

# The 2018 NYC Public Health Risk Assessment

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**NYC**<sup>TM</sup>  
**Health**

# Goal of a risk assessment

**Risk Assessment.** Characterizes the probable risks to NYC.

→ **What** we should worry about.

*Conducted every 5 years. CDC requirement.*



**Vulnerability Analysis.** Characterize populations at risk.

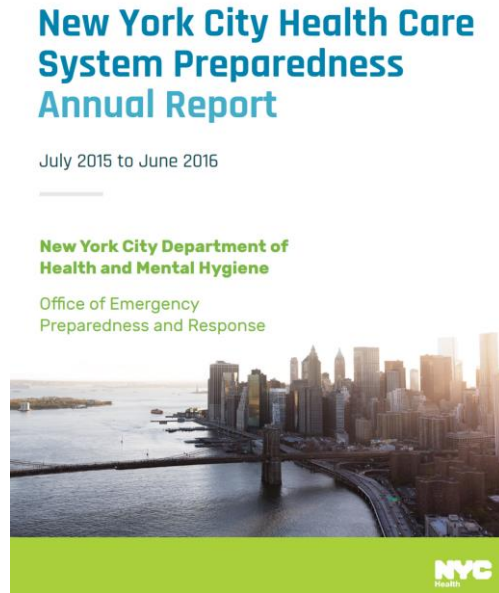
→ **Who** we should worry about.

*Vulnerability is always context dependent.*

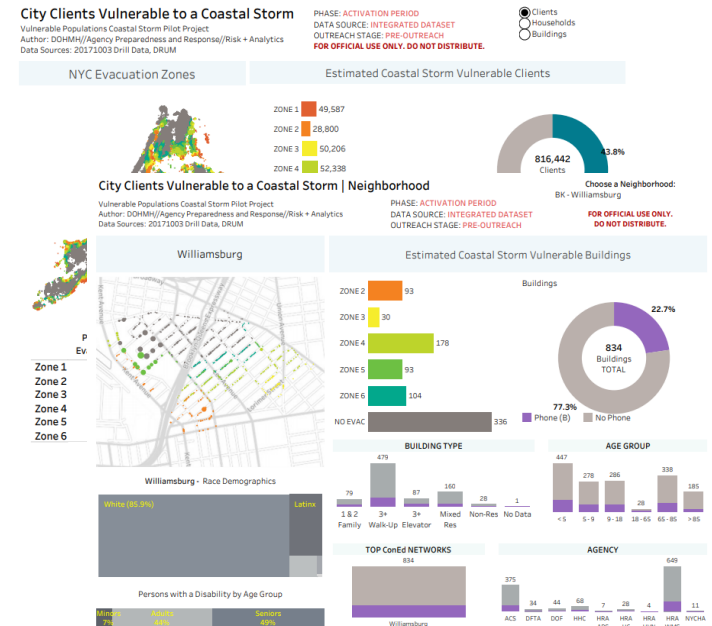
# Informs preparedness efforts across the City



**NYC EM  
Hazard Mitigation Plan**



**NYC HCC  
Hazard and Vulnerability  
Analysis**



**Mayor's Office of Operations  
Vulnerable Populations Project**



**SPARTA –Prioritizing preparedness work at DOHMH**

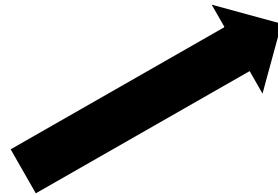
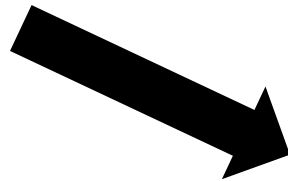
# The current standard for risk assessments












The **probability** of “Scenario X” occurring in the next 10 years is:

- ☐ Improbable
- ☐ Remote
- ☐ Occasional
- ☐ Probable
- ☐ Frequent

In “Scenario X”, would the **impact to humans** be:

- ☐ None
- ☐ Negligible
- ☐ Marginal
- ☐ Critical
- ☐ Catastrophic



RISK INDEX			
Hazard	Likelihood	Consequence	Risk Score
	High	Very High	Red
 	Very High	High	
 	High	Medium	Yellow
 	Medium	High	
	Low	High	
 	Medium	Medium	Green
	Very Low	Very Low	

