



A framework to understand the relationship between social factors that reduce resilience in cities: Application to the City of Boston



S. Atyia Martin¹

Northeastern University, College of Professional Studies, 360 Huntington Avenue, 20 BV 02136, Boston, MA 02115, United States

ARTICLE INFO

Article history:

Received 3 September 2014

Received in revised form

1 December 2014

Accepted 1 December 2014

Available online 11 December 2014

Keywords:

Social vulnerability

Social isolation

Resilience

Civil rights

Emergency management

Public health preparedness

ABSTRACT

For the first time in human history, more people across the world live in cities than in rural areas: In the U.S., approximately 80% of the population live in cities. Socially vulnerable populations and complex infrastructure exist in higher numbers in cities significantly compounding risk. People facing these social factors have disproportionate exposure to risk and a decreased ability to avoid or absorb potential loss. However, the body of literature available on social vulnerability is disparate with fragmented insight into understanding the relationship between social factors that increase vulnerability and practical approaches to reduce risk. This research focuses on developing a replicable, practical approach to understanding the complexity of social vulnerability in American cities while reducing the likelihood of civil rights violations. The Social Determinants of Vulnerability Framework (The Framework) was developed using a link analysis of social factors from existing literature. The Framework consists of seven inter-related social factors that seem to be driving vulnerability: children, people with disabilities, older adults, chronic and acute medical illness, social isolation, low-to-no income, and people of color. The Framework also includes specific poor outcomes that people with pre-emergency social factors are more likely to experience at disproportionately higher levels after emergencies: lack of access to post-incident services; displacement; injury, illness, and death; property loss or damage; domestic violence; and loss of employment. A quantitative analysis of those social factors based on City of Boston data confirmed many of the relationships among the social factors of vulnerability and the significance of social isolation.

© 2014 The Author. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

1. Introduction

For the first time in human history, more people across the world live in cities than in rural areas [45]. Approximately 80.7% of the United States population lives in metropolitan areas [47]. The growing concentration of people, assets, and infrastructure in conjunction with the threats and hazards from natural, technological, and human-caused events means that the loss potential in urban areas is high and continues to rise [45]. This population density also means socially vulnerable populations exist in higher numbers, further compounding risk in cities [17].

The social systems in cities are complex. People depend upon intricate social and physical infrastructure, such as health and human services, public transportation, and utility networks such as water, electricity and telecommunications [17]. The potential for poor outcomes after disasters in cities increases based on these complex systems, a higher density of people, and larger numbers of socially vulnerable people [24,41]. The daily circumstances of

people are significant factors in cities' ability to withstand the impact of an emergency [28].

Social vulnerability is the susceptibility of social groups to the impacts of hazards such as suffering disproportionate death, injury, loss, or disruption of livelihood; as well as their resiliency, or ability to adequately recover from the impacts [14,55]. This susceptibility is a function of the demographic characteristics of the population as well as more complex conditions such as health care provision, social capital, and access to lifelines [14]. Furthermore, at-risk populations have a higher likelihood to be socially isolated, which has proven to be an indicator of increased mortality before and after disasters [31,39]. Socially vulnerable populations are faced with a comparatively higher number of stressors before an emergency ever happens [26]. However, if community and government services are equitable and accessible before and after emergencies, socially vulnerable populations can have the same opportunities as everyone else to be more resilient [11]. When socially vulnerable populations are more resilient it increases the overall resilience of the city.

Researchers have identified many people as being socially vulnerable including those with social factors associated with being children, older adults, people of color, low-income, living

¹ Permanent address: 21 Central Avenue, Boston, MA 02136, USA

E-mail addresses: s.martin@neu.edu, atyia@live.com

alone, single parents, non-English speaking as well as those who suffer from chronic physical and mental illness, disabilities, and low-literacy. Socially vulnerable populations have a disproportionate exposure to risk and a decreased ability to avoid or absorb potential harm.

Emergency management planning identifies the actions local government will take before, during, and after emergencies. The current process to develop plans focuses on reducing the impact of emergencies on critical infrastructure, assets, and the environment. However, they do not include ways to reduce the impact of emergencies on people. Therefore, efforts often result in municipalities preparing for emergencies without accounting for the complex interaction of social, physical, and hazard environments [51]. Existing plans are designed for people who can walk, run, drive, see, hear, pay, and quickly respond to directions [25,30]. The assumptions do not align with the reality that at least half of the American population can be considered vulnerable to disasters because of their existing social circumstances [30]. The approach to emergency planning has to shift to incorporate the diverse needs of socially vulnerable people into mitigation, response, and recovery.

