Executive Summary
The COVID-19 pandemic has increased the complexity of planning for hurricanes as social distancing is in direct conflict with human mobility and congregation. Researchers at the University of South Florida’s School of Geosciences conducted a statewide survey of 7,072 respondents to understand hurricane evacuation perceptions with the compounding risk of COVID-19. It also questioned general hurricane evacuation preparedness. This report summarizes the respondents’ preparedness to handle a hurricane and their risk perceptions on sheltering-in-place, going to shelter, or evacuating elsewhere. This survey was provided as an online survey on Qualtrics and responses were gathered over two months during June, July and the beginning of August.

Demographics
Respondents ranged from 18-96 years of age. The majority of people fell in the 55-74 age range (51.4%), with younger adults (18-34) representing only 10% of the sample. 69% of respondents identified as female. The majority of respondents (75.6%) self-identified as white; the second largest population represented was Latinx with 2.6%. 6.4% of respondents identified that English was their second language. Many respondents had a college degree (68.2%). 5.5% of respondents had less than a high school education, 3% had a high school education, and 23.3% had completed some college. 54.8% of respondents were employed full-time. 2.8% of respondents said they were temporarily unemployed due to COVID-19, with 0.7% saying they were permanently unemployed due to COVID-19. Of interest to note is that 32% of respondents stated they were retired. The majority of the sample (48%) stated an annual
household income of above $80,000 a year; on the other end, 3.7% stated they made under $20,000 a
year.

**Geography of Sample Located Mostly in West Florida**

The participants were primarily concentrated in west central Florida, specifically from Pinellas (48.1%) and Manatee (24.5%) counties; however, there were respondents representing 52 counties in Florida.

**Most Respondents Own a Home Built Before 2001**

26% of individuals lived in evacuation zone A; 35.2% resided outside of a hurricane evacuation zone. 81.5% of respondents were homeowners. 74.3% percent of respondents reported living in a home built before the year 2001, indicating that their house may not be structurally sound enough to withstand a hurricane. This is especially concerning as 74.3% of respondents believe it is to some degree true that being in a shelter is riskier than sheltering in place.

**COVID-19 Health Vulnerability and Concerns Among the Elderly**

45.1% of respondents viewed themselves as vulnerable to COVID-19 due to pre-existing health risks. This aligns with the population’s aversion to going to shelters, with 86.5% preferring to just shelter-in-place rather than risking infection at a shelter. Those in older age brackets were more likely to view themselves as vulnerable ($X^2(14) = 695.229, p = < .001$); as well, the elderly were more reluctant than any other age group to choose public shelters as a viable option during a hurricane. Additional consideration should be given regarding evacuation from nursing homes as well as ensuring elderly who need to evacuate do so instead of electing to shelter-in-place in their homes.
Shelters Remain a Last Resort for Evacuees

There was a significant difference (determined through McNemar’s test) in the number of individuals who would have chosen to not utilize a public shelter during COVID-19 when they would have previously. Only 6.6% of respondents definitely would’ve gone to a shelter before COVID-19, with an additional 58% saying they probably would have gone. With COVID-19 concerns, only 3.9% would definitely still go, with an additional 10.8% saying they probably would go if needed.

Florida Residents are Extremely Mobile during Evacuations

98.7% of respondents said that they had reliable transportation to evacuate, with 96.9% of respondents claiming that they would use a personal vehicle to evacuate. 75.4% of respondents also claimed it was to some degree true that they would be able to evacuate to somewhere outside of their county. Those with higher education were more likely to take advantage of their social networks to find an alternative place to shelter.
Summary of Responses:

*Do you own or rent a home?*

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeowner</td>
<td>4995</td>
<td>81.5</td>
</tr>
<tr>
<td>Renter</td>
<td>993</td>
<td>16.2</td>
</tr>
<tr>
<td>Neither</td>
<td>140</td>
<td>2.3</td>
</tr>
</tbody>
</table>

*What year was your home built?*

<table>
<thead>
<tr>
<th>Year</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1959 and before</td>
<td>841</td>
<td>14.7</td>
</tr>
<tr>
<td>1960-1979</td>
<td>1559</td>
<td>27.2</td>
</tr>
<tr>
<td>1980-1985</td>
<td>682</td>
<td>11.9</td>
</tr>
<tr>
<td>1986-2001</td>
<td>1173</td>
<td>20.5</td>
</tr>
<tr>
<td>2002-2004</td>
<td>344</td>
<td>6</td>
</tr>
<tr>
<td>2005-2020</td>
<td>1123</td>
<td>19.6</td>
</tr>
</tbody>
</table>

*What type of structure is your home?*

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Home/Manufactured</td>
<td>345</td>
<td>5.9</td>
</tr>
<tr>
<td>Wood Frame</td>
<td>645</td>
<td>11.1</td>
</tr>
<tr>
<td>Block and Wood Frame</td>
<td>1351</td>
<td>23.2</td>
</tr>
<tr>
<td>Block Construction</td>
<td>3328</td>
<td>57.1</td>
</tr>
<tr>
<td>Boat</td>
<td>3</td>
<td>0.1</td>
</tr>
<tr>
<td>RV</td>
<td>24</td>
<td>0.4</td>
</tr>
<tr>
<td>Other</td>
<td>133</td>
<td>2.3</td>
</tr>
</tbody>
</table>

