PUBLIC DISASTER WARNINGS

HIGHLIGHTS OF REPETITIVE FINDINGS FROM THE SOCIAL SCIENCE RESEARCH RECORD

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Presented to the
Workshop on Public Response to Alerts &Warnings via Social Media
National Research Council of the National Academies
Irvine, CA: February 28, 2012

START NATIONAL CONSORTIUM FOR THE STUDY OF TERRORISM AND RESPONSES TO TERRORISM
A CENTER OF EXCELLENCE OF THE U.S. DEPARTMENT OF HOMELAND SECURITY BASED AT THE UNIVERSITY OF MARYLAND

BASIC QUESTION

How & Why People In Imminent Danger:

-STOP….

-HEAR WARNINGS…. &

-TAKE PROTECTIVE ACTION for…..

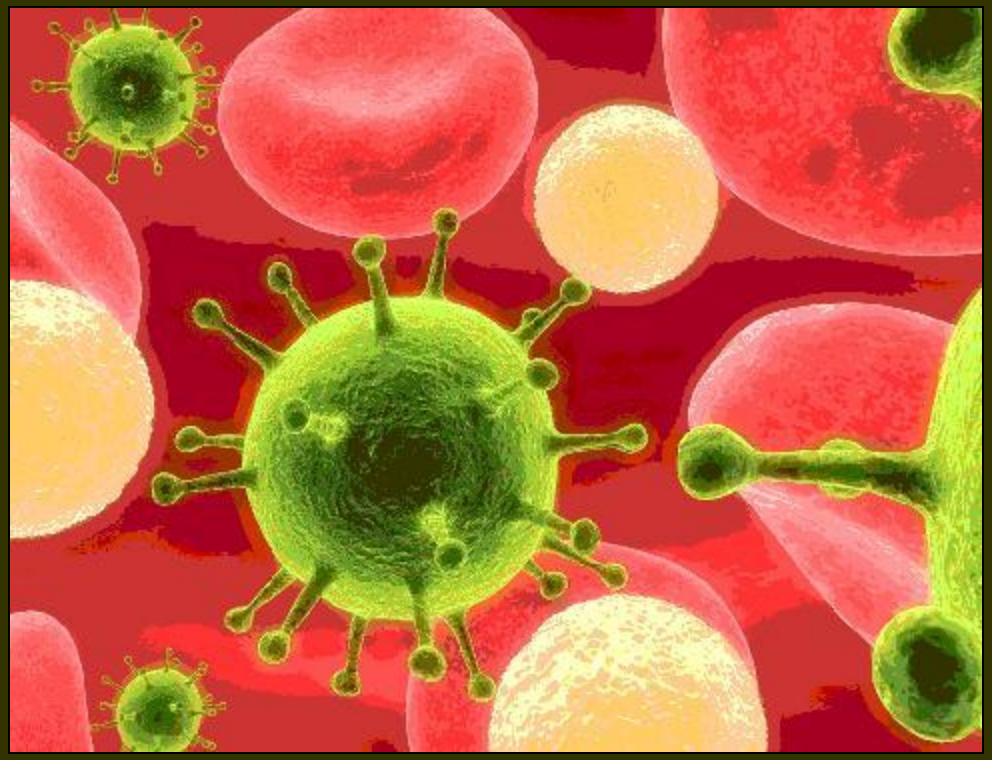
TERRORIST ATTACKS

TECHNOLOGICAL EVENTS

NATURAL DISASTERS

BUILDING FIRES

BIOLOGICAL HAZARDS



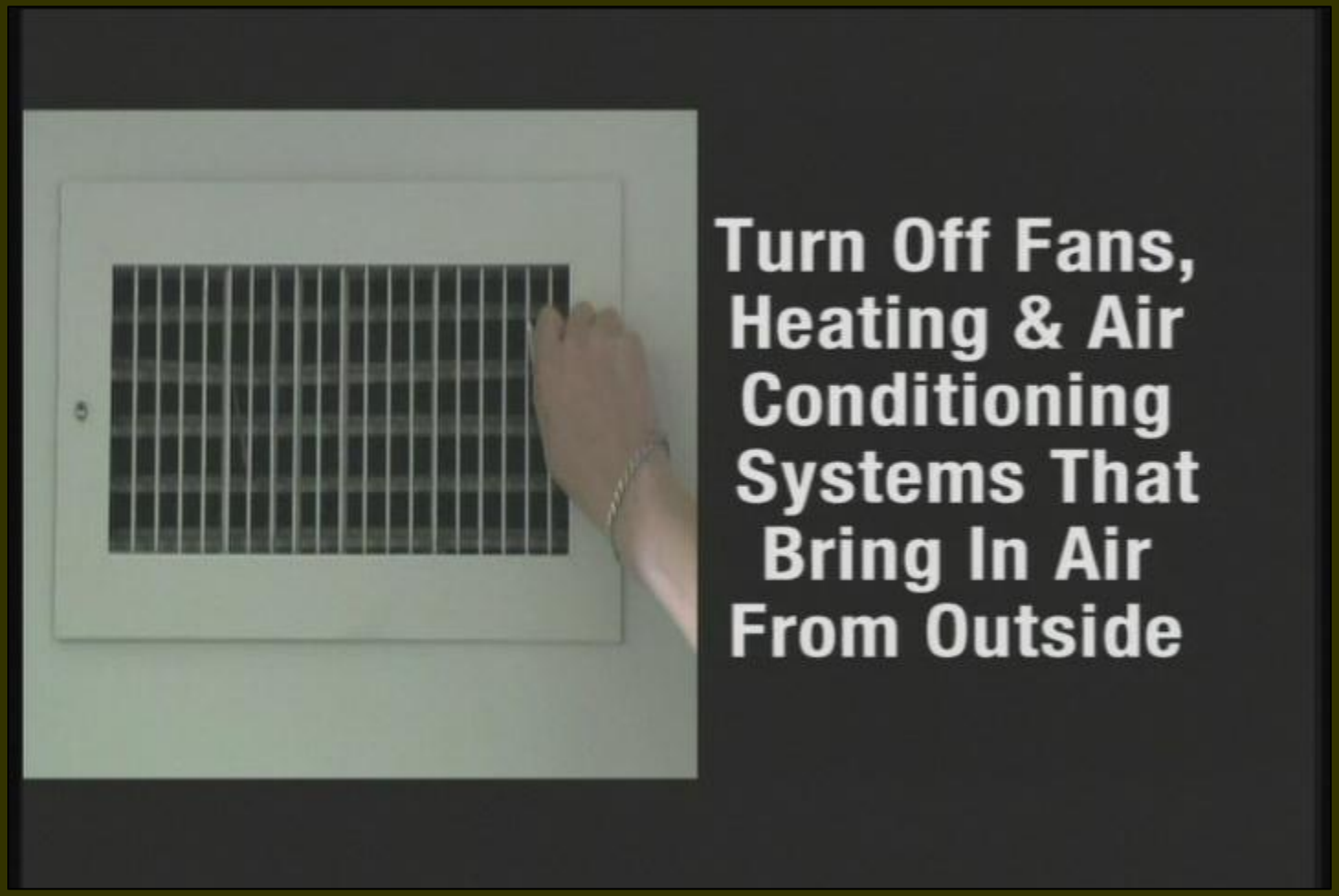
HAZARDOUS MATERIALS AND MORE….

INCLUDING PROTECTIVE BEHAVIORS SUCH AS….

