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# Knowledge, attitudes and practices related to heat vulnerability: Results from a household survey in Houston, TX

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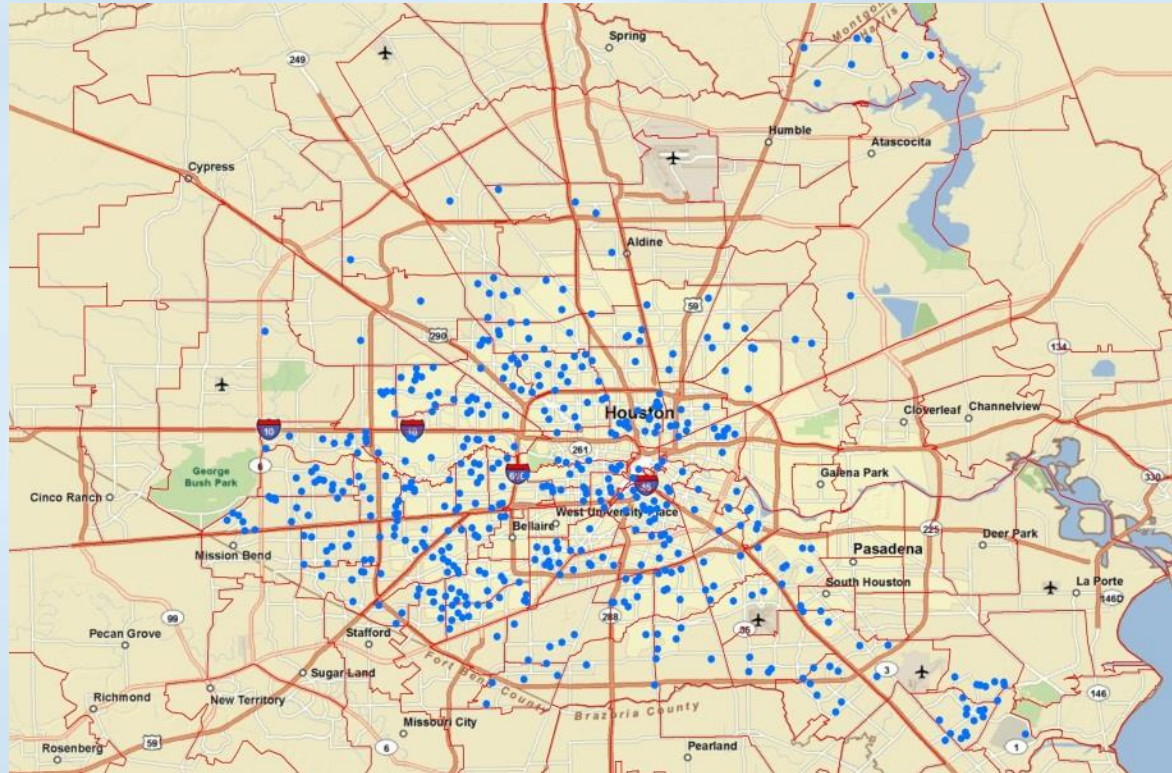
NCAR



# Household Survey

- The purpose of this survey was to better understand adaptive capacity in Houston, TX.
- Developed in collaboration with the Houston Department of Health and Human Services, Toronto Public Health, Health Canada
- RDD survey conducted by Princeton Data Services in late October/early November 2011 (1/3 cell phone)
- Participants were asked to respond to heat related questions from the summer of 2011
- 901 completed
  - 76% were sampled uniformly across 71 Houston ZIP codes
  - 24% sampled from a subset of 27 ZIP codes with expected large difference in vulnerability based on socio-economic diversity.