*What is the current COVID-19 status for your county?*

<table>
<thead>
<tr>
<th>Status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safer at home ORDER for all expect essential personnel</td>
<td>463</td>
<td>8.9</td>
</tr>
<tr>
<td>Stay at home recommendation only</td>
<td>3521</td>
<td>67.6</td>
</tr>
<tr>
<td>Other</td>
<td>1227</td>
<td>23.4</td>
</tr>
</tbody>
</table>
Do you consider yourself vulnerable to COVID-19 due to existing health risks?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2766</td>
<td>45.4</td>
</tr>
<tr>
<td>No</td>
<td>3109</td>
<td>51</td>
</tr>
<tr>
<td>Don't Know</td>
<td>219</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Would you have access to reliable transportation to evacuate to a shelter or elsewhere?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5967</td>
<td>98.7</td>
</tr>
<tr>
<td>No</td>
<td>81</td>
<td>1.3</td>
</tr>
</tbody>
</table>

If you had to leave your home due to a mandatory evacuation order, how would you evacuate the area or get to a shelter?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Vehicle</td>
<td>5914</td>
<td>96.9</td>
</tr>
<tr>
<td>Public Transport</td>
<td>23</td>
<td>0.4</td>
</tr>
<tr>
<td>Carpool</td>
<td>38</td>
<td>0.6</td>
</tr>
<tr>
<td>Other</td>
<td>129</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Prior to COVID-19, if I needed to evacuate to a shelter during the 2020 hurricane season, I would most likely have gone to a shelter.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely True</td>
<td>396</td>
<td>6.6</td>
</tr>
<tr>
<td>Probably True</td>
<td>949</td>
<td>15.8</td>
</tr>
<tr>
<td>Probably False</td>
<td>2022</td>
<td>33.7</td>
</tr>
<tr>
<td>Definitely False</td>
<td>2632</td>
<td>43.9</td>
</tr>
</tbody>
</table>
If I had to make alternative evacuation plans other than evacuating to a shelter in 2020, I could find friends or family to give me shelter IN my COUNTY.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely True</td>
<td>2089</td>
</tr>
<tr>
<td>Probably True</td>
<td>1464</td>
</tr>
<tr>
<td>Probably False</td>
<td>1006</td>
</tr>
<tr>
<td>Definitely False</td>
<td>1444</td>
</tr>
</tbody>
</table>

Considering the current situation with COVID-19, I would still go to a shelter if I needed to during a hurricane evacuation order in 2020.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely True</td>
<td>236</td>
</tr>
<tr>
<td>Probably True</td>
<td>646</td>
</tr>
<tr>
<td>Probably False</td>
<td>1772</td>
</tr>
<tr>
<td>Definitely False</td>
<td>3344</td>
</tr>
</tbody>
</table>

If I had to make alternative evacuation plans other than evacuating to a shelter in 2020, I could find friends or family to give me shelter OUTSIDE of my COUNTY.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely True</td>
<td>3015</td>
</tr>
<tr>
<td>Probably True</td>
<td>1511</td>
</tr>
<tr>
<td>Probably False</td>
<td>680</td>
</tr>
<tr>
<td>Definitely False</td>
<td>796</td>
</tr>
</tbody>
</table>

If my only option was to evacuate to a shelter in my county, I would rather shelter-in-place than risk being exposed to the potentially large group inside a shelter.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely True</td>
<td>3310</td>
</tr>
<tr>
<td>Probably True</td>
<td>1875</td>
</tr>
<tr>
<td>Probably False</td>
<td>558</td>
</tr>
<tr>
<td>Definitely False</td>
<td>248</td>
</tr>
</tbody>
</table>
If I was ordered to leave my house during a hurricane evacuation, I think the risks of being in a shelter during COVID-19 times would be worse than sheltering-in-place and enduring the risks of a hurricane.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely True</td>
<td>2251</td>
</tr>
<tr>
<td>Probably True</td>
<td>2202</td>
</tr>
<tr>
<td>Probably False</td>
<td>1112</td>
</tr>
<tr>
<td>Definitely False</td>
<td>422</td>
</tr>
</tbody>
</table>

I think if I went to a shelter, there would be adequate safeguards in place such as being able to social distance at least 6 ft. in place to keep me safe from COVID-19.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely True</td>
<td>285</td>
</tr>
<tr>
<td>Probably True</td>
<td>1594</td>
</tr>
<tr>
<td>Probably False</td>
<td>2754</td>
</tr>
<tr>
<td>Definitely False</td>
<td>1362</td>
</tr>
</tbody>
</table>

If you did need to go to a shelter, would you be able to provide your own mask for each family member with you?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5512</td>
</tr>
<tr>
<td>No</td>
<td>328</td>
</tr>
</tbody>
</table>

Do you feel you need access to a special needs shelter?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>415</td>
</tr>
<tr>
<td>No</td>
<td>5370</td>
</tr>
</tbody>
</table>

Have you or someone in your household applied to determine eligibility for a special needs shelter/accommodations?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>70</td>
</tr>
<tr>
<td>No</td>
<td>5874</td>
</tr>
</tbody>
</table>
Does anyone in your household have a disability?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1020</td>
<td>17.1</td>
</tr>
<tr>
<td>No</td>
<td>4943</td>
<td>82.9</td>
</tr>
</tbody>
</table>

Acknowledgements

We would like to acknowledge Marshall Flynn, our partner at the Tampa Bay Regional Planning Council, for his tremendous efforts at distributing this survey at a lightning-pace. Other critical collaborators to this project’s success include Elizabeth Dunn, University of South Florida College of Public Health; Joseph Borries, Pinellas County Emergency Operations Center; Maria Robles, Tampa Bay Regional Planning Council; and Andrea Tristán, Hillsborough County Department of Emergency Management for their feedback and assistance with the survey design, Spanish translation, and distribution. In addition, we would like to acknowledge students of the NSF Research Experience for Undergraduate program in “Weather, Climate and Society” (NSF Award: 1659754 (PIs: Collins and Ersing)) for their assistance in cleaning and analyzing the data. Additional thanks to the people in the field of emergency management who provided feedback on the survey instrument before and during distribution.