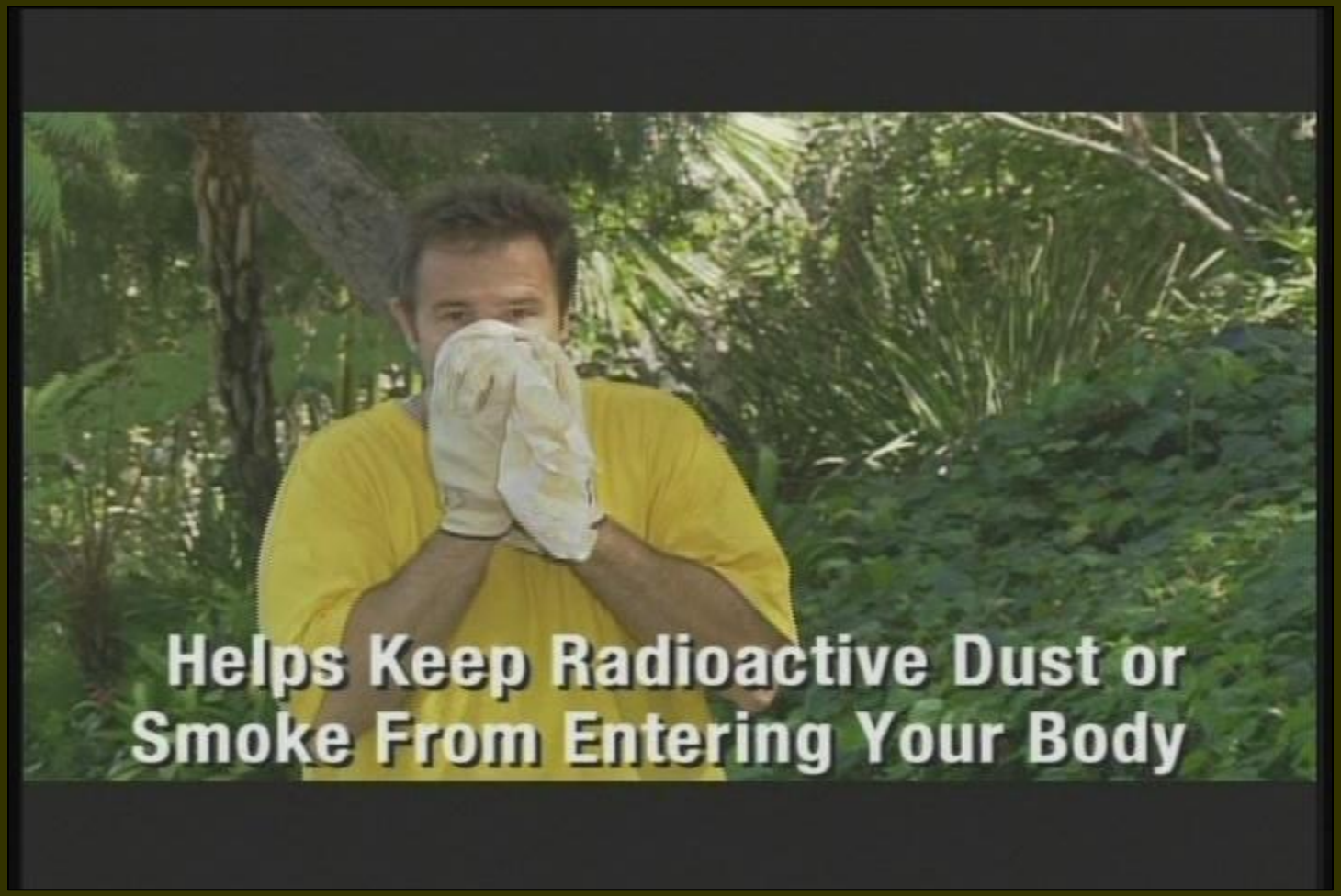
VEHICLE EVACUATION

PEDESTRIAN & OCCUPANT EVACUATION

SHELTERING IN PLACE



BREATHING PROTECTION



DECONTAMINATION

ABOUT THE RESEARCH

THE RESEARCH BASE

- Half-century social science research:
  - Hazards & disasters research literature
  - U.S. emphasis--but not exclusively
  - Protective actions studied:
    - Some a lot, others a little, some not at all

- Example events studied:
  - Natural: Hurricane Camille, Mt. St. Helens
  - Terrorism: World Trade Center 1993 & 9/11
  - Hazardous Materials: Mississauga, Nanticoke
  - Technology: Three Mile Island
  - Building Fire: MGM Grand, Cook County Hospital

RESEARCH IN COMMUNITIES

- *REFERENCES:* 350 page annotated bibliography available at:
- *http://www.colorado.edu/hazards/publications/informer/infrmr2/pubhazbibann.pdf*

