

# **Metagenomics and biodefence in Italy**

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# Metagenomics and biodefence in Italy

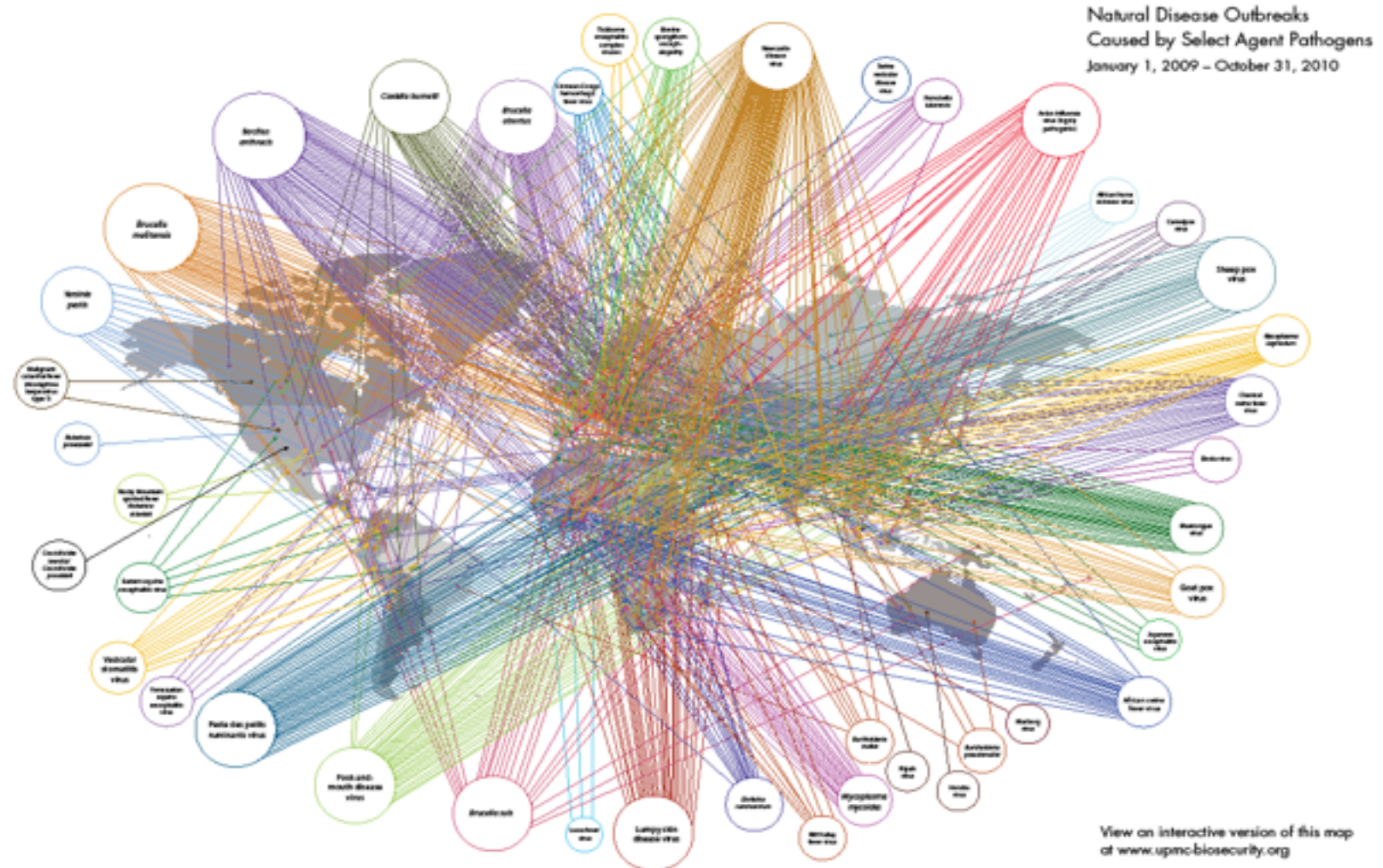




# Metagenomics and biodefence in Italy

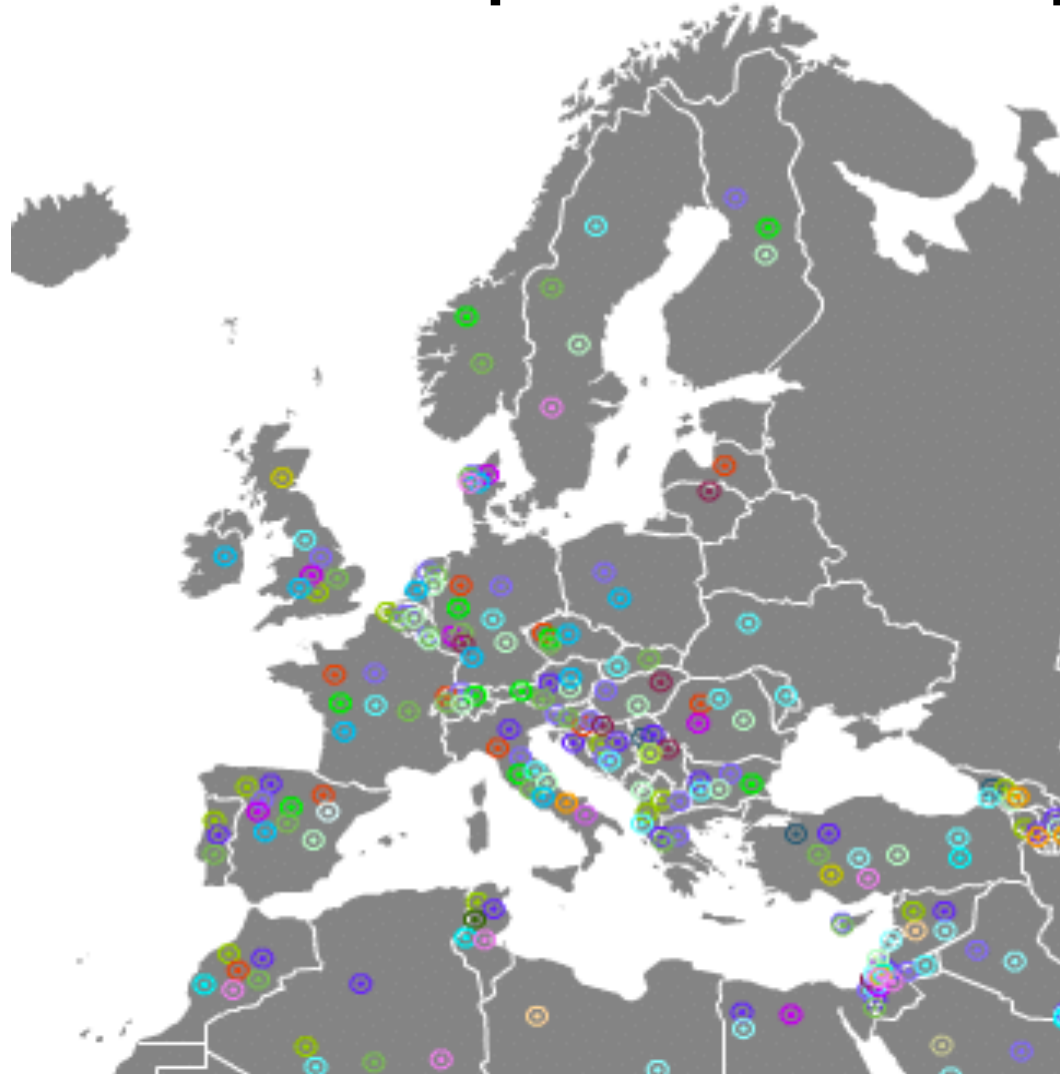
## B agents "natural" presence

Biosecurity and Bioterrorism, 9:69-71, 2011



