RESEARCH

Predictors of Emergency Preparedness and Compliance

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ABSTRACT

Background: In response to the evolving nature of potential disasters, both human made and natural, this research identifies predictors of individual emergency preparedness and compliance with government requests.

Methods: A survey of a nationally representative sample of US adults (1629 respondents) revealed which emergency supplies and plans they had in place; their perceived level of preparedness and that of their local health care system, and the likelihood of 7 terrorist and 4 naturally occurring events; whether they would evacuate their home, shelter in place at home and work, be quarantined, vaccinated, or take medication; and whether they believed that these actions would increase their chances for survival.

Results: Having supplies was predicted by being male, older, wealthier, and white, living in the Western Hemisphere, and being exposed to national news. Having plans was related to living in the Western Hemisphere, having children, and being exposed to national news. Compliance was associated with being female and ill. Holding demographic factors constant, preparedness and compliance with government requests were associated with the perceived likelihood of a natural but not a terrorist event, the perceived efficacy of requested actions, and belief in one's local health care system.

Conclusions: With a focus on natural as opposed to terrorist events, people's perceived efficacy of emergency actions and local health care systems may increase their preparedness and compliance with government requests. (*Disaster Med Public Health Preparedness.* 2009;3(Suppl 2):S1–S1)

Key Words: emergency, disaster, compliance, preparedness

The world has recently experienced an almost unprecedented string of disasters—both natural and human made—adding renewed urgency for both government agencies and the public to increase their levels of preparedness. The National Response Plan has changed dramatically in the last 2 decades, evolving from primarily natural disasters (pre-1984) to include chemical disasters (following the 1984 toxic gas spill in Bhopal, India), terrorism (post-2001), and pandemic influenza (post-2006).[1] How does an individual prepare for any of a myriad of potential disasters? On February 28, 2003, President George W. Bush issued Homeland Security Presidential Directive 5, ordering the development of the National Response Plan under the direction of the Secretary of Homeland Security to "integrate Federal Government domestic prevention, preparedness, response, and recovery plans into one all-discipline, all-hazards plan."[2–4] In 2006, this approach was codified into law in the Pandemic and All-Hazards Preparedness Act (PL 109-417).

An all-hazards approach takes a broader view of preparedness by suggesting that public health efforts should inform and motivate federal, state, and local agencies and the public to be prepared for any of a wide array of potential disasters. At the public level, a primary goal of the US Department of Health and Human Services, the Department of Homeland Security, the Centers for Disease Control and Prevention (CDC), and the American Red Cross is to convince individuals to maintain a number of recommended generic emergency supplies and to develop family communication and evacuation plans to respond to any contingency.[5–9] A secondary goal has been to increase the public's awareness and acceptance of a host of emergency measures such as quarantine, sheltering in place, and vaccination and taking certain medications (eg, potassium iodide to prevent thyroid cancer after exposure to radiation).

Disaster researchers have suggested that preparedness involves identifying existing hazards and vulnerabilities, developing strategies for responding when a disaster occurs, and having sufficient resources to respond effectively.[10] Despite recent government efforts to promote individual emergency preparedness, the public remains largely unprepared both logistically (eg, in terms of amassing supplies) and emotionally.[11,12] Moreover, many Americans report that they

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would not necessarily comply with government instructions during an emergency.[11]

Historically, those most likely to be affected by disasters—individuals with low socioeconomic status, minorities, and recent immigrants[13–16]—are less likely to be prepared[17,18] and comply with disaster response directives. A number of factors explain this social disparity, primarily sociodemographic-related factors, such as a lack of material and educational resources.[14,19–23] It has also been suggested that this disparity in response may be due in part to a failure to hear the emergency warnings through traditional or nontraditional media channels.[21] Psychological variables such as the perceived likelihood of an event, the perceived efficacy of requested actions, and an individual's beliefs about his or her own capabilities and confidence in local and national health care systems, with some notable exceptions, have been studied in local rather than broader contexts.[24]

AQ: 1

The present article seeks to identify who in the public is prepared for emergencies and those factors that predict preparedness and compliance. It differs from prior studies by incorporating an array of media exposure variables as well as psychosocial variables such as perceived preparedness, efficacy, and threat as predictors of preparedness in addition to standard sociodemographic variables.

