

## Original Research

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CDC, Centers for Disease Control and Prevention; ESK, Emergency Supply Kit; FEMA, Federal Emergency Management Agency; NHS, National Household Survey; PN, Porter Novelli

### Corresponding author:

Amy Helene Schnall,  
Email: [GHU5@cdc.gov](mailto:GHU5@cdc.gov)

# Characterizing Emergency Supply Kit Possession in the United States During the COVID-19 Pandemic: 2020–2021

Amy Helene Schnall DrPH<sup>1</sup>, Stephanie Kieszak MA, MPH<sup>1</sup>, Arianna Hanchey MPH<sup>1</sup>, Harry Heiman MD, MPH<sup>2</sup>, Tesfaye Bayleyegn MD, MPH<sup>1</sup>, Johnni Daniel PhD<sup>1</sup> and Christine Stauber PhD<sup>2</sup>

<sup>1</sup>Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA and <sup>2</sup>National Center for Environmental Health, Georgia State University, Atlanta, GA, USA

## Abstract

**Objective:** In the immediate aftermath of a disaster, household members may experience lack of support services and isolation from one another. To address this, a common recommendation is to promote preparedness through the preparation of an emergency supply kit (ESK). The goal was to characterize ESK possession on a national level to help the Centers for Disease Control and Prevention (CDC) guide next steps to better prepare for and respond to disasters and emergencies at the community level.

**Methods:** The authors analyzed data collected through Porter Novelli's *ConsumerStyles* surveys in fall 2020 (n = 3625) and spring 2021 (n = 6455).

**Results:** ESK ownership is lacking. Overall, while most respondents believed that an ESK would help their chance of survival, only a third have one. Age, gender, education level, and region of the country were significant predictors of kit ownership in a multivariate model. In addition, there was a significant association between level of preparedness and ESK ownership.

**Conclusions:** These data are an essential starting point in characterizing ESK ownership and can be used to help tailor public messaging, inform work with partners to increase ESK ownership, and guide future research.

Disasters, such as hurricanes, floods, winter storms, and human-induced incidents (eg, chemical spills, terrorism), devastate US communities every year, leading to increased morbidity and mortality among the population.<sup>1–5</sup> The year 2020 was no exception with a record-breaking 30 named storms during the Atlantic hurricane season, wildfires burning more than 8.8 million acres, and heavy rain leading to flooding in several areas of the country; all on top of the global coronavirus disease (COVID-19) pandemic.<sup>6–11</sup> Unfortunately, disasters do not impact society equitably with certain population groups facing greater risk before, during, and after disasters, including, but not limited to, access to resources and supports as well as exposure to disasters themselves.<sup>1,12,13</sup> For example, low-income communities and communities of color may have access to fewer resources, higher social vulnerability, and less access to health care.<sup>14,15</sup> They also are more likely to live in areas prone to natural disasters.<sup>14,15</sup> Once a disaster strikes, these pre-existing gaps are often exacerbated. Therefore, it is essential that preparedness policies, plans, and practices account for social, economic, and health inequities.

Millions of dollars are allocated each year for US hospital preparedness, and yet a large portion of disaster-related morbidity and mortality occurs before individuals ever have the opportunity to be transported to a hospital.<sup>16</sup> Further, much of the disaster-related morbidity and mortality that occur are indirectly related to the disaster (eg, they are associated with living in damaged or destroyed infrastructure).<sup>17–19</sup> Therefore, household preparedness is essential to a successful response and can help mitigate loss of life, injuries, and illnesses immediately after a disaster's impact. During a disaster, household members may be on their own for a period of time because of the ongoing response efforts, size of the affected area, loss of communication, impassible roads, and safety purposes that lead to shelter-in-place.<sup>20</sup> Therefore, a common recommendation is to promote household preparedness through the preparation of an emergency supply kit (ESK).<sup>21–23</sup> An ESK is a collection of basic items (eg, water and food, radio, flashlight) that a household may need in a disaster that are stored together in a manner that can be easily accessed, such as in large boxes, bins, or bags. Having an ESK can aid in short-term survival by providing essential items for use during a disaster or emergency, thus limiting the need to rely on emergency services or leave a safe structure into a hazardous environment to secure necessary items.

While an ESK is essential for everybody, it is even more essential for those who cannot (or will not) evacuate from their home. This often includes those in low-income or minority

communities, persons with disabilities, and/or those with chronic medical conditions who may lack mobility (eg, no transportation, rely on others to be physically mobile) and be less able to evacuate on short notice.<sup>24–26</sup> Yet, as ESKs can be costly and require additional storage space within the home, the same households that may be unable or unwilling to leave, may also face barriers in assembling and storing an ESK. A review of published literature on the use of ESKs following a disaster found that data tend to focus on general ESK ownership, including prevalence, factors associated with ownership, and interventions to increase ownership.<sup>27–46</sup> Data often focus on specific populations, making it difficult to generalize across studies because of the variation in population groups and questions researched. In general, ESK ownership varies based on the population assessed (eg, geographic location, demographics), with estimates ranging from as low as 22% to upward of 81%.<sup>36,47</sup> The most comprehensive data are from the Federal Emergency Management Agency's (FEMA) National Household Survey (NHS), which surveys approximately 5000 adults yearly to track progress in personal disaster preparedness.<sup>48</sup> In 2021, 45% of respondents reported they have gathered supplies, comparable to the 81% and 80% reported in 2020 and 2019, respectively.<sup>34–36</sup> While people often express optimism about having ample supplies to endure 3 days without electricity or running water, studies suggest that even with regional variation, less than half of households actually assemble dedicated ESKs.<sup>34,44</sup> Factors such as previous disaster experience, education in the field of disaster response or emergency management, and health status of individuals as well as demographic factors and social determinants of health such as education, marital status, race, ethnicity, and gender all have potential impacts on the likelihood of owning an ESK.<sup>37,46</sup>

The ongoing COVID-19 pandemic has had a major impact on many aspects of life, directly and indirectly, and may have affected the way households prepare for emergencies such as how supplies are gathered and the items to include in ESKs (eg, masks, hand sanitizer).<sup>34</sup> Because of this, many of the preparedness estimates before 2020 may no longer be accurate. In addition, with more households potentially staying at home during a disaster to avoid potential COVID-19 exposure, ESKs are even more essential. At the time of our survey implementation, there were limited current (ie, 2020–2021) national data on ESK ownership publicly available. Therefore, our goal was to characterize ESK possession on a national level to help guide next steps to better prepare for and respond to disasters and emergencies—specifically, describing the proportion and distribution of ESK ownership, exploring any regional differences, and examining how factors such as social determinants of health, previous experience, and beliefs may impact preparedness and ESK ownership.

## Methods

The Centers for Disease Control and Prevention (CDC) added 10 questions to the existing Porter Novelli's (PN) *ConsumerStyles* surveys in fall 2020 and spring 2021. PN *ConsumerStyles* is a cross-sectional market survey of a random sample of non-institutionalized adults (age 18 years or older) from Ipsos' KnowledgePanel®.<sup>46</sup> In 2020, *FallStyles* was sent to 4548 panelists between September 24 and October 10. In 2021, *SpringStyles* was sent to 10 919 panelists between March 23 and April 13. For both surveys, reminders were sent to non-responders on days 3, 7, and 13 and those who completed the survey received 5000 cash-equivalent reward points (worth approximately US \$5) and were eligible for a sweepstakes.

While sampled from the same KnowledgePanel® pool, the 2020 *FallStyles* and 2021 *SpringStyles* are 2 separate samples; there is no way of knowing if any respondents participated in both surveys.

While the specific questions related to ESKs remained the same in both surveys, there were changes to some demographic variables between fall 2020 and spring 2021 (eg, income, household type). All modifications were accounted for by creating matching variables between 2020 *FallStyles* and 2021 *SpringStyles*, except for employment which could not be aligned and, therefore, could not be directly compared. Both surveys are weighted on several demographic and household factors.<sup>49,50</sup>

Descriptive analyses examined distributions of demographic characteristics, preparedness levels (ie, having 1 or more of the 5 FEMA recommended plans<sup>26</sup>), previous disaster experience and beliefs, and ESK possession and items. Missing data were minimal in both surveys for all variables (< 5%). Chi-square tests investigated the associations between ESK ownership and demographics, disaster experience and perceptions of preparedness, and beliefs. Because *FallStyles* and *SpringStyles* data were similar in terms of descriptive statistics and significant associations, we ran a multivariable logistic regression on the most recent *SpringStyles* data to help explain the importance of key variables (eg, race, ethnicity, income, education) in terms of their relationship with overall ESK ownership, in the presence of others. The authors used a backward stepwise elimination procedure, beginning with all demographic variables in the model and eliminating those that did not statistically predict ( $P < 0.05$ ) the dependent variable (ESK ownership) 1 by 1. Only the final model is presented in the text. All data presented within this report, including the tables, are weighted. Data are presented with fall 2020 first followed by spring 2021 unless otherwise noted. However, data are presented as 1 value if they were the same for the 2 surveys. If the 2 data points had less than 1% difference, they are reported as 1 value with an approximate (~) sign.

