



Conducting a Hazard and Vulnerability Analysis

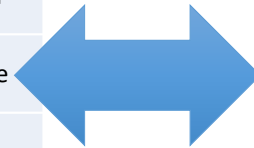
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Objectives

1. Describe how to conduct a Hazard Vulnerability Analysis in the health care setting
2. Highlight specific tools to mitigate risks once hazards have been identified and prioritized
3. Discuss the use of the HVA to develop the annual emergency management program activities
4. Demonstrate a new way to prioritize risks using actual incident information

Assessing Risk

| | |
|---|-----------------------------|
| Bioterrorism / Contamination | Labor Action/Staff Shortage |
| Catastrophic / Area Wide Event | Mass Casualty |
| Civil Unrest (External) | Medical Gas Failure |
| Civil Unrest (Internal) | Natural Gas Leak |
| Compressed Gas | Power Failure |
| Dialysis Department Response and Recovery | Radioactive Internal |
| Earthquake | Sewer System Failure |
| Evacuation | Sexual Assault |
| Explosion Checklist | Shooting or Weapons |
| Facility Threat | Suicide |
| Fire | Surge Capacity |
| Flooding | Theft |
| Hazmat | VOIP Telephony Failure |
| Health Connect | BCP |
| HVAC Failure | Water Shortage/Drought |
| Information Technology- Systems Failure | Water System Failure |
| | Weather |



| HAZARD AND VULNERABILITY ASSESSMENT TOOL NATURALLY OCCURRING EVENTS | | | | | | | | |
|--|--|--|--|--|--|--|--|------------------|
| SEVERITY = (MAGNITUDE - MITIGATION) | | | | | | | | |
| EVENT | PROBABILITY | HUMAN IMPACT | PROPERTY IMPACT | BUSINESS IMPACT | PREPARED-NESS | INTERNAL RESPONSE | EXTERNAL RESPONSE | RISK |
| | Likelihood this will occur | Possibility of death or injury | Physical losses and damages | Interruption of services | Preplanning | Time, effectiveness, resources | Community/ Mutual Aid staff and supplies | Relative threat* |
| SCORE | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = High 2 = Moderate 3 = Low or none | 0 = N/A 1 = High 2 = Moderate 3 = Low or none | 0 = N/A 1 = High 2 = Moderate 3 = Low or none | 0 - 100% |
| Hurricane | | | | | | | | 0% |
| Tornado | | | | | | | | 0% |
| Severe Thunderstorm | | | | | | | | 0% |
| Snow Fall | | | | | | | | 0% |
| Blizzard | | | | | | | | 0% |
| Ice Storm | | | | | | | | 0% |
| Earthquake | | | | | | | | 0% |
| Tidal Wave | | | | | | | | 0% |
| Temperature Extremes | | | | | | | | 0% |
| Drought | | | | | | | | 0% |
| Flood, External | | | | | | | | 0% |
| Wild Fire | | | | | | | | 0% |
| Landslide | | | | | | | | 0% |
| Dam Inundation | | | | | | | | 0% |
| Volcano | | | | | | | | 0% |
| Epidemic | | | | | | | | 0% |
| AVERAGE SCORE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0% |

*Threat increases with percentage.

| | | |
|-------------------------------|------|------|
| RISK = PROBABILITY * SEVERITY | | |
| 0.00 | 0.00 | 0.00 |

Key Components

| Probability | Impact | Preparedness |
|--|---|--|
| <ul style="list-style-type: none">• Risk• Historical data• Predictive data | <ul style="list-style-type: none">• Human• Property• Business | <ul style="list-style-type: none">• Plans• Resources• Partnerships |

Calculating Probability

- **General Risk**

- Flood plain, proximity to hazards or technology, aging infrastructure
- Hidden risks not previously identified
- FEMA data, emergency management data, local health department, USGS, internet, yellow pages...

- **Historical data**

- History of flooding, drought, wild land fire
- FEMA, USGS, health department (local, state, federal), internet, emergency management (past activations), public safety agencies, EPA, DOT, FAA

- **Predictive data**

- Earthquake risk, hurricane season, terrorist targets
- USGS, NOAA, NWS, JTTF, law enforcement (crime statistics), DOT, local emergency management, local health department

Calculating Impacts

- Human
 - Direct injury or illness, exposure and surveillance, fatalities
 - Personnel shortages
- Property
 - Infrastructure, supplies and equipment, transportation resources
 - Impact on provision of clinical services
- Business
 - Occupancy, record keeping, loss of revenue, public perception

Calculating Preparedness

- Plans
 - Existing EOP, SOPs, Response Guides, Task lists
 - Identify what is missing: does lack of plan increase the impact?
- Resources
 - Space, staff, stuff
 - Community assets
 - Agencies, military, federal response partners
- Partnerships
 - Existing relationships, MOUs, consortiums
 - Business and vendor support

