Older Adults in the Eye of the Storm: Research and Practice to Improve Health of Seniors after a Disaster

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Nothing to disclose.

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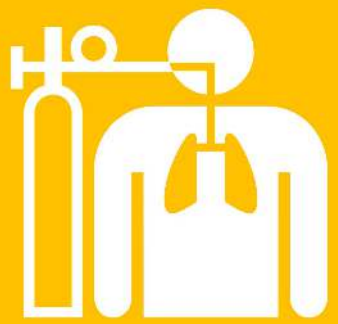
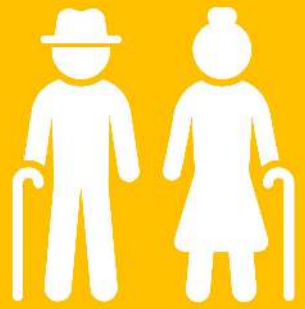
NIH K23AG059890; “Individual and Community Drivers of Hospitalization among Older Adults after Natural Disaster,” role: PI

Individual and Community Drivers of Hospitalization among Older Adults after Disaster



Aim 1: Chronic disease care after disaster to avoid hospitalization.

Aim 2: Community resilience to improve health outcomes.



Aim 3: Strategies to promote aging in place after disaster.

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NIH
National Institutes of Health

NBC News ✓
@NBCNews

Follow

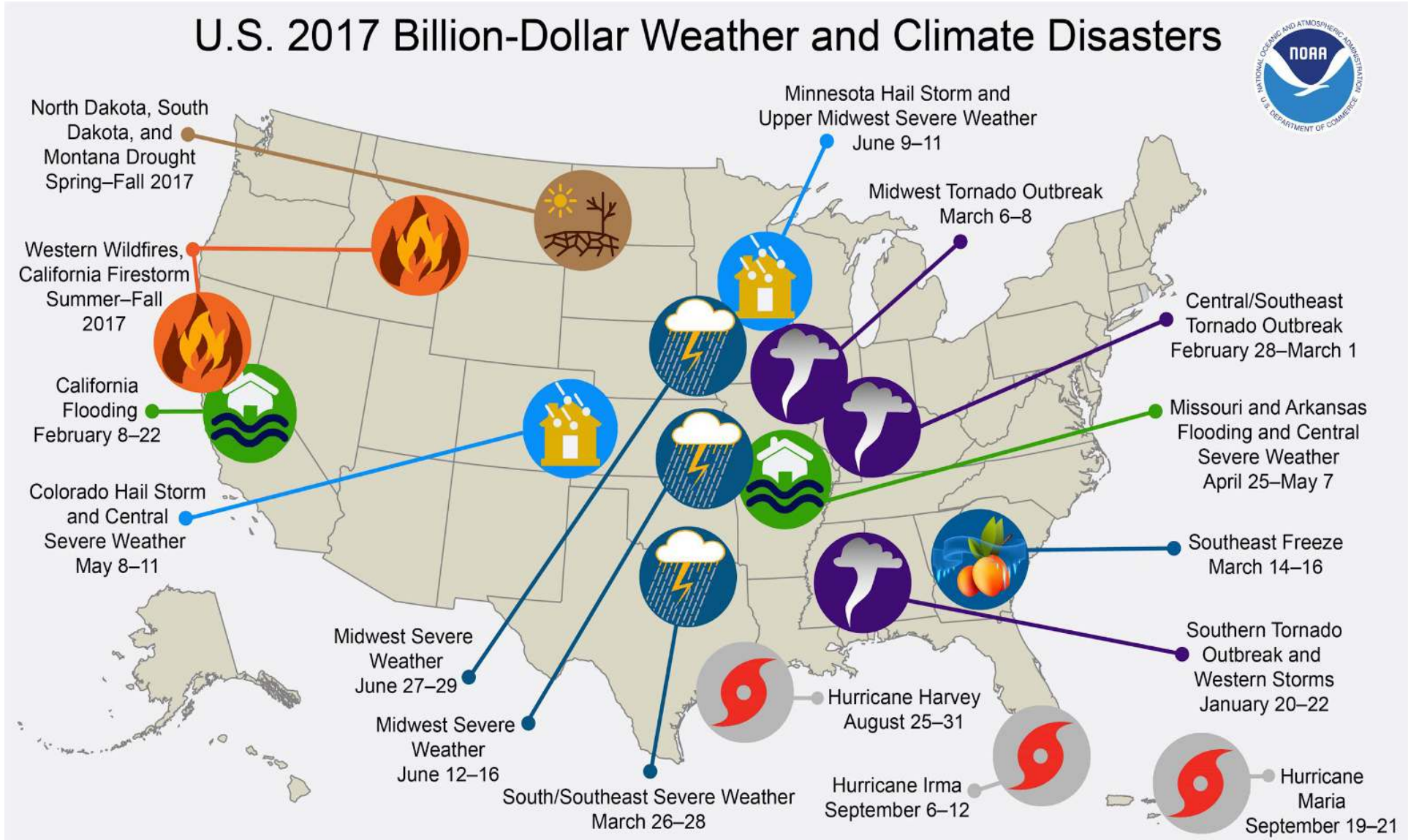
300 doctors, nurses, and paramedics await takeoff on a C-17 before heading to Orlando for Hurricane Irma response

(Photo: U.S. Air Force)

There’s no such thing as a Natural Disaster.

Hazards are natural. Disasters are human-made.

