



# The National Collaborative for Bio-Preparedness

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A Collaborative Agreement between the DHS Office of Health Affairs,  
National Biosurveillance Integration Center and  
the School of Medicine, University of North Carolina at Chapel Hill

## ***Improve National Preparedness: Surveillance, Detection and Response***

- Create a national network of data owners to detect changing conditions in the biosphere
- Provide the earliest possible warning to decision makers at all levels of government and private sector critical infrastructure
- Provide a collaborative tool for communication and simultaneous situational awareness



- **Objective:** *Create a national network of data owners, facilitated by a user-directed tool that is:*
  - Responsive to business needs of the data owners;
  - Available 24/7/365, stable, cross-platform capable;
  - Secure and HIPAA compliant; and
  - Scalable to a national footprint with multiple data types.
- **NCBP Competitive Value Proposition:**
  - A geographically diverse group of data contributors representing multiple sectors of the biosphere;
  - Custom analytics for to meet the business needs of multiple user types;
  - Data visualization capabilities; and
  - A collaborative common operational picture for data contributors, government users and commercial partners.

- **Phase 1 (FY11) – Research Phase**
  - Technology foundation
  - Organizational connections
  - Set analytic requirements
- **Phase 2 (FY12) – Prototype Development**
  - Designed and deployed visualization and analytic tools
  - Demonstrated rapid recognition with real-time data feeds
  - Explored use in other states
- **Phase 3 (FY13) – Operational Field Testing**
  - Demonstrated a model that could be scaled and implemented in other states nationwide.
  - Tested live with actual data (manipulated to cluster in time and space)
- **Phase 4 (FY14) – Move to Open Source Architecture**
  - Scalable, extensible, inexpensive
  - Driven by user stories to meet business needs of users and data owners
  - Demonstrated value of free-text analytics
- **Phase 5 (FY15) – Move to cross-platform architecture and improved analytics**
  - Rearchitected UI to HTML5
  - Expansion of geographic areas
  - Ingestion and analysis of additional data types
  - Improvement of analytics – text and categorical

# TRAJECTORY



Where we are now...	Near-term outlook...	In the end...
<ul style="list-style-type: none"><li>• System capabilities attracting new participants;</li><li>• Architecture supporting multiple platforms;</li><li>• Infinitely extensible</li><li>• Expanding geographic footprint;</li><li>• User requirements driving feature development; and</li><li>• Fully secure and HIPAA compliant.</li></ul>	<ul style="list-style-type: none"><li>• Phase 5 system to Go Live in June;</li><li>• Improving analytics for syndromic event warning;</li><li>• Expanding geography; and</li><li>• Adding additional data types.</li></ul>	<ul style="list-style-type: none"><li>• A national network of observers conferring insights valuable to the government and private sector;</li><li>• Analytics providing users with timely, targeted signals to abnormal biospheric conditions;</li><li>• Alerts improving local and national biodefense surveillance; and</li><li>• Providing real-time intelligence to support decision making.</li></ul>





## • Architecture

- Open architecture
- Usable on any platform
- Secure, HIPAA compliant
- User role-specific data access
- Data loaded daily with analytics routines for near-real-time awareness

## • Data Availability

- EMS (De-identified NEMESIS-compliant records)
- Poison Control encounters
- SMARTT Hospital Bed Availability Data
- Homeland Security Critical Infrastructure mapping
- Acute febrile illnesses in South American country (*in process*)

# USE CASE: DETECTION AND MONITORING



## Ebola-like Syndrome or Zika

User Story – “As a public health official, I need to detect and monitor encounters with patients that may have emerging ID to support interventional response.”

## NCBP Use Case

- User-defined symptom search, specific to any syndrome, including travel history
- Real time information sharing and collaboration with local, state, and federal users
- Customizable signals for any syndrome definable by data in the record

The screenshot shows the NCBP web application interface. On the left is a navigation sidebar with 'Dashboard', 'Profile', 'Help', and 'HIPAA notification'. The main content area is titled 'The National Collaborative For Bio-Preparedness' and includes a 'Log out' link. A search filter for 'Symptom Groups' is active. The 'Symptom Group Management' panel shows a list of groups: 'Constitutional' (SYSTEM), 'Constitutional(Copy)' (USER\_DEFINED), 'Environmental Hypoemia' (USER\_DEFINED), 'Food-borne illness' (SYSTEM), and 'Gastrointestinal Sensitive' (SYSTEM). A 'Save' button is at the bottom. Below this, the 'Signal Details' section contains two tables. The first table lists signals by Syndrome, Location, and Date. The second table lists signals by Source, Location, and Date.

