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The Association Between Major Disasters and Health-Related Behaviors: Using BRFSS Data from Mississippi

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Presenter Disclosures

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(1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

“No relationships to disclose”

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The Adverse Effect of Disasters on Physical and Mental Health

- ❖ Short-term effects
 - ❖ Direct physical injuries
 - ❖ Psychological stress symptoms
 - ❖ Lack of healthcare access
- ❖ Long-term effects
 - ❖ Depression, Posttraumatic Stress Disorder (PTSD) symptoms
 - ❖ More general health complaints

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The Adverse Effect of Disasters on Risk Behaviors

- ❖ Risk Behaviors
 - ❖ An increased use in tobacco and alcohol among disaster-affected populations
 - ❖ Stressed people are more likely to engage in risk behaviors




Data Source

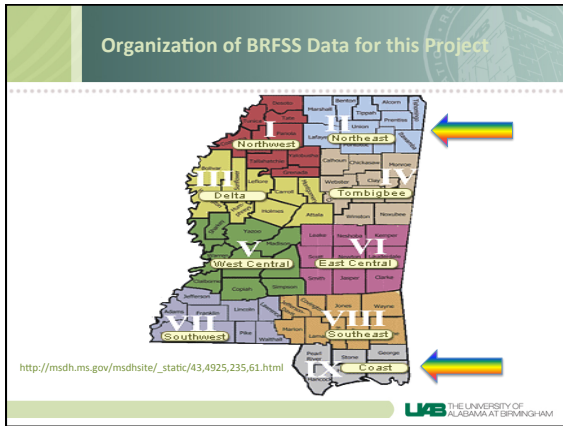
- ❖ Mississippi Behavioral Risk Factor Surveillance System (BRFSS) data from 2004 through 2010
- ❖ BRFSS: National annual telephone survey by CDC
 - ❖ A random digit dialing system
 - ❖ 18yr and older non-institutionalized civilian adults state residents



Research Questions

- ❖ Is physical health associated with disasters?
- ❖ Is mental health associated with disasters?
- ❖ Is the risk behavior of smoking associated with disasters?
- ❖ Is the risk behavior of binge drinking associated with disasters?





Data Description

- ❖ Valid Sample Size: 9511
- ❖ Average age: 54 yr
- ❖ 38% males, 81% white
- ❖ 42% employed, 26% retired, and 11% unable to work
- ❖ 58% married, 31% had children living with them, 33% had a high school diploma, 50% had annual household income ≤ \$35,000
- ❖ 23% current smokers, 8% binge drinkers

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BRFSS Variables Used as Outcomes

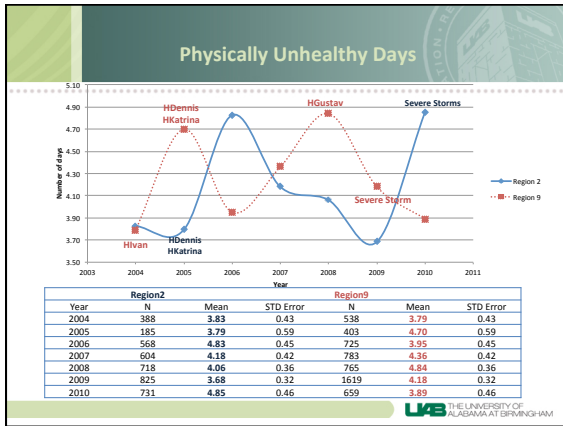
- ❖ Health Outcome Indicators
 - ❖ Physical health (0-30 days): self-reported number of physically unhealthy days in the past 30 days
 - ❖ Mental health (0-30 days): self-reported number of mentally unhealthy days in the past 30 days
- ❖ Risk Behaviors
 - ❖ Current Smoker (1 or 0)
 - ❖ Binge drinker (1 or 0): on one occasion, males having ≥ 5 drinks or females having ≥ 4 drinks

