



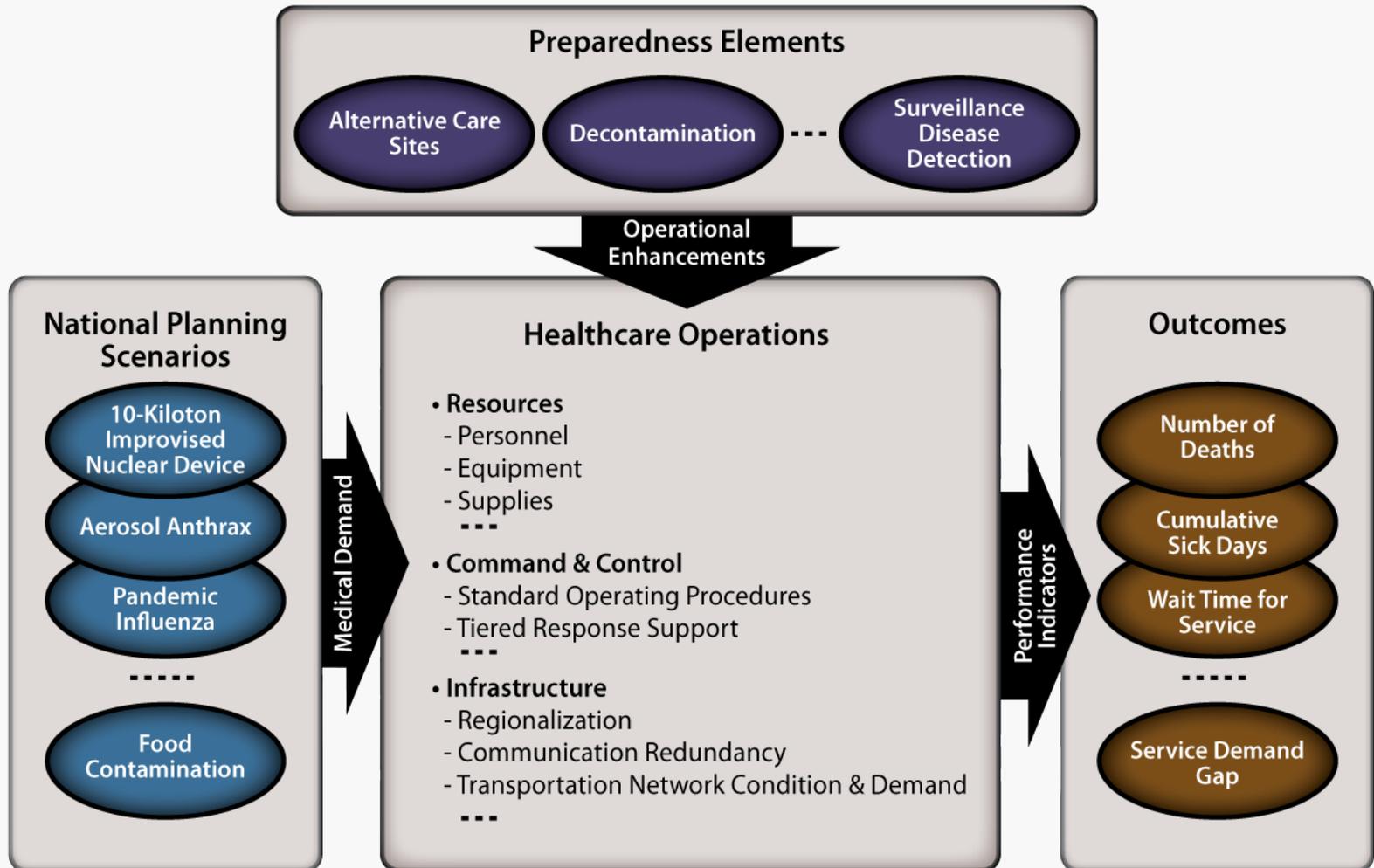
Healthcare Preparedness Model Assesses Regional Healthcare Preparedness