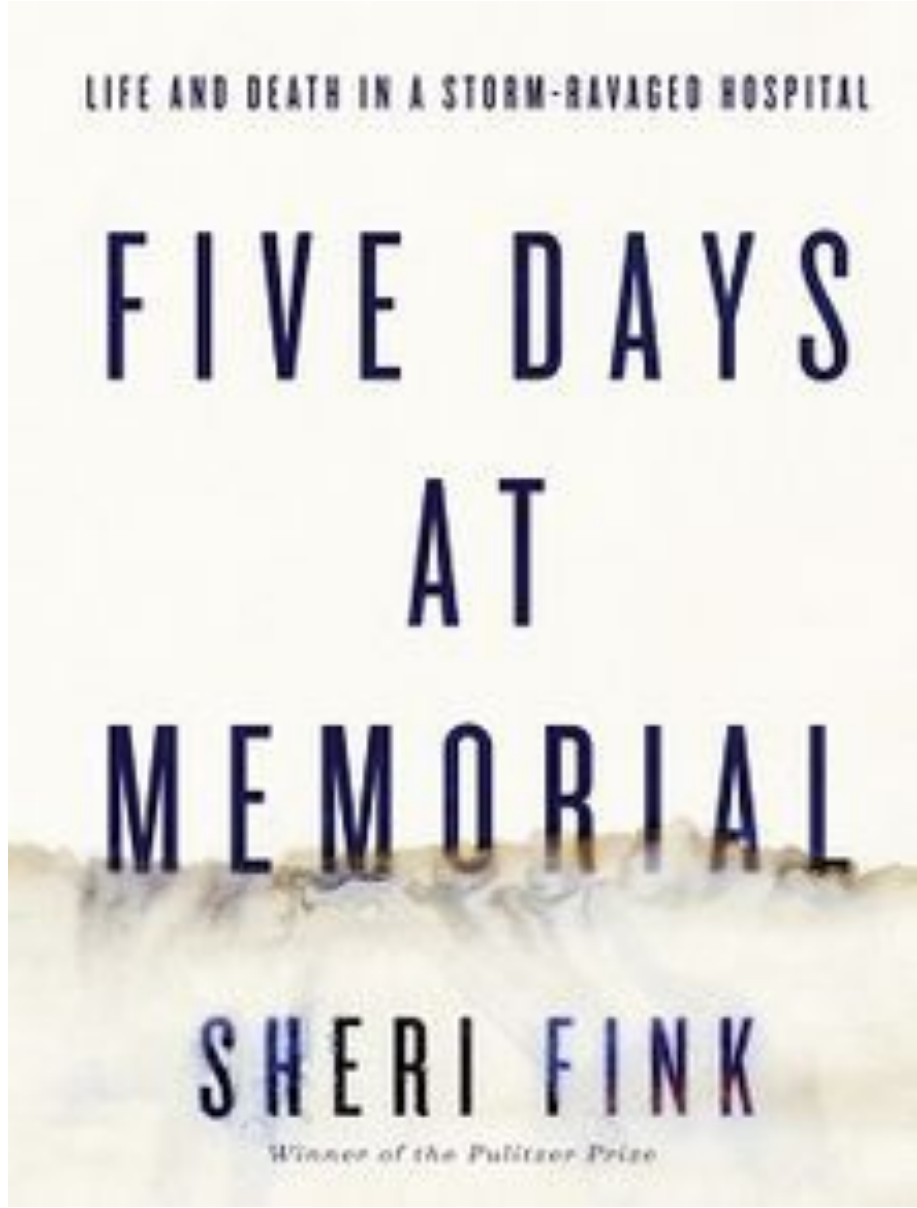
U.S. 2017 Billion-Dollar Weather and Climate Disasters



*This map denotes the approximate location for each of the **16 billion-dollar weather and climate disasters** that impacted the United States **during 2017**.*

Disasters disproportionately affect vulnerable populations.

Source: Brad Loper, Dallas Morning News


LIFE AND DEATH IN A STORM-RAVAGED HOSPITAL
FIVE DAYS AT MEMORIAL
SHERI FINK
Winner of the Pulitzer Prize

Disaster definition

$$\frac{(\text{Vulnerability} + \text{Hazard})}{\text{Capacity}} = \text{Disaster}$$

Definition: International Federation of the Red Cross/ Red Crescent

Chronic and Comorbid Disease

$$\frac{(\text{Vulnerability} + \text{Hazard})}{\text{Capacity}} = \text{Disaster}$$

Frailty **Social Isolation**

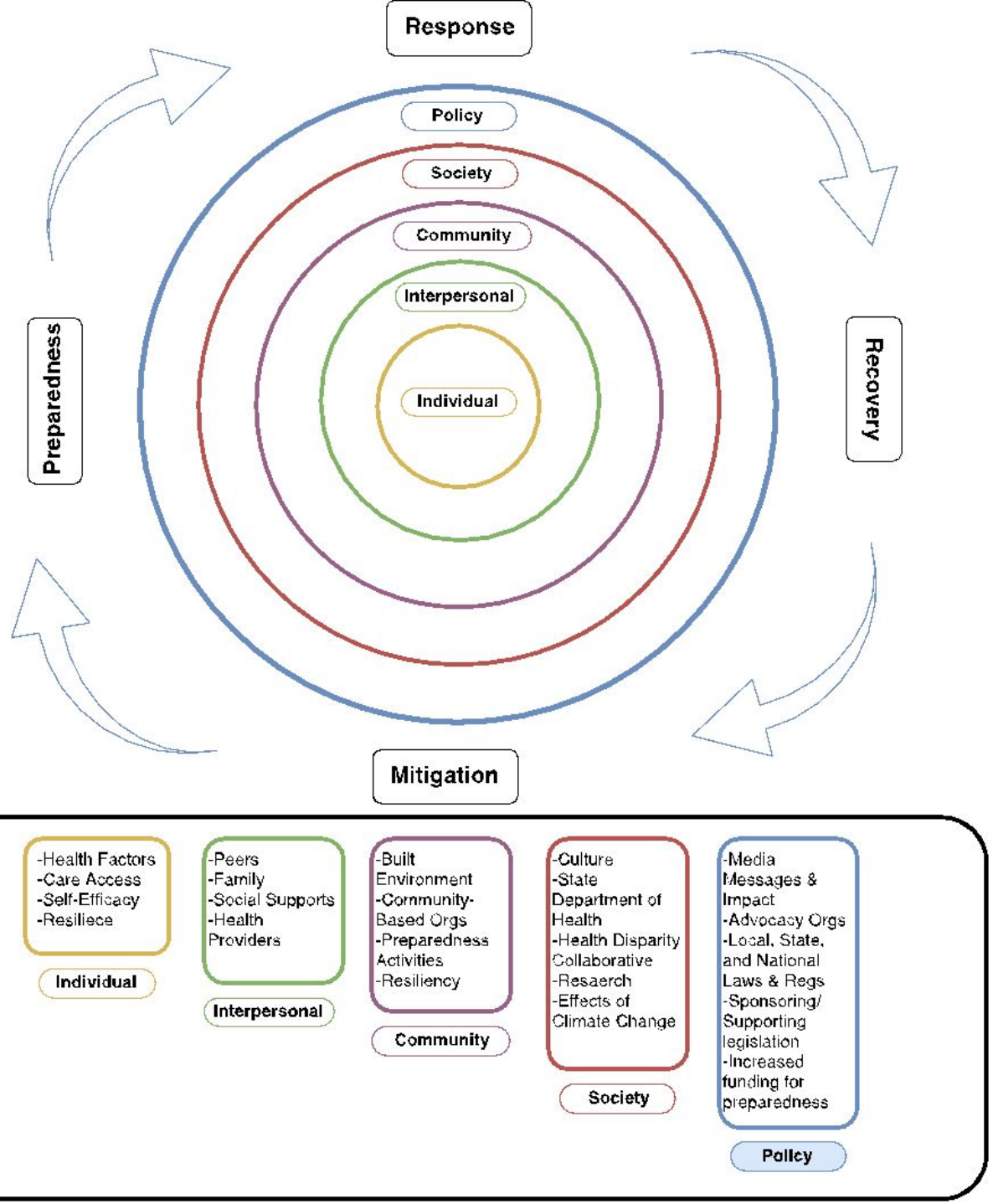
Cognitive Impairment

Disasters exacerbate existing vulnerabilities for older adults.