## Results

A total of 3625 (79.7%) completed the 2020 *FallStyles* survey and 6455 (59.1%) adults completed the 2021 *SpringStyles*. Overall, the fall and spring weighted demographics were comparable (Table 1). Slightly more than half of respondents (51.6%) were female and educational attainment was distributed across categories. Roughly 63% self-identified as white with ~11% black, ~16% Hispanic, and less than 2% multiracial. Most live in single-family homes (73.1%, 71.7%), with ~15% in apartment homes, ~8% in townhomes or duplexes, and ~4% in mobile homes, RVs, boats, or vans. The majority (73.7%, 72.5%) own their homes with a quarter (24.4%, 25.6%) renting and 1.9% living in their home without payment. The South had the most representation with ~38%, followed by the West (24%), Midwest (~21%), and Northeast (~17%), with the majority living in metro areas (86.6%) compared to non-metro (13.4%). Less than 15% live alone.

Most respondents (69.0%, 63.5%) have experienced a disaster, with severe weather with power outages being the most common (55.1%, 50.3%), followed by a tropical storm or hurricane (29.2%, 23.4%) (Table 2). A tornado; earthquake, mudslide, or landslide; or flood was experienced by roughly 15% for each disaster type. Several (16.4%, 19%) responded that they, or somebody in their household, worked, volunteered, or trained in disaster response or recovery. Overall, ~27% of respondents stated they had an "easy to get to" ESK as part of the preparedness plans and items. When given the definition of an ESK in a separate question,

**Table 1.** Weighted demographics of respondents, United States: 2020–2021

	Fall 2020 (N = 3625)		Spring 2021 (N = 6455)	
	Frequency	Percent	Frequency	Percent
<b>Age</b>				
18-34 years	1035.4	28.6	1819.9	28.2
35-54 years	1200.3	33.1	2146.4	33.3
55-74 years	1138.2	31.4	2046.1	31.7
75+ years	251.1	6.9	442.7	6.9
<b>Sex</b>				
Male	1756.1	48.4	3121.6	48.4
Female	1868.9	51.6	3333.4	51.6
<b>Education</b>				
Less than high school	365.2	10.1	688.0	10.7
High school	1022.7	28.2	1768.8	27.4
Some college	1010.5	27.9	1948.4	30.2
Bachelor's or higher	1226.6	33.8	2049.8	31.8
<b>Race/ethnicity</b>				
White, non-Hispanic	2316.1	63.9	4099.9	63.5
Black, non-Hispanic	414.4	11.4	747.2	11.6
Hispanic	582.2	16.1	1049.2	16.3
Mixed race	52.9	1.5	119.4	1.9
Other	259.4	7.2	439.4	6.8
<b>Housing structure</b>				
Single family home	2650.1	73.1	4626.0	71.7
Townhome/duplex	300.4	8.3	575.9	8.9
Apartment	529.9	14.6	990.1	15.3
Mobile home, boat, RV, van	144.6	4.0	263.1	4.1
<b>Ownership status</b>				
Owns	2671.5	73.7	4681.1	72.5
Rents	883.3	24.4	1654.6	25.6
Occupy w/o payment	70.3	1.9	119.3	1.9
<b>Region</b>				
South	1369.4	37.8	2447.6	37.9
West	869.1	24.0	1547.2	24.0
Midwest	748.5	20.7	1344.3	20.8
Northeast	638.0	17.6	1115.9	17.3
<b>Urbanicity</b>				
Metropolitan	3137.6	86.6	5592.9	86.6
Non-metropolitan	487.4	13.4	862.1	13.4
<b>Household size</b>				
Lives alone	533.1	14.7	911.5	14.1
Lives with others	3091.9	85.3	5543.5	85.9
<b>Marital status</b>				
Married/with partner	2306.4	63.6	3665.4	56.8
Single	1318.6	36.4	2789.6	43.2
<b>Children in household</b>				
Household has children	1155.0	31.9	2136.3	33.1
No children in home	2470.0	68.1	4318.7	66.9
<b>Household income</b>				
< \$25 000	485.4	13.4	796.9	12.4
\$25 000 < \$50 000	646.0	17.8	1128.2	17.5
\$50 000 < \$75 000	602.8	16.6	1119.2	17.3
\$75 000 < \$100 000	508.0	14.0	908.8	14.1
\$100 000 < \$150 000	639.9	17.7	1207.7	18.7
\$150 000 or more	742.9	20.5	1294.2	20.1

(Continued)

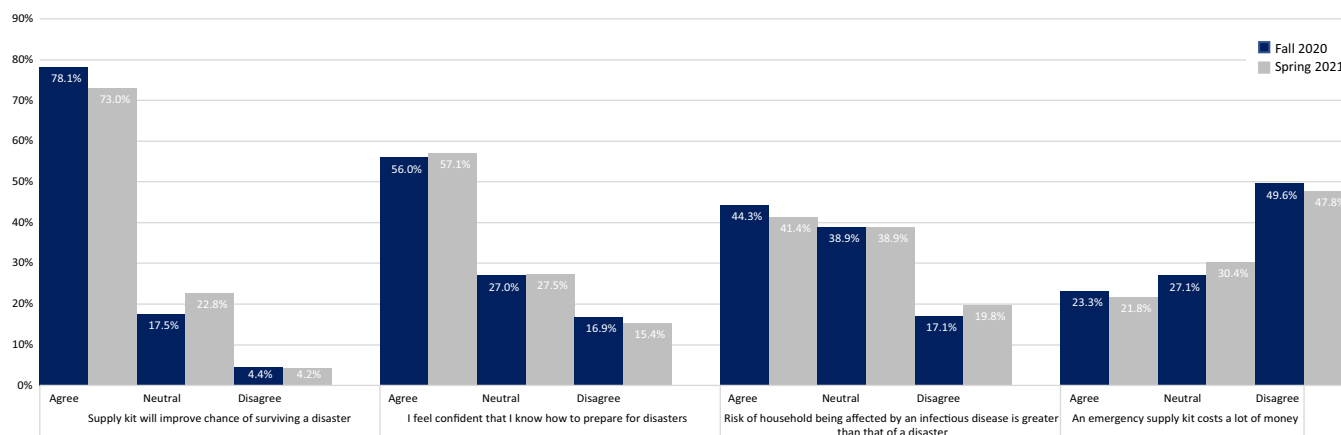
**Table 1.** (Continued)

	Fall 2020 (N = 3625)		Spring 2021 (N = 6455)	
	Frequency	Percent	Frequency	Percent
<b>Employment status*</b>				
Employed	2324.0	64.1	2805.2	43.5
Unemployed/retired	1118.7	30.9	2522.1	39.1
Other	182.4	5.0	1127.8	17.5

\*Fall 2020 “Employed” includes all currently employed persons, and “Other” includes those who are temporarily out of work; Spring 2021 “Employed” is employed full-time only, and “Other” are those who are employed part-time. Therefore, these are separate categories and should not be compared.

**Table 2.** Weighted preparedness levels and disaster experience, United States, 2020–2021

	Fall 2020 (N = 3625)		Spring 2021 (N = 6455)	
	Frequency	Percent	Frequency	Percent
<b>Experienced previous disaster</b>				
Yes	2491.5	69.0	4089.5	63.5
No	1119.4	31.0	2346.1	36.5
<b>Type of disaster experienced</b>				
Severe weather with power outages	1988.4	55.1	3235.2	50.3
Tropical storm or hurricane	1054.1	29.2	1504.1	23.4
Tornado	567.4	15.7	888.6	13.8
Earthquake, mudslide, or landslide	559.1	15.5	913.9	14.2
Flood	513.9	14.2	785.8	12.2
Wildfire	205.1	5.7	347.5	5.4
<b>Employment in disaster response/recovery</b>				
Yes	593.3	16.4	1220.5	19.0
No	3018.6	83.6	5212.0	81.0
<b>Type of response/recovery employment</b>				
Volunteered for disaster response	212.2	5.9	481.9	7.5
Work in disaster response or recovery	160.0	4.4	293.2	4.6
Taken CERT training	159.9	4.4	353.0	5.5
Work in emergency management	110.1	3.1	203.7	3.2
Volunteer with American Red Cross	102.3	2.8	180.0	2.8
Other	143.1	4.0	285.8	4.4
<b>Has the following preparedness plans/items</b>				
Stored copies of important documents	1247.6	34.6	2080.5	32.4
Easy to get to ESK	989.6	27.4	1744.3	27.2
Designated meeting place outside the home	672.2	18.6	1237.7	19.3
Multiple evacuation routes away from home	640.1	17.7	816.7	12.7
Emergency communication plan	485.0	13.4	987.0	15.4
Meeting place outside the neighborhood	342.5	9.5	463.4	7.2
<b>Preparedness level</b>				
No plans	1845.2	51.1	3366.2	52.4
Some plans	1659.0	46.0	2898.5	45.2
All 5 FEMA-recommended plans	106.3	2.9	155.0	2.4
<b>ESK</b>				
Has an ESK	1160.1	33.8	2201.3	36.3
Does not have an ESK	2276.0	66.2	3864.1	63.7
<b>ESK items</b>				
Flashlight with batteries	1106.3	95.4	2053.9	93.6
Medical supplies	981.4	84.6	1872.9	85.4
Water	926.6	79.9	1803.9	82.2
Food	803.2	69.2	1503.6	68.5
Radio	709.4	61.2	1291.8	58.9
Household cleaning supplies	378.1	32.6	643.6	29.3
Other	84.3	7.3	210.3	9.6



**Figure 1.** Weighted beliefs about disasters and emergency supply kits (ESKs), United States, 2020 -2021.

approximately a third (33.8%, 36.3%) reported having one. This difference in response could be because of the definition provided or the lack of “easy to get to” in the question. Of those who had an ESK based on the latter question (ie, with the definition provided), almost all (95.4%, 93.6%) reported having a flashlight with batteries, ~85% reported medical supplies, ~80% reported having water, almost 70% had food, and roughly 60% had a radio. Household cleaning supplies were present in approximately a third (32.6%, 29.3%) of ESKs.

