Comparison of Household Perceptions and Practices of Food and Water Emergency Preparedness Between Latter-Day Saints and Non-Latter-Day Saints in the USA

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Abstract
This study evaluated whether Latter-day Saints have more favorable perceptions and practices of food and water emergency preparedness than other households. Individuals across 46 states in the USA completed an online survey in 2014 (n = 572). Results indicated that Latter-day Saints, compared to Non-Latter-day Saints, were more likely to have a disaster supplies kit, to have long-term food storage, to have preserved food by canning/bottling, and to perceive neighborhood/community connectedness. Latter-day Saints had significantly lower odds of having less than one month of food storage available compared to Non-Latter-day Saints. Our findings suggest Latter-day Saints may be better prepared to handle a disaster than Non-Latter-day Saints.

Keywords Emergency preparedness · Religion · The Church of Jesus Christ of Latter-day Saints · Food storage · Water

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Introduction

The 2020 National Household Survey from the Federal Emergency Management Agency (FEMA) indicated 81% of households in the USA had gathered supplies to last 3 or more days (Federal Emergency Management Agency, 2021a, b). FEMA emphasizes the need for personal and community preparedness to mitigate the effects of a disaster, including collaboration with faith-based organizations (Federal Emergency Management Agency, 2014).

McGeehan and Baker (2017) examined emergency preparedness in the context of religiosity through narratives of members of four faith communities (Bahá’í, Buddhist, The Church of Jesus Christ of Latter-day Saints [The Church of Jesus Christ], and The United Methodist Church) in the Hawaiian Islands. It was found that faith-based beliefs influenced individuals’ perceptions and experiences with disaster preparedness, and that preparedness varied by religion (McGeehan & Baker, 2017). Latter-day Saint participants were most prepared, with authors recognizing that church-provided education on emergency preparedness may account in part for the greater degree of preparedness (McGeehan & Baker, 2017; The Church of Jesus Christ of Latter-day Saints, n.d.a).

Religious leaders from the Church of Jesus Christ emphasize principles of self-reliance and encourage its members to prepare for the unexpected with adequate finances, education including first aid training, regularly updated emergency plans, and a supply of food, water, and other essentials (The Church of Jesus Christ of Latter-day Saints, n.d.a). Over 100 church-run Home Storage Centers across the USA and Canada, as well as an online store (store.churchofjesuschrist.org), assist church members and others to build their long-term food supply with bulk pre-packaged shelf-stable foods and food preservation supplies (The Church of Jesus Christ of Latter-day Saints, n.d.b). Based on this, teachings on preparedness and support of member preparedness efforts by the Church of Jesus Christ may have an influence on the preparedness perceptions and practices of individuals who receive that information.

Beyond the McGeehan and Baker (2017) qualitative study, little is published concerning the actual food and water storage practices of Latter-day Saints, and whether Latter-day Saints have more favorable food and water storage practices than non-Latter-day Saints (non-LDS). Thus, the purpose of this study was to examine how a religious environment affects individuals’ perceptions and practices of household food and water emergency preparedness.

We hypothesized that Latter-day Saints would have more favorable perceptions of their readiness for and practices related to food and water emergency preparedness compared to Non-LDS. Because Latter-day Saints have partnered with other community organizations to provide emergency preparedness events for the public (The Church of Jesus Christ of Latter-day Saints, 2007), we further hypothesized that Non-LDS living in high Latter-day Saint population density areas (HNon) would have more favorable food and water preparedness perceptions and practices compared to Non-LDS living in low Latter-day Saint population density areas (LNon).
Methods

Study Design and Sample Recruitment

This was a cross-sectional study in which an online survey on emergency preparedness was administered to a convenience sample of adults (n=572, 42% response rate) enrolled as Qualtrics survey participants in August 2014. Eligibility criteria included being 18 years or older and residing in the USA. The sample drew from 46 states with most from the Western region of the USA.

Qualtrics invited survey participants to complete a series of screening questions to determine study eligibility. Eligible participants proceeded to an informed consent page and by clicking “next” signified their agreement to participate in the study. Participants received compensation for their time in taking the survey based on Qualtrics panel rates. The Brigham Young University’s Institutional Review Board approved this study.

Survey Development and Data Collection

The 142-item survey inquired about perceptions of emergency preparedness, food and water stored for emergencies, food and water storage practices, and religious affiliation. More specific details about the survey have been published elsewhere (Hiatt et al., 2021). For the current paper, a series of questions related to religious affiliation and practices, along with emergency preparedness perceptions and practices, were used. Table 1 provides more detail about the survey questions, including the type of question used (Salant & Dillman, 1994) and the associated response options.

The terms “household,” large-scale disaster or emergency,” “non-perishable foods,” “long-term food storage,” “disaster supplies kit,” and “accessible cash” were defined on questions, as applicable (Appendix). Demographics variables included sex, age, annual household income, accessible cash, and number of children in the household.

Data Analysis

The number of respondents who clicked on the survey link was 1360; 42% of these (n=572) were usable responses (n=648 exited the survey before completion; n=124 incorrectly answered an attention filter; n=12 finished the survey in less than 10 min; and n=4 had duplicate IP addresses, so only the first response was used). Demographic data were analyzed using descriptive statistics.