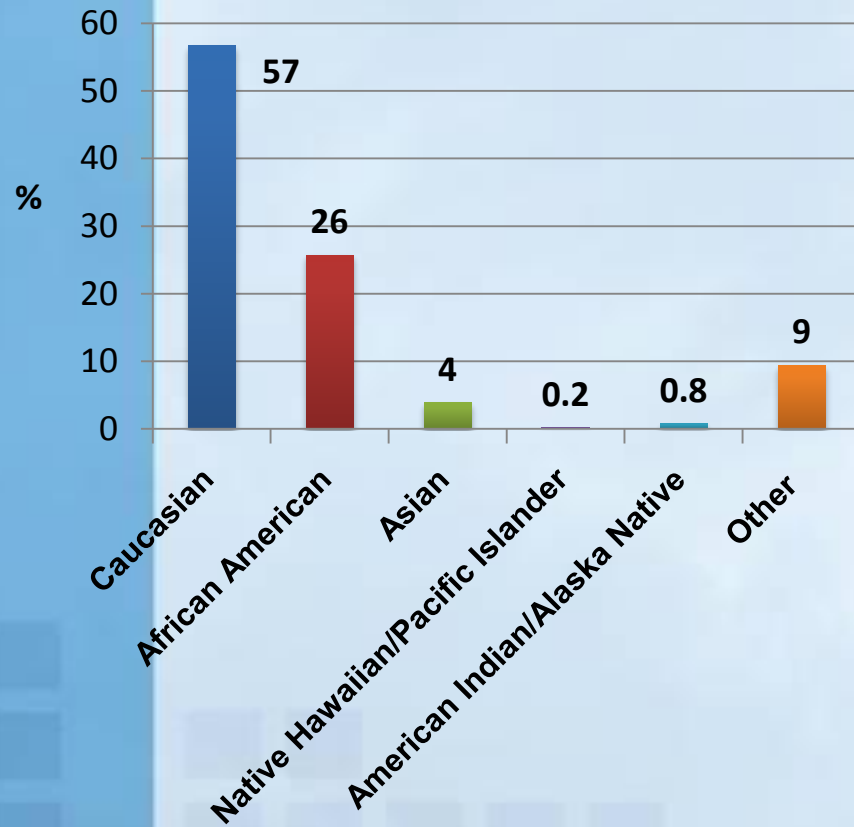
# Household survey



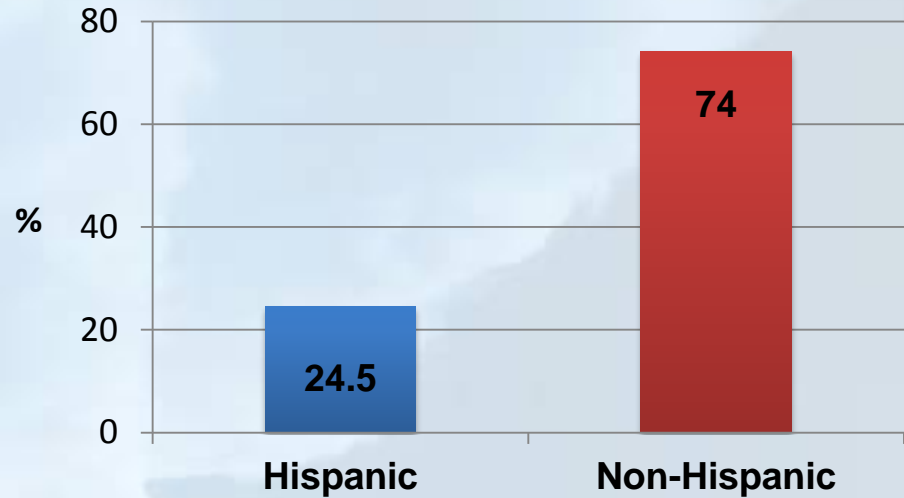
**Distribution of georeferenced households surveyed in Houston, TX in 2011 (760 households out of 901 shown here)**

