

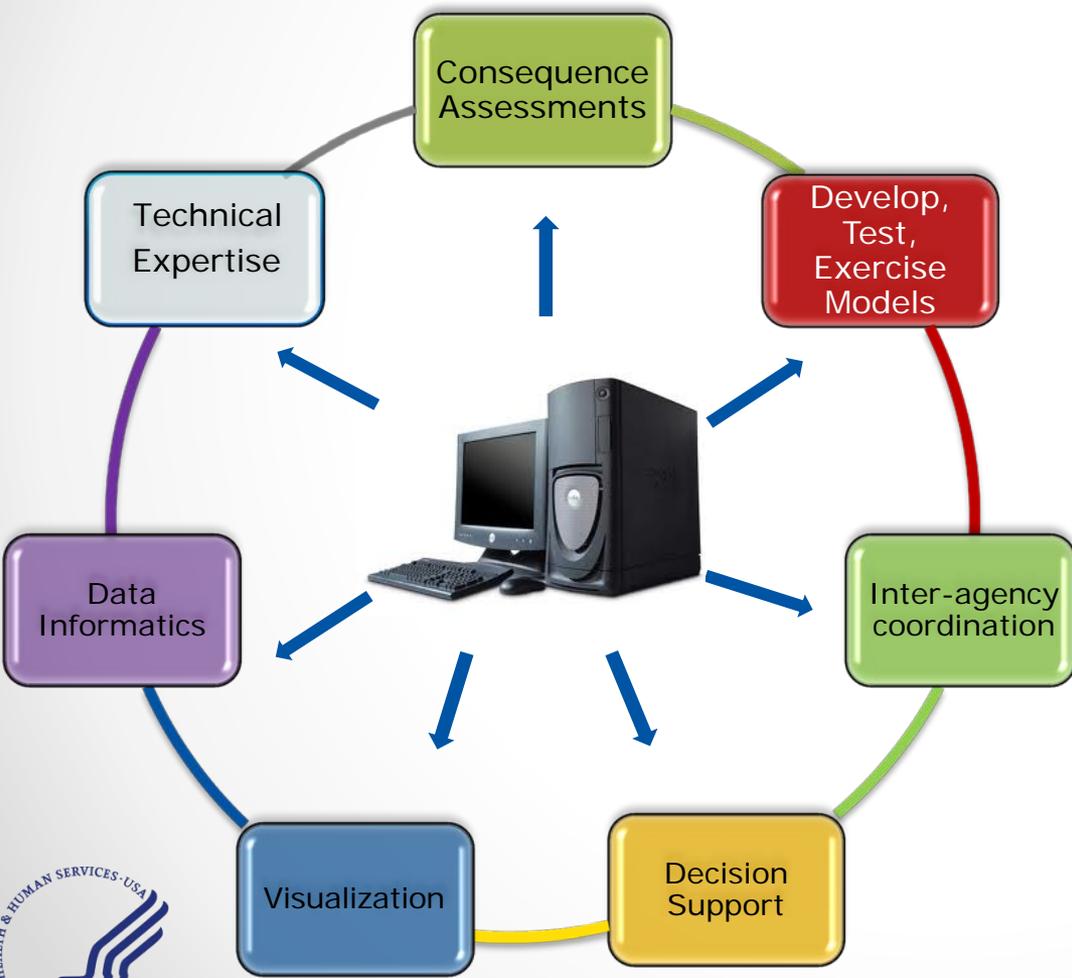


DIVISION OF ANALYTIC DECISION SUPPORT (ADS)

Tim Lant, PhD
BARDA Industry
Day October 9,
2015

Resilient People. Healthy Communities. A Nation Prepared.

BARDA ADS leads the HHS Modeling Hub as part of the National MCM Infrastructure



ADS supports the BARDA mission by ensuring consistent, coordinated analysis for requirement setting, analytic decision support across the PHEMCE, and real-time modeling during public health emergencies.



Analytic Decision Support Program Objectives

The mission of BARDA Analytic Decision Support (ADS) is to develop modeling, visualization, and decision support tools for medical consequence and public health assessments across the CBRN, pandemic influenza, and emerging infectious diseases risk spectrum.

