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SPECIAL FEATURE: URBAN DISASTER

Disasters in Urban Context

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ABSTRACT *This article provides a brief overview of the field of disaster research, summarizing what is known at present about the prevalence of disasters, the range of stressors and outcomes experienced, and sample-, event-, and individual-level risk factors for poor health and mental health outcomes. Prior research does not suggest that an urban context either enhances or reduces risk for individual survivors. It is argued, however, that the influence of extraindividual exposure, ethnic diversity, and support deterioration may be especially salient for understanding urban disasters. Investigators of urban disasters are especially well situated to expand knowledge of ecological and collective aspects of disaster response and recovery.*

Excluding droughts and war, there are almost 500 incidents annually, worldwide, that meet the definition of a disaster as given by the Red Cross: an event that involves 10 or more deaths, affects 100 or more people, or leads to an appeal to them for assistance.[1] Across these events, 50,000 people die, an additional 74,000 are seriously injured, 5 million are displaced from their homes, and over 80 million are affected in some way. The causes of disasters are many, including natural forces, such as floods, hurricanes, and earthquakes; failures of technology, such as nuclear, industrial, and transportation accidents; and mass violence, such as shooting sprees and peacetime terrorist attacks. Regardless of their cause, disasters damage local infrastructures and strain the ability of local systems to meet the population's basic needs. For the survivors, disasters may engender an array of stressors, including threat to one's life and physical integrity, exposure to the dead and dying, bereavement, profound loss, social and community disruption, and ongoing hardship. As a result of both the high prevalence and high stressfulness of disasters, the question of whether they have an impact on mental health has been of interest for decades, and substantial literature has developed that identifies and explains these effects.

Norris and colleagues[2,3] recently attempted to provide a synthesis of this vast body of literature. The review was restricted to quantitative studies published in English between 1981 and 2001 and selected from various databases using the search term *disaster(s)*. That analysis encompassed 160 distinct samples of disaster victims composed of over 60,000 individuals who experienced 102 different events. The range of consequences experienced by these disaster survivors was broad, including various psychological problems, such as depression, anxiety, and (most notably) posttraumatic stress disorder (PTSD); physical health problems, such as sleep

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disruption, somatic complaints, and impaired immune function; chronic problems in living, such as troubled interpersonal relationships and financial stress; and resource loss, such as declines in perceived control and perceived social support. Individuals varied considerably in the extent to which they experienced these outcomes. Within adult samples, more severe exposure, female gender, middle age, ethnic minority status, secondary stressors, prior psychiatric problems, and weak or deteriorating psychosocial resources most consistently increased the likelihood of adverse mental health outcomes. Among youth, family factors were primary.

Of course, not all disasters are equally serious from a public health perspective. To reflect the collective consequences of disasters in the review, the results for each sample were classified on a 4-point ordinal scale of severity of impairment. Those in a few samples (11%) showed only minimal or highly transient impairment. Those in the majority of the samples (51%) showed moderate impairment, indicative of prolonged stress, but little psychopathology. In these samples, depending on the study's design, there were significant differences between exposed participants and some comparison group, changes between predisaster and postdisaster mental health measures, or significant correlations between exposure measures and mental health measures. Those in the remaining samples showed severe (21%) or very severe (18%) impairment, indicative of a high (25%–49%) or very high (50% or more) prevalence of clinically significant distress (determined on the basis of percentages scoring above established cut points on standardized scales) or criterion-level psychological disorder (determined on the basis on diagnostic instruments).

In a regression analysis, three factors—sample type, disaster location, and disaster type—together explained a good percentage of the variance (32%) in severity of impairment of the samples. Relative to adult survivors, samples were more likely to have impaired individuals if they were composed of youths and less likely to have impaired individuals if they were composed of rescue and recovery workers. Relative to the United States, samples were more likely to have impaired individuals if they were from either developing or other developed countries, but the effect of location in a developing country was particularly large. Relative to natural disasters, samples were more likely to have impaired individuals if they had experienced mass violence. Within developed countries, samples with individuals that experienced technological disasters were also more likely to have impaired individuals than samples with individuals that experienced natural disasters.

Each of the 102 events in the database was classified by aggregating ratings from all samples experiencing that event. For example, 13 samples experienced Hurricane Andrew; their severity ratings ranged from 2 to 4 and averaged 2.8. Low-impact events had aggregate severity ratings of 1.5 or less, moderate-impact events had aggregate severity ratings of 1.6 to 2.4, and high-impact events had aggregate severity ratings of 2.5 or higher. Although disasters of mass violence were over-represented in the set of high-impact events, numerous natural and technological disasters were in this set as well. A relatively more subjective analysis of samples similarly classified suggested that the effects of disasters were greatest when at least two of the following event-level factors were present: (1) the disaster caused extreme and widespread damage to property, (2) the disaster engendered serious and ongoing financial problems for the community, (3) the disaster was caused by human intent, and (4) the impact was associated with a high prevalence of trauma in the form of injuries, threat to life, and loss of life.