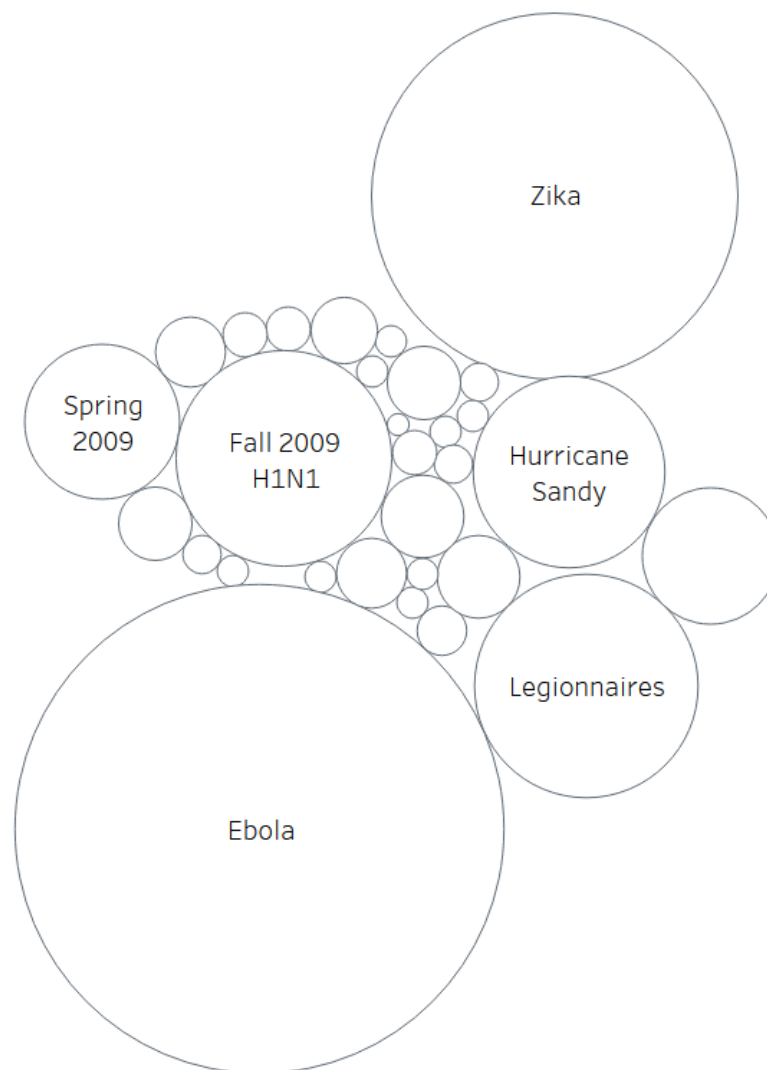
# 2013 Risk Assessment

- Focused on **Public Health Infrastructure** (DOHMH's ability to operate in a disaster)
- **24 Subject Matters Experts at DOHMH**

PUBLIC HEALTH DISASTER SCENARIO NYC HMP Section	SEVERITY	PROBABILITY	IMPACT OF PLANNING	PRIORITY RANK
Coastal Storm* Coastal Storms	2	6	2	1
Pandemic Influenza* Disease Outbreaks	5	9	1	2
Extreme Heat* Extreme Temperatures	8	1	6	2
Flooding Flooding	6	4	7	4
Aerosolized Anthrax Chem, Bio, Rad, Nuke (CBRN)	4	10	3	5
Radiological Dispersal Device* Chem, Bio, Rad, Nuke (CBRN)	3	11	3	5
Improvised Explosive Device* Not included in HMP†	7	7	5	7
Improvised Nuclear Device Chem, Bio, Rad, Nuke (CBRN)	1	12	8	8
Winter Weather Winter Storms	9	3	10	9
Chlorine Release Chem, Bio, Rad, Nuke (CBRN)	10	5	9	10
Food Contamination Disease Outbreaks	12	2	11	11
Tornado Severe Weather	11	8	12	12