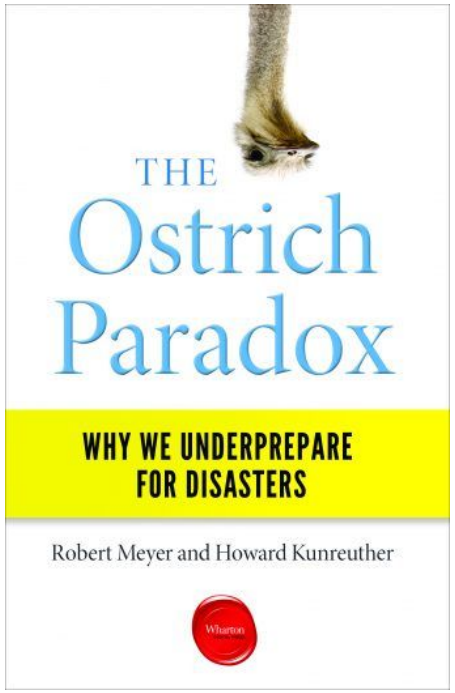
Community supports are interrupted.

Health care services are disrupted.

Loss of basic infrastructure affects chronic disease processes.


Response
Policy
Society
Community
Interpersonal
Individual
Preparedness
Recovery
Mitigation
-Health Factors
-Care Access
-Self-Efficacy
-Resiliece
Individual
-Peers
-Family
-Social Supports
-Health Providers
Interpersonal
-Built Environment
-Community-Based Orgs
-Preparedness Activities
-Resiliency
Community
-Culture
-State Department of Health
-Health Disparity Collaborative
-Resaerch
-Effects of Climate Change
Society
-Media Messages & Impact
-Advocacy Orgs
-Local, State, and National Laws & Regs
-Sponsoring/ Supporting legislation
-Increased funding for preparedness
Policy

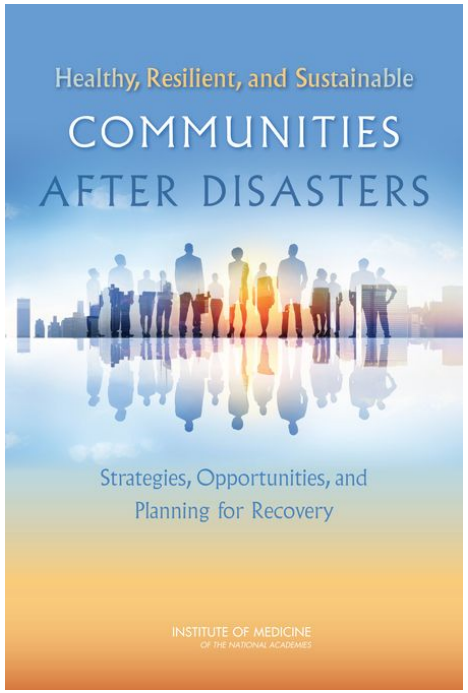
Opportunities and challenges



"We fail to evacuate when advised. We rebuild in flood zones. We don't wear helmets. We fail to purchase insurance. We would rather avoid the risk of "crying wolf" than sound an alarm."

We don't conduct data-driven research to understand the effects of disasters on population health.

Opportunities and Challenges



Research challenges:

- Reliance on cross-sectional or anecdotal accounts of individual disasters
- Little linkage to generalizable knowledge about after effects of disasters
- Linking large datasets to specific disasters

"Disaster research does not necessarily require a disaster. Available data should be mined to understand the impact of disasters on the elderly population. These include data from Medicare's home health care payment program and other home health agencies that are required to undertake a similar assessment."

*Committee Report, National Institute of Aging. Advancing Behavioral and Social Research on the Elderly in Disasters. 2009.

Annals of Emergency Medicine
An International Journal

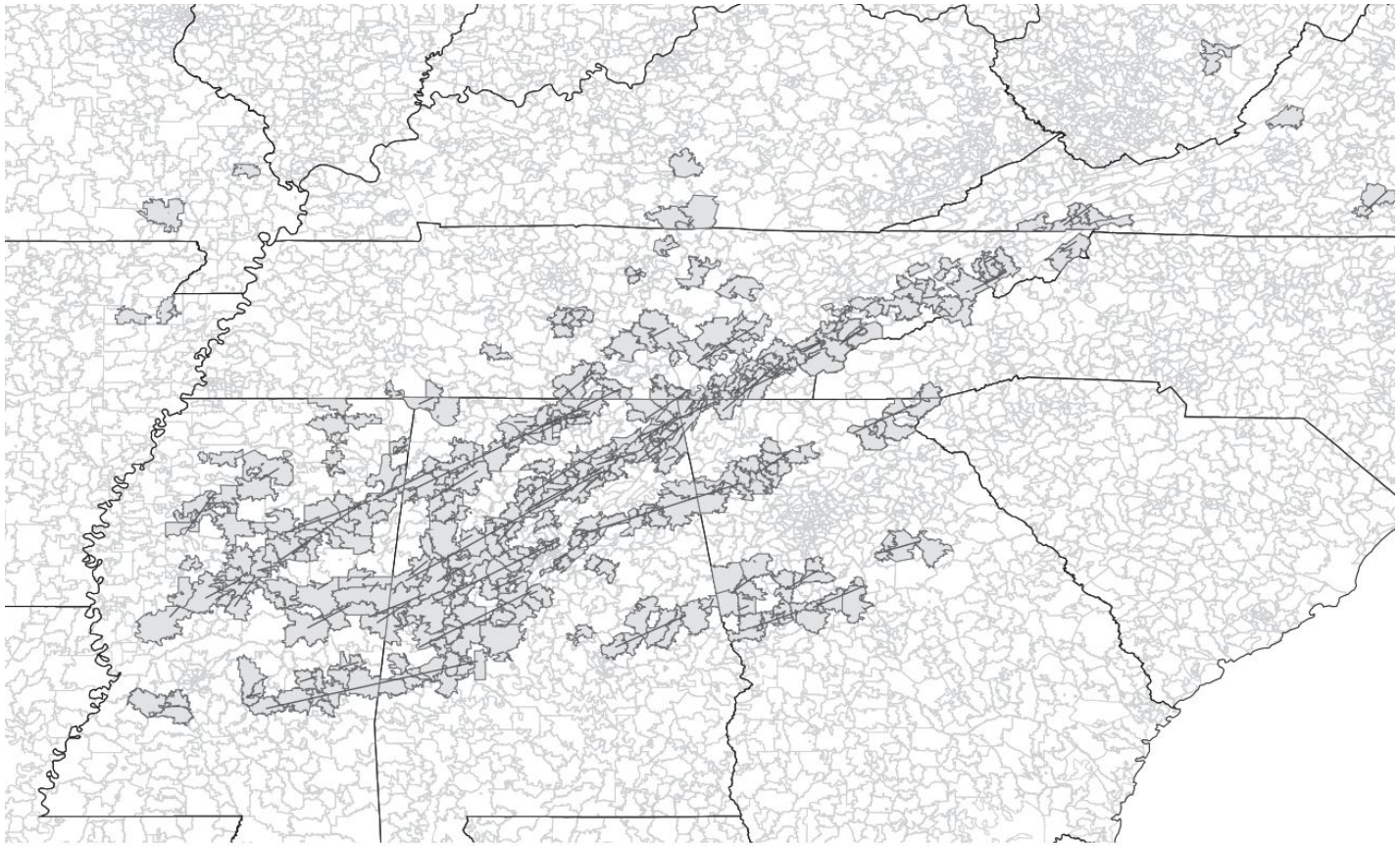
GERIATRICS/ORIGINAL RESEARCH

All-Cause Hospital Admissions Among Older Adults After a Natural Disaster

Sue Anne Bell, PhD, FNP-BC*; Mahshid Abir, MD; HwaJung Choi, PhD; Colin Cooke, MD; Theodore Iwashyna, MD, PhD

