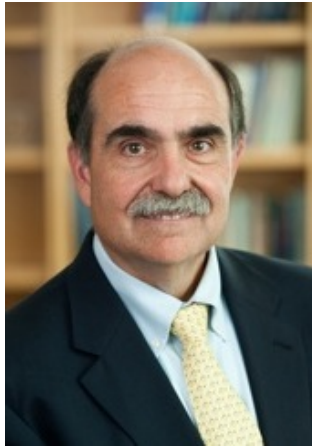


# ASPPH and CDC PERLC Webinar: Using Root Cause Analysis and Peer Assessment to Learn from Experiences with Public Health Emergencies

Michael Stoto and Rachael Piltch-Loeb  
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# Today's Presenters



- Dr. Michael Stoto



- Ms. Rachael Piltch-Loeb

# Public Health Emergency Preparedness (PHEP) systems must learn from “critical incidents”



- Our work has focused on preparedness for the health consequences of large-scale emergencies and disasters
  - Anthrax attacks (2001)
  - SARS
  - Hurricane Katrina (2005)
  - H1N1 influenza (2009)
- How do we ensure that the “lessons learned” are
  - Valid
  - Implemented

# Current approaches to assessing PHEP

- Unstructured assessments

*Are you prepared?*

*What have we learned?*

- Inventories & capacity assessments

*Have we done what's recommended?*


- Drills and exercises

*Would we be prepared?*

- **Actual events – critical incidents**

*Were we prepared?*

*What gaps in preparedness exist?*



Using HSEEP  
formatted  
Exercise  
Evaluation  
Guides (EEGs)  
and After  
Action Reports  
(AARs)

# Problems with *typical* HSEEP AARs

- Focus on Target Capability Lists (TCL)
  - Many TCLs are capacities rather than capabilities
  - One TCL/“observation” at a time
  - Assumes that the plan applies to the situation
    - Vaccine available all at once, demand high
    - NIMS model for communication
- More focus on form than probing, objective analyses
  - Root cause analysis optional
  - “Lessons learned” optional
- Improvement plans
  - Often missing altogether
  - Little analysis
- Prepared by emergency planners
  - Rather than subject matter experts

# Primary challenge: Critical incidents are “singular events”- unique in context and specifics

- Most of us were taught that rigorous evaluation focuses on patterns discerned through statistical analysis of large samples
  - “Don’t let your estimates be skewed by outliers”
  - “the plural of ‘anecdotes’ is not ‘data’”
- QI methods rely on statistical measurements
  - Singular nature of emergencies limits measurement opportunities
- What do you do when all you have is a small number of singular events?

