

REVIEW

The Impact of Disasters on Populations With Health and Health Care Disparities

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ABSTRACT

Context: A disaster is indiscriminate in whom it affects. Limited research has shown that the poor and medically underserved, especially in rural areas, bear an inequitable amount of the burden.

Objective: To review the literature on the combined effects of a disaster and living in an area with existing health or health care disparities on a community's health, access to health resources, and quality of life.

Methods: We performed a systematic literature review using the following search terms: disaster, health disparities, health care disparities, medically underserved, and rural. Our inclusion criteria were peer-reviewed, US studies that discussed the delayed or persistent health effects of disasters in medically underserved areas.

Results: There has been extensive research published on disasters, health disparities, health care disparities, and medically underserved populations individually, but not collectively.

Conclusions: The current literature does not capture the strain of health and health care disparities before and after a disaster in medically underserved communities. Future disaster studies and policies should account for differences in health profiles and access to care before and after a disaster.

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Key Words: disaster, health disparities, health care disparities, medically underserved, surge capacity

A disaster is indiscriminate in whom it affects, but limited research has shown that poor and medically underserved people, especially people residing in rural areas, bear an unequal amount of the burden.¹⁻⁷ Rural communities nationwide disproportionately suffer from a lack of public health infrastructure.⁸⁻¹¹ In a disaster, continuity of care is often disrupted, leaving behind the vestige of a fragmented primary and mental health infrastructure.^{2-4,7,12-14} This situation is especially distressing for medically underserved areas struggling with persistent health and/or health care disparities. Disasters themselves can catalyze new or exacerbate existent disparities in health and health care within the affected population. We define *health and/or health care disparities* as differences in health and health care availability across diverse populations.¹⁵ There is limited information on the impact of disasters on access to health care, use of health care services, and the exacerbation of health disparities in medically underserved areas.

Medical resource-poor communities can be labeled as medically underserved areas. Medically underserved areas are currently indexed by the US Department of Health and Human Services Health Resources and Services Administration based on inherent disparities in the following: (1) health care provider to population ratio, (2) infant mortality rate, (3) the percentage of population living at less than 100% of the federal poverty line, and (4) the percentage of the population aged 65 years or older.^{16,17} For this article, we use medically under-

served areas as an indicator for health care disparities. Medically underserved areas are low-income areas that demonstrate insufficient primary medical care coverage and are often located in rural communities.^{3,16,18-23}

In 2007, roughly 20% of Americans experienced delayed access or were unable to obtain access to medical care²⁴; since then, access for insured and uninsured people has declined. Persistent unmet needs and delayed care contribute to underlying health disparities in communities, especially among vulnerable populations. Disparities in need and deferred care pose serious threats to health for disaster victims.

Rural areas are likely to carry an inequitable amount of the burden of health care disparities and are home to a unique set of health care disparities. These disparities contribute to the inadequate provision of basic health care services that arise from fewer medical facilities, a minimal number of providers, fewer specialty practices, and a lack of accompanying technical innovations.^{19-21,25-27} In rural medically underserved settings, people experiencing barriers to primary health care tend to be low income, people of color, underinsured or uninsured, less educated, and unemployed.^{24,28-35} Nearly a quarter of the US population lives in rural areas, and more than 20% of rural residents are living at or below the US poverty line.^{28,33} Rural communities are faced with a myriad of health care disparities, each posing as a barrier to timely response and complete recovery from a disaster, including insufficient

public health infrastructure.^{7,9,28,36} Reports show that rural areas experience disproportionate access to adequate medical care. These reports have informed an emerging literature revealing that health care disparities have been a persistent understudied and under-addressed issue.^{1,15,37,38}

DISASTERS

There are 2 main types of disasters: natural and technological. Natural disasters occur outside the control of humans, whereas technological disasters are breakdowns in human-made systems.^{5,39,40} Immediate threats to public health during the response to a disaster are quite evident. When disaster strikes, the health care system is immediately overwhelmed with injuries and acute illness needs during the initial *surge*, defined as the sudden increase in demand for emergency medical services. Often, acute illnesses occurring in the initial surge evolve into chronic health needs during the recovery phase of a disaster.⁴ For example, studies have documented long-term medical needs of victims of the World Trade Center collapse due to their extremely high caustic dust exposure,⁴¹⁻⁵⁶ of victims of forest fires who had smoke inhalation,^{57,58} and of survivors of the 2004 tsunami who aspirated large quantities of seawater.⁵⁹⁻⁶¹

