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Disaster Preparedness Among Active Duty Navy, Retirees, Veterans, and Dependents

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Abstract

Background—With the increase in natural and manmade disasters, preparedness remains a vital area of concern. Despite attempts by government and non-government agencies to stress the importance of preparedness, national levels of preparedness remain unacceptably low. A goal of commands and installations is to ensure that US Navy beneficiaries are well prepared for disasters. This is especially critical in active service members to meet mission readiness requirements in crisis settings.

Objective—To evaluate active duty personnel, dependents, veterans, and retirees regarding disaster preparedness status.

Methods—The authors conducted an anonymous 29-question survey for US Navy active duty, dependents, veterans and retirees of the Greater San Diego Region evaluating actual basic disaster readiness as determined by FEMA standards of 3-day minimum supply of emergency stores and equipment. Descriptive statistics and regression analysis were used to analyze data.

Results—1150 surveys were returned and analyzed. 983 were sufficiently complete for logistic regression analysis with 394 responding “Yes” to having a 72-hour disaster kit (40.1%) while 589 had “No” as a response (59.9%).

Conclusion—The surveyed population is no more prepared than the general public though surveyed beneficiaries overall are at upper range of preparedness. Lower income and levels of education were associated with lack of preparedness, whereas training in disaster preparedness or having been affected by disasters increased the likelihood of being adequately prepared. Unlike results seen in the general public, those with chronic healthcare needs in our surveyed population were more, rather than less likely to be prepared and those with minor children were less likely,

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rather than more likely to be prepared. Duty status was assessed and only veterans were significantly more likely than most to be prepared.

Keywords

disaster; preparedness; mitigation

Introduction

Despite the number of expected natural disasters in the United States (US), many people do not adequately prepare, exposing themselves and their property to the perils of natural disasters. 'The message from the literature is that much of the public is not ready to respond to serious events.'¹ For example, according to the US Coast Guard report following Hurricane Katrina, approximately 60,000 people were left to fend for themselves for days.² This is the case, even though campaigns in recent years had attempted to better prepare individuals and communities under greatest threat from disasters.³ Federal Emergency Management Agency (FEMA) had in fact launched the 'Ready' campaign in February of 2003.⁴ However, personally experiencing a disaster seems to increase motivation for better planning and preparation by individuals leading to increased awareness of preparedness campaigns, a willingness and need to become better prepared, and for possession of an emergency preparedness kit.⁵⁻⁸

Personal and community preparation is commonly lacking for expected natural disasters for many reasons including prior limited experience, ineffective education, perception and trust of authorities, or financial ability. Older age, more education, and higher incomes are associated with increased emergency preparedness in US⁹ though there was an identified gap between perceived and actual preparedness.⁴ However, cultural and individual factors such as age, gender and level of education were not primary factors, but acted as 'mediators or amplifiers of the main causal connections'.¹⁰ One of the most pronounced reasons for the lack of personal preparedness are the shortages in social resources, limited education, and low income as disaster preparedness requires a large financial investment. Personal spending priorities focus on food, rent, medical costs, and other basic needs over disaster preparation. Limited resources are emphasized among minorities such as Latino and African-American communities in the US who are associated with less preparedness.^{5,11,12} Privileged populations are often better prepared for natural disasters than others.¹³

Access to, understanding, and application of disaster preparation information is crucial to develop disaster preparedness measures.^{8, 13} Understanding of available information provided by community resources may be significantly underestimated and comprehension may vary greatly between sub populations despite hearing the same message.⁴ In the aftermath of Hurricane Katrina, researchers found that entire communities were failed through a lack of effectively communicated disaster education along with limited community planning and guidance from the State.¹⁴