RESEARCH IN BUILDINGS

- *REFERENCES:* 150 entry bibliography available at:
- *http://www.colorado.edu/hazards/library/BuildingsEvacBib2007.doc*

RESEARCH APPROACHES

- Studies on "*hypothetical*" events:
  - Can yield *wrong* response conclusions:
    - Situational determinants of behavior NOT operating
    - Preferences & intentions = little predictive weight
  - Useful for some specialized topics:
    - E.g., which words are/aren't understandable

- Studies of "*actual*" events:
  - Yield more *realistic* response conclusions:
    - Situational determinants of behavior ARE operating
  - Real people & events = real warnings & response

BASIC DEFINITIONS

ALERTING

- Definition:
  - Get people's attention
- Old fashioned approach:
  - Air raid sirens
- Contemporary approach:
  - IPAWS, CAP, CMAS
  - Use cell phones & other devices to get people's attention & provide mini messages

WARNING

- Public messages & information that:
  - Motivate the public to take timely & appropriate protective actions
- Mini messages likely too short:
  - To motivate much protective action-taking
- Alerting & warning are different:
  - Distinction between the terms are blurred in today's world

TWO KINDS OF BEHAVIOR APPLY TO PUBLIC WARNING

PUBLIC BEHAVIOR

- Public warning response is predictable:
  - About 40% explained variance (as good as it gets)
- The factors that predict it are known:
  - Apply across hazards & events
  - In mathematical equations (tested & retested)
- Public warning behavior:
  - Varies across events because of variation in the factors that influence it
  - Is malleable & somewhat manageable:
    - By managing the factors that influence it
    - Some people will always do the wrong thing

WARNING PROVIDER BEHAVIOR

- Research also includes:
  - Predicting the behavior of public warning providers
  - E.g., the *"sender"* portion of warnings
  - Based on investigations of historical warning events
- Influences on warning provider behavior:
  - Relatively well understood
  - Variation across events
  - Is malleable and manageable:
    - By managing the factors that influence it
  - Steps to enhanced job performance known

PUBLIC RESPONSE

HUMAN "HARD WIRE"

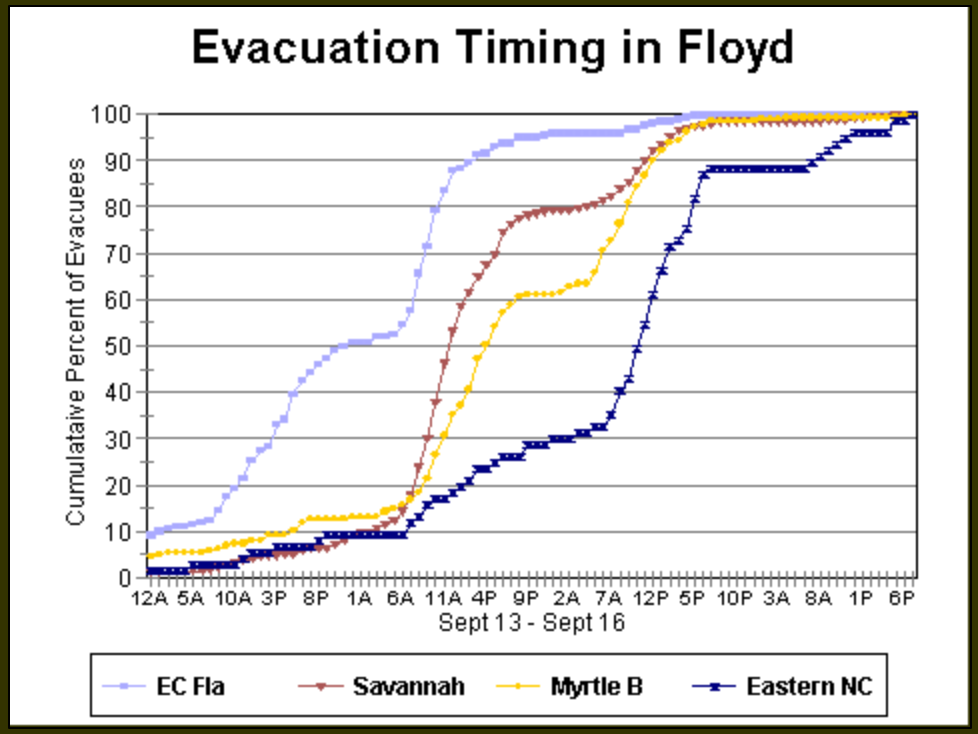
(a basic discovery)

