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Differences in Household Preparedness and Adaptation for COVID-19

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Original Research

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Abstract

Objective: To quantify differences in preparedness for and adaptations to COVID-19 in a cohort sample of New York City residents.

Methods: A proportional quota sample (n = 1020) of individuals residing in New York City during the COVID-19 pandemic participated in a Qualtrics web survey. Quotas were set for age, sex, race, and income to mirror the population of New York City based on the 2018 American Community Survey.

Results: Low self-efficacy, low social support, and low sense of community increased the odds of securing provisions to prepare for COVID-19. Being an essential worker, poor mental health, and having children in the household reduced the likelihood of engaging in preparedness practices. Essential workers and individuals with probable serious mental illness were less likely to report preparedness planning for the pandemic.

Conclusions: The findings contribute to evolving theories of preparedness. There are differences across the sample in preparedness types, and different kinds of preparedness are associated with different household characteristics. Findings suggest that public officials and others concerned with population wellbeing might productively turn attention to education and outreach activities indexed to these characteristics.

Introduction

Scholars have pointed to preparedness as a key contributor to community resilience.[1,2] Preparedness at the community level is generally defined as the actions that are taken to enable response activities in the event of a disaster.[2] At the household level, preparedness is typically understood as having a variety of supplies such as nonperishable food and stored water, taking such measures as planning an evacuation route, and preparing and practicing family reunification plans, as well as identifying and securing essential documents.[3,4] These tasks are the minimum that influential experts in academia and practice circles have considered to preserve life and safety for an initial 72 hours or so, to facilitate recovery afterwards, and are a key focus of preparedness activities in the United States.[3–6]

Studies and experience show, however, that even this modest step is not maintained by sizable proportions of the population. While Martins *et al.* found generally high self-reports of preparedness in a sample of New York City residents,[7(p1)] other studies have found a general lack of preparedness.[8] The factors that are usually tested as predicting preparedness are often inconsistent in their effect.[8] Thus, principal research questions have been: who prepares, what do they prepare with/ for, and what kinds of informative messaging can increase the likelihood of preparing. Among other interests, such studies have sought to see the influence of individual, demographic, and social capital characteristics on the likelihood of taking preparedness steps in advance of a disaster. For example, scholars have examined effects of identified gender[9]; race[10]; and income[11] on levels of preparedness, finding that being male, white, and with a relatively higher income as well as age,[12] were associated with greater preparedness. The findings in this body of literature are not consistent, however. Enarson and Scanlon,[13] found that women were more inclined to prepare and to have a higher sense of flood risk in their qualitative study of the Red River Floods in Canada. Other studies have borne out this observation,[14] but still other studies have found that men are more inclined to prepare.[15]

Social capital is another attribute that has been correlated with preparedness, though the effect is not strong universally. For example, in a survey of New York City residents, Martins *et al.*[7] found that 'trust in government and assistance from 1's social network are the strongest predictors of general household preparedness.' Kim and Kang,[16] found that social capital, operationalized as connections to 'community organizations and interpersonal networks,' among others, was associated with preparedness. Of the individual characteristics that they tested: home ownership, income, education, and risk perception, only risk perception was

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associated with preparedness. Other social capital elements, such as 'neighborhood belonging,' were associated with preparedness during the hurricane but not before it.

Noting increased rates of depression and other psychological distress in the US population, Clay *et al.*[17] used data from the Behavioral Risk Factor Surveillance Survey to study mental health effects on preparedness. They found that serious psychological distress is associated with generally decreased preparedness.

Depending on people's circumstances, the consequences of less preparation can be minimal, or can be dire. In a study of New York City residents after Hurricane Sandy, Clay *et al.*[18] found that having standard preparedness items was not associated with increased disaster recovery. However, an accounting of deaths following Hurricane Sandy showed that different attributes of preparedness might have been relevant in those situations that led to fatalities. For people who drowned from staying in their homes for fear of looting, public education or outreach might have helped: that looting is rare after disasters, and that public officials would be vigilant for that remote possibility.[19] For the household fatalities that seemed to arise from falls down stairs, perhaps a flashlight would have been beneficial. Carbon monoxide poisoning from heating appliances in the home, vehicle accidents, and electrocutions, all suggest different kinds of necessary precursor preparedness.

