

Food Insecurity and Firearm Violence in the United States



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DISCLOSURES



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THE NEW ORLEANS STORY



TRAUMA IN NEW ORLEANS

THE WALL STREET JOURNAL.

Why New Orleans Has the Highest Murder Rate in America

The city's homicide rate is up 141% this year from the same period in 2019

By Cameron McWhirter / Photographs by Emily Kask for The Wall Street Journal

TRAUMA IN NEW ORLEANS



FRAMING THE PROBLEM - FIREARM VIOLENCE

- No federal funding for firearm violence research for 20 years
- Compared to other public health problems – research on firearm deaths has fallen behind
 - Firearm deaths are leading cause of death in children in U.S.
 - In Louisiana, homicides have outpaced death rates from diabetes, heart disease, cancer
- Now that federal funding for research is available – unique opportunity to rapidly advance knowledge



Violence as a Public Health Problem

- Violence is a leading cause of death and disability
- Affects the individuals involved, their families, friends, and communities around them
- A “public health approach” recognizes that population-wide interventions that change the context or environment and those that address socioeconomic determinants
- Even with this knowledge, only few population-level, place-based solutions to violence have emerged to date

A Framework for Public Health Action: The Health Impact Pyramid

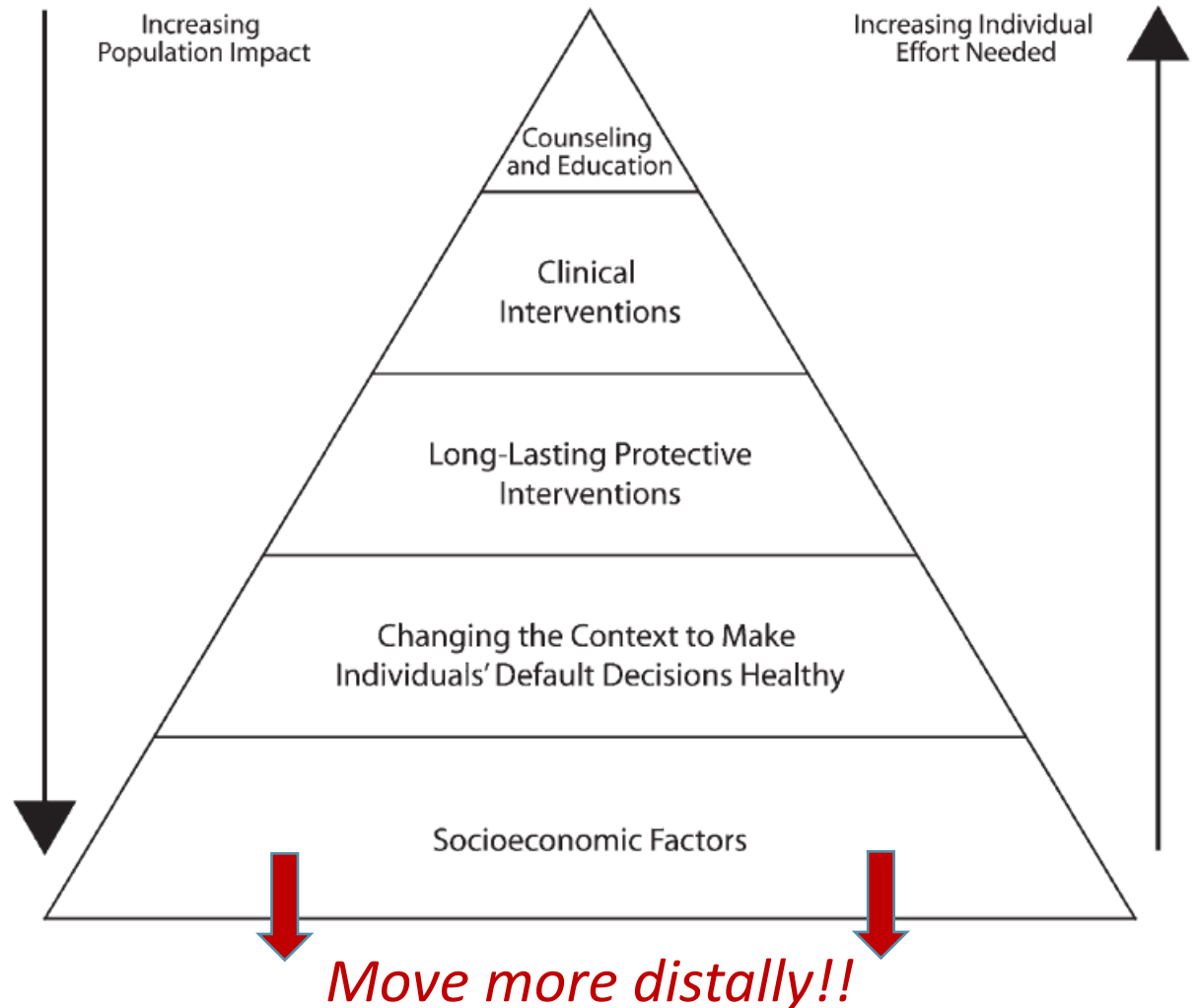


FIGURE 1—The health impact pyramid.

