

Increasing Utility of BTRA



Above: CAPT-Bio, analysis capability for what-if scenarios using BTRA models

Top Right: RiViT, explore and understand risk results

Bottom Right: BTRA Electronic Report, increased access for the community



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Application of TRA results



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The Civilian MCM Challenge

- **The Challenge:** Medical countermeasures (MCMs) are needed to mitigate the effects of threat agents to national security, and emerging infectious diseases, to protect the health of the U.S. population
- **The Process:** A transparent, streamlined requirements process that reflects threat assessment, public health consequence modeling, and SME input
- **The Result:** Policy and prioritization recommendations that support the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) leadership's MCM research, development, acquisition, and management plans resulting in a defensible portfolio

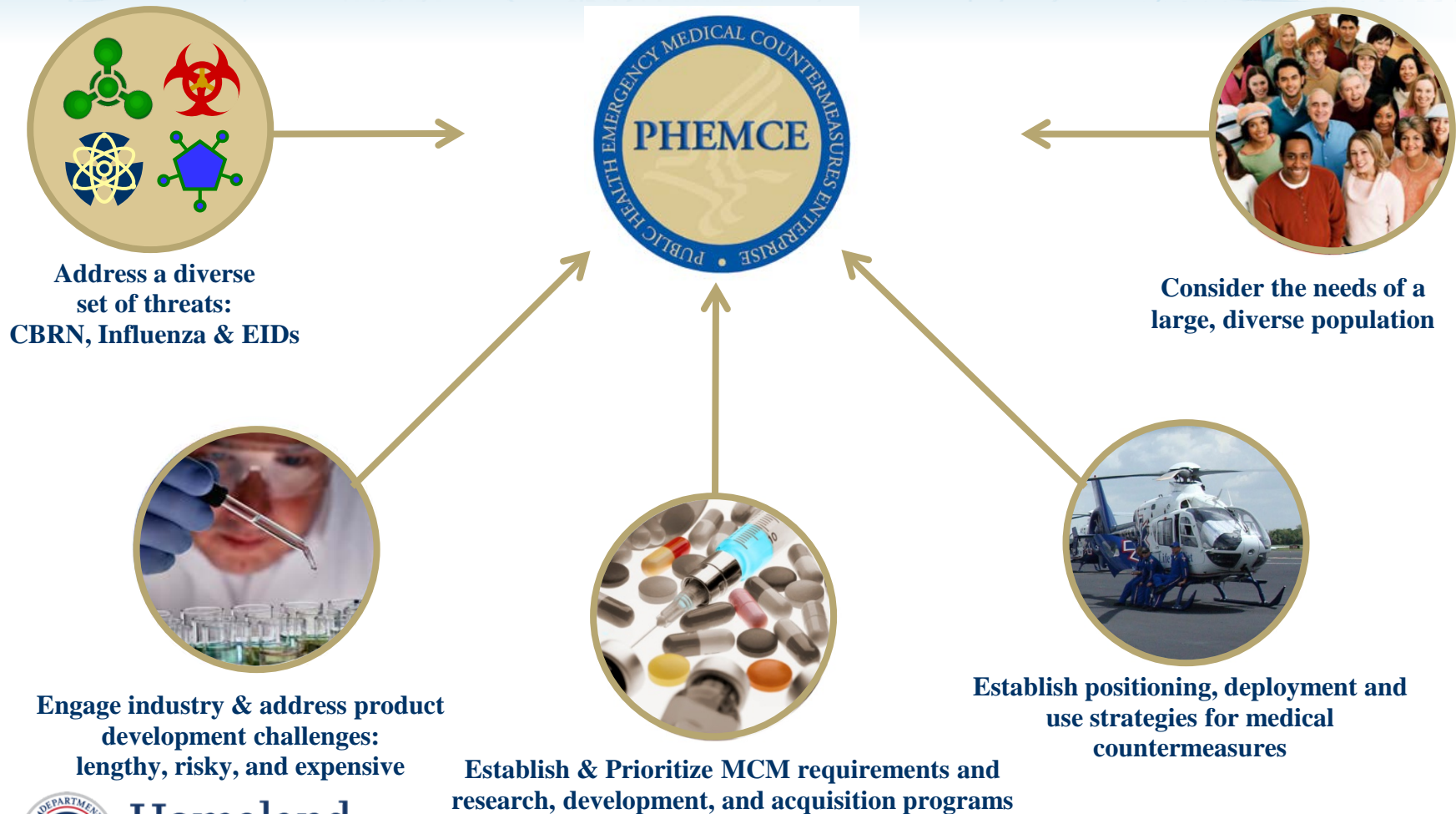


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The Civilian MCM Challenge



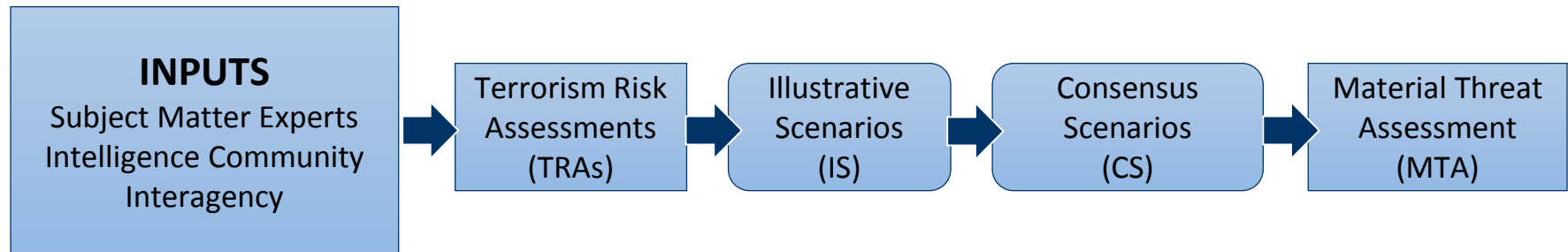
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Informing Resource Decision-making for the Strategic National Stockpile

- DHS and Biomedical Advanced Research and Development Authority (BARDA) work in collaboration to produce the MTA
- The MTA is provided to the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE)
- PHEMCE uses the MTA to make decisions regarding Strategic National Stockpile (SNS)



- Key questions include:
 - What products, if included in the SNS, would reduce risk of CBRN incidents?
 - How much of these products are needed to best reduce risk? (*Performance Optimization*)

Decision-making Context for the SNS

- CBRN incidents can be small (hurting a handful of people) or can be enormous
 - How much of a medical countermeasure is needed to address the threat?
- Some medical countermeasures are specific to a particular agent, how should investments among these countermeasures be prioritized?
- The effectiveness of some countermeasures is dependent on the dose received by a victim—which are likely to have real utility in a response?
 - If a victim gets an overwhelming dose of many chemical or radiological agents, the countermeasure will not change the medical outcome
 - The length of a prophylactic window is a function of dose for some agents (which itself depends on weapon payload and target)



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ITRA informs Material Threat Assessments (MTAs)

The scientific results of the ITRA inform investments and resource prioritization to buy down risk of CBRN terrorism by providing information for making decisions about procurements for the **Strategic National Stockpile (SNS)**

- The ITRA is integral to the **Material Threat Assessment (MTA)**, which helps determine appropriate procurements for the SNS.
- To ensure a coordinated and productive process between DHS and the Department of Health and Human Services (HHS), the agencies jointly developed the Strategic Implementation Plan (SIP) for the MTA 2.0 process