METHODS
Study Participants
This study was based on a monthly online survey of a nationally representative sample of adults living in the United States between August 2005 and February 2006. Using a sampling frame consisting of all US households with an assigned telephone number, respondents were identified and recruited by Knowledge Networks with a random-digit dialing procedure. Potential respondents were offered free WebTV (a system that allows non–Internet-savvy users to view and respond to questions appearing on their television screens) and Internet access in exchange for completing online surveys several times each month. To make the survey population more representative of the US population, individuals who did not have Internet access were provided with a choice of either a computer with Internet access or WebTV. Approximately one third (31%) of those recruited by random-digit dialing agreed to participate in the Knowledge Networks panel of more than 40,000 potential respondents. Researchers have compared the Knowledge Networks panel's characteristics to the US Census Bureau's Current Population Survey, the National Health Interview Survey, and an independent random-digit dialing sample. On most sociodemographic parameters (eg, race/ethnicity, sex), key health behaviors (eg, smoking), and the prevalence of chronic illnesses, the panel has consistently been found to be within a few percentage points of other national estimates.[25,26] The panel is somewhat biased in inclusion of fewer people with low income or educational status, as is the case with most random-digit dialing surveys.[26] Moreover, the sur-

vey was offered in English only. Thus, the participants for this survey may underrepresent Hispanics and other people whose primary language is not English.

AQ: 2

Knowledge Networks conducted 2 linked surveys to obtain the present data. The first survey, the Annenberg National Health Communication Survey (ANHCS), was fielded in June and August through December 2005. Each month it was sent to between 357 and 530 respondents with a total response rate of 75%. The Emergency Preparedness Survey (EPS) was completed by the same ANHCS respondents 4 to 6 weeks later. The survey was sent to those people who had completed the earlier ANHCS survey and were still members of the Knowledge Networks panel. Each month from late August 2005 through February 2006, between 211 and 331 respondents completed the EPS with a completion rate of 89%. Data reported here represent the 1629 respondents who completed both surveys. As a subsample of the Knowledge Networks panel, this sample may be biased and not nationally representative. Table 1 provides demographic information about the respondents included in this analysis.

T1

Survey Items and Variable Creation
Demographics
The first survey included items measuring sex, age, education (4 categories: less than high school, high school degree, some college, and bachelor's degree or higher), race (4 categories: white, non-Hispanic; black, non-Hispanic; Hispanic; other), region of the country (4 categories: midwest, northeast, west, south), household income (4 categories: <$25,000, $25,000–$40,000, $40,000–$75,000, and more than $75,000), housing (rent or own), and presence of children younger than 18 years in the household (present or not). Health status was measured as excellent, very good, good, fair, or poor or very poor.

Media Usage
Media use consisted of 5 measures with possible answers from 0 to 7 ("In the past seven days, on how many days did you read a newspaper, watch the local news on television, watch the national news on television, listen to radio talk shows or news, use the Internet for other than e-mail?"). In addition, media exposure to information about possible terrorist attacks was assessed as a lot, some, a little, or not at all.

Perceived Preparedness of Local Health Care System
Additional independent variables included perceived preparedness of the local health care system. Respondents were asked, "If an emergency were to happen in your community today, how prepared is your local health care system?" on a scale from 1 (not at all) to 10 (extremely).

Perceived Threat
The EPS also asked individuals to assess the likelihood of 7 potential terrorist attacks (a conventional bomb, a dirty bomb or a conventional bomb used to spread radioactivity, a nuclear bomb, an intentional outbreak of plague, an intentional outbreak of smallpox, a chemical attack such as nerve gas, sarin, VX, or ricin, or an intentional contamination of the food supply such as salmonella, *Esche-*