Subjects who identified as “Latter-day Saint/Mormon” were classified as Latter-day Saints (The Church of Jesus Christ of Latter-day Saints, n.d.c) and those who identified with another religious affiliation or reported no religious affiliation were classified as total Non-LDS. Total Non-LDS was separated by residence, those living in Utah or Idaho (high Latter-day Saint population density areas or HNon) and
| Table 1 | Survey questions, question type, and response options for religious and emergency preparedness variables |
|---------|---------------------------------------------------------------------------------------------------|
| **Survey question(s)** | **Survey Question Type and Response Options** |
| **Religious variables** | | |
| What is your religious affiliation, if any? | Partially closed-ended with unordered choices  
Response options: Christian, Jewish, Muslim, Other. Please specify, and None |
| (For those marking “Christian” as their religious affiliation) What is your Christian affiliation? | Partially closed-ended with unordered choices  
Response options: Orthodox, Roman Catholic, Mainline Protestant, Evangelical Protestant, Latter-day Saint/Mormon, and Other. Please specify |
| **Emergency preparedness variables** | | |
| Overall, how well prepared do you feel your household is to handle a large-scale disaster or emergency? | Closed-ended with 3-point Likert scale choices  
Response options: 1 = Not prepared, 2 = Somewhat prepared, and 3 = Well prepared |
| How well prepared do you feel your household is to do each of the following actions in a large-scale disaster or emergency? Provide food [water] for my household | Closed-ended with 3-point Likert scale choices  
Response options: 1 = Not prepared, 2 = Somewhat prepared, and 3 = Well prepared |
| Have you ever preserved food by canning, drying, or freezing? | Closed-ended with dichotomous choices  
Response options: Yes and No |
| How often have you preserved food using the following methods? Canning or bottling [Drying/dehydrating; Freezing] food | Closed-ended with ordered choices  
Response options: Within the past year, Within the past 3 years, Within the past 5 years, and More than 5 years ago |
| Do you have any food that is commercially or self-packaged for long-term storage? Mark all that apply | Closed-ended with unordered choices  
Response options: Commercially packaged (from a store or online source), Self-packaged (at home or another location), and I do not have any food packaged for long-term storage |
| Does your household have at least one "disaster supplies kit" that you could take with you if you had to leave your home on short notice? | Closed-ended with dichotomous choices  
Response options: Yes and No |
| Think about all of the food you currently have in your household, including food in your refrigerator/freezer, food on your kitchen shelves, food stored for emergency situations, or any other food available in your home. About how many days, weeks, or months could the food last to feed all members of your household based on normal portion sizes and meal patterns? | Closed-ended with ordered choices  
Response options: Less than 3 days, 3 days, More than 3 days, but less than 1 week, At least 1 week, but less than 1 month, At least 1 month, but less than 3 months, At least 3 months, but less than 6 months, At least 6 months, but less than 1 year, and 1 year or more |
| Think about all of the water you have stored in containers that could be used for drinking water in an emergency situation. About how many days, weeks, or months could your stored water last for all members of your household if you allow for 1 gallon of water per person per day? Note that 1 gallon is the size of: a milk jug, 8 water bottles (500 mL/16.9 fl oz), 2 soda bottles (2-L) | Closed-ended with ordered choices  
Response options: Less than 3 days, 3 days, More than 3 days, but less than 1 week, At least 1 week, but less than 1 month, At least 1 month, but less than 3 months, and More than 3 months |
those living in all states outside of Utah or Idaho (low Latter-day Saint population density areas or LNon). The geographic regions included in these groupings were based on findings of the 2014 Pew Research Center Religious Landscape Study which lists Utah and Idaho as having the highest percentage of Latter-day Saints in the USA (Pew Research Institute, n.d.).

Survey responses using a Likert scale were averaged. Kruskal–Wallis, Chi-square statistics, and logistic regression analyses were used to compare perceptions and practice of preparedness between Latter-day Saints, HNon, LNon, and total Non-LDS. Logistic regression analyses were adjusted for age, sex, income, number of children in the household, previous disaster experience, and perceived influence of non-religious emergency preparedness information resources. Statistical Analysis System (SAS) software (version 9.2) was used for all statistical analyses, with a Bonferroni correction-adjusted p-value of p < 0.001.

**Results**

Demographic results are presented in Table 2. Most respondents were female. Approximately 80% had accessible cash less than one week to less than six months, with no significant differences between groups. Latter-day Saints were significantly younger and had a higher average number of children in the household than total Non-LDS respondents.