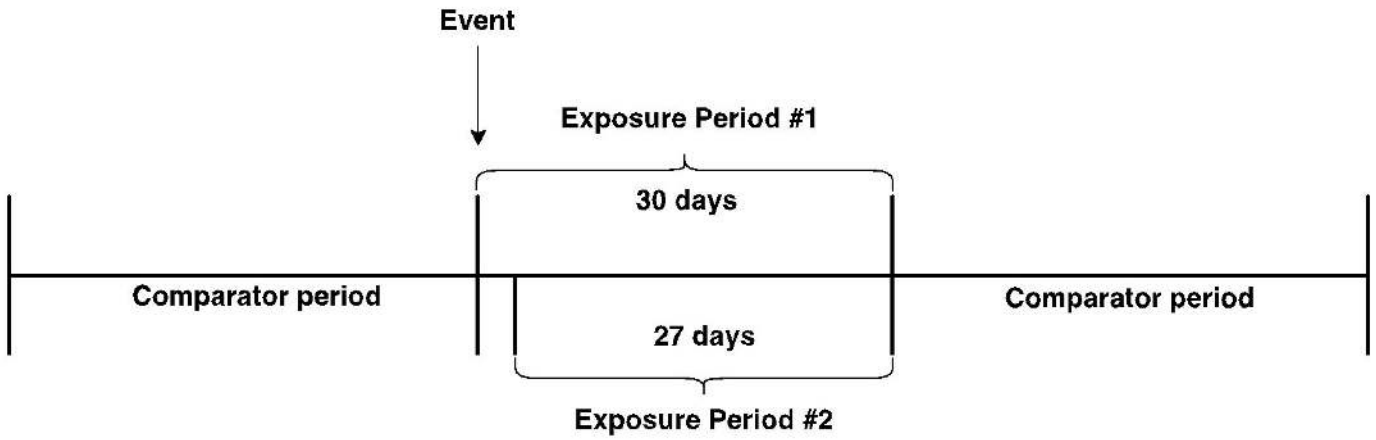
*Corresponding Author. E-mail: sabell@umich.edu, Twitter: @sueannebell.

