Health Affairs Scholar, 2023, **1**(5), 1–4
https://doi.org/10.1093/haschl/qxad062
Advance access publication: November 8, 2023
Brief Report

Health Affairs Scholar
EMERGING & GLOBAL HEALTH POLICY
OXFORD

Disparities in property insurance relief among socially vulnerable Texas communities after Winter Storm Uri

Aaron Hedquist[1], Renee N. Salas[2], Mark Soto[1], Endel John Orav[3], Jose F. Figueroa[1,3,*]

[1]Department of Health Policy & Management, Harvard T.H. Chan School of Public Health, Boston, MA 02115, United States
[2]Department of Emergency Medicine, Massachusetts General Hospital, Boston, MA 02114, United States
[3]Department of Medicine, Brigham and Women's Hospital, Boston, MA 02115, United States

*Corresponding author: Department of Health Policy & Management, Harvard T.H. Chan School of Public Health, Boston, MA 02115, United States.
Email: jfigueroa@hsph.harvard.edu

Abstract

Property insurance is an important tool for resiliency from the accelerating impacts of climate-intensified extreme weather events. However, disparities in property insurance payouts may reduce their potential protective effects. The objective of this study was to quantify disparities in insurance payouts by Texas' insurers after the 2021 Winter Storm Uri, and to understand if any socioeconomic factors were associated with higher rates of declined relief. We extracted data from the Texas Department of Insurance on rates of denied insurance claims by zip code and county at 1 month and 13 months into the recovery period. We then linked these data to community-level socioeconomic information. Finally, we produced separate linear regressions for each predictor and covariate. Across both time points, communities with a higher proportion of Hispanic people, primary Spanish speakers, people who did not graduate high school, and people living below the federal poverty line were significantly more likely to experience denied claims. Communities with higher social vulnerability scores also experienced more denied claims. While financial security is a critical social determinant of health, findings suggest that insurers may be engaging in structurally discriminatory practices and failing to provide relief for people from socially vulnerable communities in the wake of climate-intensified events.

Key words: climate change; extreme weather events; climate resilience; social determinants of health; financial status.

Introduction

In February 2021, Winter Storm Uri disrupted the southeastern United States with persistent subfreezing temperatures. In Texas, this led to electricity and water outages for millions, substantial personal property damage, and estimated increases in excess mortality. These deleterious effects, including burst water pipes and electricity blackouts, were disproportionately concentrated among low-income communities and communities of color.[1-3]

In this context, property insurance is an important resiliency tool to reduce the negative impacts of climate-sensitive extreme weather events. In the immediate aftermath of an extreme weather event, impacted households have significantly higher rates of mortgage delinquency and default. However, homeowners with access to insurance may be insulated from long-term consequences.[4] In contrast, those without insurance are left to face higher rates of severe loan delinquency that has been associated with a significant increase in depressive health symptoms, food insecurity, and decreased health care access measures.[5] However, redlining and other structural discriminatory practices may erode these financial protections among low-income and minoritized communities during times of critical need, including during extreme weather events like Winter Storm Uri.[6,7]

To date, however, we lack empirical evidence evaluating whether there are significant disparities in insurance payouts by commercial insurers among more vulnerable communities after Winter Storm Uri, which has important public health implications. Literature from Hurricanes Katrina, Rita, and Harvey observed that low-income communities and communities of color had difficulties accessing federal assistance.[8,9] Current literature acknowledges the role of affordable and healthy housing as a critical social determinant of health.[10,11] However, the role of financial protection systems in supporting housing sustainability and financial well-being is relatively understudied. Considering the growing number of climate-intensified extreme weather events that pose a catastrophic risk to vulnerable communities, conceptual frameworks of healthy housing must further interrogate the financial systems perpetuating housing discrimination and financial insecurity. Therefore, in this study, using county- and zip-code-level data, we evaluated whether there are important differences in insurance payouts among socially vulnerable Texas communities relative to other communities.

