



INSTITUTE FOR
INFECTIOUS ANIMAL DISEASES

A closer look at RISK

OIE Regional Workshop on the Role of Veterinary Services
on Animal Welfare in Natural Disasters

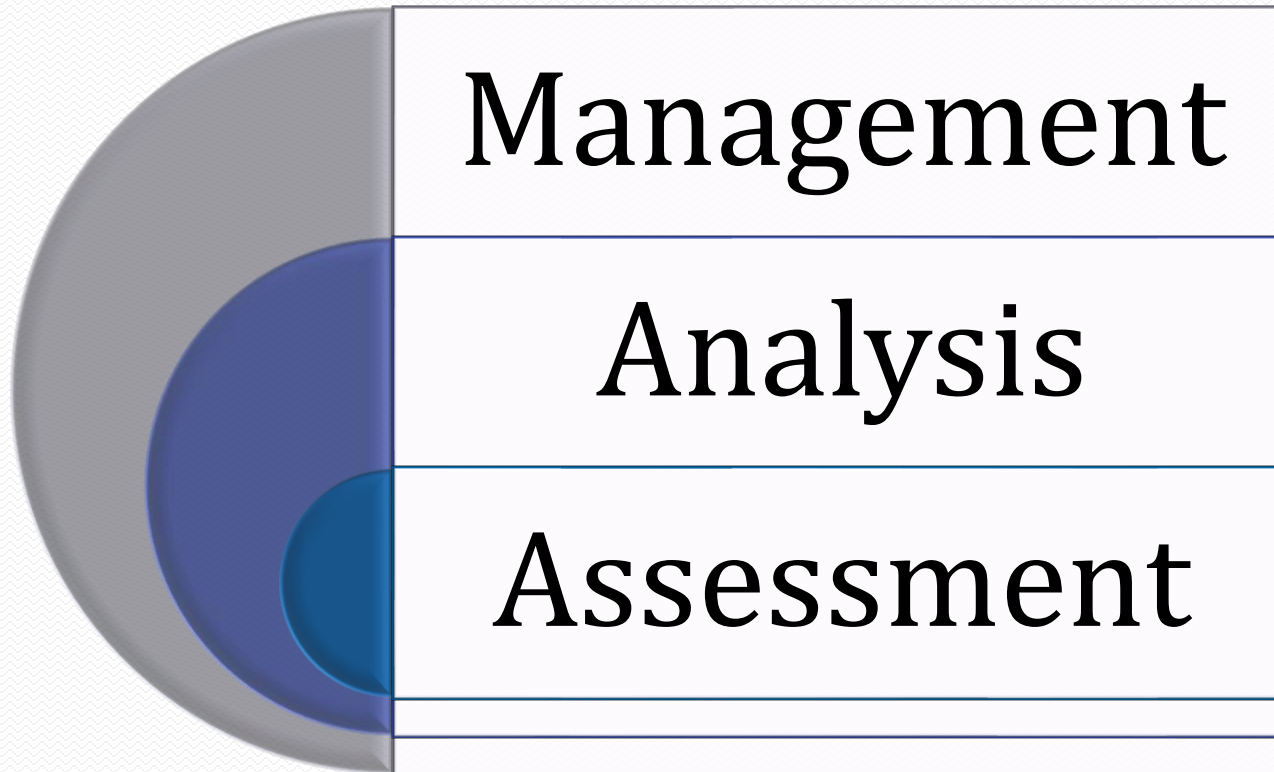
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Risk



Risk Management > Process

Risk Assessment

- What's at risk
- What's the hazard
- What's the impact
- Response resources
- Historical success
- Human behavior



Risk Analysis

- Cost-benefit analysis
- Prioritization of measures
- Establishing acceptable risk levels