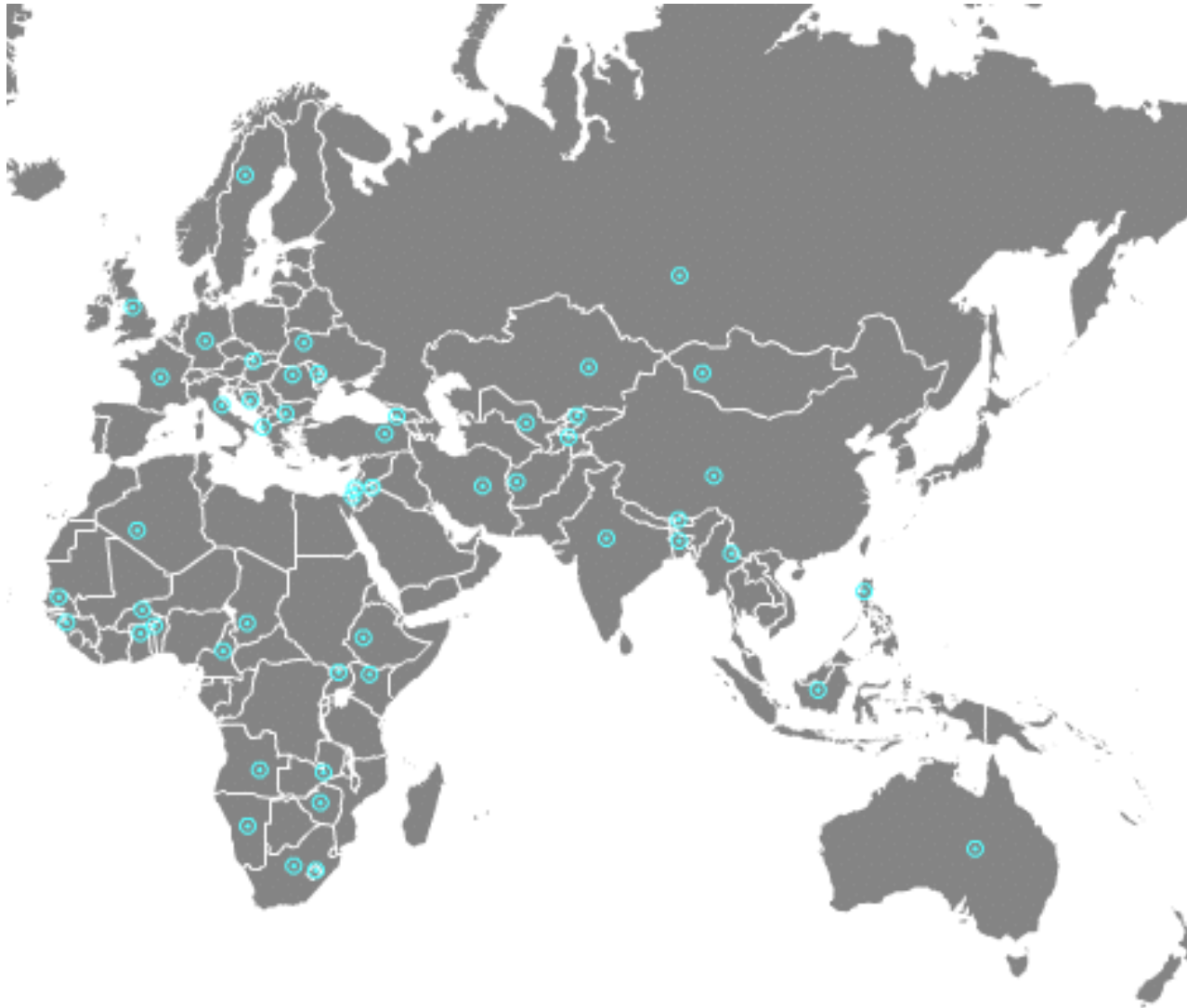
# Metagenomics and biodefence in Italy

## B agents "natural" presence in Europe



# Metagenomics and biodefence in Italy

## Anthrax "natural" presence in Africa and Eurasia



# Metagenomics and biodefence in Italy

## Analysis levels and possible solutions



The diagram features a horizontal line with an arrow pointing to the right, labeled 'Cost and Time'. Above this line, on the left, is a vertical line. A horizontal line extends from this vertical line to the right, ending in an oval labeled 'Identification'. Below the horizontal line, on the left, is the text 'Lab identification for Therapy & Prophylaxis'. Below this text is a bulleted list of questions related to identification.