# Participant Demographics

## Race



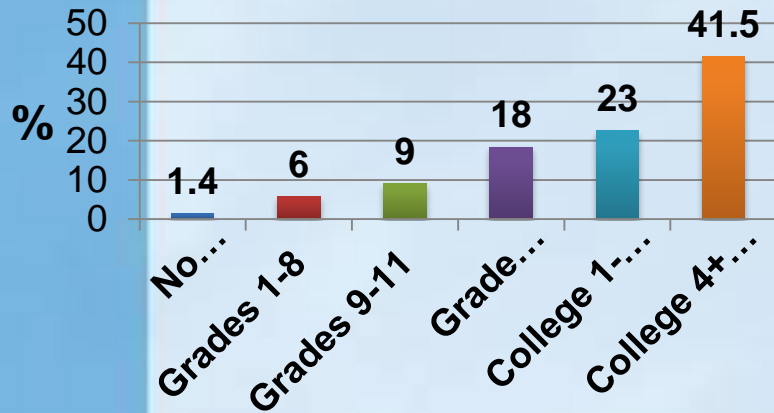
## Ethnicity



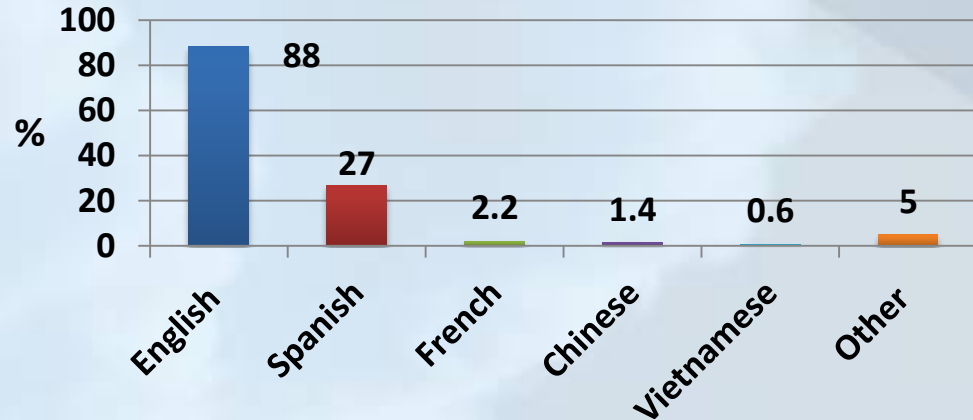


# Participant Demographics

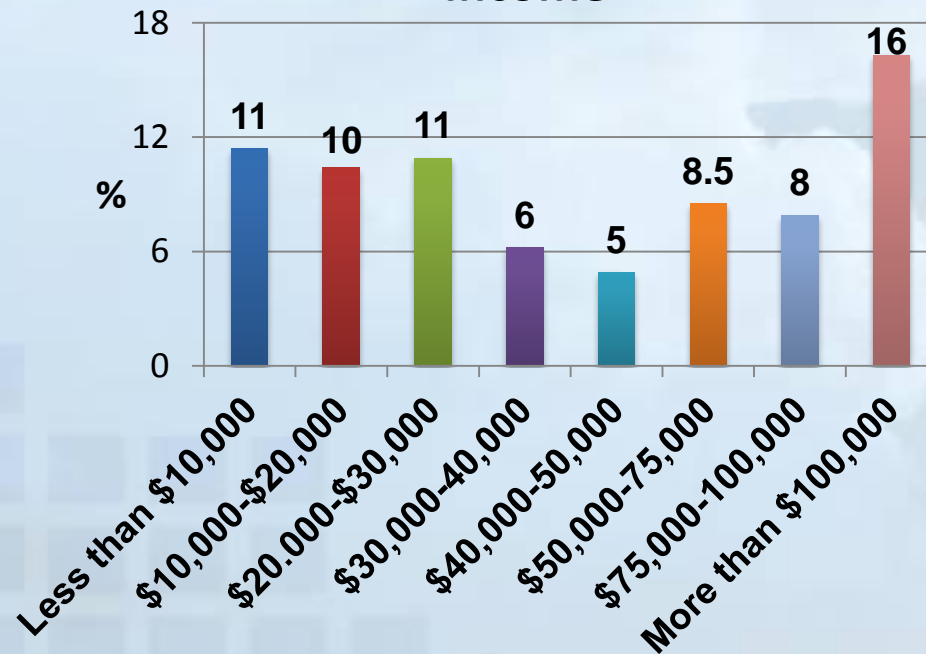
## Education



## Language



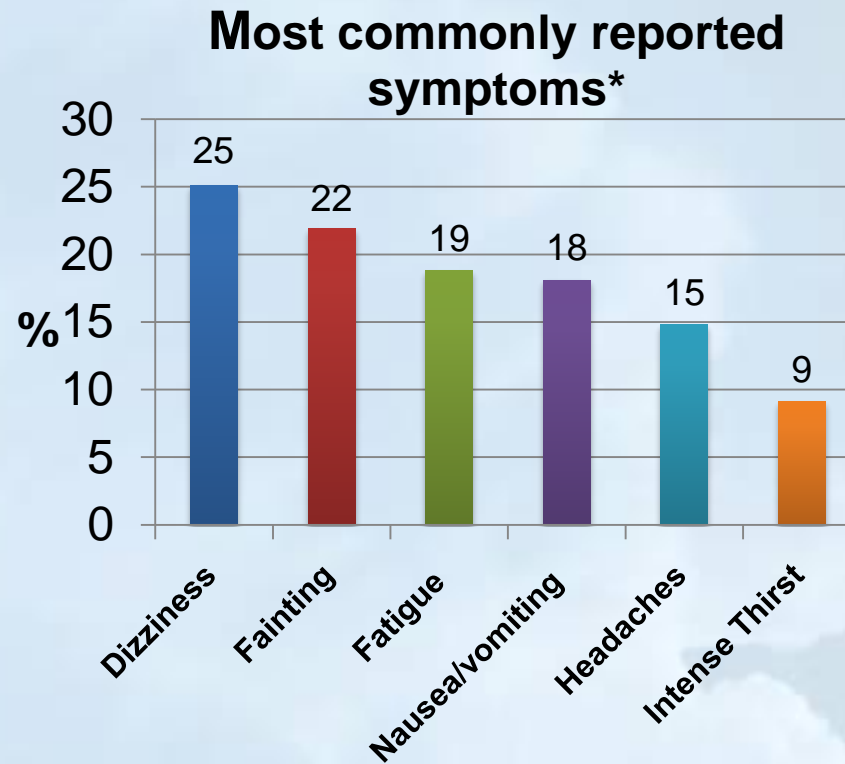
## Income



# 37% of all respondents said they felt too hot in their homes in the summer of 2011...

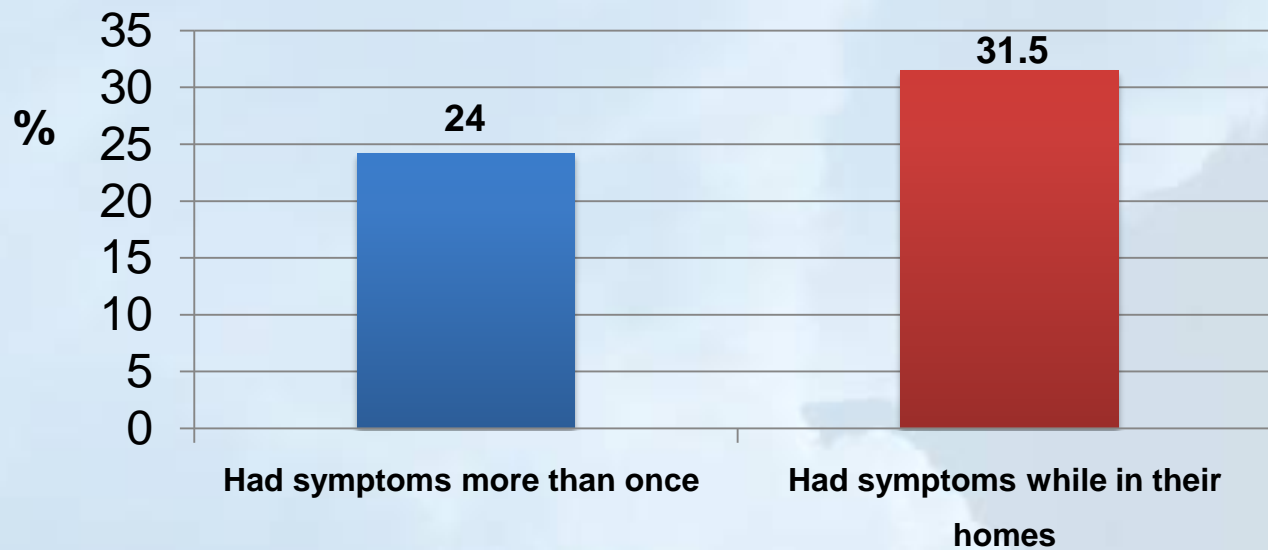
Demographic factors associated with participants being more likely to feel too hot at home	
Hispanic/Latino	p<0.001
African American	p=.025
Female	p=0.003
Not being a homeowner	p<0.001
Not speaking English in the home	p<0.001
Older age (negative correlation, OR=.98)	p<0.001
Health	
Good	
Poor	p<0.001