## Total Activation Days by Hazard Type, 2007-2017

<b>Forecast Storms</b>	<b>Total</b>	<b>9</b>
	Hurricane Irene	4
	Winter Storm Juno	2
	Hurricane Joaquin	3
<b>Actual Storms</b>	<b>Total</b>	<b>80</b>
	Hurricane Sandy	75
	Snow Storm 2011	2
	Snowstorm Stella	3
<b>Common Outbreaks</b>	<b>Total</b>	<b>66</b>
	Measles/Mumps 2014	38
	Westside Market HepA	9
	West 10th St HepA	4
	Restaurant Chain HepA	11
	West Village Hepatitis A Response	4
<b>Uncommon Outbreaks</b>	<b>Total</b>	<b>1,029</b>
	Fall 2009 H1N1	95
	Spring 2009 H1N1 First Act	11
	Spring 2009 H1N1 Re-Act	49
	Ebola	488
	Legionnaires	102
	Zika	274
	Animal Shelter Outbreak	10
<b>Building Events</b>	<b>Total</b>	<b>43</b>
	Steam Pipe Incident	10
	Deutsche Bank Fire Incident	14
	East Harlem Building Explosion	14
	East Village Building Fire/Collapse	5
<b>Terrorism</b>	<b>Total</b>	<b>3</b>
	Ricin Letter Response	3



# Challenges assessing hazard risk

- Overreliance on **perceived threats** and fictional scenarios.
  - Bias towards extreme events.
- Failure to recognize that **extreme events are created by context**.
  - The vulnerability of the WTC only commands our attention now because of the occurrence of the attacks
  - Many extreme events are of interest precisely because they are so unexpected; i.e. prior risk calculations were grossly in error.



## Watchlist | Diseases threatening a public health emergency\*

- ◆ Crimean-Congo haemorrhagic fever (CCHF)
- ◆ Ebola virus disease and Marburg virus disease
- ◆ Lassa fever
- ◆ Middle East respiratory syndrome coronavirus (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS)
- ◆ Nipah and henipaviral diseases
- ◆ Rift Valley fever (RVF)
- ◆ Zika
- ◆ Disease X

*\*Diseases posing significant risk of an international public health emergency for which there is no, or insufficient, countermeasures. Source: WHO, 2018*