Risk Management and Finances

\$ Unfortunately, response is HEAVILY impacted by two financial factors

\$ Who is and How are they,,,,,,,, going to pay for the response

\$ Govt

\$ Non Govt Agency

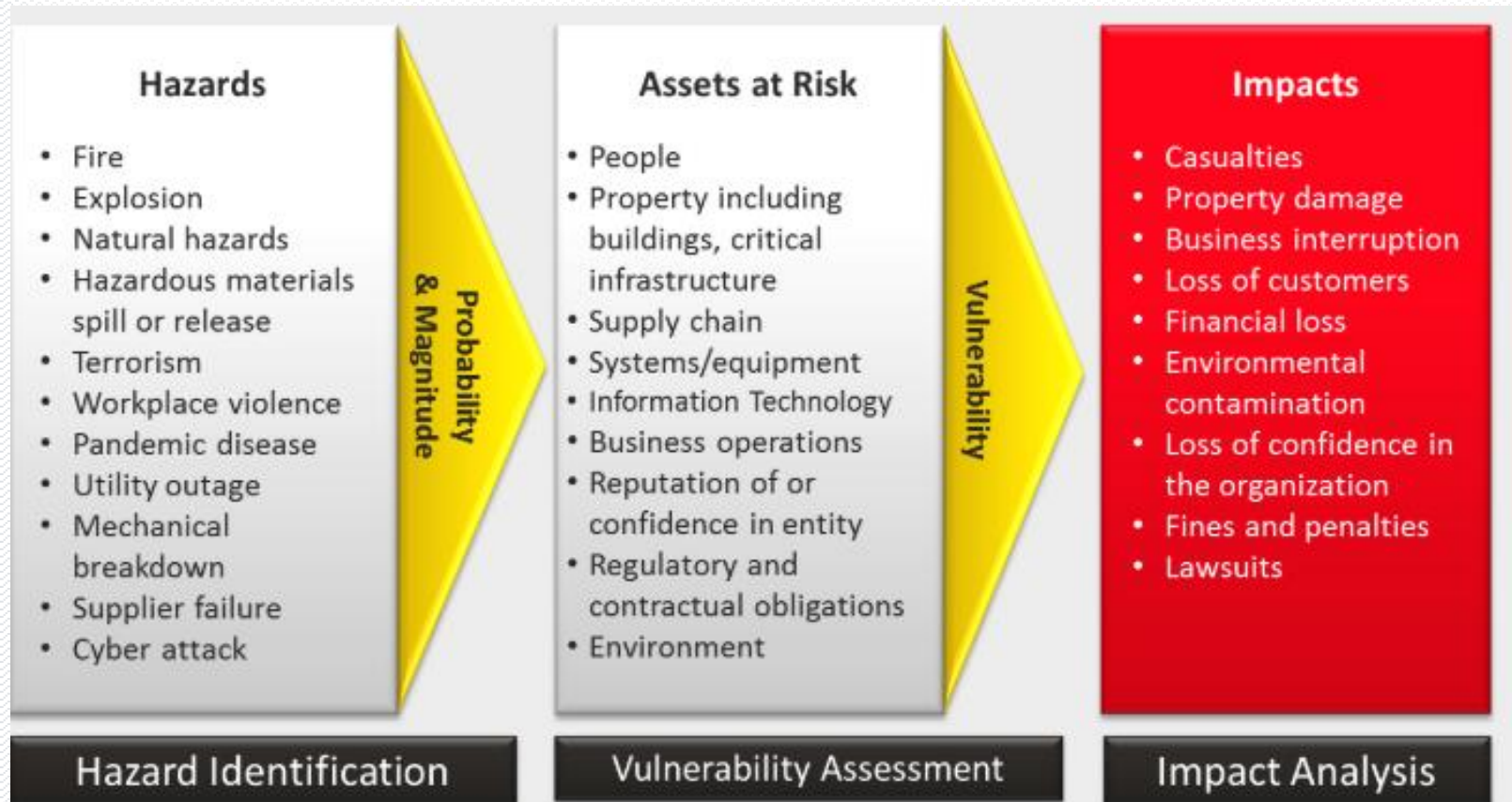
\$ Industry

Combine the Risk management process with the finance piece in mind, understanding that:

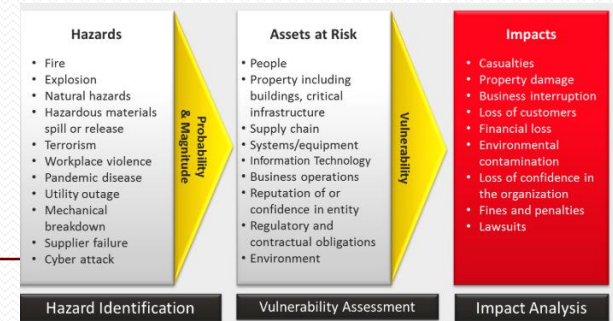
Risk Management>>>> Response >>>>>Cost



Risk Assessment



Risk Management---\$



- What did it cost to build it.... What does it cost to replace it.....
 - Food Animal Production: Per animal, per farm, per industry.....
 - Zoos/Collections: Per animal, per species group/ per facility.....Irreplaceable?
 - Pets..... Owned/stray.....Tied to human Health and Safety?
 - Wildlife....per animal/per program
- What does it cost to operate the system the animal is contained in
 - Same factors
- What does it cost to remediate the damage in terms of failure
 - Example would be disposal costs for carcasses
 - Human Health and Safety.....animals in the roadways
- Can you use your Risk Management approach/\$ >> pre-event and also while responding.....