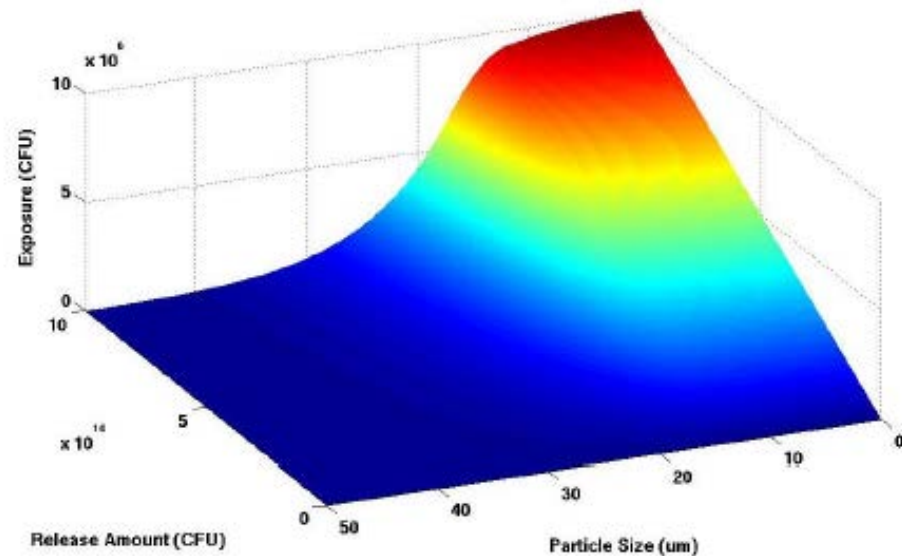
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What Scenario(s) Do We Use to Describe the Threat?

- MTA 1.0
 - Single “plausible, high-consequence” CBRN agent release scenario
 - Most involved an outdoor line release in New York City
- MTA 2.0
 - A range of scenarios provide a consistent method to compare scenarios across threats
 - Hundreds of illustrative scenarios
 - 5 different causality bins
 - New York City, Los Angeles, Washington D.C.
 - Outdoor, indoor, transit releases
 - Increased visibility on intelligence elicitation, agent selection, and modeling decisions/processes
 - IC helps assess technical capability of real or notional non-state actors to estimate plausibility of each scenario
 - Working group selects 3-5 “Consensus” scenarios” for further analysis and out-briefing



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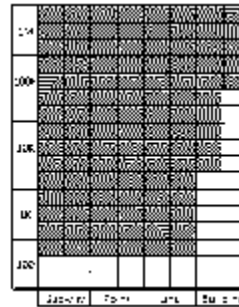
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MTA 2.0 Process

