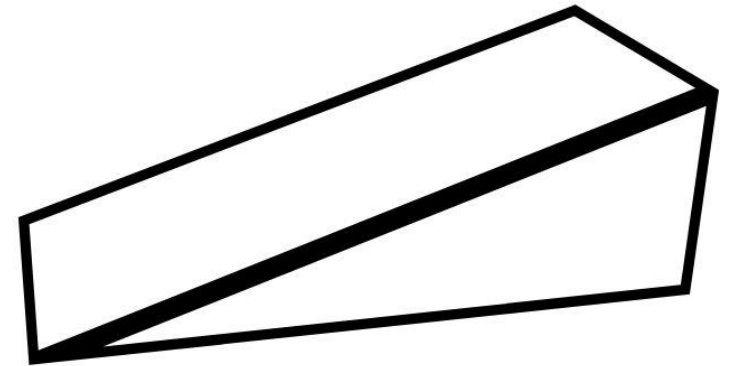


On-RAMP to Better Emergency Planning: A Tool to Apply Data and Mapping at the Local Level

Health Officers Association of California

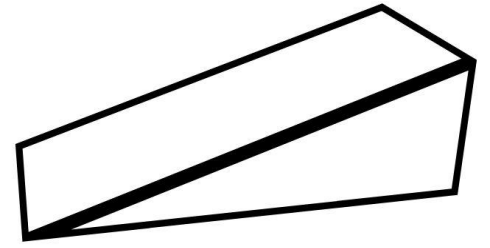
Ventura, CA

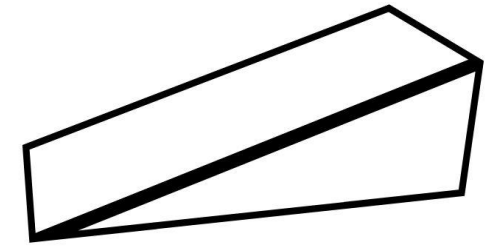
October 4, 2018



Outline/Agenda

- RAMP: Premise & Introduction
- Risk Assessment
- Mapping
- Planning
- Next Steps
- Questions/Discussion

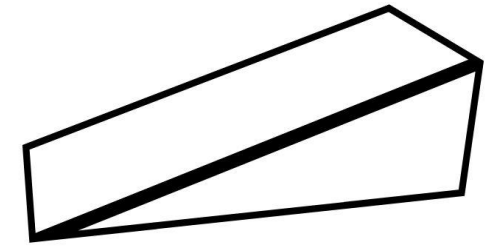




RAMP: The Premise

Assessing Health and Medical Risk is Hard

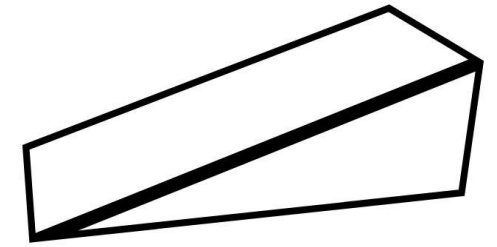
- Need for health focused risk assessment
- No standardized risk assessment focus or tools
 - Federal guidance: Different agencies, different aims (FEMA, CDC, ASPR)
 - Different metrics, different outcomes
- How does assessment inform planning?
 - Better data → Better assessment
 - Better assessment → Better planning?



RAMP: The Premise

Planning for Health and Medical Risk is Hard

- Need better methodologies and better tools:
 - Conduct an Assessment with real Analysis
 - Map hazards and those communities At-Risk from specific hazards (rural-suburban-urban)
- Plans:
 - Specific threats
 - Locally focused data: Gaps and Resources
 - Based in analysis
 - Focus on objectives; Make it real; Make it actionable



RAMP: An Introduction

Spring 2016: CDC request for proposals for: “Innovative research to improve ability of CDC and state and local health departments, emergency management organizations and health care entities to effectively prepare for and respond to public health emergencies.”

Summer 2016: LA County submitted proposal for RAMP

September 2016: LA County begins working with CDC

Project Period: September 2016- September 2019

RAMP: An Introduction

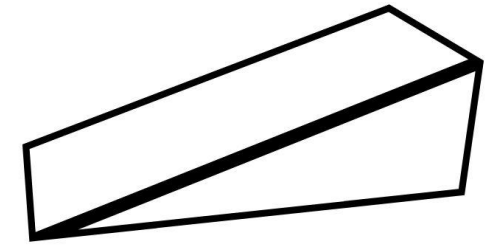
Primary Objective—Build a Tool:

- Web-based, Free, One-stop shop
- Risk Assessment for 48 hazard scenarios
- Mapping of hazards and At-Risk populations
- Provide Planning tools and templates to improve emergency preparedness, response & recovery health outcomes
- Tool developed for/ on-behalf of CDC

Deliver the Tool:

- To CDC
- For use by all state and local health departments (agencies)





RAMP: An Introduction

RAMP Team:

LA County Department of Public Health

CDC Project Officers

University of North Texas

University of Utah

Anke Richter: Operations Researchers—Naval Postgraduate Academy

Assessment Areas:

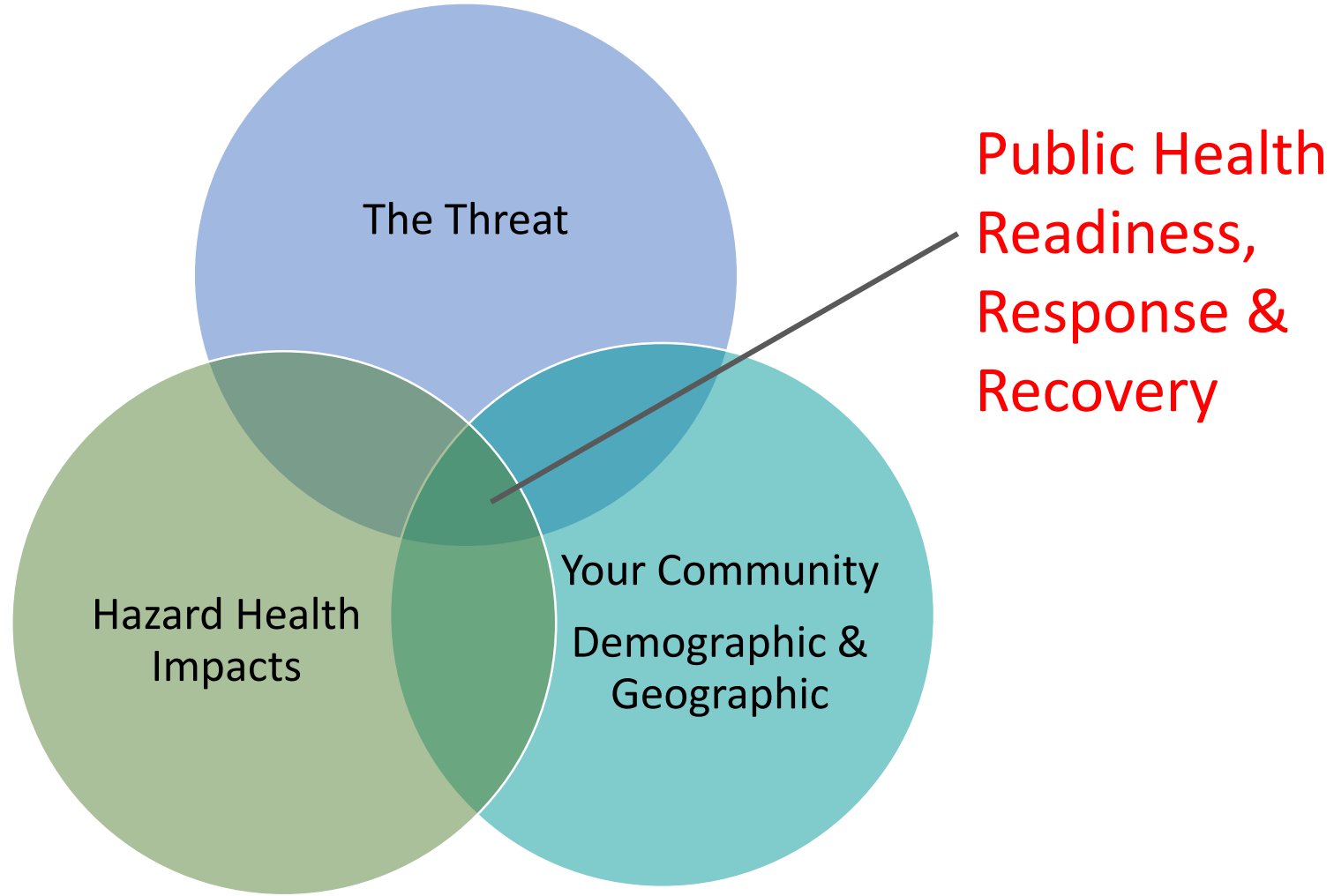
- Southern California

- Counties and State of Utah

- Oklahoma City and State

- City of Boston

Assessing Risk



Hazard Scenarios (40 total)

Examples

Natural	Biological	Chem/Rad	Technological
Earthquake*	Anthrax	Dirty Bomb	Civil Disorder
Hurricane*	Emerging Infectious Disease*	Hazmat Release	Cyber Attack
Flood	Vector-borne Disease	Nuclear Facility Failure	Dam Failure
Windstorm	Foodborne Illness	Nuclear Detonation (10kt)	Mass Shooting

* Some scenarios are scalable to account for various impact levels

Risk Assessment

- Assess Risk: Need to define Risk
- Risk is a relationship:
 - Vulnerability and Resources
 - Dynamic and Complex
- Precision is difficult
- Compare: apples to oranges
- Must equalize (standardize) viewpoint
 - Impacts and Perspectives: Health Focused
 - Communities and Health Systems
- **Goal: Determine Your Jurisdiction's Priorities and Take Action to build Capacity**