Disasters pose greater threats to communities lacking resources and access to health care,^{3,4,11,14,36,40,62} which are precursors to health care disparities. However, health care disparities are not usually explicitly accounted for in surge capacity modeling.⁶³ A recent report, "Altered Standards of Care in Mass Casualty Events: Bioterrorism and Other Public Health Emergencies" published by the Agency for Healthcare Research and Quality⁶⁴ recommended that strategic steps be taken to address community-level factors in response planning, but made no mention of persistent health or healthcare disparities often inherent in these communities.⁶³

Health and health care disparities are seldom addressed in disaster response and recovery planning. While disaster epidemiology has been recognized as an emerging field with the expansion of human populations into disaster-susceptible regions and global climate change looming on the horizon,⁶⁵⁻⁶⁹ the impact of health and health care disparities on disaster epidemiology has not.

There is a paucity of information on the combined effects of a disaster and living in a rural area or other area with existing health or health care disparities on a community's health, access to health resources, and quality of life during the disaster recovery phase. To our knowledge, there has been no report of the burden of extant and incident chronic disease during the disaster recovery phase for a vulnerable community plagued with health disparities in the aftermath of a disaster. Yet, we know that these disparities exist in populations affected by disaster.^{2,3,12,14} Alternatively, this gap conflicts with the extensive collection of articles published in the lay press during the last 30 years consistently documenting the unmet needs of underserved populations affected by a disaster. The purpose of this

article is to document the current status of the science regarding the impact of disaster on health and health care disparities. To accomplish this, we conducted a systematic literature review.

METHODS

We selected the following search terms for our systematic literature review: disaster, health disparities, health care disparities, medically underserved, and rural. By using the combination of these search terms, we performed individual inquiries on widely accepted public health electronic search indices, including the Cambridge Scientific Abstracts, CINAHL Plus, MEDLINE (EBSCO), PubMed-MEDLINE, Web of Science (ISI Citation), Annual Reviews, Applied Social Sciences Index and Abstracts, The Cochrane Library, Health Reference Center-Academic, and Ovid Medline for all relevant articles published in the United States from January 1, 1970, to May 15, 2009.

There is considerable uncertainty in the literature regarding exact definitions for health and health care disparities.^{15,70,71} The Health Resources and Services Administration's Index of Medical Underservice has provided a quantifiable way to identify a given area, facility, or population as medically underserved.^{16,17} Therefore, we used medical underservice as a proxy for health and health care disparities because we believe that underservice is the leading culprit behind health and health care disparities and better contextualizes the current problem. Therefore, we limited our search to studies conducted in the United States. Our initial inclusion criteria were peer-reviewed, US epidemiological studies published in English that discussed the delayed or persistent effects of health and health care disparities in the midst of a disaster for medically underserved areas. Consequently, owing to the absence of epidemiological studies, we expanded our search to all relevant health studies, including the social sciences and health services research.

To further document the disconnect between health and health care disparities and disaster-related health research, we conducted a minisearch of the lay press using the Lexis-Nexis Academic search database. We used the power search option, narrowing the search within news wire services published from January 1, 1970, to May 15, 2009. Search term categories were as follows: health care and disasters; health care, disasters, and recovery; health care, disasters, and chronic diseases; health care, disasters, and long-term effects; health care, disasters, and rural; health disparities and disasters; and disasters and medically underserved.

RESULTS

There has been extensive research published on disasters, health disparities, health care disparities, and medically underserved populations individually, but few studies addressed these topics collectively (Table 1). We reviewed 12 articles that met the inclusion criteria; however, only 7 pertained to disasters in medically underserved populations (Table 2).^{2-4,9,12,14,72} Of those 7,

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5 concerned a natural disaster (ie, Hurricane Katrina),^{2,4,12,14} 1 a bioterrorism disaster,⁹ and 1 concerned natural and technological disasters.⁷² There were 3 articles reporting studies of medically underserved populations,^{2,3,72} and only 1 study explicitly targeted rural medically underserved communities.⁹ Of the studies, 4 were cross-sectional,^{2,9,12,14} and the remaining 3 were descriptive.^{3,4,72} There were no relevant follow-up articles addressing the effects of a disaster on a community with preexisting medical underservice issues or subsequent ampli-

fied health care disparities after the disaster. The following is a brief critique of each of the 4 cross-sectional studies.