TABLE 1

Mean Supplies, Emergency Plans, and Compliance by Demographic Variables				
		Means		
	N (%)	Supplies (0–18)	Plans (0–4)	Compliance (1–10)
Total	1629 (100)	8.1	0.65	6.9
Age, y				
18–29	277 (17.0)	6.5[a]	0.66	6.7
30–44	456 (28.0)	7.0[a]	0.60	7.0
45–59	489 (30.0)	8.9[b]	0.71	6.7
≥60	407 (25.0)	9.6[b]	0.62	7.0
Education				
Less than high school	210 (12.9)	6.9[a]	0.47[a]	6.5[a]
High school	507 (31.1)	8.0[b]	0.57[a]	6.7[a]
Some college	423 (26.0)	8.7[b]	0.76[b]	6.9[a,b]
Bachelor's degree or higher	489 (30.0)	8.3[b]	0.69[a,b]	7.2[b]
Race/ethnicity				
White, non-Hispanic	1277 (78.4)	8.3	0.60	6.9
Black, non-Hispanic	139 (8.5)	7.2	0.78	7.2
Hispanic	140 (8.6)	7.5	0.76	6.6
Other, non-Hispanic	73 (4.5)	7.9	0.92	6.5
Sex				
Male	787 (48.3)	8.7[b]	0.70	6.6[a]
Female	842 (51.7)	7.6[a]	0.60	7.1[b]
Region				
Midwest	406 (24.9)	7.8	0.49[a]	6.8
Northeast	317 (19.5)	7.7	0.61[a,b]	6.7
West	373 (22.9)	8.6	0.66[a,b]	6.9
South	533 (32.7)	8.3	0.78[b]	7.0
Income/year				
<$24,999	404 (24.8)	7.4[a]	0.58	6.8
$25,000–$39,999	332 (20.4)	7.8[a,b]	0.61	6.8
$40,000–$74,999	550 (33.8)	8.2[b,c]	0.65	6.9
≥$75,000	343 (21.0)	9.1[c]	0.75	7.0
Housing				
Rent	370 (22.7)	6.7[a]	0.66	6.9
Own	1259 (77.3)	8.5[b]	0.64	6.9
Household with				
No children younger than 18 y	1148 (70.5)	8.5[b]	0.61[a]	6.7
Children younger than 18 y	481 (29.5)	7.2[a]	0.73[b]	6.7
Health status				
Excellent	132 (8.1)	8.0	0.63	6.7
Very good	496 (30.5)	8.5	0.71	6.8
Good	665 (40.9)	8.0	0.60	6.8
Fair	269 (16.5)	7.8	0.67	7.1
Poor or very poor	64 (3.9)	8.3	0.65	7.2

One-way analysis of variance results show that group means with different superscript letters differ significantly from one another at $P < .05$. Groups that have different superscripts are significantly different from each other.

richia coli, or botulism) as well as 4 possible naturally occurring events (a large-scale natural disaster such as an earthquake, flood, tornado, or hurricane, an outbreak of severe acute respiratory syndrome, an outbreak of avian influenza, or an industrial accident involving the release of chemical or radiological materials from a factory, train, truck, etc) using a scale ranging from 1 (not at all likely) to 10 (extremely likely).

Perceived Response Efficacy

The final independent variable was perceived response efficacy. Respondents were asked to indicate whether they be-

lieved that taking each of the compliance actions would substantially increase their chance of survival on a scale from 1 (not at all likely) to 10 (extremely likely).

Supplies

The EPS focused on 3 dependent variables, the first of which was supplies. Respondents were asked to indicate which of the following 18 supplies recommended by agencies such as the CDC, the Red Cross, and the Department of Homeland Security they possess: a 3-day supply of nonperishable food, a 3-day supply of water, a 3-day supply of cash, 1 week's supply of prescription medication, a battery-operated radio or tele-

vision, a working flashlight, extra batteries, a utility knife, matches in a waterproof container, a cloth face mask, a first aid kit, a map of the area, a half-tank of gasoline in your car, a change of clothes and footwear for each family member, a sleeping bag or blanket for each family member, duct tape and plastic sheeting to seal doors and windows, and a cellular telephone. Each respondent was given a summary supply score that ranged from 0 (possessed none of these) to 18 (possessed all of the recommended supplies).