Given the nature of these fatalities stemming from different causes, with individual preparedness forms, the present study examines predictors of certain types of preparedness activities, or if those could be categorized in some meaningful way in the context of a pandemic. In a study of risk perception in Israel, Kirschenbaum found that risk perception was related to type of preparedness behavior,[20] in a particular way. He classified preparedness into 4 types: *Provisions, Skills, Plans,* and *Protection*. He found that risk perception offered 'only a partial explanatory effect on actual preparedness behaviors. And they do so only for those preparedness behaviors that are more immediate and concrete for survival or involve evoking existing skill resources.'[20(p118)] Since there seems to be a kind of difference in types of preparedness, given that risk perception motivated only the easiest preparedness activity, what effects might we find in the United States for preparedness activities during a pandemic: a new, unfamiliar threat for most people? The present study analyzes 3 preparedness outcomes: provisions, practices, and planning, while evaluating individual, relationship, and sense of community at the community level associated with preparedness.

Methods

Sample

A proportional quota-based sample (n = 1020) of individuals residing in New York City during the COVID-19 pandemic were recruited to participate in a web survey. Participants were recruited by Qualtrics (Qualtrics Inc., Provo, Utah, USA) through survey panels they maintain.[21] Participants in Qualtrics surveys are compensated at a rate equivalent to $12 per hour. Incentives are provided in the form of gift cards or other benefits selected by participants. Quotas were set for age, sex, race, and income to mirror the demographic characteristics of New York City based on the American Community Survey 2018 5-year estimates.[22]

Data collection

Data collection took place from May 27 to September 3, 2020. Survey participants were provided an informed consent statement and indicated consent to participate and confirmed their age was 18 or older before beginning the survey. The survey asked about COVID-19 preparedness, household impact of COVID-19, stress, and mental health, as well as protective actions, social/ community context, and individual/ household demographic characteristics. Data were reviewed for quality and respondents who provided low quality data including speeding (survey completion in less than ½ the median time), straight-lining, or nonsense answers, were replaced.[23]

Measures

Preparedness questions in the survey were developed based on COVID-19 recommendations from the CDC and previous disaster preparedness survey questions used after Hurricane Sandy and modified for relevance to the pandemic context.[24,25] For example, the CDC guidance stated early in the pandemic that households should prepare to isolate for 2 weeks. Our survey questions were modified to ask about isolation or quarantine for 2 weeks such as having a plan for where to stay and having food supplies for 2 weeks. The outcome measure provision preparedness was computed by summing the number of material provisions reported by a participant including food, first aid supplies, medications, and a flashlight, as well as a radio (Figure 1). Participants reporting 3 or fewer provisions (based on the mean 3.17) were classified as having low provisions preparedness and participants reporting greater than the mean were classified as having high provision preparedness. Preparedness practices were assessed by summing the number of practices reported by a participant including searching for information about preparedness, preparing important documents, purchasing additional insurance for COVID-19, and making modifications to their home to prepare for isolation or quarantine (Figure 1). Participants reporting more than the mean number of practices were classified as having high practices preparedness (mean 1.66). Preparedness planning was evaluated by summing the number of planning activities reported by participants including planning to stay somewhere else during isolation or quarantine, a household isolation plan, a child or elder-care plan in the event a caretaker becomes ill, and a plan to reunite members of the household if separated during the pandemic (Figure 1). Participants reporting more than the mean number of planning activities were classified as having high planning preparedness (mean 1.23).

At the individual level, older adults in the household, essential workers, self-efficacy, and mental health, coupled with stress and demographic characteristics, were examined. Participants were asked how many people aged 65 or older live in the household (yes/ no) and if anyone in the household was required to work outside of the home during stay-at-home orders (essential worker, yes/ no). Self-efficacy was evaluated using the 10-item Generalized Self Efficacy (GSE) Scale.[26] The GSE was scored following published scoring procedures (Cronbach's alpha 0.76 - 0.90) and participants scoring greater than 30 were classified as having high self-efficacy.[26] Mental health was evaluated using the Kessler-6, a validated 6-item screener for psychological distress. Participants' scores were computed following standard scoring, and participants who scored greater than 12 were classified as having probable serious mental illness.[27] Stress was assessed using the Perceived Stress Scale (PSS-4), a 4-item validated measure of perceived stress.[28] The mean stress score (mean 7.16) was used as a cut point to classify participants as having higher or lower perceived stress. Individual characteristics include age (18 - 24, 25 - 44, 45 - 64, and 65+), sex (male = 0, female, transgender, non-binary = 1),