- 1** Use TRA output to select scenario types



- 2** Develop a matrix of illustrative scenarios across a range of impacts



Step 1: Scope the scenarios/analysis

Step 2: Down-select

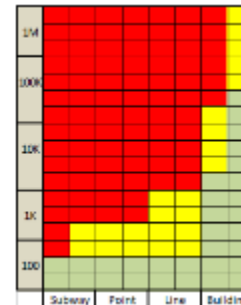
Step 3: Intelligence feasibility check

Step 4: Select final scenarios for planning

- 4** MTA WG selects consensus scenarios

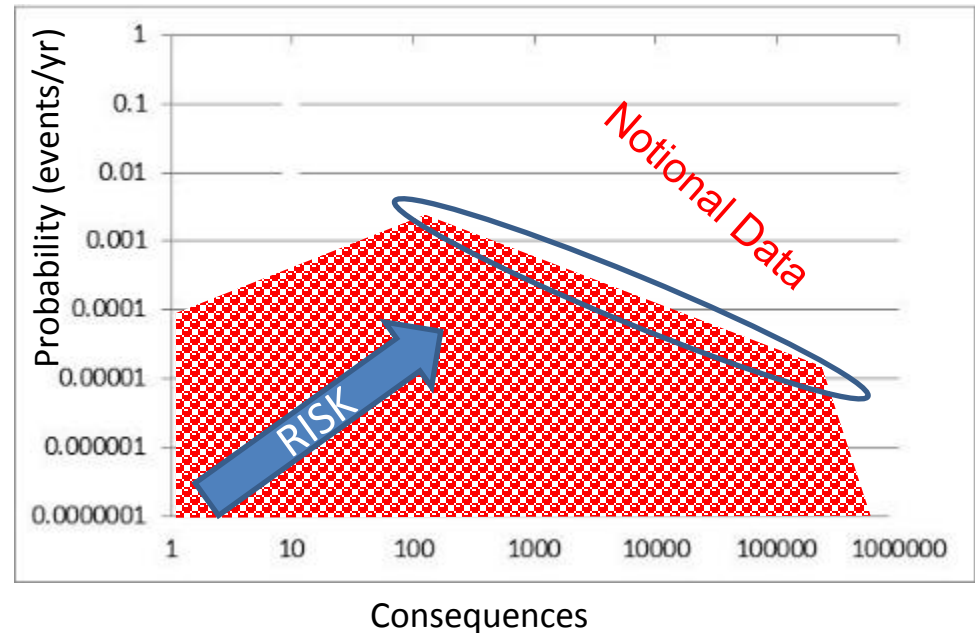


- 3** Intelligence Community confirms feasibility of illustrative scenarios



How were scenarios chosen?

- The ITRA contains millions of scenarios, each of which differs in terms of:
 - Probability
 - Consequences
 - Agent
 - Target



- To represent the risk space best, we chose (in blue circle) the riskiest scenarios that cover a variety of consequences, agents, and targets