### Identification

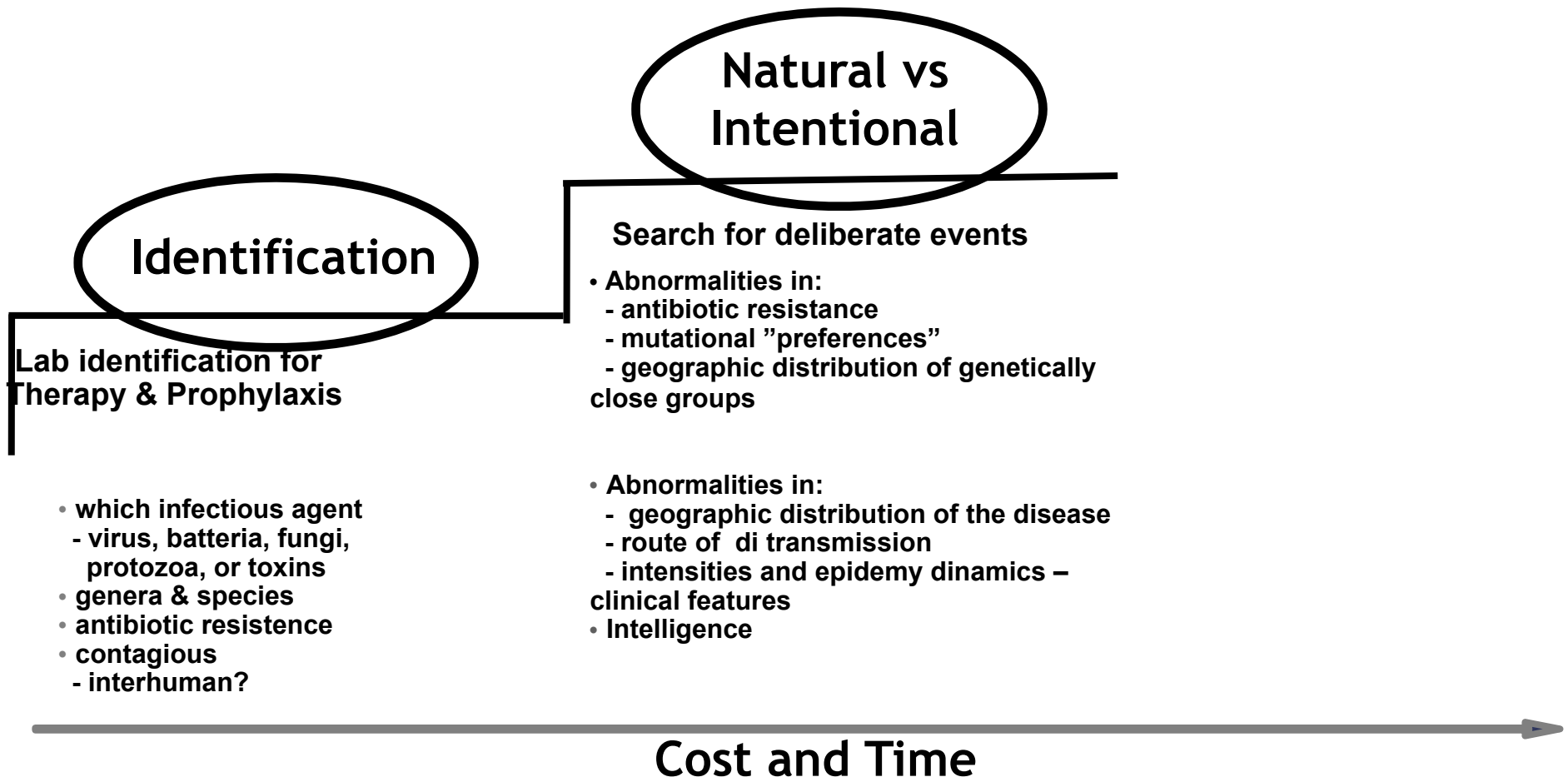
Lab identification for  
Therapy & Prophylaxis

- which infectious agent
  - virus, bacteria, fungi, protozoa, or toxins
- genera & species
- antibiotic resistance
- contagious
  - interhuman?