Demo

Our community, our hospital

- Located in the Midwest, hospital overlooks the Ohio River
- Community has high crime rate in some areas; moderate unemployment rate
- Bluegrass music festival held each spring along the water front, with camping available and houseboats docked along the water's edge
- Major employer is the OMG Nuclear Power Plant and its neighboring oil refinery
- 230 bed urban hospital, Level 2 trauma center
- No decontamination facilities
- Hospital built in 1985
- 75% of facility is on emergency power, including chillers, HVAC, main building
- Rehabilitation hospital on campus; 100% occupancy of 30 beds
- Recently hired part-time emergency manager; collateral duties in Quality Management

Demo

HAZARD AND VULNERABILITY ASSESSMENT TOOL TECHNOLOGIC EVENTS



KAISER
PERMANENTE

| EVENT | PROBABILITY | SEVERITY = (MAGNITUDE - MITIGATION) | | | | | | RISK |
|-----------------------------|--|--|--|--|--|--|---|----------|
| | Likelihood this will occur | HUMAN IMPACT Possibility of death or injury | PROPERTY IMPACT Physical losses and damages | BUSINESS IMPACT Interruption of services | PREPARED-NESS Preplanning | INTERNAL RESPONSE Time, effectiveness, resources | EXTERNAL RESPONSE Community/ Mutual Aid staff and supplies | |
| SCORE | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = High 2 = Moderate 3 = Low or none | 0 = N/A 1 = High 2 = Moderate 3 = Low or none | 0 = N/A 1 = High 2 = Moderate 3 = Low or none | 0 - 100% |
| Electrical Failure | | | | | | | | 0% |
| Generator Failure | | | | | | | | 0% |
| Transportation Failure | | | | | | | | 0% |
| Fuel Shortage | | | | | | | | 0% |
| Natural Gas Failure | | | | | | | | 0% |
| Water Failure | | | | | | | | 0% |
| Sewer Failure | | | | | | | | 0% |
| Steam Failure | | | | | | | | 0% |
| Fire Alarm Failure | | | | | | | | 0% |
| Communications Failure | | | | | | | | 0% |
| Medical Gas Failure | | | | | | | | 0% |
| Medical Vacuum Failure | | | | | | | | 0% |
| HVAC Failure | | | | | | | | 0% |
| Information Systems Failure | | | | | | | | 0% |
| Fire, Internal | | | | | | | | 0% |
| Flood, Internal | | | | | | | | 0% |
| Hazmat Exposure, Internal | | | | | | | | 0% |
| Supply Shortage | | | | | | | | 0% |
| Structural Damage | | | | | | | | 0% |
| AVERAGE SCORE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0% |

*Threat increases with percentage.

| | | |
|-------------------------------|------|------|
| RISK = PROBABILITY * SEVERITY | | |
| 0.00 | 0.00 | 0.00 |

Outcomes

| Region A | Probability | Impact Level | Potential Impact |
|----------------------------------|-------------|--------------|---|
| Earthquake | High | High | Injury and loss of life, significant structural damage, business and financial interruption |
| Epidemic or Pandemic | High | High | Injury and loss of life, business and financial interruption |
| Civil Disturbance | High | Moderate | Injury and loss of life, business and financial interruption, potential structural damage |
| Medical Surge | High | High | Injury and loss of life, business and financial interruption |
| Work Stoppage/Labor Issue/Strike | High | Moderate | Business and financial interruption |

| Region B | Probability | Impact Level | Potential Impact |
|----------------------|-------------|--------------|---|
| Earthquake | High | High | Injury and loss of life, significant structural damage, business and financial interruption |
| Epidemic or Pandemic | High | High | Loss of life, business and financial interruption |
| Mass Casualty | High | Moderate | Injury and loss of life, significant structural damage, business and financial interruption |
| Wildfires | High | Moderate | Loss of life, business and financial interruption |

Tools



2006

2014



Tools

Hospital Incident Command System - Incident Response Guides



Hospital Incident Command System (HICS) 2014

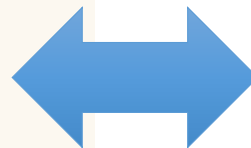
Incident Response Guides (IRGs)

Click the [Word] to download in Microsoft Word format, click the [PDF] to download in Adobe format.

All Incident Response Guides

[Word] [PDF]

Active Shooter [Word] [PDF]
Chemical Incident [Word] [PDF]
Earthquake [Word] [PDF]
Evacuation, Shelter-in-Place, & Hospital Abandonment [Word] [PDF]
Explosive Incident [Word] [PDF]
Hostage or Barricade Incident [Word] [PDF]
Infectious Disease [Word] [PDF]
Information Technology (IT) Failure [Word] [PDF]
Mass Casualty Incident [Word] [PDF]
Missing Person [Word] [PDF]
Radiation Incident [Word] [PDF]
Severe Weather with Warning [Word] [PDF]
Staff Shortage [Word] [PDF]
Tornado [Word] [PDF]
Utility Failure [Word] [PDF]
Wildland Fire [Word] [PDF]



Incident Response Guide: Infectious Disease

Mission

To effectively and efficiently identify, triage, isolate, treat, and track a surge of potentially infectious patients and staff, and to manage the uninjured, asymptomatic persons, family members, and media.

Directions

Read this entire response guide and review the Hospital Incident Management Team Activation chart. Use this response guide as a checklist to ensure all tasks are addressed and completed.