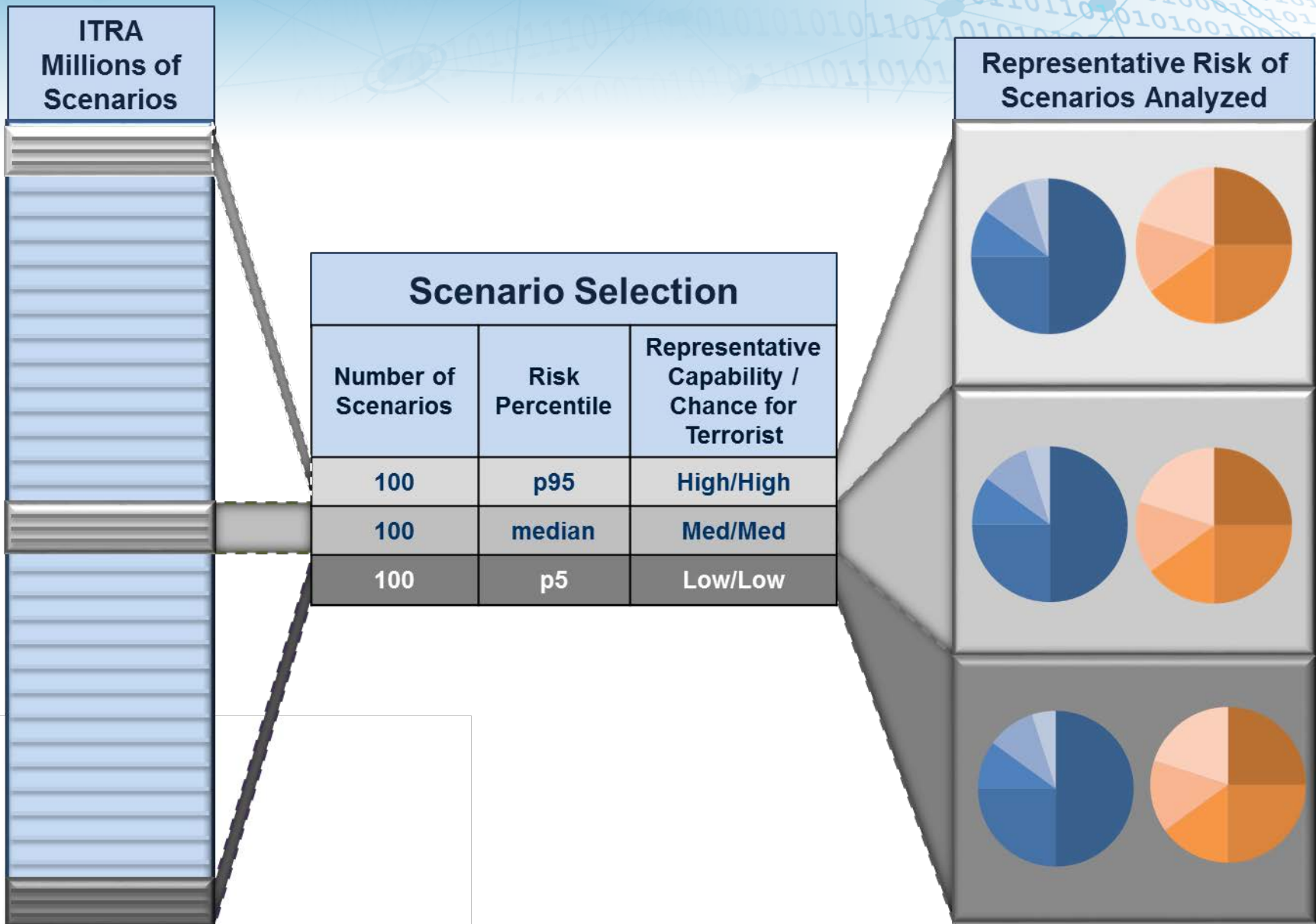


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