Community resilience (CR) refers to a set of practices focusing on traditionally vulnerable communities, such as with minority and low socioeconomic groups, which may be taught in advance. The creation and development of community resilience mitigates the negative

consequences of a disaster.^{15, 16} The Homeland Security Presidential Directive 21 (HSPD-21) has introduced a CR program of ‘education, empowerment, practice, social networks, and familiarity with local health service systems.’ This national initiative seeks to ‘enhance communities’ self-sufficiency for disaster preparedness, response, and rehabilitation.’¹⁶ The importance of this education is highlighted by the fact that having a disaster preparedness plan was the only statistically validated shared factor increasing likelihood of seeking shelter when warned of an impending disaster.¹⁷ Despite national directives focusing on educational aspects of disaster preparation, U.S. citizens also do not engage in preparing for these circumstances due to a number of factors including, personal unverified and untested preconceptions on natural disasters. Many downplay the impact and magnitude of natural disasters suggesting that long-held false assumptions on natural disasters, and lack of validated knowledge, undermine disaster preparedness.^{2,18,19}

In line with other government agencies, the US Navy adopted the Readiness and Emergency Management Flight, with Emergency Management Representatives in all units touting the Comprehensive Emergency Management Plan (CEMP) 10-2.²⁰ However, active duty families are unique in having potentially disruptive impacts due to deployments, and frequently changing duty stations, which often causes lack of social support structure. Readiness is a prime requirement for active duty personnel and their families for deployments.

In times of natural or manmade disaster, Navy personnel should be available to respond as needed. If these persons are not personally prepared to have their household cope during this time, they become part of the problem and not part of the response to the problem. The authors wished to establish whether or not the current Navy educational efforts are any more successful than the national average at encouraging disaster preparedness and increasing realistic risk perception; and thereby assess the success of the current efforts. The authors were also interested in assessing the levels of preparedness, perception of risk, and barriers to preparedness among Navy beneficiaries in the Greater San Diego Region.

Currently there appear to be only two standardized disaster preparedness questionnaires used nationally to assess preparedness. The Center for Disease Control's (CDC's) Behavioral Risk Factor Surveillance System has an optional module used consistently only by two states, (CDC BRFSS 2012)²¹ and the FEMA Citizen's Corp National Survey. (FEMA CCNS 2009)²²

Methods

This was an Institutional Review Board approved study protocol. The authors conducted an anonymous, voluntary, 29-question, paper survey that was distributed among active duty Navy personnel, reservists, retirees, and dependents beneficiaries of Naval Medical Center San Diego (NMCSD) over a four week period. The questions were modified and validated from questions originally formulated for a previous unpublished study conducted internationally by Heather Annis. The survey was conducted during a patient's waiting room stay for the emergency department (ED), pharmacy or acute care clinic. The survey was distributed by the staff of the ED, pharmacy, acute-care clinic and the researchers. Patients

were recruited by asking whether or not they would be willing to participate in a voluntary, anonymous survey. The survey was self-administered and responses were collected in marked collection boxes within the waiting areas to further assure anonymity and voluntary participation.

Disaster preparedness was defined as having the items that the FEMA recommends as the minimum requirements for basic preparedness. This consists of 72 hours' worth of non-perishable food and potable water for each individual in the household as well as medications and a few other necessary items.

The survey was divided into three sections. The first section contained demographic questions including gender, marital status, education, income, minor children in home, duty status, and deployment status. The second section evaluated risk perception with questions about prior experience with disasters, disaster specific education, residing in a disaster prone area or within 60 miles of a nuclear reactor, and five Likert scale questions asking about the respondents' feelings regarding the likelihood of a disaster and their concern for being affected by a disaster within 12-month, 5-year, and lifetime timeframes. The third section asked specific questions about basic disaster preparedness such as having 72 hours of nonperishable food and one gallon per day potable water per household member, access to an immediate shelter, access to a community shelter, a communication plan, an evacuation plan, a will etc. An extended state of disaster readiness was also evaluated with all the components of basic preparedness with two week duration of supplies. Demographic information was collected to determine the correlation between these factors and the perception of risk and preparedness as related to a natural or man-made disaster. (See Table 1). There was also a comments section at the end. 1150 surveys were returned and data were collected in a Microsoft Excel 2010 Spreadsheet (Microsoft corp., Redmond, WA).