Objectives

- ☐ Identify, triage, isolate, and treat infectious patients
- ☐ Protect patients and staff from exposure and injury
- ☐ Assure safety and security for patients, staff, visitors, and the hospital
- ☐ Admit a large number of infectious patients while protecting other (uninfected) patients

| Immediate Response (0 – 2 hours) | | | | |
|----------------------------------|--------------------|------|---|----------|
| Section | Officer/Specialist | Time | Action | Initials |
| | Incident Commander | | Receive notification of incident from local emergency medical services; notify the emergency department of possible incoming infectious patients. | |
| | | | Notify hospital chief Executive Officer, Board of Directors, and other appropriate internal and external officials of situation status. | |
| | | | Activate the Emergency Operations Plan, Infectious Disease Plan, Surge Plan, Infectious Patient Transport Plan, Hospital Incident Management Team, and Hospital Command Center. | |
| | | | Establish operational periods, objectives, and regular briefing schedule. Consider the use of Incident Action Plan Quick Start for initial documentation of the incident. | |

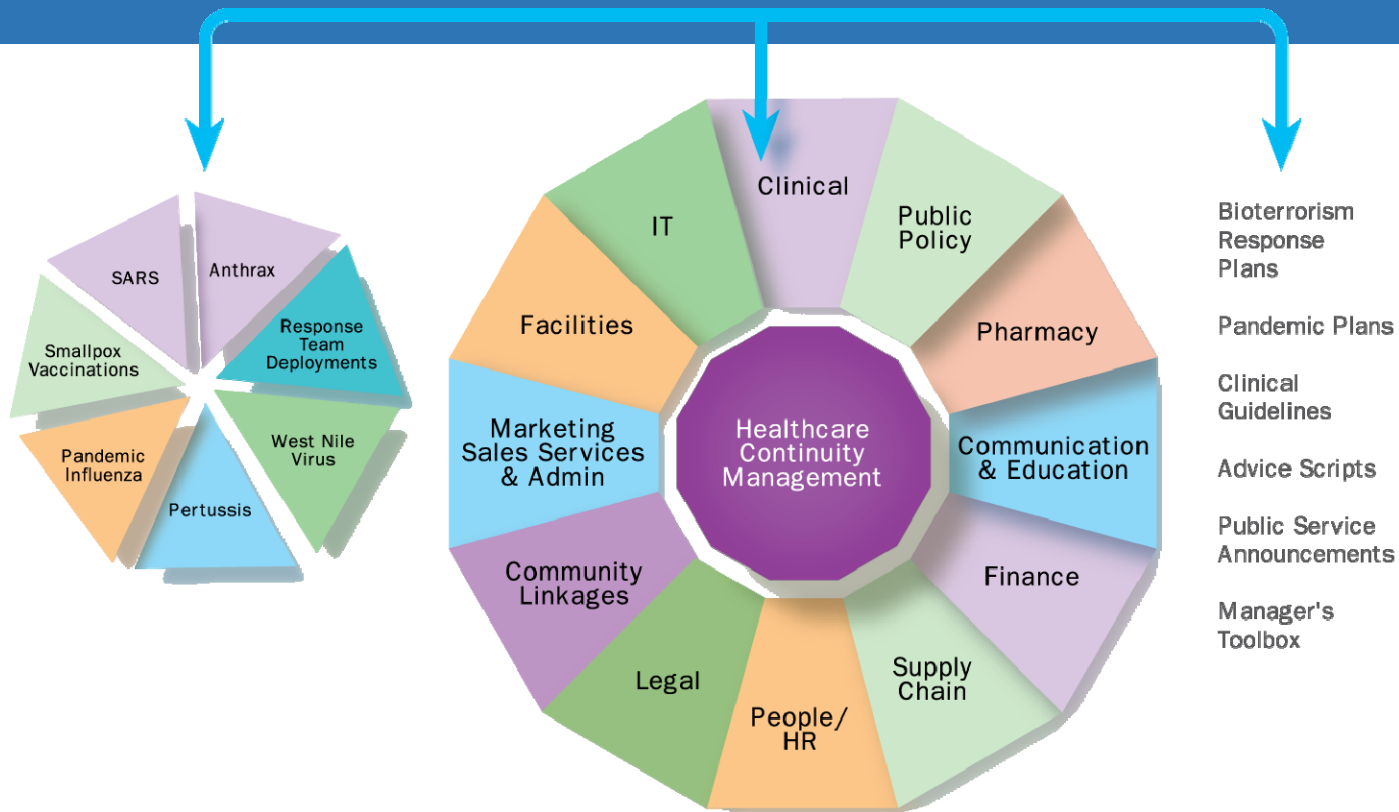
| | | |
|--|---|--|
| | Monitor safe and consistent use of appropriate personal protective equipment by staff. | |
| Medical-Technical Specialist: Infectious Disease | Verify from the emergency department attending physician and affected outpatient sites, in collaboration with local emergency medical services, the following information and report to the incident commander: <ul style="list-style-type: none"><input type="checkbox"/> Number and condition of patients affected, including asymptomatic people presenting<input type="checkbox"/> Type of biological or infectious disease involved (case definition)<input type="checkbox"/> Medical problems present in addition to the biological or infectious disease involved<input type="checkbox"/> Measures taken (e.g., cultures, supportive treatment)<input type="checkbox"/> Potential for, and scope of, communicability | |
| | Provide guidance on appropriate personal protective equipment and isolation precautions. | |
| | Provide expert input in the Incident Action Planning process. | |