Thomas R. Frieden, MD, MPH

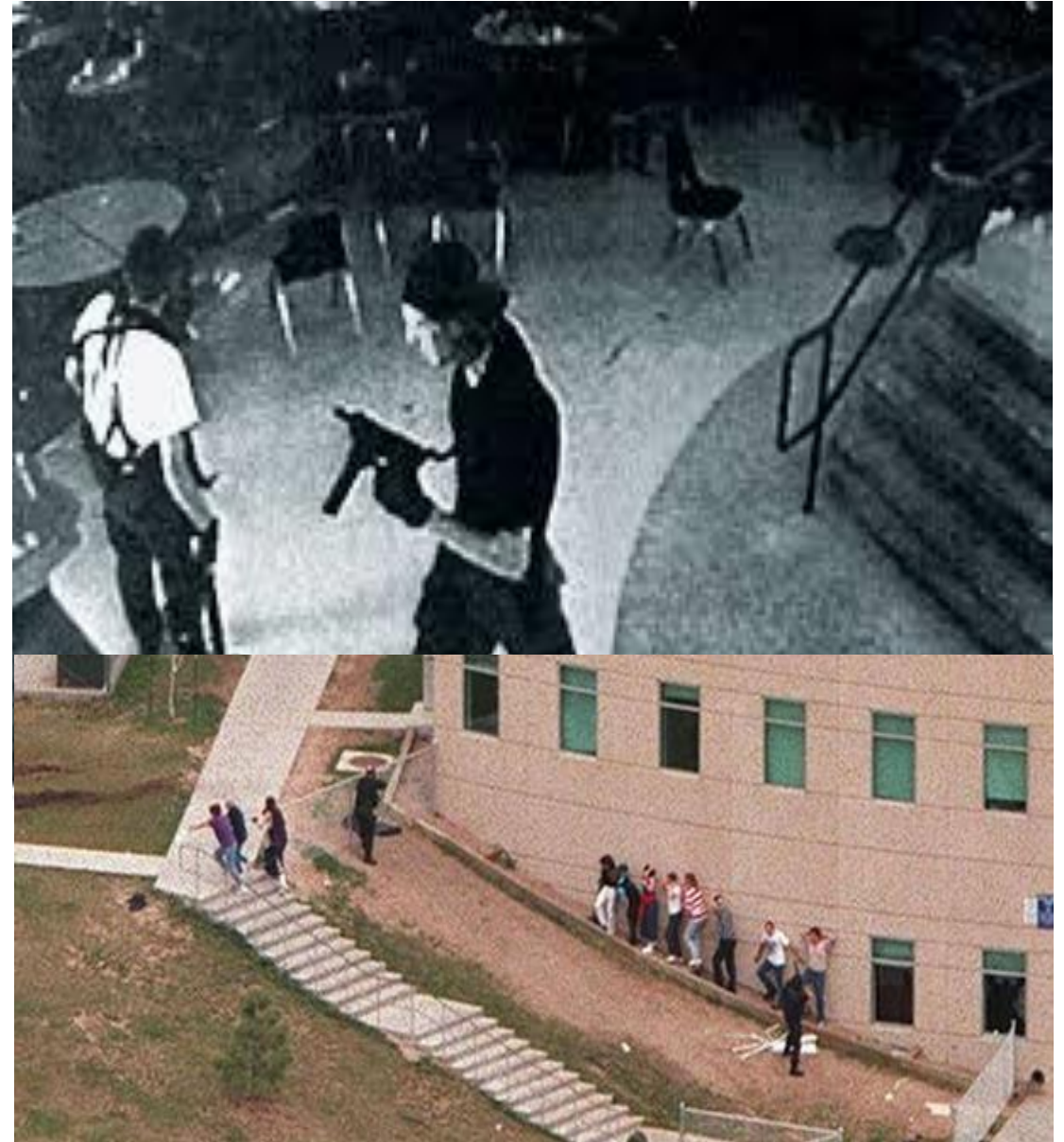
Youth Violence Prevention Centers

Rigorous Evaluations of
Prevention Strategies to
Prevent and Reduce
Community Rates of Youth
Violence



The Beginning of the YVPCs (1999-2000)

- 1999 Columbine High School shooting
- CDC's National Centers of Excellence in Youth Violence Prevention (YVPCs) established in 2000
- Objectives
 - Foster collaborations between academic researchers and communities
 - Empower communities to address youth violence
 - Develop scientific infrastructure
 - Conduct etiological work on risk/protective factors
 - Promote interdisciplinary research
 - Build the pipeline of YV prevention researchers



Maass, Brian. "Image of Columbine Murder." Time Magazine. Vol. 153 No. 17. 3 May 1999.