Cost and Time

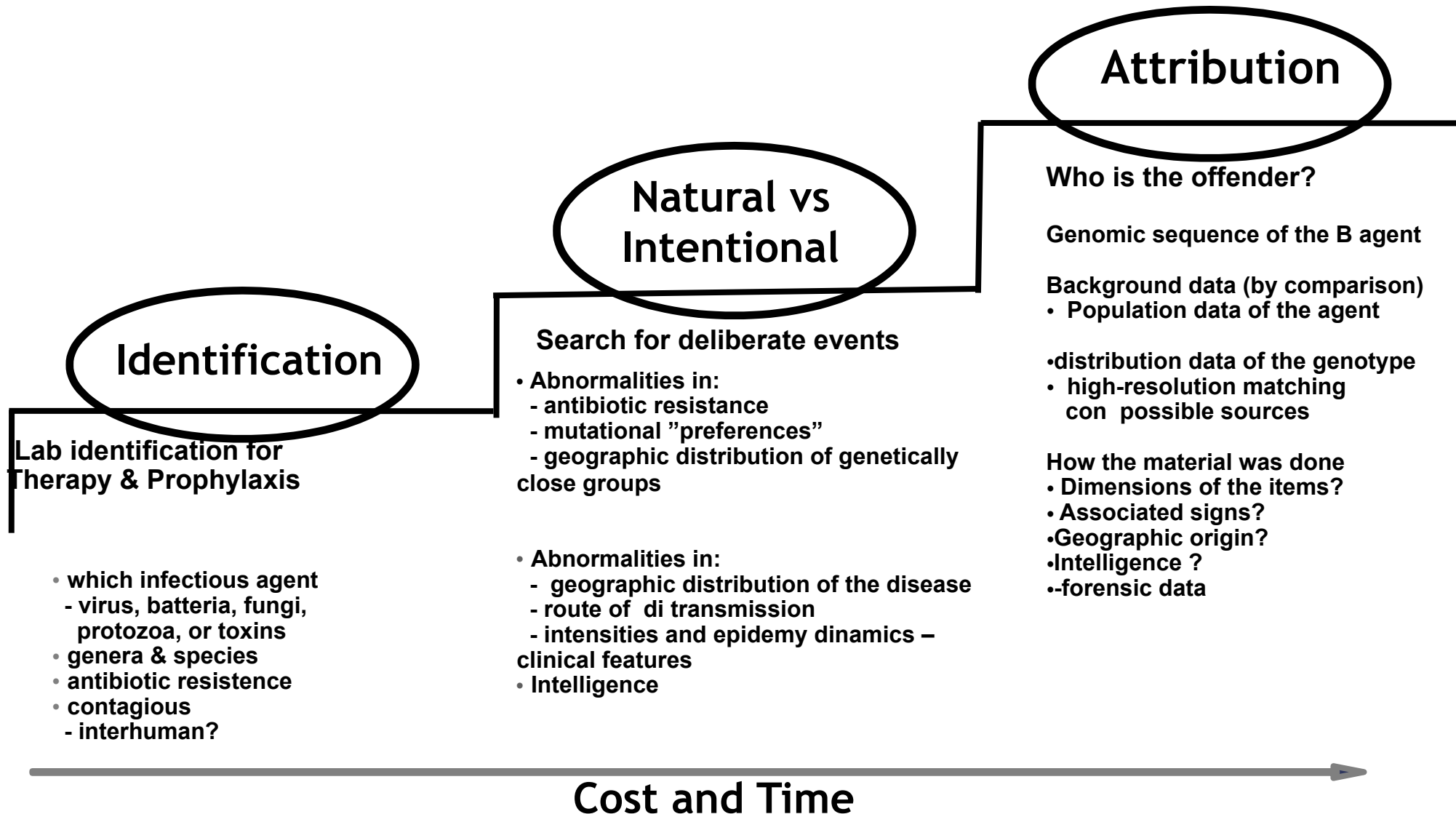
# Metagenomics and biodefence in Italy

## Analysis levels and possible