| Response (0 – 2 hours) | | | |
|------------------------------|------|---|----------|
| Branch/Unit | Time | Action | Initials |
| Section Chief | | Provide just-in-time training for both clinical and nonclinical staff regarding the status of the event, precautions they should take, and rumor control. | |
| | | Notify the emergency department of possible numbers of incoming infectious patients, in consultation with the Liaison Officer who is in communication with local emergency medical services. | |
| Medical Care Branch Director | | Implement infectious Disease Plan, including: <ul style="list-style-type: none"><input type="checkbox"/> Location for offsite triage, as appropriate<input type="checkbox"/> Proper rapid triage of people presenting requesting evaluation, coordinated with security, if necessary<input type="checkbox"/> Staff implementation of infection precautions, and higher level precautions for high risk procedures (e.g., suctioning, bronchoscopy, etc.), as per current Centers for Disease Control and Prevention (CDC) guidelines<input type="checkbox"/> Proper monitoring of isolation rooms and isolation procedures<input type="checkbox"/> Limitation of patient transportation within hospital for essential purposes only | |

Emergency Management Program Activities

- **Preparedness**
 - Resource identification and procurement, promotion of personal preparedness, development of an emergency management committee
- **Planning**
 - Development of plans, policies, protocols, decision algorithms, response guides, SOPS
 - Research best practices among partners
- **Instructional Activity / Training**
 - All hazards training, personal preparedness, response specific training
 - Organizational learning
- **Exercises**
 - Drills, exercises, demonstrations
- **Corrective Improvement Plan**
 - Evaluate the education and the exercises
 - Identify and make improvements
 - Organizational learning
 - Test and evaluate the changes

KP Model – Risk Reduction



Healthcare Risks

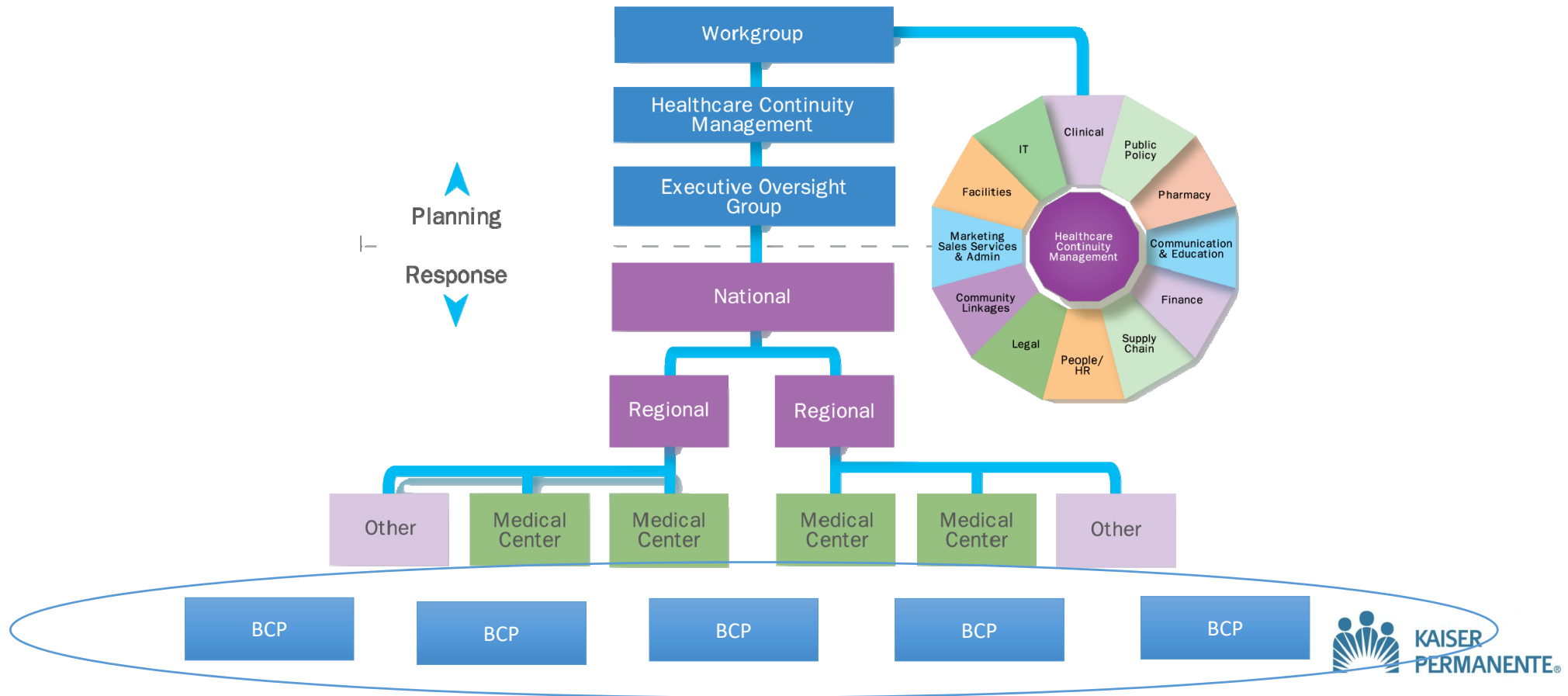


Work Group Activity



Risk Mitigation Tools

KP Model – Comprehensive Response



What if Real Incidents Are Tracked?