Table 3 presents perceived responsibility and preparedness levels of households and government entities and perceptions of neighborhood/community connectedness. No differences were observed between Latter-day Saints and total Non-LDS, Non-LDS living in high Latter-day Saint population density areas (Utah or Idaho; HNon), and Non-LDS living in low Latter-day Saint population density areas (states
| Characteristics                      | Total (n = 572) | Latter-day Saints (n = 131) | Total Non-LDS (n = 441) | HNon (n = 85) | LNon (n = 356) |
|-------------------------------------|----------------|-----------------------------|-------------------------|--------------|---------------|
|                                     | n (%)a         |                             |                         |              |               |
| **Sexb**                            |                |                             |                         |              |               |
| Male                                | 196 (34.3)     | 34 (26.0)                   | 162 (36.8)              | 24 (28.2)    | 138 (38.9)    |
| Female                              | 375 (65.7)     | 97 (74.1)                   | 278 (63.2)              | 61 (71.8)    | 217 (61.1)    |
| **Age (years)**c†                   |                |                             |                         |              |               |
| 18–24                               | 77 (13.5)      | 25 (19.1)                   | 52 (11.8)               | 7 (8.2)      | 45 (12.6)     |
| 25–34                               | 133 (23.3)     | 48 (36.6)                   | 85 (19.3)               | 21 (24.7)    | 64 (18.0)     |
| 35–44                               | 67 (11.7)      | 14 (10.7)                   | 53 (12.0)               | 13 (15.3)    | 40 (11.2)     |
| 45–54                               | 74 (13.0)      | 11 (8.4)                    | 63 (14.3)               | 13 (15.3)    | 50 (14.0)     |
| 55–64                               | 106 (18.5)     | 18 (13.7)                   | 88 (20.0)               | 19 (22.4)    | 69 (19.4)     |
| 65–74                               | 97 (17.0)      | 12 (9.2)                    | 85 (19.3)               | 10 (11.8)    | 75 (21.1)     |
| 75 and older                        | 18 (3.2)       | 3 (2.3)                     | 15 (3.4)                | 2 (2.4)      | 13 (3.7)      |
| **Annual Household Incomec**        |                |                             |                         |              |               |
| $19,999 or less                     | 94 (16.6)      | 21 (16.5)                   | 73 (16.7)               | 21 (25.0)    | 52 (14.7)     |
| $20,000 to $39,999                  | 157 (27.7)     | 29 (22.3)                   | 128 (29.3)              | 27 (32.1)    | 101 (28.6)    |
| $40,000 to $59,999                  | 120 (21.2)     | 28 (21.5)                   | 92 (21.1)               | 18 (21.4)    | 74 (21.0)     |
| $60,000 to $79,999                  | 84 (14.8)      | 27 (20.8)                   | 57 (13.0)               | 8 (9.5)      | 49 (13.9)     |
| $80,000 to $99,999                  | 46 (8.1)       | 13 (10.0)                   | 33 (7.6)                | 3 (3.6)      | 30 (8.5)      |
| $100,000 or more                    | 66 (11.6)      | 12 (9.2)                    | 54 (12.4)               | 7 (8.3)      | 47 (13.3)     |
| **Accessible Cashd**                |                |                             |                         |              |               |
| Less than 1 week                    | 137 (24.0)     | 27 (20.6)                   | 110 (25.1)              | 28 (33.0)    | 82 (23.2)     |
| At least 1 week, but less than 1 month | 118 (20.7)   | 31 (23.7)                   | 87 (19.8)               | 13 (15.3)    | 74 (20.9)     |
| At least 1 month, but less than 3 months | 122 (21.4)  | 32 (24.4)                   | 90 (20.5)               | 14 (16.5)    | 76 (21.5)     |
| At least 3 months, but less than 6 months | 70 (12.3)  | 14 (10.7)                   | 56 (12.8)               | 12 (14.1)    | 44 (12.4)     |
| At least 6 months                   | 123 (21.6)     | 27 (20.6)                   | 96 (21.9)               | 18 (21.2)    | 78 (22.0)     |
| **Previous Disaster Experiencee**  |                |                             |                         |              |               |
| Yes                                 | 357 (62.4)     | 73 (55.7)                   | 284 (64.4)              | 47 (55.3)    | 237 (66.6)    |
| No                                  | 215 (37.6)     | 58 (44.3)                   | 157 (35.6)              | 38 (44.7)    | 119 (33.4)    |
| **Number of children in household, mean ± SEb** | 0.7 ± 1.2 | 1.3 ± 0.1                   | 0.5 ± 0.1*              | 0.6 ± 0.1    | 0.4 ± 0.1‡    |

*Non-Latter-day Saints living in high Latter-day Saint population density area (UT or ID); HNon Non-Latter-day Saints living in low Latter-day Saint population density area (states outside UT or ID); Total Non-LDS All Non-Latter-day Saints living in low (LNon) and high (HNon) Latter-day Saint population density areas

aPercentages may not total 100 due to rounding
bMissing data, n = 1
cMissing data, n = 5
dMissing data, n = 2; accessible cash defined as cash stored in your home, checking account, savings account and any other account that you could access to provide basic needs (food, shelter, etc.) for your

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outside of Utah and Idaho; LNon) related to perceptions of general preparedness, food preparedness, and water preparedness.

