Implementing the BRACE Framework in Florida

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To protect, promote, & improve the health of all people in Florida through integrated state, county, & community efforts.

BRACE Framework

- Focus on the science and methodologies
- Florida-specific context for all aspects of BRACE framework implementation
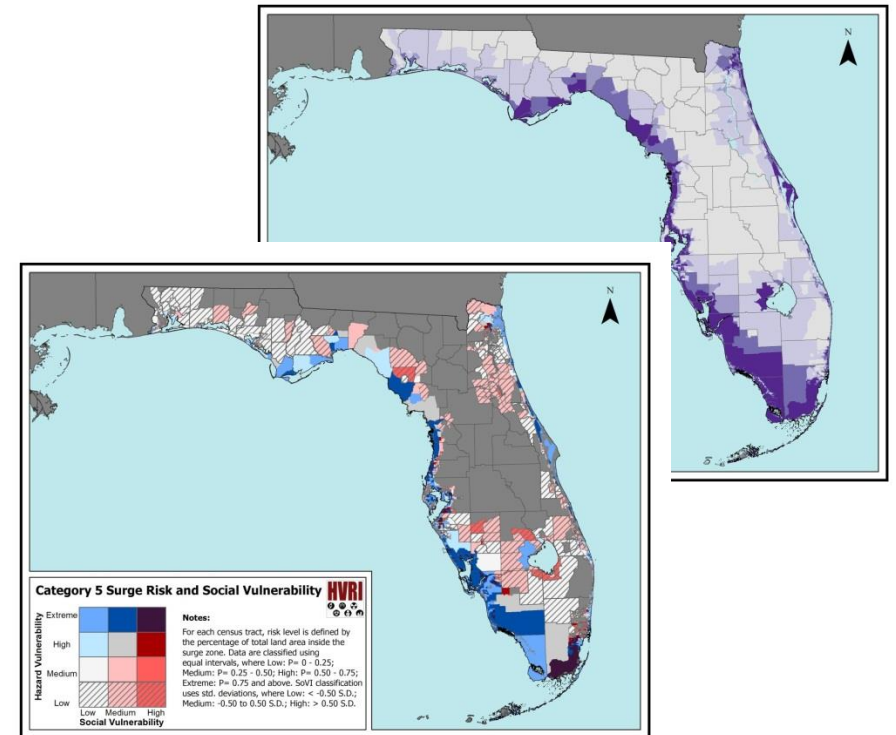- Relied heavily on local-level data

Building Resilience Against Climate Effects

01 Forecasting Climate Impacts and Assessing Vulnerabilities
Projecting the Disease Burden
02 Assessing Public Health Interventions
03 Developing and Implementing a Climate and Health Adaptation Plan
04
05 Evaluating Impact and Improving Quality of Activities