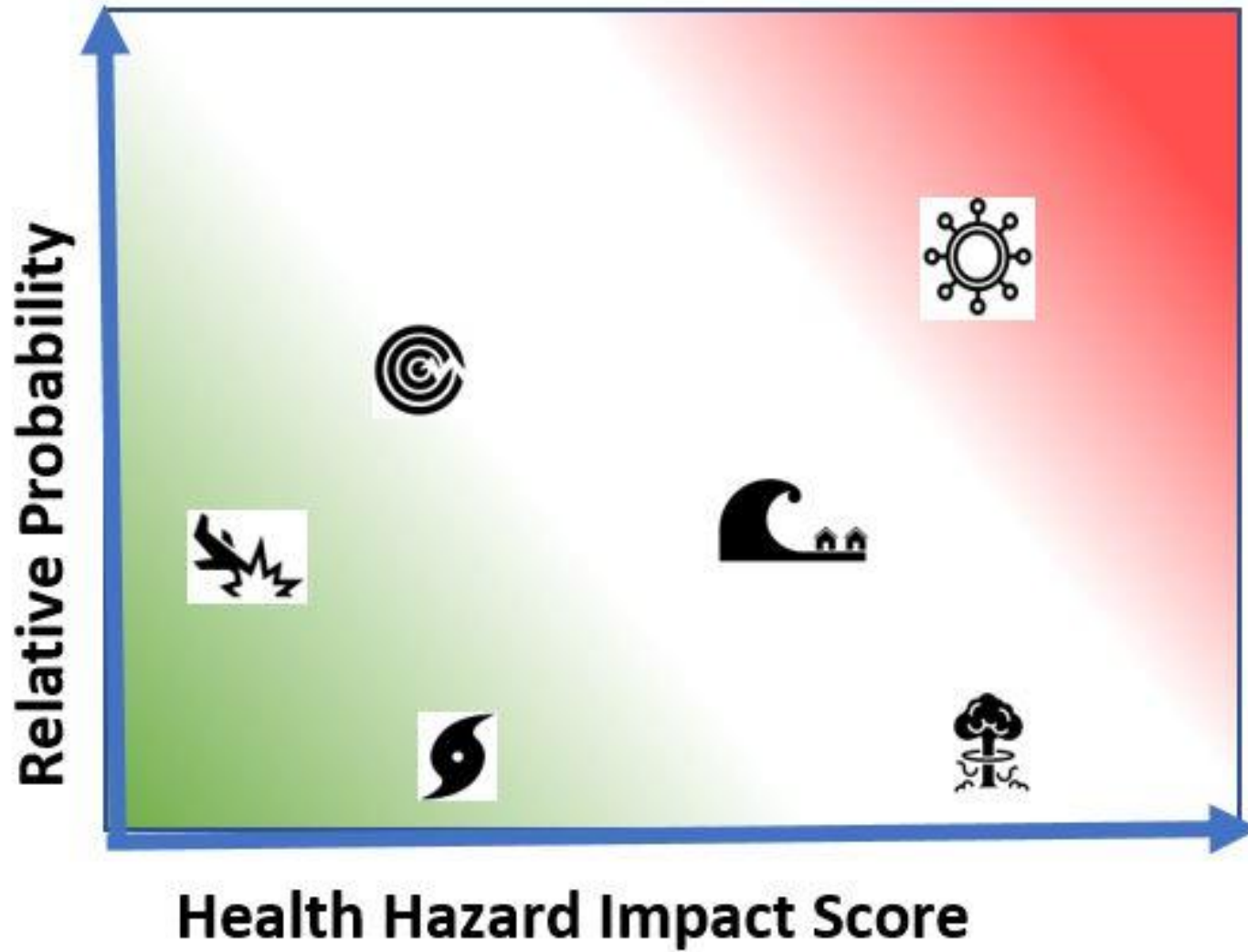
Risk Assessment

- Define Relationship as a Score
 - Probability
 - Hazard Impact
 - Human Health
 - Healthcare Systems (PH, HC, MH)
 - Response and Recovery