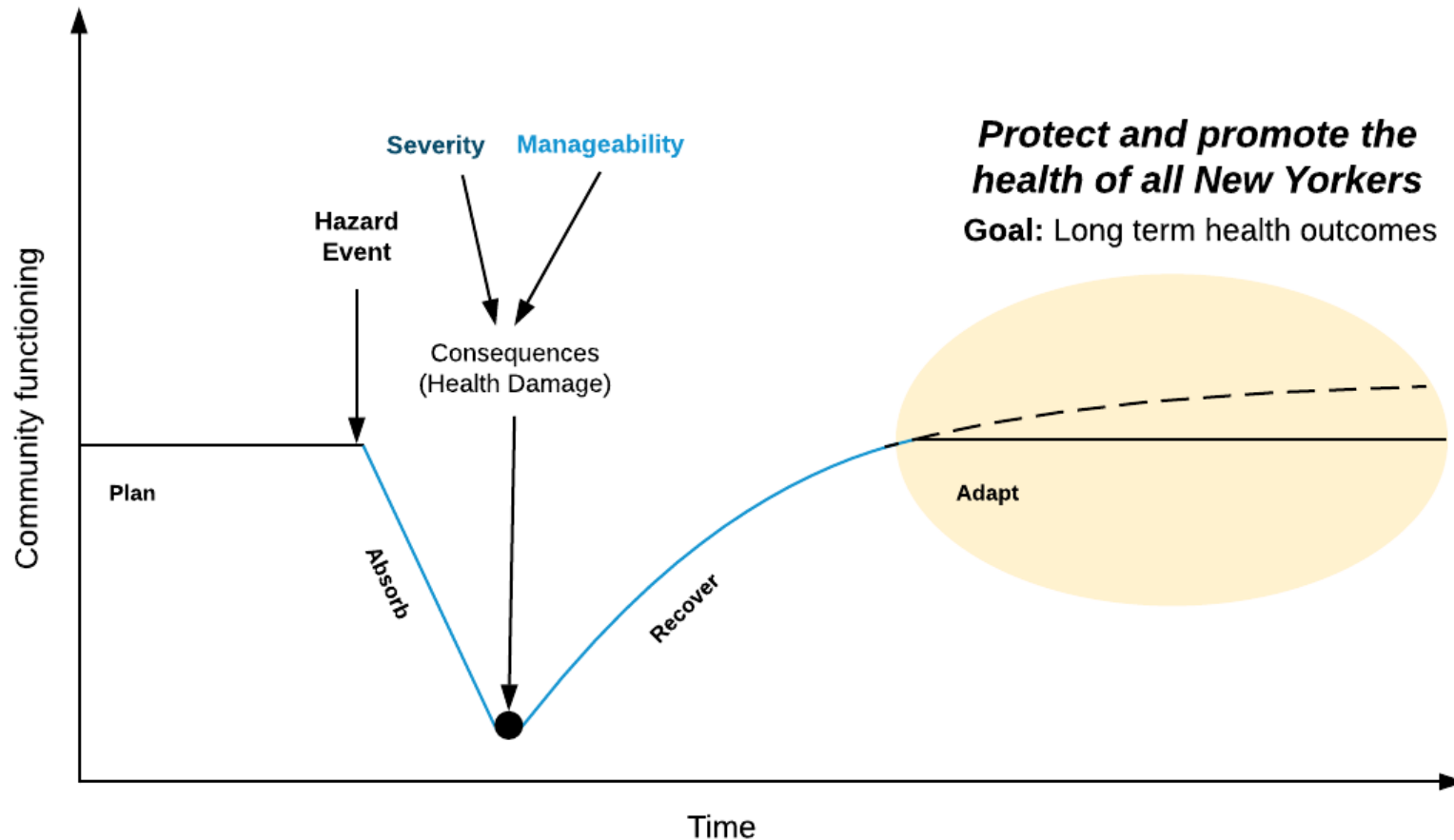
# A new approach

- **Start with social determinants of health.**
- **Focus on specific consequences, not hazards.**
- **Citywide.** Focused on public health risk at all levels  
Public Health | Health Care System | Government | Community
- **Inclusive.** Community partners will be included in defining disaster risk and ranking hazards.
- **Transparent.** All findings and methods will be made publicly available for comment and review.



# Focus on consequences, not hazards

## Community Resilience After Disasters

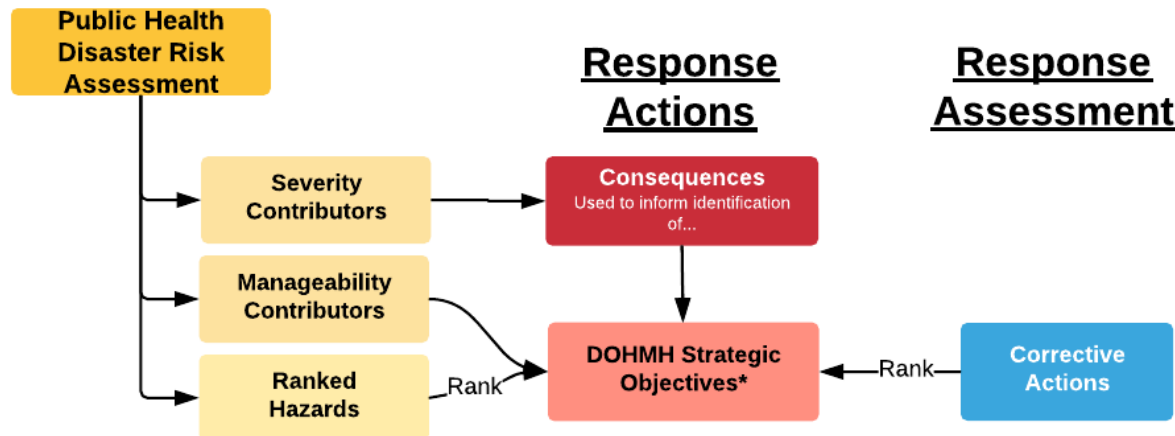


# Major goals of the risk assessment

- **Define** Public Health Disaster Risk

$$\text{Public Health Disaster Risk} = \frac{\text{Probability} \times \text{Severity}}{\text{Manageability}}$$

- Develop **measurable definitions** for Probability, Severity and Manageability.
- **Rank** public health hazards by disaster risk
- **Score Strategic Objectives** in the Response Inventory by disaster risk



