

INCREASING PUBLIC PREPAREDNESS FOR FLOODS

**RESEARCH FINDINGS & EVIDENCE-BASED
RECOMMENDATIONS FOR PRACTICE**

Luncheon Presentation

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DISCLAIMER

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■ **However:**

- Opinions, findings & conclusions are the author's and do not necessarily reflect the views of DHS

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PURPOSE

- **Describe the *"Human Element"*:**
 - The character of human beings &
 - How to motivate them to prepare
 - About people in households
 - (not organization decision makers)
- **Provide Practitioners With:**
 - A *"Tool Kit"* for increasing public preparedness based on scientific findings
- **& Answer the Question.....**

HOW DO YOU HELP PEOPLE

STOP....

LISTEN....

& GET READY....

FOR DISASTERS

- **That Most People Think:**

- Won't really happen

- **And if They Do Will:**

- Happen to other people, not them

WHY DO PEOPLE THINK THAT WAY?

- **Most People “Don’t Perceive Risk”:**
 - To high consequence low probability events
- **They “Perceive Personal Safety”:**
 - From nature’s fury and other disaster types
- **And They’re Right *(most of the time)***

TWO BASIC DEFINITIONS

WHAT IS PREPAREDNESS?

(clarifying the dependent variable)

■ **Public Preparedness:**

- Means different things to different people

■ **A Clear Definition is Important:**

- Frames the public actions want to influence

■ **Public Preparedness is More Than:**

- 72 hours of water, flashlight & batteries, canned food, & duct tape

7 PUBLIC PREPAREDNESS ACTION CATEGORIES

- **1. Learn How to Be Prepared:**
 - What to do before, during, & after an event to stay safe & more
- **2. Plan What to Do:**
 - Household disaster plan & more
- **3. Train & Practice:**
 - Learn first aid & more
- **4. Organize Supplies & Equipment:**
 - Stockpile enough of what you'll need & more
- **5. Secure Building Contents:**
 - Attach heavy furniture to the walls & more
- **6. Protect Building Structure:**
 - Evaluate the safety of your home & more
- **7. Safeguard Finances:**
 - Buy insurance and have cash on hand & more

IT LOOKS LIKE THIS



WHAT IS PREPAREDNESS INFORMATION?

(clarifying the independent variable)

- **Includes Different Things, e.g.,**
 - Brochures, internet sites, television & radio spots
 - School coloring books & grocery bag messages
 - Museum displays & refrigerator magnets
 - School, workplace, & neighborhood activities

- **And It Can Be:**
 - One-shot information events or long-lived campaigns
 - Different information from different organizations
 - A coordinated campaign across organizations
 - & more

THE RESEARCH BASIS

RESEARCH PUBLICATIONS

■ On What Factors:

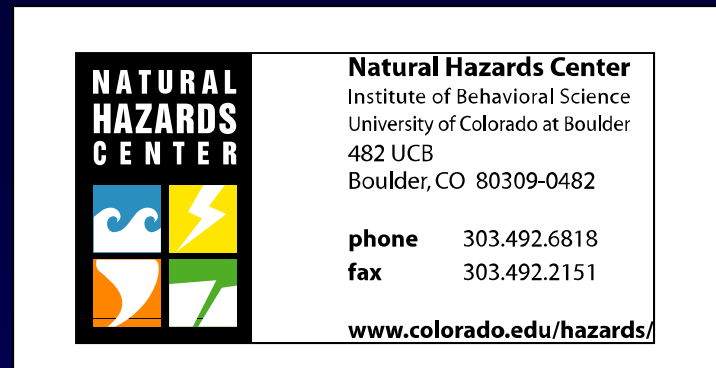
- Motivate people to take action

■ 50+ Years Communication Research:

- Different disaster types
- From education to warnings

■ Many Research Publications in Print

ACCESS THE RESEARCH



- **350 Page Annotated Bibliography (with findings summarized, 1 page per publication):**

<http://www.colorado.edu/hazards/publications/informer/infrmr2/pubhazbibann.pdf>

- **Note:**
 - One study = findings
 - Finding across all studies = knowledge

BIBLIOGRAPHY CONTENTS

■ **Full Publication Reference:**

- Author, title, publication outlet

■ **Summary Paragraph:**

- Event studied & research methods

■ **Hypotheses Supported, e.g.,**

- “A” caused “B” but only when “C” was present

QUALITY RESEARCH CHARACTERISTICS

■ **Note: All Research Isn't Good Research**

■ **Good Research Uses:**

- Past research as its context (not just a poll)
- Probability samples
- Multivariate analysis (control for "X & Z" when examining effect of "A on B")

■ **Tests Determinants of Behavior:**

- Respondents don't speculate "why"

QUALITY RESEARCH ***(cont'd)***

■ Distinguishes Between:

- What people “think” vs. “do” (they’re different)
- Good measures of what’s being studied vs. self-reports:
 - Medical exam self-report:
“On a scale of 1 to 5, how much cancer do you think you have?”
 - Readiness self-report equivalent:
“On a scale of 1 to 5, how prepared do you think you are?”

■ Recommendations for Practice Based on:

- Replicated findings across studies

SUMMARY OF RESEARCH FINDINGS

ABOUT THE FINDINGS

■ Research Record:

- Contains many different conclusions

■ Lessons Learned Piecemeal:

- Studies of small local populations
- Findings synthesis possible, but clarity, consistency, & confidence could be higher

■ Lacked “Clear Evidence” for:

- What’s most vs. least important

PUBLIC PREPAREDNESS CORRELATES

■ 1. Information Received:

- # sources, # channels, frequency, telling them what to do, consistency

■ 2. Information Observed:

- Observable social & physical cues

■ 3. Statuses:

- Income, education, occupation, age, race, gender, ethnicity, country of origin

RESEARCH FINDINGS

(cont'd)

■ **4. Roles:**

- Partnership, family, children

■ **5. Experience:**

- Disasters experienced

■ **6. Information Belief:**

- Information received, source credibility

■ **7. Knowledge:**

- What to do, where to get more information

RESEARCH FINDINGS

(cont'd)