Latter-day Saints had a significantly higher perception of neighborhood/community connectedness than Total Non-Latter-day Saints, HNon, and LNon (Table 3). Total Non-LDS had a statistically significant greater expectation than Latter-day Saints that the federal and state government be responsible for household care in an emergency. LNon had a significantly higher expectation than Latter-day Saints that the federal and state government be responsible for household care in an emergency; however, there were no significant differences in expectations for government responsibility between HNon and LNon. Yet, all groups scored individual responsibility higher than government organizations. Although significance was found between Latter-day Saints vs. Total Non-LDS and Latter-day Saints vs. LNon regarding individual responsibility, mean scores were not meaningfully different.

Table 4 presents the adjusted odd ratios for various perceptions and practices of household emergency preparedness. Latter-day Saints had significantly lower odds of having less than one month of food storage available than Total Non-LDS and Non-LDS living in low Latter-day Saint population density areas (outside of Utah and Idaho; LNon). Latter-day Saints, compared to Total Non-LDS, were seven times more likely to have a disaster supplies kit and almost five times more likely to have long-term food storage available. Latter-day Saints were three times more likely to have preserved food by canning/bottling than total Non-LDS.

Latter-day Saints and Non-LDS living in high Latter-day Saint population density areas (Utah and Idaho; HNon) had significantly higher odds of having preserved food by drying/dehydrating and canning/bottling than LNon (Table 4). Latter-day Saints were four times more likely to perceive being connected to their neighborhood/community compared to Total Non-LDS. No significant differences were evident among respondents for perceived general, food, and water preparedness and the length of time water storage would be available for their household in an emergency.

**Discussion**

The current study suggests that Latter-day Saints, compared to Non-LDS, were more prepared for a large-scale disaster or emergency by having food storage available for a longer period of time, having a disaster supplies kit available, knowing about and practicing food preservation by canning/bottling, and feeling more connected to their neighborhood/community.
Table 3: Perceived responsibility and emergency preparedness levels of households and government entities and perceptions of neighborhood/community connectedness among Latter-day Saints and Non-Latter-day Saints, by high and low Latter-day Saints population density areas, using Chi-square and Kruskal–Wallis statistics

| Perceived household general preparedness level<sup>b</sup> | Latter-day Saints (n = 131) | HNon (n = 85) | LNon (n = 356) | Total Non-LDS (n = 441) |
|-----------------------------------------------------------|-----------------------------|---------------|----------------|------------------------|
| Prepared                                                  | 93 (71.0)                   | 54 (63.5)     | 211 (59.3)     | 265 (60.1)             |
| Not Prepared                                              | 38 (29.0)                   | 31 (36.5)     | 145 (40.7)     | 176 (39.9)             |

| Perceived household food preparedness level<sup>b</sup> | Latter-day Saints (n = 131) | HNon (n = 85) | LNon (n = 356) | Total Non-LDS (n = 441) |
|--------------------------------------------------------|-----------------------------|---------------|----------------|------------------------|
| Prepared                                               | 115 (87.8)                  | 67 (78.8)     | 274 (77.0)     | 341 (77.3)             |
| Not prepared                                           | 16 (12.2)                   | 18 (21.2)     | 82 (23.0)      | 100 (22.7)             |

| Perceived household water preparedness level<sup>b</sup> | Latter-day Saints (n = 131) | HNon (n = 85) | LNon (n = 356) | Total Non-LDS (n = 441) |
|----------------------------------------------------------|-----------------------------|---------------|----------------|------------------------|
| Prepared                                                | 85 (64.9)                   | 55 (64.7)     | 217 (61.0)     | 272 (61.7)             |
| Not prepared                                            | 46 (35.1)                   | 30 (35.3)     | 139 (39.0)     | 169 (38.3)             |

| Responsibility to care for household in large-scale disaster or emergency<sup>c</sup> | Latter-day Saints (n = 131) | HNon (n = 85) | LNon (n = 356) | Total Non-LDS (n = 441) |
|----------------------------------------------------------------|-----------------------------|---------------|----------------|------------------------|
| Individual household | 4.2 ± 0.1<sup>a</sup> | 4.3 ± 0.1<sup>a</sup> | 4.2 ± 0.04<sup>b</sup> | 4.2 ± 0.04* |
| Federal government   | 2.3 ± 0.1<sup>a</sup> | 2.6 ± 0.1<sup>AB</sup> | 2.8 ± 0.1<sup>B</sup> | 2.8 ± 0.1* |
| State government     | 2.4 ± 0.1<sup>a</sup> | 2.7 ± 0.1<sup>AB</sup> | 2.9 ± 0.1<sup>B</sup> | 2.9 ± 0.1* |
| Local government     | 2.5 ± 0.1<sup>a</sup> | 2.7 ± 0.1<sup>a</sup> | 3.0 ± 0.1<sup>A</sup> | 3.0 ± 0.1 |