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Preparedness Domain	Measures
Provisions 	Maintained a two-week supply of non-perishable or long shelf-life food and snacks? Had a first aid kid or medical supplies including medications to treat cough and fever symptoms? Had an extra supply of prescription medication or needed medical supplies to stay home during a period of isolation or quarantine? Had a flashlight and batteries? Had a battery-operated radio?
Practices 	Searched for information about how to prepare for disasters? Prepared important documents in the event you or a family member becomes ill and needs to seek medical attention? Purchased additional insurance to cover potential losses related to COVID-19? Made any modifications to your home or property to prepare for isolation or quarantine?
Planning 	Made a plan to stay somewhere other than your home during isolation or quarantine? Made a household plan for isolation of an ill person within your home? Made a child or eldercare plan in the event a caretaker in your household becomes ill? Made a plan to reunite members of your household if separated during the pandemic? Did you create a pet care plan in the event the pet caretaker(s) become ill?

Figure 1. Preparedness domains.

race/ ethnicity (non-Hispanic White, Black, Asian, Hispanic, other), income in 2019 (< $25000, $25 - 49999, $50 - 99999, and $100000+), and education (high school or less, technical school or some college, 2- or 4- year degree, graduate studies).

At the relationship level, social support was assessed by asking participants if there is anyone (friends, family, neighbors, or acquaintances) that they could count on for everyday favors like getting a ride or lending several hundred dollars for a medical emergency.[29] Participants indicating 2 or more supports were classified as having higher social support consistent with past research.[30,31]

At the community level, sense of community was evaluated using the 10-item Brief Sense of Community Scale (BSCS).[32] The BSCS was scored following standard scoring,[32] and the mean (22.4) was used as a cut point for high and low sense of community.

Data analysis

Using a model building approach, each predictor was evaluated for independent association with the outcome measures of provisions, practices, and planning preparedness using chi-square analysis. Factors independently associated with the outcomes were examined in a series of multivariate logistic regression models identifying statistically significant predictors of each type of preparedness. Adjusted odds ratios (aOR) and 95% confidence intervals are reported. Analysis was completed in Stata 16 (Stata Corp., Texas, USA).[33] The University of Delaware Institutional Review Board reviewed and approved this study as Exempt.

Results

The sample is 52% female, between the ages 25 - 44, and partnered (married, domestic partnership, or living as though married) (Table 1). Non-Hispanic Whites make up 35% of the sample, followed by Black or African American (18%), and other race (17%). Hispanic (16%) and Asian (13%) participants make up the remainder of the sample. Just over 20% of the sample reported an income below $25000 in 2019 and another 20% reported an income of $25000 - $49999. Over 40% of participants reported having a child in the household.

Food (76.3%) and a flashlight (72.0%) were the most common preparedness provisions reported by participants, followed by first aid supplies (64.7%). Fewer participants reported having medications (58.6%) and a radio (44.9%). Information searching was the most common preparedness practice reported, with more than 50% of participants reporting they searched for preparedness information (58.3%). 50% of participants also reported preparing important documents in case they needed to seek medical care (50.4%). A third or fewer participants reported making home modifications (34.2%) or purchasing additional insurance for COVID-19 (23.5%). Planning was the least engaged in the set of preparedness measures with creating an in-home isolation or quarantine plan reported the most (36.8%).

Bivariate analysis (Table 2) showed that essential workers, low self-efficacy, low social support, and low sense of community, as well as race and ethnicity, income, being partnered, and children in the household were independently associated with the outcome provision preparedness. When examining preparedness practices and planning, all factors were significantly associated with planning preparedness activities except for low self-efficacy.