# Heat-related illness



**\*14% of the study population reported not knowing any symptoms of heat-related illness**

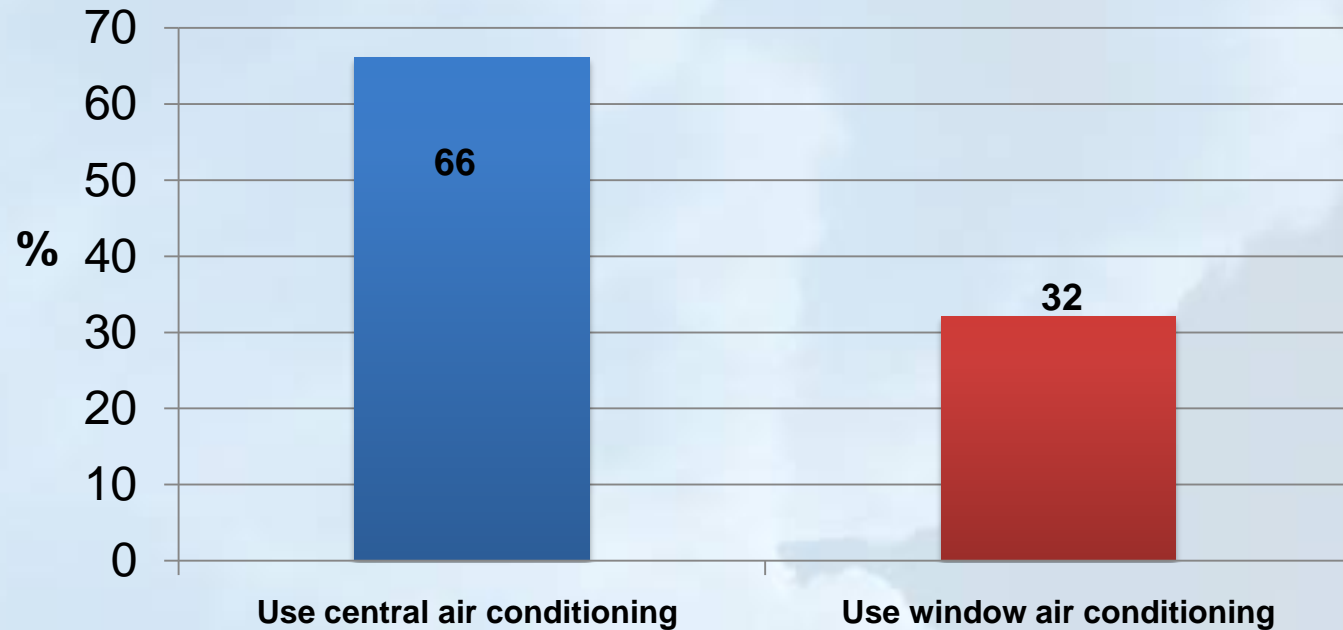
## Among the 179 respondents who reported symptoms...





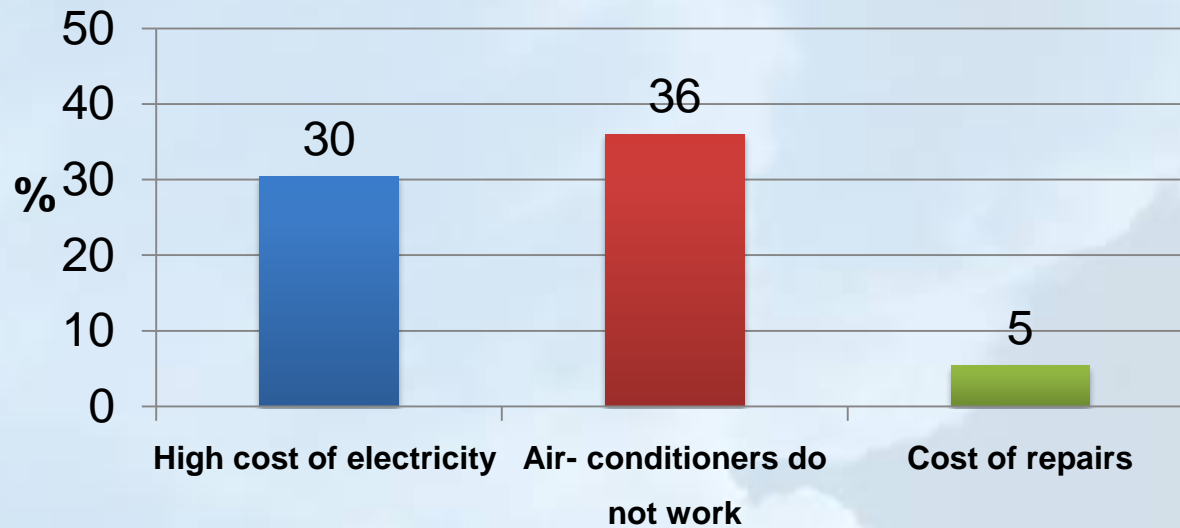
## Of the 31.5% who had symptoms in their homes...