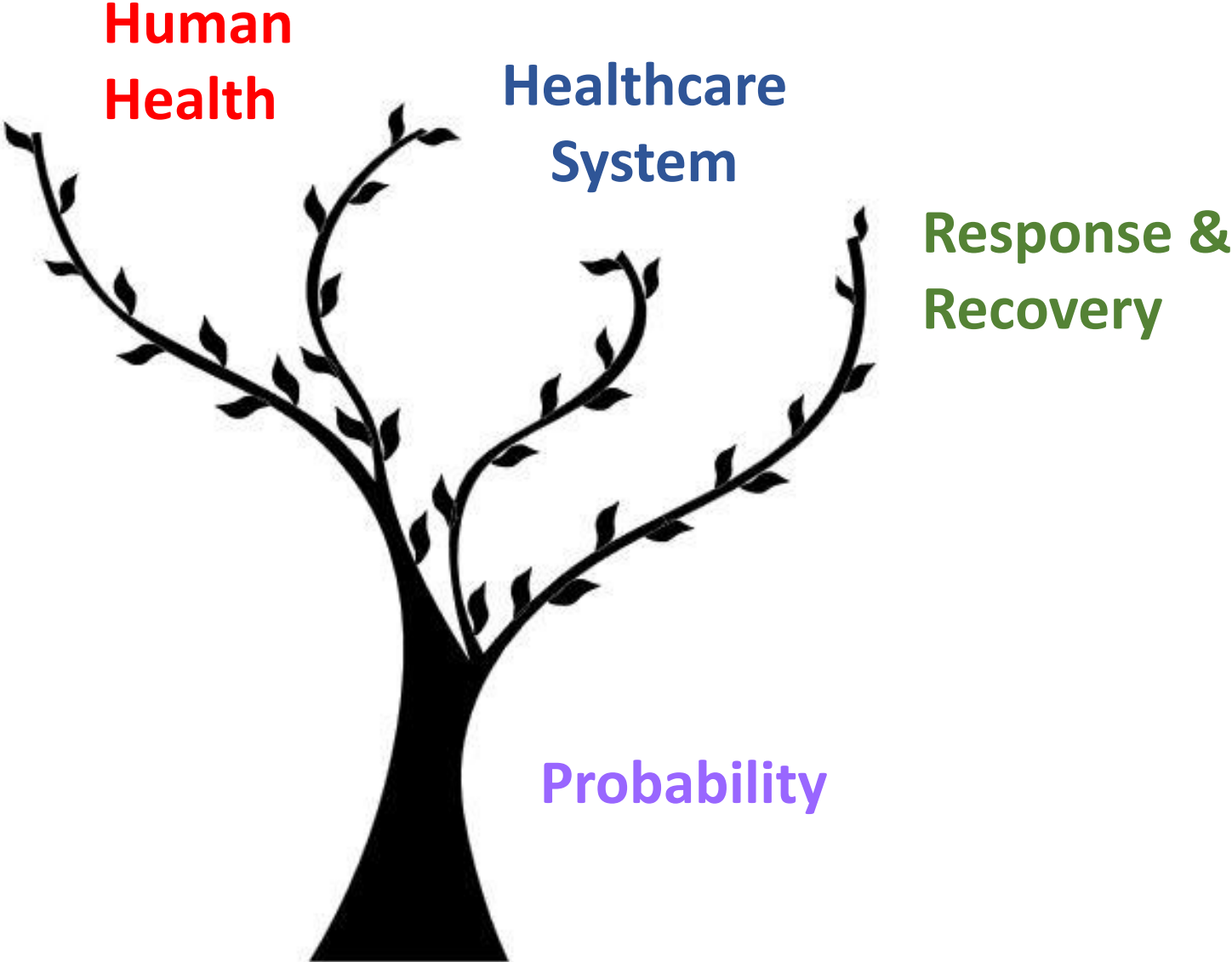


$$\textit{Risk} = \textit{Probability} \times (\textit{Impacts} - \textit{Capacity})$$

Risk Matrix



Tree of Risk:



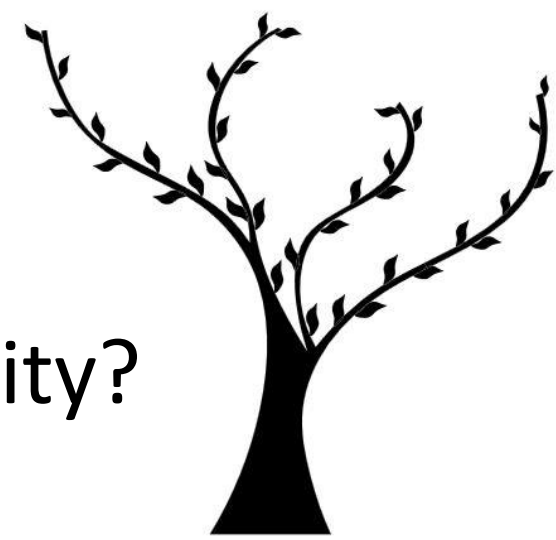


Tree of Risk: Probability

- *Probably* hardest part of assessing risk
- Extremely difficult to predict event occurrence
- Subjective assessment
- Provides *relative* sense/accounting of
 - “Routine” emergencies
 - Urgency/priority of other events

Tree of Risk: Probability

- What is *most* likely to occur in your community?



Most Likely



Sewer System Failure

Earthquake

Pandemic Influenza

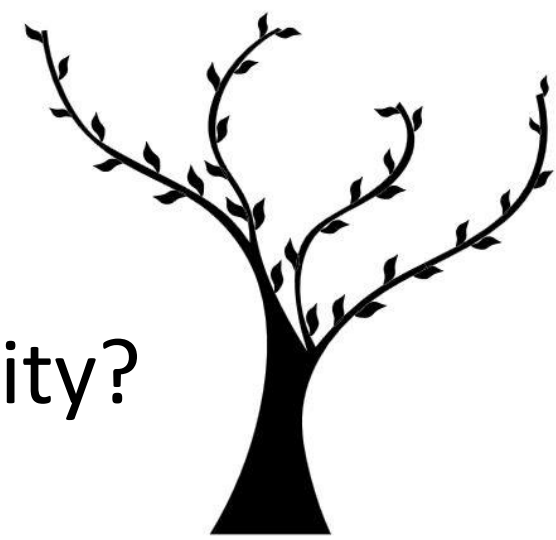
Wildland-Urban Fire

Winter Storm

Active Shooter

Cyber Attack

Least Likely



Tree of Risk: Probability

- What is *most* likely to occur in your community?