Data and methods

Data

We extracted data on insurance claims related to Winter Storm Uri reported by the Texas Department of Insurance (TDI) between March 2021 and March 2022. This publicly available dataset captures more than 94% of Texas' personal property, commercial property, and automobile insurance market.[12] These data include zip-code- and county-level aggregated counts of claims submitted, closed with payment, and those closed without payment.

Received: August 4, 2023; Revised: October 16, 2023; Accepted: November 6, 2023

Study outcomes and predictors

Using TDI data, we calculated the following primary outcomes: the proportions of claims denied at 1 month and 13 months following Winter Storm Uri. We chose these time points to reflect 2 stages of the recovery period. First, at 1 month, we were interested in the types of communities that were denied financial relief in the storm's immediate aftermath. We then examined claims at 13 months to understand if disparities grew or narrowed as the recovery period continued.

Our predictors were demographic and socioeconomic variables obtained from the 2020 American Community Survey 5-Year Estimate. Specifically, we included zip-code-level variables on age, race and ethnicity, educational attainment, primary language, and proportion of the population below the federal poverty line. Additionally, we included information on urbanicity using county-level 2013 Rural-Urban Continuum Codes (RUCCs). We defined rural areas as any county with an RUCC score greater than 7.

We also included the Centers for Disease Control and Prevention's Social Vulnerability Index (SVI) as an aggregate measure of social and climate vulnerability.[13] The SVI is a county-level composite index combining 16 social factors that broadly captures socioeconomic status, household characteristics, racial and ethnicity composition, housing, and transportation variables. The SVI was designed to identify communities particularly vulnerable to extreme weather events, natural disasters, or other man-made disasters. We included the overall county-level SVI scores as a predictor. Higher SVI scores likely indicate more climate-vulnerable communities.

Statistical analysis

Our primary analysis was a series of linear regressions using each socioeconomic or demographic characteristic individually as the predictor and the proportion of claims declined at 1 month and 13 months as the outcomes. We examined each predictor individually because of their potential interrelationships. To better compare the strength of associations for a 1-SD increase across each covariate, we expressed our results as a normalized *z*-score (except for rural-urban status, which was left as a binary). In sensitivity analysis, we weighted the regression by the population of the zip code or county.

Analyses were conducted using STATA/MP (version 17; StataCorp). Given that we used publicly available and aggregated data, this study was determined to be exempt by the Harvard T.H. Chan School of Public Health Institutional Review Board.

Study limitations

This study has limitations since it uses aggregated, observational data, which limits our ability to definitively establish causality. Additionally, analyses were limited to people with insurance who submitted claims. Therefore, the analysis does not assess the impact on people without insurance, who are more likely to be from low-income and minoritized populations.[7] Additionally, given underlying relationships between socioeconomic variables, we cannot discern the independent, adjusted effect of any colinear community characteristics.

Results

The sample included 502 040 insurance claims across 1443 of 1939 (74.4%) Texas zip codes, of which 39.2% were denied claims at 13 months. The distribution of the proportion of denied claims across Texas' communities (ie, zip code) is shown in Appendix Figure A1. As reported by the Texas Department of Insurance, these data include more than $11 billion in insured losses across the state, all directly related to Winter Storm Uri.[12]

Using normalized values, the strongest community risk factor for declined claims at 1 month and 13 months post–Winter Storm Uri was the proportion of Hispanic people within a community (+3.6% per SD at 1 month; 95% CI, 3.2% to 4.1%; $P < .001$). We observed that, for an SD increase in the Hispanic population of a zip code (an increase of 24.7%), the number of denied insurance claims increased by 3.6% in the first month following Winter Storm Uri.