■ **8. Perceived Risk:**

- Probability of occurrence, personalization

■ **9. Perceived Actions Effectiveness:**

- Link between actions to take & cutting losses

■ **10. Milling:**

- Talking it over with other, seeking more information

WHAT WAS MISSING

- **Clear Knowledge About:**

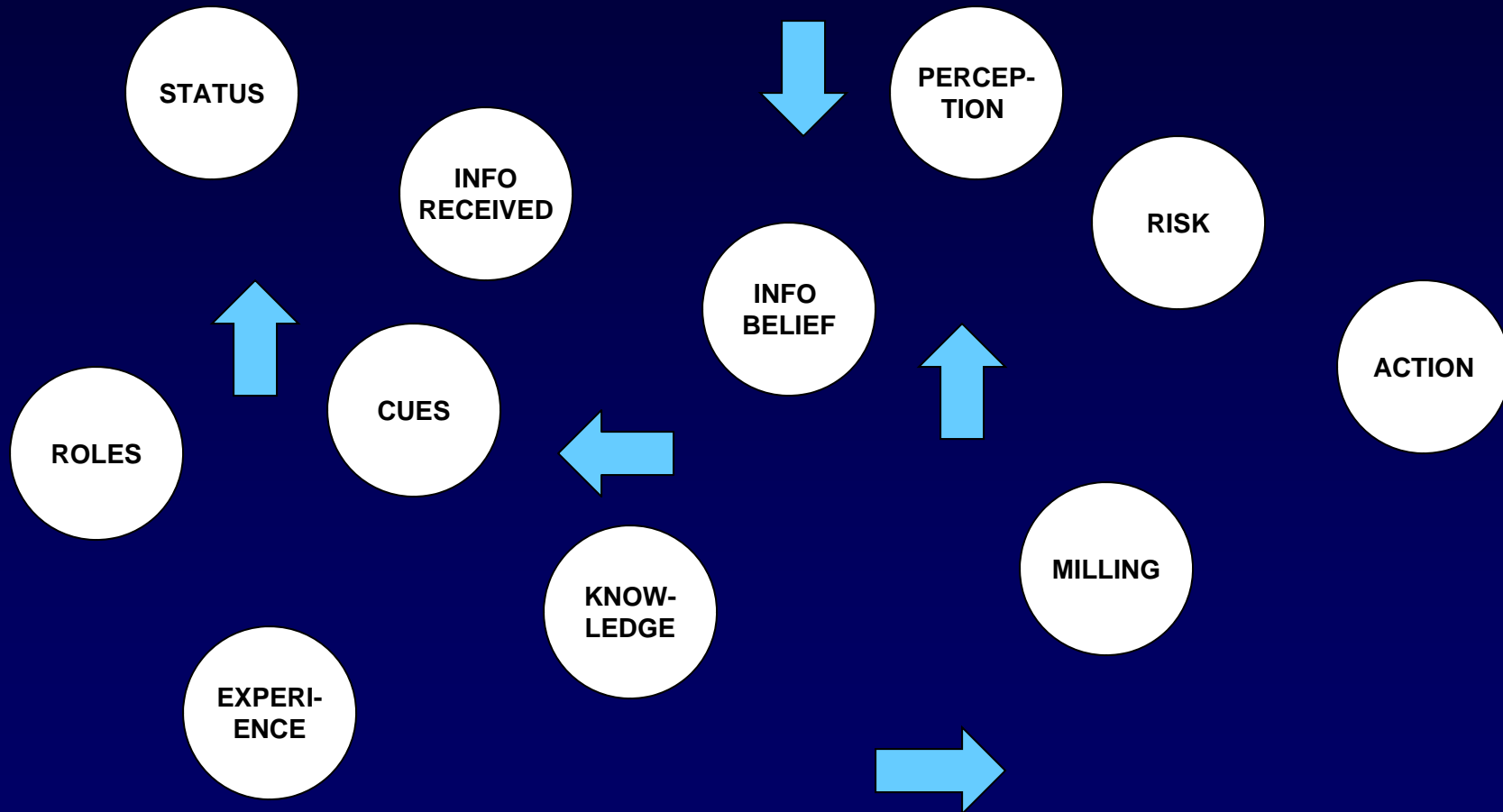
- What's most important & what isn't

- **How Factors Relate to Form:**

- *"The process whereby information received is converted into public preparedness actions"*

- **In Other Words.....**

WHAT MATTERS MOST & IN WHAT ORDER?



BUT NOW WE KNOW

- **MEGA-STUDY Completed in 2008:**
 - “Manhattan project” for public preparedness
 - Studied public preparedness for “any reason”
- **Findings = “Impeccable” Evidence:**
 - Clear, consistent, & replicated
- **Applications Ready:**
 - Confident pathways to public preparedness

MEGA-STUDY SAMPLE

■ **Geographic Areas (N = 3,300):**

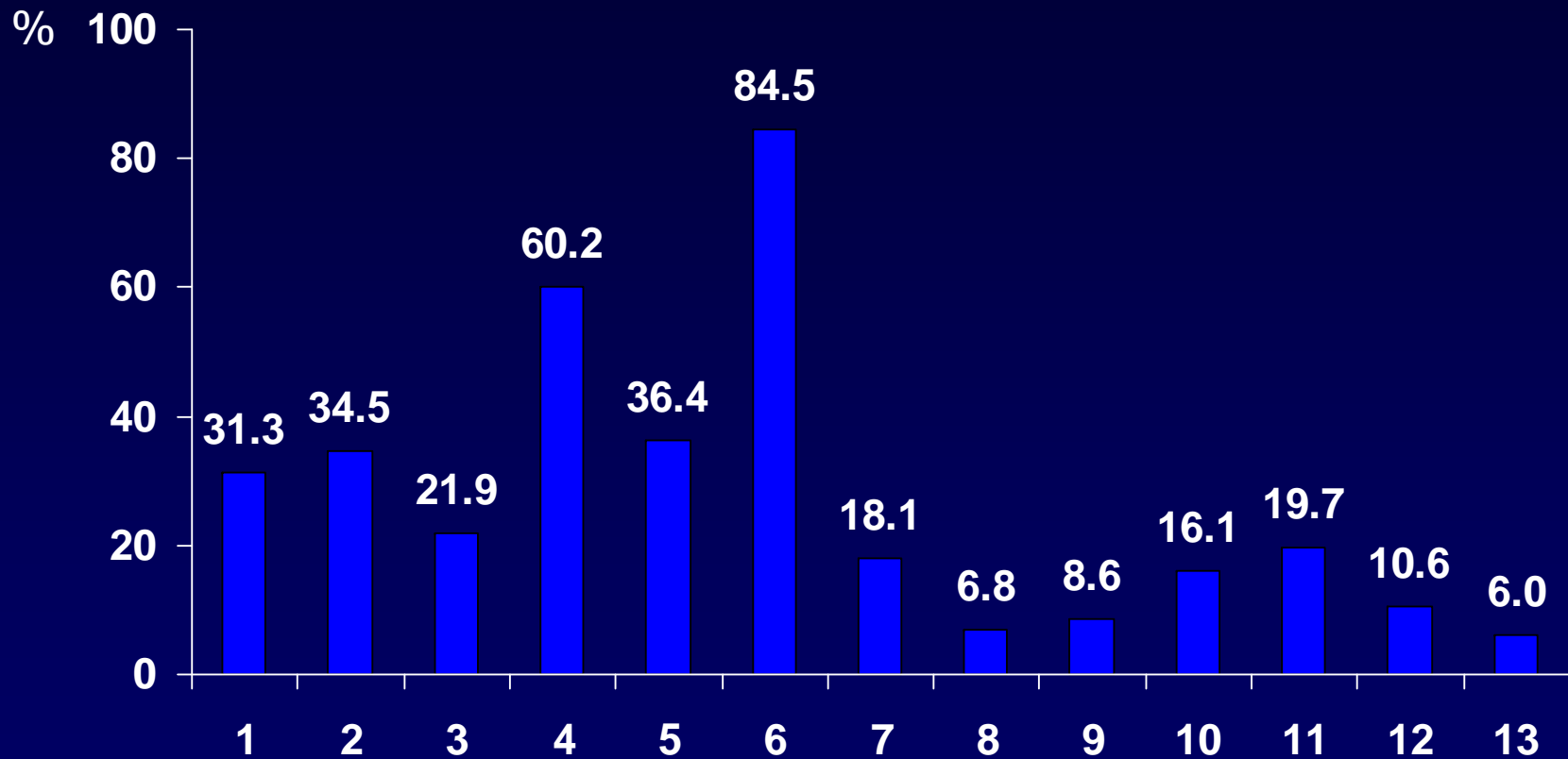
- Rest of 48 states N = 2,298 (69.6%)
- New York City N = 390 (11.8%)
- Washington, D.C. N = 200 (6.1%)
- Los Angeles N = 412 (12.5%)

■ **Racial/Ethnic Groups (N = 3,300):**

- White N = 2,312 (70.1%)
- Hispanic N = 416 (12.6%)
- African American N = 314 (10.4%)
- Asian/Pacific Islander N = 109 (3.3%)
- Other N = 119 (3.6%)

PROFILE OF THE NATION

(weighted sample: $n = 3,300$; for any reason)