*National Healthcare Preparedness
Evaluation, and Improvement
Conference 7/23/2009*

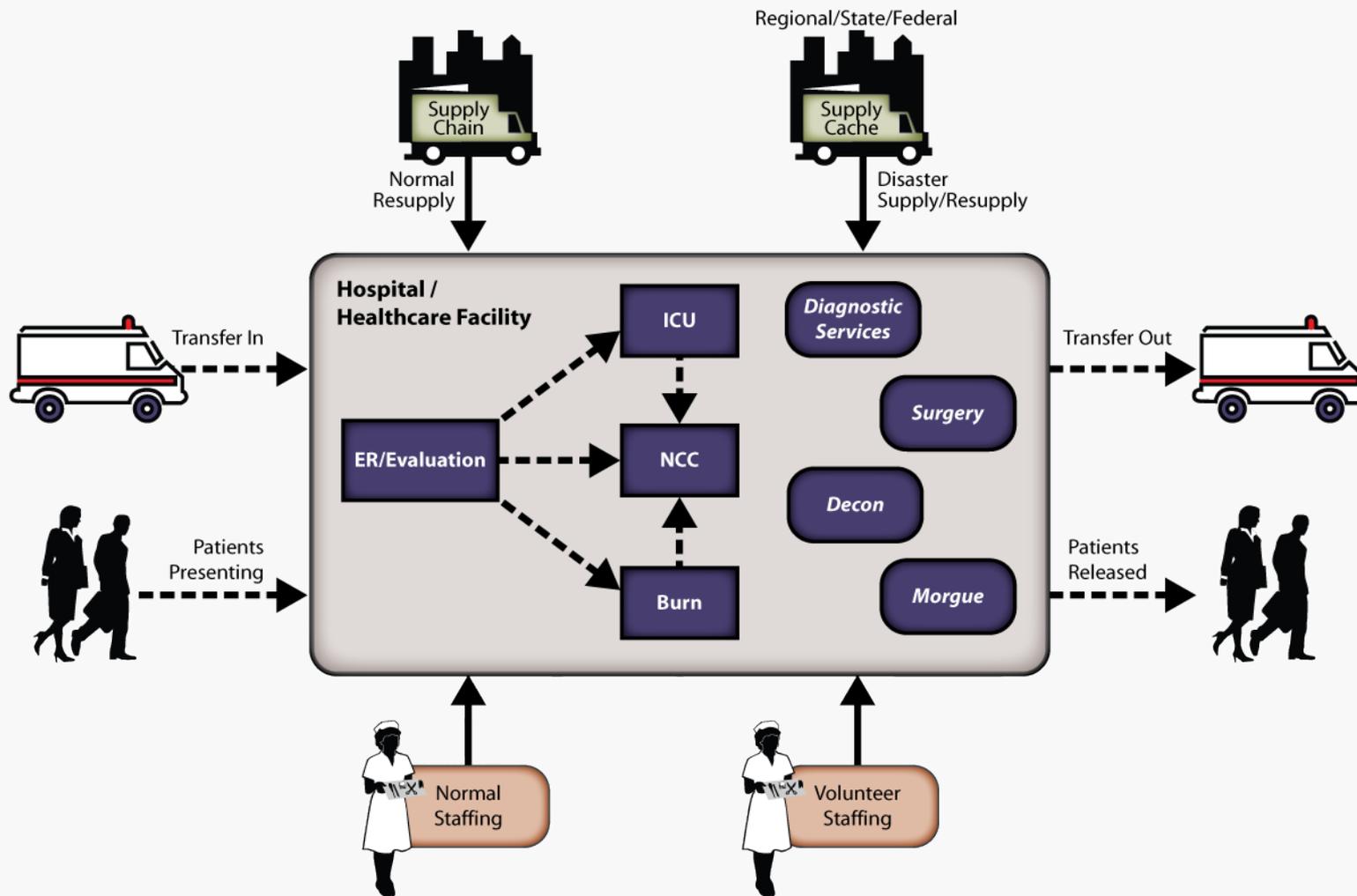
- Provide mathematical modeling that increases the understanding of the preparedness of healthcare systems
- Identify quantitative preparedness metrics that provide benchmark indicators for ongoing healthcare delivery systems and public health preparedness activities

