



# Office of the Director of National Intelligence

## National Counterproliferation Center (NCPC)

### (U) Microbial Forensics: Gaps, Opportunities and Issues



Charles L. Cooke Jr, Ph.D.  
Office of the Deputy Director for  
Strategy & Evaluation  
National Counterproliferation Center



# (U) Microbial Forensics



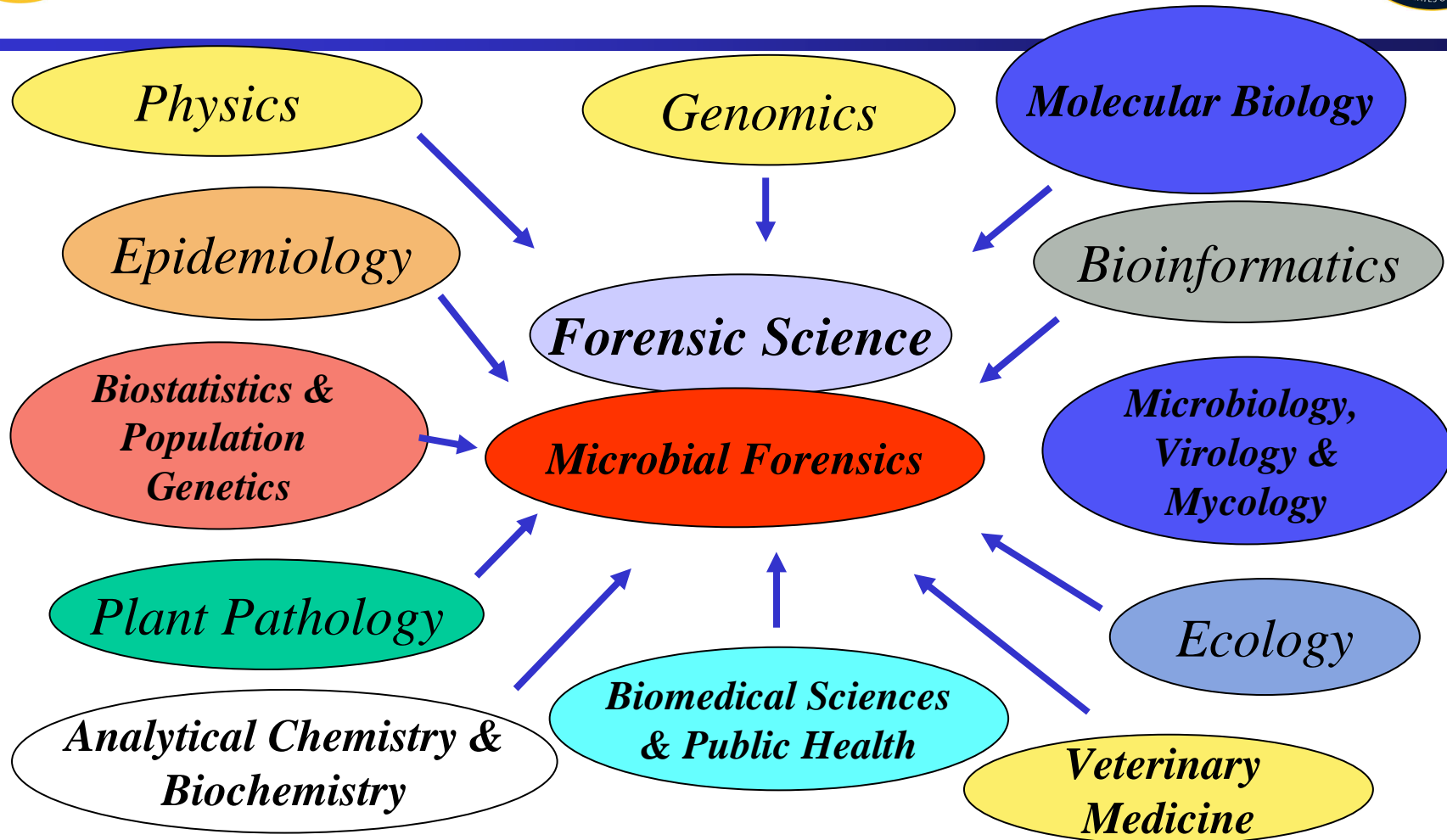
- **(U) Microbial Forensics** (aka. Forensic Microbiology, bioforensics): A *developing* interdisciplinary field of microbiology devoted to the development, assessment and validation of methods to fully characterize microbial samples for the ultimate purpose of *high confidence* comparative analyses.
  - (U) Used to support attribution investigations involving pathogens or toxins of biological origin used in a biological attack.
  - (U) Clearly different from classical forensics (fingerprint analyses, fiber, hair, huDNA)
  - (U) Incorporates many of the basic concepts of more traditional forensics such as scientific acceptance, validation, etc.