For this special issue on urban disasters, of most interest was the question of whether place influenced the disaster's impact on public health. For the larger re-

view, events had not been coded specifically according to whether they were urban or rural, but a cursory review of them suggested that urban disasters were well represented in each impact category. Well-known low-impact disasters included the Northridge earthquake in suburban Los Angeles, California, and the Loma Prieta earthquake in San Francisco, California. Moderate-impact disasters included Hurricane Hugo in Charleston, South Carolina; the Kobe, Japan, earthquake; and the civil disturbance in southeast Los Angeles. High-impact disasters included Hurricane Andrew in Miami, Florida; Hurricane Paulina in Acapulco, Mexico; the Mexico City earthquake; the landslides in Sarno, Italy; a subway fire in London; shootings in Brooklyn, New York, and Los Angeles; and the bombing of the Murrah Federal Building in Oklahoma City, Oklahoma. Apparently, an urban context, in and of itself, neither reduces nor enhances survivors' capacity to recover psychologically from a disaster.

Nonetheless, there are issues that warrant special attention when a disaster occurs in a large metropolitan area. Although always important after disasters, the social functioning of the collective may be all the more important in urban settings, where individuals are nested in workplaces (and organizational cultures), neighborhoods, and ethnic subcultures that shape how they and their social networks respond and cope. The density of the urban environment would also seem to exacerbate the potential for various negative interpersonal processes and conflicts. Thus, for understanding urban disasters, the issues of extraindividual exposure, ethnic diversity, and support deterioration may be especially salient.

The issue of extraindividual exposure is concerned with the relative contributions of two aspects of disaster exposure: personal loss and community destruction. The research has clearly focused on the former, which is the extent to which a given individual has experienced injury, trauma, or property damage. Most definitions of disaster, however, recognize the broader context in which these losses occur. For example, it is generally assumed that, as the proportion of victims to nonvictims within a community increases, the mental health consequences of the disaster increase.[4] As this proportion increases, victims are more likely to be displaced, and it becomes more difficult for them to avoid being exposed to physical destruction and even death following the more severe catastrophes. Erickson[5] proposed that the trauma experienced by survivors of the dam collapse in Buffalo Creek, West Virginia, had two facets: *individual trauma*, the personal psychic impact of the disaster, and *collective trauma*, the impairment of the prevailing sense of community. Bolin[6] observed that there are two broad categories of victims in a given disaster. *Primary victims* are those who directly experience physical, material, or personal losses. *Secondary victims* are those who live in the affected area, but sustain no personal injuries or damages. From this conceptualization, it can be inferred that a disaster is more than an individual-level event, but is also a community-level event with potential psychological consequences even for those persons who experience no direct losses.

Occasionally, severity of exposure has been assessed at the neighborhood or community level. Measures such as the respondent's proximity to the "epicenter" may be derived geographically but typically are used to group participants who had similar individual experiences and are not intended to reflect extraindividual experience. Three approaches to ecological assessment were demonstrated in this literature: (1) participants have been asked to describe conditions in their neighborhoods or communities[7]; (2) data have been aggregated "up" from the individual to the neighborhood or community level[8]; and (3) archival data have been collected

that reflect collective loss independent of personal loss.[9,10] In general, such measures tend to have modest effects, yet they often do explain variance in outcomes over and above those of individual-level measures.

In fact, in their study of 10 flooded counties, Phifer and Norris[9] showed that personal loss and community destruction interacted; victims who fared most poorly were those who experienced both high personal loss and high community destruction. Occasionally, the two measures differed in their effects in interesting and informative ways. For example, personal loss was more strongly related to increases in negative affect, but community destruction was more strongly related to decreases in positive affect, reflecting a communitywide tendency to feel less positive about their surroundings, less enthusiastic, less energetic, and less able to enjoy life. These effects could still be observed 2 years after the flood. Similarly, personal loss was more strongly related to declines in perceptions of kin support, but community destruction was more strongly related to declines in perception of nonkin support and social participation.[10] No one would suggest that such consequences constitute psychopathology, but they do indicate that disasters may impair the quality of life in the community at large for quite some time. As have subsequent studies,[11–13] these findings provide an excellent reminder that disasters impact on whole communities, not just selected individuals.