Syndrome	Location	Date
> Gastrointestinal Sensitive	NC - BUNCOMBE	March 1, 2016
> Gastrointestinal Sensitive	NC - BUNCOMBE	March 1, 2016
> Constitutional	NC - BUNCOMBE	March 1, 2016

Source	Location	Date
> EMS	SC - SPARTANBURG	Mar 31, 2016 10:02:00 PM
> CPC	NC - CATAWBA	Mar 31, 2016 5:52:25 AM
> CPC	NC - CRAVEN	Mar 31, 2016 4:43:03 AM

The screenshot shows a map interface with a popup window for an EMS incident. The popup is titled 'EMS | AGUACATAL (1 of 2)' and contains the following information: 'April 30, 2016', 'B349 INFECCION VIRAL, NO ESPECIFICADA', 'IPS: HOSPITAL BASICO CAÑAVERALEJO', 'DOCTOR: JUAN CAMILO LONDOÑO', 'Type of Work: AMA DE CASA', and 'Address: C 280 # 46 A -0'. The ID 'ID:57275dd5575eba01568c00c1' is also visible. The map shows a location in Aguacatal, Mexico, with various landmarks and roads labeled. A 'Toggle Clustering' button is at the bottom left of the map area.

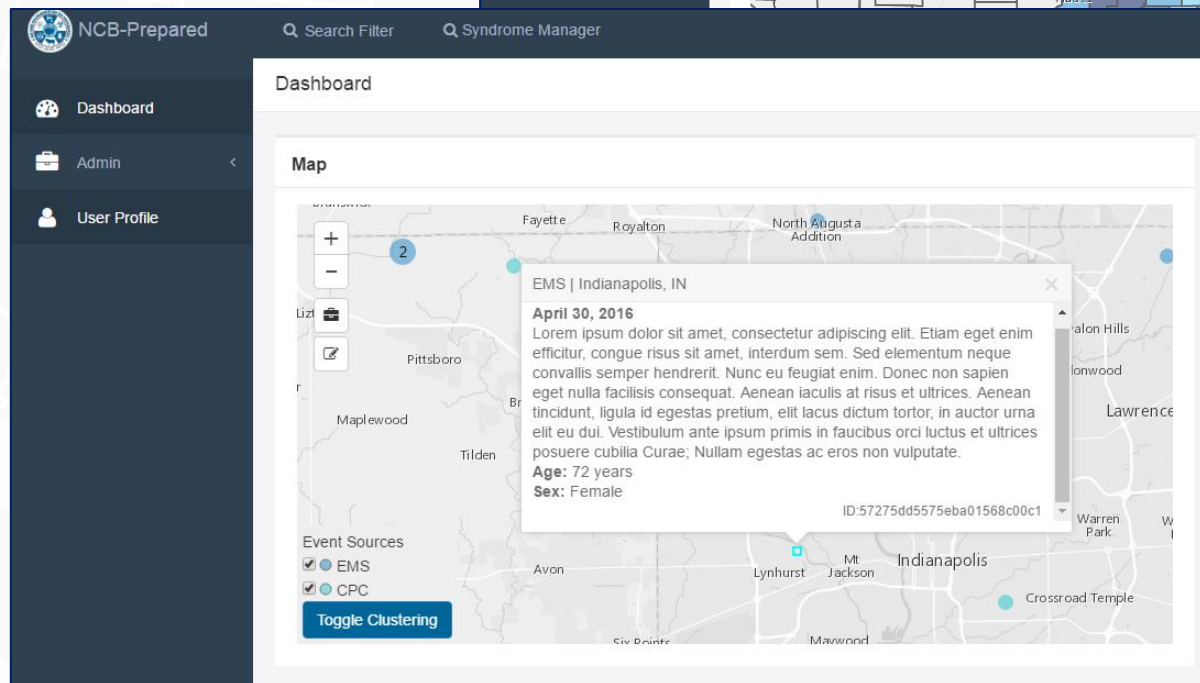
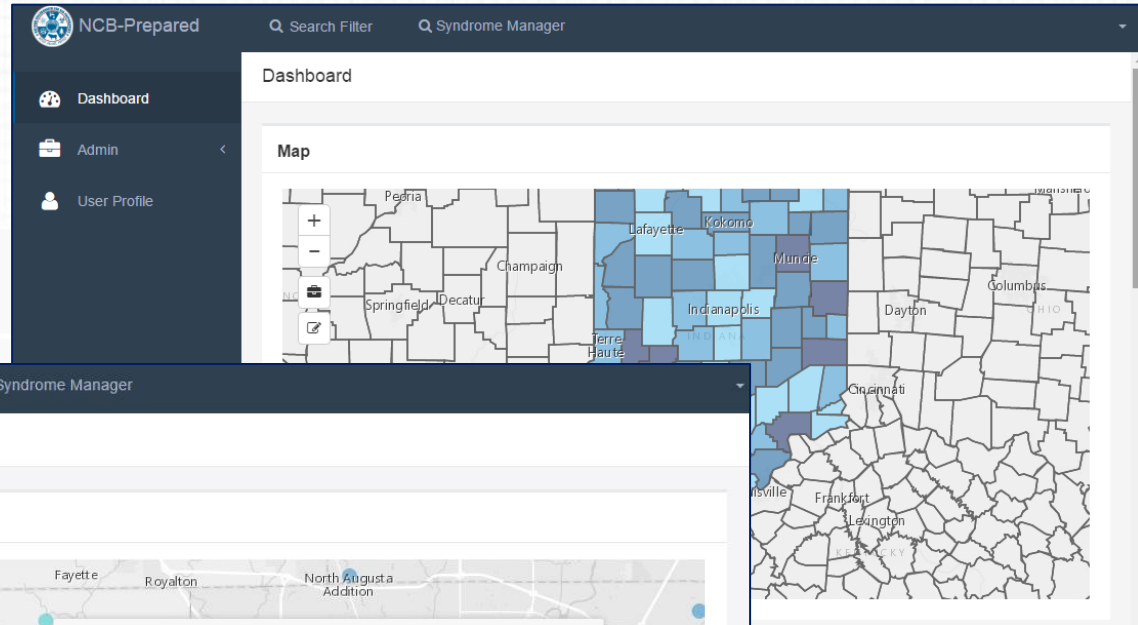