•UNCLASSIFIED



# (U) Interdisciplinary Nature of Microbial Forensics



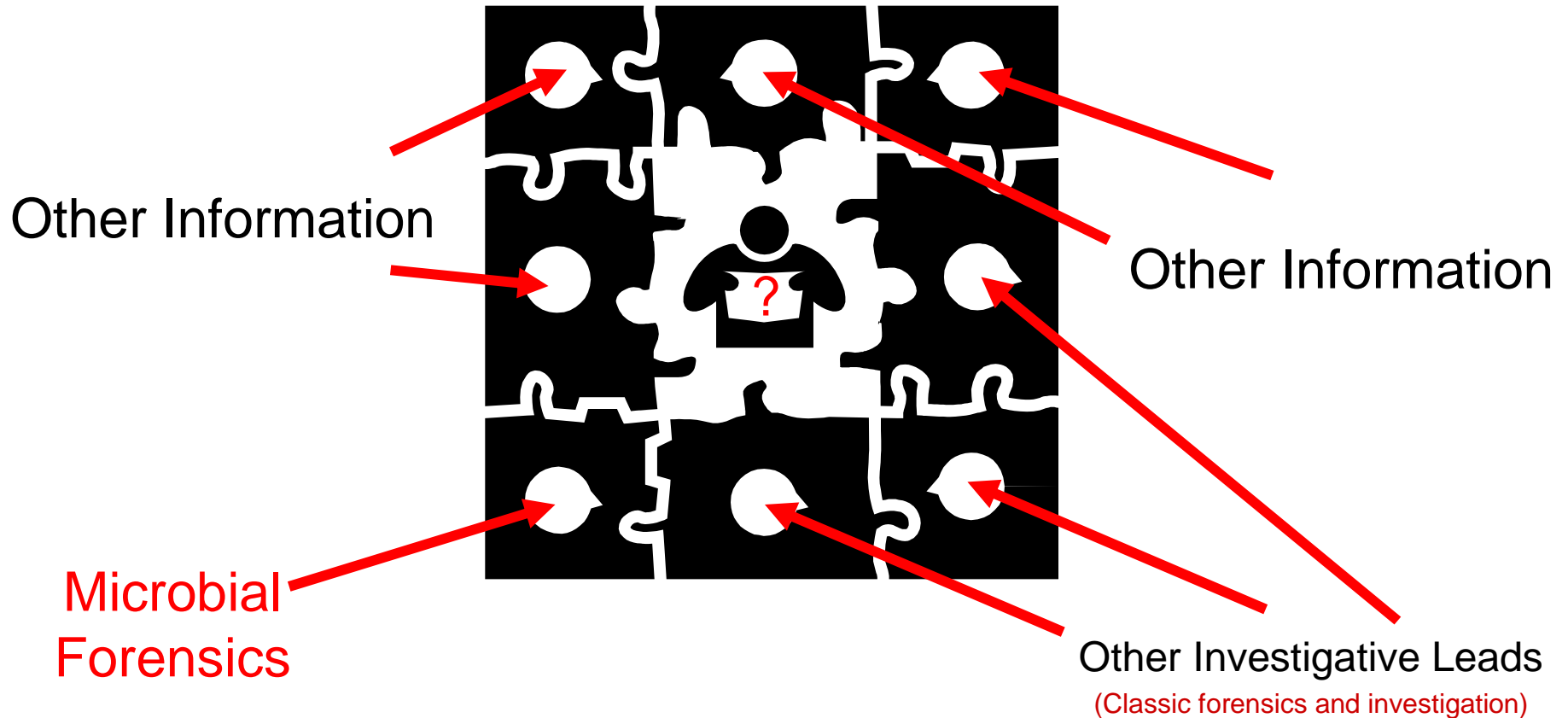
**(U) What is the Role of Microbial Forensics in “Attribution”**