Current YVPCs



CENTER FOR YOUTH EQUITY AT TULANE UNIVERSITY

A Community-Centered Approach to
Youth Violence Prevention

CDC Youth Violence Prevention
Research Center 1U01CE003384



Violence
Prevention
Institute

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Overall CYE Aims

To establish a culturally responsive youth violence prevention research center embedded within the ongoing community partnerships and existing infrastructure of the VPI to build and strengthen the network for youth violence prevention in New Orleans and across the Gulf South.

(Administrative Core)

To adapt, implement, and evaluate a multicomponent sociopolitical development (SPD) enrichment and empowerment **program** to prevent and reduce exposure to police violence among younger African American youth (10-17 years) through youth-led grassroots organizing and activism for social and structural change.

(Research Project 1 / RP1).

To evaluate the effects of a hospital-initiated, community-integrated **practice-based** approach in reducing gun violence among older youth (18-35 years).

(Research Project 2 / RP2)

To translate the evidence base for community youth violence prevention strategies into widespread outreach and dissemination efforts targeting community groups, youth-serving organizations, hospital systems, and policymakers.

(Outreach and Translation Core / O&T)

To develop innovative and transdisciplinary educational and training opportunities for early career and junior scholars, youth, and professionals aimed at developing and strengthening a workforce that is best positioned to impact youth violence prevention efforts locally, regionally, and nationally.

(Training and Education Core / T&E)



BACKGROUND ON FOOD INSECURITY

SOCIAL DETERMINANTS OF HEALTH

- WHO: “conditions in which people are born, grow, live, work, and age”, and “the fundamental drivers of these conditions”
- Poverty, income inequality, food insecurity

FOOD INSECURITY

- USDA definition: a lack of consistent access to enough food to live active, healthy lives
- Food insecurity is significantly higher in communities effected by systemic racial injustice
- Many do not qualify for federal nutrition programs
- USDA: 38 million people in the United States are food insecure, 12 million children

FOOD INSECURITY AND MEDICINE

- Associations with
 - Developmental difficulties
 - Anemia
 - Asthma
 - Child maltreatment
 - Mental health
 - Hypertension
 - Diabetes
 - Domestic partner violence
 - Substance abuse

SESC Annual Meeting Podium Paper

Food Insecurity Predicts Urban Gun Violence

**Randi N. Smith, MD, MPH^{1,2},
Keneeshia N. Williams, MD^{1,2}, Robert M. Roach, BS³, and Brett M. Tracy, MD^{1,2}**

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Community distress predicts youth gun violence☆☆☆

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STUDY IN NEW ORLEANS

2022 EAST PODIUM PAPER

The association between food insecurity and gun violence in a major metropolitan city

Ayman Ali, BS, Jacob Broome, MS, Danielle Tatum, PhD, Julia Fleckman, PhD, Katherine Theall, PhD, M. Pia Chaparro, PhD, Juan Duchesne, MD, and Sharven Taghavi, MD, MPH, MS, *New Orleans, Louisiana*



METHODS

POPULATION

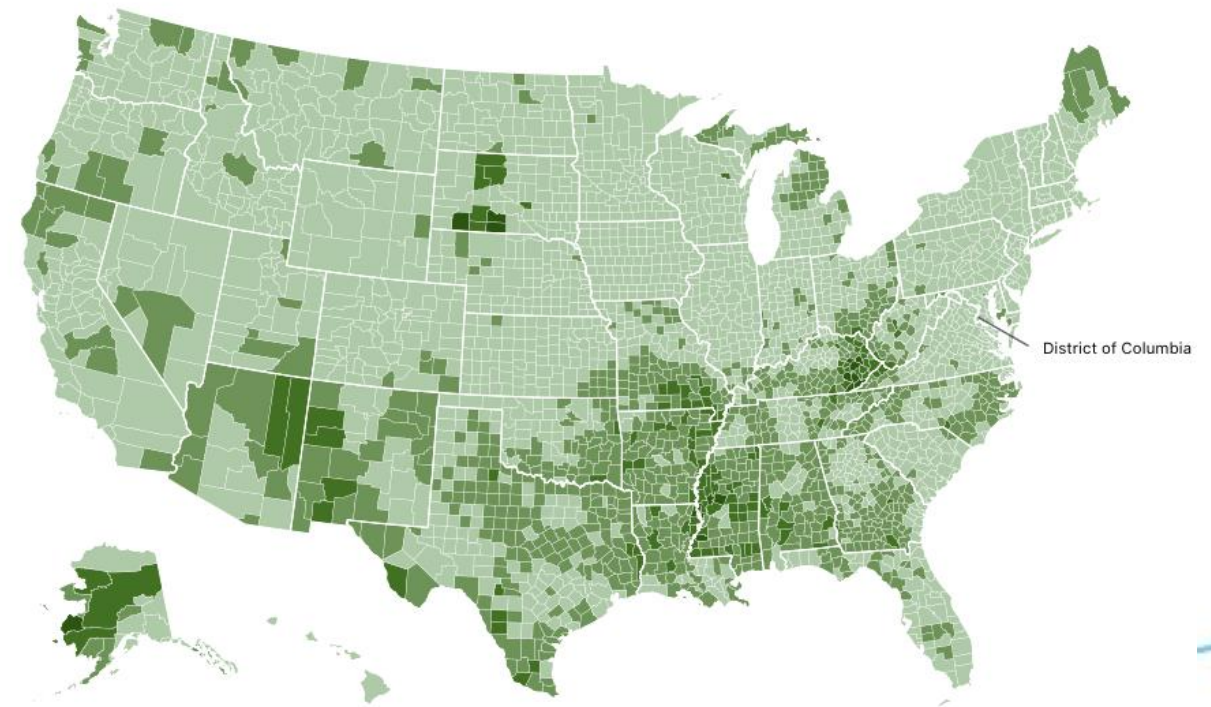
- Firearm data was acquired from University Medical Center, in New Orleans, Louisiana (2016-2020)
- Only level I trauma center in southeastern Louisiana
- Missing parish of residence data (2.5%) were excluded
- Residence outside of Louisiana (0.8%) excluded
- Transferred patients not excluded if otherwise meeting inclusion criteria
- 29 parishes with 3,115 patients in final analysis