# Setting: 2011 Southeast Superstorm
n=28,475

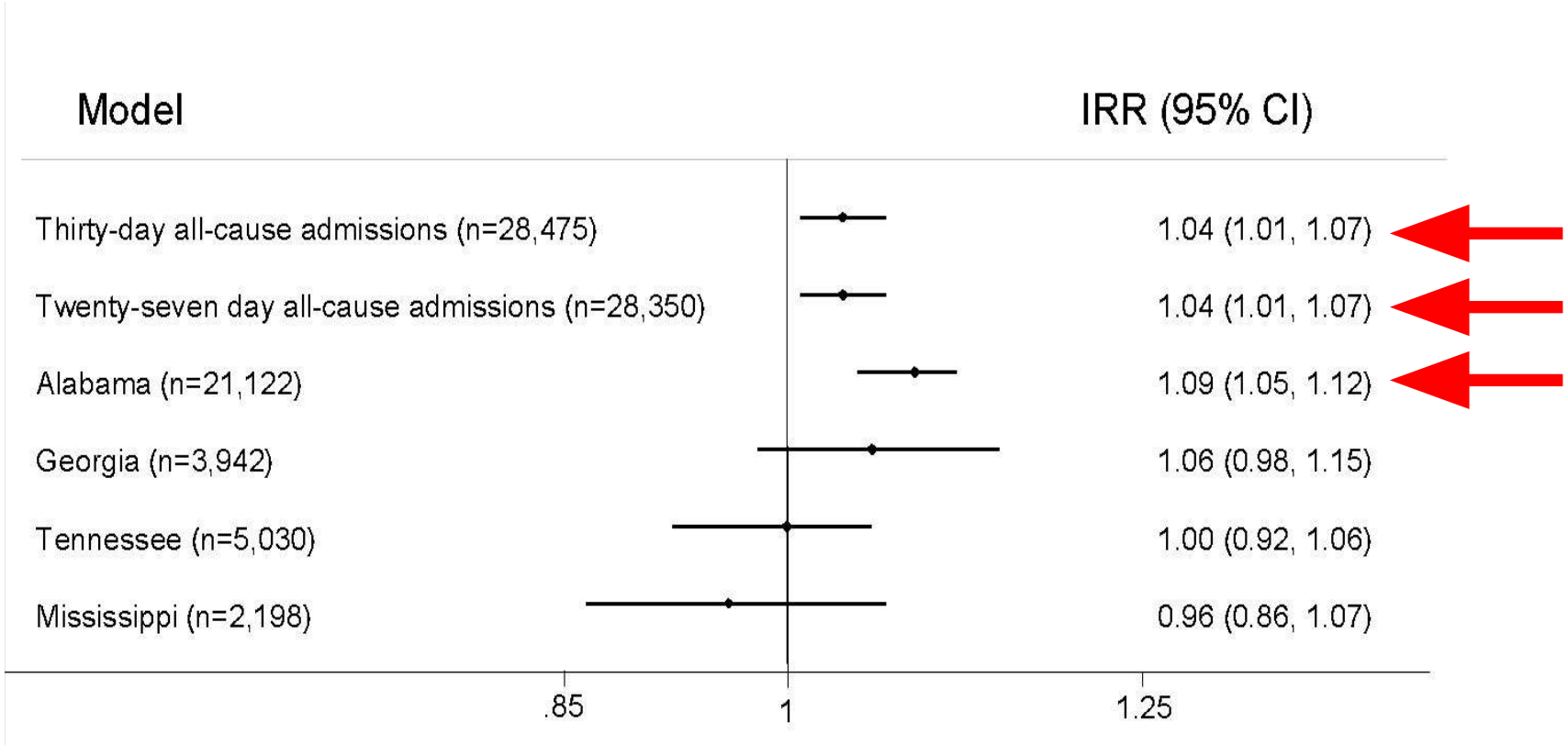


Methods

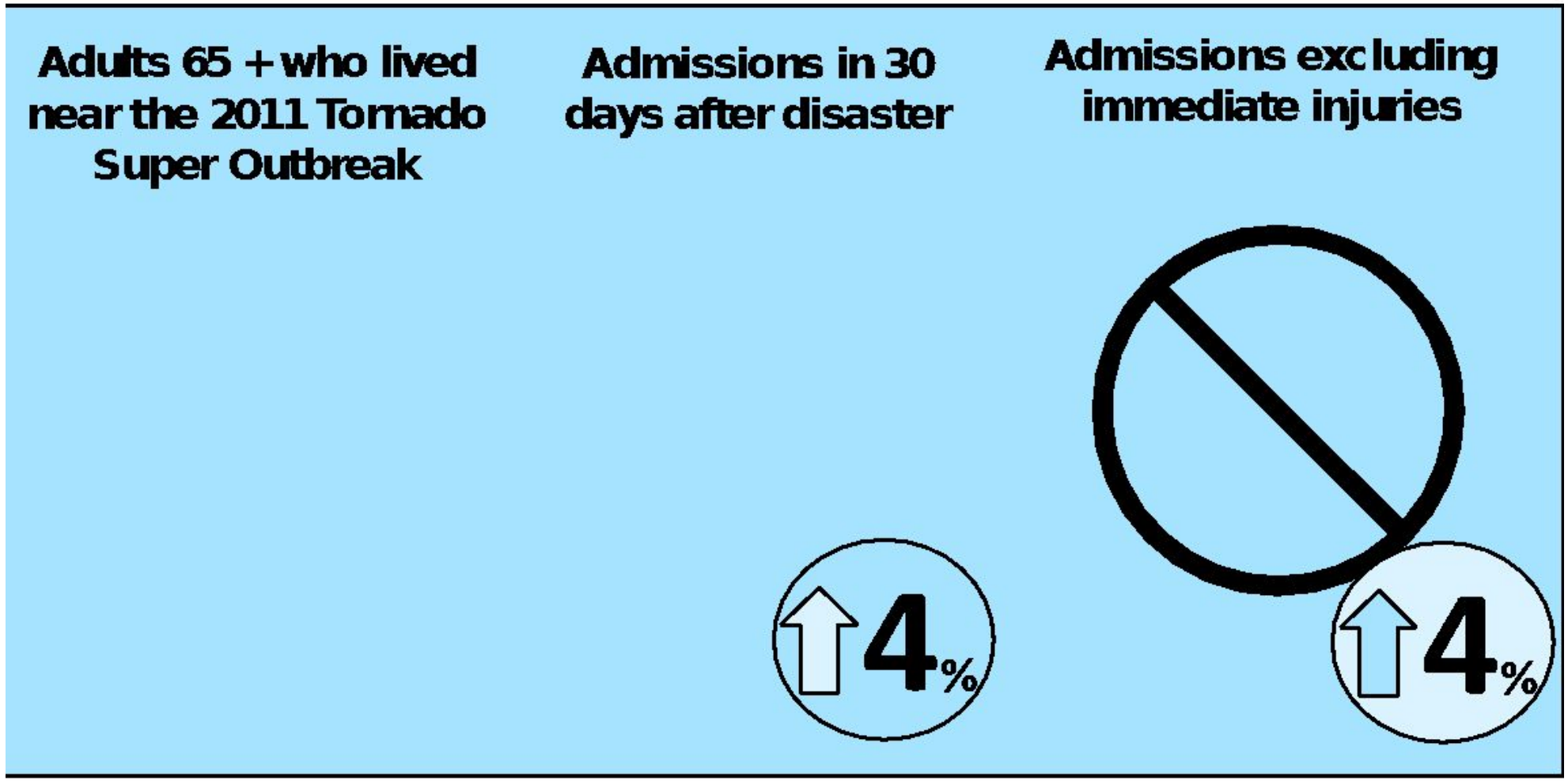
- Data source: MedPAR
- Self Controlled Case Series
- Individuals serve as their own controls and confounders are controlled for within the modeling
- Analysis based on when an event happened



Hospitalizations for older adults increased significantly in the month after one major disaster.



Hospital Admissions Among Older Adults After Disaster



Bell et al. Ann Emerg Med, 2017

@sueannebell

Health Risk Behaviors Among Older Adults after Disaster

Sue Anne Bell, PhD, FNP-BC, HwaJung Choi, PhD, Kenneth M. Langa, MD, PhD, Theodore J. Iwashyna, MD, PhD, (In press),

PreHospital and Disaster Medicine.

Research Question: Do health risk behaviors change after disaster?

- Data Sources:

HRS | HEALTH AND RETIREMENT STUDY

A public resource for data on aging in America since 1990

FEMA

Health Risk Behaviors Among Older Adults after Disaster

Unadjusted and Adjusted Logit Models			
Model	Effect Size*	(95% CI)	P value
Change in Physical Activity			
Unadjusted	OR=.89	(.84 - .95)	.001
Adjusted	OR=.84	(.79 - .89)	<.001
Increase in weight			
Unadjusted	RRR=1.19	(1.11 – 1.27)	<.001
Adjusted	RRR= 1.21	(1.13 – 1.30)	<.001
Change in Smoking			
Unadjusted	OR=.96	(.87 - 1.06)	.40
Adjusted	OR=.99	(.91 - .1.08)	.92
***OR, RRR**			

Living Through a Disaster Leads to Less Healthy Behaviors

Sue Anne Bell (@sueannebell) *et al.* PreHospital and Disaster Medicine (In Press).

In a national longitudinal cohort

using Health and Retirement Study data (@HRSisr) combined with Federal Emergency Management Agency disaster declaration data

Comparing those who experienced a disaster versus those who did not

1,451 unique disasters
60% exposed

16% <u>less</u> likely to be physically active

21% <u>more</u> likely to gain weight

adjusted odds ratio, change over time in health risk behaviors adjusting for many potential confounders

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Cancer Survival after Disaster

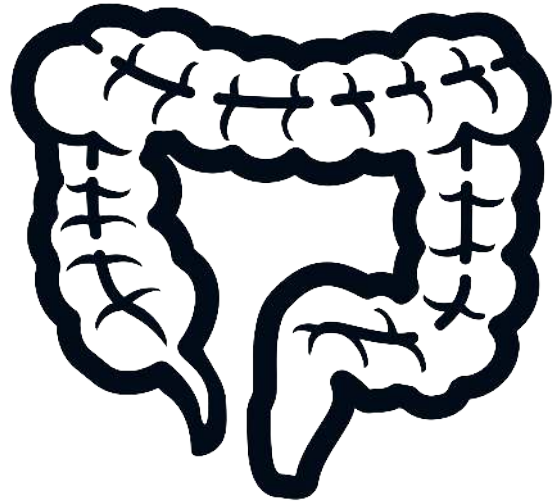
Sue Anne Bell, PhD, FNP-BC: Theodore J. Iwashyna, MD, PhD;
Jennifer Griggs, MD, MPH; Matthew A. Davis, PhD

Study Objective

To determine the extent to which exposure to a disaster affects long-term cancer survival.