Tools to help with Risk Assessment



Risk Assessment Table

(1) Asset or Operation at Risk	(2) Hazard	(3) Senario (Location, Timing, Magjtude)	(4) Oportunities for Prevention or Mitigation	(5) Probability (L, M, H)	Impacts with Existing Mitigation (L, M, H)					(11) Overall Hazard Rating
					(6) People	(7) Property	(8) Operations	(9) Environment	(10) Entity	



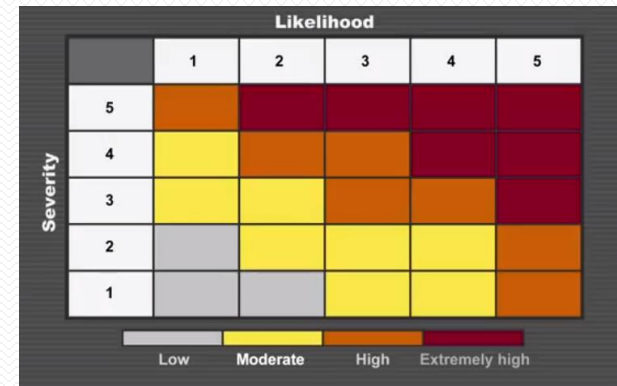
Risk Analysis methods

- Interviewing
- Sensitivity analysis
- Expert judgment -Delphi Method
- Expected Monetary Value (EMV) Analysis
- Decision Tree Analysis
- Probability Distribution and analysis
- Monte-Carlo Simulation
- Utility Theory



Narrative Preliminary Risk Analysis

Preliminary Risk Analysis (PRA) worksheet							
Project:							
Risk question:						Date:	
Step #1	Step #2	Step #3	Step #4a	Step #4b	Step #4c	Step #5	
Risk ID #	Hazard / Unwanted event	Harm / Consequences	Potential causes	Likelihood of occurrence	Severity of consequence	Risk score (L x S)	Possible additional controls/Actions
	What could go wrong?	What might be the potential impact?	How might the hazard occur?	What is the likelihood that the hazard and harm will occur? (rating scale)	How significant is the impact? (rating scale)	(calculated)	What might help control and/or mitigate the hazard?



Accompany chart with a document to summarize- for decision changes and situations where there are not readily available cost estimates and figures