Analysis

Data were analyzed with SAS/STAT® Version 9.4 software (SAS Institute Inc., Cary, NC). A power analysis for a confidence level of 99% and margin of error of <5% was performed with a sample size of >660 required. By enrolling more than 1000 participants significant representation was assured and to mitigate against drop out for incomplete surveys. To insure high significance and power <95% of the results, the author's chose a P value (α) of 0.01. Statistical analysis included the bi-variate analysis of association between the study outcomes (3-day preparedness, etc.) and potential correlates (demographics, occupation, etc.). Two-way tables, box-plots, and single predictor logistic regressions were used as the primary analytic tools. The authors also investigated whether some variables had to be transformed for reliable data analysis. Transformations included variance stabilizing transformations and categorization for continuous variables and merging categories with small count into larger but realistic groups for nominal and ordinal variables as discussed in the regression model below. The Wald Test was used when a relationship within or between data items could be expressed as a statistical model with parameters estimated from the sample.

Logistic regression analysis was used to investigate conditional associations and build the best model for predicting the 3-day preparedness for disaster. Before proceeding with the regression model, data fields were transformed as discussed above. Marital status was collapsed into three groups with 'divorced', 'separated', and 'widowed' consolidated. Within the education category, 'some high school' and 'high school graduate' were combined. Within income, the two highest brackets greater were combined because the highest bracket contained only 11 individuals. The model was built on a randomly selected subset of 66% of all surveys. Then, the model was validated on the rest of the data (34% of the data). The Receiver Operating Characteristic (ROC) curve and the area under ROC curve were used to describe predictive measures.

Results

The results of the survey revealed that Navy beneficiaries, although on the higher end of the national average, were no more likely than the general public to be prepared. As with the general public, higher rates of preparedness were seen in married persons, those with a college degree, higher income, and those with prior experience with disaster. Unlike results seen in the general public, those with chronic healthcare needs were more, rather than less likely to be prepared and those with minor children were less likely, rather than more likely to be prepared. Duty status was assessed and only veterans were significantly more likely than most to be prepared. Unfortunately, deployment status could not be assessed due to the ambiguity of the question, as evidenced in the comments made by subjects. As can be seen in Table 2, those who had taken a preparatory disaster preparedness class, those who acknowledged living in a disaster prone area, and those with high risk-perception were all significantly more likely to be prepared. The presence of a will was the most significant non-disaster related variable associated with preparedness. Sixty-six percent of all respondents meeting standards for basic preparedness had a will and 54% of respondents with a will had basic preparedness which was significantly greater than average.

Of the 1150 surveys were collected, 983 contained the data required for regression analysis and were used to derive the data required to formulate a prediction tool for assessing preparedness.

The relationship between being minimally prepared per the above defined criteria and various other preparedness activities were analyzed for effect using the Wald test. Having an extended preparedness (2 week) disaster kit, Safe Shelter, Emergency Plan, Emergency Evacuation Plan, living in a known Disaster Area, and Income were found to be significant. (See Table 3). 'Income added' was the additive effect seen per income level as the respondents moved up the within income brackets. Following logic, having a two-week disaster kit had the largest effect on preparedness.

The likelihood of the effect of each of the various individual preparedness activities having an effect on minimal disaster preparedness was then analyzed. See Table 4. From these data we can obtain the predicted probability that any individual would be minimally prepared for

a disaster using the regression equation: $Pe(Prepared) = \frac{e^x}{1+e^x}$ where x is the sum of the

intercept and the estimated maximum likelihood ratios. These other statistically significant disaster preparedness activities were then analyzed to find the estimated adjusted odds ratio. This is the estimated multiplicative influence by which each individual activity enhances the likelihood of the basic minimal level of preparedness. (See Table 4). These data again verified the obvious effect of a subject's two-week extended preparedness but also confirmed the valuable effect of having a safe shelter, and emergency and evacuation plans. The association between observed responses and preparedness was then used to develop a predictive probability that an individual would in fact be prepared for a minor disaster. (See Table 5). The five most closely associated activities, if present within any individual surveyed would predict that this individual was indeed basically prepared. Based upon this data, the resultant *c* signified that these individuals have an 88.5% chance of having basic preparedness for a disaster as defined by FEMA. The '*c* – statistic' is the average Receiver Operating Characteristic (ROC).

