmental Health
<b>OPHPR</b>	Office of Public Health Preparedness and Response
<b>OPHSS</b>	Office of Public Health Scientific Services
<b>OSTLTS</b>	Office for State, Tribal, Local, and Territorial Support
<b>PHII</b>	Public Health Informatics Institute
<b>SLB</b>	Surveillance Leadership Board
<b>STLT</b>	State, Tribal, Local, and Territorial
<b>VAE</b>	Ventilator Associated Event