In the first logistic regression model (Table 3), factors that were independently associated with provisions were examined. Low self-efficacy, low social support, and low sense of community increased the odds of securing provisions to prepare for the COVID-19 pandemic. Participants with low self-efficacy were 1.6 times more likely (aOR 1.58, 95% CI 1.22, 2.10) to report preparing with provisions than people with higher self-efficacy. Participants with lower social support were 45% more likely (aOR 1.45, 95% CI 1.09, 1.93) to assemble provisions for the pandemic. Participants reporting a lower sense of community were 73% more likely (aOR 1.73, 95% CI 1.30, 2.29) to report higher provisions to prepare for the pandemic.

In the second model (Table 3), factors independently associated with preparedness practices were analyzed. Being an essential worker, poor mental health, and children in the household reduced the likelihood of engaging in preparedness practices, and low sense

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Table 1. Characteristics of the sample

	Count	Percent
Race/ Ethnicity		
Non-Hispanic White	361	35.39
Black, African American	189	17.65
Asian	136	13.33
Hispanic	165	16.18
Other	178	17.45
Age		
18 - 24	139	13.6
25 - 44	460	45.1
45 - 64	302	29.6
65+	119	11.7
Income 2019		
Less than $25000	219	21.5
$25000 - $49999	212	20.8
$50000 - $99999	281	27.6
$100000+	308	30.2
Education		
High school or less	210	20.7
Technical school or some college	166	16.3
2- or 4- year degree	382	37.6
Graduate studies	259	25.5
Gender		
Male	479	47.0
Female	532	52.2
Transgender	5	0.5
Non-binary	4	0.4
Employment		
Full time	554	54.5
Part time	141	13.9
Not working, other	321	31.6
Partnered	539	53.1
Child in household	413	42.9
Provisions		
Food	777	76.3
First aid	658	64.7
Medications	596	58.6
Flashlight	733	72
Radio	457	44.9
Practices		
Information search	593	58.3
Prepare important documents	514	50.4
Purchase additional insurance	239	23.5
Made home modifications	348	34.2
Planning		
Stay elsewhere plan	280	27.5
In home isolation plan	375	36.8
Child, elder care plan	259	25.4
Reunification plan	339	33.3

of community, older age, not working, and female, transgender, or non-binary gender increased the likelihood of preparedness practices. Essential workers were 38% less likely (aOR 0.62, 95% CI 0.43, 0.91), participants with probable serious mental illness were 43% less likely (aOR 0.57, 95% CI 0.39, 0.84), and households with children were 54% less likely (aOR 0.46, 95% CI 0.31, 0.67) to report a high level of engagement in preparedness practices. Study participants reporting a low sense of community were more than twice as likely to engage in practices for preparedness (aOR 2.29, 95% CI 1.57, 3.35) and the likelihood of engaging in a high level of preparedness practices increased with age: 25 - 44 having double the odds (25 - 34: aOR 2.05, 95% CI 1.20, 3.49; 45 - 64: aOR 2.65, 95% CI 1.47, 4.78) to age 65 and older having more than 4 times the odds (aOR 4.55, 95% CI 1.62, 12.73). Participants who reported not working were 79% more likely to report engaging in preparedness practices (aOR 1.79, 95% CI 1.06, 3.05) and non-males were 47% more likely (aOR 1.47, 95% CI 1.02, 2.13) to report preparedness practices.

In the third model (Table 3), essential workers and individuals with probable serious mental illness were less likely to report preparedness planning for the pandemic. Participants with low social support, low sense of community, Black race, and aged 45 - 64, who reported not working prior to the pandemic were more likely to report planning preparedness measures. Essential workers were 65% less likely (aOR 0.35, 95% CI 0.24, 0.51) and individuals with probable serious mental illness were 59% less likely (aOR 0.41, 95% CI 0.28, 0.60) to report preparedness planning for the pandemic. Study participants with low social support were nearly twice as likely (aOR 1.95, 95% CI 1.18, 3.23) and participants with low sense of community were 47% more likely (aOR 1.57, 95% CI 1.10, 2.24) to engage in preparedness planning. Black participants were 74% more likely to engaging in planning preparedness compared to non-Hispanic White participants (aOR 1.74, 95% CI 1.01, 3.00), and participants aged 45 - 64 had 2.23 greater odds of planning than participants aged 18 - 24 (aOR 2.23, 95% CI 1.24, 4.01). Finally, individuals who reported not working prior to the pandemic had 2.35 greater odds of engaging in planning preparedness activities compared to those working full time prior to the pandemic (aOR 2.35, 95% CI 1.43, 3.87).