Emergency Plans

The second key dependent variable was whether the respondent has an emergency plan in place. Specifically, respondents were asked to indicate whether they had each of the following 4 plans recommended by the CDC in place: a prearranged meeting place for family members (other than their home); a prearranged out-of-town contact person for family members to check in with; an evacuation plan for their home and copies of essential documents such as birth certificates, insurance policies, and titles in a safe place outside their home. Respondents each received a summary plan score ranging from 0 (had no plans in place) to 4 (all).

Compliance During an Emergency

The final dependent variable was compliance. Respondents were asked to estimate the likelihood that they would take each of the following 6 specific actions if instructed to do so by the authorities during an emergency on a scale from 1 (not at all likely) to 10 (extremely likely): evacuating their home, sheltering in place at home, sheltering in place at work, being quarantined, being vaccinated, or taking preventive medication.

Analysis

The first round of analysis conducted was a bivariate analysis examining the relation between each of the independent variables and the dependent variables. Specifically, one-way analysis of variance was conducted with the α level set a priori as 0.05. Because bivariates can be multicolinear, multivariate regression analyses were also conducted. For each of the 3 dependent variables (supplies, emergency plans, and compliance), the first model included only demographic variables. The second model also included respondents' usage of various types of media and how frequently they heard about terrorist attacks on those media. The third and final model also added respondents' assessments of the preparedness of the health care system, the likelihood of terrorist attacks in their community and nationally, the likelihood of natural disasters, and respondents' beliefs about the efficacy of specific actions in increasing survival following an emergency. In addition, nested hierarchical linear models with clusters by region were run. Because they largely agreed with the multiple linear regressions, the results of the simpler models are shown here.

In addition to the analysis presented, we tested the indirect effects of all of our predictors[27,28] but found no significant effects. We also tested our models for endogenous variables[29] and potential effect moderators (interaction effects) but did not find any.

RESULTS

Preanalysis

Participants' responses to questions about whether they had each of the 18 recommended emergency supplies were added to create a scale ranging from 0 (none) to 18 (all). Respondents had an average of 8.1 of the 18 supplies. However, the percentage of people with any given supply varied greatly: a 3-day supply of food was 49.3%, a 3-day supply of water was 33.8%, cash for 3 days was 38.0%, a 1-week supply of medicines was 49.8%, a battery-operated radio or television was 51.8%, a flashlight was 78.5%, extra batteries were 62.4%, a utility knife was 59.9%, matches in a waterproof container were 18.5%, a cloth face mask was 11.8%, a first aid kit was 51.9%, a map was 38.0%, a half-tank of gasoline was 60.6%, a change of clothes and footwear were 39.3%, a blanket was 43.2%, duct tape was 38.0%, plastic sheeting was 15.8%, and a cellular telephone was 71.6%. In general, respondents were most likely to have single-purchase items also used for nonemergency purposes (eg, flashlight, cellular telephone) and least likely to have emergency-specific items (eg, cloth face mask, waterproof matches).

A summary score for the 4 possible emergency plans was created that ranged from 0 (had none of the plans) to 4 (had all of the plans in place). The average respondent reported having only 0.65 of the 4 emergency plans. Only 15.3% reported having a prearranged meeting place, 15.0% having an out-of-town contact person, 15.3% having a home evacuation plan, and 19.1% having copies of essential documents. Sixty-four percent, or roughly two thirds of our sample, did not have any plans in place.

On average, people reported a moderately high degree of likelihood to comply with protective measures (mean 6.9 on a 10-point scale, SD 2.4). People were especially willing to be vaccinated (mean 7.3, SD 2.8) and shelter in place at home (mean 7.1, SD 2.7) and almost as willing to evacuate their homes (mean 6.8, SD 2.9), be quarantined (mean 6.9, SD 3.0), and take medications (mean 6.9, SD 3.0). In contrast, people were less willing to shelter in place at work (mean 5.6 among those who worked as paid employees, SD 3.0). A mean composite score for the 6 compliance measures was created. For individuals who worked as paid employees, all 6 compliance items were included, but for other respondents, the item that addressed sheltering at work was not included. Because responses for each of the compliance items could range from 1 (not at all likely) to 10 (extremely likely), the compliance composite scale was summed and divided by the appropriate number of factors to produce a mean score ranging from 1 to 10. Likewise, a scale for perceived efficacy of complying with the scales was constructed in the same manner.