Most Likely



Sewer System Failure

Earthquake

What about the health impact of each on your community?
Impact on health systems?

Pandemic Influenza

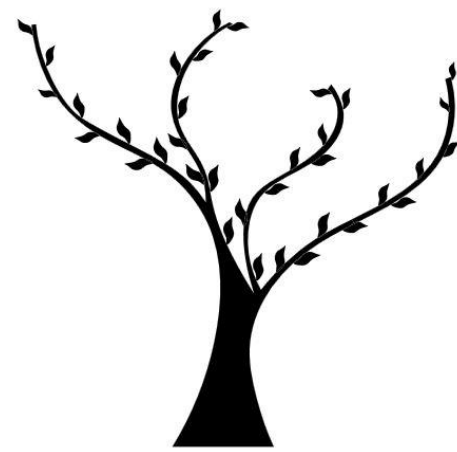
Wildland-Urban Fire

Winter Storm

Active Shooter

Least Likely

Cyber Attack



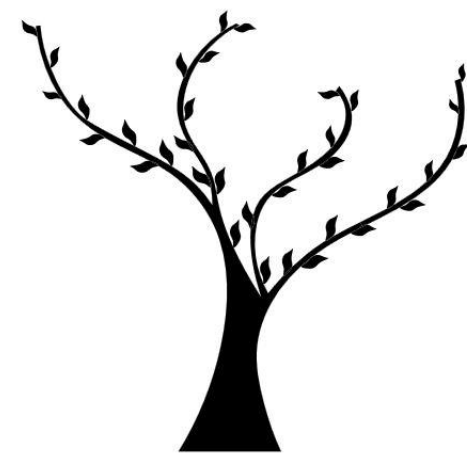
Tree of Risk: **Health Hazard Impacts**

To assess risk from different hazards, we need a common and standardized measurement (apples to oranges)

For the tool:

- Develop weighted values to measure the **impact** of each hazard on:
 - **Human Health**
 - **Healthcare System (Pub.Health, Healthcare, Mental Health)**
 - **Response and Recovery**

Fills in the Health Impact Score (x axis)

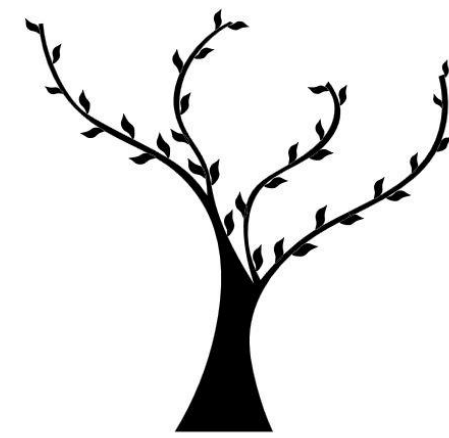


Tree of Risk: Human Health

The impact of a hazard on the *health* of people in your jurisdiction – additional casualties from hazard

- Intuitive vs. measurable

- 1) Fatalities
- 2) Hospitalized Cases
- 3) Non-Hospitalized Cases
- 4) Mental Health Casualties

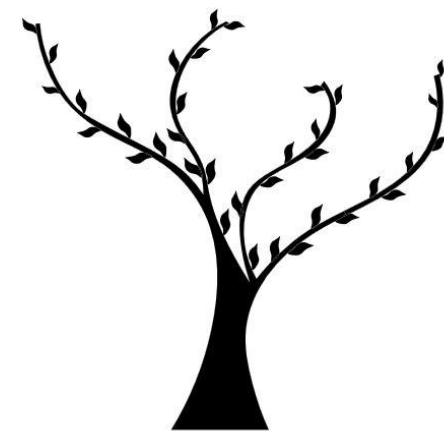


Tree of Risk: Healthcare System

The impact of a hazard on the ability of *health systems* in your jurisdiction to provide care; infrastructure, staff

- 1) Functional Hospitals
- 2) Functional Clinics
- 3) Functional Long-Term Care/Skilled Nursing Facilities
- 4) Dialysis Centers