Ford et al¹² conducted a cross-sectional study that explored how an existent surveillance system could be used to estimate chronic disease needs for a natural disaster by using the 2004 Behavioral Risk Factor Surveillance System to estimate prevalence of diabetes, heart disease, stroke, hypertension, and asthma. Cardiopulmonary disease was not included. A quarter of respon-

TABLE 1

Summary of All Search Term Hits by Public Health Index for Literature Review From January 1, 1970, to May 15, 2009

Search Terms	Public Health Search Indices									
	Cambridge Scientific Abstracts	CINAHL Plus	MEDLINE (EBSCO)	PubMed-MEDLINE	Web of Science (ISI Citation)	Annual Reviews	Applied Social Sciences Index and Abstracts	The Cochrane Library	Health Reference Center-Academic	Ovid MEDLINE
Disaster	7591	4772	12 715	23 662	12 098	629	532	5407	1605	5438
Rural	43 100	15 048	80 382	65 261	77 856	1642	7301	266	11 174	78 158
Health disparities	748	1158	1549	6577	5401	666	257	84	1185	1645
Health care disparities	39	78	533	140	3086	372	3	21	51	556
Medically underserved	142	1242	4110	4067	385	78	47	4	382	4226
Disaster and rural	417	108	226	447	120	197	21	1	44	187
Disaster and health disparities	10	3	3	35	9	56	1	0	5	4
Disaster and medically underserved	2	7	9	30	2	5	0	0	1	9
Disaster and health disparities and rural	2	0	0	2	0	23	0	0	0	0
Disaster and medically underserved and rural	1	1	2	4	0	1	0	0	0	2
Disaster and health care disparities	1	0	4	22	5	7	0	0	1	4

TABLE 2

Key Articles Discussing the Effects of a Disaster on Medically Underserved Populations

Source	Study Design and Objectives	Disaster Type	Rural vs Urban	Geography	Sample	Results
Ford et al, ¹² 2007	Cross-sectional; explored how a preexisting surveillance system could be used to estimate chronic disease needs for a natural disaster	Natural	Urban	New Orleans—Metairie—Kenner, Louisiana (Metropolitan Statistical Area)	N = 1681	25.5% of adults had at least 1 chronic condition (diabetes, 9.0%; coronary heart disease, 4.6%; myocardial infarction, 3.0%; asthma, 6.3%)
Hsu et al, ⁹ 2006	Cross-sectional; assessed language, confidence, and training needs of rural physicians in Texas in responding to public health emergencies	Technological (bioterrorism)	Rural	37 counties in north Texas	N = 841 practicing or retired physicians	Rural physicians in north Texas are serving diverse ethnic populations and need to be trained in emergency response needs of Hispanic communities.
Krol et al, ² 2007	Cross-sectional; mobile medic approach to target underserved populations residing in Mississippi after Hurricane Katrina	Natural	Urban	Gulfport-Biloxi area between September 5 and 20, 2005	N = 1205 patient encounters	Frequent reasons documented included the following: 53.7% needed vaccines; 12.6% needed prescription drugs; frequent diagnoses were as follows: respiratory, 17.1%; circulatory, 17.1%; minor injury, 11.8%; and skin conditions, 11.6%
Ridenour et al, ¹⁴ 2007	Cross-sectional; needs assessment to identify needs of evacuees after Hurricane Katrina in West Virginia	Natural	Not stated	Displaced evacuee population in West Virginia	N = 164	Acute illness, 25%; chronic medical condition, 46%

TABLE 3

Summary of Newspaper Hits in Lexis-Nexis From January 1, 1970, to May 15, 2009

Search terms	No. of Newspaper Articles
Health care <i>and</i> disasters	999
Health care <i>and</i> disasters and recovery	998
Health care <i>and</i> disasters and chronic diseases	737
Health care and disasters <i>and</i> long-term effects	983
Health care <i>and</i> disasters and rural	995
Health disparities <i>and</i> disasters	996
Disasters <i>and</i> medically underserved	172

dents had at least 1 chronic disease, 15.6% had 1 condition, 8.4% had 2 conditions, 1.1% had 3 conditions, and 0.3% had 4 or more conditions. This study revealed that preexisting surveillance systems, such as the Behavioral Risk Factor Surveillance System, can aid disaster response personnel in assessing chronic disease needs among disaster-affected populations. Ford et al¹² demonstrated that chronic disease management after a disaster is an understudied research priority.