**Percent of participants with air-conditioning**



# Of the 31.5% who had symptoms in their homes...

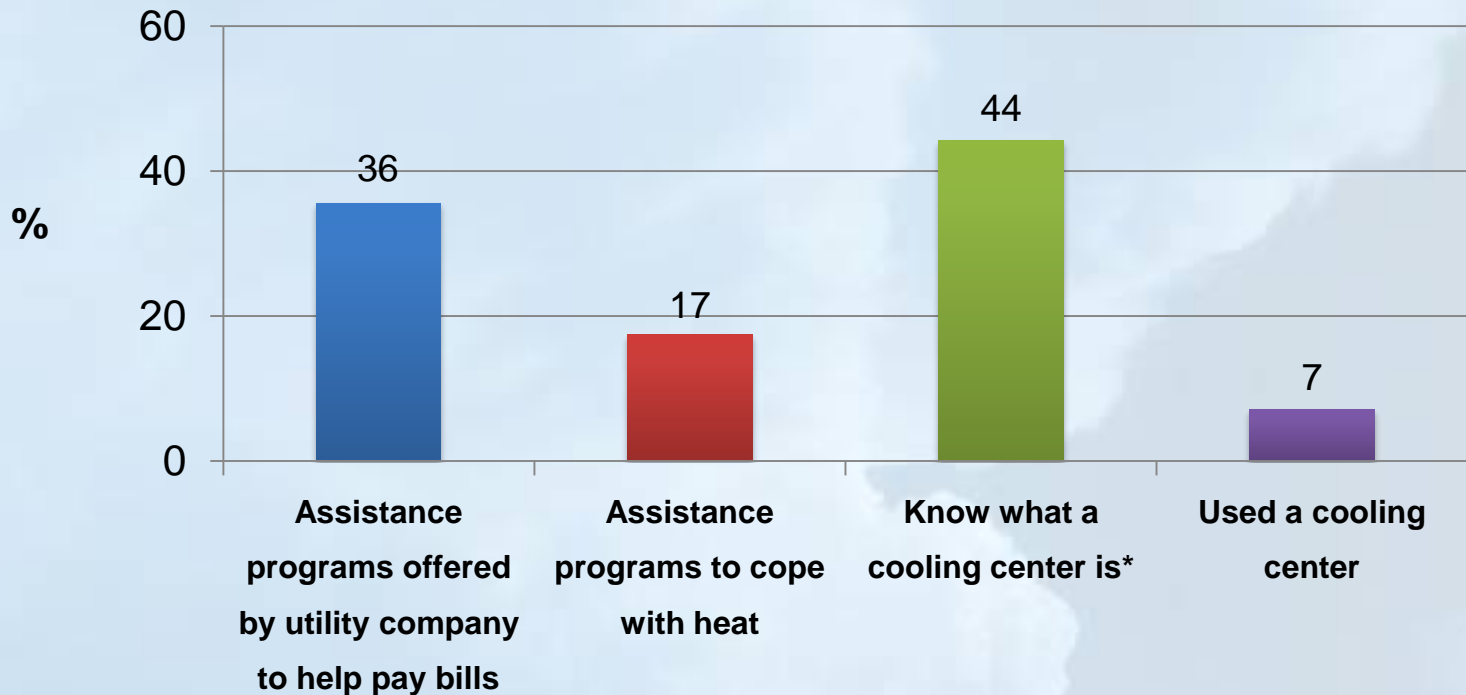
## Barriers to air-conditioning usage



# Demographic characteristics associated with difficulty paying electric bill

Demographic factors associated with reported difficulty in paying their electric bill	
Hispanic/Latino	p<0.001
African American	p<0.001
Not a homeowner	p<0.001
Do not speak English in the home	p<0.001

# Awareness of programs/resources for coping



\*Less than half (45%) of those who were familiar with a cooling center knew where one was located

# Awareness of programs/resources for coping

## Demographic factors associated with:

- **Knowing of programs to help with the electricity bill**
  - *Homeowners* ( $p < 0.001$ )
  - *Non-Hispanics* ( $p < 0.001$ )
  - *Speak English at home* ( $p < 0.001$ )
- **Knowing of heat-specific assistance programs**
  - *Speak English at home* ( $p < 0.001$ )
  - *Females* ( $p < 0.001$ )
  - *Non-Hispanics* ( $p = 0.009$ )
- **Knowing where a cooling center is located**
  - *Homeowners* ( $p < 0.001$ )
  - *Non-Hispanics* ( $p < 0.001$ )
  - *Speak English at home* ( $p < 0.001$ )
  - *Employed* ( $p = 0.002$ )

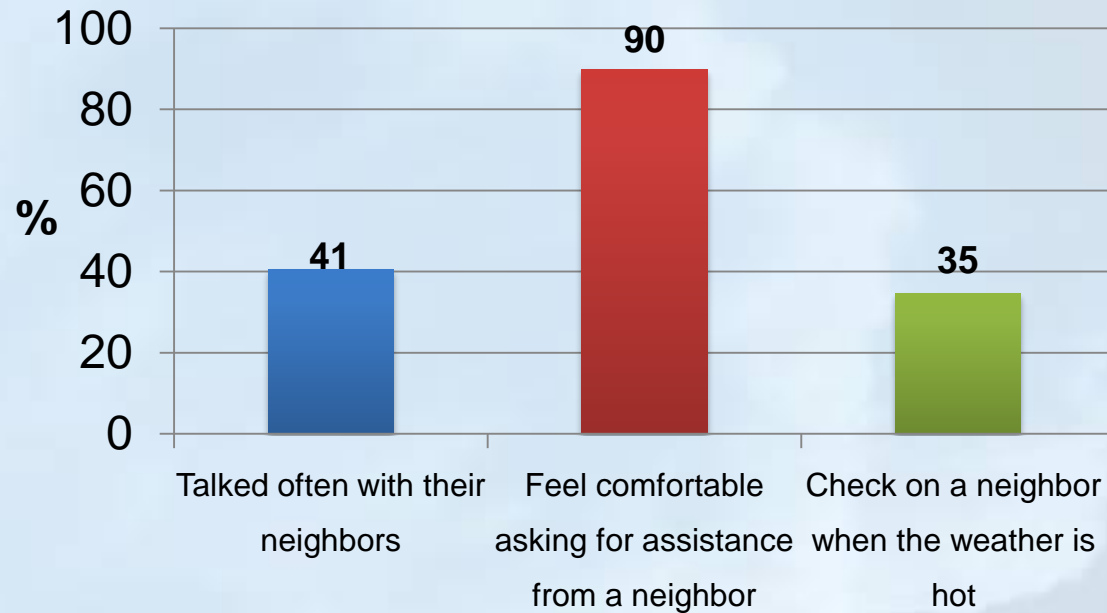
# 45% of all respondents considered people in their neighborhood to be vulnerable to heat...

## Demographic factors associated with this response:

<b>Hispanic/Latino</b>	<b>p&lt;0.001</b>
<b>African American</b>	<b>p&lt;0.001</b>
<b>Non-homeowners</b>	<b>p&lt;0.001</b>
<b>Do not speak English in the home</b>	<b>p&lt;0.001</b>
<b>Unemployed</b>	<b>p&lt;0.001</b>
<b>Income:&lt;\$75,000</b>	<b>p&lt;0.001</b>
<b>Health: Fair/poor</b>	<b>p&lt;0.001</b>