- "Objective" reality for people = what they *think* is real
- What people *think* comes from *interacting* with others
- Most people go through life thinking they're *safe*
- Warnings tell them *they're not* & consequently
- Compel most people to *mill* around:
  - *Interact with others* & get more information & *search for confirming information* to form new ideas about safety & risk
- "*Milling*" *(some call it "sense-making")* *intervenes* between warning receipt & protective action-taking
- It results in public protective action-taking delay

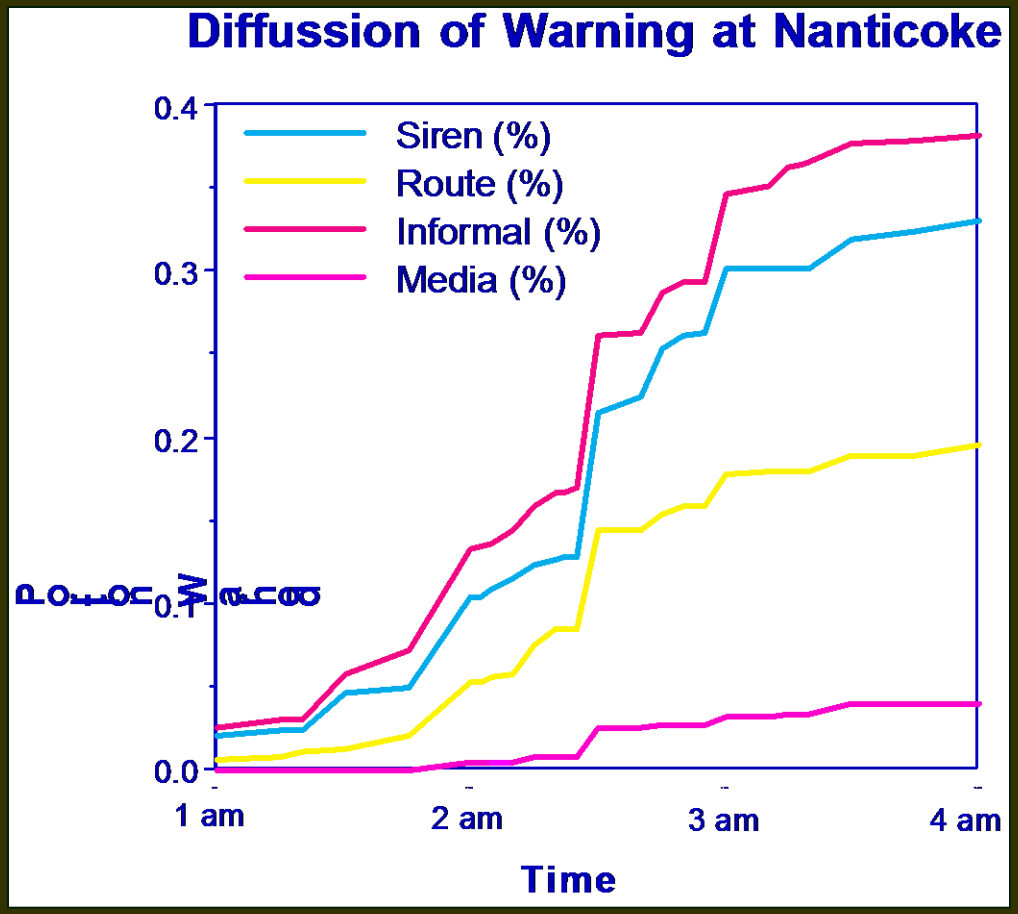
CONSEQUENCE

- Human beings are……
  - *"the hardest animal of all on the planet to warn"*
- An *"exaggerated"* example:
  - While all the forest animals are running away from the flames…..most people are talking about it with neighbors, looking at TV coverage, texting, & rubber necking trying to find out what it means & deciding what to do
- Creates a public warning GAP:
  - Few public warning providers are skilled at shortening the time people spend delaying protective action resulting in many unknowingly doing things that increase it