# Four stakeholder groups with a distinct mission:



**IT'S A DISASTER**

**WHAT WILL YOU CHOOSE?**

## DEFINE SEVERITY

DOHMH Bureaus | NYCHCC | City Agencies |  
Community Groups

## DEFINE MANAGEABILITY

ICS Leadership | NYCHCC | City Agencies |  
Community Groups

## DEFINE PROBABILITY

DOHMH SMEs | External SMEs

## RANK HAZARDS

*By Severity:* Bureaus, NYCHCC, Community Groups  
*By Manageability:* ICS Leadership  
*By Probability:* SMEs

# Stakeholder Commitment

## Risk Assessment Steps for Participants in Each Group

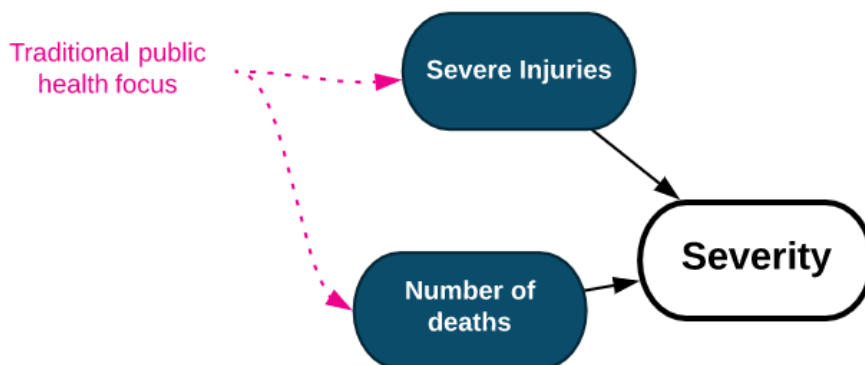
April	Round 1. <b>Identify all options</b> <i>Outcome: Universe of all options (Long list)</i>	Survey	Survey Monkey
May	Round 2. <b>Determine initial positions</b> <i>Outcome: Initial list of top concerns (Short list)</i>	Survey	Survey Monkey
June	Round 3. <b>Review and reevaluate positions</b> <i>Outcome: Final list of top concerns (Short list)</i>	Survey	Survey Monkey
July/ August	Round 4. <b>Pairwise ranking of options</b> <i>Outcome: Weighted list of concerns (Prioritized list)</i>	Online Tool	Feedback Server

