National Homeland Security
Knowledge Management/Information Brokerage System

“The Cosmos of Knowledge”
**DOD Network-Centric Warfare**

NCW focuses on using computers, high speed data links, and networking software to link military personnel, platforms, and formations into highly integrated local and wide-area networks. Within these networks, personnel will share large amounts of critical information on a rapid and continuous basis. DOD believes that NCW will dramatically improve combat capability and efficiency.

**DHSS Network-Centric Health Emergency Response**

NCHER focuses on using computers, high speed data links, local social networks and networking software and processes to link health emergency preparedness and response personnel, resources, platforms, systems and communities into highly integrated local and wide-area electronic and social networks. Within these networks, personnel will share large amounts of critical information on a rapid and continuous basis, assess system needs, and provide, coordinate and manage the resources and intelligence necessary for a multi-faceted response to a community threat. DHSS believes that NCHER will dramatically improve public health and healthcare delivery response capability and efficiency.
Hippocrates High Level Architecture (HLA)

Development of an enabling system that unifies multi-jurisdictional private, public and philanthropic sectors through knowledge management/information brokerage in support of homeland security, community resiliency, and continuity of society.

This system will support:

> System Analysis and Assessment

> Resource Management

> Information Brokerage (Relevant and Irrelevant)
Hippocrates HLA
Knowledge Management and Information Brokerage

Cosmos of Knowledge

Data storage and grouping

Clouds

Data movement and sharing

Internet

Non-integrated silo data

Black Holes

Coordinated resource sharing and problem solving in dynamic, multi-institutional virtual organizations*

Information Grids

**“The Anatomy of the Grid,” Foster, Kesselman, Tuecke, 2000**
What is Hippocrates?

- A high level architecture data collection, integration, display, analysis and knowledge management/information brokerage system

- Web-based application suite developed and owned by the NJ Department of Health & Senior Services

- The software backbone for New Jersey’s network centric health emergency preparedness and response network

- A component of the all-hazards knowledge management/information brokerage system among public and private homeland security partners that supports continuity of society operations
Dynamic and Static Data Integration & Brokerage

HEALTH LAYERS
- Advanced and Basic Life Support
- Acute and Non-Acute Care Hospitals
- Points of Distribution
- Blood Banks
- RSS Medical Stockpile Locations
- Health Departments
- Hospitals from Surrounding States
- Long Term Care
- Command Centers

BASE MAP LAYERS
- Schools
- Utilities
- Roads
- Municipalities
- Counties
- Surrounding State Counties

REAL-TIME DATA
- Incidents
- Events
- Weather/Traffic
- Medical Stockpile
- SitStat Surveys
- Hospital Divert Status
- Ambulance Locations
Current Hippocrates Users

- NJ Department of Health & Senior Services
- State Health Command Center (HCC)
- Regional Medical Coordination Centers (MCCs)
- Acute Care Facilities & Healthcare Systems
- LINCS Agencies (County/City Health Departments)
- NJ State Police (e.g. RIOC/State Emergency Operations Ctr)
- Federal Agencies (e.g. USDHHS Region II/HHS/DHS)
- External Partners (e.g. New Jersey Hospital Association)
Developing a National Knowledge Management/Information Brokerage (KM/IB) High Level Architecture (HLA)

Two Parallel and Coordinated Projects

Hippocrates High Level Architecture

- Demonstrate HLA pilot through use of an existing, in-production health KM/IB system
- Focus on Health Emergency Preparedness Data Exchange and Display (incident, hospital diversion, HavBED)
- Provide linkage to National Data Fusion Centers
- Serve as a pilot for a national Health Information Technology HLA

Data Standards

- Develop or expand data standards for health emergency preparedness data exchange
- Serve as building block for overarching HIT data exchange
- Develop an implementation plan for national HIT standards
Developing a **National Knowledge Management/Information Brokerage (KM/IB)**

**High Level Architecture (HLA)**

*Why This is Achievable*

- Consistent with national objectives and local desires (HSPD, PAHPSA)
- Data exchange based on standards
- Existing partners and supporting organizations include:
  - Federal: HHS, DHS, CDC, DoD
  - State: NJ, NY, FL, CA, AL, WA
  - Other: Washington DC, NYC
  - Private Sector: ESRI+
- Focused product
- HLA fills gap but is permissive of existing efforts
- HLA is supportive of existing organizational structures (FEMA/REC Regions) and responsibilities (Federal and State)
Federal Health Emergency Preparedness and Response
Roles, Responsibilities, and Capabilities

Observations and Assumptions

Organization

<table>
<thead>
<tr>
<th>NOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DoD</td>
</tr>
</tbody>
</table>

Function

- Title 10 Operations
- Federal/State/Local
- Augment
- Natl Guard Support

- Intelligence and Health Data Fusion
- Inter-agency Response Coordination
- Critical Infrastructure Coordination

- Public Health Preparedness
  and Response
- Bio and Disease surveillance

- Healthcare and Healthcare Delivery
- System Preparedness and Response
- Healthcare system readiness
- Health Response Fusion