| Preparedness to handle a large-scale disaster or emergency | Latter-day Saints (n = 131) | HNon (n = 85) | LNon (n = 356) | Total Non-LDS (n = 441) |
|------------------------------------------------------------|-----------------------------|---------------|----------------|------------------------|
| Individual household | 3.1 ± 0.1<sup>a</sup> | 3.0 ± 0.1<sup>a</sup> | 2.9 ± 0.06<sup>a</sup> | 2.9 ± 0.05 |
| Federal government   | 2.4 ± 0.1<sup>a</sup> | 2.8 ± 0.1<sup>a</sup> | 2.8 ± 0.06<sup>a</sup> | 2.8 ± 0.05 |
| State government     | 2.8 ± 0.1<sup>a</sup> | 2.8 ± 0.1<sup>a</sup> | 2.8 ± 0.06<sup>a</sup> | 2.8 ± 0.05 |
| Local government     | 2.9 ± 0.1<sup>a</sup> | 2.9 ± 0.1<sup>a</sup> | 2.8 ± 0.05<sup>a</sup> | 2.8 ± 0.05 |

| Neighborhood/community connectedness | Latter-day Saints (n = 131) | HNon (n = 85) | LNon (n = 356) | Total Non-LDS (n = 441) |
|--------------------------------------|-----------------------------|---------------|----------------|------------------------|
|                                      | 2.8 ± 0.1<sup>a</sup> | 2.3 ± 0.1<sup>B</sup> | 2.4 ± 0.05<sup>B</sup> | 2.4 ± 0.04* |

<sup>a</sup>Percentages may not total 100 due to rounding

<sup>b</sup>Researchers grouped responses of “well prepared” and “somewhat prepared” to form the “prepared” category and responses of “not at all prepared” to form the “not prepared” category

<sup>c</sup>Respondents could select response from 5-point Likert scale: 1 = Strongly Disagree to 5 = Strongly Agree

<sup>d</sup>Different letters (A or B) within rows indicate statistical significance (p < 0.001), excluding “Total Non-LDS” column which was only compared with the “Latter-day Saints” column

<sup>e</sup>Missing data, n = 1

* p < 0.001, Latter-day Saints vs. Total Non-LDS
Table 4 Logistic regression models for perceptions and practices of food and water emergency preparedness for a large-scale disaster or emergency among Latter-day Saints and Non-Latter-day Saints, by high and low Latter-day Saints population density areas

| Perceptions and practices of food and water emergency preparedness | Latter-day Saints (n = 131)a | HNon (n = 85) | LNon (n = 356) | HNon (Ref)b vs. LNon | Total Non-LDS (Ref)c vs. Latter-day Saints |
|---------------------------------------------------------------|------------------------------|---------------|----------------|---------------------|------------------------------------------|
| Adjusted OR (95% CI)d                                          |                              |               |                |                     |                                          |
| Perceived general household preparedness                      | 1.0                          | 0.7 (0.4–1.3) | 0.5 (0.3–0.8) | 0.7 (0.4–1.2)       | 2.0 (1.2–3.2)                            |
| Perceived household food preparedness                         | 1.0                          | 0.5 (0.2–1.0) | 0.4 (0.2–0.7) | 0.9 (0.5–1.6)       | 2.4 (1.3–4.6)                            |
| Perceived household water preparedness                        | 1.0                          | 1.0 (0.5–1.9) | 0.7 (0.4–1.1) | 0.7 (0.4–1.2)       | 1.3 (0.8–2.1)                            |
| Household food storage available < 1 month                    | 1.0                          | 2.6 (1.4–4.7) | 2.9 (1.8–4.6)* | 1.1 (0.7–1.9)       | 0.4 (0.2–0.6)*                           |
| Household water storage available < 1 month                   | 1.0                          | 2.1 (0.9–4.8) | 2.1 (1.1–3.8) | 1.0 (0.5–2.2)       | 0.5 (0.3–0.9)                            |
| Disaster supplies kit available                               | 1.0                          | 0.2 (0.1–0.5)* | 0.1 (0.1–0.2)* | 0.5 (0.3–0.9)       | 7.2 (4.4–11.9)*                          |
| Long-term food storage available                              | 1.0                          | 0.3 (0.1–0.5)* | 0.2 (0.1–0.3)* | 0.8 (0.4–1.3)       | 4.8 (3.0–7.7)*                           |
| Preserved food previously                                    | 1.0                          | 1.4 (0.8–2.4) | 1.2 (0.8–1.8) | 0.9 (0.5–1.4)       | 0.8 (0.5–1.2)                            |
| Preserved food previously by drying/dehydrating               | 1.0                          | 1.0 (0.5–1.8) | 0.4 (0.2–0.6)* | 0.4 (0.2–0.6)*      | 2.1 (1.4–3.4)                            |
| Preserved food previously by canning/bottling                 | 1.0                          | 0.6 (0.3–1.1) | 0.2 (0.2–0.4)* | 0.4 (0.2–0.7)*      | 3.3 (2.1–5.2)*                           |
| Preserved food previously by freezing                        | 1.0                          | 0.8 (0.4–1.6) | 0.5 (0.3–0.8) | 0.6 (0.4–1.1)       | 1.8 (1.1–2.9)                            |
| Perceived neighborhood/community connectedness                | 1.0                          | 0.2 (0.1–0.4)* | 0.2 (0.1–0.5)* | 1.2 (0.7–2.0)       | 4.3 (2.3–8.2)*                           |

A large-scale disaster or emergency defined as “any event that leaves you isolated in your home or displaces you from your home for at least 3 days.”