When asked whether an ESK would help their chance of surviving a disaster, three-quarters (78.1%, 73.0%) agreed while few (~4%) disagreed (Figure 1). The cost of an ESK does not seem to be a barrier for almost half (49.6%, 47.8%), but slightly more than 20% agreed that an ESK costs a lot of money. When asked whether the risk of their household being affected by an infectious disease was greater than that of a disaster, slightly more agreed in the fall (44.3%) than the spring (41.4%). Based on chi-square tests, there is a significant association between ESK ownership and age, race/ethnicity, region, and household income for both surveys (Table 3). In addition, ESK ownership is associated with housing structure, household size, and ownership status in *FallStyles* and education in *SpringStyles*. Preparedness level, disaster experience, and beliefs are also associated with ESK ownership (Table 4). All preparedness plan items are significantly associated with increased ESK ownership. Of those who do not have any preparedness plans, 82.0% and 78.1% also do not have an ESK. Of those who have all 5 preparedness plans, 89.6% and 94.7% have an ESK. Experience through work, volunteering, or training in disaster response or recovery is also associated with ESK ownership. Roughly half of those who indicated they or a household member had experience in the response and recovery field had an ESK (53.8%, 50.8%).

As far as beliefs, being confident in knowing how to prepare for a disaster and agreeing that ESKs will improve chance of survival are significantly associated with having an ESK; over 40% of those who agree they are confident have a kit (43.3%, 45.8%) and a higher percentage of those who agree a kit will improve the chance of surviving a disaster own a kit versus those who disagree (36.5% vs 30.4%; 41.6% vs 18.6%). Additionally, the belief that ESKs cost a lot of money is associated with kit ownership; those who are neutral have lower reported kit ownership than those who either agree or disagree with the statement. However, there is some discrepancy between *FallStyles* and *SpringStyles* with regards to the perception that the risk of an infectious disease is greater than that of a disaster. While there is no significant association in the fall data

( $P = 0.5403$ ), there is a significant association in *SpringStyles* with 42.0% of those who disagree that infectious disease is a greater risk to their household than a disaster reporting kit ownership.

With regard to believing an ESK will improve their chance of survival (Table 5), education level, race/ethnicity, urbanicity, and household income all have significant associations in both surveys. Also, several variables are associated with believing that ESKs are expensive (Table 6). For example, women were more likely than men to agree that an ESK is expensive. In addition, of those with a household income of less than \$25,000, ~29% agree supply kits are expensive compared to 19.7% and 14.9% of those with a household income of more than \$150,000 annually, and ~28% households with kids agree kits are expensive compared to 20.8% and 18.9% of homes without kids.

Adults ages 35–54 years and 55–74 years have a 32.0% and 37.8% increased odds, respectively, of having an ESK compared to older adults ages 75 years and more (data not shown). In addition, there is a 10.9% decreased odds that women will have a kit (compared to men). As mentioned, region plays an important role, with those in the Midwest and Northeast being close to half (44.6% and 40.4%, respectively) as likely to have a kit as those in the South. The South and the West were comparable.

Those who are fully prepared (ie, have all 5 FEMA recommended plans), are ~64 times more likely to have an ESK (data not shown). But, having any plans increases the likelihood of also having an ESK (OR = 3.4). When analyzed individually, the preparedness plan with the highest odds ratio was an emergency communication plan (OR = 6.5). When it comes to disaster experience, experiencing a previous disaster increases the odds of having an ESK by 57% (OR = 1.6). Among individual disasters included in the questionnaire, experiencing wildfires had the highest odds for ESK ownership (OR = 1.9). Working, volunteering, or having training (eg, Community Emergency Response Team [CERT]) increases the likelihood of having a kit more than twofold (OR = 2.1).

Those who are confident (ie, agree with the statement) that they know how to prepare for a disaster have almost 4.5 times the odds of having a kit as those who disagree and almost 3 times the odds of being prepared (OR = 2.9) (data not shown). Furthermore, those who believe that an ESK will improve their chance of surviving a disaster are also more than 3 times as likely to have a kit as those who disagree with that sentiment (OR = 3.1). They are also 86.0% more likely to be prepared overall (OR = 1.9). When it comes to beliefs about the cost of ESKs, those who agree they cost a lot of money are more likely to have a kit than those who disagree