Across both time points, communities with a higher SVI, a greater proportion of primary Spanish speakers, a higher proportion of the community who did not graduate high school, and a greater proportion living below the federal poverty line were significantly more likely to experience denied claims. We did not observe a statistically significant relationship between the proportion of a community that identifies as Black non-Hispanic with denied claims at either time point. Finally, communities with a higher proportion of White residents and rural communities were less likely to have declined claims at 1 month (Figure 1) and 13 months (Figure 2).

When results were weighted by the population of the zip code or county, our study returned similar relationships between socioeconomic characteristics and the proportion of declined claims (Appendix Figures A2 and A3). (To access the Appendix, click on the Details tab of the article online.) We do, however, note some differences between the 2 models: the SVI becomes statistically insignificant and the community's proportion of Black, non-Hispanic individuals becomes a predictor of lower denial rates.

Discussion

In Texas, more socially and climate-vulnerable communities—including those with higher proportions of low-income or Hispanic people—were less likely to receive insurance relief payments in the first and thirteenth months after Winter Storm Uri. Importantly, we noted regressive relationships among other community-level variables of social vulnerability. Communities with a higher proportion of people with lower educational attainment and higher rates of Spanish speakers as a primary language were more likely to be declined insurance relief. Taken together, our findings are concerning, especially considering low-income and communities of color experienced the brunt of storm-related damages and would arguably benefit the most from financial protections.

Our findings have important implications. First, these data raise concern that Texas' insurers are disproportionately denying claims from more socially vulnerable communities after an extreme weather event—in this case, Winter Storm Uri. There may be a lasting legacy to insurance redlining (ie, insurers refusing to sell insurance products based on community racial, ethnic, or other socioeconomic characteristics).[6] In evidence from previous climate-sensitive extreme weather events, this may leave socially vulnerable communities serviced by smaller, less well-financed, and lower-quality, insurance companies.[7] These companies may be enacting stricter claims policies, inhibiting assistance.

Other evidence has also highlighted the high administrative burden of accessing assistance. During Hurricanes Rita and