EXPOSURE: FOOD INSECURITY DATA



- Food insecurity at the parish level, estimated by the Map the Meal Gap dataset
- Estimated with variables associated with food insecurity (disability, income, poverty, unemployment, homeownership)



Food Insecurity Rates

4-14%

15-19%

20-24%

25-29%

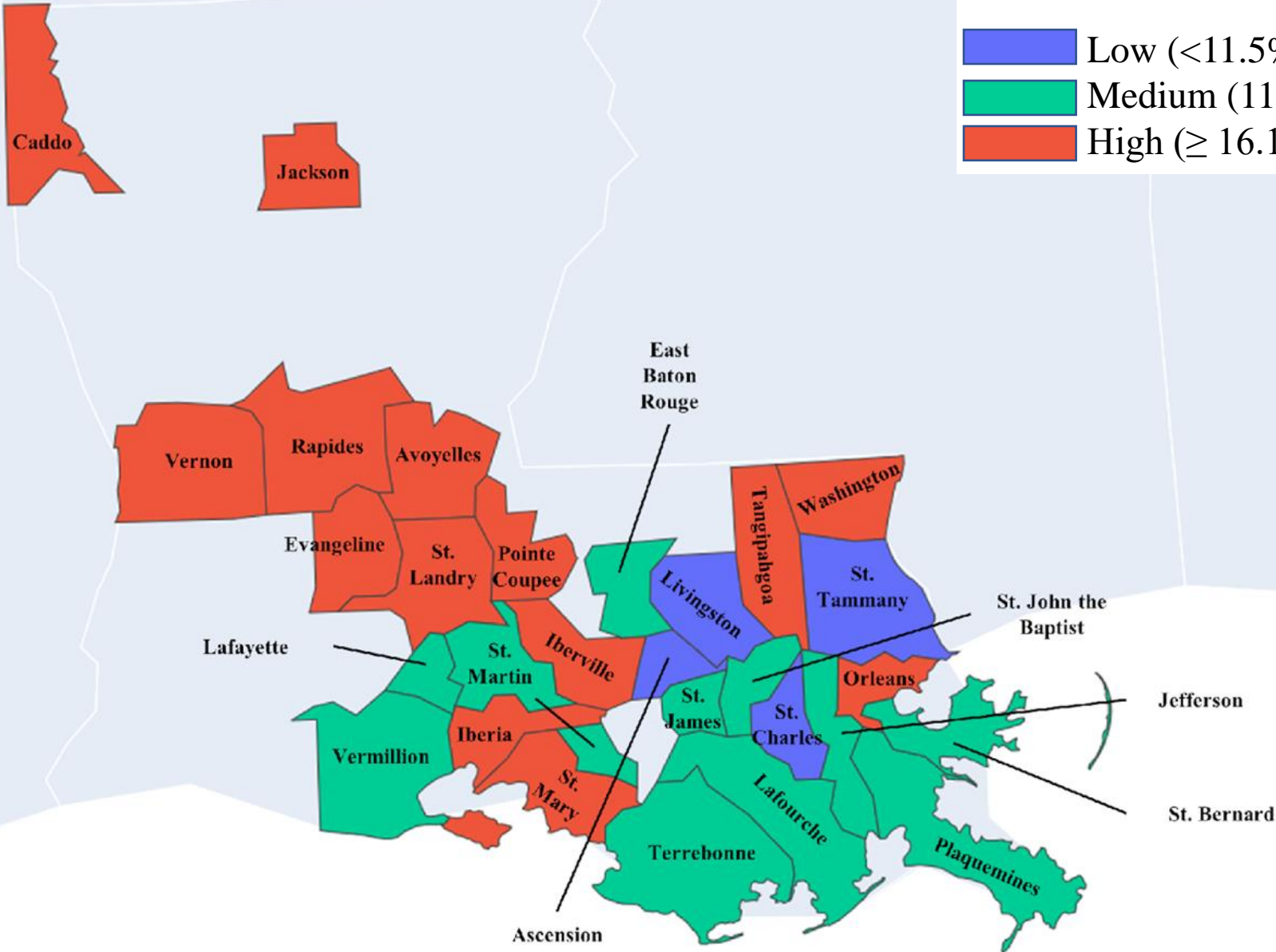
30% +

FOOD INSECURITY

- Food insecurity categorized per parish as low, medium and high
 - For examination of demographical differences
- Low: parish food insecurity level lower than the national average (11.5%)
- Medium: parish food insecurity level between the national (11.5%) and Louisiana (16.1%) averages
- High: parish food insecurity level higher than Louisiana averages (16.1%)

Level of Food Insecurity

- Low (<11.5%)
- Medium (11.5% to 16.1%)
- High ($\geq 16.1\%$)



OUTCOME DEFINITIONS

- Outcomes: firearm violence & firearm-related trauma
- For firearm-related trauma, only cases with catchment area were included (9/29 parishes, 96% of study population)