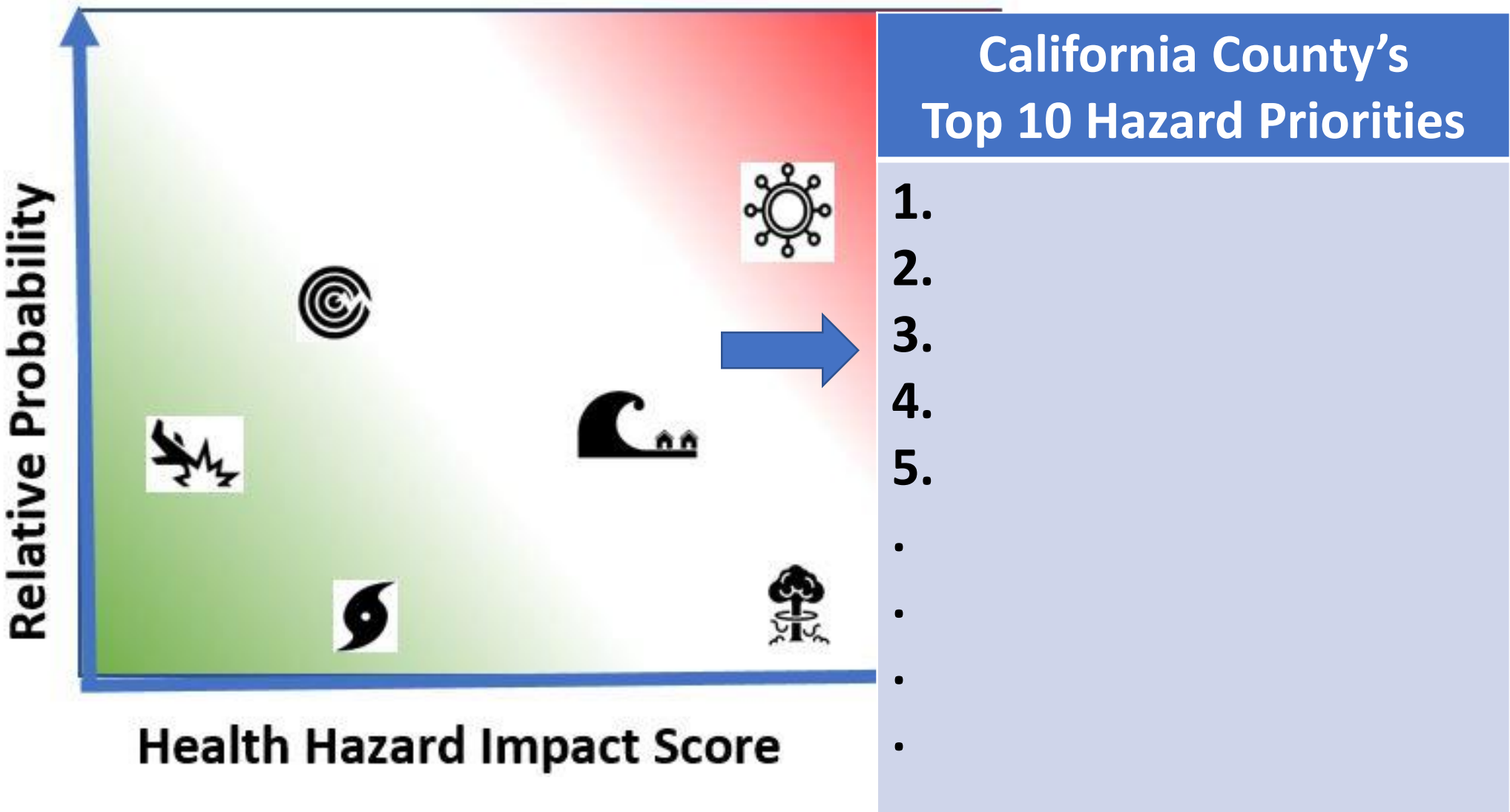
Tree of Risk: Response & Recovery



The role and capability of existing health systems to respond and recover from a hazard scenario

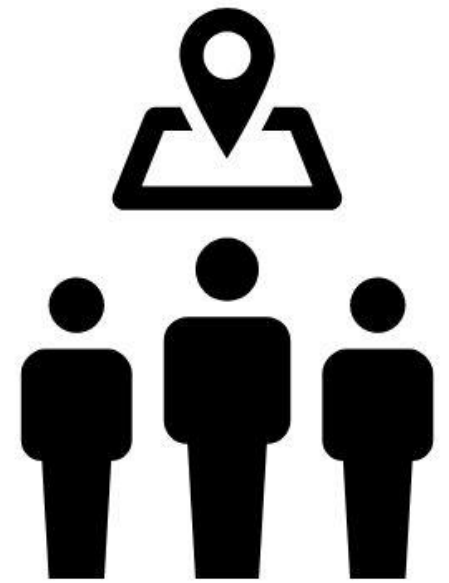
- 1) Public Health
- 2) Environmental Health
- 3) Command, Control, Coordination & Communication

Risk Matrix



Mapping: Help the Local Health Dept.

- What do you find valuable about mapping?
- What kind of data would you like to map?
 - Physical features & threats: Fault lines, flooding, etc.
 - At-Risk Populations
 - Resources: Hospitals, clinics, schools, etc.
- What functions would you like in a mapping tool?



Planning: Build Better Plans

- Hazard specific Objectives, Strategies
- Health Missions, Objectives & Strategies
 - Community Specific
 - Hazard Specific
 - Mission Specific
- How do you engage different communities, organizations and perspectives?
- What would you need in a tool to help make planning easier and better for you?