Many people who are considered socially vulnerable are also protected by civil rights. When there is a lack of inclusive planning, jurisdictions may be inadvertently violating civil rights. Civil rights statutes and supporting federal guidance protect the rights of Americans so that they are not denied the benefit from or participation in federally-funded programs and activities on the basis of race, color, national origin, disability, age, economic status, or limited English proficiency [35,40,48]. Cities are not compliant with the protection afforded by these rights if these populations are not represented in the planning process, included in the considerations for emergency management plans, or post-incident services provided by local, state, federal, and nongovernmental organizations. The lack of inclusion is de facto exclusion and results in local government developing and executing plans that do not meet the needs of their constituents and potentially violates their civil rights. The Social Determinants of Vulnerability Framework (see Appendix A) was developed to identify the relationship between social factors that increase vulnerability in order to support inclusive emergency planning and social resilience.

Although people are not responsible for the occurrence of a natural disaster, we can change the severity of the consequences [1]. The impact of a disaster on any community is not random; it is determined by the daily circumstances of people living in the area [32].

2. Purpose

This research focuses on developing a replicable, practical approach to understanding the complexity of social vulnerability in American cities for policy makers and emergency planners across all sectors of government and industry, particularly emergency management and public health emergency preparedness. Ideally, the results of this research can be used to complement existing risk assessments and hazard vulnerability analyses to increase social resilience. The study was conducted in two phases. This paper focuses on the second phase. However, to have full context of the second phase of the research, an overview of the first phase is included.

The first phase of the research identifies the co-existence of social vulnerability categories and the social, physical, economic, and psychological health impacts of exposure to hazards. The goal was to develop a Social Determinants of Vulnerability Framework that focused on the characteristics of social vulnerability and their associated impacts. The research questions for the first phase

were: What are the socially factors that contribute to vulnerability in cities that appear in the literature? What are the relationships between the social factors that appear in the literature with other social factors that also appear in the literature?

For the second phase, the Social Determinants of Vulnerability Framework was applied to the City of Boston to determine if the relationships between social factors as identified in the literature remain consistent based on data for a city. Additionally, this study identifies the geographic distribution and the strength of the relationships between the social characteristics that increase vulnerability.

The social factors of vulnerability are closely related. Existing literature does not take into account the manner in which social vulnerability factors are often compounded to produce negative consequences before, during, and after emergencies. Emergency planners are often faced with long lists of categories of people that are considered vulnerable. The sheer volume and unclear co-occurrence of these factors becomes a practical challenge in identifying the most vulnerable populations within a community. The tension between the volume of social factors and the need to focus scarce resources impedes the development of strategies to reduce socially vulnerable people's exposure to harmful public health and safety consequences of emergencies.

In order to answer to the previous questions, this study used a mixed methods approach in two phases. First, a grounded theory approach was used to develop the Social Determinants of Vulnerability Framework which shows the interrelationships between social factors to determine which ones were most related to other social factors. Sixty-three social vulnerability attributes and their relationships to other social factors were uploaded into Touch-Graph Navigator, a link analysis software. Social network analysis logic was used to identify the relationships between each social factor and associated social factors. This process is similar to social network analysis and is beneficial because of its ability to reveal patterns in complex data that would be undetectable using other analytic approaches [33]. This methodology identified co-occurrence and frequency of co-occurrence across attributes. The result of this analysis is the Social Determinants of Vulnerability Framework which depicts the co-existing socially factors on which to focus mitigation, response, and recovery planning.

The second phase, and the primary focus of this paper, is the application of the Social Determinants of Vulnerability Framework to the City of Boston. For each social condition or characteristic, the geospatial hot spots were identified. In order to compare the relationships in the literature to the Boston data, a correlation analysis was conducted for social factors from the Social Determinants of Vulnerability Framework at the city level and for each neighborhood. In order to explore the relationship between social isolation and social vulnerability, the author conducted a regression analysis using social isolation as the dependent variable and the remaining social factors from the Framework as the independent variables.

3. Social vulnerability, social isolation, physiological impacts, and resilience

The potential for poor outcomes after disasters in cities is incredibly high as the result of the complex infrastructure, higher density of people, and large numbers of socially vulnerable populations [15,24,41]. Social vulnerability is the result of pre-emergency social factors that create a lack of capacity or capability to prepare for, respond to, and recover from emergencies. Social vulnerability includes people who are more likely to suffer disproportionately because of their existing social circumstances such as those associated with age, gender, race, medical illness, disability, literacy, and English

Download English Version:

<https://daneshyari.com/en/article/7473221>

Download Persian Version:

<https://daneshyari.com/article/7473221>

[Daneshyari.com](https://daneshyari.com)