•UNCLASSIFIED



•UNCLASSIFIED

# (U) Role of Microbial Forensics in Attribution of a Biological Attack



**(U) Dynamic and complex puzzle where the pieces may be filled in at different rates with variable reliability.**

•UNCLASSIFIED

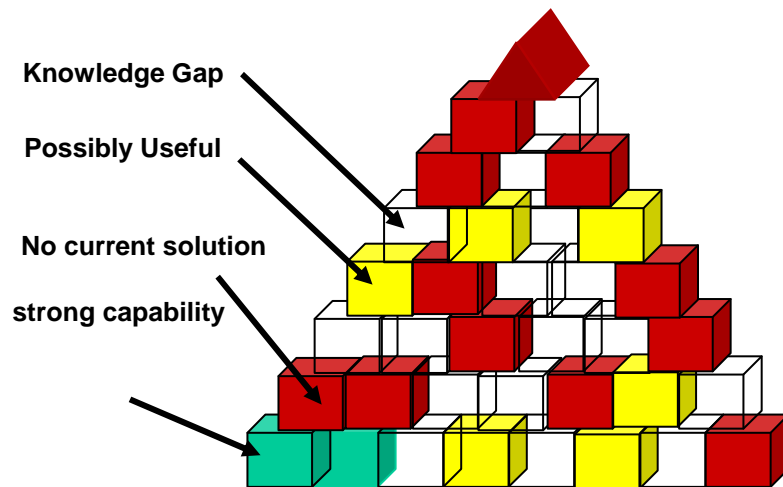


•UNCLASSIFIED



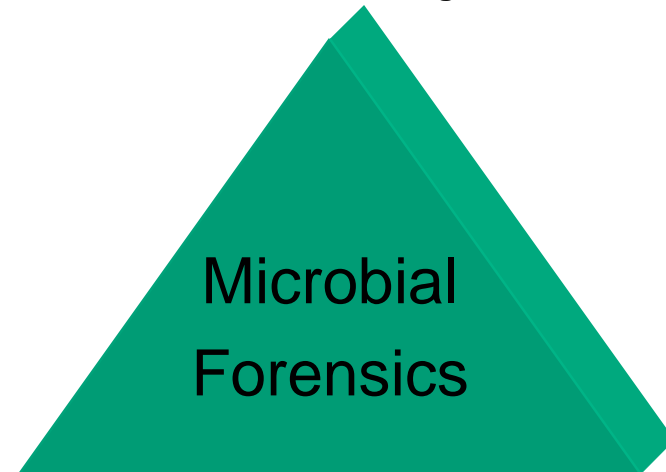
# (U) State of Microbial Forensics

Building capability to support attribution investigations.



Current Capability

Robust capability to support attribution investigation!!