- Dr James Vesper <https://www.youtube.com/watch?v=olMKwMzEcyU>



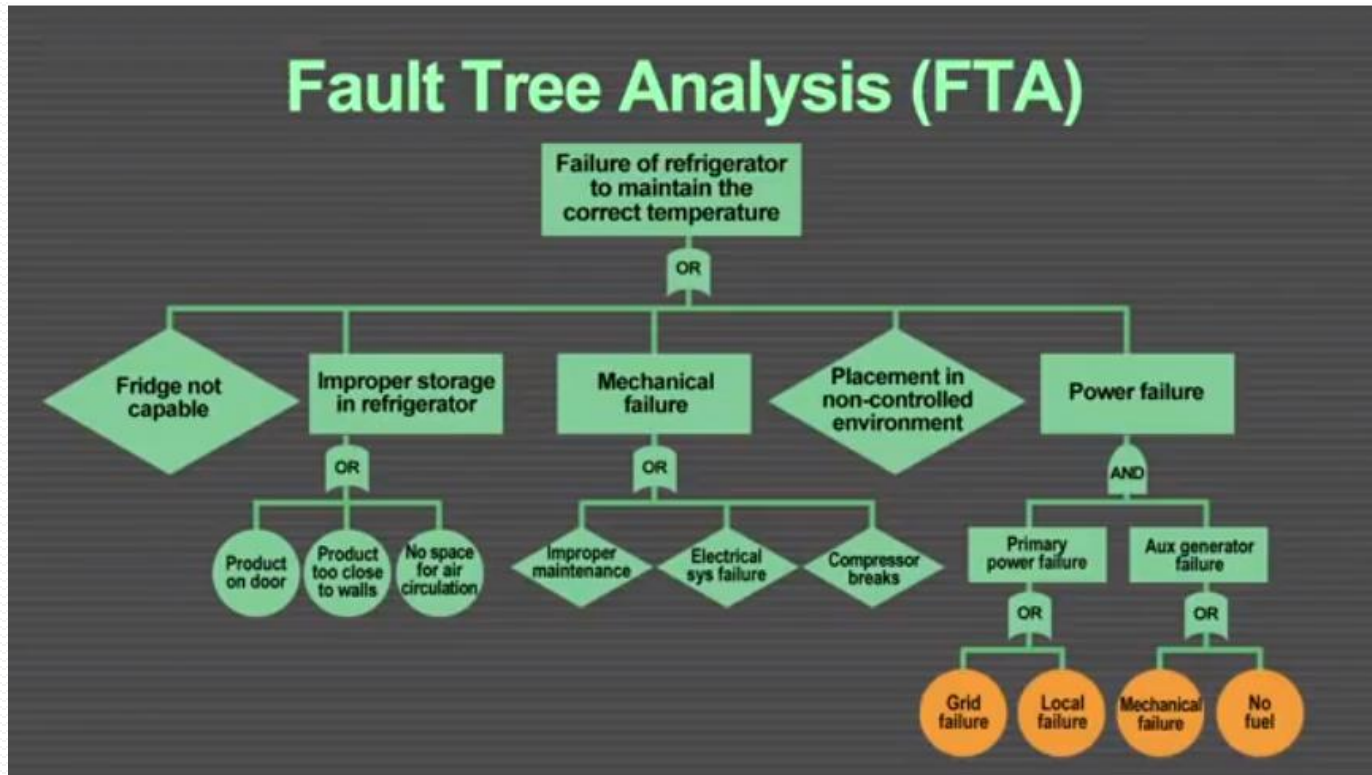
FMEA type Analysis

FAILURE MODE AND EFFECTS ANALYSIS																			
Item: <u>Drill Hole</u>		Responsibility: <u>J. Doe</u>				FMEA number: <u>123456</u>													
Model: <u>Current</u>		Prepared by: <u>J. Doe</u>				Page : <u>1 of 1</u>													
Core Team: <u>J. Doe (Engineering), J. Smith (Production), B. Jones (Quality)</u>						FMEA Date (Orig): <u>1/1/2008</u>		Rev: <u>1</u>											
Process Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C a u s e s	Potential Cause(s)/ Mechanism(s) of Failure	O c c u r r e n c e	Current Process Controls	D e t e c t e d	R P N	Recommended Action(s)	Responsibility and Target Completion Date	Action Results							
												Actions Taken	S e v e r i t y	O c c u r r e n c e	D e t e c t e d	R P N			
Drill Blind Hole	Hole too deep	Break through bottom of plate	7		Improper machine set up	3	Operator training and instructions	3	63										0
	Hole not	Incomplete			Improper		Operator training												