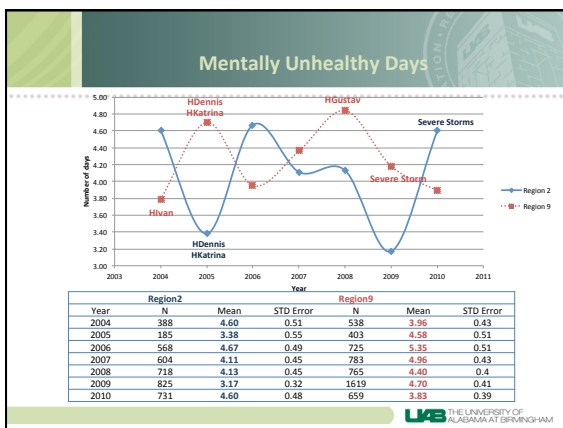
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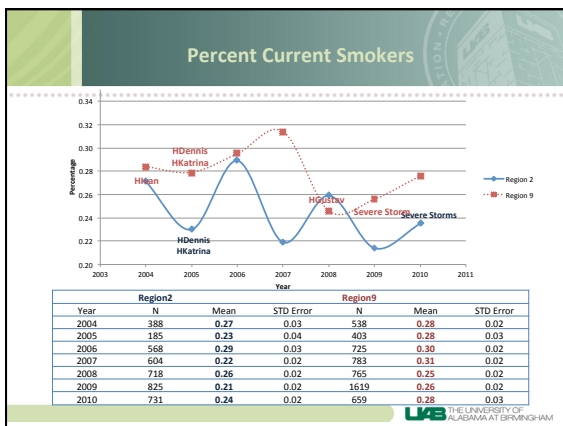
Key Predictors – Disaster Days / Lagged (365 days)			
Year	Disaster	Region 2 (Days)	Region 9 (Days)
2004	Hurricane Ivan 9/13-9/20	0	8
2005	Hurricane Dennis 7/10-7/15	$6 * 0.31 = 1.86$	6
2005	Hurricane Katrina 8/29-10/14	$47 * 0.9 = 42.3$	47
2008	Hurricane Gustav 8/28-9/8	0	12
2009	Severe Storms, flooding and tornadoes 3/25-3/28	0	1.36
2010	Severe Storms, tornadoes and flooding 4/23-4/24, 5/1-5/2	$2 * 0.62 + 0.08 * 2 = 1.4$	0

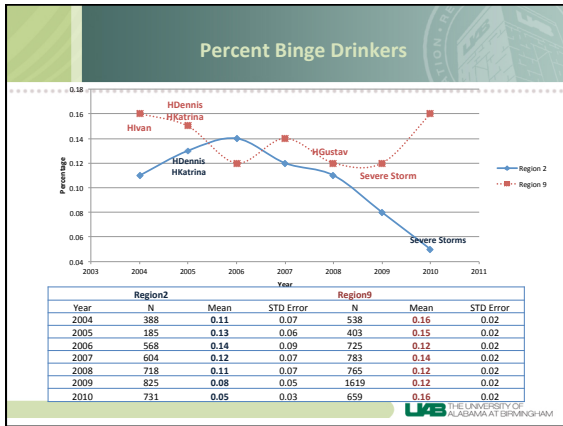
- Demographic Predictors**
- ❖ Age
 - ❖ Gender
 - ❖ Race
 - ❖ Marital status
 - ❖ Children
 - ❖ Employment
 - ❖ Education
 - ❖ Income
 - ❖ Region

- Healthcare Access Predictors**
- ❖ Self-reported general health status (1-5)
 - ❖ Health insurance plans (1 or 0)
 - ❖ Personal doctors (1 or 0)
 - ❖ Having avoided doctor visits due to costs (1 or 0)









Data Analysis

- ❖ Physically Unhealthy Days Fixed Effects Models
 - ❖ $Physically_unhealthy_days = Disaster_days + Mtq3 + Disaster_days * Mtq3 + Mentally_unhealthy_days + (Demographic) + (Healthcare_Access) + i.year$
 - ❖ $Physically_unhealthy_days = Lagged_disaster_days + Mtq3 + Lagged_disaster_days * Mtq3 + Mentally_unhealthy_days + (Demographic) + (Healthcare_access) + i.year$

Data Analysis


- ❖ Mentally Unhealthy Days Fixed Effects Models
 - ❖ $Mentally_unhealthy_days = Disaster_days + Mtq3 + Disaster_days * Mtq3 + Physically_unhealthy_days + (Demographic) + (Healthcare_access) + i.year$
 - ❖ $Mentally_unhealthy_days = Lagged_disaster_days + Mtq3 + Lagged_disaster_days * Mtq3 + Physically_unhealthy_days + (Demographic) + (Healthcare_access) + i.year$