HNon Non-Latter-day Saints living in high Latter-day Saint population density area (UT or ID), LNon Non-Latter-day Saints living in low Latter-day Saint population density area (states outside UT or ID), Total Non-LDS All Non-Latter-day Saints living in low (LNon) and high (HNon) Latter-day Saint population density areas

aLatter-day Saints set as reference group, with comparison to HNon and LNon

bRef. = the reference group is HNon set at an odds ratio of 1.0

cRef. = the reference group is non-LDS, set at an odds ratio of 1.0

dAdjusted for effect of age, sex, income, number of children in the household, previous disaster experience, and perceived influence of non-religious emergency preparedness information resources

*p < 0.001
to their neighborhood/community. However, despite these findings, no differences in perceptions of food or water storage, or general preparedness were observed between Latter-day Saints and Non-LDS. These inconsistent findings were surprising given the emphasis of the Church of Jesus Christ on members being prepared (The Church of Jesus Christ of Latter-day Saints, n.d.a).

The FEMA Ready campaign guidelines suggest that a key component of preparedness is maintaining an emergency supply kit (formerly called disaster supplies kit) with a supply of non-perishable food, water, and other supplies (Federal Emergency Management Agency, 2020). The current study finding that Latter-day Saints were seven times more likely than Non-LDS to have a disaster supplies kit, with over 60% of Latter-day Saints having a disaster supplies kit available, suggested the majority were well prepared to meet FEMA guidelines. Further, Latter-day Saints were almost five times as likely to have long-term food storage for more than one month, compared with Non-LDS, possibly putting them in an even better position for being able to provide food for their household during an emergency.

It is likely that the emphasis by the Church of Jesus Christ leaders on emergency preparedness explains the noted differences between Latter-day Saints and Non-LDS in our study (The Church of Jesus Christ of Latter-day Saints, n.d.a). In a qualitative study by McGeehan and Baker (2017), religious narratives revealed that Latter-day Saint interviewees were the only religious affiliates aware of disaster preparedness or educational outreach initiatives within their faith community. McGeehan and Baker (2017) further noted that the Church of Jesus Christ provides a culture of emergency preparedness through church-wide educational materials, welfare program, storage centers, and leadership support.

Members of the Church of Jesus Christ are encouraged by church leadership to build and maintain a household emergency supply including clothing and bedding, drinking water, financial reserves, important documents, a longer-term supply of basic food items, medication and first aid supplies, and a three-month supply of food that is part of the household’s normal diet (The Church of Jesus Christ of Latter-day Saints, n.d.a). Latter-day Saints are likely being exposed to more preparedness information than Non-LDS by way of religious teachings, church events and social connections with other members, thus helping to explain the difference in preparedness practice among Latter-day Saints and Non-LDS in our study.

The finding that Latter-day Saints were more likely to have preserved food through canning/bottling than Non-LDS was not surprising considering the emphasis church leaders place on self-reliance practices such as maintaining a fruit and vegetable garden, raising livestock, and preserving and storing food for long-term storage for times of need such as disasters (The Church of Jesus Christ of Latter-day Saints, 2000). Historically, the Church advised that each person should learn techniques of home canning, freezing, and drying foods (The Church of Jesus Christ of Latter-day Saints, 1978). More currently, Church recommendations for long-term food storage include preservation methods using oxygen absorbers to extend shelf-life of low moisture foods (The Church of Jesus Christ of Latter-day Saints, n.d.d; Chapman et al., 2010; Lloyd et al., 2014). Eighty-two percent of Latter-day Saint respondents in the current study said they were “likely” or “very likely” to act on counsel given by their religious leaders (data not shown). Thus, Latter-day Saints in
the current study likely made effort to learn about and practice food preservation as counseled by their leaders. It is unknown, however, whether this contributed to the larger supply of food storage among Latter-day Saints in the current study, compared to Non-LDS, or if Latter-day Saints had accurate knowledge or practice of creating safely preserved foods.

Non-LDS respondents living in Utah and Idaho were similar to Latter-day Saints in knowledge and practice of food preservation but reported significantly more knowledge and practices than those living outside of Utah and Idaho. It is possible that food preservation information and skills that members learn through the Church of Jesus Christ are shared with Non-LDS friends and neighbors. The Official Newsroom of The Church of Jesus Christ reports instances of member volunteers teaching preparedness techniques such as portable water purification, canning food, sanitation, and financial preparedness at emergency preparedness events jointly hosted with public organizations like the Red Cross (The Church of Jesus Christ of Latter-day Saints, 2007). Additionally, members are encouraged to invite others to join them in learning about emergency preparedness (The Church of Jesus Christ of Latter-day Saints, 1997).

Latter-day Saints in the current study were four times more likely than Non-LDS to report being connected to their community or neighborhood. However, even though many Latter-day Saints and Non-LDS living in Utah and Idaho (HNon) share the same community and neighborhoods, HNon did not report feeling the same connectedness to their community that Latter-day Saints did. This may suggest that Latter-day Saints find their sense of social connectedness mainly within their church community, and the community at-large does not provide Non-LDS with that same sense of social connectedness that Latter-day Saints feel within their sector of the community.