Hsu et al⁹ conducted a cross-sectional study that assessed language, confidence, and training needs in responding to public health emergencies among rural medical providers in Texas. The sampling frame consisted of a physician database supplied by the Texas State Board of Medical Examiners. A semistructured survey was mailed or administered over the Internet to 841 practicing or retired physicians in 37 north Texas counties that assessed language use, perceived confidence in ability to respond to public health emergencies, and training experience. Prior experience in chemical exposure emergencies was reported by 20.9% of respondents. Nearly half were willing to offer their services in a public health emergency. However, 77.5% lacked confidence in their skills to effectively diagnose and treat victims of a public health emergency. This study highlighted the fact that many physicians lack public health emergency awareness, knowledge, and expertise, especially physicians in rural areas.

Krol et al² used an innovative mobile medic approach to conduct a cross-sectional survey that identified the acute and chronic health care needs of medically underserved populations residing in Mississippi after Hurricane Katrina. Data from 2 Children's Health Fund mobile medical units at 23 sites in the Gulfport-Biloxi area included all patient encounters (ie, chief complaint, diagnoses, vaccines dispensed, prescription medications distributed, and referrals) from September 5 through 20, 2005. Out of the 1,187 recorded patient encounters, there were 1,428 documented reasons to visit the mobile medical unit. The top 2 reasons were for vaccinations (n=638 patients with a documented reason to visit) and prescription medication needs (n=149 patients with a documented reason to visit).

Respiratory (27.8%), circulatory (27.8%), and minor injury (19.2%) were the most common diagnoses among all persons surveyed. For people with at least 1 chronic disease, asthma was the most commonly reported among people in the 0- to 21-year age group (31 [16.5%]), whereas hypertension was the most reported for the 22- to 65-year age group (99 [26.1%]) and the older than 65 years group (29 [59.2%]). The study addressed the need to consider chronic conditions and ensure primary care accessibility for vulnerable populations during recovery from a disaster.

Ridenour et al¹⁴ conducted a needs assessment to identify the needs of evacuees in West Virginia after Hurricane Katrina. A health status questionnaire adapted from a CDC surveillance instrument and West Virginia University School of Medicine at Morgantown medical screening tool was used to assess acute conditions, chronic medical conditions, and current needs. Surveys were linked to Red Cross household registration records that included information on the following: (1) address before the disaster, (2) dwelling type and homeowner insurance, (3) total household income, (4) incurred damage from the hurricane on the home, and (5) current housing needs. Only 51% of evacuees responded to the survey. A quarter of respondents had an acute condition, and 46% had at least 1 chronic medical condition at the time of the survey. Current medical needs expressed by the evacuees included the following: dental care, 57%; eyeglasses, 34%; dentures, 28%; and medical services, 25%. The study noted that chronic disease management and medical equipment needs are often overlooked priorities among displaced populations after a disaster.

Following a cursory examination of publications in the lay press, we found hundreds of newspaper articles addressing our proposed search categories (Table 3). For example, the search terms "health disparities and disasters" resulted in 996 hits with articles. On further searching, we noted that these articles dated back to 1982. These findings differed greatly from the number of health studies found in the literature for this same category, wherein applicable studies did not emerge until around 2005. Results from newspaper hits signify a more relevant and engaged media.

DISCUSSION

A dearth of research exists on the effects of a disaster for communities disproportionately affected by health and health care disparities. Few published studies assess a disaster's effect on chronic disease mortality and morbidity among medically underserved populations. Contrasting sharply with these glaring deficits apparent in the literature are countless articles in the lay press that have more than adequately addressed the issue of underlying health disparities in the wake of a disaster. For example, a seminal article was featured in the Washington Post just two weeks after Hurricane Katrina. The article, "At Risk Before the Storm Struck: Prior Health Disparities Due to Race, Poverty Multiply Death, Disease," stressed that many of the disaster-affected areas had "a bunch of people who have less than

optimal healthcare to begin with, and they have a large number of these diseases that people who get less than optimal healthcare end up getting” that in turn “left this high-risk group in greater peril than those with better health and access to care.”⁷²

The lay press has been at the forefront of this major public health issue, with thousands of newsprint articles discussing this issue now in circulation, while disaster epidemiology and health and health care disparities research have largely been out of touch, as seen by the paucity of peer-reviewed literature. Although it is difficult to say why, we could only speculate that the media’s ability to identify this issue as “newsworthy” suggests that it is much more conscientious and responsive to issues faced by its audience. People will continue to suffer from the effects of disasters. As a result, public health professionals must become more deliberate at accomplishing research directives that tackle real-world issues.