Data Analysis

❖ **Smoking Fixed Effects Model**

❖ Smoker= Disaster_days + Mtq3 + Disaster_days*Mtq3 + Physically_unhealthy_days + Mentally_unhealthy_days + (Demographic) + (Healthcare_access) + i.year

❖ Smoker= Lagged_disaster_days + Mtq3 + Lagged_disaster_days*Mtq3 + Physically_unhealthy_days + Mentally_unhealthy_days + (Demographic) + (Healthcare_access) + i.year




Data Analysis

❖ **Drinking Fixed Effects Models**


❖ Drinker= Disaster_days + Mtq3 + Disaster_days*Mtq3 + Physically_unhealthy_days + Mentally_unhealthy_days + (Demographic) + (Healthcare_access) + i.year

❖ Drinker= Lagged_disaster_days + Mtq3 + Lagged_disaster_days*Mtq3 + Physically_unhealthy_days + Mentally_unhealthy_days + (Demographic) + (Healthcare_access) + i.year




Risk Factors for Physical Health

❖ More disaster days	❖ Healthcare Access Predictors
❖ More mentally unhealthy days	❖ Worse general health status
❖ Demographic Predictors	❖ With health plans
❖ White	❖ With personal doctors
❖ Unable to work	❖ Having avoided medical visits due to costs
❖ Without a high school diploma	❖ Binge drinkers reported fewer physically unhealthy days




Risk Factors for Mental Health

- ❖ More lagged disaster days
- ❖ More physically unhealthy days
- ❖ Demographic Predictors
 - ❖ Unmarried
 - ❖ Unable to work
 - ❖ Without a high school diploma
 - ❖ Income ≤ \$35,000
- ❖ Healthcare Access Predictors
 - ❖ Worse general health status
 - ❖ With health plans
 - ❖ Having avoided medical visits due to costs
- ❖ Smokers reported more mentally unhealthy days




Risk Factors for Smoking

- ❖ Fewer lagged disaster days
- ❖ Fewer mentally unhealthy days
- ❖ Demographic Predictors
 - ❖ Age 18-35, age ≥ 66
 - ❖ Female
 - ❖ Non-white
 - ❖ Married
 - ❖ Retired
 - ❖ High school and higher
 - ❖ Income ≥ \$50,000
- ❖ Healthcare Access Predictors
 - ❖ Better general health status
 - ❖ With health plans
 - ❖ With personal doctors
 - ❖ Not having avoided medical visits due to costs
- ❖ Obese
- ❖ Non-drinker
- ❖ Non-stressed




Risk Factors for Binge Drinking

- ❖ More lagged disaster days
- ❖ More physically unhealthy days
- ❖ Demographic Predictors
 - ❖ Any age group other than 18-35
 - ❖ Female
 - ❖ Married
 - ❖ Without high school diploma
 - ❖ Income ≤ \$35,000
- ❖ Healthcare Access Predictors
 - ❖ Worse general health status
 - ❖ With personal doctors
- ❖ Obese
- ❖ Non-smoker
- ❖ Non-stressed




Limitations

- ❖ BRFSS Data
 - ❖ Selection bias, non-response and recall bias
 - ❖ Under-report or over-report
 - ❖ Cross-sectional data
- ❖ Disaster days are measured as community collective exposure



Summary


- ❖ Disaster days: (-) physical health
- ❖ Lagged disaster days: (-) mental health (+) drinking (-) smoking
- ❖ Physical health: (+) mental health
- ❖ Being stressed: (-) smoking (-) drinking



Summary

- ❖ Smokers vs. Drinkers
 - ❖ Common Characteristics
 - ❖ Married
 - ❖ Retired
 - ❖ Obese
 - ❖ Different Characteristics

	Income	Education	Unhealthy Days
Current Smokers	High	High	More mentally
Binge Drinkers	Low	Low	Fewer physically



Conclusions

- ❖ Disasters correlated with short term physical health and long term mental health
- ❖ Drinkers and smokers similar in some ways different in others
- ❖ Obesity correlated with smoking and binge drinking
- ❖ Stressed population less likely smoking and binge drinking
- ❖ Provide strategies to develop evidence-based and tailored interventions

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