BRACE
Building **R**esilience **A**gainst **C**limate **E**ffects

Florida Priority Hazards

- Sea level rise
- Hurricanes and other storms
- Floods
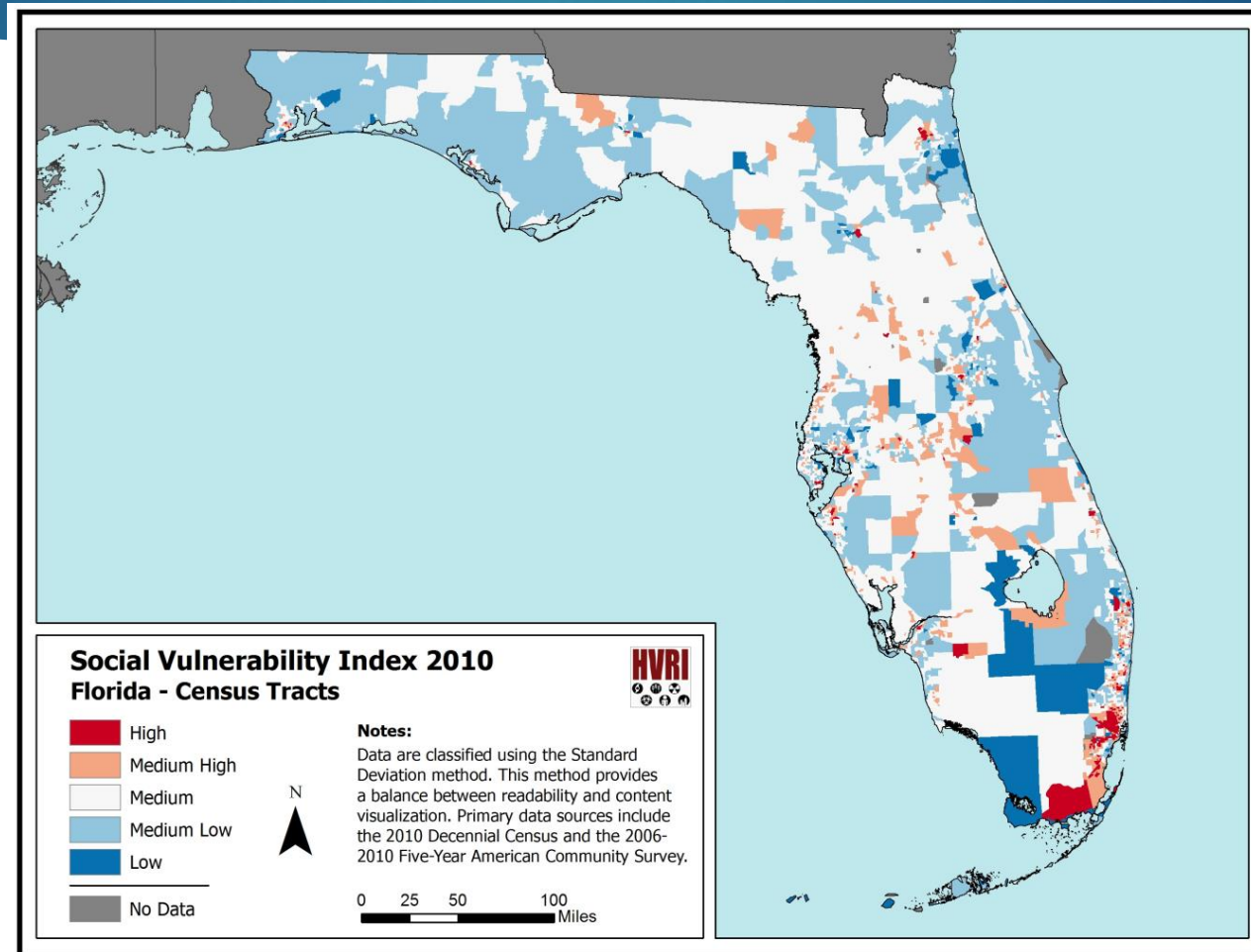- Drought
- Heat
- Wildland Fires
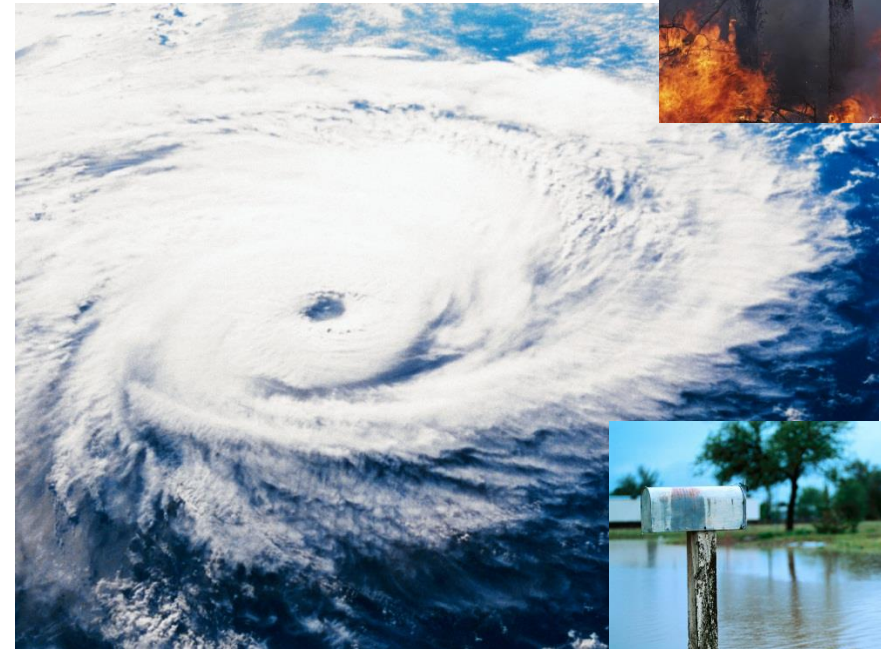
Vulnerability Assessment