solutions



# Metagenomics and biodefence in Italy

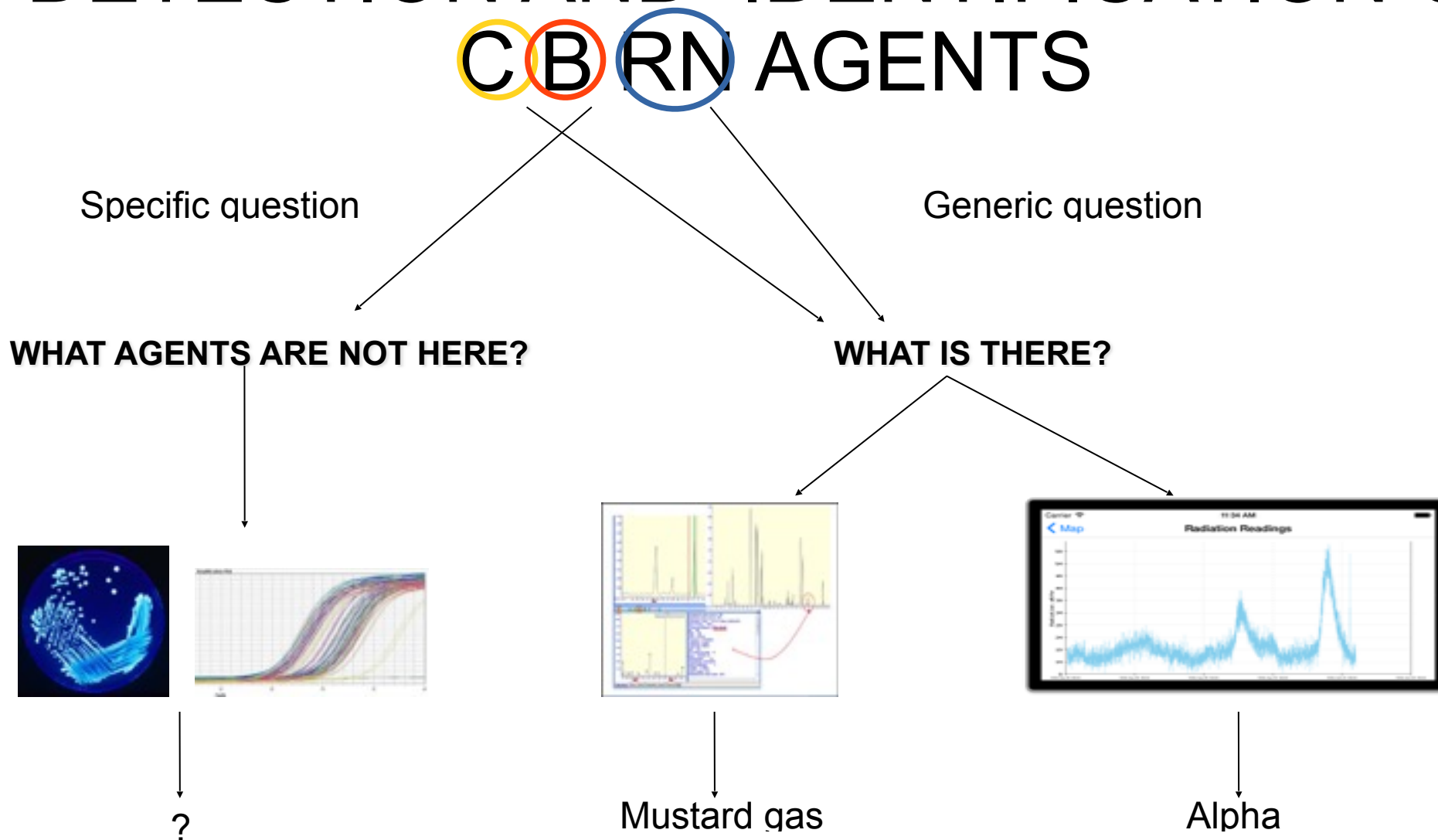
## Analysis levels and possible solutions