 - Parish level firearm-related trauma rate were estimated with cases divided by population
- Gun-related violence was classified when intent was considered an assault

HYPOTHESIS TESTING

- Considered: age, sex, race, payment method, psychiatric/neurologic comorbidities, history of substance abuse
- Demographics: Pearson's chi-squared and Wilcoxon-Kruskal-Wallis test for categorical/continuous variables respectively
- Overall firearm-related trauma rates: linear regression
- Violence: logistic regression
- Food insecurity encoded as a continuous variable for regressions
- Final covariates selected for regression models with forward and backwards stepwise AIC criterion



RESULTS



3,224 firearm-related incidents

- 1. 80 (2.5%) patients excluded for missing location of residence
- 2. 29 (0.9%) patients excluded for non-Louisiana residence (Texas, Mississippi, and Alabama)

3,115 patients

Analysis 1: Assault

Analysis 2: Rate of Firearm-Related Trauma

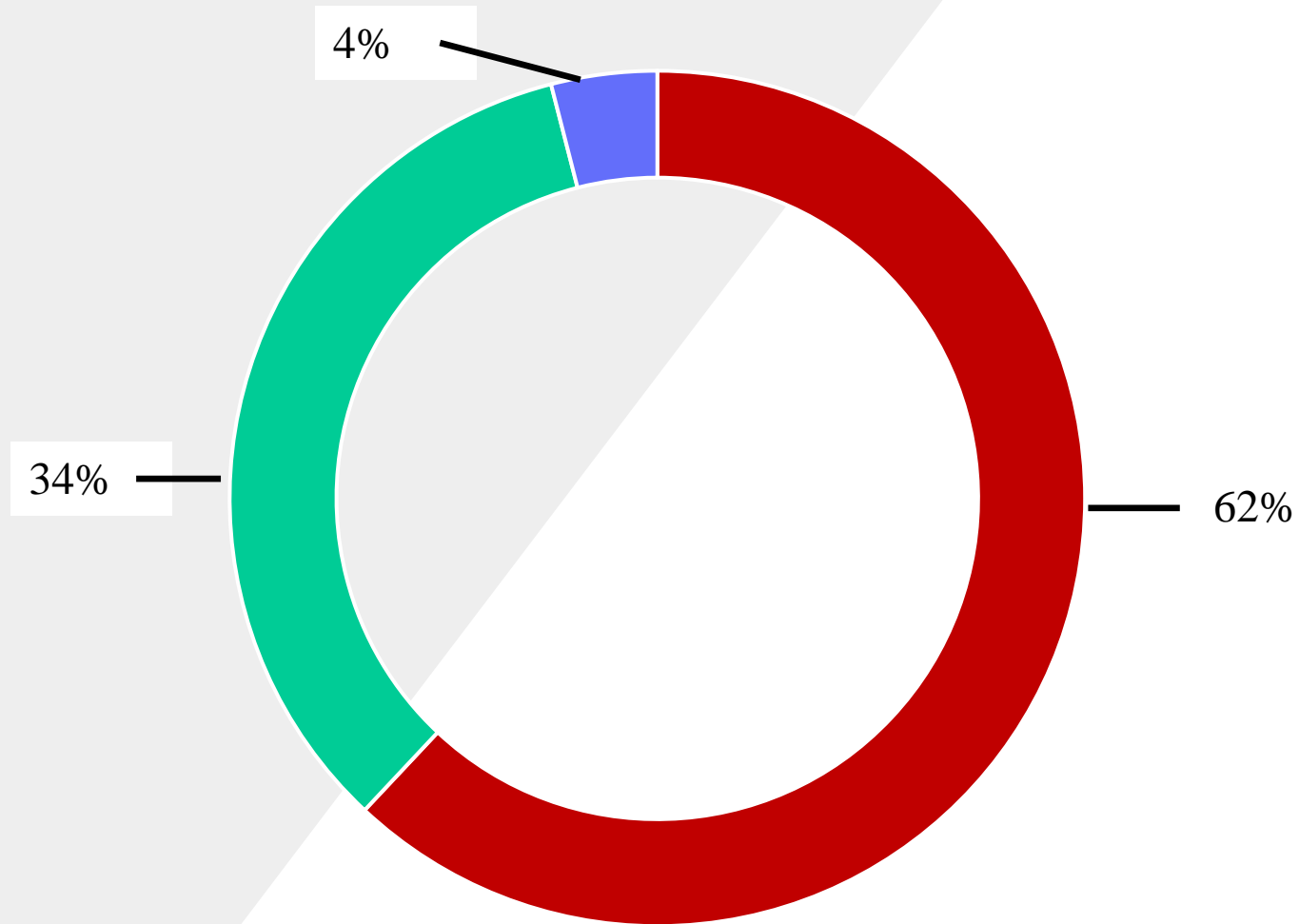
14 (0.4%) patients excluded for undetermined intent of injury