Feeling connected to a community has been shown in previous research to be advantageous during disaster response and in preparing for a disaster (Kim & Kang, 2010; Murphy, 2007; Wood et al., 2012). Examination of community-based responses to disasters suggested that communities with shared vision and values, and access to resources along with willingness to engage those resources in disaster mitigation programs, have a greater ability to manage preparedness activities (Marsh & Buckle, 2001). Therefore, for Latter-day Saints, connectedness to a community of other members of the Church who are regularly taught about preparedness by religious leaders, and report being likely to act on religious leadership counsel, may make them more likely to prepare themselves. This sense of connectedness may also help explain why Latter-day Saints in the current study were more likely to report having a household disaster supplies kit and availability of long-term food storage than Non-LDS.

The influence of the preparedness information Latter-day Saints receive from church teachings should be strengthened by the feeling of community connectedness among members, and members’ intentions to act on religious leaders’ counsel. Anecdotally, this should translate into higher overall perceptions of household preparedness for Latter-day Saints. However, no significant differences between Latter-day Saints and Non-LDS were found related to overall perceived household preparedness, food, or water preparedness. The reasoning for these inconsistencies is
unclear. One possible explanation lies in the interpretation of terms employed in the survey tool. While a “large scale disaster or emergency” was clearly defined in the survey, “prepared” was not defined. Instruction and cultural/leadership expectations of Latter-day Saints may mean that Latter-day Saints hold higher expectations for the standard of being “prepared” than Non-LDS do. Higher expectations for household preparedness may lead a greater proportion of Latter-day Saints than Non-LDS to perceive and report not being prepared, explaining in part the lack of a significant difference seen in perceptions of preparedness between Latter-day Saints and Non-LDS. However, further testing needs to be done to understand the influence of religious teachings on an individual’s perception of emergency preparedness.

While social connectedness did not appear to be significantly affecting the overall perceptions of general preparedness of Latter-day Saints in the current study, it may be of benefit to them during and in the aftermath of an actual disaster. Taylor-Clark et al. (2010) found that access to social networks during Hurricane Katrina were integral to residents knowing about and responding to evacuation orders. In a study of those affected by Hurricane Ivan, it was found that feelings of belonging among neighbors positively influenced behavior during the hurricane such as contacting others after the disaster occurred to ensure their safety (Kim & Kang, 2010). Further, Murphy (2007) reported examples from two disasters in which community members aided one another to mitigate the negative effects after the disaster. As social connectedness plays an important role in a community’s ability to cope with a disaster, efforts to create a sense of connectedness in the community at-large should be made. Faith communities, in which many members experience a feeling of social connectedness, as was observed in the current study, may offer valuable insights into how to create a more connected community for purposes of disaster mitigation.

Coordination between faith communities and government or public emergency organizations is not a new concept. FEMA encourages partnership between government emergency managers and faith-based and community organizations (FBCO) as each have distinct strengths to offer in terms of disaster mitigation (Federal Emergency Management Agency, 2021a, b). After Hurricane Katrina in 2005, FBCOs were instrumental in providing assistance to those affected by the disaster (Pant et al., 2008). However, it has been noted that formal emergency preparedness plans among FBCOs are limited (Joshi, 2010; Zhi et al., 2017). Further, Joshi (2010) reported little collaboration among FBCOs, or between FBCOs and the government, has taken place. Recently, a New York initiative in which local government agencies offered emergency preparedness trainings to FBCOs was found to be effective in increasing emergency preparedness activities among these groups (Rivera et al., 2019). As noted by Rivera et al. (2019), continued efforts should be instigated across the USA to better facilitate partnerships among these organizations for disaster mitigation efforts.

FEMA acknowledges that some emergencies are beyond the capability of communities to handle alone, so the responsibility for preparedness must be shared among all levels of government, non-governmental organizations, the private sector, and US citizens (Federal Emergency Management Agency, 2014; U.S. Department of Homeland Security, 2021). In the current study, Latter-day Saints felt less strongly than Non-LDS that federal and state governments should be responsible for
household care in a large-scale disaster or emergency. Compared to Non-LDS living outside of Utah and Idaho (LNon), Latter-day Saints also felt less strongly about the responsibilities of federal and state governments in an emergency.

It is possible that Latter-day Saints feel that some emergency household care responsibility should be shared with their local church units (stakes and wards) rather than with the government as local congregational leadership is encouraged to create, review, and update a local emergency response plan that coordinates with community plans (The Church of Jesus Christ of Latter-day Saints, n.d.e). The Stake and Ward Emergency Planning Guide for local congregations instructs the determining and reporting of the condition of church members, obtaining medical care for the injured, reuniting separated families, and arranging for the supply of basic provisions and services for church members and others (The Church of Jesus Christ of Latter-day Saints, n.d.e). It is also possible that Latter-day Saints who have had past disaster experience in which the government failed to adequately respond were less likely to attribute responsibility of helping their household in an emergency to government entities. Although we asked about past disaster experience in this study, our sample size was not sufficient enough to tease out these potential variations among Latter-day Saints and how it might influence preparedness practices.