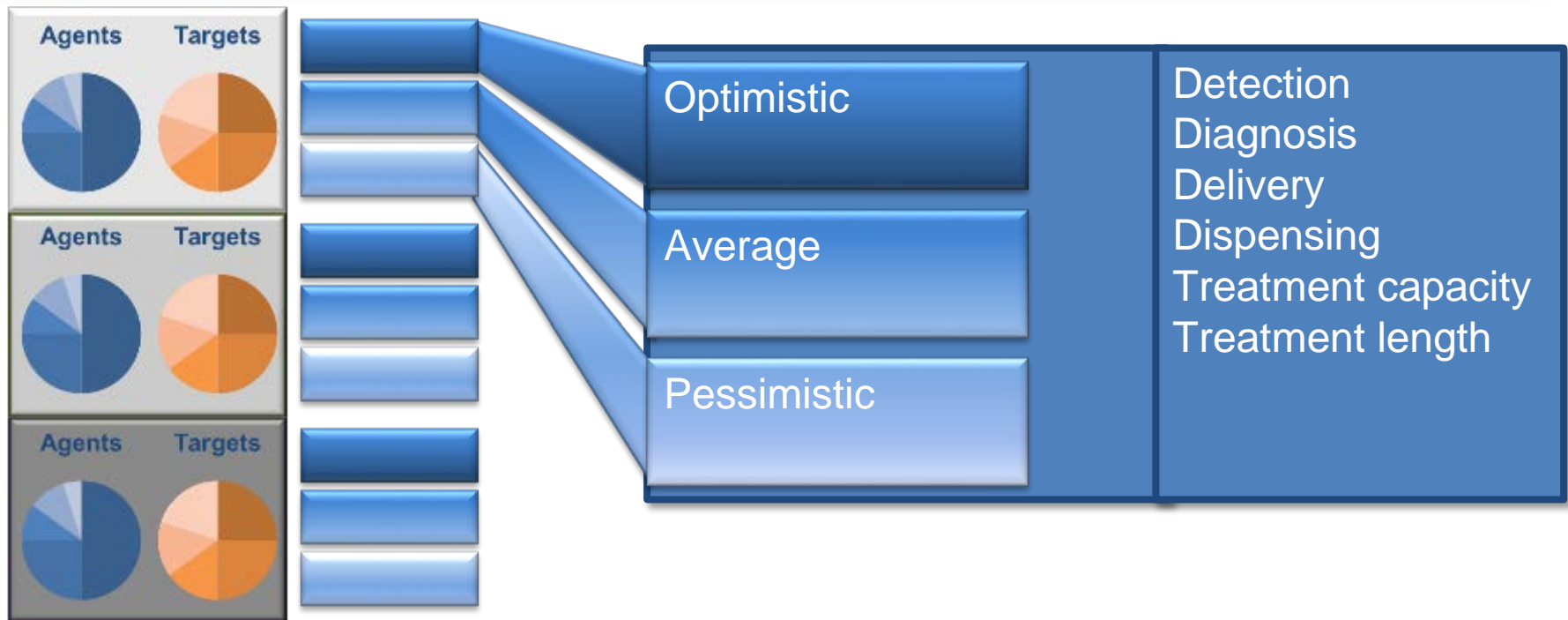
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Sampling the Risk Assessments