What is a Disaster Incident Log?

Disaster:

**A calamitous event, especially one that's sudden and causing great loss of life, damage, or hardship, as a flood, airplane crash, or business failure.*

Incident:

**An event or occurrence*

Log:

**A record of performance, events, or day-to-day activities*

Disaster + Incident + Log:

A record of performance for calamitous events or occurrences

**The Oxford Dictionary*

Information Tracked

- All pertinent data as it relates to a disaster from start to finish
 - Type of incident, when and where it occurred
 - Response efforts - activation of plans and/or command center, resource support
 - Impacts to patient care, business/operations, buildings/structures

KP Disaster Incident Log

Kaiser Permanente

Emergency Management

Data - Los Angeles

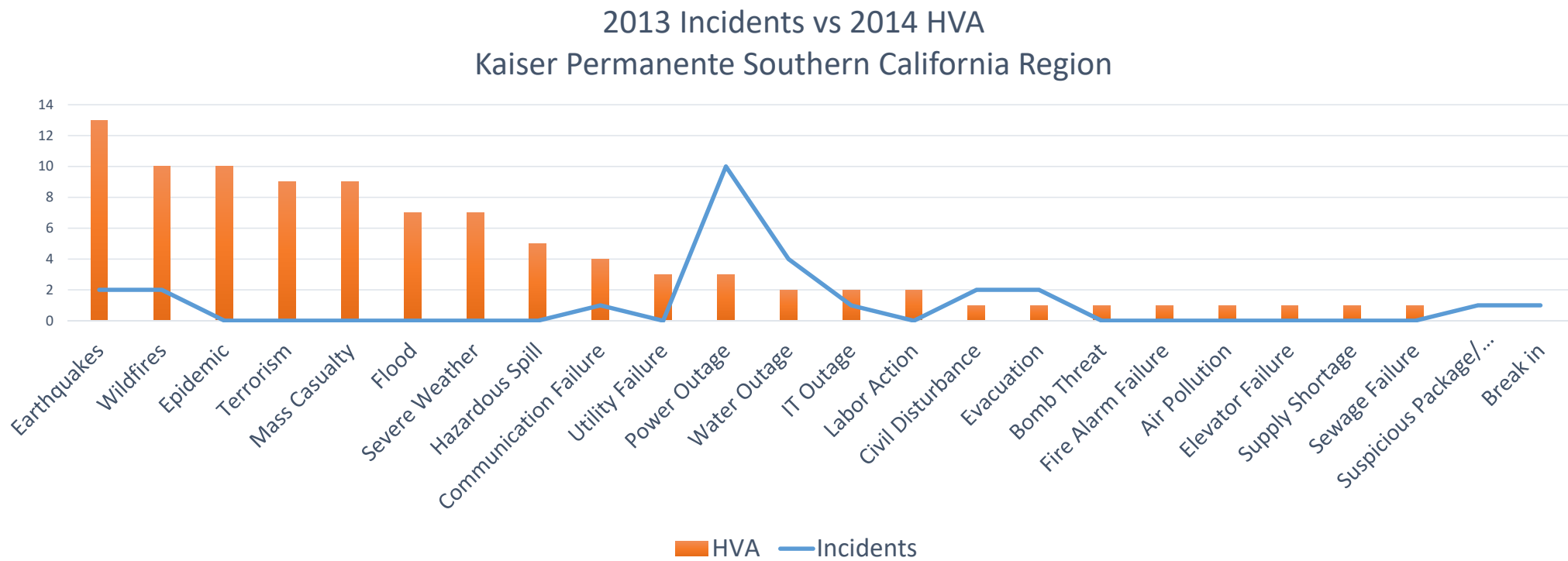
| Date | Alert Category | Alert Type | Internal / External | Responder | Location | Address | Notification Method | Point of Contact |
|----------|----------------|------------|---------------------|-----------|-------------|------------------|---------------------|------------------|
| 06/15/15 | Natural | Earthquake | Both | John Doe | Los Angeles | 1234 Sunset Blvd | email | Jane Doe |

| Command Center Activation | Patient Care Impacts | Business / Operational Impacts | Structural Impacts | Resource Request | Recovery Plan Activation | AAR | Top 5 HVA | End Date | Event Summary |
|---------------------------|----------------------|--------------------------------|--------------------|------------------|--------------------------|-----|-----------|----------|---------------|
| Yes | Yes | Yes | Yes | Not Sure | Not Sure | Yes | Yes | 08/15/15 | Demo |