1 Developed emergency plans
2 Stockpiled supplies
3 Purchased things to be safer
4 Learned about terrorism

5 Duplicated documents
6 Became more vigilant
7 Reduced plane travel
8 Reduced train travel

9 Reduced public transit
10 Changed mail handling
11 Avoided certain cities
12 Avoided tall buildings

13 Avoided national landmarks

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MEGA-STUDY CORRELATIONS

	X16	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15
X16a	1	.05	-.01	-.03	.10	.17	.54	.28	.51	.26	.43	.42	.34	.12	.24	.42
X16b	1	-.09	.05	-.10	-.12	.05	.15	.41	.15	.37	.13	.04	.18	.42	.15	.11
X16c	1	.08	.00	.06	.15	.09	.25	.20	.31	.18	.31	.28	.16	.03	.13	.31
X16d	1	-.07	-.01	-.06	.01	.10	.19	.40	.18	.37	.18	.06	.14	.27	.17	.14
X1		1	-.04	-.01	.12	-.03	-.05	-.06	-.04	-.01	.02	.15	-.12	-.12	-.12	.01
X2			1	.28	-.04	-.01	-.13	-.08	-.04	-.07	-.17	-.08	-.14	.02	-.15	-.10
X3				1	.18	.10	.00	-.08	.04	-.01	.02	.10	-.21	-.24	-.03	.02
X4					1	.16	.17	.07	.19	.09	.21	.21	-.14	-.30	.01	.12
X5						1	.23	.16	.19	.13	.22	.14	.00	-.10	.13	.16
X6							1	.42	.51	.29	.50	.35	.24	.00	.23	.37
X7								1	.26	.41	.32	.14	.11	.21	.14	.20
X8									1	.46	.57	.47	.20	-.01	.19	.46
X9										1	.39	.24	.06	.13	.13	.25
X10											1	.43	.17	-.03	.18	.45
X11												1	.12	-.04	.15	.43
X12													1	.47	.26	.19
X13														1	.14	.01
X14															1	.20
X15																1

WHAT THE CORRELATIONS SHOWED

- **The 2 Variable Correlations:**
 - Virtually the same conclusions as everyone else who ever did this kind of research
 - Dozens of factors correlate (most of them weakly) with public readiness action-taking
- **What the Mega-study Did Next.....**

MODELED SOCIAL PROCESS

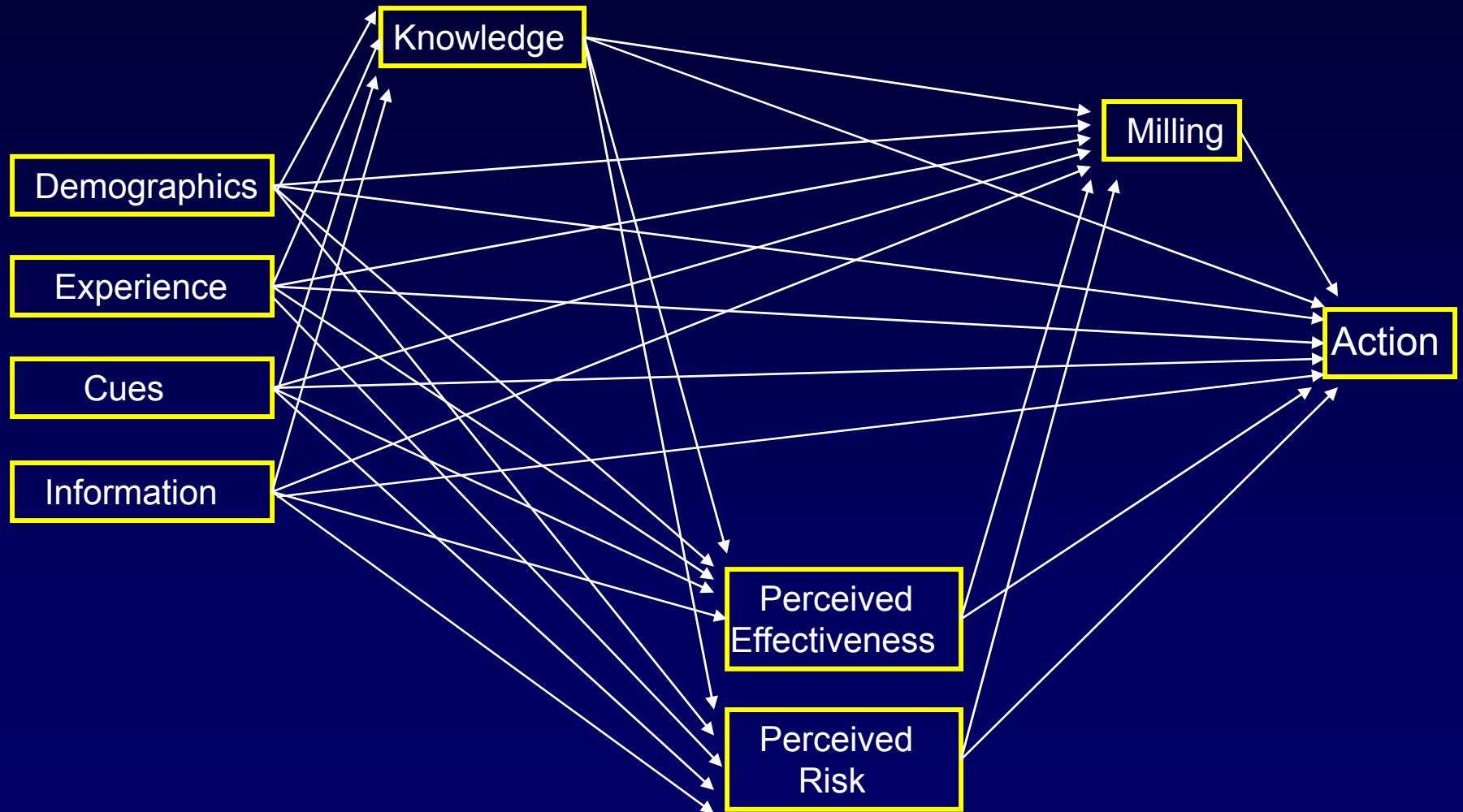
■ Goal:

- Identify KEY factors/processes that motivate the public to take preparedness actions