Factor analyses for the 3 scales indicated that each of these dependent variables—supplies, plans, and compliance—re-

solved to a single factor. Tests for reliability using Cronbach α similarly showed the 3 scales to be highly correlated with α of 0.89, 0.66, and 0.90 for supplies, plans, and compliance, respectively.

Emergency Supplies
Bivariate Analyses
Table 1 shows the breakdown of means of emergency supplies by demographic variables with statistically significant differences. One-way analyses of variance revealed that the number of emergency supplies tended to increase as a function of increasing age, education, and income. Being male, having no children younger than 18 years in the household, and owning a home were also significantly related to respondents reporting increased number of supplies.

Multivariate Analyses
Three multivariate regression models of supplies as the dependent variable were fitted. Each successive model accounted for a greater percent of the variance in emergency supplies, even after adjusting for the number of variables entered. The final model including the psychological variables accounted for a substantial amount (18%) of the variance in emergency supplies. All 3 models are shown in Table 2.

As can be seen from the third model, while holding other factors constant, on average males were likely to have 1 more of the recommended supplies than females. Increased age and household income also predicted having disaster supplies. Black, non-Hispanic people reported having 0.97 fewer supplies than white, non-Hispanic people. People living in either the northeastern or midwestern regions of the United States had significantly fewer supplies than those living in the west. With respect to media use, watching national news or listening to radio talk shows was related to having more supplies. The more prepared that people perceived their local health care system to be, the more supplies they had. Although the belief that a natural disaster is likely significantly increased the number of supplies that people had, the perceived threat of a terrorist attack did not have a similar effect. Finally, greater belief in the efficacy of complying with instructions by authorities was related to an increased number of supplies.

Emergency Plans
Bivariate Analyses
One-way analyses of variance showed that education, region, and presence of children within the household were significantly related to the number of emergency plans. The average number of emergency plans was significantly higher for people who had some college education than those with a high school education or less. People in the south had significantly more emergency plans than those in the midwestern US. Likewise, respondents living in households with children younger than 18 years also had more emergency plans in place than those without children.

TABLE 2

Predictors of Having Supplies

	Multivariate Linear Regression β Coefficients		
	Model 1	**Model 2**	**Model 3**
Date (per 30 days)	−0.04	−0.05	−0.05
Demographics			
Sex (reference: male)	−0.97**	−0.86**	−1.02**
Age	0.07**	0.05**	0.05**
Education	0.20	0.14	0.02
Race/ethnicity (reference: white, non-Hispanic)			
Black, non-Hispanic	−0.59	−0.75	−0.97*
Hispanic	−0.23	−0.56	−0.41
Other, non-Hispanic	0.07	−0.01	0.34
Region (reference: west)			
Northeast	−0.87*	−1.07*	−0.94*
Midwest	−0.72*	−0.828	−0.79*
South	−0.18	−0.22	−0.32
Household income	0.13**	0.11**	0.12**
Housing (reference: own)	−0.62*	−0.69*	−0.56
Presence of children younger than 18 y in household	−0.46	−0.35	−0.36
Health status[a]	−0.12	−0.12	−0.15
Media usage			
Read a newspaper (days/wk)	—	0.09*	0.06
Watch national news (days/wk)	—	0.16*	0.16*
Watch local news (days/wk)	—	0.04	0.06
Listen to radio talk show (days/wk)	—	0.15**	0.16**
Use Internet (for other than e-mail; days/wk)	—	0.02	0.00
Heard much about terrorist threat in past 30 days from the media[b]	—	−0.19	−0.11
Perceived preparedness, efficacy, and threat			
How prepared is local health care system?[c]	—	—	0.29**
In the next year, how likely is			
A terrorist attack in your community?[c]	—	—	−0.12
A specific terrorist attack in the US?[c]	—	—	−0.02
A specific natural disaster in the US?[c]	—	—	0.07*
How effective do you think complying with specific instructions from the government is?[c]	—	—	0.04**
R^2	0.11	0.14	0.18
Adjusted R^2	0.11	0.13	0.17

[a]Increasing scores for health status indicate worse health.
[b]Measured on a 4-point scale.
[c]Measured on a 10-point scale.
*$P < .05$; **$P < .001$.