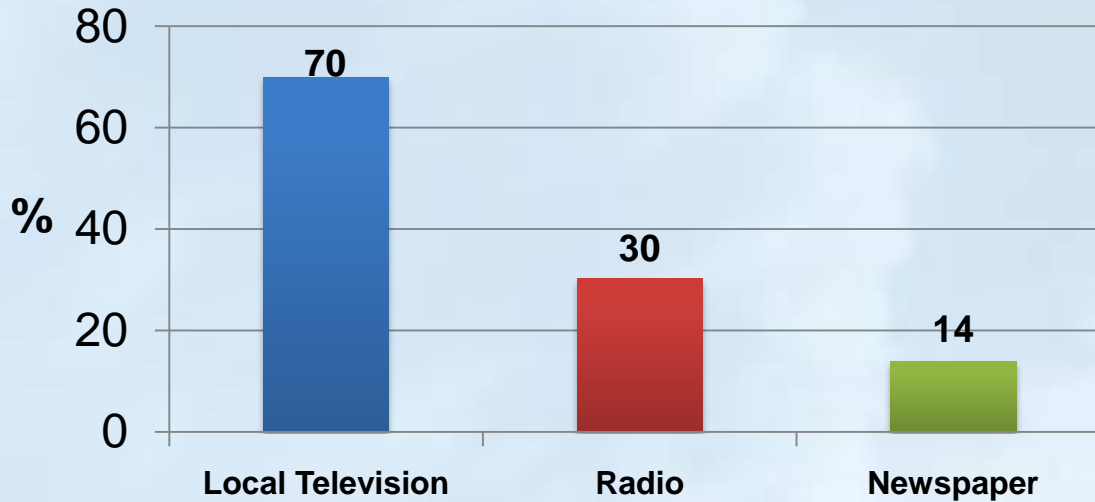
## Of the 89% of respondents who reported knowing some or all of their neighbors...



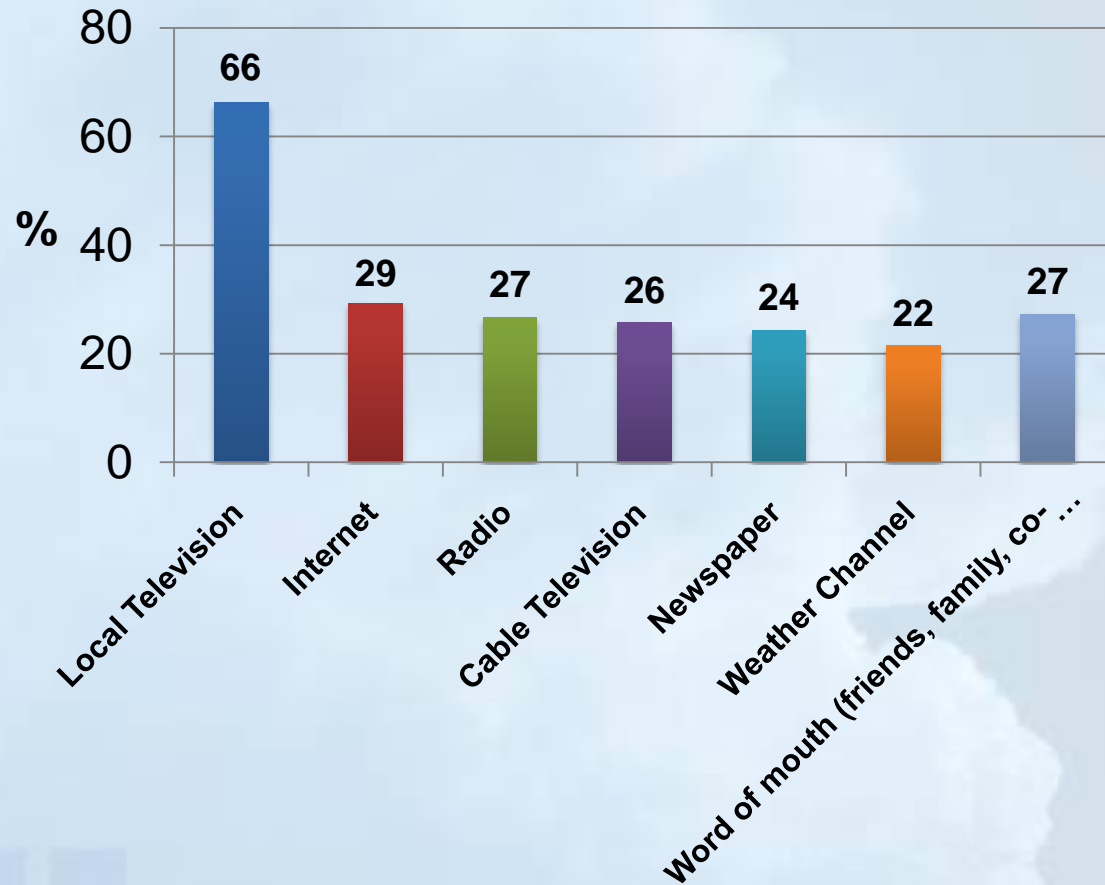
### Demographic factors associated with lower likelihood of knowing any of their neighbors

African-American	p<0.001
Non-homeowners	p<0.001
Income <\$40,000	p<0.001
Health: poor	p=0.007

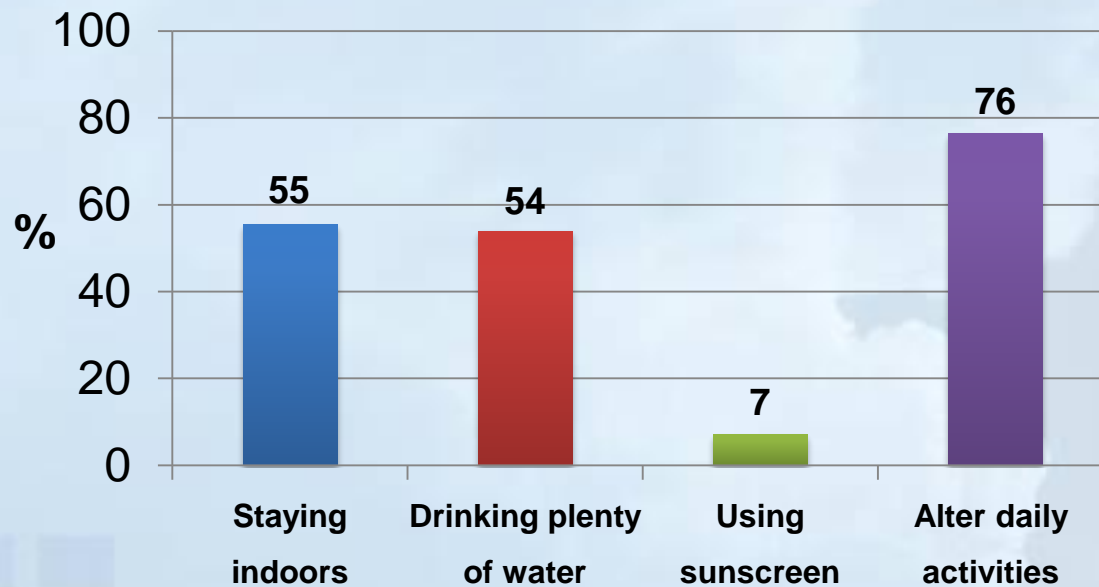
## Sources of heat-related information (for those participants who recalled hearing warnings)