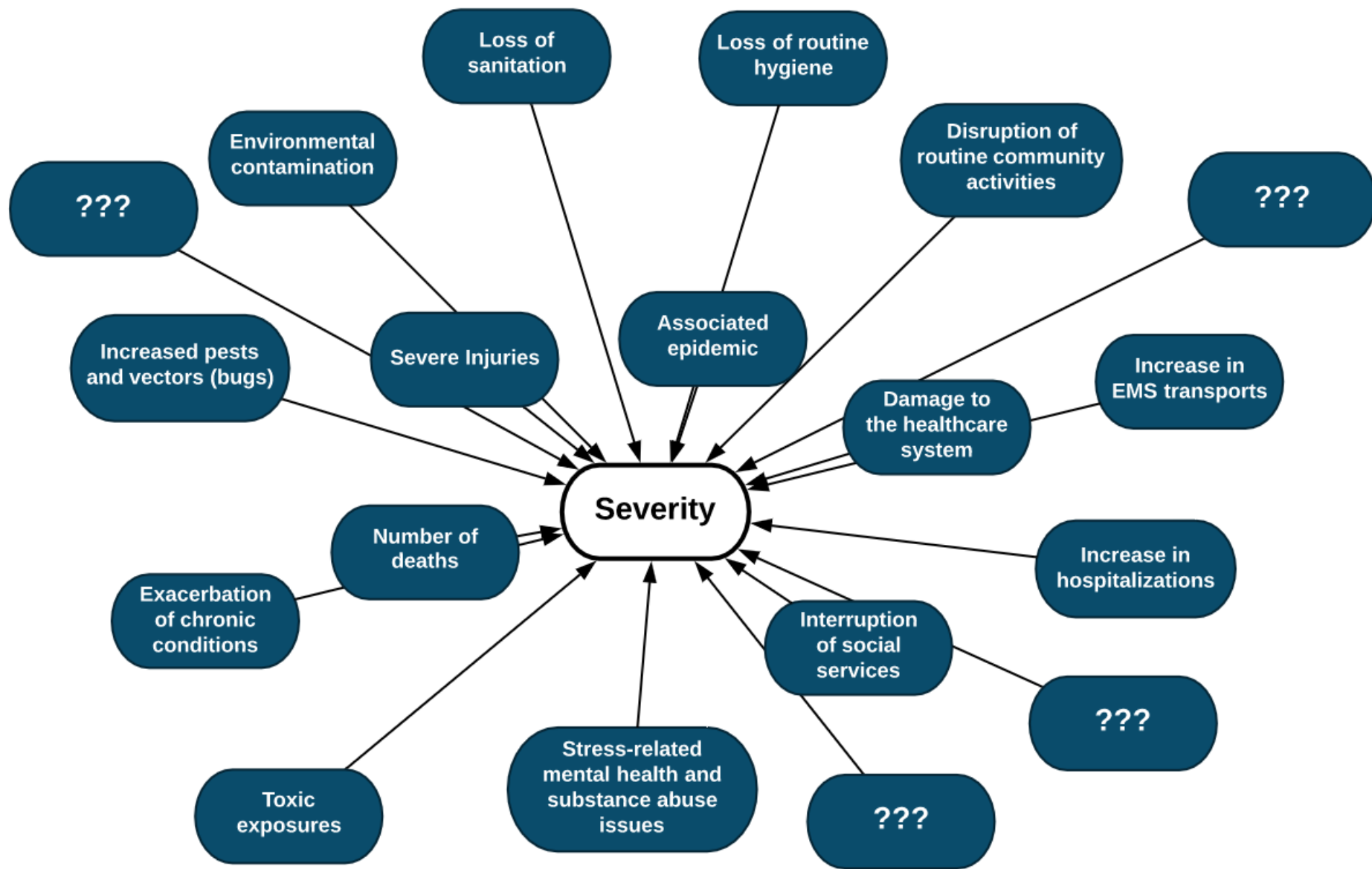
### Healthcare partners included

- NYC HCC Leadership
- Hospital, NH, ACF EPCs
- FQHCs
- NYSDOH

Methods Example

# Identify all contributors to the severity of a public health disaster

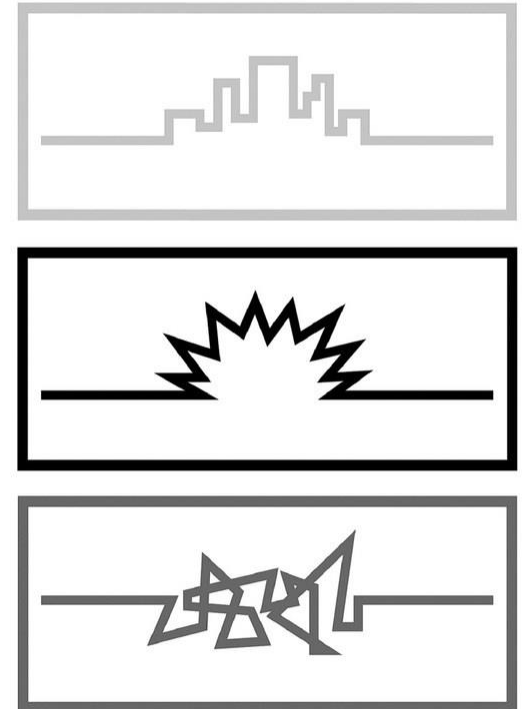
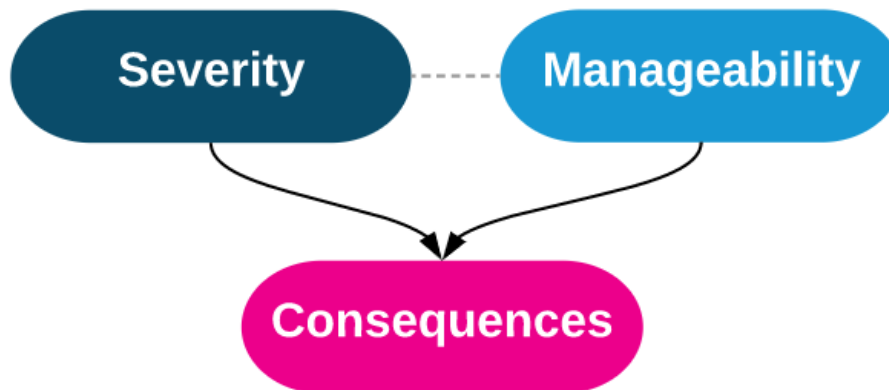