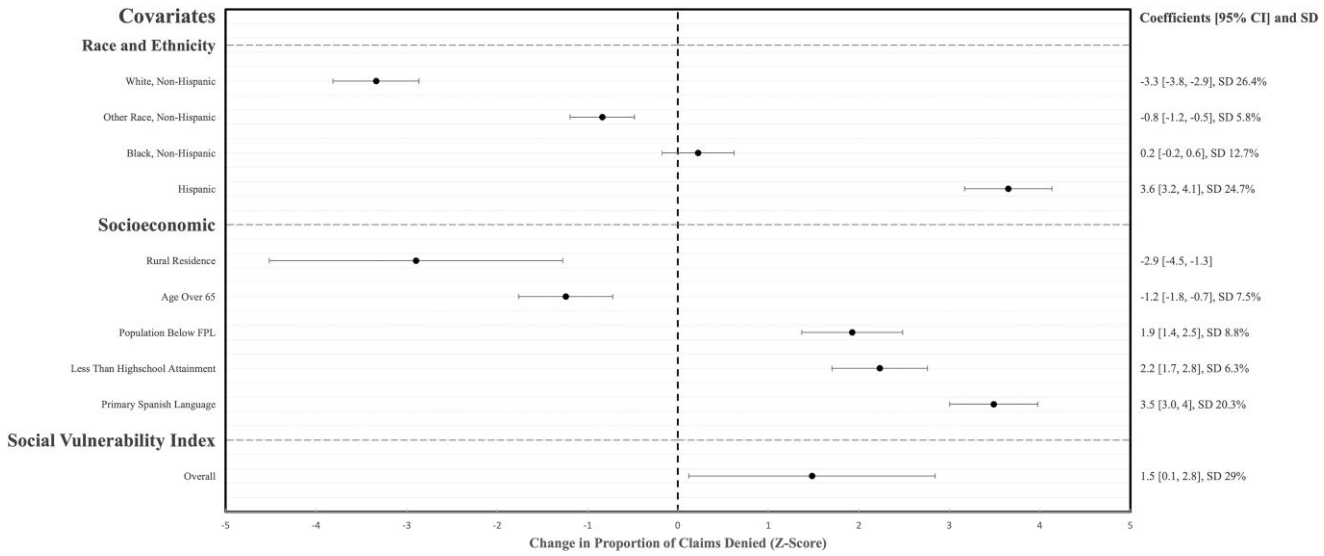

Figure 1. Denied insurance claims at 1 month by community characteristics after Winter Storm Uri in Texas. Source: Authors' analysis of Texas Department of Insurance Aggregated Insurance Claims for Winter Storm Uri. Abbreviation: FPL, federal poverty level.

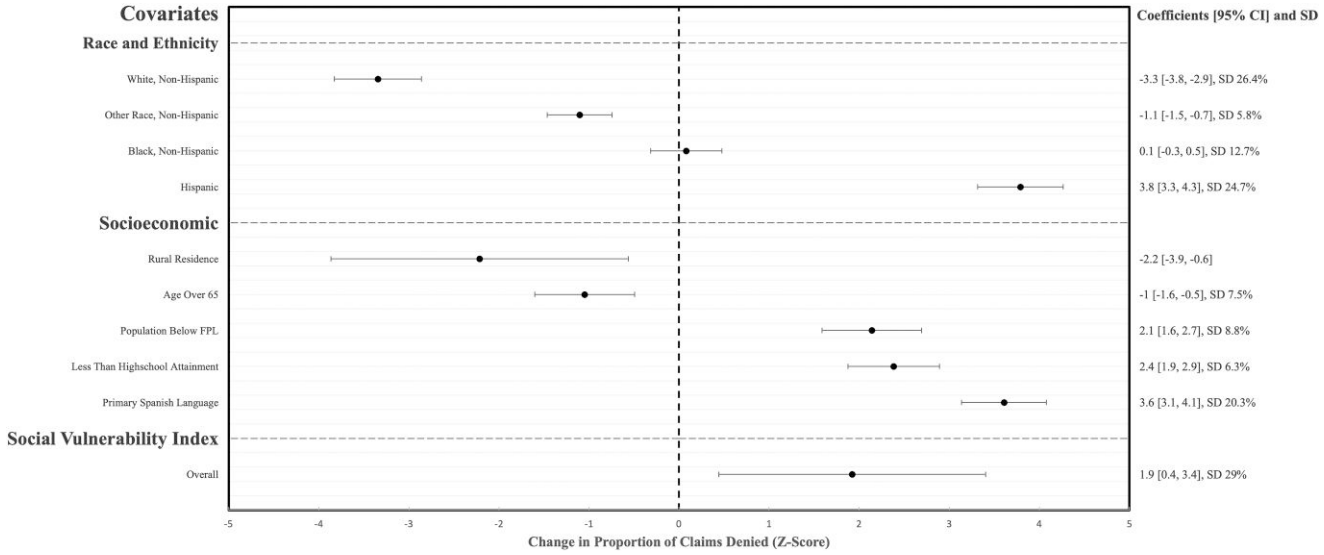

Figure 2. Denied insurance claims at 13 months by community characteristics after Winter Storm Uri in Texas. Source: Authors' analysis of Texas Department of Insurance Aggregated Insurance Claims for Winter Storm Uri. Abbreviation: FPL, federal poverty level.

Katrina, many low-income communities of color experienced a high number of procedural denials for inability to be contacted by Federal Emergency Management Agency (FEMA) officials, poor documentation, or having property in heavily damaged areas that remained inaccessible for FEMA inspection.[8] These administrative burdens may limit financial protections even among insurance policyholders.

These results contribute to a body of literature focused on understanding potential underlying structurally discriminatory factors that lead to health inequities and financial hardship in the aftermath of extreme weather events. While much of the discussion on extreme weather events emphasizes the regressive distribution of property damage, our study demonstrates that potential discrimination in insurance payouts extends well into the recovery period. Climate emergencies, like Winter Storm Uri, illustrate that structural racism may be apparent even in the underlying financial institutions meant to protect communities and individuals' financial well-being in times of critical need.

