National Collaborative for Bio-Preparedness

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Disclosures

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Opportunities in Emergency Care:

Timing, severity and acuity of disease and treatment
Benefits of Lytic Therapy are Time Dependent
Mortality reduction versus treatment delay

Randomized trials of rtPA for Ischemic Stroke

Goldstein L B Circulation 2007;116:1504-1514

Copyright © American Heart Association
Emergency Care Regionalization

Right Care at Right Place at Right Time
North Carolina – Heart Disease Death Rates
Total population, Ages 35+, 2000-2006

Source: CDC, 2011
Reperfusion of Acute Myocardial Infarction in North Carolina Emergency Departments (RACE)

RACE Hospitals by PCI and Reperfusion Designation

- Primary PCI (21)
- Transfer for Primary PCI (52)
- Lytics (31)
- Mixed (15) (primary PCI if transport readily available)

Assessment of Temporal Trends in Mortality With Implementation of a Statewide ST-Segment Elevation Myocardial Infarction (STEMI) Regionalization Program

Seth W. Glickman, MD, MBA, Melissa A. Greiner, MS, Li Lin, MS, Lesley H. Curtis, PhD, Charles B. Cairns, MD, Christopher B. Granger, MD, Eric D. Peterson, MD, MPH

All ages – RACE vs non-RACE

Medicare– RACE vs non-RACE

NQF Regionalization of Emergency Care

Episode of Care: Acute Myocardial Infarction

Examples:
- Presence of a Regional STEMI destination with cath lab and ICU
- Presence of EMS Triage and Destination Protocols for STEMI
- Presence of Communication Technology for use between EMS, ED, Cardiology

PHASE 1

Examples:
- Identification of STEMI by EMS Personnel
- Care Process Measures
- Timeliness Measures
- EMS - ED - Cath Lab Communication
- Standards of care and specialty care coordination

PHASE 2

Examples:
- Post PCI ICU care
- Care Coordination measures
- Communication between providers

PHASE 3

Feedback:
- Ensure closed loop communication such that the system learns from itself
- Ensure that data informs the system in order to facilitate system improvement as well as prevention of further episodes.

End of Episode
Evaluation of Patient-Oriented Outcomes:
- Neurologically Intact Survival to Discharge
- Functional Status

Clinical Episode Begins: Patient has symptoms, calls 911

Appropriate Times Throughout Episode
- Assessment of Patient Oriented intermediate outcomes, if valid to evaluate the performance of the system.
- Ensure measurement of transitions between units of service
- Emphasize appropriate measurement to facilitate comparison across similar regionalized systems in different organizations
Every minute counts when public health is at risk.

Federal and state agencies recognize the urgent need to accurately detect and rapidly analyze biological hazards to ensure public health and safety.

National Collaborative for Bio-Preparedness (NCB-Prepared) responds to this need with a comprehensive system that both improves surveillance, awareness and responsiveness to emergent threats, and supports better care and health outcomes for all Americans.

Bio-security depends on bio-preparedness.

http://www.ncb-prepared.org
NCB-P Project Goals

- Earlier recognition of outbreaks
- Augment bio-surveillance
- Improve situational awareness
- Better inform decision makers
- Provide insight into the quality of care and management systems.
Interventional vs. Investigational Approach

Typical Bio-surveillance = *investigational*

NCB-P Bio-Preparedness = *interventional*

*Intervention* involves *action*.

*Action* must be *timely* to be *effective*. 
Across Data and Time

Data Generated by the Incident

- Poison Data
- EMS Data
- Google Flu
- 911 Data
- ED Data
- Food Safety
- ED Data

Analytics & Visualization

Daily

- NBIC Feeds
- ProMED
- SMARTT

Periodic

- Healthcare Infrastructure
- Flood Plain

Visualization
Health Data Timeliness

Time from Event

- Minutes
- Hours
- Days
- Weeks
- Months
- Weeks
- Days
- Hours
- Minutes

Time to Data Availability

- Federal
- State
- Local

- 911 Data
- CPC Data
- EMS Data
- ED Data
- Lab Data
- Hospital Data

1 to 22 hours
24 hours to months to years
Analytics

Reactive vs. Proactive

What happened?

What happened?

How many, how often, where?

Where exactly is the problem?

What actions are needed?

What will happen next?

What if these trends continue?

What’s the best that can happen?

Degree of Intelligence

Existing process

Current NCBP

NCBP 3 Year Goal

Situational Awareness

Alerts

Query Drilldown

Ad hoc Reports

Std. Reports

Statistical Analysis

Predictive Modeling

Optimization

Analytics

Reactive vs. Proactive
**NCB-P combines data collection, analytics, and visualization capabilities to create user-specific insights for decision makers.**

<table>
<thead>
<tr>
<th>Data Source Type</th>
<th>Geographic Scope and/or Entities Contributing</th>
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<tbody>
<tr>
<td>EMS</td>
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<tr>
<td>9-1-1</td>
<td>State-wide NC, all counties</td>
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<td>Poison Center Food Safety Calls</td>
<td>National</td>
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<td>SMARTT</td>
<td>South Carolina</td>
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<td>ProMED-mail</td>
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<td>Critical Healthcare Infrastructure</td>
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<td>Google Flu</td>
<td>National</td>
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<tr>
<td>Population Characteristics</td>
<td>National</td>
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Influenza 2012-2013: A Successful Prediction

- NCB-P demonstrated success predicting the 2012-2013 flu season
- On September 1, 2012, NCB-P alerts revealed a rising concern about the flu after analyzing unusual activity with Google Flu Search Data
- On September 23, 2012 a TAP alert was generated in North Carolina from EMS data and reported to NBIC
- On December 3, 2012, the CDC released a flu warning
- NCB-P was able to predict the flu outbreak 90 days before CDC alert
H7N9: The next pandemic flu?

United States
Critical Illness and Injury Trials Group
Program for Emergency Preparedness
(USCIITG-PREP)

Blum et al, Chest 2013