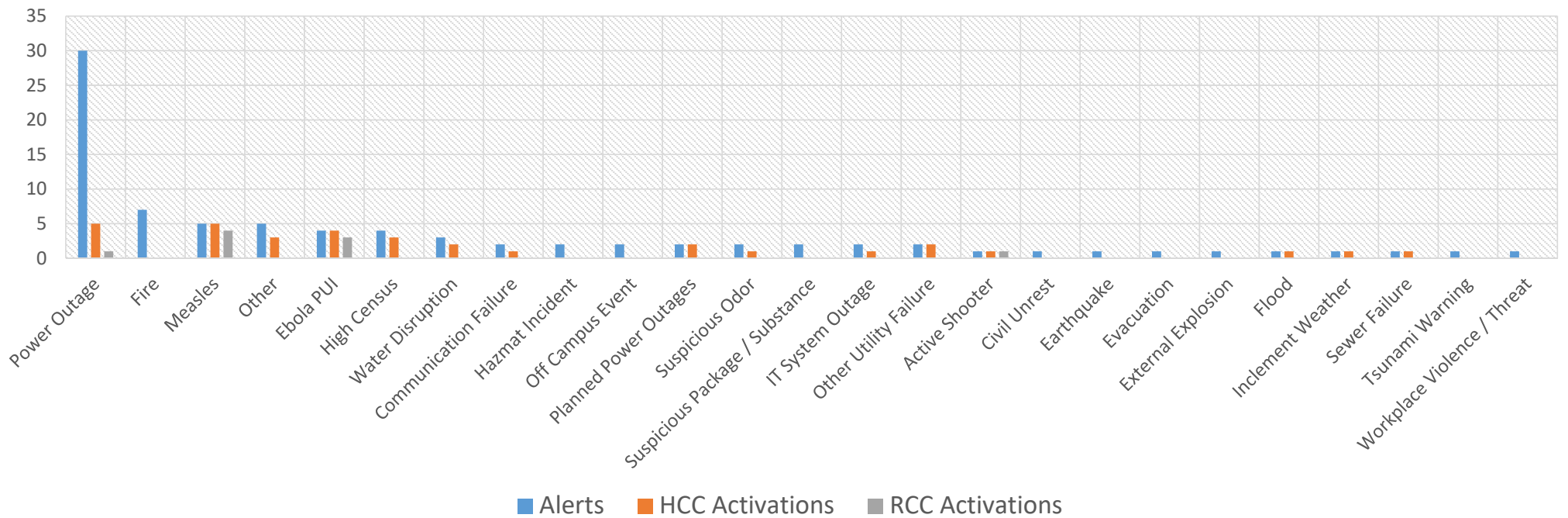
Microsoft Excel
Binary Worksheet

Incidents vs HVA

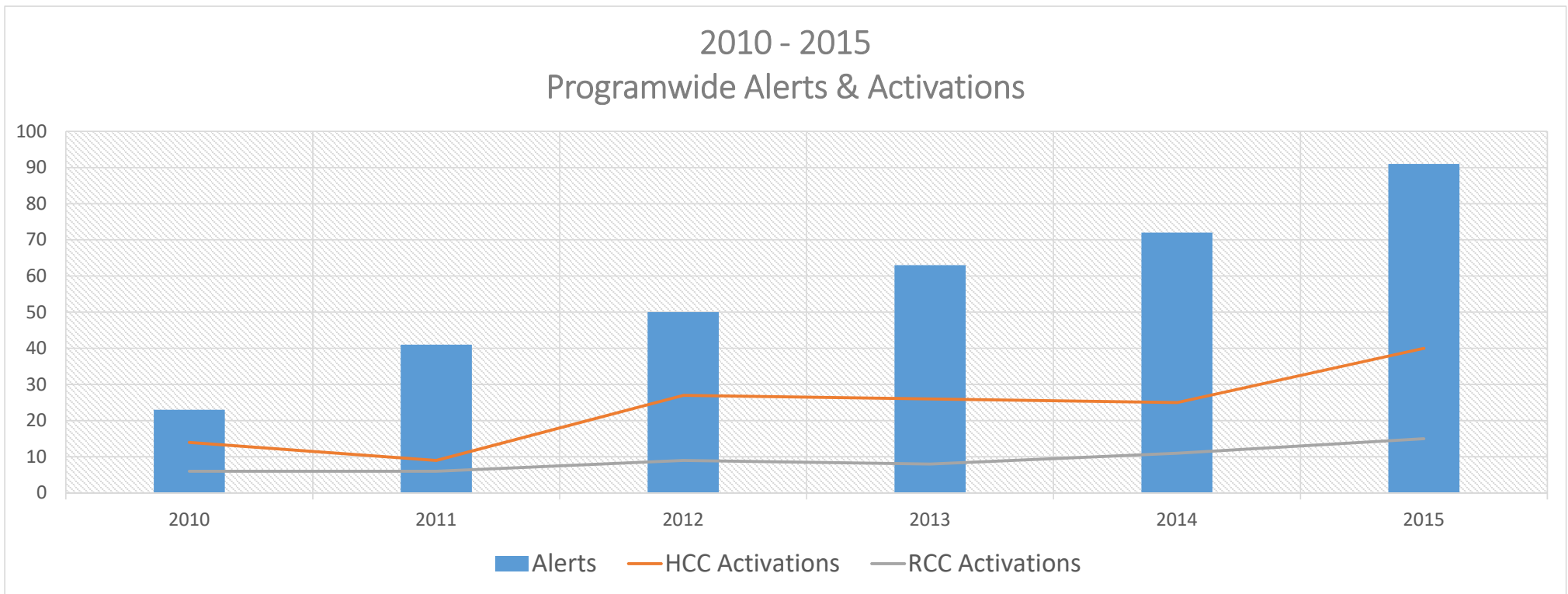


Annual Analysis

2015 Programwide Alerts & Activations



Programwide Trends



Benefits of an Incident Log

Learn from past experiences

Fine-tune HVA

Adjust preparation and
mitigation efforts

Record for reimbursements

Accreditation Definitions

Emergency:

“...can be either human-made or natural (such as an electrical system failure or a tornado), or a combination of both, and they exist on a continuum of severity.”

Disaster:

“...a type of emergency that, due to its complexity, scope, or duration, threatens the organization’s capabilities and requires outside assistance to sustain patient and resident care, safety, or security functions.”

(EM 01.01.01)

Meets Accreditation Requirements

- The organization conducts a hazard vulnerability analysis (HVA) to identify potential emergencies that could affect demand for the organization's services or its ability to provide those services, the likelihood of the potential emergencies occurring, and the consequences of those events. The findings of this analysis are documented (EM 01.01.01 EP2)
- The organization communicates its needs and vulnerabilities to community emergency response agencies and identifies the community's capability to meet its needs. This communication and identification occur at the time of the organization's annual review of its Emergency Operations Plan and whenever needs or vulnerabilities change (EM 01.01.01 EP4)