Multivariate Analyses
The greatest amount of variation was accounted for by the full multivariate regression model with demographic, media usage, and perceived preparedness, efficacy, and threat variables included (Table 3). This model accounted for 8% of the variance

TABLE 3

Predictors of Having Emergency Plans

	Multivariate Linear Regression β Coefficients		
	Model 1	Model 2	Model 3
Date (per 30 days)	0.02	0.02	0.01
Demographics			
Sex (reference: male)	−0.09	−0.07	−0.11
Age	0.003*	0.00	0.00
Education	0.06*	0.05	0.04
Race/ethnicity (reference: white, non-Hispanic)			
Black, non-Hispanic	0.16	0.12	0.03
Hispanic	0.13	0.07	0.05
Other, non-Hispanic	0.28*	0.27*	0.31*
Region (reference: west)			
Northeast	−0.02	−0.09	−0.05
Midwest	−0.11	−0.14	−0.16*
South	0.15*	0.12	0.10
Household income	0.01	0.01	0.01
Housing (reference: own)	0.06	0.04	0.09
Presence of children younger than 18 y in household	0.13*	0.14*	0.13*
Health status[a]	−0.01	0.00	−0.02
Media usage			
Read a newspaper (days/wk)	—	0.03**	0.03*
Watch national news (days/wk)	—	0.03*	0.04*
Watch local news (days/wk)	—	0.00	0.00
Listen to radio talk show (days/wk)	—	0.01	0.01
Use Internet (for other than e-mail; days/wk)	—	0.00	0.00
Heard much about terrorist threat in past 30 days from the media[b]	—	−0.07*	−0.05
Perceived preparedness, efficacy, and threat			
How prepared is local health care system?[c]	—	—	0.05**
In the next year, how likely is			
A terrorist attack in your community?[c]	—	—	−0.02
A specific terrorist attack in the US?[c]	—	—	0.00
A specific natural disaster in the US?[c]	—	—	0.02**
How effective do you think complying with specific instructions from the government is?[c]	—	—	0.00
R^2	0.03	0.05	0.08
Adjusted R^2	0.02	0.04	0.07

[a]Increasing scores for health status indicate worse health.
[b]Measured on a 4-point scale.
[c]Measured on a 10-point scale.
*$P < .05$; **$P < .001$.

in having supplies. People with race/ethnicity other than white, black, or Hispanic reported having the greatest number of emergency plans. As was the case with emergency supplies, people who lived in the midwest had significantly fewer plans than those in the west. However, there was no effect for respondents living in the northeast. The presence of children in the household was associated with a higher number of emergency plans. Reading a newspaper or watching the national news on television also predicted a greater number of emergency plans. Finally, having plans in place was predicted by the perception of one's local health care system as being prepared and by the perceived threat of a natural disaster Table 4.   T4

Compliance

Bivariate Analyses

The compliance composite score showed a different pattern from emergency supplies and plans. Of the demographic variables, only education and sex were significantly related to likelihood of complying in one-way analysis of variance. Specifically, increasing education and being female were significantly associated with higher levels of compliance with authorities' requests in an emergency.

Multivariate Analyses

Again, the full multivariate regression model, including demographic, media usage, and perceptions about emergency events, was by far the most significant model. Even after adjustment, it accounted for 57% of the variance in compliance. Interestingly, people who watched local television news more were significantly less likely to comply with authorities during an emergency. Compliance also tended to increase slightly over time perhaps as a function of ongoing events. Females were more likely to comply with authorities during an emergency than males. In addition, negative health status also increased the likelihood of compliance. Beliefs that the local health care system was prepared were also related to higher levels of compliance, as were beliefs of a greater likelihood of a natural disaster. Perceived efficacy of complying with authority instructions was strongly related to likelihood to comply with the same instructions.