Result: **Long list** of contenders for consideration when we rank hazards

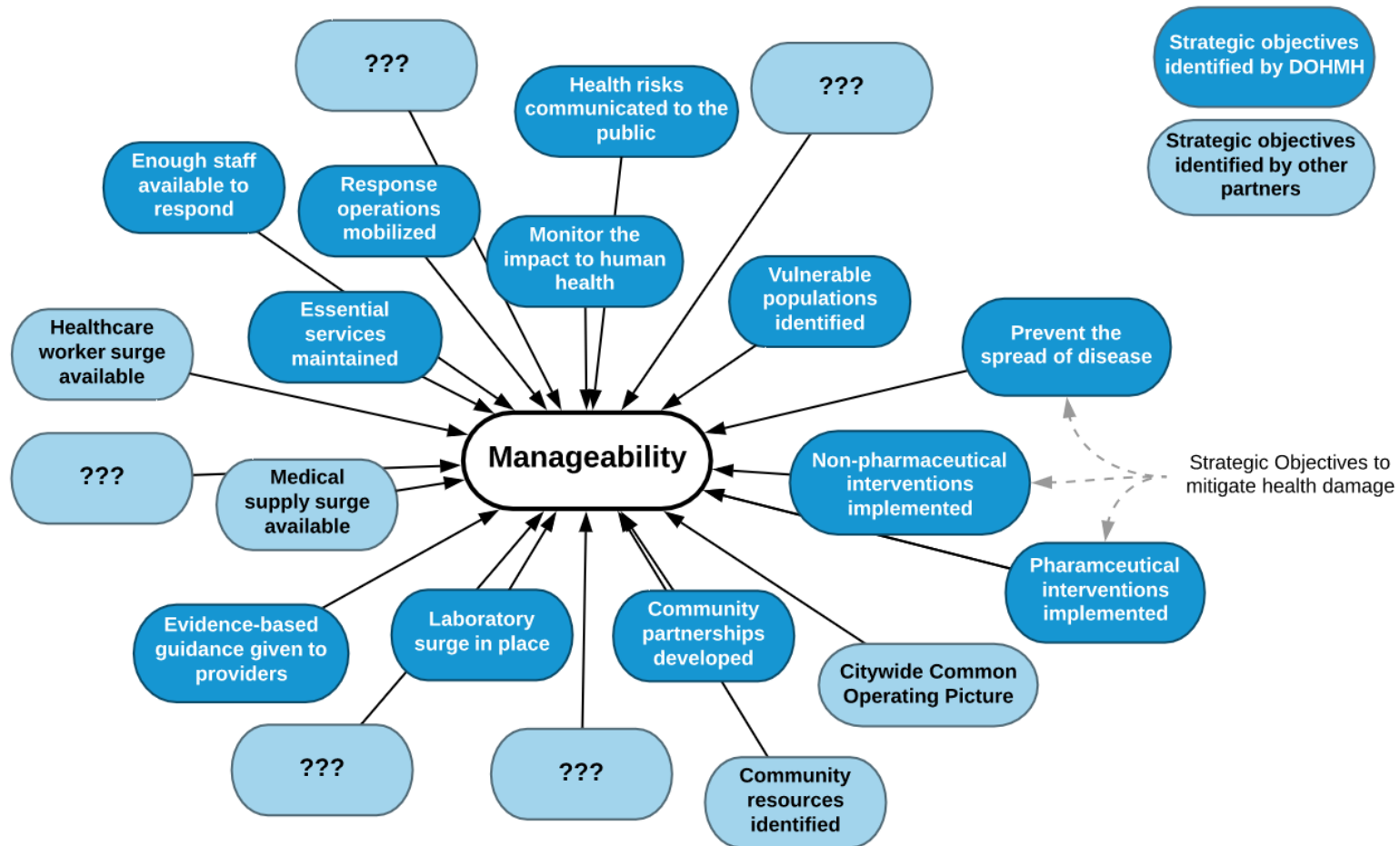
# Identify all contributors to the manageability of a public health disaster

Manageability contributors include anything that can **decrease the severity** of a hazard (mitigation) or **increase the coping capacity** of the City.