Discussion

The authors realize that military installations are at higher risk of manmade disasters due to domestic or foreign terrorist attacks, however base and command level preparedness are outside the scope of this study. Despite the efforts of federal and state government along with non-government agencies to educate the general public on the need for disaster preparedness, national reported rates remain low. The figures for basic preparedness, as defined by FEMA, appears to range between 19 and 42% nationwide and seems to correlate with the efforts to educate the public at the state and local level. Alabama with its proactive 'Get 10' campaign appears the most successful with 42% reporting having the basic FEMA recommendations.²³

Navy personnel receive routine training in readiness and preparation for short-notice deployments as missions dictate and have access to numerous informational resources on preparedness. In addition to required predetermined deployment care plans for these personnel and their families, there are several recommended disaster preparedness resources through web sites such as the U.S. Fleet Forces Command disaster preparedness web page and Navy Knowledge Online to take classes in preparedness. Members are also required to register, and keep current all personal information with the Navy Family Accountability and Assessment System (NFAAS). Immediately following a declared disaster, members are required to muster with their command or shelter in place as advised; and complete a needs assessment with NFAAS as soon as possible. This led the authors to speculate that Navy personnel, retirees, and dependents might be better prepared than the average citizen. In Navy beneficiaries, low income and limited education mirrors the general public's association with limited preparedness and poses the greatest threat. Individuals with low income are more often unable to afford the materials they require to prepare themselves for any disaster,²⁴ and they are less able to cope with the burden imposed by a disaster.⁹

The Navy has disaster preparedness guidelines that are mainly geared towards protection of the families of people working with the Navy. This normally entails a home fire escape plan, Family Emergency Plan (it includes an Evacuation plan and a communication plan), Emergency contact cards and an emergency Supplies Kit,²⁰ and yet the Navy population was

no better prepared than the average person. There were two areas where the Navy population differed from the general public. This population was no more likely than average to be prepared in households with minor children, whereas this demographic among the general public is better prepared. In this population those with chronic illness were better prepared than average whereas this demographic is less prepared in the general public. One is hesitant to speculate as to why this might be. However, in those with chronic medical conditions it might be related to perceived income security and/or comprehensive medical coverage which until recently was not readily available to the general public especially low-income persons.

Limitations

The survey was provided to a convenience sample during the times that the research associates were working certain shifts, particularly daytime hours. Coverage during nights was less frequent and may offer a possible selection bias though majority of patient volume for this facility occurs during daytime operations. Subjects, due to survey design limitations, may have misinterpreted survey questions. Other non-measured considerations for disaster preparedness of beneficiaries involve individual factors, provision and access to educational opportunities, and resources that were not measured in our survey. Finally, this was a survey conducted in a single center, which may not adequately reflect other regions of Navy-based beneficiary risk perception or preparedness levels.

Conclusion

Disaster preparedness requires the commitment of resources both by the individual and the government. Coordinating efforts with our surrounding community and establishing a good rapport with our beneficiaries is crucial to mitigating disaster risks. We have found that a majority of our subjects have not adequately prepared for a natural or man-made disaster. Certain groups reflect the trends of the general population and are at higher risk of poor preparedness, such as those with minimal financial and social resources. Education with accurate information is also imperative in ensuring that appropriate measures are pursued for preparedness, but that this requires knowledge of local hazards posing reasonable risks. In addition, there are several factors that relate to an individual's perception of risk and preparedness for a disaster.