A few (initial) mockups of
RAMP Tool User Interface



Select Jurisdiction(s)

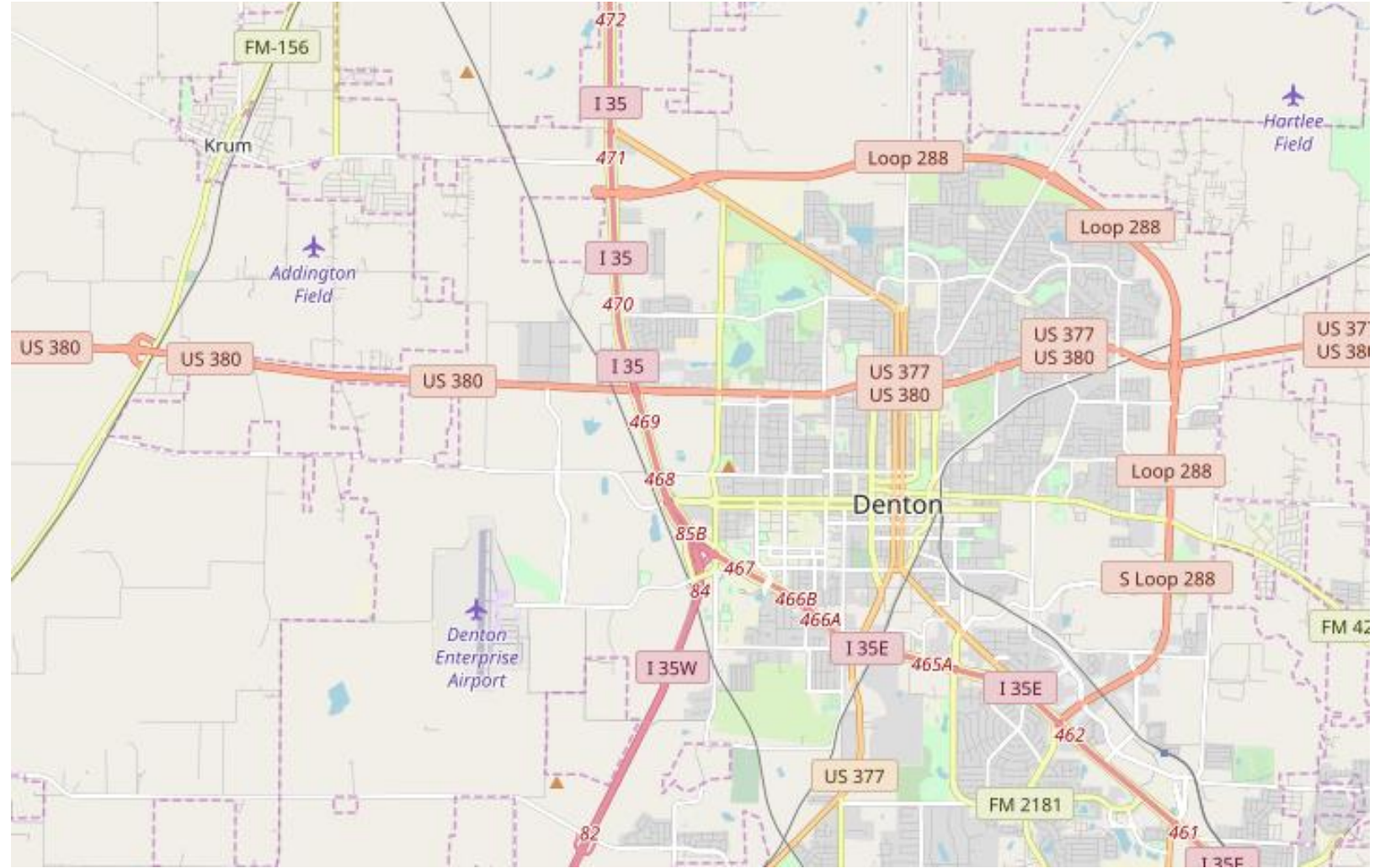
Select Jurisdiction Level

Select State

Select County

Select City

Continue





Hazards
Hazard 1
Hazard 2
Hazard 3
Hazard 4
Hazard 5
Hazard 6
Hazard 7
Hazard 8
Hazard 9

Hazard 48

Hazard Variables

Instructions ---
Hazard 1
Scenario details go here....