Limitations

This study has several limitations to bear in mind when considering the results. The cross-sectional nature of the data limits understanding of causation. To mitigate this limitation, study participants were asked about changes to their living and working circumstances specifically in reference to the COVID-19 pandemic. The proportional quota sampling frame was selected to recruit a sample that looks like the population of New York City, however we cannot generalize about New York City residents because not all residents had an opportunity to participate. Only individuals enrolled in a Qualtrics panel and with internet access were eligible to participate. While most Americans have internet access (89% overall, 88% of Hispanics, 87% of Blacks in the United States),[34] this method excluded residents without internet access. Nevertheless, a cross-sectional web survey that could be fielded quickly with limited resources while the pandemic was unfolding in New York City was prioritized to provide timely information on preparedness for the pandemic of many New York City residents.

Discussion

There are some surprising findings. People with lower reported self-efficacy were more likely to report acquiring provisions which suggests efficacious behavior. Perhaps they are more self-efficacious than they think, or perhaps people reporting higher self-

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Table 2. Association* of individual and household characteristics with disaster preparedness provisions, practices, and planning

	Total		Provisions (High)			Practices (High)			Planning (High)		
	Count	%	Count	%	*P diff*	Count	%	*P diff*	Count	%	*P diff*
Older adult in the household	222	24.5	118	27.1	0.09	43	17.6	*P* < 0.01	54	16.8	*P* < 0.001
Essential worker	300	29.4	168	34.1	*P* < 0.01	140	48.4	P <0.001	193	51.1	*P* <0.001
Low self-efficacy (GSE)	576	56.5	241	48.9	*P* <0.001	151	52.3	0.10	218	57.7	0.525
Probable Serious Mental Illness (K-6)	364	35.7	170	34.5	0.47	163	56.4	*P* <0.001	213	56.4	*P* <0.001
Higher stress (PSS-4)	560	55.1	273	55.6	0.75	188	65.7	*P* <0.001	247	65.9	*P* <0.001
Low social support	166	16.3	55	33.1	*P* <0.001	33	11.4	*P* <0.01	34	9.0	*P* <0.001
Low sense of community (BSCS)	495	48.5	191	38.7	*P* <0.001	68	25.5	*P* <0.001	113	29.9	*P* <0.001
Race/ Ethnicity											
Non-Hispanic White	361	35.39	192	38.95	*P* <0.05	118	40.8	*P* <0.05	149	39.4	*P* <0.01
Black, African American	189	17.65	84	17.04		39	13.5		48	12.7	
Asian	136	13.33	55	11.16		30	10.4		45	11.9	
Hispanic	165	16.18	85	17.24		54	18.7		76	20.1	
Other	178	17.45	77	15.62		48	16.6		60	15.9	
Age											
18 - 24	139	13.6	64	13.0	0.33	52	18.0	*P* <0.001	61	16.1	*P* <0.001
25 - 44	460	45.1	214	43.4		168	58.1		222	58.7	
45- 64	302	29.6	149	30.2		61	21.1		82	21.7	
65+	119	11.7	66	13.4		8	2.8		13	3.4	
Income 2019											
Less than $25000	219	21.5	102	20.7	0.05	66	22.8	*P* <0.05	78	20.6	*P* <0.05
$25000 - $49999	212	20.8	94	19.1		46	15.9		62	16.4	
$50000 - $99999	281	27.6	129	26.2		76	26.3		112	29.6	
$100000+	308	30.2	168	34.1		101	35.0		126	33.3	
Education											
High school or less	210	20.7	96	19.6	0.83	54	18.8	*P* <0.001	60	16	*P* <0.001
Technical school or some college	166	16.3	79	16.1		35	12.2		43	11.5	
2- or 4- year degree	382	37.6	190	38.7		95	33.0		141	37.6	
Graduate studies	259	25.5	126	25.7		104	36.1		131	34.9	
Employment pre-COVID											
Full time	554	54.5	275	56.1	0.56	196	68.3	*P* <0.001	262	70.1	*P* <0.001
Part time	141	13.9	65	13.3		41	14.3		55	14.7	
Not working, other	321	31.6	150	30.6		50	17.4		57	15.2	
Gender											
Male	479	47.0	225	45.6	0.47	168	58.1	*P* <0.001	196	51.9	*P* <0.05
Female, transgender, non-binary	541	53.0	268	54.4		121	41.9		182	48.2	
Partnered	539	53.1	276	56.2	0.05	187	64.9	*P* <0.001	240	64.2	*P* <0.001
Child in household	413	42.9	220	47.0	*P* <0.05	186	68.9	*P* <0.001	229	64.3	*P* <0.001