# USE CASE: ALERTING CAPABILITY



## USER-DEFINED SIGNALS

- Select your signal type
- Select your signal source
- Select your signal syndrome
- Limit by date range
- Limit by geography
- Filter by text in the narrative





# USE CASE: SEARCH CAPABILITY



## USER-DEFINED SEARCHING

- Select your data source
- Select your symptoms
  - Place thresholds if necessary
- Select your geography
- Limit by demographics if necessary
- Select your date range
- Add any specific terms in Boolean text field
- **Execute search!**

**Search Filters**

Date Range: 02/29/2016 00:00 03/31/2016 23:59 Filter Side Panel

States: States...

Counties: Counties...

Signal Type: Signal Types...

Sources: Sources...

Syndromes: Syndromes...

Symptoms: Symptoms...

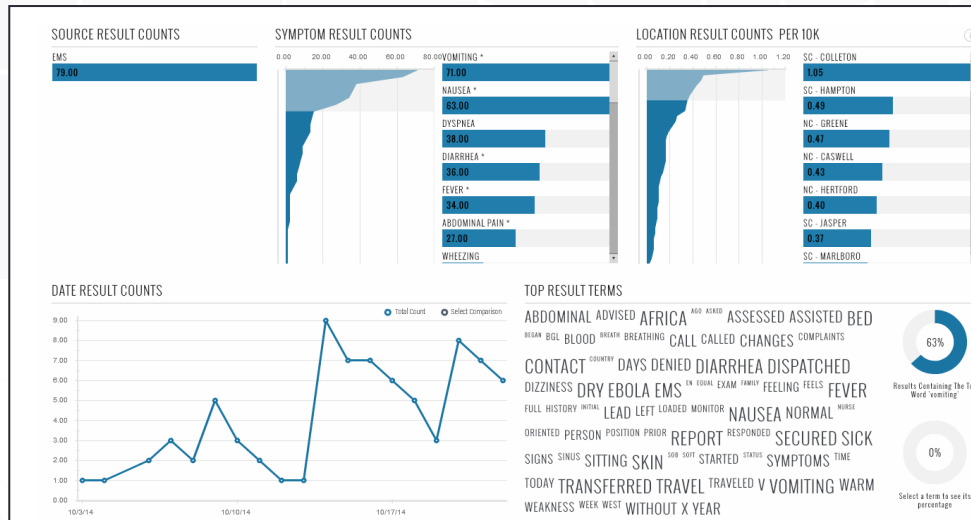
Age Range: None None

Genders: Genders...

Races: Races...

Ethnicity: Ethnicities...

Text Search:



# UPCOMING VALUE IMPROVEMENT



- Growth of collaborators/data owners
- Additional data sets that confer insights for event detection and characterization
- Analytic enhancements toward predictions and business optimization