**Table 3.** Emergency supply kit (ESK) ownership by demographic characteristics (weighted) United States, 2020–2021

	Fall 2020				Spring 2021			
	Has kit (N = 1160)	No kit (N = 2276)	Total (N = 3436)	P-value	Has kit (N = 2201)	No kit (N = 3864)	Total (N = 6065)	P-value
<b>Age</b>								
18-34 years	287.3 (30.2)	663.2 (69.8)	950.5 (27.7)	0.0067	554.1 (34.0)	1073.6 (66.0)	1627.8 (26.8)	0.0068
35-54 years	423.8 (37.1)	718.3 (62.9)	1142.1 (33.2)		768.6 (37.6)	1277.7 (62.4)	2046.3 (33.7)	
55-74 years	375.8 (34.1)	727.5 (65.9)	1103.3 (32.1)		748.1 (37.9)	1223.9 (62.1)	1972.0 (32.5)	
75+ years	73.2 (30.5)	166.9 (69.5)	240.1 (7.0)		130.4 (31.1)	288.9 (68.9)	419.3 (6.9)	
<b>Sex</b>								
Male	582.0 (34.8)	1090.7 (65.2)	1672.8 (48.7)	0.2130	1101.3 (37.7)	1821.7 (62.3)	2923.0 (48.2)	0.0308
Female	578.1 (32.8)	1185.2 (67.2)	1763.3 (51.3)		1100.1 (35.0)	2042.4 (65.0)	3142.4 (51.8)	
<b>Education</b>								
Less than high school	105.8 (32.2)	222.7 (67.8)	328.5 (9.6)	0.1043	212.0 (35.3)	387.8 (64.7)	599.8 (9.9)	0.0019
High school	295.8 (30.9)	661.4 (69.1)	957.1 (27.9)		544.4 (33.2)	1094.0 (66.8)	1638.4 (27.0)	
Some college	334.9 (34.9)	624.6 (65.1)	959.6 (27.9)		731.1 (39.5)	1122.1 (60.6)	1853.2 (30.6)	
Bachelor's or higher	423.6 (35.6)	767.3 (64.4)	1190.8 (34.7)		713.8 (36.2)	1260.3 (63.8)	1974.0 (32.6)	
<b>Race/ethnicity</b>								
White, non-Hispanic	692.2 (31.1)	1533.3 (68.9)	2225.5 (64.8)	< 0.0001	1361.8 (34.9)	2540.6 (65.1)	3902.5 (64.3)	0.0155
Black, non-Hispanic	143.5 (37.3)	241.0 (62.7)	384.5 (11.2)		269.8 (40.2)	401.5 (59.8)	671.3 (11.1)	
Hispanic	197.7 (37.7)	326.7 (62.3)	524.4 (15.3)		364.2 (37.1)	616.4 (62.9)	980.7 (16.2)	
Mixed race	13.7 (26.8)	37.4 (73.2)	51.1 (1.5)		48.4 (44.0)	61.6 (56.0)	110.1 (1.8)	
Other	113.0 (45.1)	137.5 (54.9)	250.4 (7.3)		157.1 (39.2)	243.9 (60.8)	980.7 (16.2)	
<b>Housing structure</b>								
Single family home	875.6 (34.8)	1637.9 (65.2)	2513.5 (73.2)	0.0008	1631.7 (37.2)	2760.0 (62.9)	4391.6 (72.4)	0.1463
Townhome/duplex	105.1 (37.2)	117.7 (62.8)	282.8 (8.2)		177.2 (33.2)	357.0 (66.8)	534.2 (8.8)	
Apartment	130.9 (26.0)	372.9 (74.0)	503.8 (14.7)		311.2 (34.4)	594.4 (65.6)	905.6 (14.9)	
Mobile home, boat, RV, etc.	48.5 (35.7)	87.5 (64.3)	136.0 (4.0)		81.2 (34.7)	152.7 (65.3)	233.9 (3.9)	
<b>Ownership status</b>								
Owns	906.8 (35.5)	1644.8 (64.5)	2551.6 (74.3)	0.0007	1632.2 (36.7)	2816.7 (63.3)	4448.9 (73.4)	0.5707
Rents	232.2 (28.3)	587.9 (71.7)	820.1 (23.9)		533.3 (35.2)	981.5 (64.8)	1514.7 (25.0)	
Occupy w/o payment	21.0 (32.7)	43.3 (67.3)	64.3 (1.9)		35.9 (35.3)	65.9 (64.8)	101.8 (1.7)	
<b>Region</b>								
South	497.5 (38.3)	800.2 (61.7)	1297.7 (37.8)	< 0.0001	938.4 (40.8)	1360.6 (59.2)	2298.9 (37.9)	< 0.0001
West	312.3 (38.1)	508.4 (62.0)	820.7 (23.9)		601.5 (41.8)	837.3 (58.2)	1438.8 (23.7)	
Midwest	183.0 (26.0)	520.9 (74.0)	703.8 (20.5)		354.4 (27.7)	924.5 (72.3)	1279.0 (21.1)	
Northeast	167.3 (27.3)	446.4 (72.7)	613.8 (17.9)		307.0 (29.3)	741.7 (70.7)	1048.7 (17.3)	
<b>Urbanicity</b>								
Metropolitan	146.3 (32.2)	307.7 (67.8)	453.9 (13.2)	0.4559	1925.3 (36.7)	3327.3 (63.4)	5252.6 (86.6)	0.1374
Non-metropolitan	1013.8 (34.0)	1968.3 (66.0)	2982.1 (86.8)		276.0 (34.0)	536.7 (66.0)	812.8 (13.4)	
<b>Household size</b>								
Lives alone	147.3 (29.6)	350.9 (70.4)	498.2 (14.5)	0.0321	329.2 (39.1)	513.8 (61.0)	843.1 (13.9)	0.0727
Lives with others	1012.8 (34.5)	1925.0 (65.5)	2937.8 (85.5)		1872.1 (35.9)	3350.2 (64.2)	5222.3 (86.1)	
<b>Marital status</b>								
Married/with partner	757.9 (34.4)	1446.9 (65.6)	2204.8 (64.2)	0.3094	1311.3 (37.3)	2207.5 (62.7)	3518.8 (58.0)	0.0641
Single	402.2 (32.7)	829.0 (67.3)	1231.2 (35.8)		890.0 (35.0)	1656.6 (65.1)	2546.6 (42.0)	
<b>Children in household</b>								
Household has children	382.3 (35.3)	702.2 (64.8)	1084.5 (31.6)	0.2107	744.8 (37.5)	1241.4 (62.5)	1986.2 (32.8)	0.1732
No children in home	777.8 (33.1)	1573.7 (66.9)	2351.5 (68.4)		1456.5 (35.7)	2622.6 (64.3)	4079.1 (67.3)	
<b>Household income</b>								
< \$25 000	150.7 (34.4)	287.5 (65.6)	438.3 (12.8)	< 0.0084	253.2 (36.1)	448.0 (63.9)	701.3 (11.6)	0.0314
\$25 000 < \$50 000	172.5 (28.4)	435.7 (71.6)	608.1 (17.7)		368.2 (35.0)	685.2 (65.1)	1053.5 (17.4)	
\$50 000 < \$75 000	191.4 (33.7)	376.6 (66.3)	567.9 (16.5)		376.1 (35.6)	681.0 (64.4)	1057.2 (17.4)	
\$75 000 < \$100 000	159.3 (33.1)	321.8 (66.9)	481.1 (14.0)		282.7 (32.7)	582.4 (67.3)	865.1 (14.3)	
\$100 000 < \$150 000	209.9 (33.6)	414.3 (66.4)	624.1 (18.2)		451.8 (39.6)	689.6 (60.4)	1141.5 (18.8)	
\$150 000 or more	276.3 (38.6)	440.1 (61.4)	716.5 (20.9)		469.2 (37.6)	777.8 (62.4)	1247.0 (20.6)	

(Continued)

Table 3. (Continued)

	Fall 2020				Spring 2021			
	Has kit (N = 1160)	No kit (N = 2276)	Total (N = 3436)	P-value	Has kit (N = 2201)	No kit (N = 3864)	Total (N = 6065)	P-value
<b>Employment status*</b>								
Employed	798.0 (34.5)	1458.1 (65.5)	2226.1 (64.8)	0.4588	952.9 (35.5)	1729.2 (64.5)	2682.1 (44.2)	0.1788
Unemployed/retired	338.7 (32.3)	709.2 (67.7)	1047.9 (30.5)		847.5 (36.1)	1501.4 (63.9)	2349.0 (38.7)	
Other	53.4 (33.0)	108.6 (67.0)	162.0 (4.7)		400.9 (38.8)	633.4 (61.2)	1034.3 (17.1)	

\*Fall 2020 “Employed” includes all currently employed persons, and “Other” includes those who are temporarily out of work; Spring 2021 “Employed” is employed full-time only, and “Other” are those who are employed part-time. Therefore, these are separate categories and should not be compared.

(OR = 1.2), but those who are neutral are 33.2% less likely to have a kit (OR = 0.7). Finally, those who believe the risk of their household being affected by an infectious disease is greater than that of a disaster are 28.0% less likely to have an ESK (OR = 0.7) and 15.5% (0.8) less likely to be prepared.

### Limitations

These data are not without limitations. *ConsumerStyles* surveys are cross-sectional and limited to only those within the panel. Therefore, while we have 2 surveys, they are only 2 snapshots in time and do not represent a longitudinal analysis. Also, even though KnowledgePanel® works to ensure representativeness of the respondents on several key aspects, there are some potential differences in areas that have traditionally mattered in disaster preparedness and response, such as household structure, home ownership, and persons within the home (eg, marital status, living with others, having kids). However, none of these determinants were found to be significant in our modeling. Further, the panel only represents those within the 50 US states and does not include panel members from the territories. The US territories are prone to disasters and should be included in all disaster research. However, as previous data have shown, the island territories may have different preparedness needs as, for example, the traditional 3-day supply of food and water may not be enough for such harder-to-reach geographies.<sup>31</sup> As far as the survey questions, the demographic categories changed between fall 2020 and spring 2021, making it impossible to compare employment and limiting the analysis of household type by combining mobile homes with boats, RVs, and vans. Finally, because all questions were closed-ended, any reasoning for certain responses (eg, “other”) had to be inferred. While this research is integral in acquiring knowledge of current possession of ESKs, it does not address the gap in knowledge regarding actual use and effectiveness of ESKs during a disaster. Therefore, a needed step is to explore in detail the actual effectiveness of ESKs with more granular data. This would require an immediate post-impact survey assessing whether households had an ESK, what they did (and did not) use within the kit, what items were missing or needed that required them to leave the home or call for emergency services, and related questions.

### Discussion

This analysis reflects nationally representative samples characterizing ESK possession in the United States during the COVID-19 pandemic. Overall, the fall and spring samples are comparable and show that ESK ownership remains lacking across the country. While most respondents believed that an ESK would help their

chance of survival, only a third have one. Of note, for those respondents only reporting 1 preparedness plan or item, an ESK was the second most popular (after copies of important documents). This shows that, while ownership is low, ESKs are still one of the top preparedness items among households. Similarly, there is a strong increase in the likelihood of having an ESK when having 1 or more emergency preparedness plans.

Results highlighted that there seems to be some confusion about what comprises an ESK. Two questions were asked within the survey (as part of the preparedness plans and separately) and answers varied by roughly 10%. Of those who reported not having an ESK when asked directly, roughly 8% reported having an “easy to get to emergency supply kit” in the previous question. While the wording differed (one specifying “easy to get to” and the other providing a definition), the varied responses are concerning and indicate a need for communication efforts to clearly define ESKs to the general population. Despite this confusion, of those who reported having an ESK, the most common item was a flashlight with batteries, followed by medical supplies, water, food, and a radio; all of which are recommended on both FEMA and CDC websites. However, because the question did not define medical supplies (eg, it included a 7-day supply of prescription medication) or the amount of food and water (ie, a 3-day supply), it is unclear whether the ESK would be adequate for the household during an emergency response.