Exposure Variable

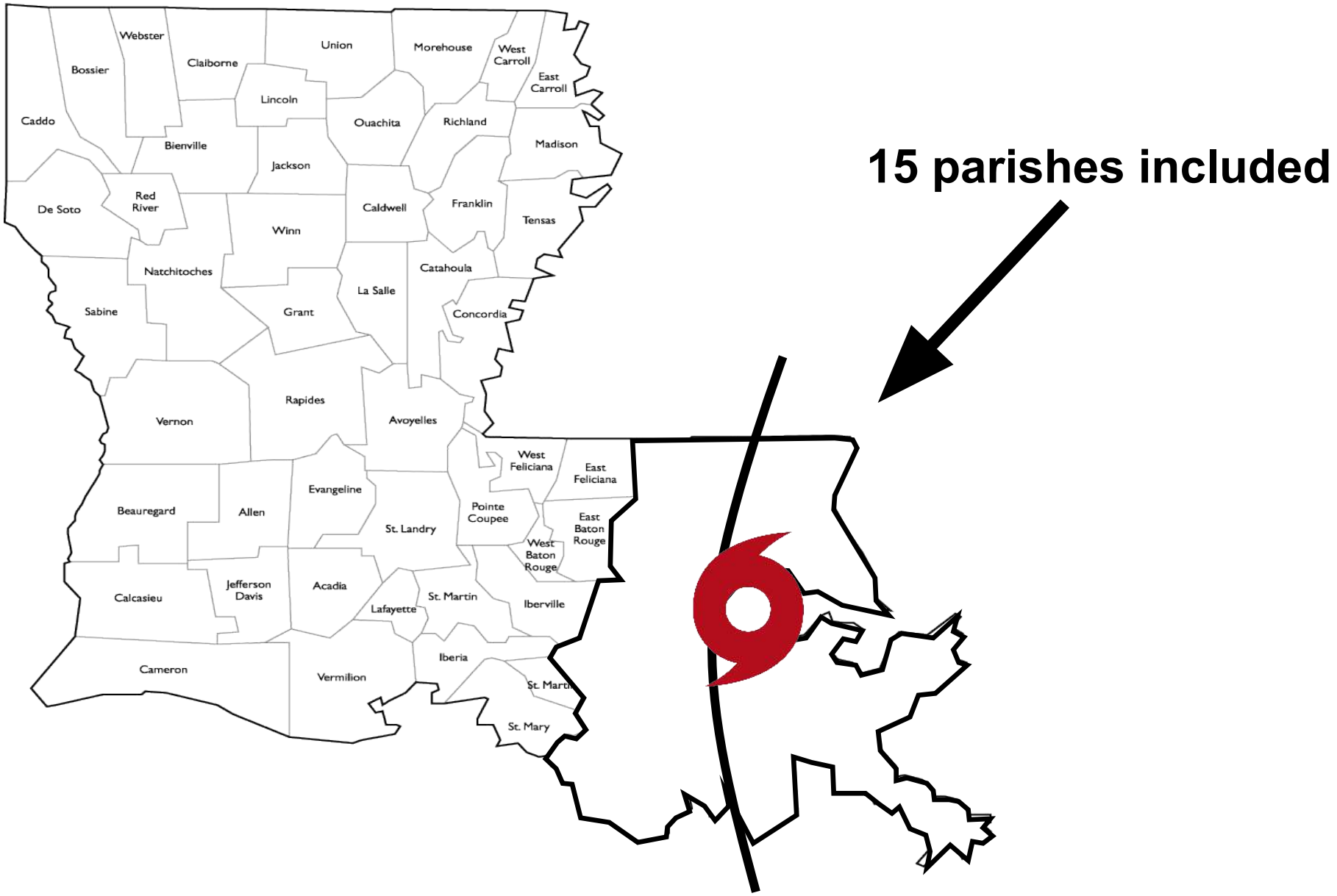
Cancer cases diagnosed six months before Hurricane Katrina.