DISCUSSION

The survey results present a fairly pessimistic view of the state of preparedness in the United States. Having weathered a series of natural and human-made disasters, the public remains relatively ill prepared, having on average only 8.1 of the 18 recommended supplies on hand. Respondents were most likely to have common household items that were 1-time purchases such as flashlights (78.5%) and cellular telephones (71.6%). They were far less likely to have supplies that needed to be replenished such as a 3-day supply of food (49.3%) or water (33.8%) and least likely to have emergency-specific items such as cloth face masks (11.8%). Moreover, respondents reported having on average less than 1 of the 4 recommended emergency plans in place (having a meeting place 15.3%, having an out-of-town contact 15.0%, having a home evacuation plan 15.3%, and having copies of essential documents 19.1%). Sixty-four percent or roughly two thirds of our respondents did not have a single plan in place.

Despite the well-documented mistakes made by authorities during the Hurricane Katrina evacuation,[30–33] US residents

TABLE 4

Predictors of Complying With Instructions by Authorities

	Multivariate Linear Regression β Coefficients		
	Model 1	Model 2	Model 3
Date (per 30 days)	0.09*	0.06	0.09*
Demographics			
Sex (reference: male)	0.55**	0.55**	0.27*
Age	0.01	0.01	0.00
Education	0.23**	0.17*	0.04
Race/ethnicity (reference: white, non-Hispanic)			
Black, non-Hispanic	0.29	0.34	0.14
Hispanic	−0.27	−0.31	−0.23
Other, non-Hispanic	−0.48	−0.45	−0.28
Region (reference: west)			
Northeast	−0.11	−0.18	0.01
Midwest	−0.02	0.01	0.08
South	0.14	0.12	−0.07
Household income	0.01	0.01	0.01
Housing (reference: own)	0.22	0.20	0.17
Presence of children younger than 18 y in household	0.14	0.14	−0.01
Health status[a]	0.14*	0.16*	0.14*
Media usage			
Read a newspaper (days/wk)	—	0.02	0.00
Watch national news (days/wk)	—	0.03	0.01
Watch local news (days/wk)	—	−0.01	−0.05*
Listen to radio talk show (days/wk)	—	−0.02	−0.01
Use Internet (for other than e-mail; days/wk)	—	0.05*	0.03
Heard much about terrorist threat in past 30 days from the media[b]	—	−0.09	0.01
Perceived preparedness, efficacy, and threat			
How prepared is local health care system?[c]	—	—	0.06*
In the next year, how likely is			
A terrorist attack in your community?[c]	—	—	0.00
A specific terrorist attack in the US?[c]	—	—	−0.01
A specific natural disaster in the US?[c]	—	—	0.03*
How effective do you think complying with specific instructions from the government is?[c]	—	—	0.13**
R^2	0.04	0.04	0.58
Adjusted R^2	0.03	0.03	0.57

[a]Increasing scores for health status indicate worse health.
[b]Measured on a 4-point scale.
[c]Measured on a 10-point scale.
*$P < .05$; **$P < .001$.

nevertheless remain fairly willing to take protective measures if asked to do so by authorities during an emergency.[34,35] Respondents were the most willing to engage in relatively familiar activities such as being vaccinated or sheltering in place at home. They were less willing to evacuate their homes, be quarantined, and take medications and the least willing to shelter in place at work.

The multivariate analyses also paint a fairly concise picture of who is and who is not prepared for an emergency and willing to comply with authorities. The standard demographics that predicted having more of the recommended supplies were being male, being older, being white, and having a higher income. Living in the west (as opposed to the northeast or midwest) was also predictive of greater preparation. Disasters are not random, but rather tend to "cluster temporally or geographically, and therefore are somewhat predictable" (p. 15).[36] Indeed, the relation between place of residence and previous experience with specific disasters may call into question the relevance to the public of an all-hazards approach. Having the recommended plans in place was also related to living in the west (as opposed to the midwest), having children younger than 18 years old living at home, and, in contrast to supplies, being nonwhite. When all of the other factors were held constant, being female and in relatively poor health were the only demographic variables that predicted greater compliance.