Navy leadership and commands should formulate policies aimed at bolstering better disaster preparedness by providing more access to informational and logistical resources. Further study is needed to identify and eradicate the barriers preventing disaster preparedness in our population. A prepackaged 72-hour emergency kit is available to beneficiaries at the Navy Exchange for less than \$70, which would suggest removal of the financial barrier for anyone with sufficient awareness. With proper marketing, even low income Navy personnel, retirees, reservists, and veterans can afford this emergency kit. With the addition of sufficient potable water along with preparations for an escape, evacuation, communication and shelter plan, they may meet minimum standards of disaster preparedness. Navy training efforts should be tailored to educating personnel and beneficiaries in disaster preparedness through an all hazards approach in addition to highlighting potential local disaster risks. Access to

military, local community, and online resources should be reviewed at command orientation and offered to our other beneficiaries through ombudsmen programs, informational media or other resources. A wealth of information at Ready.gov and Fleet Forces Command are examples of potential reference sites for disaster preparedness.^{20,25,26}

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Table 1
Navy Beneficiary Population Demographics

Category	N	%
Gender		
Male	602	52%
Female	545	48%
Total	1147	100%
Age		
18 - 24	199	17%
25 -39	495	44%
40 - 59	251	22%
60 and older	191	17%
Total	1136	100%
Marital status		
Never Married	222	20%
Married	783	69%
Divorced	73	6%
Widowed	40	3%
Separated	20	2%
Total	1138	100%
Duty Status		
Active	524	47%
Veteran	230	20%
Reserve	24	2%
Dependent	343	3%
Total	1121	100%
Education		
Some high school	25	2%
High school diploma	195	17%
Some college	424	37%
2yr college degree	148	13%
4yr college degree	223	20%
Professional degree	126	11%
Total	1141	100%
Income		
<\$30,000	369	34%
<\$50,000	409	38%
<\$95,000	202	18%
<200,000	85	8%
200, 000	23	2%
Total	1088	100%

Demographic information provided on questionnaires.

Table 2

Navy Beneficiary Disaster Preparation Results

	72 hour Disaster Kit (Comparison as a function of row)			72 Hour Disaster Kit (Comparison as a function of column)			
Variables	Total N=1133(%)	No N=677(%)	Yes N=456(%)	Total N=1133(%)	No N=677(%)	Yes N=456(%)	P Value
Gender							
Male	598 (100.0)	335 (56.0)	263 (44.0)	598 (53.0)	335 (49.7)	263 (57.8)	0.007
Female	531 (100.0)	339 (63.8)	192 (36.2)	531 (47.0)	339 (50.3)	192 (42.2)	
Marital status							
Never Married	219 (100.0)	156 (71.2)	63 (28.8)	219 (19.5)	156 (23.2)	63 (14.0)	<.001
Married	773 (100.0)	446 (57.7)	327 (42.3)	773 (68.9)	446 (66.4)	327 (72.7)	
Divorced	72 (100.0)	44 (61.1)	28 (38.9)	72 (6.4)	44 (6.5)	28 (6.2)	
Widow	38 (100.0)	15 (39.5)	23 (60.5)	38 (3.4)	15 (2.2)	23 (5.1)	
Separated	20 (100.0)	11 (55.0)	9 (45.0)	20 (1.8)	11 (1.6)	9 (2.0)	
Minor child in Household							
No	620 (100.0)	370 (59.7)	250 (40.3)	620 (56.2)	370 (56.1)	250 (56.3)	0.958
Yes	483 (100.0)	289 (59.8)	194 (40.2)	483 (43.8)	289 (43.9)	194 (43.7)	
Education level							
1 Some high school	25 (100.0)	14 (56.0)	11 (44.0)	25 (2.2)	14 (2.1)	11 (2.4)	0.004
2 High school diploma	192 (100.0)	128 (66.7)	64 (33.3)	192 (17.1)	128 (19.0)	64 (14.2)	
3 Some college	418 (100.0)	267 (63.9)	151 (36.1)	418 (37.2)	267 (39.6)	151 (33.6)	
4 2 year degree	145 (100.0)	77 (53.1)	68 (46.9)	145 (12.9)	77 (11.4)	68 (15.1)	
5 4 year degree	219 (100.0)	113 (51.6)	106 (48.4)	219 (19.5)	113 (16.8)	106 (23.6)	
6 Professional degree	125 (100.0)	75 (60.0)	50 (40.0)	125 (11.1)	75 (11.1)	50 (11.1)	
Income							
1 < \$30,000	364 (100.0)	249 (68.4)	115 (31.6)	364 (33.9)	249 (38.8)	115 (26.6)	<.001
2 < \$50,000	406 (100.0)	243 (59.9)	163 (40.1)	406 (37.8)	243 (37.9)	163 (37.7)	
3 < \$90,000	198 (100.0)	92 (46.5)	106 (53.5)	198 (18.5)	92 (14.4)	106 (24.5)	
4 < \$200,000	83 (100.0)	46 (55.4)	37 (44.6)	83 (7.7)	46 (7.2)	37 (8.6)	
5 > \$200,000	22 (100.0)	11 (50.0)	11 (50.0)	22 (2.1)	11 (1.7)	11 (2.5)	<.001
Duty status							