Therefore, it is vital to provide clear guidance on the essential components of a household ESK. While there are suggested items on FEMA, CDC, American Red Cross, and several other agency (both local and federal) websites, there is little consistency among these lists, and several include over 20 items, which can cost hundreds of dollars depending on the size of the family.<sup>51</sup> In fact, an environmental scan synthesizing recommendations identified 36 common items (defined as listed on at least a third of lists) among the 196 ESK lists around the United States.<sup>51</sup> While no single item was listed on all 196 lists, the most common item was a flashlight (83%), followed by a radio (82%), batteries (81%), and medications (80%). While ESKs should have some items tailored to regional or local needs (eg, sunscreen, mylar thermal blankets), there should be a core set of common items recommended on all lists (eg, food, water). In addition, creative solutions must be implemented to ensure that cost is not a barrier to preparedness. This could include campaigns that encourage purchasing 1 item each month to reduce cost burden, making homemade kit items, providing discounts for prebuilt kits in major retailers, or providing kits at no cost to low-income households.

The identified gaps in ESKs are not equitable across the nation, with several social and demographic factors associated with kit ownership including age, gender, education level, and region of the country. These data are comparable to the recently released

**Table 4.** Emergency supply kit (ESK) ownership by preparedness, disaster experience, and beliefs (weighted) – United States, 2020–2021

	Fall 2020				Spring 2021			
	Has kit (N = 1160)	No kit (N = 2276)	Total (N = 3436)	P-value	Has kit (N = 2201)	No kit (N = 3864)	Total (N = 6065)	P-value
<b>Has the following preparedness plans/items</b>								
Copies of important docs	608.0 (50.5)	596.4 (49.5)	1204.4 (35.2)	< 0.0001	1049.0 (52.0)	966.9 (48.0)	2015.9 (33.4)	< 0.0001
Easy to get to ESK	755.4 (79.4)	196.1 (20.6)	951.5 (27.8)	< 0.0001	1396.9 (82.4)	298.7 (17.6)	1695.5 (28.1)	< 0.0001
Meeting place outside home	381.8 (58.4)	271.5 (41.6)	653.3 (19.1)	< 0.0001	714.7 (59.5)	487.4 (40.6)	1202.1 (19.9)	< 0.0001
Multiple evacuation routes	379.2 (61.9)	233.8 (38.1)	613.0 (17.9)	< 0.0001	529.9 (66.9)	262.5 (33.1)	792.4 (13.1)	< 0.0001
Emergency comms plan	342.6 (73.2)	125.4 (26.8)	468.0 (13.7)	< 0.0001	695.7 (72.9)	258.4 (27.1)	954.0 (15.8)	< 0.0001
Meeting place outside of the neighborhood	242.4 (73.3)	88.2 (26.7)	330.6 (9.7)	< 0.0001	328.6 (73.7)	117.2 (26.3)	445.8 (7.4)	< 0.0001
None of the above	191.4 (12.3)	1370.5 (87.8)	1561.9 (45.6)	< 0.0001	343.3 (12.8)	2332.1 (87.2)	2675.4 (44.4)	< 0.0001
<b>Preparedness level</b>								
No plans	311.9 (18.0)	1416.8 (82.0)	1728.7 (50.5)	< 0.0001	677.5 (21.9)	2415.8 (78.1)	3093.3 (51.3)	< 0.0001
Some plans	755.1 (47.4)	838.9 (52.6)	1594.1 (46.6)		1366.1 (49.1)	1418.9 (51.0)	2785.0 (46.2)	
All plans	91.2 (89.6)	10.6 (10.4)	101.9 (3.0)		145.8 (94.7)	8.1 (5.3)	153.9 (2.6)	
<b>Experienced previous disaster</b>								
Yes	863.3 (36.0)	1534.5 (64.0)	2397.8 (70.0)	< 0.0001	1562.6 (40.0)	2346.7 (60.0)	3909.3 (64.6)	< 0.0001
No	290.9 (28.3)	736.0 (71.7)	1027.0 (30.0)		636.9 (29.8)	1501.3 (70.2)	2138.2 (35.4)	
<b>Type of disaster experienced</b>								
Sever weather w/outages	678.0 (35.4)	1238.2 (64.6)	1916.3 (56.0)	0.0191	1231.5 (39.5)	1885.6 (60.5)	3117.1 (51.5)	< 0.0001
Hurricane/storm	422.4 (41.7)	590.4 (58.3)	1012.8 (29.6)	< 0.0001	649.5 (44.8)	801.3 (55.2)	1450.8 (24.0)	< 0.0001
Tornado	224.7 (41.3)	319.3 (58.7)	544.0 (15.9)	< 0.0001	384.7 (45.4)	463.2 (54.6)	847.9 (14.0)	< 0.0001
Earthquake/landslide	226.9 (41.7)	317.7 (58.3)	544.6 (15.9)	< 0.0001	392.1 (45.6)	467.1 (54.4)	859.2 (14.2)	< 0.0001
Flood	233.3 (47.9)	253.8 (52.1)	487.1 (14.2)	< 0.0001	330.1 (44.5)	411.2 (55.5)	741.3 (12.3)	< 0.0001
Wildfire	89.8 (44.6)	111.5 (55.4)	201.2 (5.9)	0.0007	167.6 (50.7)	163.2 (49.3)	330.8 (5.5)	< 0.0001
<b>Employment/volunteer in disaster response/recovery</b>								
Yes	307.7 (53.8)	264.4 (46.2)	572.1 (16.7)	< 0.0001	594.4 (50.8)	576.4 (49.2)	1170.8 (19.4)	< 0.0001
No	844.8 (29.6)	2006.0 (70.4)	2850.8 (83.3)		1599.2 (32.8)	3275.9 (67.2)	4875.1 (80.6)	
<b>Would evacuate if told to do so</b>								
Yes	681.5 (34.4)	1299.6 (65.6)	1981.1 (57.8)	0.3797	1346.0 (37.7)	2227.3 (62.3)	3573.2 (59.1)	0.0089
No	476.6 (33.0)	969.4 (67.0)	1446.1 (42.2)		850.9 (34.4)	1624.2 (66.6)	2475.1 (40.9)	
<b>Confident and knows how to prepare for a disaster</b>								
Agree	849.6 (43.3)	1110.5 (56.7)	1960.1 (57.2)	< 0.0001	1616.0 (45.8)	1909.3 (54.2)	3525.3 (58.2)	< 0.0001
Neutral	219.6 (24.8)	666.0 (75.2)	885.6 (25.8)		434.2 (27.2)	1164.7 (72.8)	1598.9 (26.4)	
Disagree	85.4 (14.7)	496.9 (85.3)	582.3 (17.0)		149.2 (16.0)	785.1 (84.0)	934.3 (15.4)	
<b>ESK will improve chance of surviving a disaster</b>								
Agree	991.5 (36.5)	1723.9 (63.5)	2715.4 (79.2)	< 0.0001	1871.0 (41.6)	2627.4 (58.4)	4498.3 (74.3)	< 0.0001
Neutral	120.1 (21.2)	446.1 (78.8)	566.2 (16.5)		282.6 (21.7)	1017.5 (78.3)	1300.1 (21.5)	
Disagree	44.8 (30.4)	102.6 (69.6)	147.4 (4.3)		47.8 (18.6)	209.7 (81.5)	257.5 (4.3)	
<b>ESK costs a lot of money</b>								
Agree	257.3 (32.4)	536.4 (67.6)	793.7 (23.2)	0.0083	552.4 (41.8)	770.7 (58.3)	1323.1 (21.8)	< 0.0001
Neutral	270.8 (30.3)	622.2 (69.7)	893.1 (26.1)		512.5 (29.2)	1245.4 (70.8)	1757.9 (29.0)	
Disagree	628.7 (36.1)	1113.4 (63.9)	1742.1 (50.8)		1136.4 (38.1)	1844.1 (61.9)	2980.4 (49.2)	
<b>Risk of my household being affected by an infectious disease is greater than that of a disaster</b>								
Agree	521.1 (33.6)	1029.5 (66.4)	1550.6 (45.3)	0.5403	876.0 (34.3)	1679.7 (65.7)	2555.7 (42.2)	< 0.0001
Neutral	423.7 (33.1)	857.1 (66.9)	1280.8 (37.4)		814.0 (35.7)	1468.3 (64.3)	2282.3 (37.7)	
Disagree	212.1 (35.7)	382.9 (64.4)	595.1 (17.4)		510.9 (42.0)	705.1 (58.0)	1216.0 (20.1)	

FEMA NHS, which collected data in the first half (February through May) of 2021 and found that 45% had “assembled or updated supplies,” with lower percentages among groups at higher risk (eg, non-primarily English-speaking households, socioeconomically disadvantaged, minority populations).<sup>34</sup> Interestingly, race, income, housing structure type, and home ownership status were not significant within the multivariable models of our data. This could

potentially be because these factors are overlapping with the other components (eg, education level) or are modifiers of the relationship, which has been found in other research.<sup>52,53</sup> This is also consistent with our understanding of race as a social construct disproportionately associated with social, economic, and environmental disadvantages because of systemic and structural racism.<sup>54</sup> While income may not be a barrier to having an ESK, the fact that roughly a quarter cited