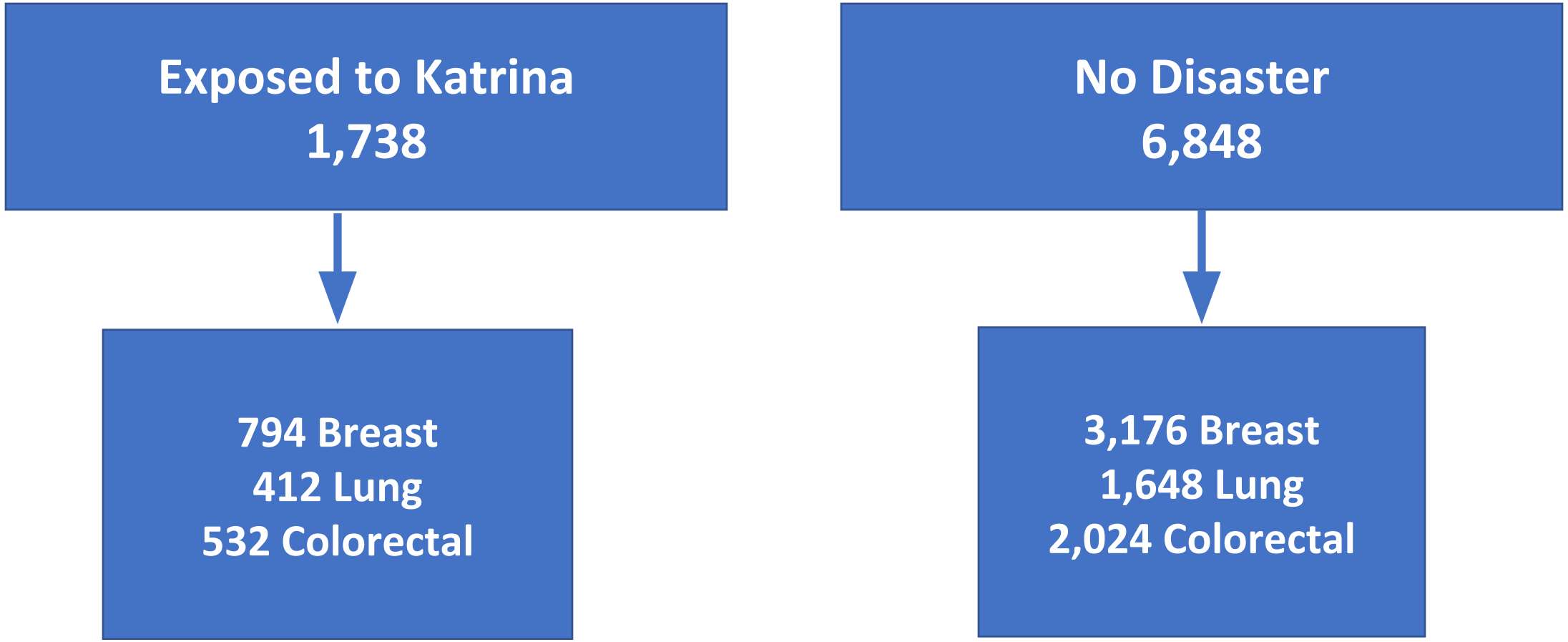


NATIONAL CANCER INSTITUTE

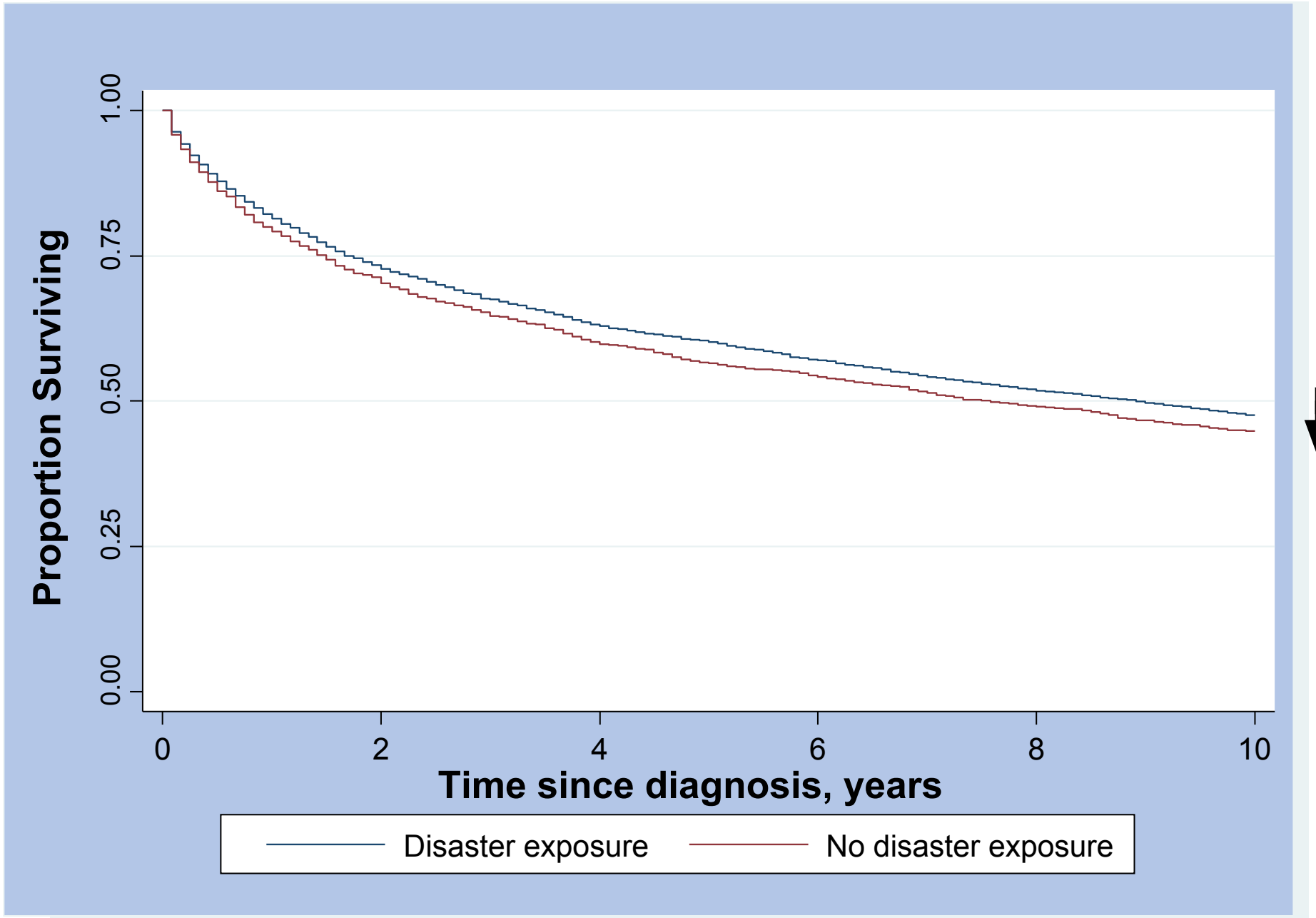
Surveillance, Epidemiology, and End Results Program

- 19 separate population-based cancer registries across the US
- Louisiana data collection started in 2001
- SEER excluded Louisiana cases after Katrina


15 parishes included
Webster
Bossier
Claiborne
Union
Morehouse
West Carroll
East Carroll
Lincoln
Caddo
Ouachita
Richland
Madison
Bienville
Jackson
Red River
De Soto
Caldwell
Franklin
Tensas
Winn
Natchitoches
Catahoula
La Salle
Sabine
Grant
Concordia
Vernon
Rapides
Avoyelles
West Feliciana
East Feliciana
Evangeline
Beauregard
Allen
Pointe Coupee
St. Landry
East Baton Rouge
West Baton Rouge
Jefferson Davis
Acadia
Calcasieu
St. Martin
Lafayette
Iberville
Iberia
Cameron
Vermilion
St. Mary