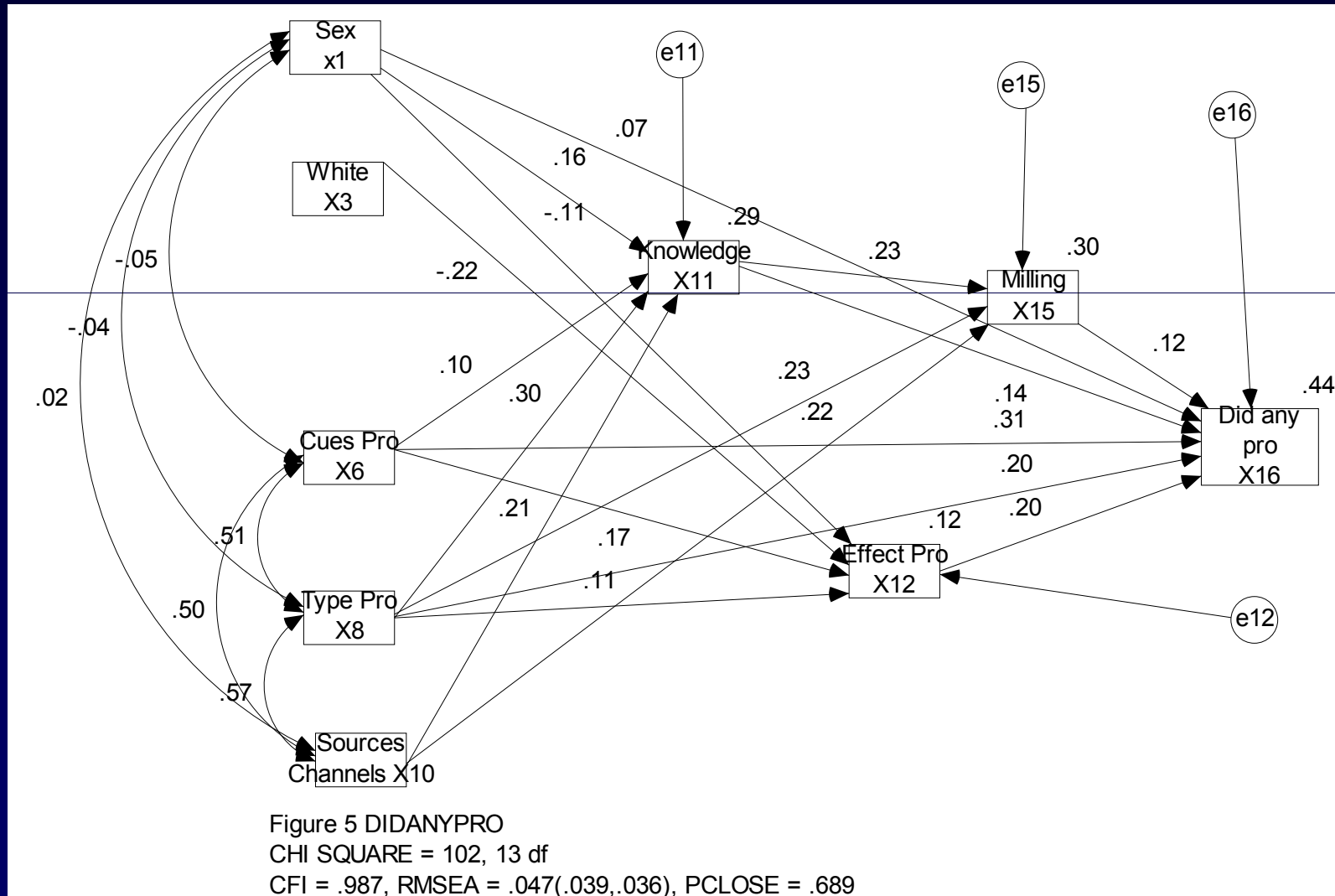
■ Approach:

- START: examine effects of all factors ever found to correlate with public action-taking
- USE: analysis approach informed by theory
- END: short list of “key factors” & how they relate to form human process

MODELS CONSTRUCTED



MODELS ESTIMATED



THE FINAL MODEL

CORRELATIONS

MODEL VARIABLES	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇
X ₁ Content of preparedness information received	1.00						
X ₂ Density of preparedness information received	.47*	1.00					
X ₃ Preparedness action information observed	.42*	.36*	1.00				
X ₄ Knowledge of preparedness actions	.38*	.41*	.29*	1.00			
X ₅ Perceived effectiveness of preparedness actions	.19*	.12*	.23*	.10*	1.00		
X ₆ Milling about preparedness actions	.37*	.42*	.29*	.41*	.10*	1.00	
X ₇ Preparedness actions taken	.43*	.31*	.51*	.35*	.31*	.32*	1.00

$p < .001$

MODEL ESTIMATES

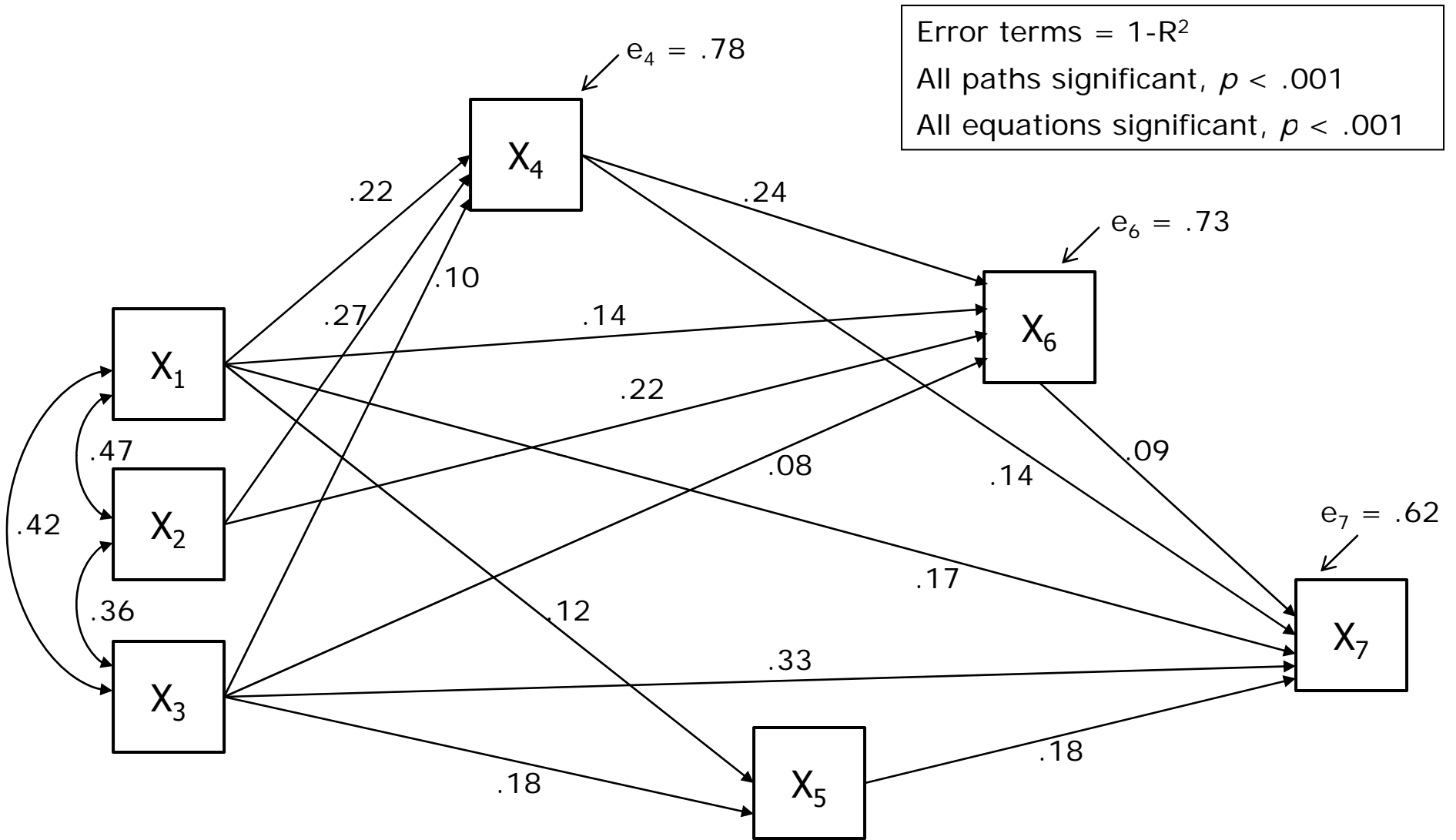
Endogenous Variable*	Beta	Estimate	SE	R ²
X ₄ Knowledge	β_{41}	.22	.02	.22
	β_{42}	.27	.01	
	B_{43}	.10	.02	
X ₅ Perceived Effectiveness	β_{51}	.12	.02	.06
	β_{53}	.18	.02	
X ₆ Milling	β_{61}	.14	.04	.27
	β_{62}	.22	.03	
	β_{63}	.08	.04	
	β_{64}	.24	.06	
X ₇ Preparedness Actions Taken	β_{71}	.17	.02	.38
	β_{73}	.33	.02	
	β_{74}	.14	.03	
	β_{75}	.18	.02	
	β_{76}	.09	.01	