- Dr James Vesper <https://www.youtube.com/watch?v=olMKwMzEcyU>



FTA- root causes of Failure

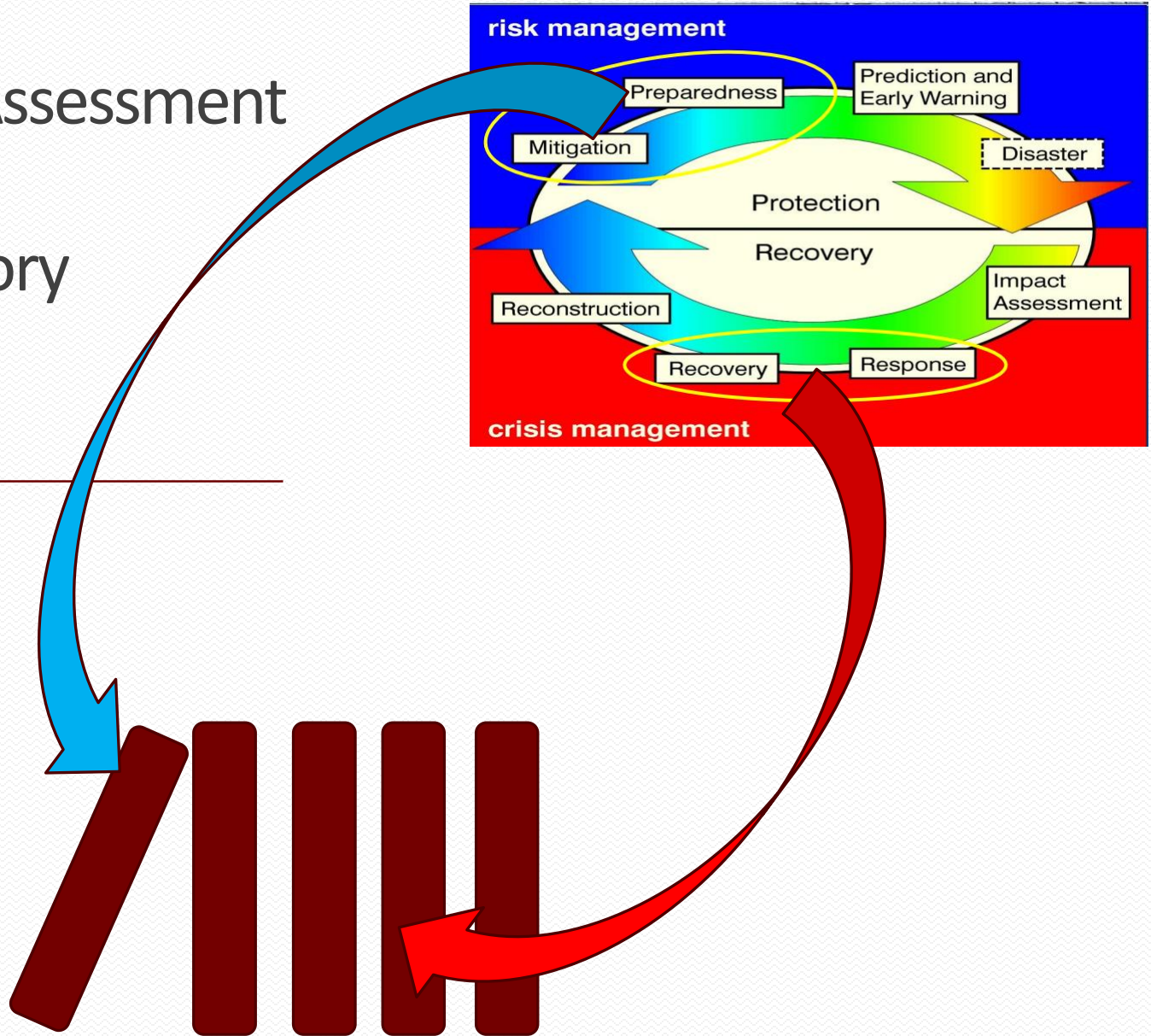


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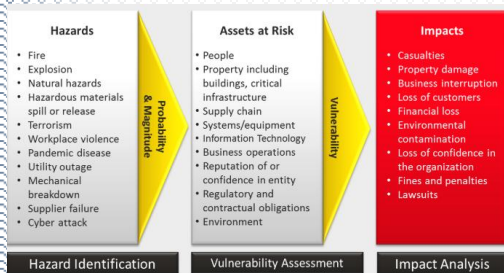
Art of Risk Assessment