Human Health

Fatalities: # Info Box

Hospitalized Cases: # Info Box

Non-Hospitalized Cases: # Info Box

Mental Health Casualties: # Info Box

Healthcare System

Fatalities: # Info Box

Hospitalized Cases: # Info Box

Non-Hospitalized Cases: # Info Box

Mental Health Casualties: # Info Box

Next

Progress Bar for Risk Assessment

Jurisdiction and Hazard Name

| Map | Facilities | Charts |

Export

Print

Jurisdictions

Demographics

Population

Households

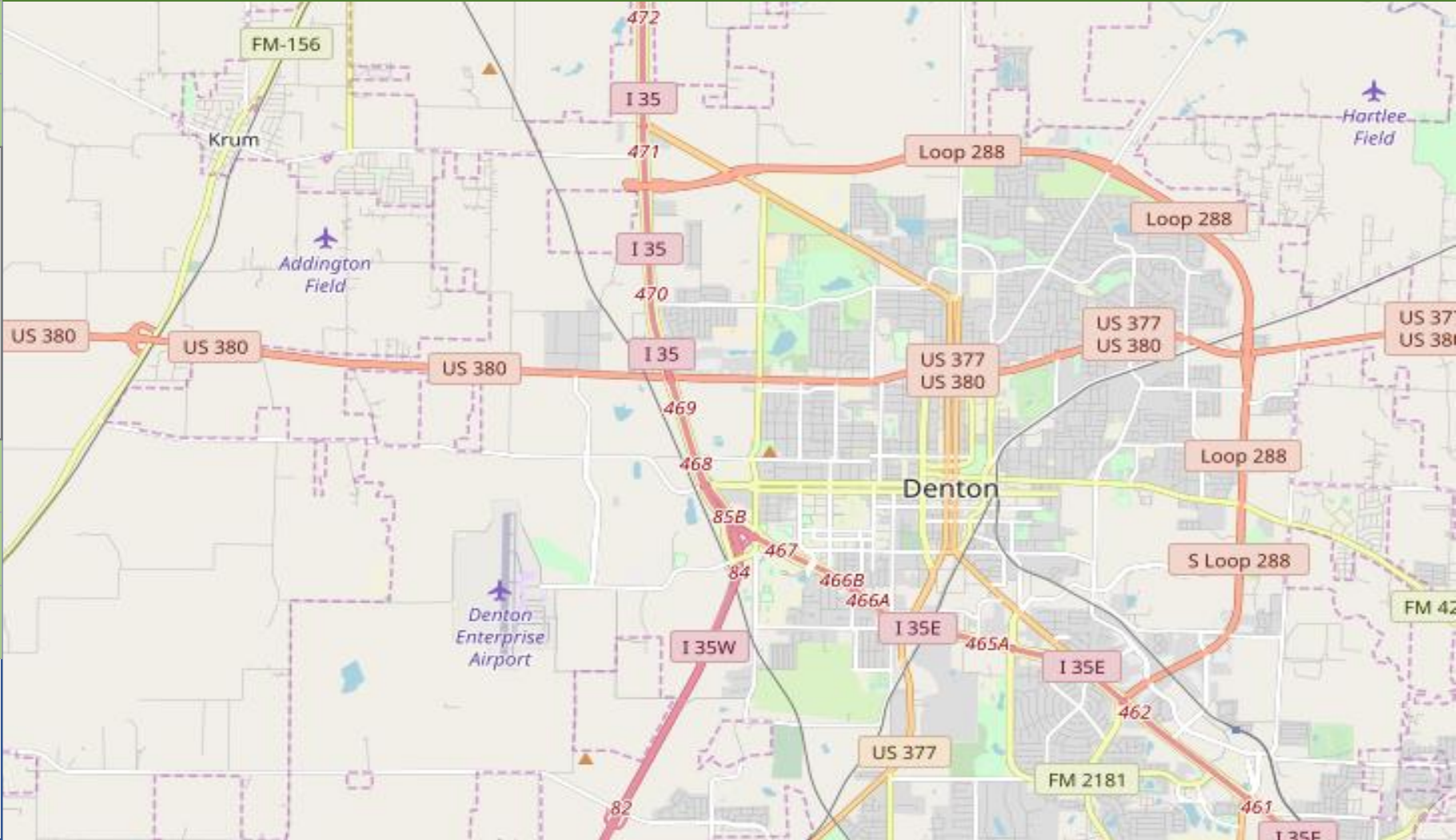
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Languages

Hazard Data

Healthcare Resources/Facilities

Upload option



Planning Page

Back to Risk Matrix

Complete Risk Assessment

Project Updates

- Focus Groups with local health departments complete
- Assessment values and math complete
- Building tool prototype (UNT)
 - Tool demonstration: spring 2019
 - Final adjustments of tool: summer 2019
- Sept. 25, 2019 Delivery to CDC

- We would be happy to meet with any CA local health dept. present tool, receive feedback, etc.

Questions/Discussion

THANK YOU!!!

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Credits

All icons courtesy of the Noun Project

- Airplane Crash: Aldric Rodriguez
- Calculation: Dinosoft Labs
- Earthquake: Robin Richards
- Explosion: Anbileru Adaleru
- Hurricane Symbol: Rien Mokol
- Planning: Delwar Hossain
- Map: Casper Jensen
- Mapping: Iconathon
- Ramp: Alberto Venegas
- Tree: fms_design
- Thank you: Gan Khoon Lay
- Tsunami: Aldric Rodriguez
- Virus: Adnen Kadri

Defining Risk Score

Relative

$$\text{Risk} = \text{Probability} \times (\text{Impacts} - \text{Capacity})$$

Human Health
Public Health
System Impacts
Healthcare System
Impacts
Mental Health
System Impacts

Public Health
System Resources
Healthcare System
Impacts
Mental Health
System Impacts