Project Bioshield
(2004)

- Material Threat Assessments, Medical Consequences

National Influenza
Strategic Plan
(2005)

- On-site HHS real-time Modeling Hub

PHEMCE
Implementation
Plan (2012)

- Information Visualization Tools

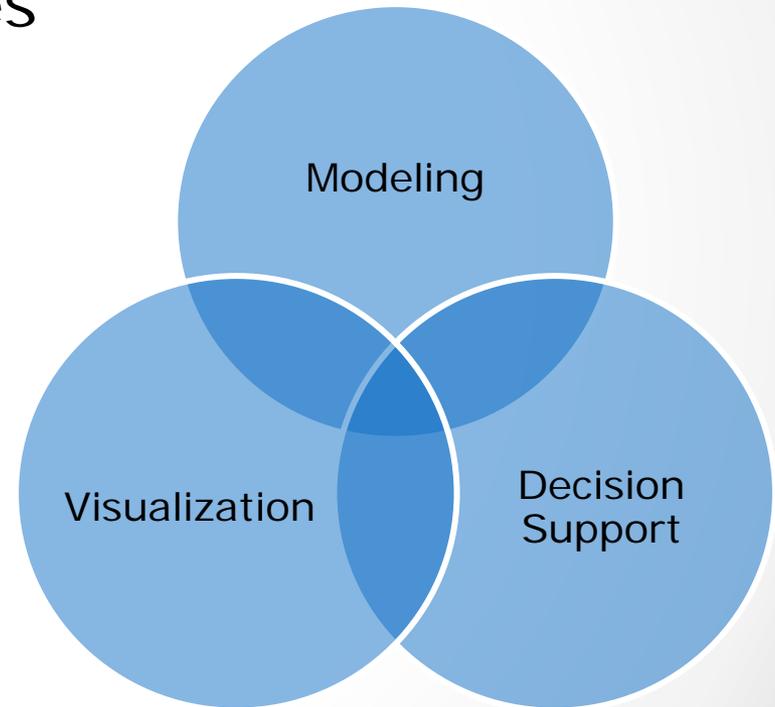
HHS Innovation
Lab (2016)

- BARDA Visualization Hub



BARDA's Division of Analytic Decision Support (ADS) Provides Modeling, Visualization, and Computing to Support BARDA and PHEMCE Decisions.

- Knowledge, Skills, & Abilities
 - Mathematics
 - Computational Epidemiology
 - Weapons effects
 - Microbiology
- New Areas
 - Visualization
 - Application Development
 - Decision Sciences



ADS has unique responsibilities during both preparedness activities and during a response

■ Preparedness

- Medical & Public Health Consequence Assessments
- Inter-agency coordination
- Decision Support for Working Groups and Project Teams

■ Response

- Rapid Assessments & Forecasts
- Modeling Coordination Group with government, academia, and industry
- Decision Support for senior leadership



Recent responses to Ebola, H7N9, H1N1, and MERS-CoV inform ongoing operational modeling tool development.