Robust Maximum Likelihood Estimation

Satorra-Bentler $\chi^2 = 8.58$, $df = 4$, $p = .07$; CFI = .998; RMSEA = .020, 90% CI (.000 - .039)

All paths and equations significant at $p < .001$; N = 2,811

X₁ = content of information received, X₂=density of information received, and X₃=information observed



Error terms = $1-R^2$
 All paths significant, $p < .001$
 All equations significant, $p < .001$

X_1 =Information Content
 X_2 =Information Density
 X_3 =Information Observed (cues)
 X_4 =Knowledge
 X_5 =Perceived Effectiveness
 X_6 =Information Seeking (milling)
 X_7 =Preparedness Actions

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Satorra-Bentler $\chi^2 = 8.58, df = 4, p = .07$
 RMSEA = 0.020, 90% CI (.000 - .039)
 CFI = 0.998

BREAKTHROUGH RESULTS

■ **“Consistent”** (*very rare*) Findings:

- **ALL GROUPS**: Hispanics, African Americans, Asian/Pacific Islanders, Anglos, Other
- **ALL AREAS**: New York City, Los Angeles, Washington, D.C., the Nation

■ **“Strong”** (*also rare*) Findings:

- High explained variance (about 40%) in all models

***THE KEY FACTORS THAT
MOTIVATE PREPAREDNESS
CAN BE SUMMARIZED
In 1 Slide....***

2 FACTORS DRIVE PUBLIC PREPAREDNESS

- ***Information RECEIVED (if dense):***
 - From: *multiple sources*
 - Over: *multiple communication channels*
 - About: *what preparedness actions to take*
 - Explains: *how actions cut losses*
 - That's: *consistent across messages*
- ***2. Information OBSERVED:***
 - Cues: *seeing the actions other have taken*

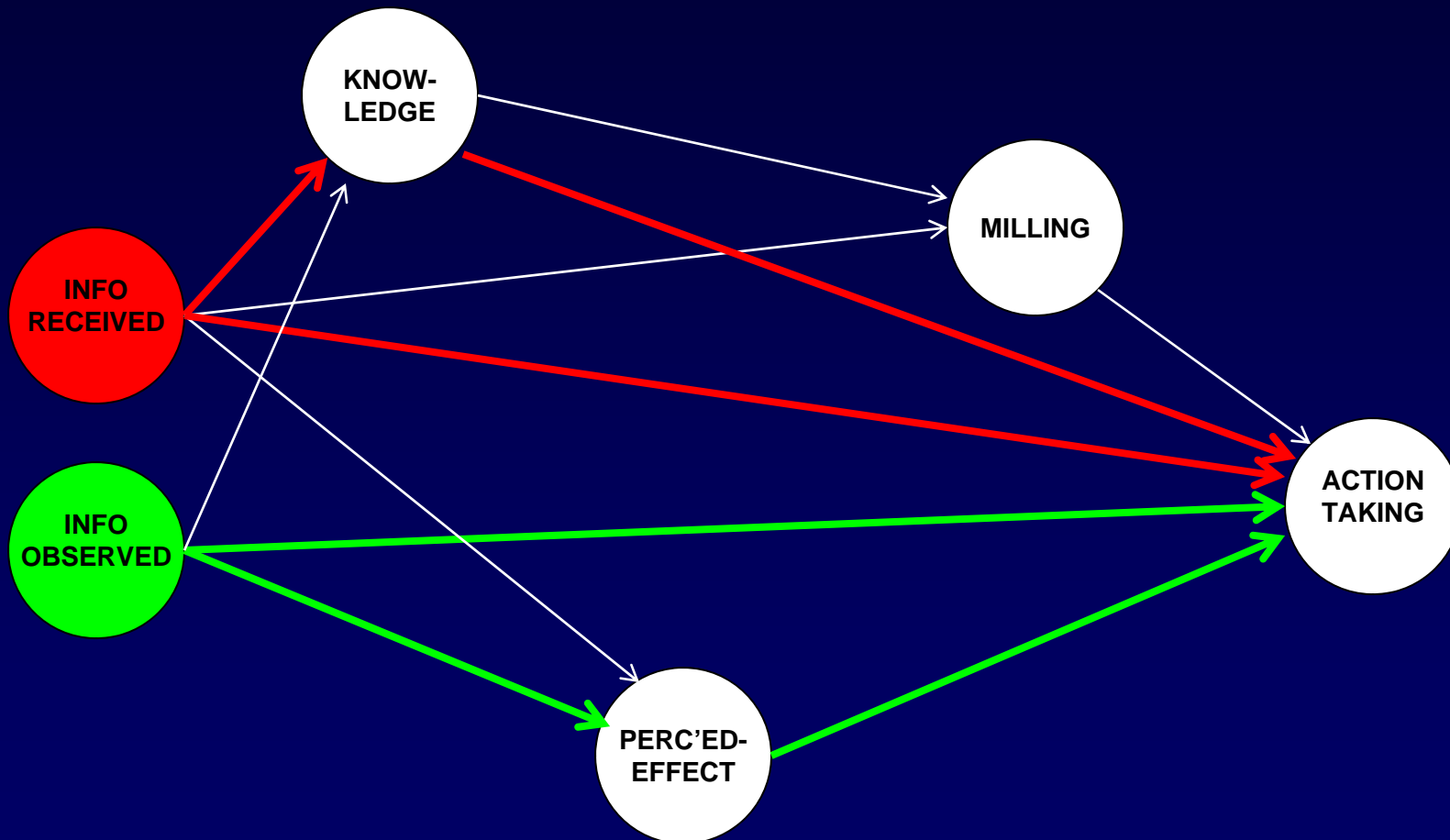
THESE FACTORS DRIVE ACTION 2 WAYS

- **DIRECTLY:** Information motivates action
- **INDIRECTLY:** Information also motivates action by increasing 3 other "*intervening*" factors that also motivate action:
 - *Knowledge:* What's known about actions
 - *Perceived Effectiveness:* How they cut losses
 - *Milling:* Talking about & seeking more information about actions

IN SIMPLE LANGUAGE

IT LOOKS LIKE THIS

(colored lines = major effects)