- Spatial analysis of future hazards

- Intersection of hazards with social and medical vulnerability

- Completed in consultation with the University of South Carolina Hazards and Vulnerability Research Institute (USC HVRI)

Category 5 Surge Risk and Social Vulnerability

Notes:
For each census tract, risk level is defined by the percentage of total land area inside the surge zone. Data are classified using equal intervals, where Low: P= 0 - 0.25; Medium: P= 0.25 - 0.50; High: P= 0.50 - 0.75; Extreme: P= 0.75 and above. SoVI classification uses std. deviations, where Low: < -0.50 S.D.; Medium: -0.50 to 0.50 S.D.; High: > 0.50 S.D.

Social Vulnerability (SoVI)

▶ Reflects characteristics of social groups that influence differential capacity to prepare for and respond to environmental threats

▶ Uses 28 variables from the 2010 U.S. Census

- ▶ Race-ethnicity
- ▶ Socioeconomic status
- ▶ Gender
- ▶ Age
- ▶ Rural/urban location
- ▶ Renter status

- ▶ Occupations
- ▶ Family structure
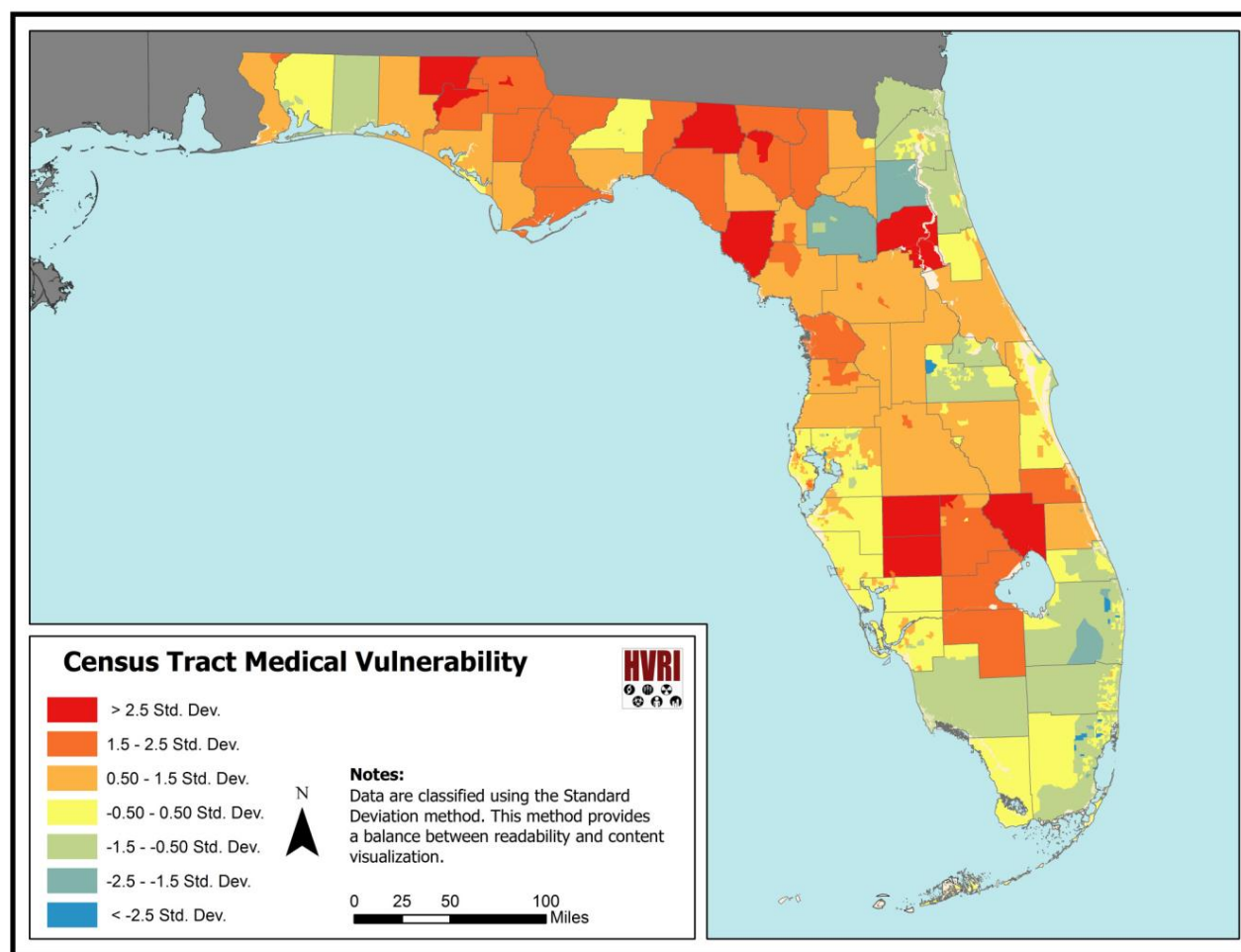- ▶ Employment
- ▶ Education
- ▶ Population growth