PHR Uncertainty

Uncertainty in public health response (PHR) was accounted for using three response capabilities



This approach provided an understanding of: the upper and lower bounds of current, possible response capabilities; demonstrated which responses had the most impact and the best possible reduction of risk with MCM.



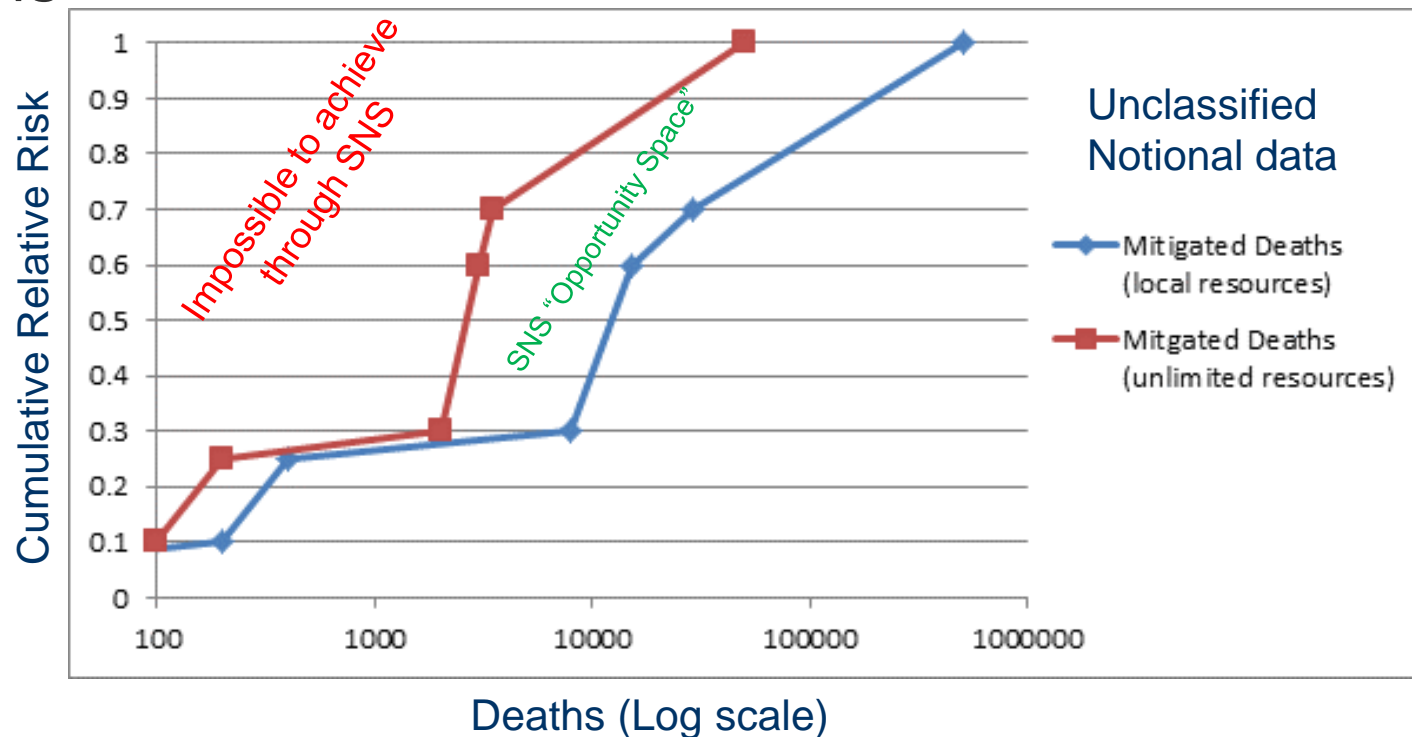
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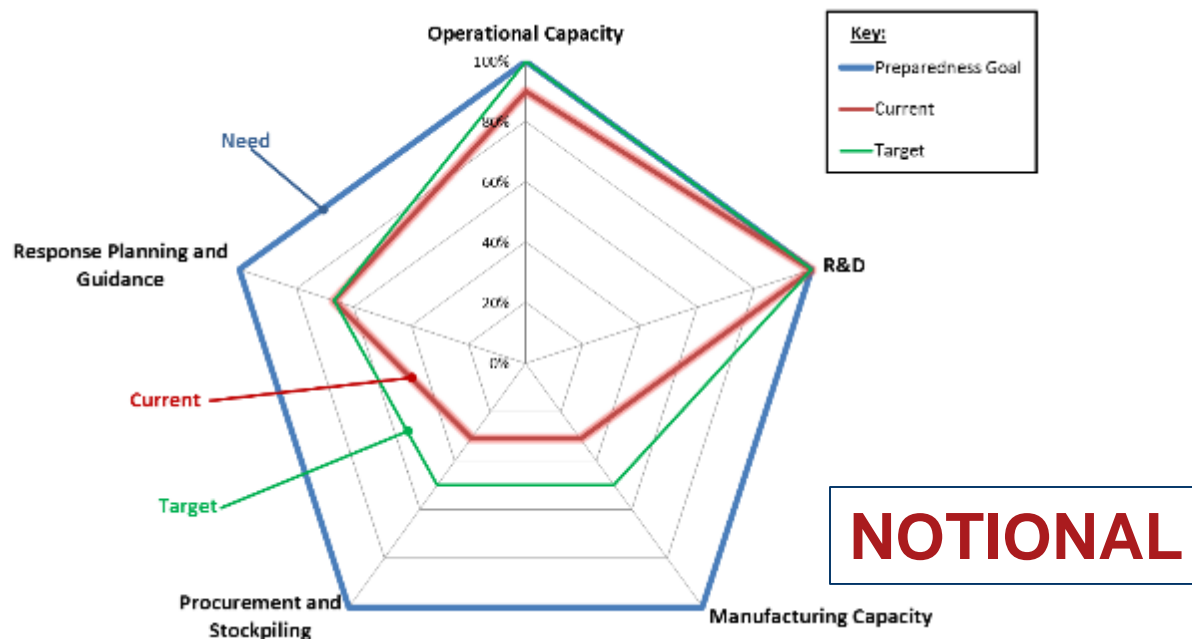
TRAs inform SNS

- To bound our analysis, we determine the deaths in each scenario assuming only local resources are available and the deaths assuming unlimited resources in the SNS
 - The area between these curves is the “opportunity space” for the SNS



Requirement Process Informs the PHEMCE

- Informs acquisitions
- Coordinates intra & inter-agency budgets towards a common goal
- Benchmark for federal preparedness



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Risk Assessments Inform Risk Management



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TRAs Help the USG Understand & Plan for CBRN Terrorism in the Homeland

- **Uses clear scenarios to prepare against**
 - Prioritizes scenarios according the [probability they will occur and the severity of consequences](#)
- **Risk assessment addresses key questions**
 - What should we worry about?
 - How likely is it?
 - How bad could it be?
 - What factors contribute the most to the risk?
 - What knowledge gaps are most important to understanding the risk?
- Risk assessment informs risk management decisions such as:
 - What can be done?
 - How effective are the different options?



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