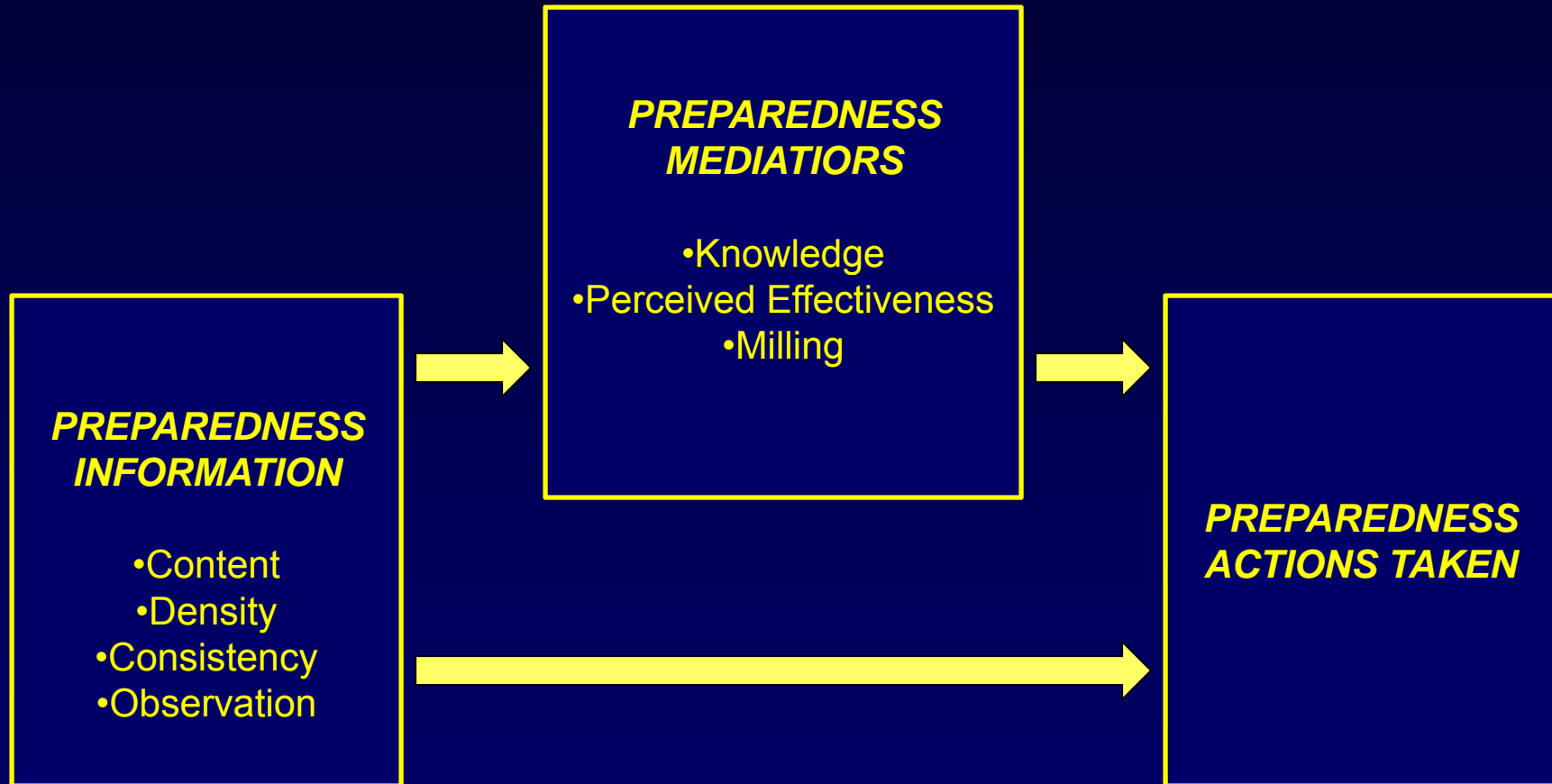


THE GENERAL EQUATIONS ARE:

- $X_3 = \beta_{31}X_1 + \beta_{32}X_2 + e_3$
- $X_4 = \beta_{41}X_1 + \beta_{42}X_2 + e_4$
- $X_5 = \beta_{51}X_1 + \beta_{53}X_3 + e_5$
- $X_6 = \beta_{61}X_1 + \beta_{62}X_2 + \beta_{63}X_3 + \beta_{64}X_4 + \beta_{65}X_5 + e_6$

Where: X_1 =information received, X_2 =information observed, X_3 =knowledge, X_4 =perceived effectiveness, X_5 =milling, and X_6 =preparedness action-taking

AND IT MEAN THIS



THESE DISCOVERIES

■ **Can Increase Public Preparedness:**

- Because public information is “pliable” & can be shaped by policies & programs

■ **And the Relationships are Linear:**

- More information = more public actions
- Less information = less public actions

AND THEY TURN PRACTICE UPSIDE-DOWN

■ Traditionally We've:

- Started by communicating risk to the public
- Hope people *infer taking action*

■ The New Evidence Suggests:

- Start by communicating actions to the public
- Let people *infer risk*

OTHER THINGS JUST DON'T MATTER MUCH

- **Some Other Factors Aren't:**
 - Statistically significantly related to readiness
- **Some Other Factors Are, But Either:**
 - Their effects aren't real & go away when other things are controlled, or
 - Their effects have so little predictive value that they should be ignored

SOME EXAMPLES

■ **Perceived Risk** *(no relationships):*

- Fell out of all predictive models
- Increased probabilities doesn't increase public preparedness actions
- Fear doesn't sell preparedness

■ **Demographics** *(little predictive value):*

- Don't really predict "public motivation"
- Can impact action-taking affordability & information pathway effectiveness

***AN EVIDENCE-BASED
"TOOL KIT"
FOR GROWING PUBLIC
PREPAREDNESS
(10 Steps)***

THE GENERAL PRINCIPLE

- **Information is the KEY Factor that Motivates Public Preparedness:**
 - Works *everywhere* for *everyone* (in U.S.)
 - Mainstream Americans & minorities
 - Across the country & in different cities
 - Rich fields of information (received & seen) yield public preparedness action-taking
 - **Here are the 10 steps.....**

STEP 1: USE EVIDENCE BASED APPROACHES

- **All Public Education & Information Campaigns Are Not Equal:**
 - More could be accomplished if we redesign & distribute public readiness information that....
 - *"Uses research-based evidence about how to make it effective"*

STEP 2: STOP DOING **THINGS THAT DON'T WORK**

■ Don't Try to "Motivate" the Public with Probabilities or Fear:

- People need to be aware of unknown hazards
- Increased probabilities may be useful for many other things & audiences but....
- *"Increasing perceived risk does not motivate or predict PUBLIC preparedness action-taking"*

STEP 3: USE MULTIPLE INFORMATION SOURCES

- **Provide Information from as Many Different Sources as Possible:**
 - *"Regardless of who you are, you alone can't provide very effective public information"*
 - You need partners to be "really" effective:
 - The more partners = the more sources
 - The more sources = the more the public does