114 (3.7%) patients excluded for region of injury outside of center catchment area

3,104 patients included

3,001 patients included

Patient Parish of Residence



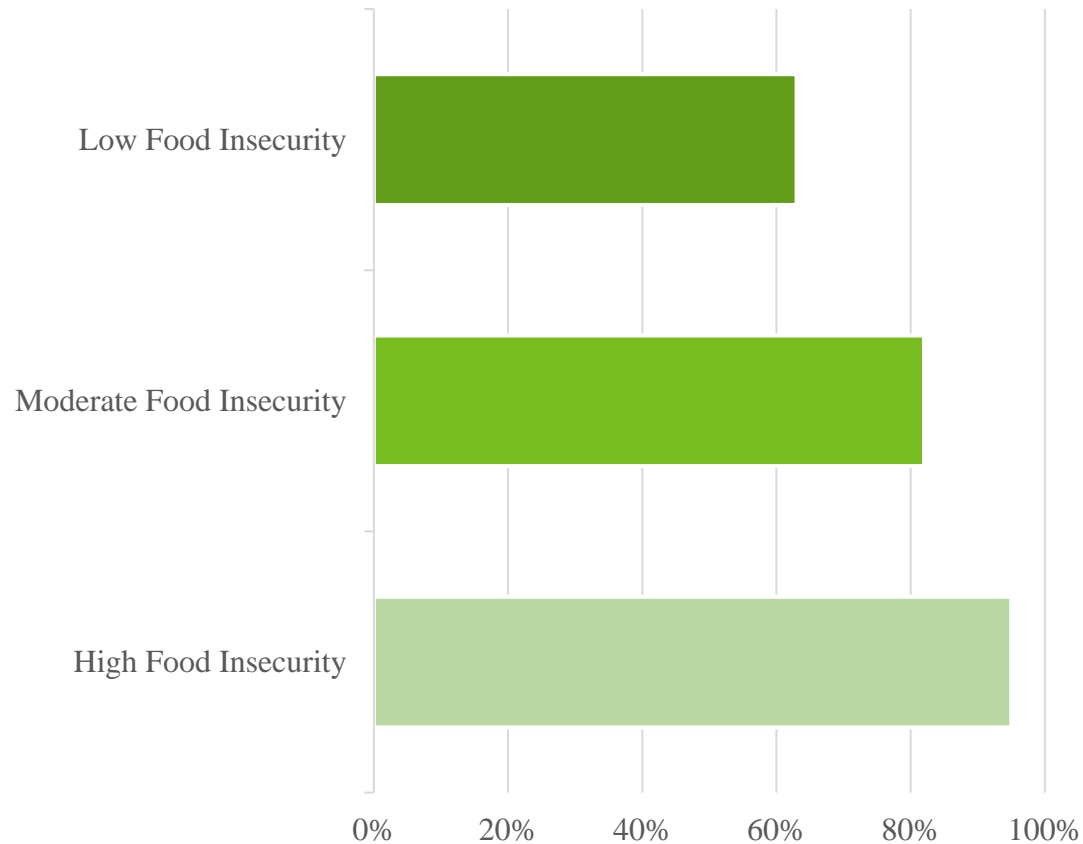
■ High Food Insecurity

■ Moderate Food Insecurity

■ Low Food Insecurity

DEMOGRAPHICS

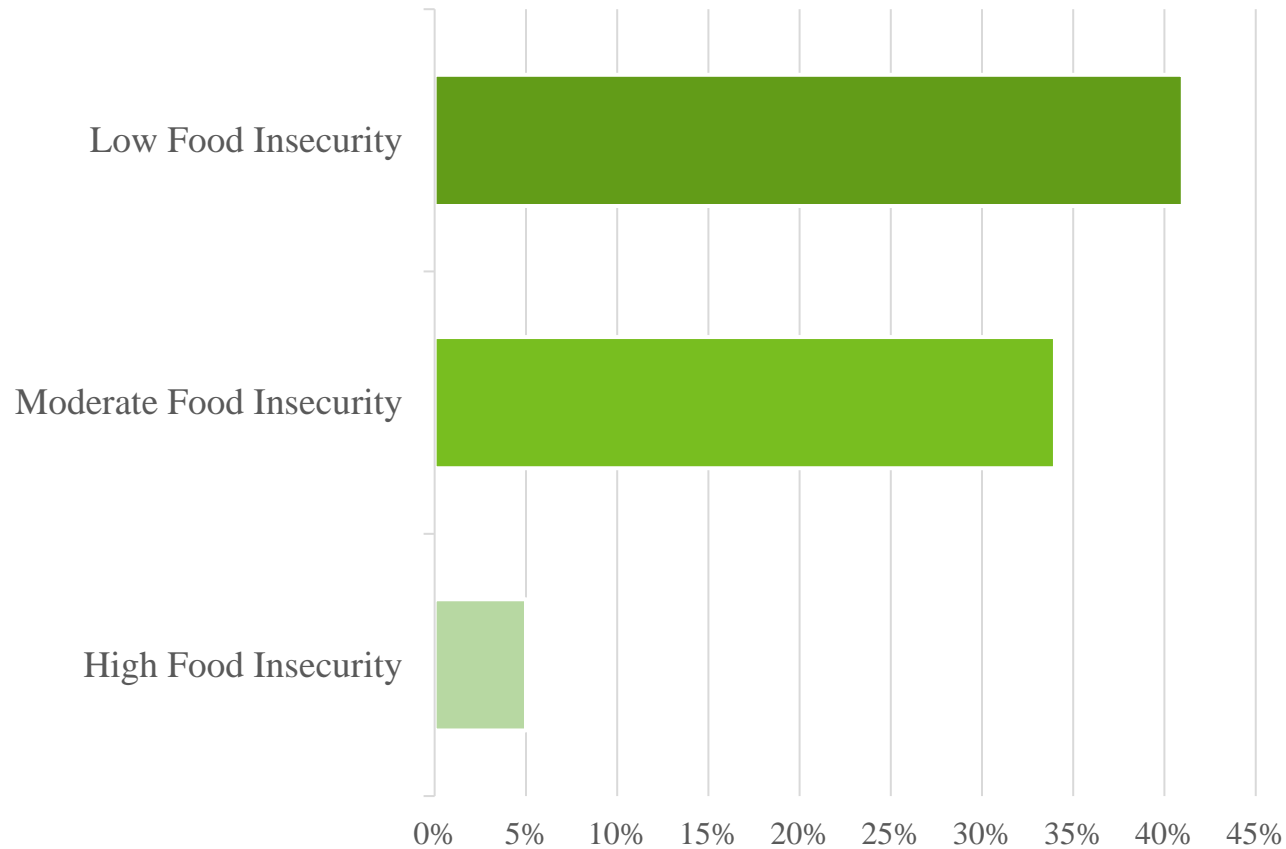
Non-White Race



- 63% of patients from low FI were non-white
- 82% of patients from moderate FI were non-white
- 95% of patients from high FI regions were non-white

ARE PATIENTS INJURED WHERE THEY LIVE?

Percent Injured in a Different Parish from Residence



- 41% of patients from low FI parishes were injured in a different parish of their residence
- 34% and 5% of patients residing in medium and high FI parishes were injured in a different parish of their residence

FOOD INSECURITY INCREASES ODDS OF ASSAULT

- 90.6% of cases classified as assault
- FI was significantly associated with gun violence

<u>Explanatory Variable</u>		<u>Odds Ratio</u> <u>(multivariable)</u>
Age (Mean Years, Standard Deviation)	28.9 (12.0)	0.98 (0.98-0.99, p=0.001)
Non-White Race (n, %)	2613 (94.5)	8.13 (6.02-10.98, p<0.001)
Food Insecurity of Residence (Mean %, Standard Deviation)	16.4 (2.2)	1.13 (1.07-1.19, p<0.001)
Psychiatric/Neurologic Comorbidities (n, %)	147 (77.4)	0.42 (0.28-0.65, p<0.001)

FIREARM-TRAUMA PER 100,000 PARISH RESIDENTS

- Each percent increase in food insecurity was related to 56 additional cases of firearm-related trauma per 100,000 parish residents