Health Care Needs Among Rural Disaster Populations

Following a disaster, the medical infrastructure becomes overwhelmed with acute injury and illness (the primary surge), and thought is rarely given to chronic conditions.^{2,4,12} If left untreated, preexisting chronic health problems can quickly become acute and have been linked to increased mortality among vulnerable populations in the wake of a disaster.¹² However, it can be reasoned that chronic disease within the context of a disaster can have a bidirectional effect, whereby the initial acute disorders may advance to long-term illnesses if insufficiently treated. This effect creates a “secondary surge” in required medical treatment long after the event and exaggerates health disparities among medically underserved populations. We have defined *secondary surge* as the sudden increase in the need for long-term health care services for incident chronic diseases following a disaster. Although there is sufficient evidence, no research documenting the effects of the secondary surge following a disaster on a stressed community’s health status and health care needs exists in the literature.^{4,10,73-75} The secondary surge of chronic diseases after a disaster coupled with inherent health care disparities, as those commonly found in rural medically underserved areas, makes access to routine health care very difficult during the recovery phase. Health care disparities in rural settings are likely to modify the effectiveness of disaster recovery efforts for a community after a disaster, but to date, we are not aware of any literature documenting this hypothesis. We know that mortality rates attributed to cardiovascular disease, cancer, and other chronic diseases are markedly worse in rural areas, and these health disparities are exceptionally higher in the rural South, an area at high risk for disasters.^{20,33,76-78} But how do these health care disparities impact response to and recovery from a disaster, especially among medically underserved populations? New research is needed to answer this important public health question.

Limitations

The reports of several studies that examined health care disparity issues have been published in Australia,⁸⁰⁻⁸⁸ Europe,⁸⁹⁻¹⁰⁸

Asia,¹⁰⁹⁻¹²⁰ and South America,¹²¹⁻¹³² However, health care disparities and unequal access to medical care within the context of disasters are very much underappreciated global issues. One reason may be that methods used to quantify health care disparities are scarce and inconsistent. In addition, keywords including medically underserved, health disparities, and health care disparities have emerged only within the last decade as relevant topic areas. Terminology poses a problem when attempting to identify these issues in older studies of disasters. Therefore, we may have overlooked older articles that addressed these issues. Since there have been guidelines in place to quantify medically underserved areas in the United States for the past 3 decades, we used medical underservice as a proxy for health care disparities and limited our search to studies published in the United States.^{15,70,71} We may have missed research published outside of the United States and in other languages.

Logue and colleagues¹³³ noted in 1979 that the majority of disaster epidemiology literature is descriptive, and cohort studies during the extended recovery period are scarce. Nearly 30 years after this acknowledgement, little work has been done to elucidate the long-term health effects observed during disaster recovery, especially pertaining to technological disasters other than the World Trade Center collapse.^{40,53,66,68,134} Furthermore, there have been no long-term follow-up studies published in the literature that have documented chronic disease management and other health care needs among medically underserved communities after a disaster. Many longitudinal studies following the Chernobyl, Bhopal, and World Trade Center disasters have been published.^{53,135-138} None published in the English language have examined health or health care disparities and health outcomes in medically underserved populations. We observe a critical gap in the current literature examining how disaster-affected communities address the escalating burden of chronic disease in the midst of ongoing health care disparities long after the initial response efforts have ceased. Some studies provide evidence for this issue, but they have failed to identify and discuss explicit ways in which health and health care disparities impede disaster recovery efforts.^{2-4,9,14} Several studies have documented the need to study the long-term effects of psychological sequelae,^{5,74,139-152} but we propose that longitudinal research on health and health care disparities in chronic disease management after a disaster are an equally understudied research priority. Longitudinal assessment and follow-up are especially necessary because the delayed health effects following a disaster, especially for a technological disaster, may not appear until many years later.

CONCLUSIONS

The precise mechanisms through which a community with preexisting health and health care disparities may become more susceptible to the deleterious effects of a disaster are unknown. The focus on the context of health and health care disparities before and after a disaster is important because the current literature does not capture the subsequent strain on medical resources imposed by the secondary surge of incident chronic

disease in medically underserved communities. Given that chronic disease accounts for the greatest cause of morbidity in the United States, especially in rural areas, it is imperative to address chronic disease management in disaster response and identify ways to mitigate the health and health care disparities associated with populations vulnerable to disaster.