Predicting Quantitative Outcomes



- 10 Kiloton Improvised Nuclear Device
- Aerosol Anthrax
- Pandemic Influenza
- Plague
- Blister Agent
- Toxic Industrial Chemicals
- Nerve Agent
- Chlorine Tank Explosion
- Major Earthquake
- Major Hurricane
- Radiological Dispersal Devices
- Bombing Using Improvised Explosive Devices
- Food Contamination
- Alternative Care Sites
- Decontamination
- Electronic Resource Tracking
- Interoperable Communications
- Medical Surge–Patient
- Medical Surge–Supplies
- Personal Protective Equipment
- Pharmaceutical Caches
- Special Needs Population
- Surveillance Disease Detection
- *Education and Preparedness Training*
- *Exercise, Evaluations, and Corrective Actions*

Virtual Hospital/Healthcare Facility

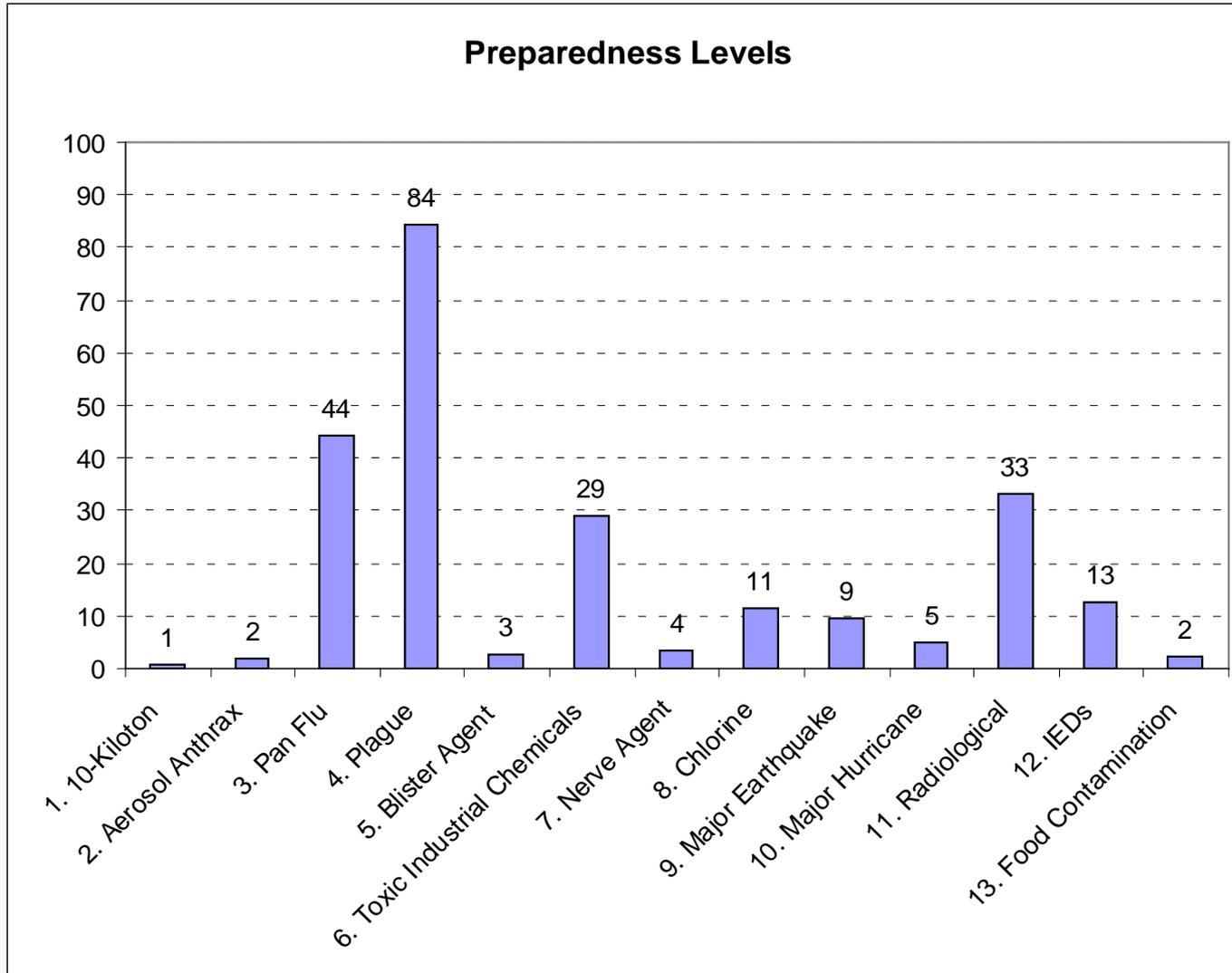


- *Measurement: Medical Outcomes*
 - Function of Mortality and Morbidity
 - Loss of life estimated to be the loss of remaining days of life
 - Based on US Census data
 - Average US life expectancy
 - Average US population age
- *Medical Outcome (MO) = 15 MO_D + MO_S*
 - MO_D = # of deaths (Mortality)
 - MO_S = 1000 cumulative sick days (Morbidity)

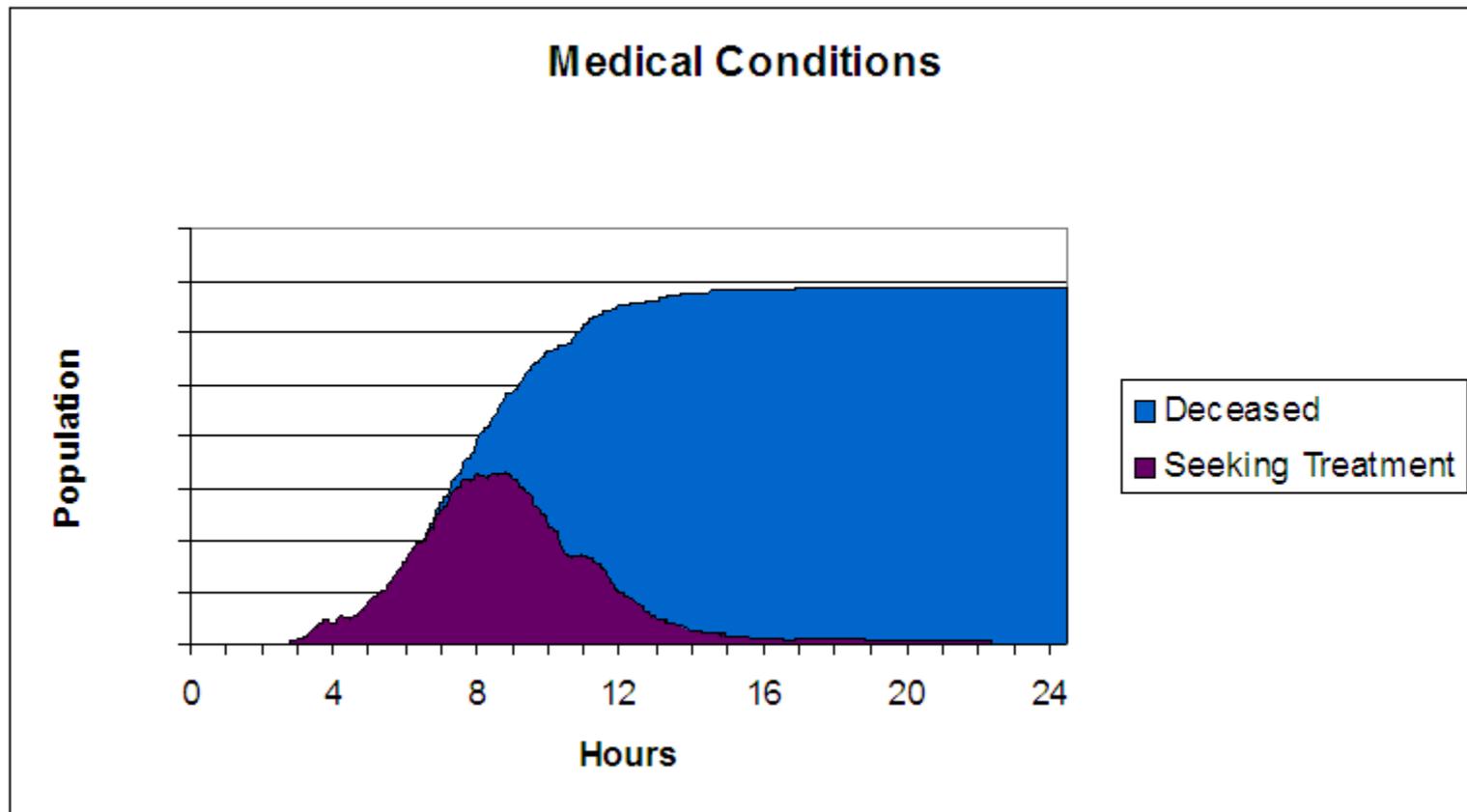
- Scenario-specific preparedness level
 - Scaled (0 – 100) impact of regional healthcare capacity and capability on medical outcome
 - 0 = worst possible outcome (i.e., no medical intervention)
 - 100 = best possible outcome (i.e., best that medical intervention can accomplish)