THE RESPONSE GAP



THE DIFFUSION GAP



MESSAGE FILTER

- Audience factors impact what people hear, how they interpret it & what they do:
  - Statuses (gender, sex, age, ethnicity, SES)
  - Roles (children, family united, pets, kinship)
  - Not just demographics:
    - Experience, knowledge, perceptions & beliefs
    - Environmental and social cues
- Effects of audience factors vary:
  - Significant but not large with poor warning messages
  - Many weaken in presence of strong warning messages
- Some constrain communication & response:
  - Special needs sub-populations *(unique effects)*
  - Special communication channels *(for sub-populations)*

MESSAGE CONTENT

- Topics that matter (what to say):
  - *WHAT:* Tell them what to do
  - *WHEN:* Tell them by when (time) to do it
  - *WHERE:* Say who should & shouldn't do it
  - *WHY:* Tell about the impact's consequence & how what you're asking them to do reduces it
  - WHO: Say who's talking (source):
    - There is NO single credible source, local firefighters are best, but a panel of multiple sources works better
- Public response effects: strong

MESSAGE STYLE

- Style matters too (how to say it):
  - *CLEAR*: Simply worded
  - *SPECIFIC*: Precise & non-ambiguous
  - *ACCURATE*: Errors cause problems
  - *CERTAIN*: Be authoritative and confident
  - *CONSISTENT*:
    - Externally: Explain changes from past messages & differences from what others are saying
    - Internally: Never say "attack will occur soon, don't worry"
- Public response effects: strong

MESSAGE DELIVERY

- *Number* of communication channels:
  - More channels work better than fewer channels
  - Some subpopulations need unique channels
- *Type* of communication channels
  - Personal delivery channels work best
  - Channel "diversity" (multi-media) helps too
- *Frequency* of communications:
  - The more its repeated & heard the better:
    - Repetition fosters confirmation which yields taking action
- Public response effects: strong

INFORMATION MANAGEMENT

- Not just about official warning messages:
  - Public receives information from many sources
- Public in an *"information soup"* when warned:
  - Many formal & informal information sources
  - Some information is correct & some is not
  - Inconsistencies slow protective action-taking
- What works best: *deliver* official warnings AND try to *manage* the soup:
  - Put good information in & take bad information out

WHAT THAT LOOKS LIKE

- Managed warning information includes:
  - Use of evidence-based messages (pre-scripted & vetted)
  - Take audience factors into account (e.g., delivery)
  - Actions to reduce public milling & response delay
    - Match messages across information providers
    - Distribute messages repetitively over diverse channels
    - Send the messages to other providers + JIC
  - Inform people not at risk to reduce "response creep"
  - Monitor public response (people at & not at risk)
  - Listen for wrong information & then
  - Re-warn with adjusted messages based on what people are + aren't doing, wrong information, & any changed protective actions recommendations plus
  - Q & A provide & staff a call-in number

THE BOTTOM LINE

- Even great public warning messages:
  - Aren't silver bullets that work well on their own
- Public warning messaging that can most effectively impact public response:
  - More than distributing a message
  - *"A process of public information management based on plans & procedures"*
- Bottom line:
  - Emergency planning works, not planning doesn't work quite as well

WARNING PROVIDER

BEHAVIOR

WARNING "SYSTEMS"

- Public warnings involve a *system* of people, agencies & organizations:
  - A systems perspective helps "see" all the parts
- Public "warning preparedness" helps to:
  - Design, plan, train & exercise to create a more *"highly reliable warning system"*
  - In place long before an actual event occurs

SYSTEM FUNCTIONS

RISK
Natural Environment
Technological
Civil

MANAGEMENT
Interpretation
Decision to Warn
Warning Content &
Protective Action Selection
Warning Method & Channel
Response Monitoring
Warning Feedback