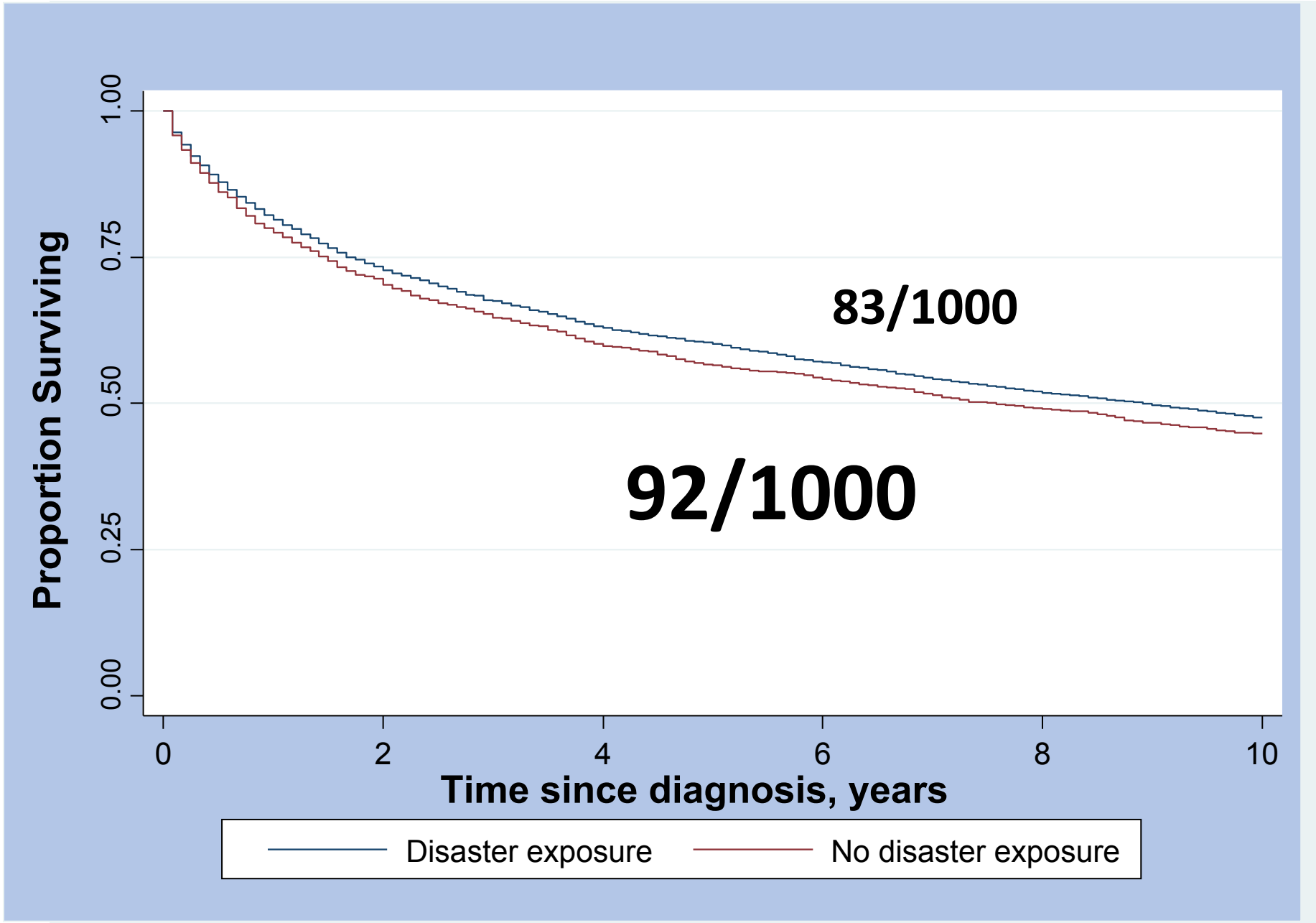

Exposed to Katrina
1,738
794 Breast
412 Lung
532 Colorectal
No Disaster
6,848
3,176 Breast
1,648 Lung
2,024 Colorectal

1:4 Match

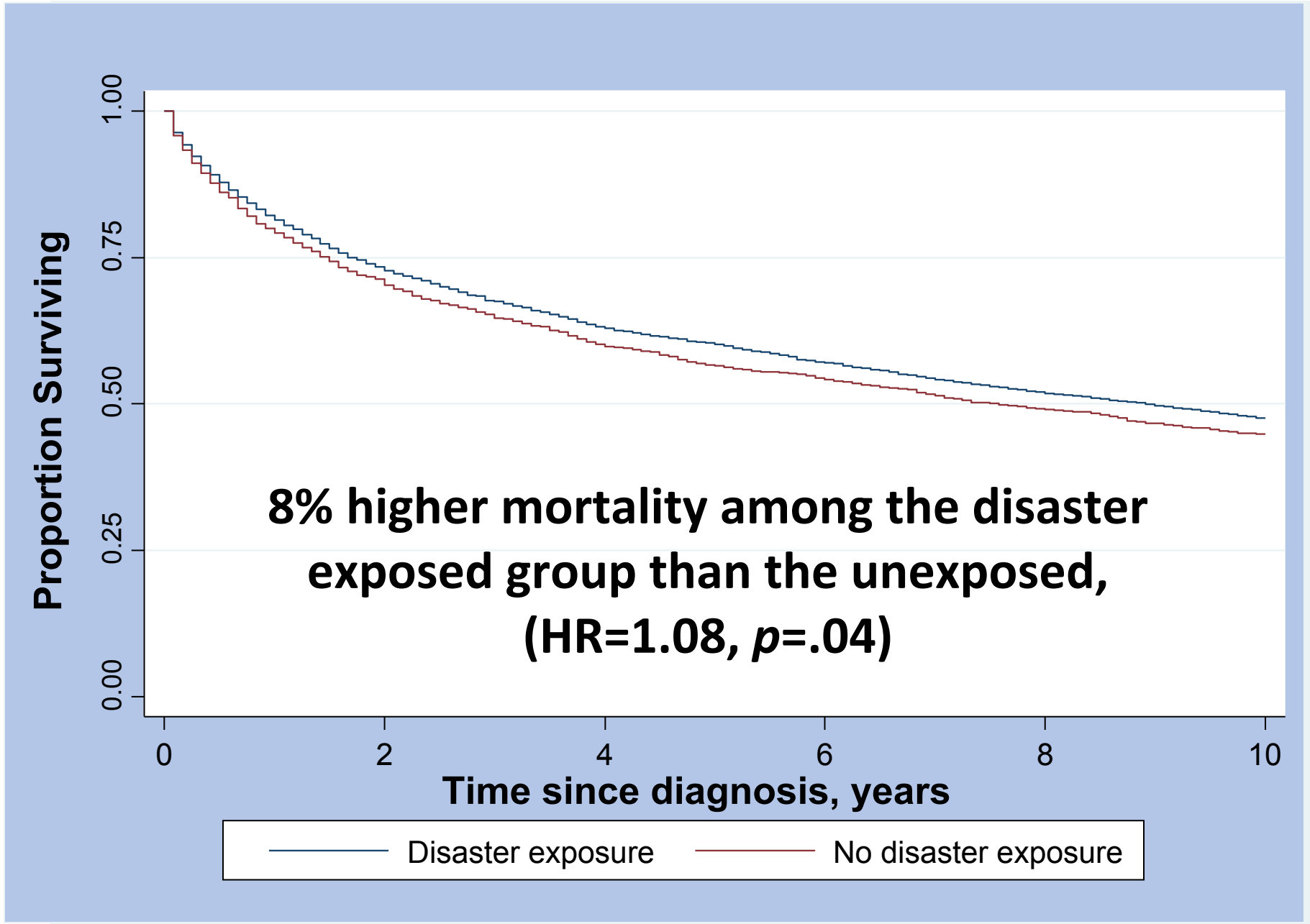


p=.02

Overall Time to Mortality


Proportion Surviving
1.00
0.75
0.50
0.25
0.00
83/1000
92/1000
0
2
4
6
8
10
Time since diagnosis, years
Disaster exposure
No disaster exposure

p=.02



Adjusted for:

- Cancer stage
- Age at diagnosis
- Sex
- Race/ethnicity
- Marital status
- Education
- Household Income

Cancer Control Continuum

Prevention

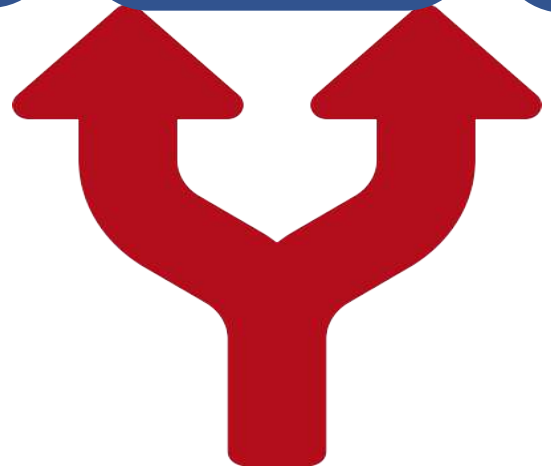
Early Detection

Diagnosis

Treatment

Survivor-ship

End of Life Care



How can we do better?

"With a shared healthy community vision, strategic planning that prioritizes health, and coordinated implementation, disaster recovery can result in communities that are healthier, more livable places for current and future generations to grow and thrive—communities that are better prepared for future adversities."

National Academy of Medicine, 2015

Photo credit: ABC news

Thank you!

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