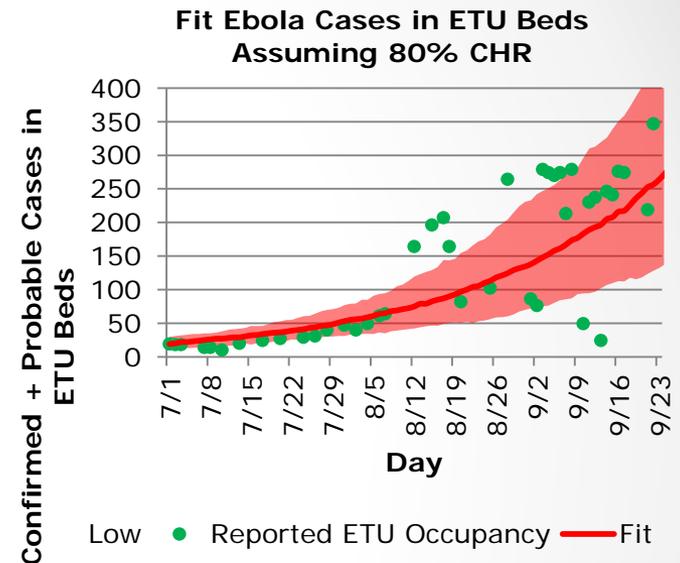
FY 2015 Accomplishments

- Ebola Response and the Modeling Coordination Group (The MCG)
- First Material Threat Assessment 2.0 for Anthrax
- Five New Decision Support Tools (CBRN agents, Pandemic Influenza, and Hospital MCM supply demand)
- BARDA Visualization Hub and HHS Innovation Lab