**Table 5.** Respondent believes an emergency supply kit (ESK) improves chance of survival (weighted) – United States, 2020–2021

	Fall 2020					Spring 2021				
	Agree (N = 3682)	Neutral (N = 1769)	Disagree (N = 992)	Total (N = 6443)	P-value	Agree (N = 3682)	Neutral (N = 1769)	Disagree (N = 992)	Total (N = 6443)	P-value
<b>Age</b>										
18-34 years	830.3 (80.6)	160.4 (15.6)	39.9 (3.9)	1030.7 (28.5)	0.0021	1337.6 (73.7)	417.8 (23.0)	60.6 (3.3)	1816.1 (28.2)	0.4266
35-54 years	928.2 (77.5)	233.7 (19.5)	36.6 (3.1)	1198.5 (33.1)		1543.1 (72.1)	496.1 (23.2)	102.3 (4.8)	2141.5 (33.3)	
55-74 years	877.5 (77.2)	191.8 (16.9)	67.7 (6.0)	1137.0 (31.4)		1498.7 (73.4)	458.3 (22.4)	86.0 (4.2)	2043.0 (31.7)	
75+ years	187.5 (74.9)	47.1 (18.8)	15.8 (6.3)	250.4 (6.9)		320.6 (72.8)	98.8 (22.4)	21.1 (4.8)	440.5 (6.8)	
<b>Sex</b>										
Male	1342.3 (76.5)	323.5 (18.4)	88.9 (5.1)	1754.8 (48.5)	0.0508	2231.3 (71.6)	746.8 (24.0)	139.2 (4.5)	3117.3 (48.4)	0.0503
Female	1481.3 (79.6)	309.5 (16.6)	71.1 (3.8)	1861.9 (51.5)		2468.8 (74.3)	724.3 (21.8)	130.8 (3.9)	3323.9 (51.6)	
<b>Education</b>										
Less than high school	261.3 (71.6)	78.8 (21.6)	25.1 (6.9)	365.2 (10.1)	< 0.0001	434.7 (63.2)	214.6 (31.2)	38.8 (5.6)	688.0 (10.7)	< 0.0001
High school	764.0 (74.9)	218.1 (21.4)	38.6 (3.8)	1020.7 (28.2)		1258.8 (71.6)	431.8 (24.6)	66.8 (3.8)	1757.5 (27.3)	
Some college	788.7 (78.2)	169.5 (16.8)	50.3 (5.0)	1008.5 (27.9)		1468.4 (75.4)	401.7 (20.6)	77.3 (4.0)	1947.4 (30.2)	
Bachelor's or higher	1009.6 (82.6)	166.6 (13.6)	46.0 (3.8)	1222.2 (33.8)		1538.2 (75.1)	423.0 (20.7)	87.0 (4.3)	2048.2 (31.8)	
<b>Race/ethnicity</b>										
White, non-Hispanic	1759.8 (76.2)	442.1 (19.1)	107.6 (4.7)	2309.5 (63.9)	0.0254	2942.3 (72.0)	969.1 (23.7)	176.9 (4.3)	4088.2 (63.5)	0.0241
Black, non-Hispanic	343.1 (82.8)	58.2 (14.0)	13.1 (3.2)	414.4 (11.5)		534.8 (71.8)	172.5 (23.2)	37.6 (5.1)	745.0 (11.6)	
Hispanic	468.3 (80.6)	90.1 (15.5)	22.3 (3.9)	580.8 (16.1)		814.2 (77.6)	202.3 (19.3)	32.7 (3.1)	1049.2 (16.3)	
Mixed race	41.1 (78.3)	9.5 (18.1)	1.9 (3.7)	52.5 (1.5)		93.8 (78.5)	22.1 (18.5)	3.5 (3.0)	119.4 (1.9)	
Other	211.2 (81.4)	33.1 (12.8)	15.0 (5.8)	259.4 (7.2)		315.1 (71.7)	105.1 (23.9)	19.2 (4.4)	439.4 (6.9)	
<b>Housing structure</b>										
Single family home	2068.1 (78.3)	463.0 (17.5)	110.9 (4.2)	2642.1 (73.1)	0.1163	3393.1 (73.5)	1027.5 (22.3)	195.8 (4.2)	4616.4 (71.7)	0.0883
Townhome/duplex	233.9 (77.8)	43.7 (14.5)	22.8 (7.6)	300.4 (8.3)		398.2 (69.3)	152.4 (26.5)	24.3 (4.2)	574.8 (8.9)	
Apartment	407.0 (76.9)	101.4 (19.2)	21.1 (4.0)	529.5 (14.6)		728.3 (73.6)	217.8 (22.0)	43.0 (4.4)	989.0 (15.4)	
Mobile home, RV, etc.	114.6 (79.3)	24.9 (17.2)	5.1 (3.5)	144.6 (4.0)		180.5 (69.2)	73.5 (28.2)	6.9 (2.6)	260.8 (4.1)	
<b>Ownership status</b>										
Owns	2098.2 (78.8)	446.6 (16.8)	118.7 (4.5)	2663.5 (73.7)	0.3173	3436.2 (73.6)	1040.4 (22.3)	192.7 (4.1)	4669.2 (72.5)	0.4441
Rents	675.0 (76.5)	169.8 (19.2)	38.1 (4.3)	882.9 (24.4)		1181.7 (71.5)	399.4 (24.2)	72.5 (4.4)	1653.6 (25.7)	
Occupy w/o payment	50.4 (71.8)	16.6 (23.7)	3.2 (4.5)	70.3 (1.9)		82.1 (69.4)	31.3 (26.5)	4.8 (4.1)	118.3 (1.8)	
<b>Region</b>										
South	1058.3 (77.5)	250.8 (18.4)	56.7 (4.2)	1365.8 (37.8)	0.4379	1826.0 (74.7)	516.6 (21.1)	102.0 (4.2)	2444.6 (38.0)	0.0002
West	684.3 (78.8)	140.5 (16.2)	43.9 (5.1)	868.7 (24.0)		1168.5 (75.6)	317.4 (20.5)	60.3 (3.9)	1546.1 (24.0)	
Midwest	572.7 (76.6)	143.4 (19.2)	31.7 (4.2)	747.8 (20.7)		916.4 (68.4)	362.8 (27.1)	60.7 (4.5)	1339.9 (20.8)	
Northeast	508.4 (80.1)	98.3 (15.5)	27.6 (4.4)	634.3 (17.5)		789.2 (71.1)	274.3 (24.7)	47.0 (4.2)	1110.6 (17.2)	
<b>Urbanicity</b>										
Metropolitan	2471.2 (78.9)	523.8 (16.7)	137.5 (4.4)	3132.5 (86.6)	0.0059	4111.8 (73.7)	1250.1 (22.4)	220.8 (4.0)	5582.7 (86.7)	0.0025
Non-metropolitan	352.4 (72.8)	109.3 (22.6)	22.5 (4.6)	484.1 (13.4)		588.2 (68.5)	221.0 (25.7)	49.2 (5.7)	858.4 (13.3)	

(Continued)