Desired Capability

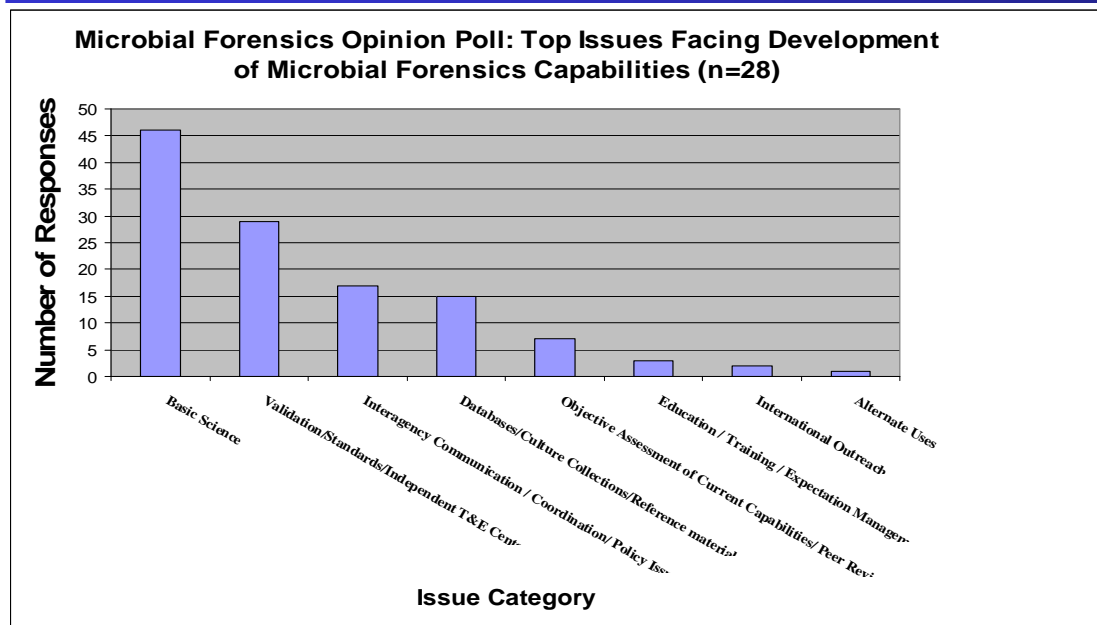
(U) A statistically reliable capability is supported by a solid foundation of high quality science. How do we get there?

•UNCLASSIFIED

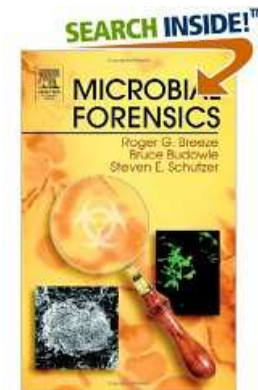
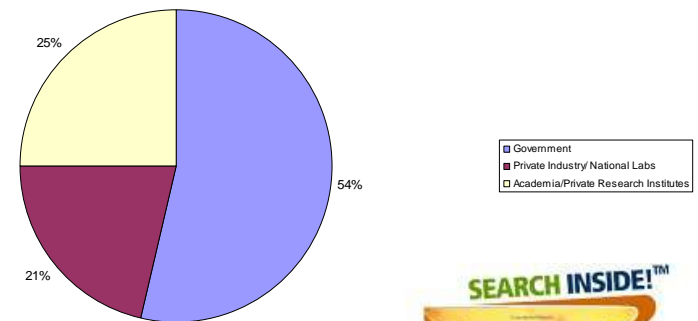


•UNCLASSIFIED

# (U) Top Issues Facing Microbial Forensics



Microbial Forensics Opinion Poll Responder Demographics



- Tier I: Basic Science, Validation/Standards/Independent T&E Centers
- Tier II: Interagency Communication & Coordination, Policy Issues, Databases, Culture Collections, Reference materials
- Tier III: Education & Training, Expectation Management, International Outreach

•UNCLASSIFIED



•UNCLASSIFIED

## **(U) Fostering the Development of Microbial Forensics**



- (U) Support Basic R&D (*Many Gaps!*)**
  - (U) Develop National R&D Strategy to address Scientific Knowledge Gaps**
  - (U) Engage top scientific talent in R&D**
  - (U) Provide Dedicated Sustained Funding**
  
- (U) Establish QA/QC Standards for all labs**
  
- (U) Adopt Rigorous Validation Approaches**
  - (U) Standard reference materials**
  - (U) Objective and thorough review of validation claims**

•UNCLASSIFIED



•UNCLASSIFIED

## (U//FOUO) Fostering the Development of Microbial Forensics (con't)



- (U) Develop Rigorous Standards for Data Interpretation
  - (U//FOUO) Court Cases vs. National Security Decisions
    - (U//FOUO) Both can have *high regret* consequences
  - (U) Scientifically Defensible IS the minimum standard
- (U) Perform Objective Capabilities Assessments
  - (U) Test the system with realistic exercises
- (U) Robust Peer Review for All Aspects!

•UNCLASSIFIED