Variables	72 hour Disaster Kit (Comparison as a function of row)			72 Hour Disaster Kit (Comparison as a function of column)			P Value
	Total N=1133(%)	No N=677(%)	Yes N=456(%)	Total N=1133(%)	No N=677(%)	Yes N=456(%)	
Active	519 (100.0)	331 (63.8)	188 (36.2)	519 (47.0)	331 (49.9)	188 (42.5)	
Veteran	225 (100.0)	106 (47.1)	119 (52.9)	225 (20.4)	106 (16.0)	119 (26.9)	
Reservist	24 (100.0)	15 (62.5)	9 (37.5)	24 (2.2)	15 (2.3)	9 (2.0)	
Dependent	337 (100.0)	211 (62.6)	126 (37.4)	337 (30.5)	211 (31.8)	126 (28.5)	
Deployed member							
No	504 (100.0)	296 (58.7)	208 (41.3)	504 (47.3)	296 (46.8)	208 (48.1)	0.656
Yes	561 (100.0)	337 (60.1)	224 (39.9)	561 (52.7)	337 (53.2)	224 (51.9)	
Chronic health condition							
No	731 (100.0)	468 (64.0)	263 (36.0)	731 (65.0)	468 (69.5)	263 (58.3)	<.001
Yes	393 (100.0)	205 (52.2)	188 (47.8)	393 (35.0)	205 (30.5)	188 (41.7)	
Will							
No	550 (100.0)	400 (72.7)	150 (27.3)	550 (50.4)	400 (61.5)	150 (33.9)	<.001
Yes	542 (100.0)	250 (46.1)	292 (53.9)	542 (49.6)	250 (38.5)	292 (66.1)	
Disaster kit for 2 weeks							
No	864 (100.0)	658 (76.2)	206 (23.8)	864 (76.7)	658 (97.9)	206 (45.3)	<.001
Yes	263 (100.0)	14 (5.3)	249 (94.7)	263 (23.3)	14 (2.1)	249 (54.7)	
Safe shelter							
No	860 (100.0)	608 (70.7)	252 (29.3)	860 (76.5)	608 (90.6)	252 (55.6)	<.001
Yes	264 (100.0)	63 (23.9)	201 (76.1)	264 (23.5)	63 (9.4)	201 (44.4)	
Secondary shelter							
No	781 (100.0)	551 (70.6)	230 (29.4)	781 (71.5)	551 (84.4)	230 (52.4)	<.001
Yes	311 (100.0)	102 (32.8)	209 (67.2)	311 (28.5)	102 (15.6)	209 (47.6)	
Emergency plan							
No	677 (100.0)	527 (77.8)	150 (22.2)	677 (61.3)	527 (79.8)	150 (33.8)	<.001
Yes	427 (100.0)	133 (31.1)	294 (68.9)	427 (38.7)	133 (20.2)	294 (66.2)	
Communication plan							
No	657 (100.0)	481 (73.2)	176 (26.8)	657 (59.5)	481 (73.1)	176 (39.5)	<.001
Yes	447 (100.0)	177 (39.6)	270 (60.4)	447 (40.5)	177 (26.9)	270 (60.5)	