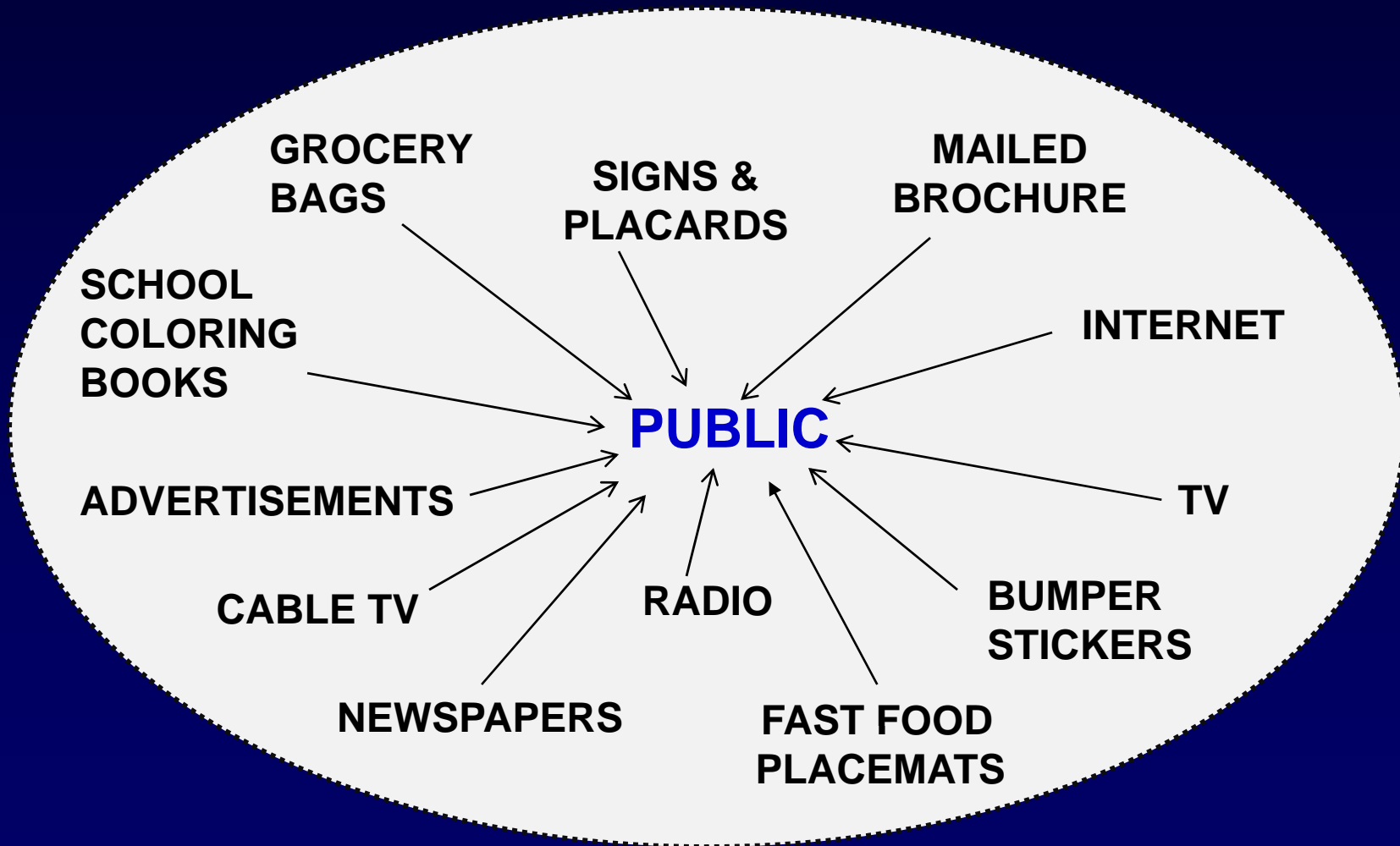
STEP 4: BRAND THE MESSAGE

- It's About *Them* Not *You*:
 - *"Brand the message, not the messenger"*
- Convince Groups (including your own) To Stop Providing Unique Messages:
 - Work with other information providers so everyone tells the public the same thing
 - *"Branded readiness messages work best"*

STEP 5: USE MULTIPLE INFORMATION CHANNELS

- **Distribute the Same Information Over Diverse Channels:**
 - *"People do more when they get the same information different ways"*

IT LOOKS LIKE THIS



STEP 6: COMMUNICATE OVER THE "LONG-HAUL"

■ **Its Better to Communicate:**

- Over time & not just for a day or week
- *"People do more after receiving the same message many times"*

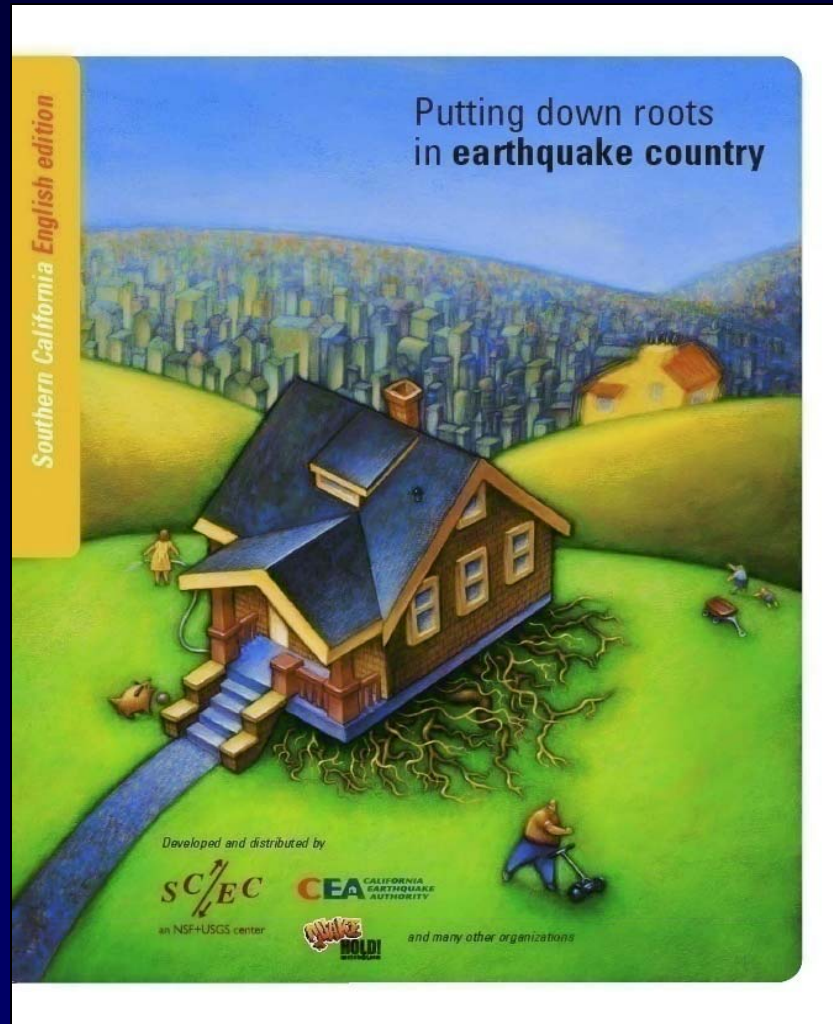
■ **And its Best if Communication is:**

- *"Sustained over extended periods of time and even better if its ongoing & doesn't end"*
- Direct mailed brochure in midst of the stream

STEP 7: FOCUS PROVIDED INFORMATION ON ACTIONS

- **The Most Effective Thing to Say to Motivate People to Prepare is:**
 - *"WHAT THEY SHOULD DO TO PREPARE"*
 - *"And where to find more about HOW to do it"*
 - For example.....

“WHAT TO DO” BROCHURE



STEP 8: EXPLAIN *CONSEQUENCE REDUCTION*

- **Tell Them How Recommended Preparedness Actions Reduce Losses:**
 - *"People are more likely to take actions if information explains how those actions can cut their losses if something happens"*

STEP 9: GIVE PEOPLE CUES

"The Big Ticket Item"