Enablers

- Title 10 Forces
- C4ISR
- JTF
- Hospital Ships
- MASH
- Transcom
- Northcom
- AFMIC

- Fusion Centers
- NBIC
- MMRS
- NBA
- FEMA
- EMAC*
- BDS
- BioWatch

- HAN
- LRN
- DIOC
- SNS
- USPHS
- MMWR
- Epi-X
- Epi Service

- HavBed
- ECC
- SOC
- USPHS
- FMC
- ERT
- REC
- DMAT/DMORT/VMAT
National Data Management/Information Brokerage
NEPIS – National Emergency Preparedness Information System

Data Broker
National Server
Resource Management

- External influences
- Resources and Resource Databases
- HLA KM and IB
- Needs
- Processes (e.g. EMAC)
Incident information is shared with national server in other regions, fusion centers, local health depts, etc.

ORIGINATOR CONTROLS INFORMATION
Hippocrates National Network

Regional Incident: White powder incident in New Jersey

Local incident promoted to state incident

REGION VIII

Another white powder incident in New Jersey

Nearby hospital goes on divert

HAvBED data for diverted hospital

Colorado and New Jersey share incidents with the national server

HAvBED data for Region III

Regional View

1.5% of hospitals are on Divert-Full/Total [15:02:14 - 04/07/09] [13:17:14 - 04/07/09] 1.2% of hospitals are on Divert-Full/Total

Available Beds

- Adult ICU: 402
- Medical/Surgical: 1861
- Burn: 20
- Pediatric ICU: 182
- Pediatrics: 428
- Psychiatric: 398
- Airborne Infection Isolation: 404
- Operating Rooms: 612

Other Capabilities

- Mass Decontamination: 220
- Ventilators: 2826
Composite View

- **Incident**
- **Operational**
  - Hospital on Divert
  - DMAT (GPS)
  - Air Ambulance (GPS)
- **Command & Control**
  - EMS TF Cmd (GPS)
  - HHS ERT
- **Equipment**
  - Field Medical Stations

**Disease Outbreak**

- Possible
- Probable
- Confirmed

**LRN Location**

**SNS Sites**

**NJ HA vBED Data**

<table>
<thead>
<tr>
<th>Category</th>
<th>Available Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult ICU</td>
<td>170</td>
</tr>
<tr>
<td>Medical/Surgical</td>
<td>1050</td>
</tr>
<tr>
<td>Burn</td>
<td>14</td>
</tr>
<tr>
<td>Pediatric ICU</td>
<td>68</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>117</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>252</td>
</tr>
<tr>
<td>Airline Infection Isolation</td>
<td>226</td>
</tr>
<tr>
<td>Operating Rooms</td>
<td>240</td>
</tr>
</tbody>
</table>

**Other Capabilities**

- Mass Decontamination: 117
- Ventilators: 1287

**Law Enforcement Operations**

- **JFO**
- **FEMA/JFO**
- **USPS BDS**

**Inception – Chemical agent**

**National Guard Armories**

**WMD CST**

**DoD Medical Operations**

**FEMA/JFO**

**USPS BDS**

**LRN Location**

**SNS Sites**
DHS View

⚠️ Incident – Positive Biowatch Indicator
DHS View

- Incident – **Positive Biowatch Indicator**

Inter-Agency Coordination

- Law Enforcement Operations
- JFO
- FEMA/JFO
- USPS BDS
HHS ASPR View

- Incident

Operational
- Hospital on Divert
- DMAT (GPS)
- Air Ambulance (GPS)

Command & Control
- EMS TF Cmd (GPS)
- HHS ERT

Equipment
- Field Medical Stations

NJ HAvBED Data

<table>
<thead>
<tr>
<th>Available beds</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult ICU</td>
<td>170</td>
</tr>
<tr>
<td>Medical/Surgical</td>
<td>1010</td>
</tr>
<tr>
<td>Burn</td>
<td>14</td>
</tr>
<tr>
<td>Pediatric ICU</td>
<td>68</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>117</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>252</td>
</tr>
<tr>
<td>Airborne Infection Isolation</td>
<td>225</td>
</tr>
<tr>
<td>Operating Rooms</td>
<td>248</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Capabilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass Decontamination</td>
<td>117</td>
</tr>
<tr>
<td>Ventilators</td>
<td>1297</td>
</tr>
</tbody>
</table>
CDC View

*Disease Outbreak*

- Possible
- Probable
- Confirmed

- LRN Location
- SNS Sites
DoD View

- Incident – *Chemical agent*
- National Guard Armories
- WMD CST
- DoD Medical Operations
Proposed Critical Infrastructure Module

Critical Infrastructure
North Jersey Gas & Electric
Power Grid #18 (14.7 GW)
Status: OUT

CI Facilities in Grid
Acute-care Hospitals: 3
Fire Stations: 4
Police Stations: 3
Pharma Mfrs: XYZ Pharmaceuticals
Incident/Critical Infrastructure Correlations
Hippocrates During H1N1