	72 hour Disaster Kit (Comparison as a function of row)			72 Hour Disaster Kit (Comparison as a function of column)			
Variables	Total N=1133(%)	No N=677(%)	Yes N=456(%)	Total N=1133(%)	No N=677(%)	Yes N=456(%)	P Value
Evacuation plan							
No	735 (100.0)	551 (75.0)	184 (25.0)	735 (66.5)	551 (83.7)	184 (41.2)	<.001
Yes	370 (100.0)	107 (28.9)	263 (71.1)	370 (33.5)	107 (16.3)	263 (58.8)	
Affected by prior disaster							
No	814 (100.0)	517 (63.5)	297 (36.5)	814 (72.5)	517 (76.9)	297 (66.0)	<.001
Yes	308 (100.0)	155 (50.3)	153 (49.7)	308 (27.5)	155 (23.1)	153 (34.0)	
Taken a Preparatory class							
No	668 (100.0)	443 (66.3)	225 (33.7)	668 (60.0)	443 (66.7)	225 (50.1)	<.001
Yes	445 (100.0)	221 (49.7)	224 (50.3)	445 (40.0)	221 (33.3)	224 (49.9)	
Live in Disaster area							
No	697 (100.0)	447 (64.1)	250 (35.9)	697 (65.0)	447 (69.5)	250 (58.3)	<.001
Yes	375 (100.0)	196 (52.3)	179 (47.7)	375 (35.0)	196 (30.5)	179 (41.7)	

The first three columns of data compare 72 hr. preparedness (basic preparedness) for an individual response to a question illustrating how each variable affects basic preparedness. (For example, only 36.5% of those who had not been affected by a disaster were prepared compared to 49.7% of those who had). The remaining three data columns compare variability within each state of basic preparedness. (For example, 23.1% of those who were not prepared had previously experienced a disaster whereas 34% who were prepared had).

Table 3
Analysis of Effects of Individual Preparedness Related Activities on Basic Disaster Preparedness

Analysis of Effects			
Effect	DF	Wald Chi-Square	Pr > ChiSq
Disaster Kit (2WKS)	1	122.4005	<.0001
Safe Shelter Plan	1	17.8062	<.0001
Emergency Plan	1	15.6825	<.0001
Evacuation Plan	1	9.5685	0.0020
Income added	1	10.8060	0.0010
Disaster Kit (2WKS)	1	9.4300	0.0021

DF - Degrees of Freedom

Table 4**Maximum Likelihood Ratio and Odds Ratio Estimates**

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-2.7795	0.2472	126.4616	<.0001
Disaster Kit (2WKS)	Yes	1	3.7291	0.3371	122.4005	<.0001
Safe Shelter Plan	Yes	1	0.9764	0.2314	17.8062	<.0001
Emergency Plan	Yes	1	0.8858	0.2237	15.6825	<.0001
Evacuation Plan	Yes	1	0.7208	0.2330	9.5685	0.0020
Income added		1	0.2944	0.0959	9.4300	0.0021
* Individual variable's effect on preparedness						
Adjusted Odds Ratio Estimates						
Effect	Point Estimate	95% Wald Confidence Limits				
Disaster Kit (2WKS) (Yes vs No)	41.643	21.509 80.621				
Safe Shelter Plan (Yes vs No)	2.655	1.687 4.178				
Emergency Plan (Yes vs No)	2.425	1.564 3.759				
Evacuation Plan (Yes vs No)	2.056	1.302 3.247				
Income added	1.342	1.112 1.620				
* Multiplicative influence of each individual activity on the likelihood of the basic minimal level of preparedness						

Table 5
Association of Predicted Probabilities and Observed Responses. C being the predictive power of this association

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	87.5	Somers' D	0.769
Percent Discordant	10.6	Gamma	0.784
Percent Tied	1.9	Tau-a	0.370
Pairs	232066	C	0.885