Social Vulnerability (SoVI)

Social Vulnerability Index 2010
Florida - Census Tracts

HVRI

- High
- Medium High
- Medium
- Medium Low
- Low
- No Data

N

Notes:
Data are classified using the Standard Deviation method. This method provides a balance between readability and content visualization. Primary data sources include the 2010 Decennial Census and the 2006-2010 Five-Year American Community Survey.

0 25 50 100
Miles

Medical Vulnerability (MedVI)

▶ Reflects indicators of health need with inherent medical vulnerability independent of social factors

▶ Data collected from sources including DOH Vulnerable Population Profiles, Florida Law Enforcement, County Health Rankings, Florida Agency for Health Care Administration (AHCA)

▶ Includes 61 indicators that can be broadly classified as

  ▶ Health care access

  ▶ Health system capacity

  ▶ Medical need (physical and psychological health needs)
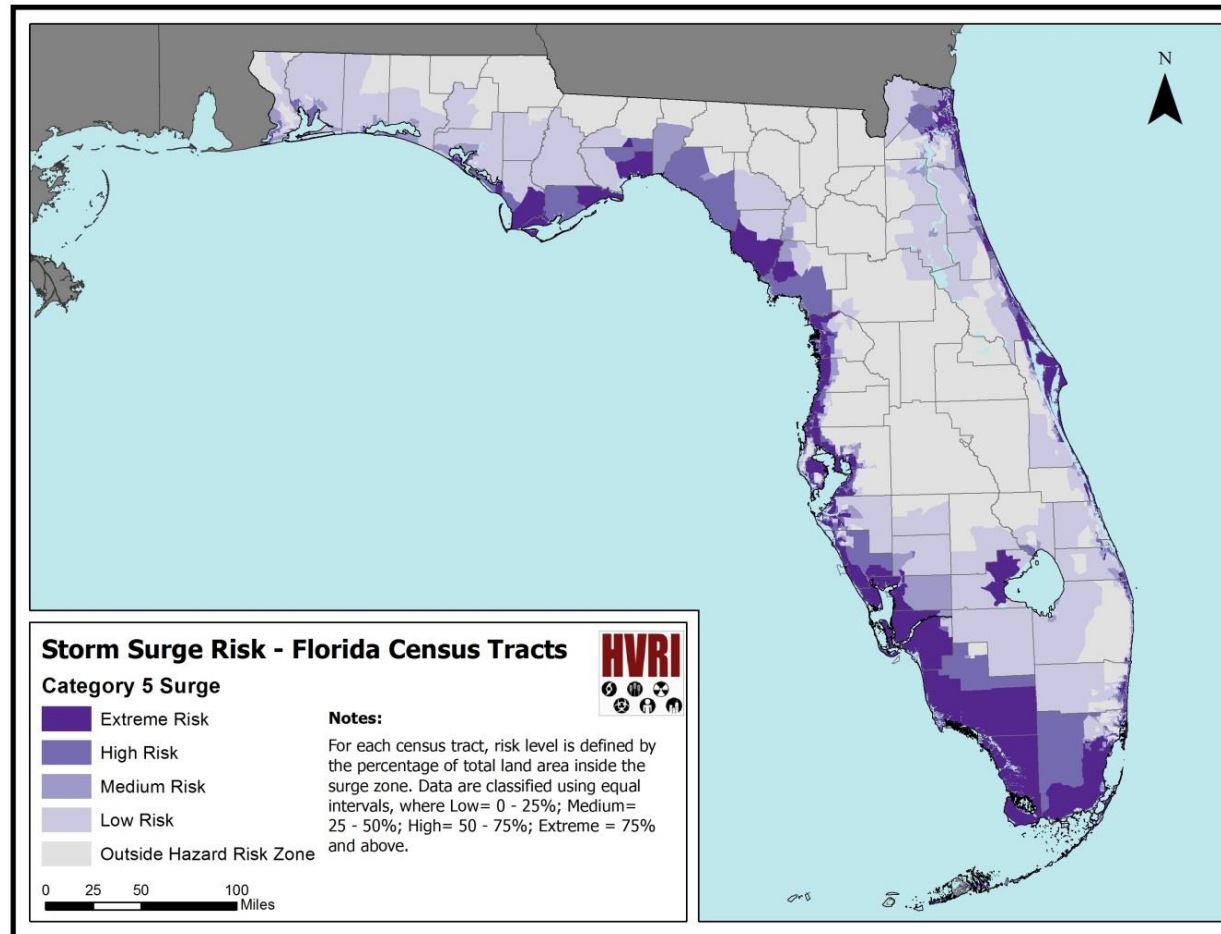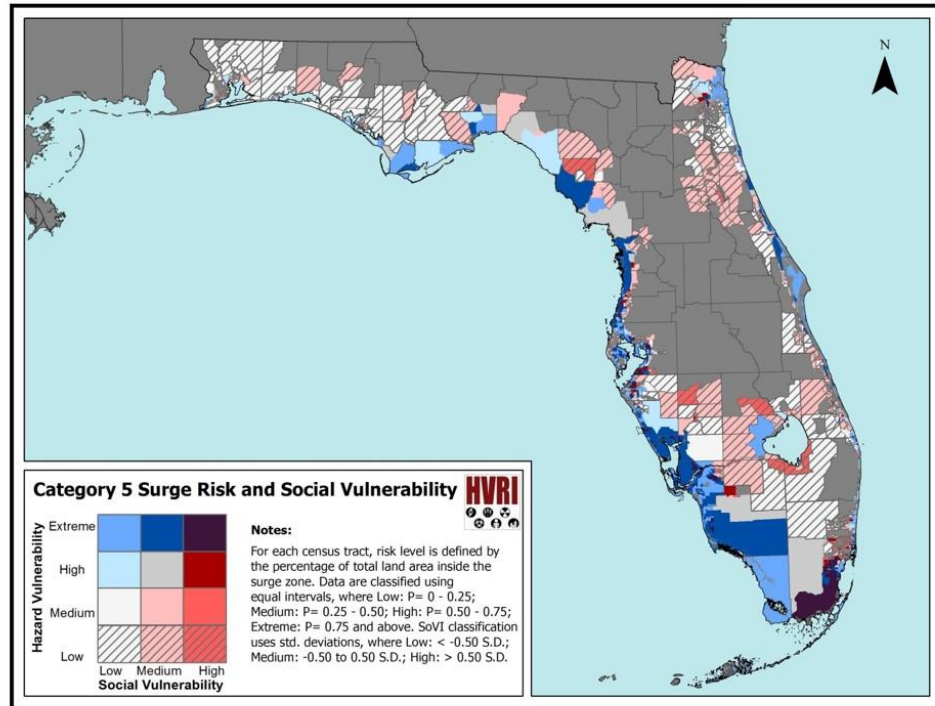
Medical Vulnerability (MedVI)

Census Tract Medical Vulnerability

HVRI

- > 2.5 Std. Dev.
- 1.5 - 2.5 Std. Dev.
- 0.50 - 1.5 Std. Dev.
- -0.50 - 0.50 Std. Dev.
- -1.5 - -0.50 Std. Dev.
- -2.5 - -1.5 Std. Dev.
- < -2.5 Std. Dev.

N

Notes:
Data are classified using the Standard Deviation method. This method provides a balance between readability and content visualization.

0   25   50   100
                    Miles

Intersectionality

▶ One negative factor may not be problematic in the long run.

▶ However, places with higher risk and higher vulnerability are more likely to see adverse outcomes.

▶ Analysis allows for identifying areas where:

  ▶ Hazard itself should be the main focus.

  ▶ Underlying social demographics provide biggest opportunity for positive outcomes.

  ▶ Combination of hazard and social adaptation/mitigation practices can maximize positive outcomes.