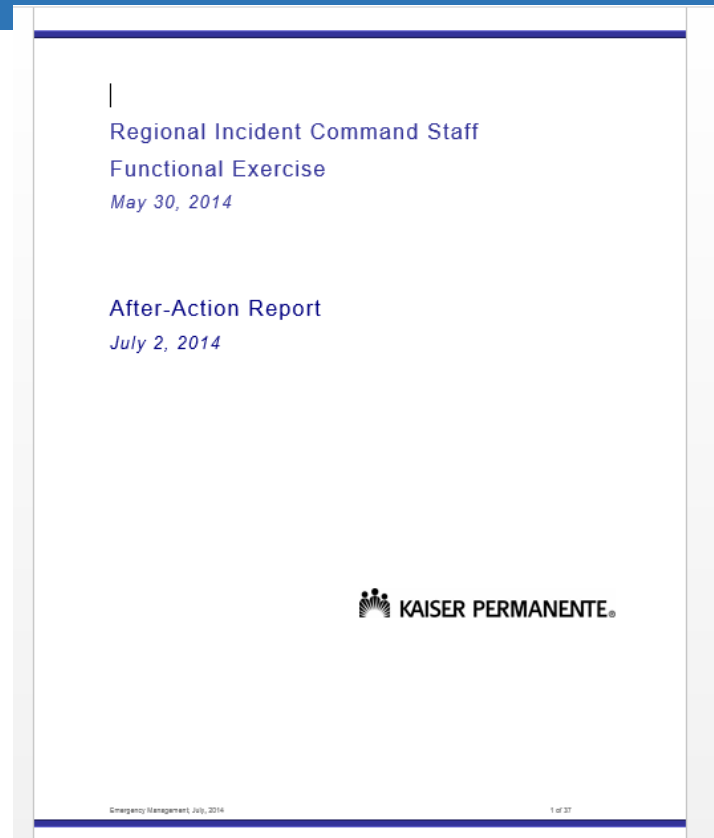
Meets Accreditation Requirements

- The organization uses its hazard vulnerability analysis as a basis for defining mitigation activities (that is, activities designed to reduce the risk of and potential damage from an emergency) (EM 01.01.01 EP5)
- The organization uses its hazard vulnerability analysis as a basis for defining the preparedness activities that will organize and mobilize essential resources (EM 01.01.01 EP6)
- The organization's incident command structure is integrated into its community's command structure (EM 01.01.01 EP7)
- The organization keeps a documented inventory of the resources and assets it has on site that may be needed during an emergency, including, but not limited to, personal protective equipment, water, fuel, food, and medical- and medication-related resources and assets (EM 01.01.01 EP8)

Meets Accreditation Requirements

- Note: The incident command structure used by the organization should provide for a scalable response to different types of emergencies.
- Footnote *: The National Incident Management System (NIMS) is one of many models for an incident command structure available to health care organizations. The NIMS provides guidelines for common functions and terminology to support clear communications and effective collaboration in an emergency situation. The NIMS is required of organizations receiving certain federal funds for emergency preparedness.