*Chi-square analysis, column percentages reported.

efficacy felt more confident of their ability to obtain necessary equipment after an event or under crisis conditions and were thus less inclined toward preparedness. It seems reasonable that respondents reporting less social support and less community connection would fortify themselves with provisions. Meanwhile, consistent with Clay *et al.*,[17] we found that people with self-reported stress or mental illness are less likely to be prepared in the domains of practices, and planning.

The research on racial predictors of preparedness is mixed, with race found to have little difference in a study using BRFSS (CDC, Atlanta, Georgia, USA) data,[35] while in a review of the literature Kohn *et al.*[36] found that people identifying as Black engaged in fewer preparedness behaviors. Bourque, in a review of the literature,[37(p362)] found that '[n]ationally Whites and Asians/ Pacific Islanders were more likely than African Americans and Hispanics to report doing preparedness activities, but less likely to engage in avoidance activities.' Eisenman *et al.*[14(p1)] found that in the context of terrorism, being African-American and Latino was 'associated with having emergency supplies' as well as with having a plan. These differences in studies are likely due to many confounding factors, including population under study, geographic location of the study, the nature of the risk in hazard-specific studies (e.g., hurricane, terrorism), and the timeframe in which the study is conducted. In the present study, we too did not detect an influence of race on the preparedness of provisions and practices, but we did find an association on the measure of planning. Reporting race as Black or African American and roughly middle age all pointed to increased likelihood of preparedness practices. These preparedness practices may indicate response to a particular cultural moment: the serious racial

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Table 3. Factors associated* with disaster preparedness provisions, practices, and planning

	Provisions (High)		Practices (High)		Planning (High)	
	aOR	*95% CI*	*aOR*	*95% CI*	*aOR*	*95% CI*
Older adult in the household			0.81	0.49, 1.36	1.10	0.67, 1.82
Essential worker	0.87	0.64, 1.17	**0.62**	**0.43, 0.91**	**0.35**	**0.24, 0.51**
Low self-efficacy (GSE)	**1.61**	**1.22, 2.11**				
Probable Serious Mental Illness (K-6)			**0.57**	**0.39, 0.84**	**0.41**	**0.28, 0.60**
Higher stress (PSS-4)			0.90	0.62, 1.32	0.79	0.55, 1.15
Low social support	**1.62**	**1.11, 2.37**	1.21	0.72, 2.05	**1.95**	**1.18, 3.23**
Low sense of community (BSCS)	**1.72**	**1.29, 2.28**	**2.29**	**1.57, 3.35**	**1.57**	**1.10, 2.24**
Race/ Ethnicity						
Non-Hispanic White	ref		ref		ref	
Black, African American	1.13	0.76, 1.69	1.44	0.83, 2.12	**1.74**	**1.01, 3.00**
Asian	1.18	0.76, 1.83	1.31	0.71, 2.44	0.97	0.56, 1.69
Hispanic	1.02	0.68, 1.53	1.19	0.70, 2.01	0.99	0.59, 1.66
Other	1.24	0.82, 1.87	1.24	0.72, 2.12	1.52	0.90, 2.57
Age						
18 - 24			ref		ref	
25 - 44			**2.05**	**1.20, 3.49**	1.67	0.97, 2.87
45 - 64			**2.65**	**1.47, 4.78**	**2.23**	**1.24, 4.01**
65+			**4.55**	**1.62, 12.73**	2.01	0.79, 5.10
Income 2019						
Less than $25000	ref		ref		ref	
$25000 - $49999	1.21	0.79, 1.83	1.30	0.75, 2.26	1.54	0.90, 2.66
$50000 - $99999	1.25	0.84, 1.86	1.59	0.91, 2.77	1.56	0.90, 2.68
$100000+	0.98	0.64, 1.51	1.38	0.74, 2.58	1.66	0.90, 3.07
Education						
High school or less			ref		ref	
Technical school or some college			1.17	0.62, 2.00	1.12	0.63, 1.99
2- or 4- year degree			1.09	0.65, 1.86	0.79	0.48, 1.33
Graduate studies			0.83	0.46, 1.50	0.58	0.33, 1.03
Employment prior to COVID-19						
Full time			ref		ref	
Part time			1.03	0.60, 1.78	1.14	0.68, 1.91
Not working, other			**1.79**	**1.06, 3.05**	**2.35**	**1.43, 3.87**
Gender						
Male			ref		ref	
Female, transgender, non-binary			**1.47**	**1.02, 2.13**	0.82	0.58, 1.18
Partnered	1.05	0.77, 1.42	0.84	0.55, 1.28	0.71	0.48, 1.06
Child in household	0.93	0.70, 1.25	**0.46**	**0.31, 0.67**	0.53	0.68, 4.10