To better facilitate disaster recovery, it is vital that study designs account for effect modification by health and health care disparities for more accurate risk assessment models. Future studies should account for differences in health status and access before and after the disaster to better address the interaction between disparities in health and health care and adverse health outcomes in disaster populations. Disaster preparedness is not often a leading priority for most communities in the United States. Furthermore, lessons learned from Hurricane Katrina regarding existent health and health care disparities and increased morbidity and mortality among poor populations should be more extensively documented so that they can be used to plan for future disaster events.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act)¹⁵³ governs the federal response to disasters within the United States, including provisions for medical care and treatment of injured victims. However, the act does not address health and health care disparities or the specific needs of communities that are medically underserved. Therefore, further research is needed to better understand the most appropriate approaches to addressing health and health care disparities in the context of the Stafford Act. Factors contributing to health and health care disparities must be accounted for in disaster planning and response to ensure that rural and vulnerable populations are equipped to be resilient during the initial and secondary surges and other disaster-related events. We believe that the secondary surge of incident chronic disease after a disaster is an underappreciated phenomenon and needs further study.

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REFERENCES

1. Andrus DP, Siddiqui NJ, Gantner JL. Preparing racially and ethnically diverse communities for public health emergencies [published correction appears in *Health Aff (Millwood)* 2007;26(6):1794]. *Health Aff (Millwood)*. 2007;26(5):1269-1279.
2. Krol DM, Redlener M, Shapiro A, Wajnberb A. A mobile medical care approach targeting underserved populations in post-Hurricane Katrina Mississippi. *J Health Care Poor Underserved*. 2007;18(2):331-340.
3. Mack D, Brantley KM, Bell KG. Mitigating the health effects of disasters for medically underserved populations: electronic health records, telemedicine, research, screening, and surveillance. *J Health Care Poor Underserved*. 2007;18(2):432-442.
4. Mokdad AH, Mensah GA, Posner SF, et al. When chronic conditions become acute: prevention and control of chronic diseases and adverse health outcomes during natural disasters. *Prev Chronic Dis*. 2005;2 (special issue):1-4.
5. Phifer JF. Psychological distress and somatic symptoms after natural disaster: differential vulnerability among older adults. *Psychol Aging*. 1990;5(4):412-420.
6. Shultz JM, Russell J, Espinel Z. Epidemiology of tropical cyclones: the dynamics of disaster, disease, and development. *Epidemiol Rev*. 2005; 27(1):21-35.
7. Straker H, Finister S. Not business as usual. *J Health Care Poor Underserved*. 2007;18(2):241-246.
8. Hagedorn M. Hermeneutic photography: an innovative esthetic technique for generating data in nursing research. *ANS Adv Nurs Sci*. 1994; 17(1):44-50.
9. Hsu CE, Mas FS, Jacobson HE, Harris AM, Hunt VI, Nkhoma ET. Public health preparedness of health providers: meeting the needs of diverse, rural communities. *J Natl Med Assoc*. 2006;98(11):1784-1791.
10. Kirk MA, Deaton ML. Bringing order out of chaos: effective strategies for medical response to mass chemical exposure. *Emerg Med Clin North Am*. 2007;25(2):527-548, abstract xi.
11. Kleinpeter MA. Public health preparedness for diverse populations and communities. *J Natl Med Assoc*. 2007;99(4):447-448.
12. Ford ES, Mokdad AH, Link MW, et al. Chronic disease in health emergencies: in the eye of the hurricane. *Prev Chronic Dis*. 2006;3(2):1-7.
13. Guglielmo WJ. New Orleans' doctors: still MIA. *Medical Economics*. 2006; 83(6):17.
14. Ridenour ML, Cummings KJ, Sinclair JR, Bixler D. Displacement of the underserved: medical needs of Hurricane Katrina evacuees in West Virginia. *J Health Care Poor Underserved*. 2007;18(2):369-381.
15. *National Healthcare Disparities Report, 2004*. Rockville, MD: Agency for Healthcare Research and Quality; 2004.
16. US Department of Health and Human Services Health Resources and Services Administration. HPSA Designation Criteria. HRSA Web site. <http://bhpr.hrsa.gov/shortage/hpsacrit.htm>. Accessed March 3, 2008.
17. Ricketts TC, Goldsmith LJ, Randolph R, Lee R, Taylor DH, Ostermann J. Designating places and populations as medically underserved: a proposal for a new approach. *J Health Care Poor Underserved*. 2007;18 (3):567-589.
18. Bronstein JM, Morrissey MA. Determinants of rural travel distance for obstetrics care. *Med Care*. 1990;28(9):853-866.
19. Casey MM, Thiede Call K, Klingner JM. Are rural residents less likely to obtain recommended preventive healthcare services? *Am J Prev Med*. 2001;21(3):182-188.
20. Eberhardt MS, Pamuk ER. The importance of place and residence: examining health in rural and nonrural areas. *Am J Public Health*. 2004; 94(10):1682-1686.
21. Hartley D. Rural health disparities, population, health, and rural culture. *Am J Public Health*. 2004;94(10):1675-1678.
22. Rosenblatt RA, Andrilla HA, Curtin T, Hart G. Shortages of medical personnel at community health centers: implications for planned expansion. *JAMA*. 2006;295(9):1042-1049.
23. Stamm BH, Lambert D, Piland NF, Speck NC. A rural perspective on health care for the whole person. *Prof Psychol Res Pr*. 2007;38(3):298-304.