- Preparedness Levels
- Predicted Healthcare Demand
- Performance Indicators
 - Bed Occupancy
 - Peak Percentage Capacity
 - Service Wait Queues
 - Mean Wait Times
- Key Findings and Recommendations

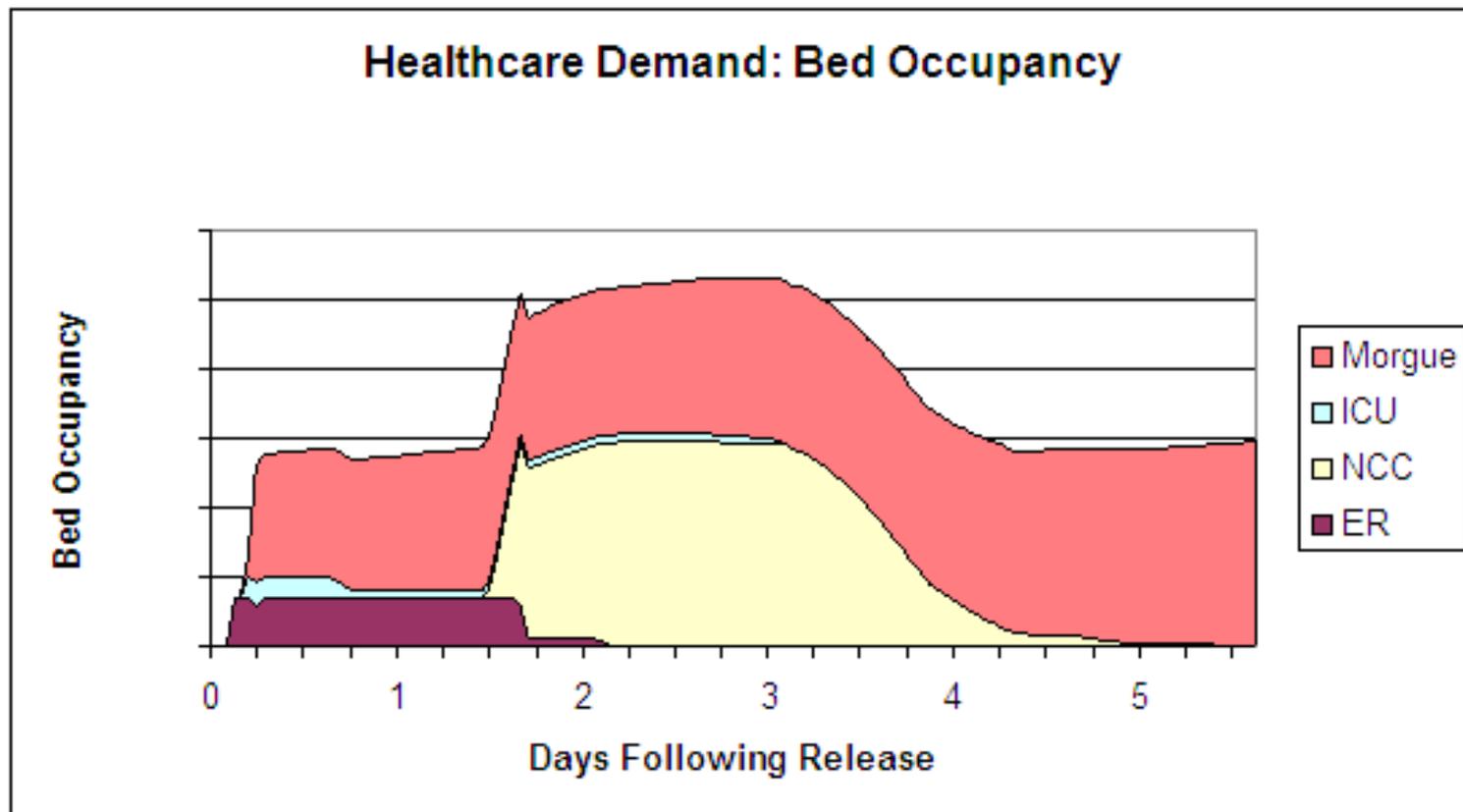
Pilot Study: Preparedness Levels



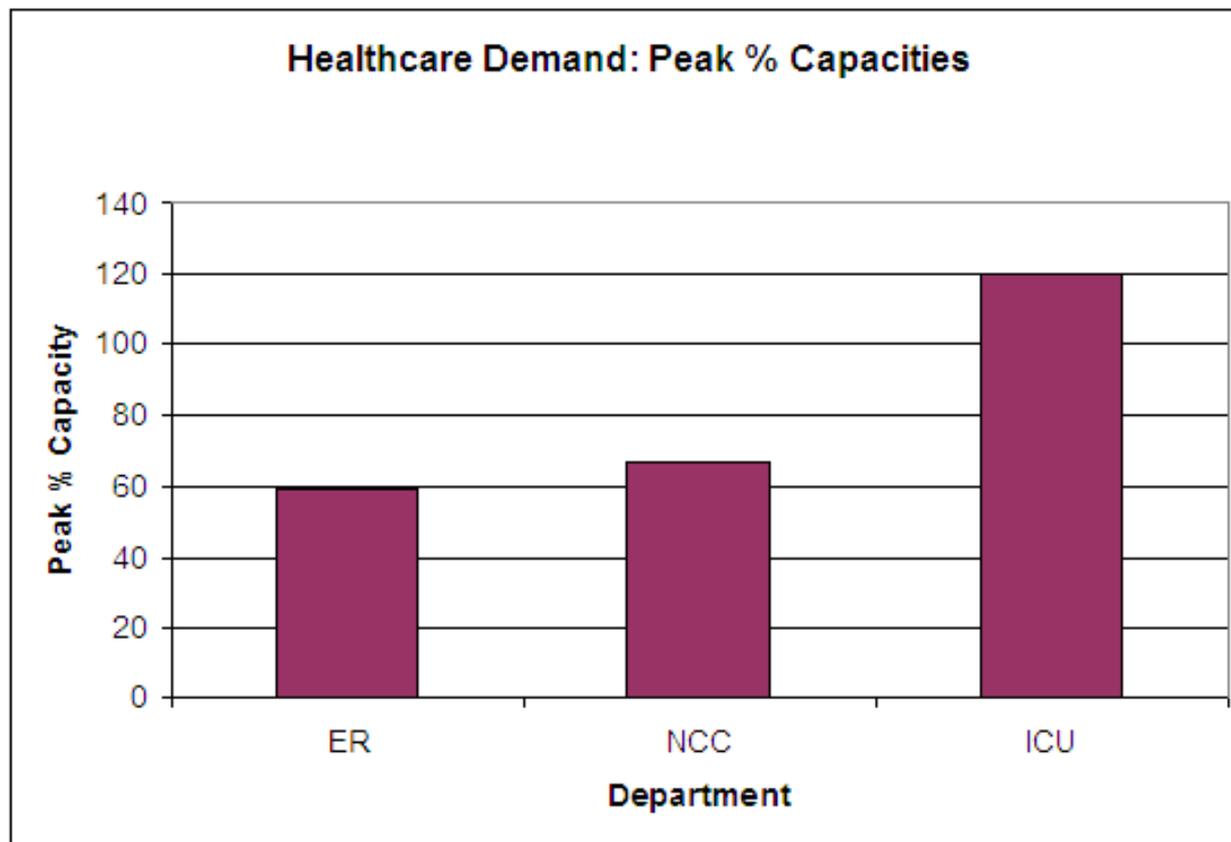
Pilot Study: Predicted Healthcare Demand