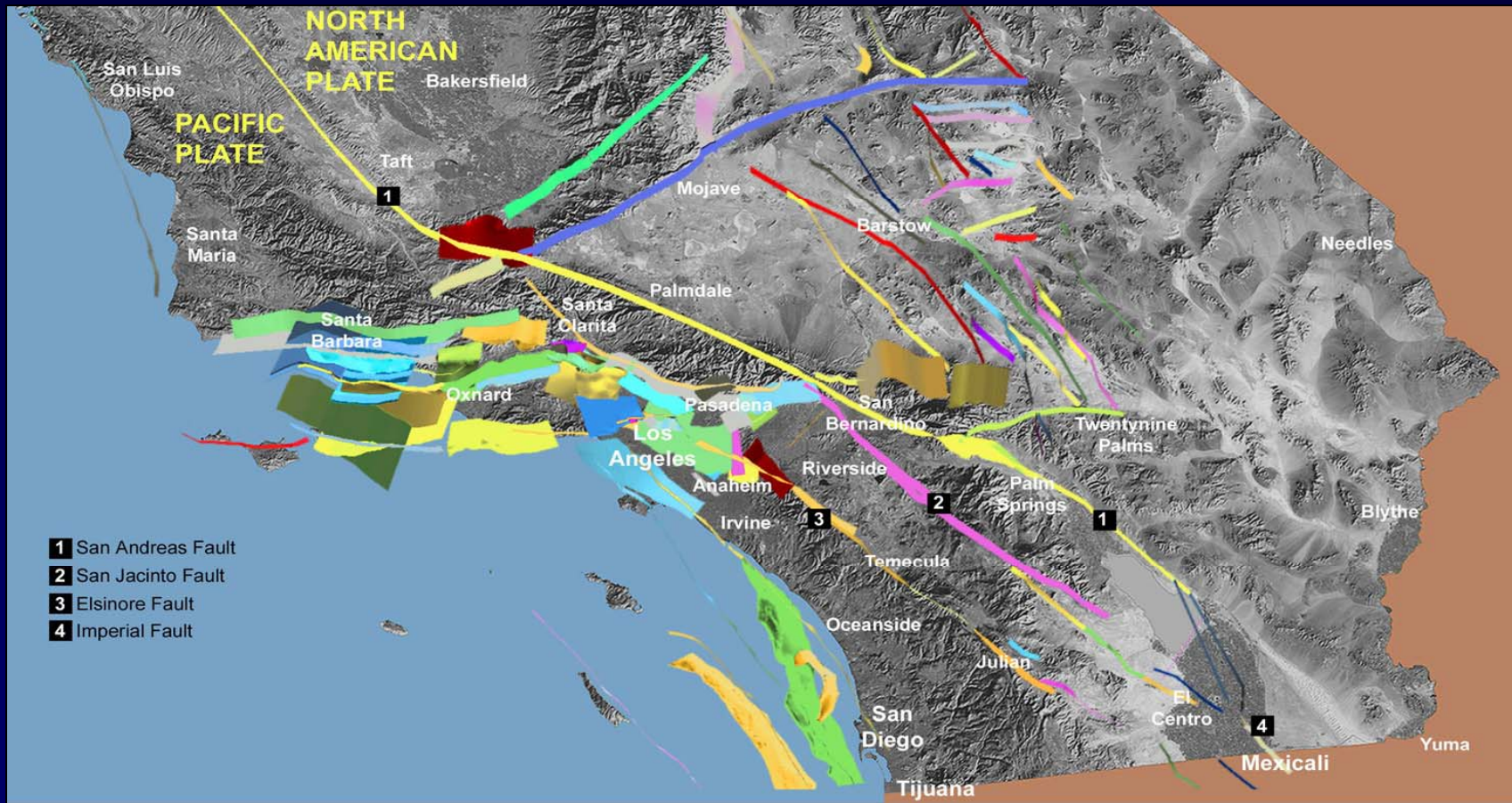
- **Get Public Preparedness Out of the Closet and Into the Streets:**
 - People are most likely to take actions to prepare if:
 - They see what other people have done &
 - Other people tell them about it (not you)
 - Why?: *"Monkey see, monkey do"*

STEP 10: TARGET TALKING

■ Encourage People to Talk about Preparing with Each Other:

- People are more likely to do something if they think doing it is their own idea:
 - Comes from talking about it with others
- *"Use innovative ways to get people talking about preparedness actions with others"*
- Here's an example.....

"LET'S TALK ABOUT OUR FAULTS" (SoCal EQ Alliance)



LAST: EVALUATE

■ **Measure Your Starting Place:**

- Get a “baseline” of public preparedness

■ **Measure Changes:**

- Is public preparedness changing over time

■ **Evaluate Program Effectiveness:**

- Which information components work/don't work

■ **Fine Tune:**

- Revise information provided based on findings

SURVEYS CAN DO THAT

INTERVIEWER: _____ **DATE:** _____ **RESPONDENT ID:** _____

HOUSEHOLD READINESS SURVEY

INTERVIEW START TIME: _____ : _____ **AM / PM**

INTRODUCTION

Hello, I'm ... calling from the University of California. We are interviewing people to find out what they think should be done to prepare for emergencies and disasters in their community. This information may help us improve responses to emergencies like Hurricane Katrina and other disasters. As a thank you, participants will receive a \$20 gift certificate. I need to ask just a few questions to see if you are eligible to participate.

S1A. Have I reached you at your home phone?

YES SKIP TO S1D 1

NO ASK S1B 2

S1B. Is this a residence?

YES ASK S1E 1

NO TERMINATE, DIAL AGAIN 2

For this survey, I have to speak with someone who lives there who is 18 years old or older. Are you 18 or over?

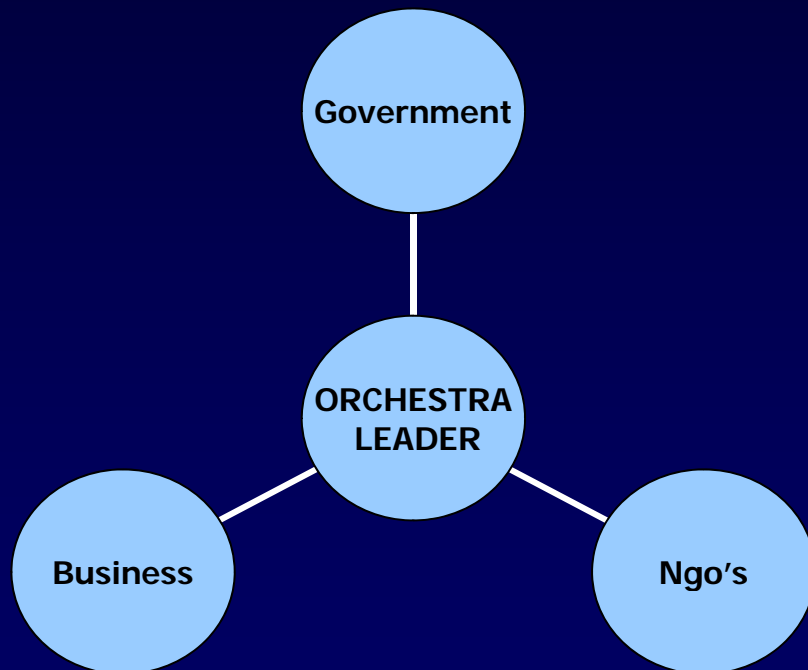
YES SKIP TO S1F 1

NO ASK S1E 2

NO ONE IN HH IS 18 OR OLDER, TERMINATE 3

THE STEPS SUMMARIZED

(Conclusions from the Scientific Evidence)



■ Many Sources+Channels:

- Partnerships
- Someone in charge

■ Same Message/Branding

■ Over Time/Long-Haul

- Repetitive messaging
- Direct mailed brochure

■ Actions to Take Plus:

- How actions cut losses
- Encourage talking

■ Visible Action-taking Cues

■ Evaluate & Revise

SUMMARY OF SUMMARY

- **Fear Doesn't Motivate, Information About Preparedness Does If You:**

"Sell It Like They Sell Coca-Cola"

- **The Most Effective Salespersons Are:**

"People Who Already Bought It"

POST SCRIPT 1

■ **Everything Doesn't Have to Say Everything:**

- Refer them to other places to find out more
- Seeking additional information (or milling) on their own increases the odds that they'll take action

POST SCRIPT 2

■ **Remove Wrong Information:**

- Not just about putting in “good” information
- Also about taking out “bad” information
- They don’t know they believe wrong things, they think what they believe is true

POST SCRIPT 3

■ **Issues Remain for Low Resource People:**

- The same “motivation” process applies
- But the level of preparedness they can afford can be constrained:
 - Point out “no cost” actions to take
 - Work with NGOs to fill the readiness gap

POST SCRIPT 4

- **Demographics Don't Really Impact the Motivation Process**

- **But Demographics May Be Important for Other Reasons, e.g.,**
 - Selecting the mix of communication channels
 - And more

POST SCRIPT 5

- **We Didn't Cover Everything**
- **We Covered:**
 - PROCESS to “motivate” public readiness
- **We Didn't Cover Information:**
 - CONTENT (exactly what to say):
 - Some are generic, others are hazard-specific
 - STYLE (how it's presented):
 - Format, order, colors, wording & more

QUESTIONS?

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