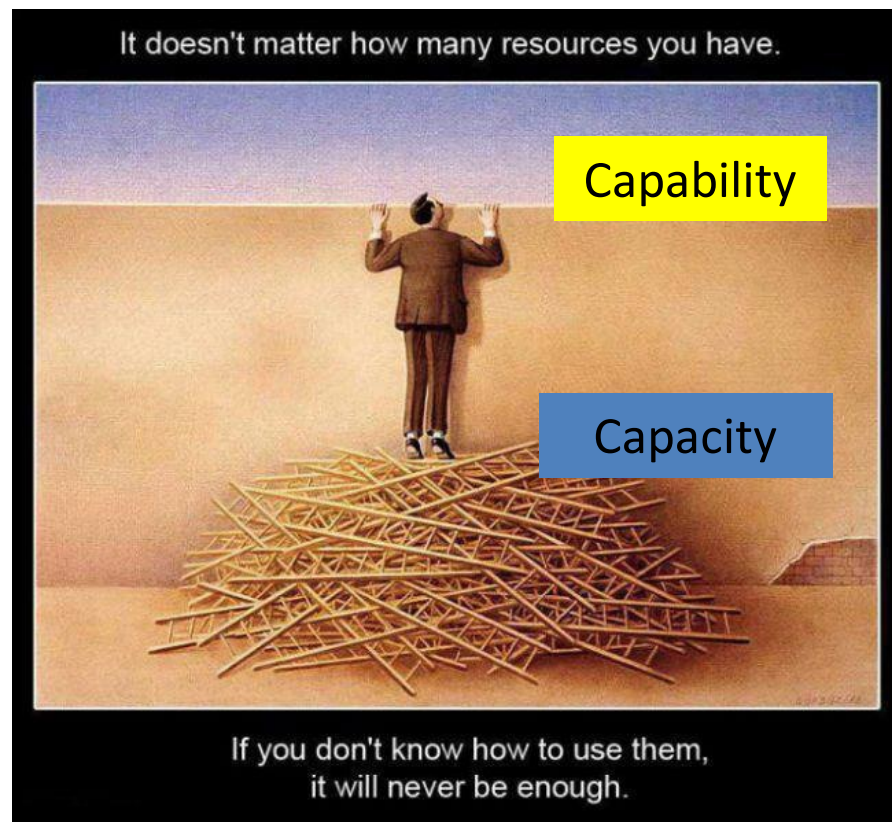
# Additional challenges

- Public health “system” is fragmented
  - City, county, and state departments
    - Structure and function vary
  - Non public health partners
    - Health care, policy, EMS, media, ...
  - Who’s responsible for what?
- Effective response is complex and multi-factorial
  - Not always clear what is effective and needs to be done
  - Don’t know “counterfactuals”



# Some possible solutions

- Focus on capabilities rather than capacities
  - Capacities
    - resources—infrastructure, response mechanisms, knowledgeable and trained personnel—that a public health system has to draw upon
    - inventories may not predict response capabilities or outcomes
  - Capabilities
    - actions a public health system is capable of taking to effectively identify, characterize, and respond to emergencies
    - can be assessed in small and large event
- For QI purposes, ask
  - How and why the system (not just specific capabilities) performed as it did
  - Not only how many or how well the system performed





# “Facilitated look-back” methodology

- Established method for examining public health systems’ emergency response capabilities and for conducting a candid systems-level analysis (RAND TR-320 [http://www.rand.org/pubs/technical\\_reports/TR320.html](http://www.rand.org/pubs/technical_reports/TR320.html))
- Structured discussions with
  - public health leaders and key staff
  - stakeholders involved with the response
- Neutral facilitator and a no-fault approach
- Dimensions of decisions are probed and nuances in past decision-making explored

# Root cause analysis

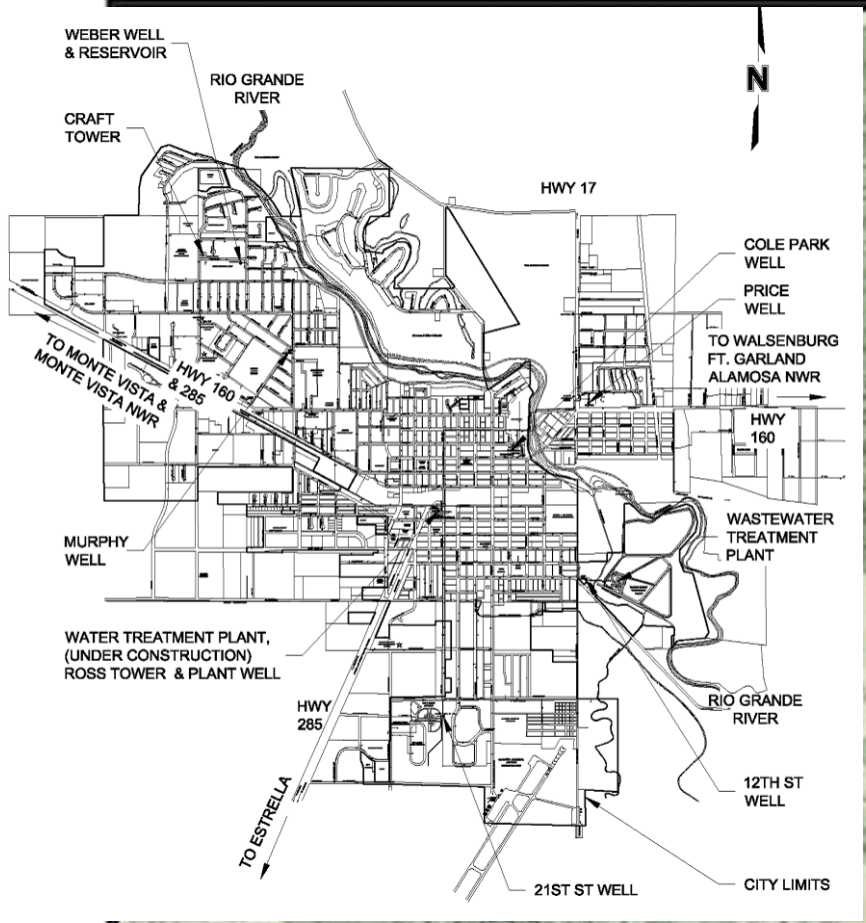
- Goal: move from superficial, proximate causes to system-level root causes by repeatedly asking why each identified problem occurred
- Focuses on primary response challenges, immediate causes that lead to the challenges, and contributing factors
  - Contributing factors can be modifiable, unmodifiable, or pre-determined root causes
- Identifies lessons learned from adaptations and solutions that met response challenges