Category Five Storm Surge Risk

Storm Surge Risk - Florida Census Tracts

Category 5 Surge

- Extreme Risk
- High Risk
- Medium Risk
- Low Risk
- Outside Hazard Risk Zone

Notes:

For each census tract, risk level is defined by the percentage of total land area inside the surge zone. Data are classified using equal intervals, where Low= 0 - 25%; Medium= 25 - 50%; High= 50 - 75%; Extreme = 75% and above.

HVRI

0   25   50   100
                        Miles

Storm Surge Risk and Vulnerability

Cat 5 Surge and SoVI

Cat 5 Surge and MedVI
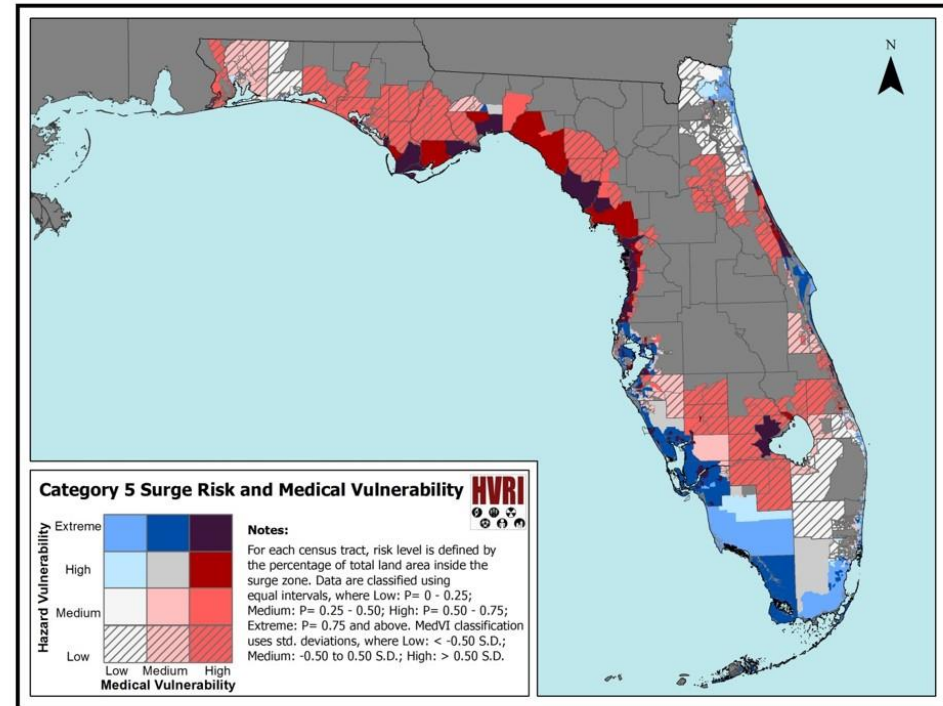
Hazard and Health Profile Reports

- Historic Patterns
- Geographic Vulnerability
- Health Implications
- Methods
- Associations with Health Outcomes
- Conclusions

Drought and Human Health

- **Drought Profile Indicators**
  - Asthma and Respiratory Diseases
    - Allergic rhinitis
    - Asthma
    - Respiratory disease (all, excluding asthma)
  - Foodborne and Waterborne Disease
    - Campylobacteriosis
    - Cryptosporidiosis
    - Giardiasis
    - Salmonellosis

Health Effects of Precipitation Abundance and Deficits in Florida

Hurricanes and Human Health

Health Effects of Tropical Storms and Hurricanes in Florida

Florida HEALTH

- **Hurricane Profile Indicators**
  - Carbon Monoxide Poisoning
  - Drowning (fatal)
  - Foodborne and Waterborne Disease
  - Injury (all-cause)

Summer Heat and Human Health

- **Heat Profile Indicators**
  - Heat-related Illness
  - Cardiovascular Diseases
    - Acute myocardial infarction
    - Ischemic stroke
  - Asthma
  - Mental Health and Behavioral Disorders
    - Organic psychotic conditions
    - Substance-related disorders

Health Effects of Summer Heat in Florida

Florida HEALTH

Disease Burden Projections

▶ Five disease burden projections

- ▶ Heat and heat-related illness
- ▶ Tropical cyclones and injury
- ▶ Tropical cyclones and carbon monoxide poisoning
- ▶ Drought and asthma
- ▶ Drought and salmonellosis