Pilot Study: Bed Occupancy



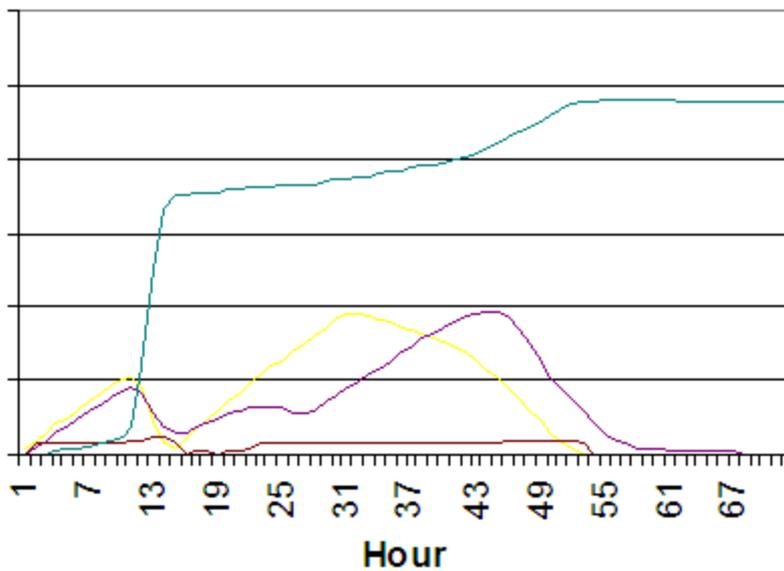
Pilot Study: Peak % Capacities



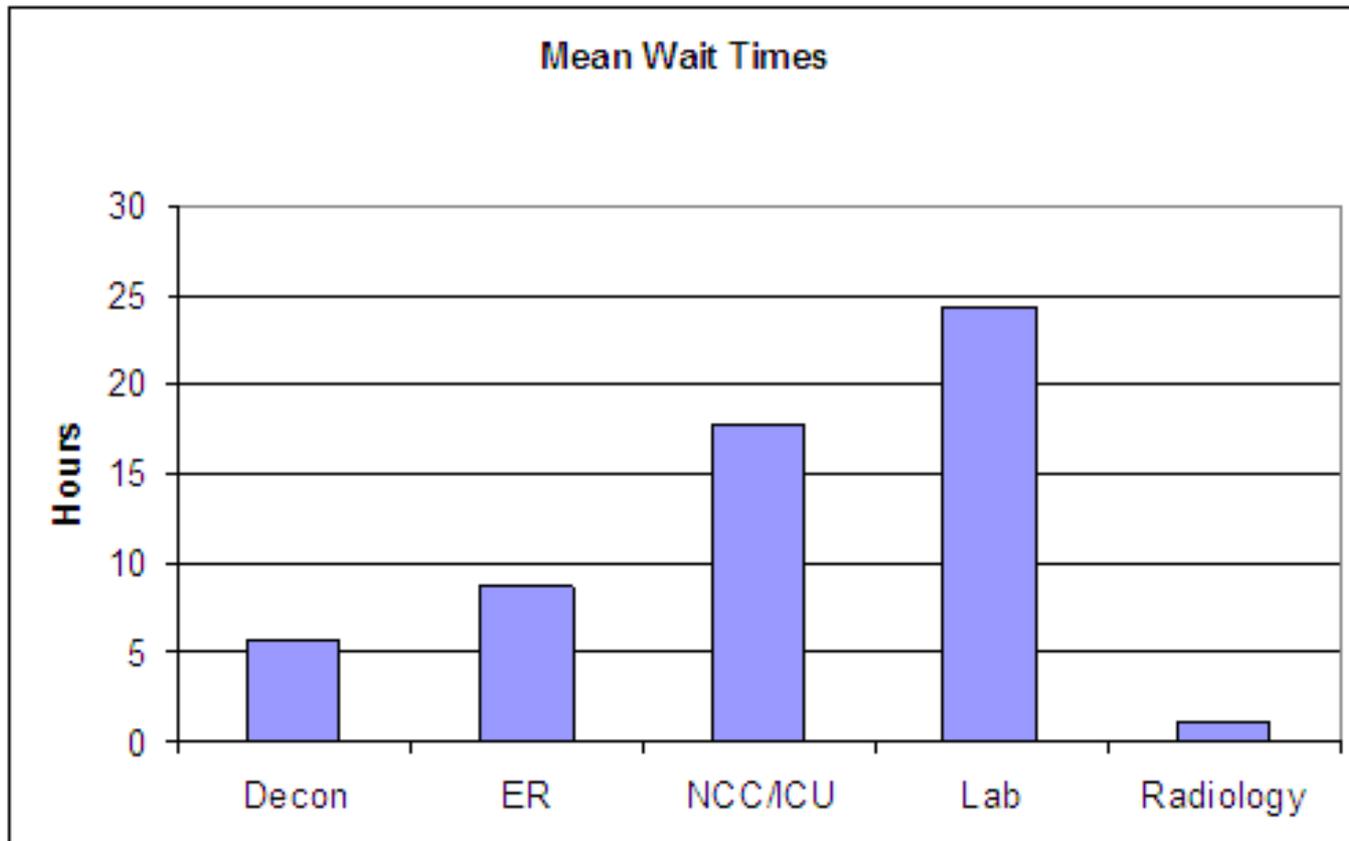
Pilot Study: Service Wait Queues

Healthcare Demand: Service Wait Queues

Pending Service Requests



Pilot Study: Mean Wait Times



Pilot Study: Key Findings & Recommendations



- Key Findings
 - Strengths
 - Sensor Network & Syndromic Surveillance
 - Communication Redundancy
 - Decontamination Capabilities
 - Resource Tracking
 - Local Volunteers
 - Weaknesses
 - Pharmaceutical Shortages
 - Limited Effectiveness of Alternative Care Sites
- Recommendations
 - Regional Pharmaceutical Cache
 - Increased Morgue Surge Capacity
 - Hospital Specific Improvements in Communication Redundancy and Coordinated Resource Tracking

- Model development winding up initial spiral development phase
 - Simulation Framework Design
 - Prototype Model Development
 - Pilot Site Preparedness Analysis
- Next Steps
 - Toolkit for Site Self-Assessments
 - Additional Pilot Site Assessments
 - Identify Resource Shortages
 - What/When/How Much
 - Additional Scenarios
 - Additional Preparedness Elements

Patti Iles Aymond, PhD

Senior Scientist, Research & Development

IEM, Inc.

8550 United Plaza Blvd. Suite 501

Baton Rouge, LA 70809

patti.aymond@iem.com

(225) 526-8844