DETECTION
Monitoring
Risk Detection
Data Assessment & Analysis
Prediction
Informing

PUBLIC RESPONSE
Interpretation
Confirmation & Milling
Response
Warn Others

SYSTEM ACTORS

RISK
Nature
Technology
Terrorists & more

MANAGEMENT
Government
(Local, State, Tribal)
Building Operators

DETECTION
Scientific Agencies
Law Enforcement
(Police, DHS, CIA, FBI)
Public

RESPONSE
General Public
Racial & Ethnic Minorities
Visitors & Transients
Special Needs Groups
Organizations & Facilities

SYSTEM RELIABILITY

- Warning system failures can occur anywhere in the system:
  - Many links across functions & actors
  - Historical examples of non-failures & failures
  - Reasons for historical failures documented

- Warning preparedness:
  - Integrates all parts of the system resulting in a "more reliable" system with lower odds of failing

EXAMPLE SYSTEM FAILURES

- SYSTEM DESIGN FLAWS:
  - Warning system design, preparedness, training lacking
  - Un-reliable system linkages, e.g., detectors to managers
  - Actor's personality not removed with procedures
  - Fail safe solutions for technological problems missing
  - Problems of non-communication not addressed
- MESSAGING FLAWS:
  - Evidence-based messages not used
  - Everyone at risk not reached
  - People not at risk not communicated to
  - Repetitive message dissemination absent
  - Message management missing

A KEY SYSTEM LINKAGE

- The link between:
  - Risk detectors & local warning providers
- Ready local warning providers:
  - To receive information from risk detectors
  - With *"planned triggers & procedures"* about when to warn linked to different public protective actions
- Ad hoc approaches have historically been the root cause of warning system failures

BELIEF IMPEDIMENTS

- Warning messages should be short
- People may panic
- One-way delivery is communication
- People will understand the message
- Messages can't be changed
- There's one public
- A credible message source exists
- People blindly follow instructions
- One channel delivery works
- Great messages guarantee great response

PUBLIC EDUCATION

- *Don't confuse with preparedness education*
- Pre-event public "*warning*" education:
  - Doesn't much influence response in an actual event
  - Why: warning response is largely determined "*in situ*"
- Use to teach people:
  - Hazard exists, warning system & source, etc.
- And to acquaint people with:
  - Protective actions, e.g., don't pick kids up at school
- In other words:
  - *It can prime the public* by removing surprises and reducing confusion in future warning events

WARNING PROVIDER EDUCATION

- Community warning metric:
  - Assess social science knowledge implementation
- Measured in several UASI areas:
  - Washington, D.C., New York, & Los Angeles
- Key findings:
  - Application lags behind knowledge
  - What is applied is done so unevenly
- Possible needs identified:
  - Plan development & training for local warning providers
  - Modernized guidance
  - Pre-scripted (& pre-vetted) warning messages

GAME CHANGERS

MOBILE DELIVERY DEVICES

- Big part of our public warning future
- Combines alerting & warning:
  - Blurs distinction (calls them both alerting)
- Message length limits:
  - 90 or 140 characters (not words) long
- Holds promise & raises hypotheses:
  - Decrease diffusion time?
  - Increase milling & response delay time?
  - Enhance risk personalization?
  - *Research is needed*

SOCIAL MEDIA

- Won't change some things:
  - How people are "hard wired"
  - Strong impact of message factors on public response behavior
- Will change other things (hypotheses):
  - Accelerate milling, confirmation, informal notification
  - How public response can be monitored
  - Evidence so far = is mixed (about actual use)
  - Role & use likely to change over time
  - Holds promise
  - *Research is needed*

END NOTES

- We *"hit the highlights"*:
  - More could be said about everything:
    - This was a speech not a semester-long seminar
    - Some topics mentioned only briefly
- Social science knowledge can't:
  - Provide guarantees about public response or
  - Solve all public warning & response problems
- But it can:
  - Help solve some problems
  - Point to planning & training needs

SUMMING UP

"The key determinant of public warning response has more to do with what public information providers give the public than anything to do with the public itself"

QUESTIONS?

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