## Sources of information for preventing heat-related illness



# How to protect oneself from the heat



# Summary

- Knowledge, Attitudes and Practices – 14% of the survey population had no knowledge of symptoms of heat stress; 7% suggested using sunscreen to reduce negative impacts of heat. Additionally, few knew what a cooling center was and even fewer where one was located.
- Multiple demographic factors may interact to compound vulnerability, including lack of social capital. Those who reported heat related illness:
  - Non-homeowners
  - African Americans and Hispanic/Latinos
  - Incomes less than \$20,000 per year
  - Unemployed
  - Poor health
- Those who reported poor health were significantly less likely to know their neighbors, be non-homeowners, or feel safe in their neighborhoods, suggesting that they may be at risk if no one checks on them during extreme heat.

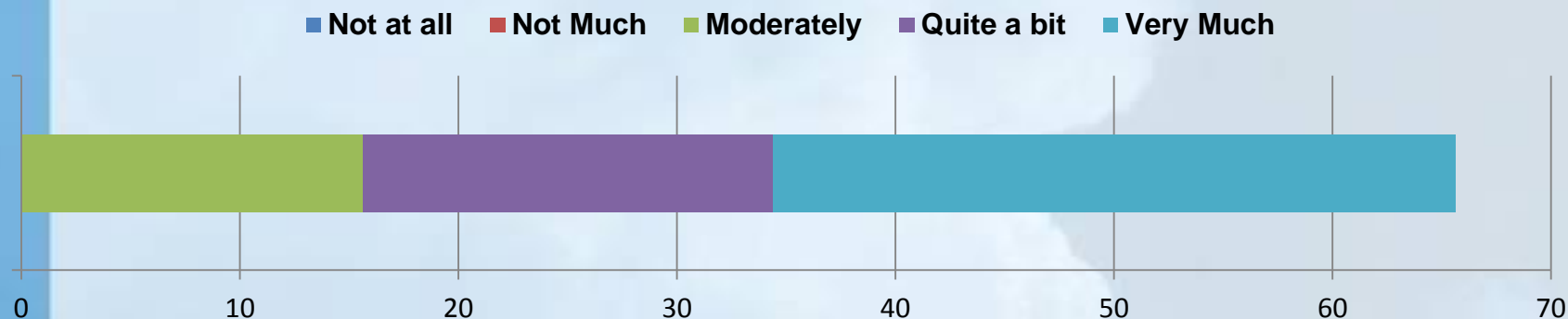
# Stakeholder Survey

- Developed in collaboration with the Houston Department of Health and Human Services, Toronto Public Health, Health Canada
- Conducted via SurveyMonkey in early 2012
- Sent to representatives from multiple sectors in Houston
- Eighty-nine surveys sent out with 32 respondents for a response rate of 36%