➤ Tell the story



Risk Assessment associated with Response and Behavioral factors

- Red magnifies the impact
- Green mitigates/lowers the impact

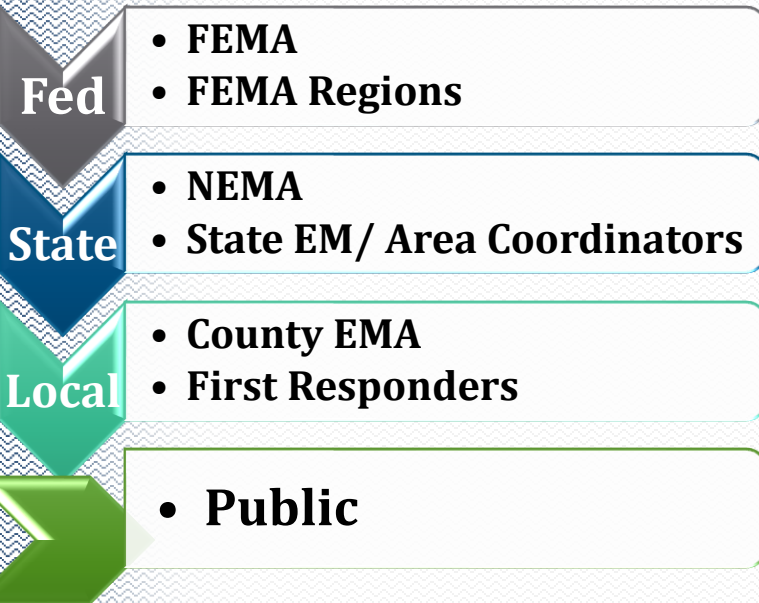


- Human health and safety is a first response priority
 - Resources will be tied up for the first 4-7 days or longer
 - Your use of assets can be seen as competing
 - Your use of assets can be re-prioritized
- Historical response knowledge
 - If the last applicable disaster was greater than 5 years ago- questionable as to whether it will help
 - If never, or media convinces it has never happened before then people will go to a “default” action
 - If can understand that default, then it will help assess risk
 - Example: Shelter in place verses evacuate
 - The “art of assessment” . Understanding these concepts while conducting a risk assessment will help you understand that the above impacts may increase risk to animal populations or add new ones as response may be delayed putting animals at increased risk for existing/new challenges.