# Root cause analysis model

- Includes the following components:
  - Response challenge
  - Objective or goal
  - Immediate causes
  - Contributing factors [i.e. root causes]
  - Lessons learned
  - Adaptations and Solutions
- Benefits:
  - Variety of stakeholders address critical issues rather than attributing blame
  - Root causes tend to be system rather than personal issues

# Example: 2008 Salmonella outbreak

- Alamosa County, CO
  - rural community in Southwestern Colorado with a population of approximately 15,000
  - one of the poorest in Colorado
  - many citizens are home-bound or have limited modes of communication
  - large Hispanic and Mormon populations
  - one public school system and one state university
- County “health department”
  - Alamosa County Nursing Services (ACNS)
  - supported by regional epidemiologist, preparedness staff, ...
- City of Alamosa has separate administration
  - responsible for public works including the management of the water supply
  - knew the water supply was not chlorinated, and that there was at least one break in the water system.



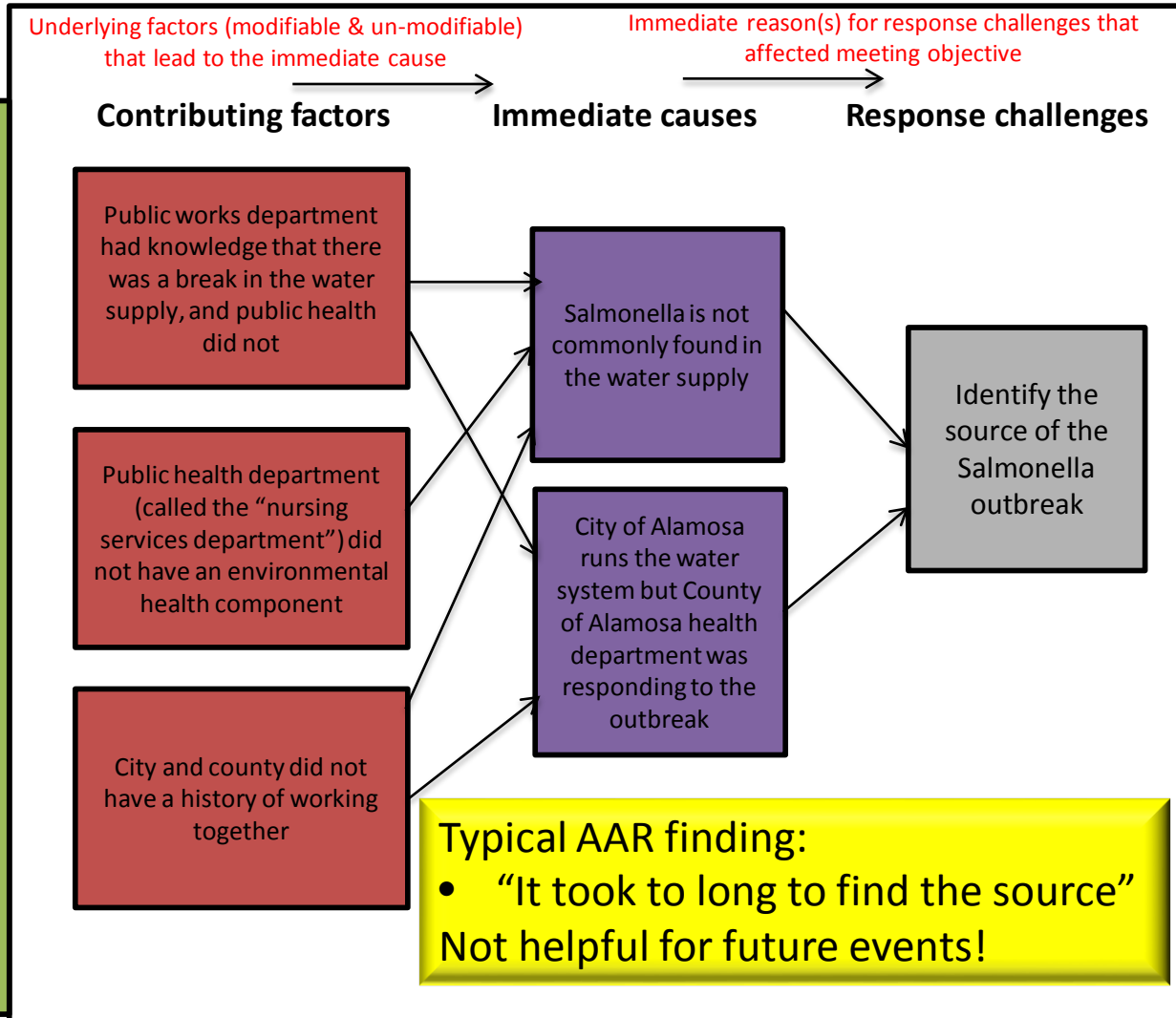


# Identifying the source of the problem

- Fri., Mar. 7: First cases of severe GI disease present at local medical facility
- Sat., Mar. 8: Regional epidemiologist assembles team and starts to interview cases
- Wed., Mar. 12: State lab confirms Salmonella, 25 people ill
- McDonald's originally thought to be the source, but case in infant and mapping suggested water system
- Wed., Mar. 19: Water system confirmed as source



Story Arc: Residents of Alamosa County, were becoming ill with a severe gastrointestinal illness at abnormally high rates. Approximately twenty cases were identified before the public works department admitted that the water system could be to blame.



**Lessons for Systems Improvement:**

- The city and county must communicate to conduct outbreak investigations successfully
- The water supply must be chlorinated to prevent outbreak