Media use also predicted preparedness and compliance over and above the standard demographic factors. Reading a newspaper and watching the national news on television were related to having more plans in place. Watching the national news also predicted having a greater number of supplies as did listening to radio news shows. Ironically, the only media variable that was related to compliance—watching the local news—was inversely correlated in that the more respondents in our study watched local news the less likely they were to comply with authorities during an emergency. Use of the Internet for purposes other than e-mail was not predictive. This overall pattern of findings suggests that although the mass media, particularly the national news, may be serving a key function in preparedness, there is still room for improvement, particularly in terms of the Internet and local television news.

Perhaps the most tantalizing findings, however, are revealed when the final set of psychological variables—perceived preparedness, efficacy, and threat—are added to the model. Even after holding constant all demographic and media use variables, the more respondents felt their local health care system was prepared to handle emergencies, the more they themselves were prepared in terms of both having supplies and plans in place and the more likely they were to comply with taking protective measures. Intuitively, one may have expected the opposite pattern of results with respect to preparedness—that those citizens who are cynical about the preparation level of local agencies may strive for self-reliance by gathering their own supplies and making emergency plans for themselves and their families. It is also possible that the direction of effect runs in the opposite direction, such that respondents who have positive perceptions of the local health care system are more likely to prepare themselves.

Also of note is the finding that the more likely respondents perceived a natural disaster to be, the more likely they were to have supplies and plans in place, and the more willing they were to take protective actions requested by authorities. Interestingly, the perceived likelihood of a terrorist attack had no effect. This may be due, in part, to the previously documented finding that people see "random" events, such as terrorism, to be less likely to affect them personally.[37]

Finally, our analyses revealed that a belief in the perceived efficacy of the protective actions being requested by government officials is crucial to both preparedness and compliance. To further examine this relation between perceived efficacy and compliance, multivariate regression models similarly controlling for demographics, media usage variables, and perceived preparedness and threat were run. Results showed that women were significantly more likely than men to perceive compliance with authority instructions as effective (β 2.19, $P < .01$). Higher education level also predicted higher levels of perceived efficacy (β 1.07, $P < .01$). Finally, greater perceptions that the health system is prepared (β 0.78, $P < .001$) and higher perceived threat of natural disasters (β 0.19, $P < .01$) predicted higher levels of perceived efficacy. Because the predictors for perceived efficacy showed it to be different than compliance, perceived efficacy was entered as a predictor variable for supplies, plans, and compliance. However, it is possible that causality is in the reverse direction, with compliance predicting perceived efficacy.

Limitations and Implications for Future Research

Although this study used a national random sample, it may have underrepresented Hispanics. Future studies should administer surveys in multiple languages to reach a larger portion of the population. Moreover, as a survey, the data collected are based on self-report. Future studies may benefit from examining which emergency supplies people possess through firsthand observation. In addition, it would be useful to follow participants longitudinally to determine how their emergency preparedness varies over time. This survey was based on a cross-section snapshot of people's preparedness for an emergency at only 1 time point. This allows some questions about the direction of causal relations. To better understand predictors of preparedness, researchers must examine how these patterns change with emergency occurrences and/or media discussion of potential threats.

Taken together, these results suggest that those who believe that their local health care system is prepared to handle an emergency and that authorities would only recommend options that would increase their chance of survival are both more likely to be prepared and to comply. Conversely, these data warn that individuals who lack faith in their local, state, and federal emergency system may be particularly unprepared and vulnerable. These results underscore the importance of not only increasing the level of public preparedness in terms of emergency supplies and plans but also understanding the psychological predictors of preparedness such as perceived threat and relative response efficacy.

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Dr Murphy was a coprincipal investigator and primary author. Dr Cody was a coprincipal investigator and the primary editor. Ms Frank was the research analyst responsible for final analysis and first draft of the methods and results sections. Dr Glik was a coprincipal investigator, editor, and expert in the emergency preparedness literature. Dr Ang was the initial research analyst and was responsible for preliminary data analysis and editing the final methods and results sections.

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AUTHOR QUERIES

AUTHOR PLEASE ANSWER ALL QUERIES 1

AQ1: AUTHOR—Changed "larger" to "broader" for better symmetry with "local."

AQ2: AUTHOR—OK to add "and other people whose primary language is not English"?, or was this specific to Hispanics/Latinos?