While Non-LDS living in Utah and Idaho (HNon) did not have significantly different beliefs than Latter-day Saints in the responsibility of government to help households during an emergency, their belief scores also were not significantly different than LNon. A possible explanation for this is that HNon may be influenced in part by the beliefs of Latter-day Saints in their community. However, if this influence is in effect, it is not strong enough to make the government responsibility beliefs of HNon significantly different than LNon.

We expected Latter-day Saints to report a significantly higher sense of personal responsibility for household care in an emergency than Non-LDS given the potential for an additive effect of government and church teachings on this matter, and although statistics revealed significant differences between Latter-day Saints and Non-LDS, their mean scores were not meaningfully different. This may suggest that most households, regardless of religious affiliation, perceive similar expectations of personal responsibility to care for their household in a disaster, as found by Diekman et al. (2007).

**Study Limitations**

Respondents self-reported their practice and perception of their household’s emergency preparedness, with no assessment of actual household emergency preparedness conducted. As such, these data are not an accurate measure of household preparedness, but rather only a measure of perceptions surrounding food and water household emergency preparedness. We used a convenience sample; although responses came from 46 states across the USA, data cannot be considered representative of the nation. Further, our sample of Latter-day Saints may not be representative of the general Church of Jesus Christ membership in the USA; however, given
the Church of Jesus Christ teachings are standardized for all members, we anticipate the findings of this study would be reflective of members’ experiences.

Conclusions

The Church of Jesus Christ has an extensive faith-based emergency preparedness education and support system. The current study indicates members of The Church of Jesus Christ generally were following the counsel given by church leadership in being prepared to provide relief for their household in an emergency. Evidence of this relates to the findings that Latter-day Saints were more likely than Non-LDS to have a disaster supplies kit, long-term food storage, and to have preserved food through canning/bottling.

The behaviors observed in this study among Latter-day Saints may have been promoted through the emergency preparedness culture in the Church of Jesus Christ, which not only provides educational materials about emergency preparedness but also facilitates events to become prepared (The Church of Jesus Christ of Latter-day Saints, n.d.a; The Church of Jesus Christ of Latter-day Saints, 2007). Still, future research should be done to discover what influences Latter-day Saints’ perceptions of overall household, food, and water readiness and why their perceptions of being prepared was no different than non-LDS, despite data from our study that indicated that they were more likely to meet some recommended preparedness practices than other households. With the recent COVID-19 pandemic, future research could explore how a global emergency has affected preparedness efforts among faith-based communities, including Latter-day Saints.

Latter-day Saints in the current study also felt substantially more connected to their neighborhood/community than Non-LDS, thus potentially enhancing their ability to handle the effects of a disaster (Kim & Kang, 2010; Murphy, 2007). However, the ability of this connectedness to extend beyond members of the Church of Jesus Christ appeared limited, based on the results in the current study. This suggests that the Church of Jesus Christ should forge stronger connections with the surrounding community, including other faith-based organizations, to improve household preparedness. Further, emergency managers seeking to collaborate with faith-based communities may benefit from establishing strong connections with their leadership and better outlining how government entities can complement preparedness work being done by faith-based communities (Sheikhi et al., 2020).

Appendix. Definitions of terms used in related survey questions.

| Definition |
|------------|
| The term “household” refers to yourself and any individuals living with you in your current residence/dwelling who share a food supply and finances for at least nine months out of the year |
Definition

A “large-scale disaster or emergency” is any event that leaves you isolated in your home or displaces you from your home for at least three days. This might include natural disasters such as earthquakes, hurricanes, tornadoes, floods, ice storms, or man-made disasters such as explosions, terrorist events, or blackouts.

“Non-perishable foods” means foods that do not require refrigeration such as canned foods, staples (flour, sugar, grain, pasta, etc.), dry mixes (dry soup mixes, macaroni and cheese, cake mixes, etc.), dry and ready-to-eat cereals, snack foods (crackers, chips, etc.), and food set aside for emergency situations.

“Long-term storage” is non-perishable food (such as grain, dried fruits and vegetables, freeze dried foods, powdered milk, beans, Meals-Ready-to-Eat [MREs], etc.) that is specially packaged in tightly sealed containers (such as plastic buckets, No. 10 cans, or foil pouches) and is intended to be used as an emergency food supply. This type of food is often advertised to have a shelf-life of more than 10 years.

A “disaster supplies kit” (also known as a 72-h kit) is a collection of basic items that includes food, water, and other emergency supplies, stored in a portable container, for use in the event of a disaster.

“Accessible cash” could come from any of the following: Cash stored in your home, checking account, savings account and any other account that you could access to provide basic needs (food, shelter, etc.) for your household if your regular household income was not available.

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Declarations

Conflict of interest The authors have no relevant financial or non-financial conflicts of interest to disclose.

Ethical Approval The questionnaire and methodology for this study was approved by the Human Research Ethics committee of Brigham Young University (X-130213).

Informed Consent Implied consent was obtained from all individual participants included in the study.

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