Supplementary material

Supplementary material is available at *Health Affairs Scholar* online.

Funding

The authors acknowledge grant support for this work from the Episcopal Health Foundation (Grant ID: 8331637).

Conflicts of interest

Please see ICMJE form(s) for author conflicts of interest. These have been provided as supplementary materials.

Notes

1. Castellanos S, Potts J, Tiedmann H, et al. A synthesis and review of exacerbated inequities from the February 2021 winter storm (Uri) in Texas and the risks moving forward. *Progr Energy*. 2023;5(1): 012003. https://doi.org/10.1088/2516-1083/aca9b4
2. Cardinal CR, Ratnapradipa D, Scarbrough A, Robins A, Boes K. Extreme winter storms: environmental impacts of public utility policies on vulnerable populations. *J Environ Health*. 2022;84(7): 12-19.
3. Grineski SE, Collins TW, Chakraborty J, Goodwin E, Aun J, Ramos KD. Social disparities in the duration of power and piped water outages in Texas after Winter Storm Uri. *Am J Public Health*. 2023;113(1):30-34. https://doi.org/10.2105/AJPH.2022.307110
4. Kousky C, Palim M, Pan Y. Flood damage and mortgage credit risk: a case study of Hurricane Harvey. *J Housing Res*. 2020;29(sup1): S86-S120. https://doi.org/10.1080/10527001.2020.1840131
5. Alley DE, Lloyd J, Pagan JA, Pollack CE, Shardell M, Cannuscio C. Mortgage delinquency and changes in access to health resources and depressive symptoms in a nationally representative cohort of Americans older than 50 years. *Am J Public Health*. 2011;101(12):2293-2298. https://doi.org/10.2105/AJPH.2011.300245
6. Squires GD. Racial profiling, insurance style: insurance redlining and the uneven development of metropolitan areas. *J Urban Affairs*. 2003;25(4):391-410. https://doi.org/10.1111/1467-9906.t01-1-00168
7. Kousky C. The role of natural disaster insurance in recovery and risk reduction. *Annu Rev Resour Econ*. 2019;11(1):299-418. https://doi.org/10.1146/annurev-resource-100518-094028
8. Raker EJ, Woods T. Disastrous burdens: Hurricane Katrina, federal housing assistance, and well-being. *RSF: Russell Sage Found J Social Sci*. 2023;9(5):122-143. https://doi.org/10.7758/rsf.2023.9.5.06
9. Billings SB, Gallagher EA, Ricketts L. Let the rich be flooded: the distribution of financial aid and distress after hurricane harvey. *J Financ Econ*. 2022;146(2):797-819. https://doi.org/10.1016/j.jfineco.2021.11.006
10. Blankenship KM, Rosenberg A, Schlesinger P, Groves AK, Keene DE. Structural racism, the social determination of health, and health inequities: the intersecting impacts of housing and mass incarceration. *Am J Public Health*. 2023;113(S1):S58-S64. https://doi.org/10.2105/AJPH.2022.307116
11. Swope CB, Hernandez D. Housing as a determinant of health equity: a conceptual model. *Soc Sci Med*. 2019;243:112571. https://doi.org/10.1016/j.socscimed.2019.112571
12. Texas Department of Insurance. Catastrophe Statistical Plan Data. 2022. Insured losses resulting from the February 2021 Texas winter weather event. Accessed September 12, 2023. https://www.tdi.texas.gov/reports/
13. Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR). *CDC/ATSDR Social Vulnerability Index*. US Agency for Toxic Substances and Disease Registry; 2020. Accessed September 12, 2023. https://www.atsdr.cdc.gov/placeandhealth/svi/data_documentation_download.html