# Metagenomics and biodefence in Italy

## DETECTION AND IDENTIFICATION OF C B R N AGENTS



# Metagenomics and biodefence in Italy

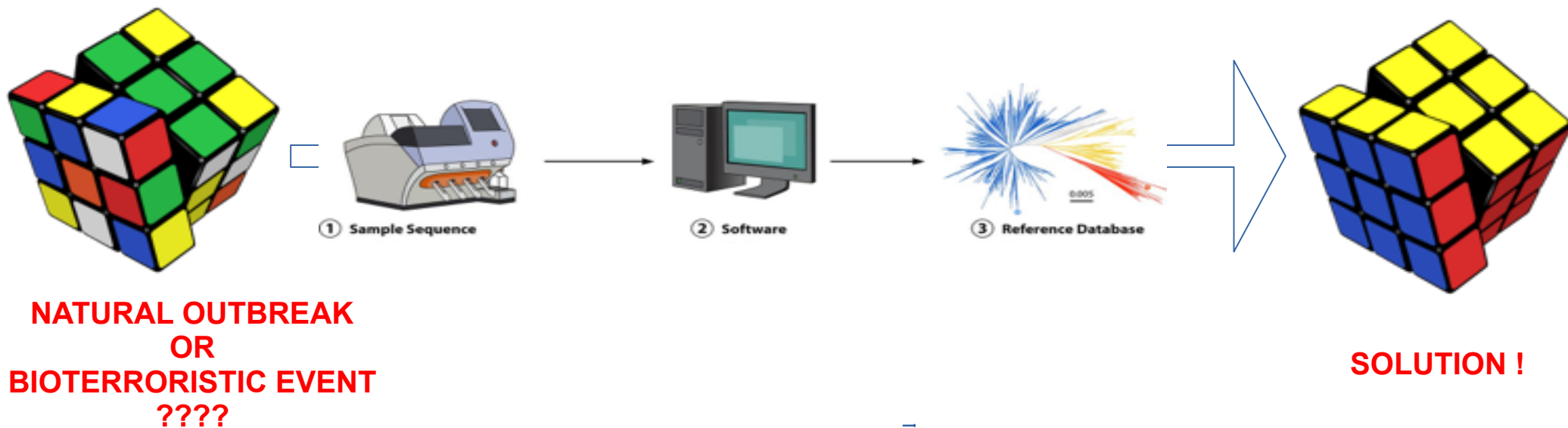
## CBRN FRAMEWORK



A **generic** detection method for **biological warfare agents** still need to be developed

# Metagenomics and biodefence in Italy

## How to solve bioterroristic puzzle



# Metagenomics and biodefence in Italy

## PAST EXPERIENCE

“WEAG CEPA13.14”  
2004-2006  
6 Countries  
**B-agent detection**



“EDA B-agent database”  
2008-2011  
12 Countries  
**constitution of a common  
B-agent database**



“EDA EBLN”  
2012-2015  
10 Countries  
**B-agent database implementation,  
Virus, NGS**



# Metagenomics and biodefence in Italy

**Rome 2.9 million residents in 1,285 km<sup>2</sup> (496.1 sq mi)**

**Rome Subway system is 3 lines (A,B and C)**

**Line A 27 stations (290 runs/day, estimated n. passengers 450K)**

**Line B 26 stations (308 runs/day, estimated n. passengers 350K)**

**Line C 21 stations (new no data available yet)**





# **Metagenomics and biodefence in Italy**

## **Current status**

**perform actual sampling (2 teams of 3 individuals for each line = 18 people) in a single day**

**we plan to collect swabs from all city stations sampling 3 points/stations**

**+**

**sampling on the train seats at the terminal stations**

**=**

**about 250 samples**

**waiting authorization from military authorities**

**contact transit municipal authorities in Rome (everybody changed since june 19th)**