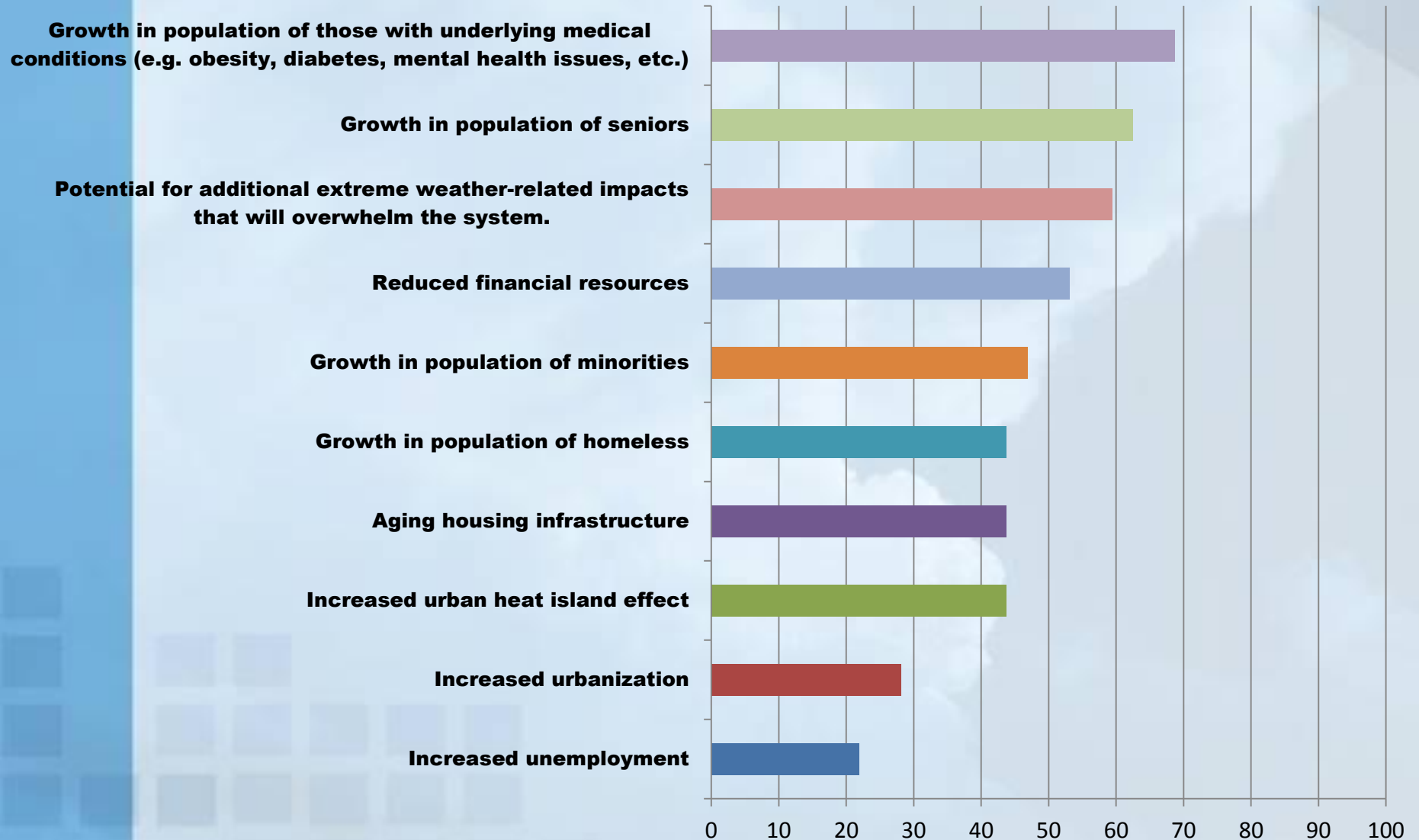
# Stakeholder survey

**How much do you think risks to the health of people living in Houston from extreme heat events will grow in the future?**



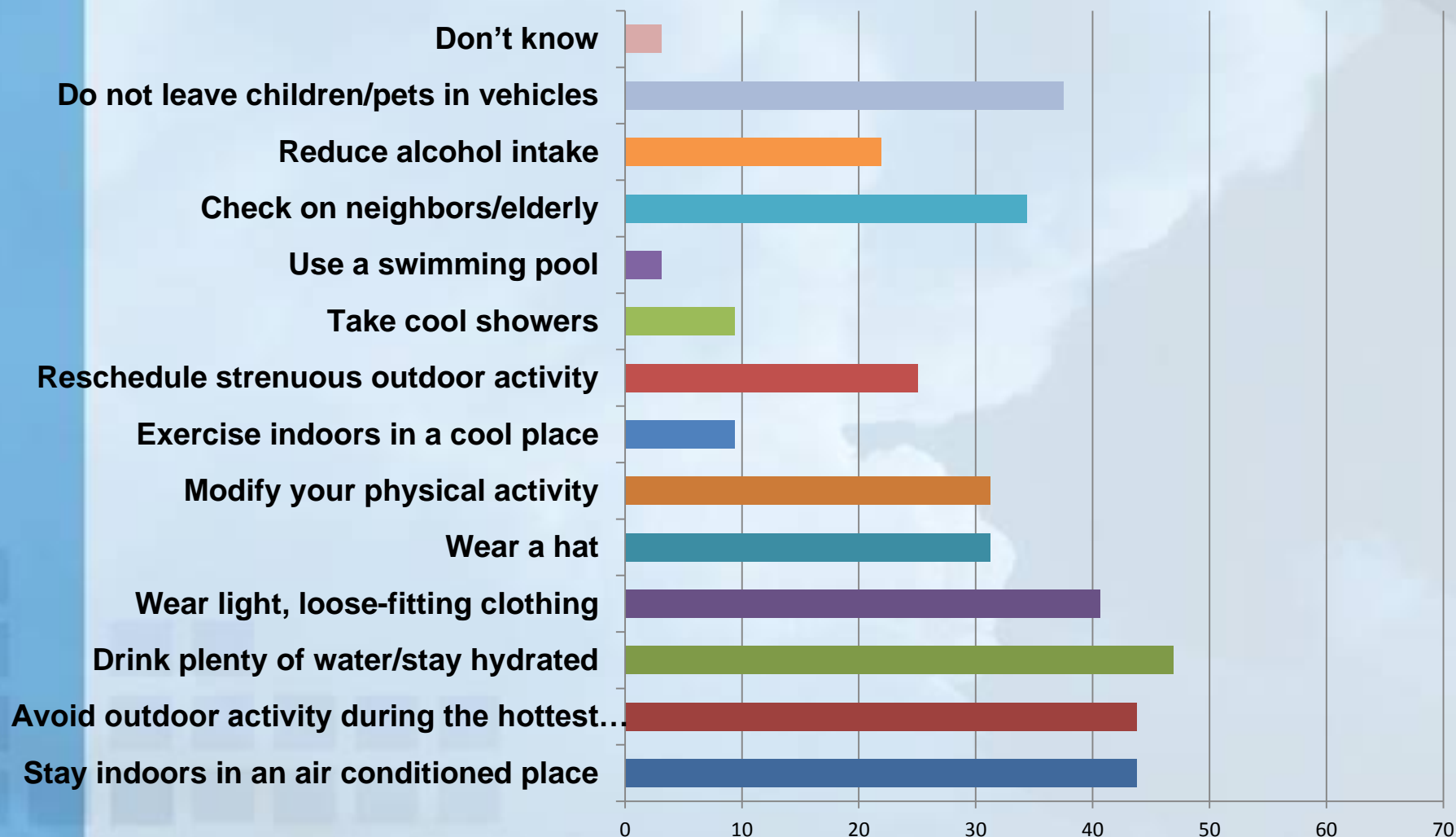
# Stakeholder survey

Describe how you think vulnerability to health risks from extreme heat may increase in the future. Please check all that apply



# Stakeholder survey

What actions does your organization recommend to your clients during an extreme heat event? Please check all that apply:



# Stakeholder survey

## What might prevent your clients from taking recommended actions during extreme heat events?

*“Some patrons cannot choose when to make their trips; lack of bathroom facilities may want them to limit their water intake.”*

*“Not receiving communication about extreme heat events or not having a way to get to a cooling shelter.”*

*“Lack of access to service and facilities.”*

*“Lack of access to media messages. Lack of social connections for vulnerable populations.”*

*“We have poor utilization with cooling centers probably because air conditioning is abundant throughout Houston.”*

*“Reduced perception of the actual risk/threat.”*

*“Choosing to ignore the warnings and/or having limited knowledge to the dangers of extreme heat events.”*

*“Lack of awareness heat health indications. Lack of public transportation. Lack of publically regulated utilities - way too expensive.”*

*“Communication barriers”*

*“Economic”*

*“Not knowing what to do.”*

# Thank you!

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