The astute reader will also have made two observations regarding the preceding discussion: (1) the differences between the effects of individual- and community-level exposure were more qualitative than quantitative in character, which points to a need for additional conceptual progress if the goal is to describe postdisaster public health; and (2) the illustrative study of floods in eastern Kentucky was decidedly not urban. Capturing community-level exposure in urban settings will be far more complex because of the multitude of ways in which people transverse physically defined areas during the course of an average day. Its difficulty notwithstanding, there is a clear need for urban investigators to address this issue in their research.

Understanding the aftermath of urban disasters may be even more challenging because of the diversity that is characteristic of many metropolitan areas. People with a variety of ethnic heritages, countries of origin, and socioeconomic statuses often live in proximity. Compared to gender and age, there is relatively little information about the effects of ethnicity on disaster response. The Norris et al. review[2] identified only 11 studies that provided relevant information. In all but two of these studies, ethnic groups with individuals who were of minority group status fared more poorly than persons of majority group status.

One study from this set is useful to highlight because it was designed specifically to facilitate ethnic comparisons of disaster effects. Six months after Hurricane Andrew, Perilla and colleagues[8] interviewed 404 residents of Homestead and Miami, Florida. The sample was composed of equal numbers of Latinos, non-Hispanic blacks, and non-Hispanic whites. Most Latinos elected to complete the interview in Spanish; all other interviews were conducted in English. Ethnic groups differed strongly in the prevalence of PTSD. Overall, non-Hispanic white disaster victims showed the lowest rate (15%), Spanish-preferring Latinos showed the highest rate (38%), and non-Hispanic black victims showed a rate (23%) between these two extremes. Among Latinos, acculturation was more important than Hispanic heritage per se because, as a group, English-preferring Latinos (of whom 19% met study criteria for PTSD) were more similar to non-Hispanic white survivors than to Spanish-preferring Latinos. This observation has important implications for studies of urban American disasters because it speaks to the need to validate and include

Spanish language instruments in the research.[14] It also points to the diversity among Latino populations and the potential danger of treating this population as a homogeneous group.

What is perhaps more important about the study was its attempt to determine whether differential exposure or differential vulnerability best explained the results. Consistent with the differential exposure hypothesis, non-Hispanic whites were less often personally traumatized and far less exposed to neighborhood trauma than Latinos or non-Hispanic blacks. The severity of their exposure accounted for much of minority group members' higher posttraumatic stress. However, the effects of ethnicity increased as severity of exposure increased, indicating that differential vulnerability also would have to be considered. Some of minorities' disproportionate distress was explained by their higher levels of fatalism (external control) and acculturative stress (discomfort in dealing with members of other ethnic groups). The mediating role of fatalism is consistent with a large body of literature that shows that external control is a risk factor for poor psychological outcomes following stressful life events. It is reasonable to speculate that the intergroup tensions manifested in acculturative stress could hinder help-seeking or otherwise exacerbate the effects of other stressors. Theoretically, it was important to demonstrate that differential exposure and vulnerability can work in tandem and are thus not necessarily rival explanations. It is equally important to recognize that these processes did not provide a complete explanation of minorities' elevated risk. Their historical marginalization may have affected their psychological functioning in ways that were not captured well by measures collected at the individual level.

Other research suggests that ethnic minority groups sometimes differ in their capacity to mobilize informal social support after disasters. Following Hurricane Hugo, Kaniasty and Norris[15] observed a pattern of neglect: African Americans received less tangible and emotional support from their social networks than comparably affected disaster victims who were white. The same pattern held when less and more educated disaster victims were compared. Socially and economically disadvantaged groups are frequently too overburdened to provide ample help to other members in time of additional need. "In a sense, the poor in disaster are double victims: they are first of all victims of poverty and that, in turn, adds to the degree of 'victimization' in disasters." [16(p247)] Sometimes, the neglect may be more imagined than real, as it is not uncommon for people from all walks of life to believe that other neighborhoods or groups received more—or more timely—formal assistance than they did.

In addition to those tied to ethnicity and culture, there are other social processes that are not unique to urban disasters, but are likely to be more pronounced in cities because of the density, crowding, and "overload" that are characteristic of that context. Previous research indicates that the quantity and quality of interpersonal relationships decline after disasters, and that these declines partly explain health and mental declines.[10,17] The implications of these processes for social support[18] and community functioning[19] have been discussed at length previously. In brief, there are many reasons why disaster victims are at risk for deterioration of social support. Most tragically, disasters remove significant supporters from victims' networks through death. Temporary or permanent relocation is often necessary. Although victims frequently find shelter among people they know, the quality of their relationships with hosting families may eventually break down as conflicts emerge due to crowding and financial difficulties. Temporary communities (e.g., tent camps) seldom reflect predisaster neighborhood patterns. Some people move

away and never come back, changing the structure of social relations permanently. The loss of important attachments is almost unavoidable.