Disease Burden Projections – Methods

- Temperature and precipitation projections
  - 10 regional climate models based on the A2 scenario
  - In-house processing with assistance from climate experts
- Hurricane and tropical storm projections
  - Qualitative approach focusing on increasing intensity
- Population projections obtained from NCAR's 15-km gridded global population estimates
  - Aggregated to region
  - Available for A2 scenario for each decade from 2000 to 2100

Intervention Assessments

▶ Completed in conjunction with the Midwest and Southeast BRACE states

▶ Included literature reviews and assessment of the available evidence

- ▶ Air quality
- ▶ Carbon monoxide poisoning
- ▶ Drought
- ▶ Extreme heat
- ▶ Extreme weather injuries
- ▶ Flooding and harmful algal blooms
- ▶ Flooding and mold

- ▶ Mosquito-borne diseases
- ▶ Pollen
- ▶ Tick-borne diseases
- ▶ Waterborne diseases
- ▶ Wildland fire
- ▶ Mental health and floods/storms
- ▶ Mental health and heat

Evidence Rating

► **Scientifically Supported:** most likely to make a difference, tested in many robust studies with consistently positive results.

► **Some Evidence:** likely to work, but further research is needed; tested more than once and results trend positive overall.

► **Expert Opinion:** recommended by credible, impartial experts but have limited research documenting effects; further research is needed to confirm effects.

► **Insufficient Evidence:** limited research documenting effects; further research, often with stronger designs, is needed to confirm effects.

► **Mixed Evidence:** tested more than once and results are inconsistent or trend negative; further research is needed to confirm effects.

► **Evidence of Ineffectiveness:** not good investments; tested in many robust studies with consistently negative and sometimes harmful results.

What works for Health, http://www.countyhealthrankings.org/roadmaps/what-works-for-health/our-ratings

Intervention	Description	Effectiveness
Evacuation	Evacuation consists of urgent removal of individuals from an area, such as a building or a community, when there's an immediate risk to human health and safety. Evacuations as an intervention for wildfire smoke can include entire populations for sub-populations of vulnerable individuals who are particularly susceptible to the health effects from smoke exposure.	Scientifically supported
Air Filtration and Cleaners- Home, Room, Facility	Filtration is defined as "the removal of particulate matter (PM) from air using an air-handling system and a filter (or a bank of filters)." Air cleaning is "the removal of gaseous contaminants from air using an air-handling system and sorbent filters (such as granular activated carbon, potassium permanganate impregnated alumina and impregnated carbon)."	Scientifically supported
Personal Air Masks	Respirator masks, or "particulate respirators", (which look like paper masks) can filter out 95% of particulates that are 0.3 microns and larger, therefore filtering a significant portion of smoke. Respirator masks labled "R95", "N95", or "p95", or soft masks with higher ratings (R, N, or P99 abd R, N, or P1000) will filter out most particles associated with wildfire smoke. Respirators with purple HEPA filters offer the highest protection.	Some evidence
Forecast/ Warning Systems	Air quality forecasting is conducted by a wide variety of agencies at a state and national level. These forecasting symptoms usually use an Air Quality Index (AQI) for reporting and forecasting daily air quality. The EPA, in conjunction with NOAA, calculate the AQI for five major pollutants: groundlevel ozone, particulate pollution (particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide.	Some evidence
Public Service Announcements	A Public Service Announcement (PSA) is a message to the public disseminated by the media with a primary purpose of informing and education the public. PSA's could be utilized to spread a message informing the public of the health risks of wildfire smoke inhalation and preventive measures to protect lungs.	Some evidence

Adaptation Projects

- Funded three local adaptation projects in 2015
  - Health care community assessment
  - Evaluation of county-level capacity to respond to hazards
  - Vulnerability and critical infrastructure assessment of high hazard areas
- Currently funding three local adaptation projects in 2016
  - Urban heat-island mitigation in vulnerable communities
  - Mosquito surveillance and evaluation of public health education to reduce mosquito exposure
  - Built environment assessment

Adaptation Planning Guide

Outputs

Step 3: Assessing Public Health Interventions

Step 4: Developing and Implementing a Health Adaptation Plan

Evidence-based intervention options (based on collaborative assessment)

Community engagement strategies (trends and best practices)

Florida-specific guidance (local planning process; recommendations for priority hazards)

Thank you!

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