Biosurveillance Defined

“The term “biosurveillance” means the process of data-gathering with appropriate analysis and interpretation of biosphere data that might relate to disease activity and threats to human or animal health – whether infectious, toxic, metabolic, or otherwise, and regardless of intentional or natural origin – in order to achieve early warning of health threats, early detection of health events, and overall situational awareness of disease activity.” (HSPD-21)
Continuum of Biosurveillance

Integrated Global Biosurveillance and Situational Awareness

- Global Epidemiology and Infectious Disease Awareness
- Environmental / Passive Monitoring
- Active Surveillance
- Diagnostics/Pathogen Characterization
- Therapeutics

Identify, Reduce, and Respond to Bio Threats, Global Epidemics, Pandemics .... And Ensure Mission Readiness
Biosurveillance: Global Approach

* This graphic is a representative example and may not be exhaustive

**In-Reach**
Coordinating integration across the DoD spectrum

**Out-Reach**
Establishing interagency and international partnerships to leverage global assets
JPEO-CBD Biosurveillance Trail Boss

Roles

• Biosurveillance Trail Boss is the lead for identifying and integrating next-generation and existing JPEO-CBD programs/capabilities that are relevant to supporting national Biosurveillance strategies as defined in Homeland Security Presidential Directive 21

• CBMS includes the JPM Biosurveillance (Provisional) Office which executes Trail Boss activities and brings together key BSV programs under one leadership (ex. Diagnostics, CRP)

Responsibility

• The overall goal of the Biosurveillance Trail Boss is to integrate the JPEO-CBD core competencies across internal and external stakeholders to achieve strategic goals

JPEO-CBD’s mission is to, “Provide Research, Development, Acquisition Fielding and Life-Cycle Support of Chemical, Biological, Radiological and Nuclear Defense Equipment, Medical Countermeasures and Installation and Force Protection Integrated Capabilities Supporting the National Strategies.”
HSPD-21 Biosurveillance

Situational Awareness of Disease Activity

Early Warning of Health Threats

Early Detection of Health Events

Biosurveillance

Medical Analysis, Epidemiology, & Diagnostics

Hostile Event

Human, Veterinary, & Plant Surveillance

Data Management & Fusion

Environmental Surveillance & Hazard Detection

Mitigate Hazard

Biodetection

Combating Weapons of Mass Destruction

Public Health

Situational Awareness

Force Health Protection

CWMD - FHP COP

CWMD - FHP Interaction
New Efforts in Biosurveillance

*(Pre-decisional)*

**JRO Capability Areas**

- **Diagnostics (Funded FY12 POM)**
  - Provides the war-fighter with an integrated system for detection, rapid identification, and diagnostic confirmation of CBRN threats

- **Environmental Biological Surveillance (EBS)**
  - Provides Warfighter with a comprehensive and adaptive capability to detect and identify plant, animal and human pathogens in environmental sample matrices and a advanced front-end instrumentation to feed BSV tools and models.

- **Joint Biosurveillance Communications Framework (JBCF)**
  - Provides Warfighter the ability to extract and fuse CBRN medical, environmental and incident management data from sensors, diagnostic platforms and IT-systems in a robust system that can “plug and play” with networks around the world.

- **Rapid Assay Response System (RARS)**
  - Provides Warfighter with a faster, agile and more accurate diagnostic capability that will increase the speed and accuracy of a post-event diagnostic/detection response.

<table>
<thead>
<tr>
<th>As-Is</th>
<th>To-Be</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threat Specific</td>
<td>Threat Agnostic</td>
</tr>
<tr>
<td>Traditional Threats</td>
<td>Non-traditional Threats (EID/AT)</td>
</tr>
<tr>
<td>Fixed Architectures</td>
<td>Modular/ Flexible Architectures</td>
</tr>
<tr>
<td>Stand Alone Data (Med ≠ Env)</td>
<td>Fused Data (Med = Env)</td>
</tr>
<tr>
<td>Stovepipe IS (CBDP ≠ FHP/ PH)</td>
<td>Integrated IS (CBDP = FHP/ PH)</td>
</tr>
</tbody>
</table>
Materiel Solution Approach: Provide common enterprise framework for an open, standardized DISA-approved, web-based, service-oriented architecture tools for managing biological events in real-time between DOD and Non-DOD Communities.

Current Flow on Service C2 Platforms

- CBRN Non-Medical
- CBRN Medical
- External Sources
- Data Fusion & Analysis

Current Systems (JWARN/JEM)

DOD

COCOMS

- NBIC
- Public Health
- NCMI
- Health Affairs
- Other

Compliments existing approach,
Unlikely to be an increment of current programs

Early Warning Saves Lives!
Sensor Materiel Solution Approach: Emerging Concepts of Employment and threat require sensors adaptable to pre- & post-event bio events; near real-time confirmation; expandable to meet emerging and advanced threats.

Current Sensors

- Traditional Threats
- Emerging Threats
- Advanced Threats

w/ EBS

- Traditional Threats
- Emerging Threats
- Advanced Threats

✓ Dual Benefit
✓ Expanded Use
✓ Increased Information
✓ Fully Integrated

EBS will likely be a family of sensors/capabilities for a broader user set that in turn is complimented by existing sensors under certain concepts of employment envisioned in the BSV OV-1

Early Warning Saves Lives!

Current Assay Response Timeline

- **Sequencing**
- **Identification**
- **Characterization**
- **Development/Fielding**

- **Months**
  - ✓ Increased Speed & Agility
  - ✓ Optimize pathogen characterization pipelines

- **Weeks**
  - w/ RARS
    - Seq.
    - ID
    - Char.
    - Dev.

Agile response Saves Lives!
Biosurveillance

• BSV Market Survey
  – Hardware Technologies
  – Software Technologies (TBD)
• Threat Analysis/Studies
  – National Center for Medical Intelligence (NCMI)
  – JHU-APL Threat Study
• Vector Sample Prep Study
• Pre-positioned Emergency Use Authorization (EUA) Packages for Diagnostics
• Able Response Exercise
Continuum of Biosurveillance

Integrated Global Biosurveillance and Situational Awareness

Global Epidemiology and Infectious Disease Awareness
- JEM
- JWARN
- JBCF (notional)

Environmental / Passive Monitoring
- Point Detection (JPS, JBPDS)
- Standoff (JBSDS)
- Tactical (JBTDS)
- Mobile (CALS/ALS, EBS (notional))
- CRP

Active Surveillance
- CALS/ALS
- CRP
- NGDS
- EBS (notional)

Diagnostics/Pathogen Characterization
- NGDS
- TMT

Therapeutics

Identify, Reduce, and Respond to Bio Threats, Global Epidemics, Pandemics .... And Ensure Mission Readiness
Needs from Industry to Support Biosurveillance

• Indications and Warnings
  – Predictive disease modelling
  – Modelling/analysis tools
  – Understanding disease at human-animal interfaces

• Tools to surveil normal health activity
  – Vector-borne disease tracking
  – Endemic disease mapping
  – Sample characterization

• Detection/Diagnostics
  – Point of care diagnostics
  – Lightweight systems
  – Flexibility to expand targets

• Information Systems
  – Tools for data fusion
  – Medical informatics/public health expertise
  – Development of a data trust tier to facilitate data sharing across multiple COIs and models
  – Development of data intermediary capabilities to facilitate data sharing between multiple producers and consumers
Questions?