Moreover, although help is usually abundant in the immediate aftermath of a disaster, the heightened sense of altruism seldom persists for the entire length of the recovery process. The attentive media and generous outsiders leave for another crisis. Families and social networks become saturated with stories of and feelings about the event and may escape interacting. Whereas victims want and need to be listened to, they and others in their social environments may not necessarily wish to be the listeners. Physical fatigue, emotional irritability, and scarcity of resources increase the potential for interpersonal conflicts and social withdrawal. Thus, over time, mutual helping and cohesion may yield to conflict and disharmony, mobilization of support to deterioration of support.[18,19]

In summary, the research base on postdisaster mental health is extensive. The range of effects is broad, and the severity of effects varies predictably according to characteristics of the event, population, and individual. The available data do not indicate that survivors of urban disasters, overall, fare either more poorly or better than survivors of rural disasters. Perhaps the resources afforded by an urban environment (e.g., more available and accessible services) offset the risks (e.g., intergroup tensions, interpersonal conflict, support fatigue). There is still much to be learned about the social and ecological processes through which disasters exert their psychological effects, about how communities respond and behave collectively, and about how these responses and behaviors are shaped by contexts of culture and place. Investigators of urban disasters are especially well situated to address these concerns.

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REFERENCES

1. International Federation of Red Cross and Red Crescent Societies. *World Disaster Report*. Dordrecht, The Netherlands: Martinus Nijhoff; 1999.
2. Norris F, Friedman M, Watson P, Byrne C, Diaz E, Kaniasty K. 60,000 disaster victims speak, Part I: an empirical review of the empirical literature, 1981–2001. *Psychiatry*. In press.
3. Norris F, Friedman M, Watson P. 60,000 disaster victims speak, Part II: summary and implications of the disaster mental health research. *Psychiatry*. In press.
4. Green B. Assessing levels of psychological impairment following disaster: consideration of actual and methodological dimensions. *J Nerv Ment Dis*. 1982;170:544–552.
5. Erikson K. Loss of communality at Buffalo Creek. *Am J Psychiatry*. 1976;133:302–305.
6. Bolin R. Disaster characteristics and psychosocial impacts. In: Sowder B, ed. *Disasters and Mental Health: Selected Contemporary Perspectives*. Rockville, MD: National Institute of Mental Health; 1985:3–28.
7. Hanson R, Kilpatrick D, Freedy J, Saunders B. Los Angeles County after the 1992 civil disturbances: degree of exposure and impact on mental health. *J Consult Clin Psychol*. 1995;63:987–996.

8. Perilla J, Norris F, Lavizzo E. Ethnicity, culture, and disaster response: identifying and explaining ethnic differences in PTSD 6 months after Hurricane Andrew. *J Soc Clin Psychol*. 2002;21:20–45.
9 Phifer J, Norris F. Psychological symptoms in older adults following disaster: nature, timing, duration, and course. *J Gerontol*. 1989;44:207–217.
10. Kaniasty K, Norris F. A test of the support deterioration model in the context of natural disaster. *J Pers Soc Psychol*. 1993;64:395–408.
11. Galea S, Ahern J, Resnick H, et al. Psychological sequelae of the September 11 terrorist attacks in New York City. *N Engl J Med*. 2002;346:982–987.
12. Pfefferbaum B, Seale T, Mcdonald N. Posttraumatic stress two years after the Oklahoma City bombing in youths geographically distant from the explosion. *Psychiatry*. 2000;63:358–370.
13. Smith D, Christiansen E, Vincent R, Hann N. Population effects of the bombing of Oklahoma City. *J Okla State Med Assoc*. 1999;92:193–198.
14. Norris F, Perilla J, Murphy A. Postdisaster stress in the United States and Mexico: a cross-cultural test of the multi-criterion conceptual model of posttraumatic stress disorder. *J Abnorm Psychol*. 2001;110:553–563.
15. Kaniasty K, Norris F. In search of altruistic community: patterns of social support mobilization following Hurricane Hugo. *Am J Community Psychol*. 1995;23:447–477.
16. Bolin R. *Long-Term Family Recovery From Disaster*. Boulder, CO: Institute of Behavioral Science, University of Colorado; 1982.
17. Norris F, Kaniasty K. Received and perceived social support in times of stress: a test of the social support deterioration deterrence model. *J Pers Soc Psychol*. 1996;71:498–511.
18. Kaniasty K, Norris F. Social support dynamics in adjustment to disasters. In: Duck S, ed. *Handbook of Personal Relationships*. 2nd ed. London: Wiley; 1997:595–619.
19. Kaniasty K, Norris F. Individuals and communities sharing trauma: unpacking the experience of disaster. In: Gist R, Lubin B, eds. *Psychosocial, Ecological, and Community Approaches to Understanding Disaster*. London: Bruner/Mazel; 1999:25–62.