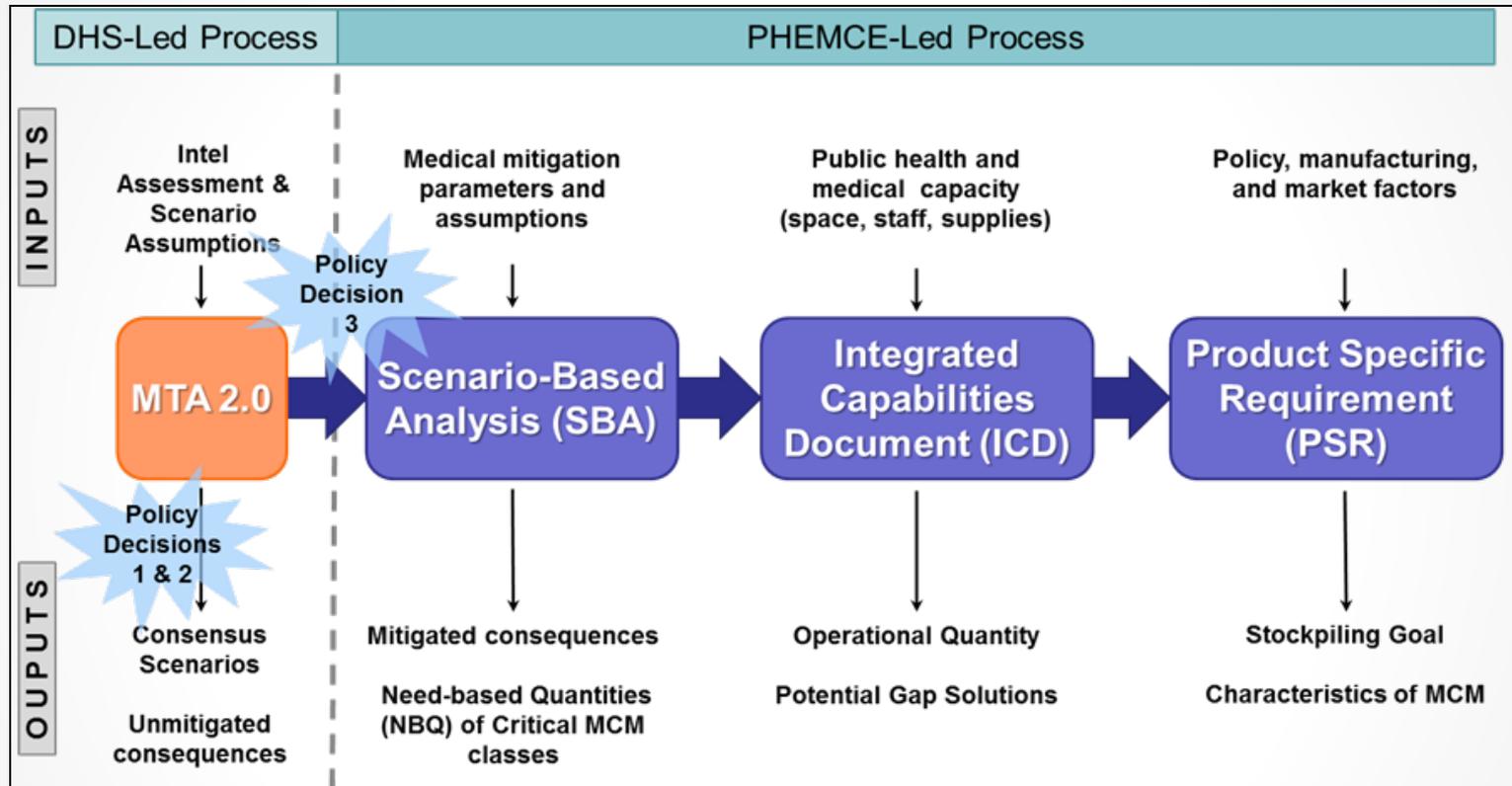


Modeling Coordination Efforts during the 2014-15 Ebola Response

- Weekly meetings of modeling community from Academia, Industry, National Labs, and Government
 - Weekly Forecasts of cases in West Africa
 - Risk of domestic cases in US
 - Estimates for quantities of therapeutics, vaccines, diagnostics, PPE
 - Population at Risk
 - Evacuation Planning
 - Risk of international spread from airlines
 - Risk of regional spread from mobile phone data
 - Sample collection and movement



Material Threat Assessments with DHS



- ADS Co-Chairs the MTA 2.0 Working Group and works closely with DHS to produce Material Threat Assessments.

DART 2.0

Challenge: Public health planners need to understand the medical consequences from anthrax scenarios based on timing and availability of medical countermeasures.

Solution: DART was developed to share ADS models with local health officials

Impact: Los Angeles and New York used DART extensively during a pilot project in 2014. Three additional regions have requested the tool.



SUMMIT

Challenge: The Anthrax MTA 2.0 has 720 scenarios that will be used for MCM requirement setting and planning that are classified.

Solution: SUMMIT was created to help the Federal working groups choose, sort and visualize the scenario outcomes in an unclassified application.

Impact: SUMMIT will be used by the PHEMCE to develop the requirements, which will save considerable time.



The Hospital Surge Model 2.0

Challenge: In 2014, the PHEMCE began assessments on the hospital-based resources required to use countermeasures and ancillary supplies.

Solution: ADS re-developed and improved the Hospital Surge Model to align with current PHEMCE uses.

Impact: Stakeholders can assess potential patient load and resource needs specific to their individual medical systems.

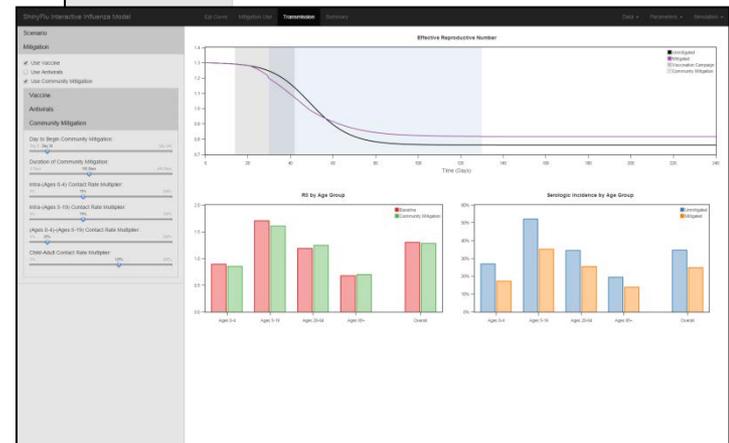
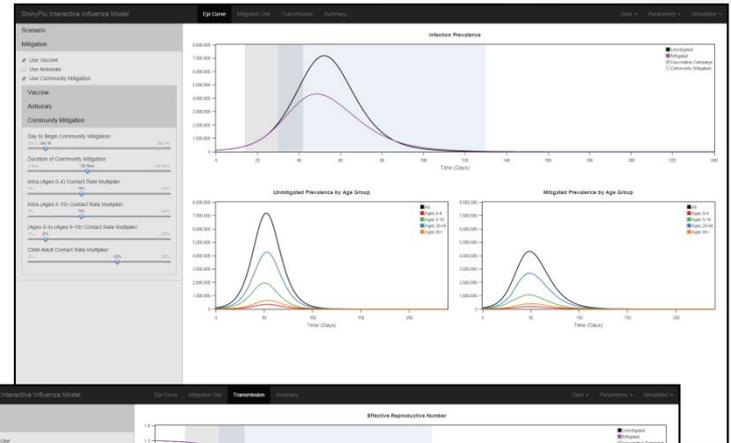


Influenza Tool Kit

Challenge: During the 2013 H7N9 response, it took too long to generate forecasts for vaccine production and medical consequences for flu scenarios.