**Table 5.** (Continued)

	Fall 2020				P-value	Spring 2021				P-value
	Agree (N = 3682)	Neutral (N = 1769)	Disagree (N = 992)	Total (N = 6443)		Agree (N = 3682)	Neutral (N = 1769)	Disagree (N = 992)	Total (N = 6443)	
<b>Household size</b>										
Lives alone	416.7 (78.2)	101.7 (19.1)	14.2 (2.7)	532.7 (14.7)	0.0727	633.7 (69.9)	213.7 (23.6)	59.0 (6.5)	906.3 (14.1)	0.0005
Lives with others	2406.9 (78.1)	531.3 (17.2)	145.7 (4.7)	3083.9 (85.3)		4066.4 (73.5)	1257.4 (22.7)	211.0 (3.8)	5534.8 (85.9)	
<b>Marital status</b>										
Married	1607.6 (77.2)	368.1 (17.7)	105.9 (5.1)	2081.6 (57.6)	0.0664	2675.4 (73.1)	839.0 (22.9)	145.4 (4.0)	3659.8 (56.9)	0.6029
Not married	1216.0 (79.2)	264.9 (17.3)	54.1 (.5)	1535.0 (42.4)		2024.7 (72.8)	632.1 (22.7)	124.6 (4.5)	2781.4 (43.2)	
<b>Children in household</b>										
Household has children	905.6 (78.5)	203.8 (17.7)	43.6 (3.8)	1153.0 (31.9)	0.4394	1584.1 (74.3)	458.0 (21.5)	89.8 (4.2)	2131.8 (33.1)	0.1875
No children in home	1918.0 (77.9)	429.2 (17.4)	116.4 (4.7)	2463.6 (68.1)		3116.0 (72.3)	1031.1 (23.5)	180.2 (4.2)	4309.3 (66.9)	
<b>Household income</b>										
< \$25 000	336.6 (69.8)	112.1 (23.2)	33.5 (6.9)	482.2 (13.3)	< 0.0001	547.6 (68.8)	224.6 (28.2)	23.5 (3.0)	795.8 (12.4)	0.0004
\$25 000 < \$50 000	486.0 (75.2)	135.0 (20.9)	24.9 (3.9)	646.0 (17.9)		798.9 (71.2)	269.9 (24.0)	54.0 (4.8)	1122.8 (17.4)	
\$50 000 < \$75 000	477.0 (79.3)	98.5 (16.4)	25.7 (4.3)	601.2 (16.6)		808.7 (72.4)	263.1 (23.6)	45.6 (4.1)	1117.4 (17.4)	
\$75 000 < \$100 000	399.0 (78.7)	75.1 (14.8)	32.7 (6.5)	506.8 (14.0)		666.5 (73.4)	193.8 (21.3)	48.1 (5.3)	908.4 (14.1)	
\$100 000 < \$150 000	511.1 (80.2)	106.9 (16.8)	19.5 (3.1)	637.5 (17.6)		913.2 (75.7)	256.1 (21.2)	37.5 (3.1)	1206.7 (18.7)	
\$150 000 or more	613.9 (82.6)	105.4 (14.2)	23.6 (3.2)	742.9 (20.5)		965.1 (74.8)	263.6 (20.4)	61.3 (4.8)	1290.0 (20.0)	
<b>Employment status*</b>										
Employed	1830.3 (78.9)	397.6 (17.2)	90.6 (3.9)	2318.5 (64.1)	0.0127	2016.2 (72.0)	653.5 (23.3)	130.6 (4.7)	2800.3 (43.5)	0.1703
Unemployed/retired	859.1 (77.0)	192.0 (17.2)	64.7 (5.8)	1115.7 (30.9)		1845.8 (73.3)	566.1 (22.5)	105.2 (4.2)	2517.1 (39.1)	
Other	134.3 (73.6)	43.4 (23.8)	4.7 (2.6)	182.4 (5.0)		838.1 (74.6)	251.5 (22.4)	34.1 (3.0)	1123.7 (17.5)	

\*Fall 2020 “Employed” includes all currently employed persons, and “Other” includes those who are temporarily out of work; Spring 2021 “Employed” is employed full-time only, and “Other” are those who are employed part-time. Therefore, these are separate categories and should not be compared.

**Table 6.** Respondent believes emergency supply kits are expensive – United States, 2020 - 2021

	Fall 2020				p-value	Spring 2021				p-value
	Agree (N=3682)	Neutral (N=1769)	Disagree (N=992)	Total (N=6443)		Agree (N=3682)	Neutral (N=1769)	Disagree (N=992)	Total (N=6443)	
<b>Age</b>										
18-34 years	332.8 (32.3)	218.9 (21.2)	478.9 (46.5)	1030.7 (28.5)	<.0001	515.0 (28.4)	516.3 (28.4)	784.8 (43.2)	1816.1 (28.2)	<.0001
35-54 years	290.5 (24.2)	340.7 (28.4)	567.3 (47.3)	1198.5 (33.1)		531.4 (24.8)	612.5 (28.6)	1000.9 (46.7)	2144.8 (33.3)	
55-74 years	190.1 (16.7)	334.7 (29.4)	612.1 (53.8)	1136.9 (31.4)		302.3 (14.8)	657.3 (32.2)	1083.6 (53.0)	2043.1 (31.7)	
75+ years	30.0 (12.0)	85.8 (34.3)	134.6 (53.8)	250.4 (6.9)		57.6 (13.0)	175.7 (39.7)	209.4 (47.3)	442.7 (6.9)	
<b>Sex</b>										
Male	361.8 (20.6)	505.1 (28.8)	887.8 (50.6)	1754.8 (48.5)	0.0006	605.3 (19.4)	1003.7 (32.2)	1509.3 (48.4)	3118.3 (48.4)	<.0001
Female	481.6 (25.9)	475.0 (25.5)	905.2 (48.6)	1861.8 (51.5)		801.0 (24.1)	958.0 (28.8)	1569.3 (47.2)	3328.4 (51.6)	
<b>Education</b>										
Less than high school	85.9 (23.5)	110.7 (30.3)	168.6 (46.2)	365.2 (10.1)	<.0001	160.1 (23.3)	261.7 (38.0)	266.2 (38.7)	688.0 (10.7)	<.0001
High school	280.2 (27.5)	306.0 (30.0)	433.2 (42.5)	1019.4 (28.2)		422.4 (24.0)	601.7 (34.1)	728.8 (41.9)	1762.9 (27.4)	
Some college	236.4 (23.4)	283.2 (28.1)	489.2 (48.5)	1008.9 (27.9)		459.8 (23.6)	592.5 (30.4)	895.2 (46.0)	1947.5 (30.2)	
Bachelor's or higher	240.9 (19.7)	280.1 (22.9)	702.0 (57.4)	1223.0 (33.8)		364.1 (17.8)	505.8 (24.7)	1178.4 (57.5)	2048.2 (31.8)	
<b>Race/Ethnicity</b>										
White, Non-Hispanic	497.5 (21.5)	660.8 (28.6)	1152.4 (49.9)	2310.7 (63.9)	0.0069	863.7 (21.1)	1207.6 (29.5)	2020.3 (49.4)	4091.5 (63.5)	0.0001
Black, Non-Hispanic	105.4 (25.4)	118.8 (28.7)	190.2 (45.9)	414.4 (11.5)		143.5 (19.2)	241.8 (32.4)	361.9 (48.4)	747.2 (11.6)	
Hispanic	154.0 (26.6)	134.4 (23.2)	291.1 (50.2)	579.5 (16.0)		274.7 (26.2)	340.9 (32.5)	433.5 (41.3)	1049.2 (16.3)	
Mixed Race	12.8 (24.4)	9.6 (18.3)	30.1 (57.3)	52.5 (1.5)		34.2 (28.6)	31.1 (26.0)	54.1 (45.4)	119.4 (1.9)	
Other	73.6 (28.4)	56.5 (21.8)	129.3 (49.9)	259.4 (7.2)		90.3 (20.6)	140.3 (31.9)	208.8 (47.5)	439.4 (6.8)	
<b>Housing Structure</b>										
Single family home	590.8 (22.4)	703.1 (26.6)	1348.1 (51.0)	2642.0 (73.1)	0.0237	946.3 (20.5)	1407.3 (30.5)	2265.1 (49.0)	4618.6 (71.6)	<.0001
Townhome/Duplex	78.2 (26.0)	81.3 (27.1)	140.9 (46.9)	300.4 (8.3)		118.3 (20.5)	181.1 (31.5)	276.5 (48.0)	575.9 (8.9)	
Apartment	128.7 (24.3)	150.4 (28.4)	250.4 (47.3)	529.5 (14.6)		252.2 (25.5)	290.5 (29.3)	447.4 (45.2)	990.1 (15.4)	
Mobile home, RV, etc.	45.7 (31.6)	45.2 (31.3)	53.7 (37.1)	144.6 (4.0)		89.6 (34.2)	82.9 (31.6)	89.7 (34.2)	262.1 (4.1)	
<b>Ownership Status</b>										
Owns	574.3 (21.6)	716.9 (26.9)	1372.2 (51.5)	2663.4 (73.7)	<.0001	900.1 (19.3)	1434.4 (30.7)	2339.3 (50.1)	4673.7 (72.5)	<.0001
Rents	256.8 (29.1)	249.1 (28.2)	376.9 (42.7)	882.9 (24.4)		469.3 (28.4)	480.9 (29.1)	704.4 (42.6)	1654.6 (25.7)	
Occupy w/o payment	12.4 (17.6)	14.0 (19.9)	43.9 (62.5)	70.3 (1.9)		37.0 (31.3)	46.4 (39.2)	34.9 (29.5)	118.3 (1.8)	
<b>Region</b>										
South	286.6 (21.0)	355.5 (26.0)	723.1 (53.0)	1365.2 (37.8)	<.0001	519.7 (21.2)	726.3 (29.7)	1200.8 (49.1)	2446.8 (38.0)	<.0001
West	246.5 (28.4)	247.6 (28.5)	375.0 (43.2)	869.1 (24.0)		442.3 (28.6)	459.6 (29.7)	644.4 (41.7)	1546.2 (24.0)	
Midwest	183.1 (24.5)	203.4 (27.2)	361.3 (48.3)	747.8 (20.7)		272.3 (20.3)	410.3 (30.6)	660.5 (49.2)	1343.1 (20.8)	
Northeast	127.2 (20.1)	173.5 (27.3)	333.7 (52.6)	634.3 (17.5)		172.1 (15.5)	365.6 (32.9)	572.9 (51.6)	1110.6 (17.2)	
<b>Urbanicity</b>										
Metro	732.3 (23.4)	825.5 (26.4)	1574.7 (50.3)	3132.4 (86.6)	0.0288	1199.9 (21.5)	1690.5 (30.3)	2694.5 (48.3)	5584.9 (86.6)	0.1030
Non-Metro	111.2 (23.0)	154.6 (31.9)	218.4 (45.1)	484.1 (13.4)		206.4 (24.0)	271.2 (31.5)	384.1 (44.6)	861.7 (13.4)	