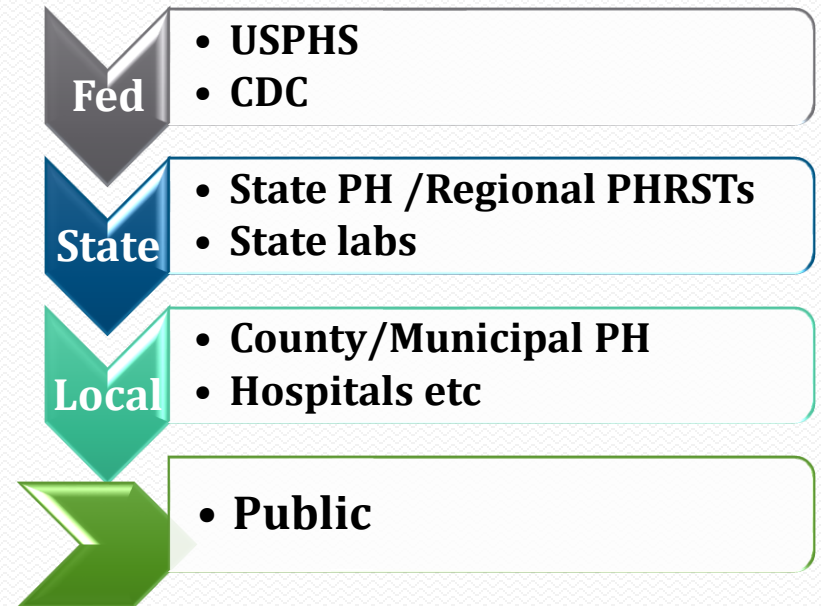


Depth of Response Infrastructure

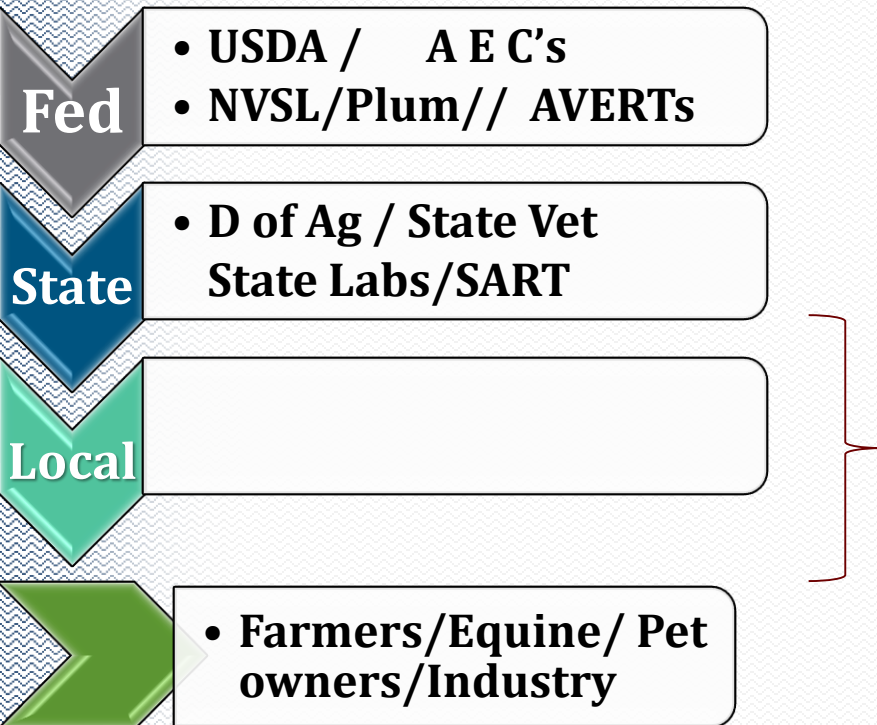
Emergency Management Infrastructure



Human Health Infrastructure



Animal Response Infrastructure



Lack of coordination

- No Local Animal Emergency Management
- No Local animal health directors

Potential Response

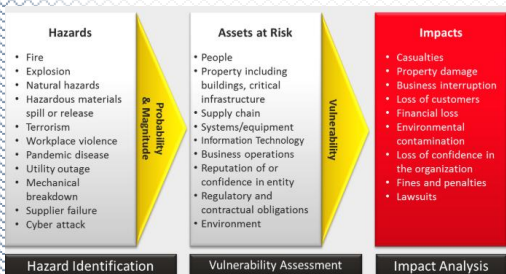
- Animal Control
- Cooperative Extension
- Private Vets
- Food Animal Production Industry



Delays in Response

- Red magnifies the impact
- Green mitigates/lowers the impact

- Adding time to response increases likelihood of:
 - Destabilized health status in shelters
 - Loose the 3 staged shelter concept
 - Receiving, holding, disposition
 - Worsened condition of animals rescued
 - Secondary, non-supported efforts intervening
 - Response not organized/supported/integrated
 - Loss in public support due to:
 - Lost interest
 - Criticism undermining effort

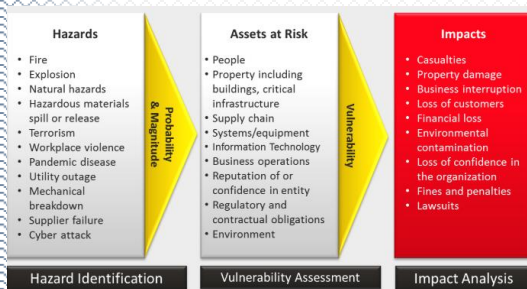


EXPECT DELAYS



Risk Assessment associated with Response and behavior

- Red magnifies the impact
- Green mitigates/lowers the impact



- Historical perspective:
 - Smart owners doing smart things
 - Creative and innovative solutions
 - Understanding of response timeframes/delays
 - These mean owners and locals will not “wait” but will address impacts quickly and decisively and plan for them in their preparedness activities and training
- Response structure extends to ground level
 - Rapid assessment
 - Increased knowledge of challenges, solutions, personnel and local infrastructure
- The “art of assessment” . Understanding these concepts while conducting a risk assessment will help you understand that the above impacts may decrease risk to animal populations as owners and local responders act effectively to lessen risk.



Understanding what's at Risk >>

Expectations of reasonable response



Perception of animals and plants

- Family-best care possible
- Work partner
- Property
- Other- neglected/ignored

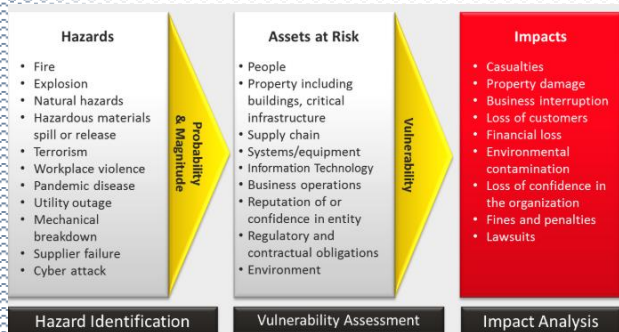


Risk Assessment applied to Damage Assessment post initiation of event

- Puerto Rico Dairy- what's at risk
 - Largest component of Ag Industry
 - 280 dairy farms, 50% prod. of US, modern
 - 2 dairy plants that serve industry/2x day pickup
 - Feed- co-Op and Pan-American Grain/Green chop
 - Govt support program – input costs tracked 2x month
 - Generators on each farm-
 - Burial or landfill for mortality

■ Puerto Rico Dairy- vulnerabilities

- Island
- Communication
- Transport and access
- Power >> feed and water
- Animal health
- Owner/worker health



Puerto Rico's Dairy Industry after the two storms: New challenges-

- 280 farms– ***all except 6 ready***
- On Generators
- Cattle contained
- Milk tankers could run
- Dairy plants operational
- Feed suppliers operational
-
- Fuel- \$\$\$, rationed/access
- No power for.....months
- No replacement generators
 - Island/2 Cat 5 Harvey
- NO Credit for Feed



