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TAMEST NATURAL HAZARDS SUMMIT

Responding to and Mitigating the Impacts

PART I: VIRTUAL SUMMIT 10.19.2021

#NATURALHAZARDSSUMMIT

Theme Two:

EMERGENCY RESPONSE AND RECOVERY

Moderated by: CHANDRA FRANKLIN WOMACK, P.E.

Owner and Chief Executive Officer, Aran & Franklin Board Chair, Texas Windstorm Insurance Association









Disparate Impacts of Natural Disasters and Disease





Distinguished Professor *Texas Southern University*



LOREN HOPKINS, PH.D.

Chief Environmental Science Officer City of Houston



PETER HOTEZ, M.D., PH.D. (NAM)

Dean, National School of Tropical Medicine Baylor College of Medicine

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Intersection between Environment, Natural Disasters and Disease in Houston

Loren Hopkins, PhD Houston Health Department Rice University October 19, 2021

Houston Findings:

- Air pollution increases adverse health effects in Houston.
- These same adverse health effects are seen at a greater level in specific populations.
- The population is harder hit by natural disasters.
- COVID-19 is affecting these populations more severely.



Air Pollution and Asthma Attacks

Raun et al. Environmental Health 2014, **13**:58 http://www.ehjournal.net/content/13/1/58

RESEARCH



Open Access

Using community level strategies to reduce asthma attacks triggered by outdoor air pollution: a case crossover analysis

Loren H Raun^{1,2*}, Katherine B Ensor¹ and David Persse^{3,4}

- 11,754 emergency medical service ambulance treated asthma attacks in Houston between 2004-2011 were statistically assessed in conjunction with air pollution concentrations.
- Cumulative exposure for ozone (0-2 day lag) is of concern, whereas for nitrogen dioxide the concern is with single day exposure.
- Persons at highest risk are aged 46-66, African Americans, and males.

Raun et al., 2014

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Air Pollution and Cardiac Arrests

- 11,677 EMS 911 cardiac arrest cases between 2004-2011 in Houston were statistically assessed in conjunction with air pollution concentrations.
- An increase in PM2.5 and Ozone was associated with an increased risk of OHCA.
- Relative risk estimates were higher for men, blacks, or those aged >65 years.

Ensor et al., 2013

Circulation

Volume 127, Issue 11, 19 March 2013; Pages 1192-1199 https://doi.org/10.1161/CIRCULATIONAHA.113.000027

ORIGINAL ARTICLE

A Case-Crossover Analysis of Out-of-Hospital Cardiac Arrest and Air Pollution

Katherine B. Ensor, PhD, Loren H. Raun, PhD, and David Persse, MD

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High Rate Region of Health Effects



- 2x rate of cardiac arrest for in high rate area compared to out of high rate
- 6x rate of asthma attacks for high rate areas compared to out of high rate
- Overlapping
- Population consists of Socio-economically disadvantaged

Raun et al, 2013, and Raun et al., 2015



One Zip Code: Air Pollution, High Rate Region, Natural Disaster





High Rate Region Compared to Low Risk Zip Codes



High Rate Region, Natural Disasters: COVID-19 Rates and Respiratory Hazard



Many of the block groups in the High Rate Region are also high for both respiratory hazard and COVID-19 positivity rate

NATA Respiratory Hazard Environmental Justice Index by block group (pink)

Cumulative Positivity Rate for COVID-19 by block group (light blue)

When both NATA Respiratory Hazard and Cumulative Positivity Rate are high for a block group the color is dark blue



High Rate Region: Natural Disasters: COVID-19 Vaccines and Cancer Risk



- Most block groups in the zip codes of interest (orange) have low vaccination (less than 50%) compared to the comparison zip codes (greater than 50%).
- Environmental Justice (EJ) Index = (Environmental Indicator) X (Demographic Index for Block Group – Demographic Index for US) X (Population Count for Block Group)

https://www.epa.gov/ejscreen/ejscreen-map-descriptions

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High Rate Region, Natural Disasters: COVID-19 Vaccines and Respiratory Hazard



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