(Continued)

**Table 6.** (Continued)

	Fall 2020				p-value	Spring 2021				p-value
	Agree (N=3682)	Neutral (N=1769)	Disagree (N=992)	Total (N=6443)		Agree (N=3682)	Neutral (N=1769)	Disagree (N=992)	Total (N=6443)	
<b>Household Size</b>										
Lives alone	120.7 (22.6)	157.8 (29.6)	254.6 (47.8)	533.1 (14.7)	0.3688	174.9 (19.2)	266.4 (29.3)	468.2 (51.5)	909.5 (14.1)	0.0339
Lives with others	722.7 (23.4)	822.2 (26.7)	1538.5 (49.9)	3083.4 (85.3)		1231.4 (22.2)	1695.3 (30.6)	2610.4 (47.1)	5537.1 (85.9)	
<b>Marital Status</b>										
Married	431.7 (20.7)	569.7 (27.4)	1080.1 (51.9)	2081.5 (57.6)	<.0001	754.4 (20.6)	1098.4 (30.0)	1809.3 (49.4)	3662.1 (56.8)	0.0039
Not married	411.7 (26.8)	410.3 (26.7)	713.0 (46.5)	1535.0 (42.4)		652.0 (23.4)	863.3 (31.0)	1269.3 (45.6)	2784.6 (43.2)	
<b>Children in home</b>										
Household has kids	331.2 (28.8)	285.2 (24.8)	535.4 (46.5)	1151.7 (31.9)	<.0001	592.5 (27.8)	591.0 (27.7)	948.3 (44.5)	2131.8 (33.1)	<.0001
No kids in home	512.2 (20.8)	694.9 (28.2)	1257.7 (51.0)	2464.8 (68.2)		813.8 (18.9)	1370.7 (31.8)	2130.3 (49.4)	4314.8 (66.9)	
<b>Household Income</b>										
<\$25,000	134.1 (27.8)	152.6 (31.6)	195.5 (40.6)	482.2 (13.3)	<.0001	231.5 (29.1)	253.3 (31.8)	312.1 (39.2)	796.9 (12.4)	<.0001
\$25,000 < \$50,000	177.4 (27.5)	203.4 (31.5)	265.2 (41.1)	646.0 (17.9)		284.4 (25.3)	384.8 (34.2)	457.0 (40.6)	1126.2 (17.5)	
\$50,000 < \$75,000	130.0 (21.6)	187.0 (31.1)	284.2 (47.3)	601.2 (16.6)		267.8 (24.0)	368.3 (32.9)	482.3 (43.1)	1118.4 (17.4)	
\$75,000 < \$100,000	119.3 (23.5)	120.2 (23.7)	268.6 (52.9)	508.0 (14.1)		190.6 (21.0)	304.5 (33.5)	413.3 (45.5)	908.4 (14.1)	
\$100,000 < \$150,000	136.5 (21.5)	152.2 (23.9)	347.5 (54.6)	636.2 (17.6)		239.3 (19.8)	341.7 (28.3)	625.8 (51.9)	1206.7 (18.7)	
\$150,000 or more	146.2 (19.7)	164.7 (22.2)	432.0 (58.2)	742.9 (20.5)		192.7 (14.9)	309.2 (24.0)	788.1 (61.1)	1290.0 (20.0)	
<b>Employment Status*</b>										
Employed	560.1 (24.2)	621.7 (26.8)	1135.9 (49.0)	2317.7 (64.1)	0.0950	577.7 (20.6)	867.4 (30.9)	1358.5 (48.5)	2803.6 (43.5)	0.0050
Unemployed/Retired	231.5 (20.7)	310.4 (27.8)	574.5 (51.5)	1116.5 (30.9)		581.1 (23.1)	791.9 (31.4)	1146.4 (45.5)	2519.3 (39.1)	
Other	51.9 (28.5)	47.9 (26.3)	82.6 (45.3)	182.4 (5.0)		247.5 (22.0)	302.5 (26.9)	573.7 (51.1)	1123.7 (17.4)	

\*Fall 2020 "Employed" includes all currently employed persons and "Other" includes those who are temporarily out of work; Spring 2021 "Employed" is employed full time only and "Other" are those who are employed part-time. Therefore, these are separate categories and should not be compared.

that ESKs cost a lot of money suggests that this is a potential barrier that needs to be addressed. Those who think it costs a lot report higher kit ownership than those who disagree or are neutral so their perception could be based on their experience in purchasing items. Further analysis into this relationship between cost (or perception of cost) and possession of an ESK is warranted.

Of particular concern are older adults (those 75 years or more) who were less likely than other age groups to have a kit. Older adults tend to have more chronic conditions, mobility issues, or other factors that may impact their health and safety during a disaster. Men are more likely than women to have an ESK as well as be confident in preparing for a disaster. In addition, those who completed at least some college were more likely to have a kit than those with just a high school education. There are several promotional efforts that could be done to help mitigate the potential financial barrier and address the demographic disparities (eg, older adults, women) such as campaigns that suggest gathering supplies over time to reduce the financial burden, marketing pre-made kits at discounted prices in common retailers, and using preparedness funds to help provide kits to those in need.<sup>40,46</sup> This could help ensure that those who are both most in need and least likely to have a kit have a basic level of preparedness.

Despite their importance, social determinants were not the only factors that mattered in terms of ESK ownership. As expected, being prepared in 1 area increased the likelihood of having an ESK. In fact, those who had all 5 recommended FEMA plans were almost 64 times more likely to have an ESK. Even having some plans increased the odds of having a kit by almost 3.5 times. This positive impact on having an ESK by having 1 or more emergency preparedness plans can be leveraged to further increase awareness and education around preparedness planning and encourage the creation of such plans by households. In addition, those who felt confident in preparing for a disaster had over 4 times the odds of having an ESK and had almost 3 times the odds of being prepared. Also, those who believed that ESKs would improve their chance of surviving a disaster were 3 times more likely to have a kit. This is important in terms of people's mindset and is consistent with previous research on preparedness and several theories on behavior modifications.<sup>55–57</sup>

Believing that a disaster is not the greatest threat to the household also has an impact. Those who believe the risk of an infectious disease is greater than that of a disaster were less likely to have a kit than those who disagreed with the statement. This is important to help inform and target communication efforts to households. For example, if someone is confident in their preparedness for a disaster or does not believe that a disaster will affect their home, they may not listen to standard approaches to messaging. In addition, the personal experiences of respondents played a key role in both attitudes and behaviors. Most respondents had experienced some type of disaster. This factored into their preparedness with those experiencing any type of disaster reporting higher levels of kit ownership than those who had not. While respondents in these surveys experienced mostly natural disasters, such as flooding and wildfires, ESK recommendations should not be limited to such incidents. ESKs are beneficial to any disaster or emergency that may necessitate staying within the home for a period of time or that limits access to resources (eg, road blockages, supply chain issues). The COVID pandemic served to reinforce this point and the continued need for such an all-hazards approach to preparedness.

The impact of respondent disaster experience was amplified when it came to experience working or volunteering in disaster

response or recovery. Those who had such experiences had more than 100% increased odds of having a kit and almost 200% increased odds of being prepared. Those who have experienced wildfires were the most likely to have an ESK. This is important since wildfires can occur without warning and in unpredictable ways, causing necessary evacuations to happen quickly. The disaster-type associations could be linked to regional associations as geographic region significantly impacts ESK ownership. Respondents in the South and West were more likely to report having ESKs. Texas and California are the 2 most disaster-prone states in the United States with 102 and 100 federal major disaster declarations since 1950, respectively.<sup>57</sup> However, while the South had the most disaster declarations in that time frame (n = 989), the Midwest had the second most disaster declarations with 576, and New York state (in the Northeast) ranked fourth. Therefore, while true that Southern states have the most experience and therefore could be more prepared based on such experience, disasters can (and do) happen in all regions.

## Conclusion

Overall, these data show that, as a nation, there is much work to be done in terms of ESK ownership. While these data are important to provide a national picture to federal agencies, the significant regional differences also highlight the fact that all disasters are local. Therefore, efforts must continue to be made at the local level to both inform and address ESK ownership. For example, the need for tailored strategies focused on groups that have been marginalized and under-resourced communities who are both at high risk for disasters and have low levels of emergency kit ownership. These include focused communication strategies to address barriers, including those related to costs, as well as efforts to provide ESKs. These data are an essential starting point in characterizing ESK ownership and can be used to help tailor public messaging, work with partners to increase ESK ownership, and guide future research.

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**Ethical standards.** These data were considered not human subjects research by the CDC's National Center for Environmental Health (NCEH) Office of Science on August 14, 2020; therefore, it was exempt from the human subjects institutional review board review.

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