- Public works needs to develop an ongoing relationship with public health and emergency operations

**Objective:**

Identify the source of the outbreak causing residents of the Alamosa area to get sick to mitigate the spread of the disease.

*Related Capability: Public Health Surveillance and Epidemiological Investigation (CDC PHP 13)*

Directly impacted whether the **objective** was met



# Peer Assessment for PHEP

- One challenge with learning from critical incidents is ensuring objective, systematic, and reliable analyses
  - difficult if officials evaluating their own response
- Assessment by peers offers potential for
  - Reliable and objective analyses by professionals familiar with
    - Public health preparedness
    - Particularities of the responding PHEP system
  - “more hands”
- Can be effective way to share best practices across jurisdictions
  - Evidence from Health Officers Assoc. of Calif., ...



# The peer assessment process

- Field trials in
  - Alamosa, CO – 2008 Salmonella
  - Dallas Metroplex, TX – 2012 West Nile Virus
- Just-in-time training
- Lessons learned
  - Participants contribute a variety of perspectives to incident
  - Process encouraged thoughtful engagement especially for those with different view points
  - Peer assessors contribute to meaningful discussion through facilitation
  - Follow up reports can be used to improve existing reviews

# Learning from critical incidents

- National Health Security Strategy calls for systematic quality improvement (QI) approach to enhance national health security
- Needed: Critical Incident Registry (CIR) for Public Health Emergency Preparedness
- Registry concept
  - Database of incident reports filed by public health agencies that responded to a critical incident
- Objectives
  - Drive organizational improvement through careful post-event analysis of “own” events
  - Facilitate identification and sharing of “best practices”
  - Facilitate cross-case analyses to identify contexts and mechanisms that determine success