Evaluation & After Action Reporting



Demo

| Event | PROBABILITY | ALERTS | ACTIVATIONS | SEVERITY = (MAGNITUDE - MITIGATION) | | | | | | RISK |
|-----------------------------------|--|------------------|-----------------------|--|--|--|--|--|--|-------------------|
| | | | | HUMAN IMPACT | PROPERTY IMPACT | BUSINESS IMPACT | PREPARED-NESS | INTERNAL RESPONSE | EXTERNAL RESPONSE | |
| | Likelihood this will occur | | | Possibility of death or injury | Physical losses and damages | Interruption of services | Preplanning | Time, effectiveness, resources | Community/Mutual Aid staff and supplies | * Relative threat |
| SCORE | 0 = N/A 1 = Low 2 = Moderate 3 = High | Number of Alerts | Number of Activations | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = Low 2 = Moderate 3 = High | 0 = N/A 1 = High 2 = Moderate 3 = Low | 0 = N/A 1 = High 2 = Moderate 3 = Low | 0 = N/A 1 = High 2 = Moderate 3 = Low | 0 - 100% |
| Active Shooter | 1 | 0 | 0 | 3 | 1 | 3 | 2 | 2 | 2 | 14% |
| Acts of Intent | 1 | 0 | 0 | 3 | 3 | 3 | 2 | 2 | 2 | 17% |
| Bomb Threat | 1 | 0 | 0 | 3 | 3 | 3 | 2 | 2 | 2 | 17% |
| Building Move | 1 | 0 | 0 | 1 | 2 | 1 | 2 | 2 | 2 | 11% |
| Chemical Exposure, External | 1 | 0 | 0 | 2 | 2 | 1 | 2 | 2 | 2 | 12% |
| Civil Unrest | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 13% |
| Communication / Telephony Failure | 3 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 33% |
| Dam Failure | 0 | 0 | 0 | 2 | 3 | 2 | 3 | 3 | 3 | 0% |
| Drought | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 20% |
| Earthquake | 3 | 1 | 0 | 3 | 3 | 3 | 1 | 1 | 1 | 44% |
| Epidemic | 1 | 0 | 0 | 3 | 1 | 2 | 2 | 2 | 2 | 13% |
| Evacuation | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 28% |
| Explosion | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 41% |
| External Flood | 1 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 12% |
| Fire | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 2 | 2 | 49% |
| Flood | 2 | 2 | 0 | 2 | 2 | 3 | 2 | 2 | 2 | 41% |
| Forensic Admission | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 2 | 2 | 9% |
| Gas / Emissions Leak | 2 | 0 | 0 | 1 | 0 | 2 | 2 | 2 | 2 | 20% |
| Generator Failure | 1 | 0 | 0 | 1 | 1 | 3 | 2 | 2 | 2 | 12% |
| Hazmat Incident | 2 | 0 | 0 | 2 | 1 | 2 | 2 | 2 | 2 | 24% |

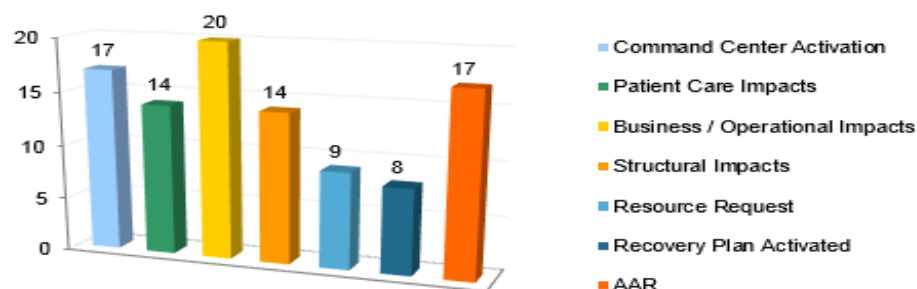
Incident Log Summary Report – Single Hospital

Kaiser Permanente

Emergency Management

Summary For - Enter Name of Hospital

| ALERT TYPE | OCCURRENCE |
|--------------------------------|------------|
| Command Center Activation | 17 |
| Patient Care Impacts | 14 |
| Business / Operational Impacts | 20 |
| Structural Impacts | 14 |
| Resource Request | 9 |
| Recovery Plan Activated | 8 |
| AAR | 17 |
| Total Alert | 27 |



2015

| TOP 10 HVA | RANK | OCCURRENCE |
|---------------------------------|------|------------|
| Patient Surge | 1 | 7 |
| Power Outage | 2 | 6 |
| Fire | 3 | 2 |
| Earthquake | 4 | 1 |
| IT System Outage | 5 | 4 |
| Explosion | 6 | 1 |
| Flood | 7 | 2 |
| Supply Chain Shortage / Failure | 8 | 2 |
| Inclement Weather | 9 | 0 |
| HVAC Failure | 10 | 1 |

2015

| TOP 10 ACTUAL ALERTS | OCCURRENCE | HVA RANK |
|---------------------------------|------------|----------|
| Patient Surge | 7 | 1 |
| Power Outage | 6 | 2 |
| IT System Outage | 4 | 5 |
| Fire | 2 | 3 |
| Flood | 2 | 7 |
| Supply Chain Shortage / Failure | 2 | 8 |
| Explosion | 1 | 6 |
| Earthquake | 1 | 4 |
| Evacuation | 1 | 23 |
| HVAC Failure | 1 | 10 |

Thank you!



Thoughts and Suggestions?

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