<u>Explanatory Variable</u>	<u>Coefficient (multivariable)</u>
Alcohol/Drug Use	34.98 (5.82 to 64.14, p=0.02)
Psychiatric/Neurologic Comorbidities	-20.96 (-43.80 to 1.88, p=0.07)
Race (Non-White)	80.15 (61.42 to 98.89, p<0.001)
Primary Payor	
Private/Commercial	-
Medicaid/Medicare/Free	-20.66 (-37.44 to -3.87, p=0.02)
None	-7.75 (-27.89 to 12.40, p=0.45)
Other	-24.68 (-64.68 to 15.32, p=0.23)
Food Insecurity Rate of Residence (%)	56.32 (53.78 to 58.86, p<0.001)



CONCLUSIONS

FOOD INSECURITY AND FIREARM TRAUMA

- Increase in food insecurity is related to increased assault by firearm and all firearm-related injury
- Race associated with assault and rate of firearm-related trauma
- Low FI patients more likely to get shot in high FI area – concentrating gun violence in disproportionately non-white areas
- Food assistance may be a root-cause intervention for firearm trauma
 - Community level
 - Individual level (hospital)

NATIONWIDE ANALYSIS

NATIONWIDE ANALYSIS

- Cross-sectional analysis of 51 largest metropolitan statistical areas
- Demographic data from US Census Bureau
- Food Insecurity obtained from Feeding America
- Firearm homicide rates obtained from the Centers for Disease Control and Prevention (CDC)

NATIONWIDE ANALYSIS

Principal City	MSA Total Population	Firearm Homicide Rate (per 100,000)	Food Insecurity Rate (%)	Child Food Insecurity Rate (%)	Average Cost Per Meal (\$)
Baltimore, MD	2,844,510	37.2	11.0	16.1	3.18
Birmingham, AL	1,115,289	21.1	16.1	21.1	3.21
Chicago, IL	9,618,502	10.9	10.1	11.9	3.19
Cincinnati, OH	2,256,884	7.5	14.1	18.7	3.05
Cleveland, OH	2,088,251	10.0	15.9	21.6	3.24
Detroit, MI	4,392,041	14.2	17.3	20.0	3.00
Memphis, TN	1,337,779	22.7	15.0	18.7	3.13
New Orleans, LA	1,271,845	27.1	18.0	25.9	3.67
Philadelphia, PA	6,245,051	18.8	16.3	22.0	3.37
St. Louis, MO	2,820,253	14.2	10.9	11.3	3.31
Washington, DC	6,385,162	16.5	10.7	18.0	4.33

NATIONWIDE ANALYSIS

TABLE 1. Factors Independently Associated with Firearm Homicide

Independent Factors	Standardized β	95% Confidence Interval		p
		Lower Limit	Upper Limit	
% Black Population	4.32	3.26	5.38	< 0.001
Food Insecurity	1.33	0.27	2.39	0.02

CONCLUSIONS

- Community-based programs that target food insecurity may help combat the gun violence epidemic
- Individual or hospital-based programs targeting food insecurity may help high risk individuals avoid firearm injuries
 - Hospital-based programs may help decrease recidivism

WHAT ARE WE DOING IN NEW ORLEANS?

INCLUSION CRITERIA – SHIFT TRIAL

1. Gunshot injury due to community violence
2. Ages 18 – 24
3. Capacity to give voluntary informed consent
4. Resident of Orleans or Surrounding Parishes
5. Not in legal detention status

HVIP RESOURCES

- Credible messenger uses motivational interviewing
- Total of 6 months support
- Trauma and Grief support with licensed LCSW and MSW
- Advocacy with law enforcement
- Crime victim's reparations (monetary support)
 - VOCA funds

HVIP RESOURCES

- Intensive case management
 - Housing
 - Medical needs
 - Food stamps
 - SSI
- Referral to other community programs
- Firearm Safety Training
 - Biometric gun locks



CONCLUSIONS

FOOD INSECURITY AND FIREARM TRAUMA

- Food insecurity is related to firearm injury
 - Both violent and non-violent
- Suggestion that food assistance may be a root-cause intervention for communities
- Trauma centers should screen victims of firearm trauma for food insecurity
 - Lead to more research
 - Reduce recidivism
- Individual interventions may be effective preventative measures

QUESTIONS?



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MOTIVATIONAL INTERVIEWING (MI)

- Applied mostly to substance abuse literature
- Driven by a trained Credible Messenger
- Collaborative – developing a partnership in which patient's input and expertise is central
- Assumes motivation for change resides within the patient
- Respect patient's right to make informed changes (or not)
- Emphasizes patient control and choice

LIMITATIONS

- Unable to determine when an effect of food intervention may occur: immediate or for future generations?
- Assumption that residence at time of injury was long-term residence
- Assumption that all catchment area cases were diverted to UMC
- Specific to a single institution, and may not be generalizable, particularly to rural areas