**Risk Assessment: simply, about to
lose the Industry as a whole**



USDA grant > rescue the industry

- Prioritize and provide fuel
- Provide \$\$ to purchase feed
- Veterinary care
- Cache of replacement generators
- Rural recovery-# 1 Ag Industry
- **PR accounting of the industry**
- Stars aligned



How much to run the industry for a month.....\$15 m



Risk Assessment Art- Food Animal Production

- How animals and business are cared for:

- Food Animal Production Animals

- Account for the Husbandry infrastructure

- Shelter in place
 - Power, access (roads/bridges), fuel, feed,.....
 - Response capability and capacity of owners



- Mapping capability showing impacts
 - Ability to ground truth those impacts
 - Prioritizing resources to those impacts

- How does Emergency Management perceive Food Animal Production

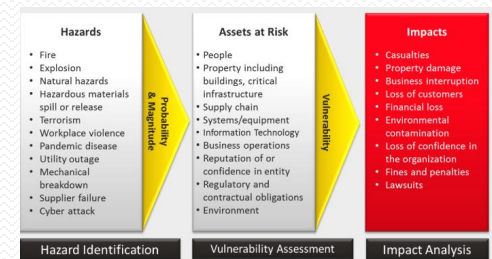
- Business and it is on its own
 - Rural community that will aid greatly in recovery



Role of Human Health and Safety in Risk Management tied to financial support of response

Challenge of understanding the “what’s at risk” fully

- USA Evacuation Risk Assessment
- Stats showing that ~60% of population own pets-AVMA
 - Around 60%+ would not evacuate without their pets
 - Understand the % of humans that will evacuate
 - Simple math should give us what’s at risk and how to respond.....
- True Result:
 - always overestimate the numbers of animals to be sheltered



Risk Management making a difference

- Risk assessment
 - Companion animal owners that perceive their animals to be family members, will risk their own lives (evacuate/share food/water) increasing risk for themselves and their pets
- Risk analysis
 - Cost benefit and loss estimates dictate that animals cannot be left out of human life/safety response goals. Failed evacuation mission.
- Risk management policy change
 - To reduce risk to humans and animals, evacuation and sheltering plans will accommodate those animals recognized as “Pets”



Need for additional Plans

Pets will now be evacuated and sheltered with owners

■ Government and Response

- Evacuation provisions
 - Cages/transport/rescue
- Shelters
 - Co-located/stand alone/cohabitated
- Food/water considerations
- Funding

■ Responsible Owners

- Evacuation plans that include pets
 - Crates and equipment to evacuate
- Shelters
 - Ability to care for pet while in shelter
- Food and water for 5 days



Risk Management

Disease events

- Catastrophic Disease events less common
- Reactions to event are not as well understood
 - As producers/owners
 - As consumers
- Industry has consolidated and contracted in distribution altering risk both in location and in operations
- Economics are confounded by impact from international trade and inability to predict response outcomes
- Escalate by nature

Natural Disasters

- More common with variability in type to assist in identify risk and factors
- Reactions are less complicated or at least better understood
- Response community and public much more familiar with what is needed for response, prevention, and mitigation
- Depth of resources is greater than with disease response (ex. Non-Govs)
- Less regulatory restrictions
- Escalate if response is inadequate



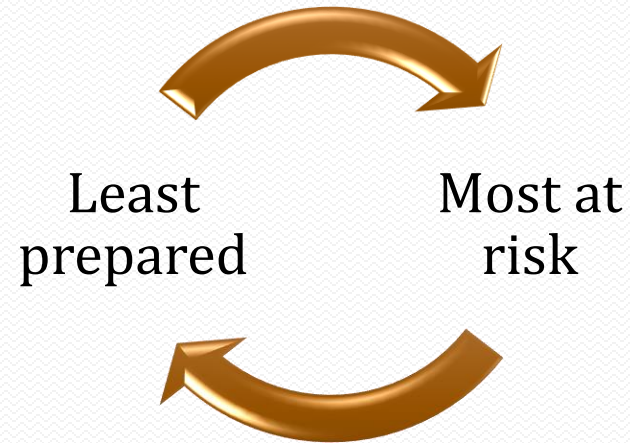
Plight of the Poor

Less resiliency

Located in higher risk areas (less valued property)

Struggle with daily and do not recover from extraordinary

Individual > Local community > Nation



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