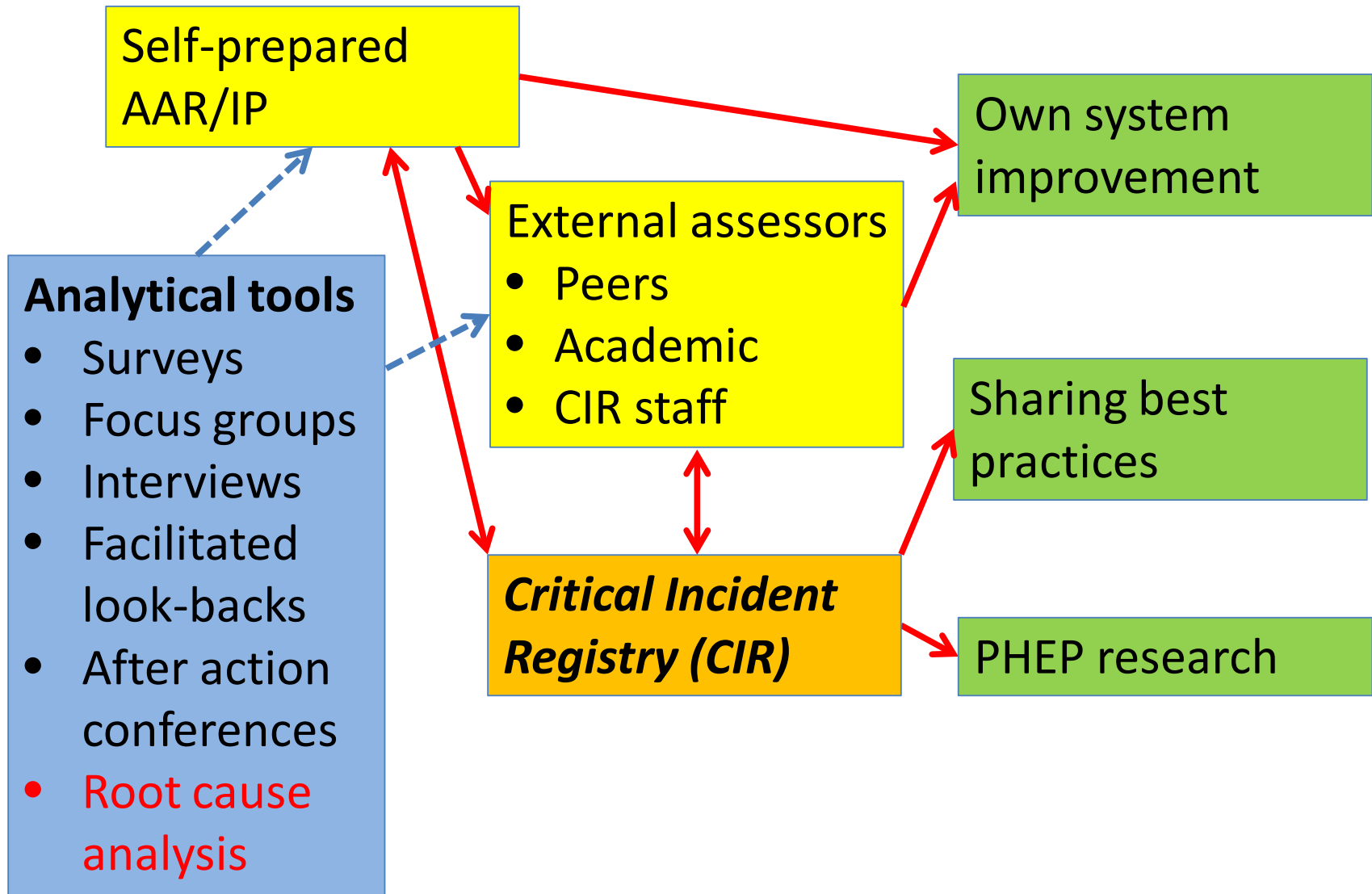
# Scope: What is a critical incident?

- Public health played a significant role
  - tested one or more public health preparedness capabilities
- Incident was “meaningful”
  - magnitude of morbidity or social disruption
  - stretch response capabilities and reveal critical vulnerabilities
  - significantly altered systems behavior or beliefs
  - helped to identify best practices
  - captured the PHEP community’s attention
- Appropriate scope (time and organizations) to capture the event (“bite size chunk”)

# Critical incidents in the last decade

- Bioterrorism: Anthrax, smallpox vaccination
- Emerging and re-emerging pathogens
  - West Nile virus, SARS, Monkeypox, measles
  - H5N1 (avian) influenza, H1N1 (swine) influenza
- Foodborne disease outbreaks
  - Hepatitis A, Salmonella
  - *E. coli* in meat products, lettuce, bean sprouts
- Natural disasters: Katrina, Irene, Sandy
- Boston Marathon bombing
- Other incidents
  - 2004 flu vaccine shortage

# How *a CIR* could enhance learning from experience in PHEP



# Report structure

- Common structure that facilitates analysis of individual incidents and supports cross-case analysis
  - Structured summary, searchable by
    - Practitioners looking for best practices
    - Researchers looking to identify trends across incidents
  - Relevant context: Characteristics of the responding public health system, including history and training
  - Major events in the incident: Timeline
  - Analysis of PHEP system's role: PHEP capabilities tested at high enough level to allow generalization
- Just enough detail to understand why particular mechanisms worked in that context
  - Standard descriptions of context & PHEP capabilities

# Reporting

- Reporting requirements
  - Mandatory reporting with penalties (e.g. FAA)
  - Condition of funding (e.g. CDC cooperative agreements)
  - Voluntary
- Barriers
  - Staff time, effort and skills
  - Embarrassment or liability concerns
- Incentives
  - Clarify goal of organizational learning
  - Provide support
    - RCA “tool” and training
    - Peers
    - Schools of public health
  - Reward thoughtful reports

# Next steps

- Continue developing training materials & approaches
  - toolkit and on-line training
  - case examples
  - Rapid dissemination of the RCA tool
- More pilot tests
  - both the RCA and peer assessment components
  - help us continue refining the training and assess feasibility of asking peer assessors to take this on
  - In progress: Kanawha Charleston, West Va.
- More discussions with organizations that might be interested in hosting a registry, and supporting the process of identifying and training peer assessors



# Questions?



For more information please see:

<http://www.hsph.harvard.edu/h-perlc/>

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