Solution: ADS Developed a suite of integrated tools that automate these analyses and now share it with CDC.

Impact: BARDA and CDC can now use the same validated modeling system in real-time.

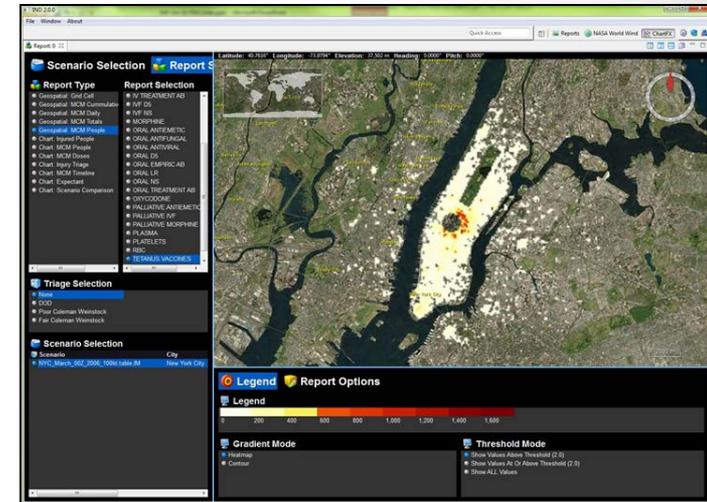


IND SIM 2.0

Challenge: Nuclear Detonation Scenarios are incredibly complex to model and require significant data and computing resources.

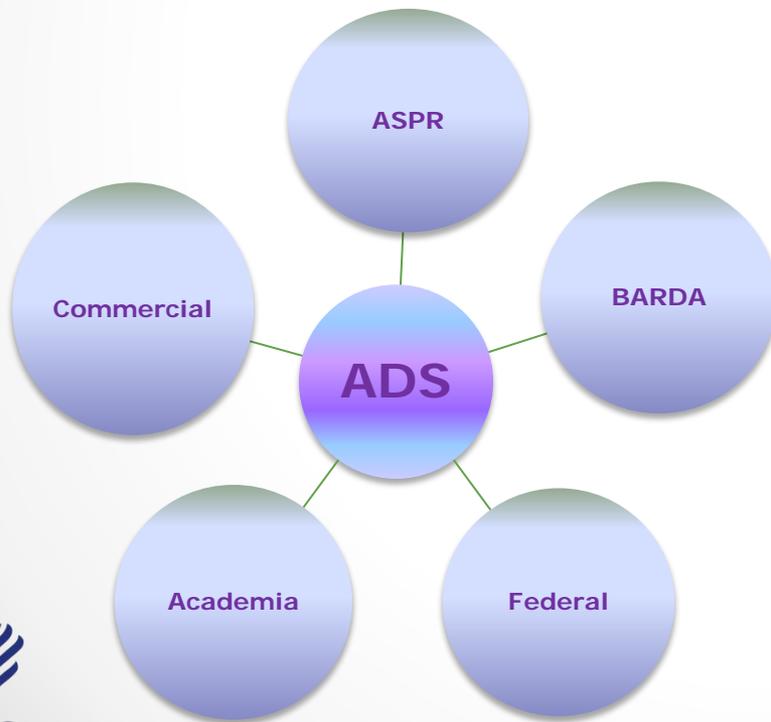
Solution: ADS developed a decision support tool that integrates the medical consequence modeling with a visualization and decision support system for greater transparency.

Impact: Decision makers can better understand the geographic distribution of injury and resource needs in various cities in order to improve preparedness.