# Identifying all contributors to manageability



Result: **Long list** of contenders for consideration when we rank hazards

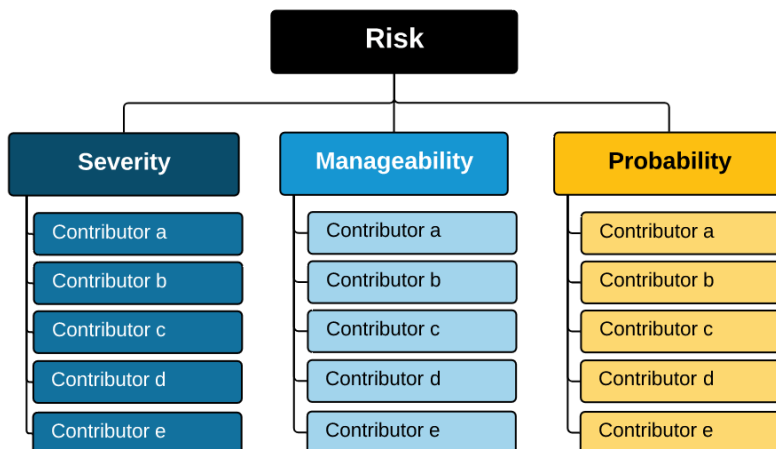
# Each group reviews the list of contributors and chooses the most important for ranking hazards

- Participants in each group triage the universe of contributors
  - Initial results shared with the group
  - Highlight disagreements for consideration
- Participants retake the survey

*Result:* A **short list** of contributors to Severity, Manageability and Probability used to rank hazards.

\* From the following list of contributors to **severity**, choose the most important ones for ranking hazards. You may choose no more than 10.

- ☐ Mortality
- ☐ Stress-related mental health and substance abuse problems
- ☐ Severe injuries
- ☐ Increase in pests and vectors
- ☐ Food scarcity
- ☐ Damage to health care facilities
- ☐ Environmental contamination
- ☐ Job loss/economic damage
- ☐ Decrease in health care staff available for primary care
- ☐ Longer wait time in emergency rooms
- ☐ Toxic exposures
- ☐ Loss of clean water
- ☐ Loss of power
- ☐ Loss of shelter



# Pairwise comparison of hazards to create a prioritized list

For which hazard is our ability to **assist the healthcare system with their response to emerging health threats** more complete?



# Results!

April -	<b>Risk Assessment outreach</b>
August	
September	<b>Short summary of findings</b>
October	<b>Rank Objectives in the Response Inventory</b>
December	<b>Full detailed report</b>




**SPARTA Mission** Prioritize the *most important* Response Functions for which we have less capacity/preparedness.



Strategic Objectives	Criticality <i>by Tier</i>	Preparedness Gaps <i>by Tier</i>	Capacity Gaps <i>by Tier</i>	Priority Decision
A	1	3	2	
B	3	2	4	
C	1	1	2	
D	3	4	1	
E	1	1	3	
F	2	1	1	

# Benefits! Outcome of the process

- **First of its kind public health risk assessment** with community input
- Ranked list of **public health hazards** with customized results for the healthcare sector and community.
- **Ranked response inventory** to guide DOHMH preparedness work
- **Identified gaps** in City efforts that DOHMH can help address.

Risk-based Rank	Owner	Strategic Objective	Preparedness Score	Capacity Assessment	2019 Rank
1	DOHMH	Provide mental health resources to respond to meet the mental health needs of the public	 1.2	4	
2	DOHMH	Provide evidence-based, response specific information to healthcare providers on the disaster	 3.2	2	
3	DOHMH	Determine non-pharmaceutical intervention strategies	 2.5	3	
4	City	Provide accessible transportation options in the disaster	Need to define with City partners		
5	Community	Provide neighborhood resources and assistance to families	Need to define with Community partners		