*Logistic regression analysis, adjusted odds ratios (aOR) and 95% Confidence Intervals reported

violence and associated protests in the US around the time that our study was conducted, or they may be reflective of the generally higher levels of preparedness found in New York City by Martins *et al.*[7] Interestingly, respondents who had not been working prior to the pandemic were more likely to have engaged in planning, which might suggest having the necessary time to do so.

A curious finding, somewhat contrary to literature, is less preparedness practices among households with children. While typically such households are more likely to prepare,[36] we posit that perhaps the overwhelming character of having children at home, distance learning, balancing work-from-home, and the other unusual pandemic transformations may have displaced planning.

Our findings suggest there is indeed something different about the types of preparedness activities, since we detected differences in provisions, practices, and planning actions across several of the independent variables that we tested. By itself, this is a key finding, but we can draw additional scientific and practice implications from this discovery. The findings are significant from 2 standpoints. First, preparedness is not created equal, with some kinds of preparedness of different salience in different social and environmental contexts. Second, these different kinds of preparedness are associated with different household characteristics. This means, in turn, that public officials might productively turn attention to education and outreach activities indexed to their needs. New York City is already doing this, for example, the 'Be a Buddy NYC',[38] and the Ready Girl programs.[39]

Our findings have some other implications. As noted earlier, researchers and public officials aim to bolster preparedness, while studies in general show mixed levels of preparedness overall, and mixed outcomes on preparedness types. Bourque[37(p365)] argued that research should consider differently the kinds of items people have on hand because they use them every day, such as flashlights

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and can openers. 'These studies suggest that we need to do a better job connecting *mitigation and preparedness* with those things that households do all the time.' Clay *et al.*[17] found high preparedness levels on having a flashlight and radio (typical household items, even in homes with modest incomes) and less preparedness on having a plan (which takes knowledge and deliberate effort). Similarly, far more respondents reported searching for information than such more intensive efforts as preparing a plan or purchasing additional insurance. It may be that the disaster science community needs to take a different look at preparedness. As it stands, preparedness messaging comes from specialized agencies (e.g., FEMA, Red Cross) and is, in a manner of speaking, ancillary to normal life. It would perhaps be better, as a testable proposition for future research and policymaking, if preparedness were a fixture of a whole-of-society approach to hazard knowledge and local environmental awareness.

Conclusions

What could this look like? Disaster preparedness, apart from modest and infrequent materials and activities, is remote from people's thinking. They stock up on goods in advance of a looming threat and may or may not have simple items stored around the house. A whole-of-community approach suggests that hazard awareness should be merged with school curricula. Students already learn about earth processes and seismicity; the implications of human interaction with those processes are important. We are certainly aware that schools are overloaded with tasks, but the growing threats to life and property from climate-related hazards, human movement into environmentally precarious areas, increased and irregularly-distributed social vulnerability, and (notwithstanding the current efforts to pass an infrastructure investment bill in the US) decaying infrastructure, suggest that hazard awareness from an early age is necessary to help people safeguard their future safety and their future economic wellbeing. This awareness should go beyond provisions and include at a fundamental level the practices and planning activities that might help people avoid or minimize hazards, rather than merely responding to their effects.

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