Modeling & Visualization Hub

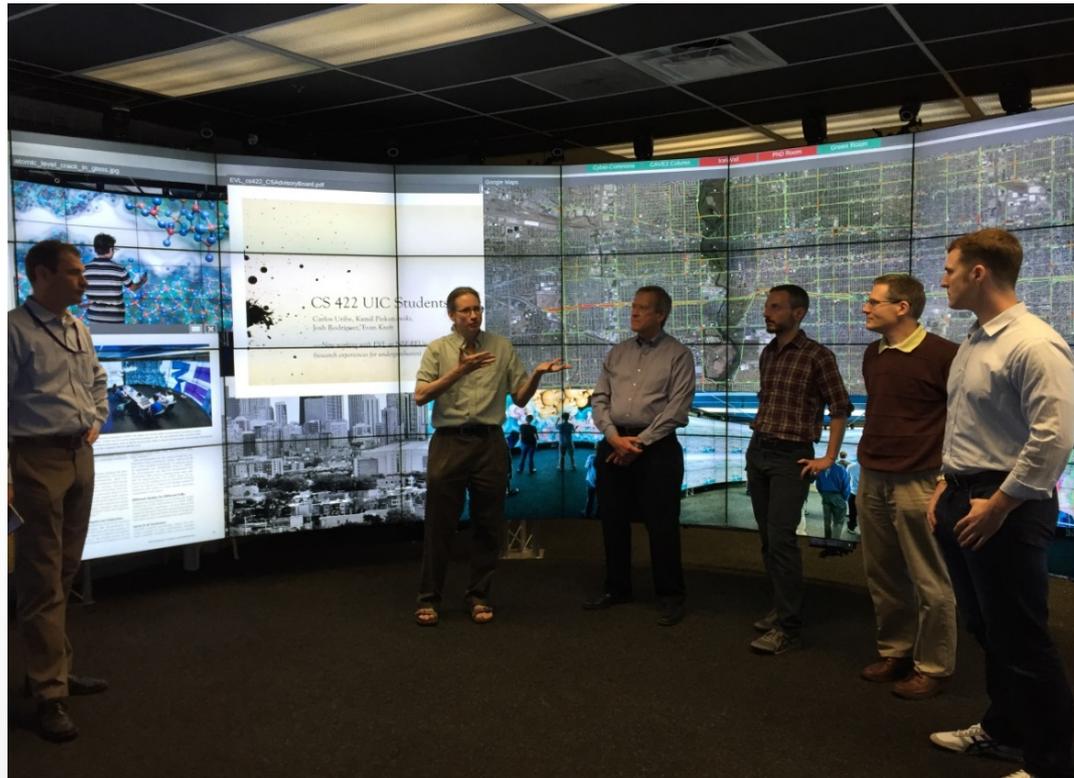
- To meet its planning, preparedness, and real-time response requirements, HHS has established within BARDA ADS a central HHS Modeling & Visualization Hub to provide real-time modeling, simulation, and analysis designed to explore and characterize response options for decision makers.



The "Hub" was required by the Homeland Security Council in 2005

The BARDA Modeling and Visualization Hub in 2016

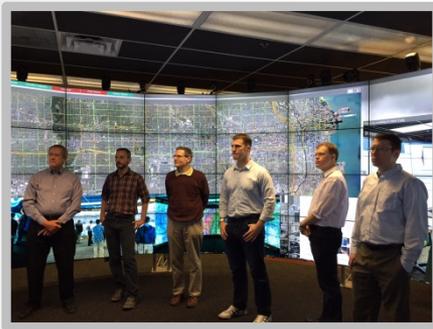
- BARDA is currently installing a CAVE2™ visualization system in the new HHS Innovation Lab to inform and support decisions.



Visualization Hub and Reception Area



ADS is building in-house capabilities for future innovation



Expertise

An expert team of modeling professionals and supporting staff

Decision Support Tools

A broad portfolio of models and visualization tools to support PHEMCE, ASPR, and BARDA decision-making and requirement setting

Modeling Hub & Visualization

A state-of-the-art modeling and visualization center to support innovation in Science Preparedness and Response activities

Coordination

Broad inter-agency and academic collaboration to spur advanced research and development of decision support, forecasting, threat/risk assessments, and other scientific tools