24. Cunningham PJ, Felland LE. Falling behind: Americans' access to medical care deteriorates, 2003-2007. *Track Rep.* June 2008;(19):1-5.
25. Johnson M, Brems C, Warner T, Roberts L. Rural-urban health care provider disparities in Alaska and New Mexico. *Adm Policy Ment Health.* 2006;33(4):504-507.
26. Moscovice I, Rosenblatt R. Quality-of-care challenges for rural health. *J Rural Health.* 2000;16(2):168-176.
27. Slifkin RT, Goldsmith LJ, Ricketts TC. Race and place: urban-rural differences in health for racial and ethnic minorities. Chapel Hill, NC: University of North Carolina at Chapel Hill; 2000. NC RHRP Working Paper Series, No. 66.
28. Gazewood JD, Rollins LK, Galazka SS. Beyond the horizon: the role of academic health centers in improving the health of rural communities. *Acad Med.* 2006;81(9):793-797.
29. Kawachi I, Daniels N, Robinson DE. Health disparities by race and class: why both matter. *Health Aff (Millwood).* 2005;24(2):343-352.
30. Low AK, Grothe KB, Wofford TS, Bouldin MJ. Addressing disparities in cardiovascular risk through community-based interventions. *Ethn Dis.* 2007;17(2 suppl 2):S2-55-S2-59.
31. Lurie N, Jung M, Lavizzo-Mourey R. Disparities and quality improvement: federal policy levers. *Health Aff (Millwood).* 2005;24(2):354-364.
32. Meyers K. Issue Brief: Racial and Ethnic Health Disparities. Oakland, CA: Kaiser Permanente Institute for Health Policy; 2007.
33. O'Brien T, Denham SA. Diabetes care and education in rural regions. *Diabetes Educ.* 2008;34(2):334-348.
34. Perlino CM. Issue Brief: The Public Health Workforce Shortage: Left Unchecked, Will We Be Protected? Washington, DC: American Public Health Association; 2006.
35. Smith DB. Racial and ethnic health disparities and the unfinished civil rights agenda. *Health Aff (Millwood).* 2005;24(2):317-324.
36. Messias DKH, Lacy E. Katrina-related health concerns of Latino survivors and evacuees. *J Health Care Poor Underserved.* 2007;18(2):443-464.
37. Forrest CB. Strengthening primary care to bolster the health care safety net. *JAMA.* 2006;295(9):1062-1064.
38. Iglehart JK. Grassroots activism and the pursuit of an expanded physician supply. *N Engl J Med.* 2008;358(16):1741-1749.
39. International Federation of Red Cross and Red Crescent Societies. World Disasters Report 2003: Focus on Ethics in Aid. Geneva, Switzerland: International Federation of Red Cross and Red Crescent Societies; 2003.
40. Quarantelli EL. *Urban Vulnerability to Disasters in Developing Societies.* Newark, DE: University of Delaware Disaster Research Center; 2003. <http://dspace.udel.edu:8080/dspace/handle/19716/1312>.
41. Balmes JR. The World Trade Center collapse: a continuing tragedy for lung health? *Am J Respir Crit Care Med.* 2006;174(3):235-236.
42. Banauch GI, Hall C, Weiden M, et al. Pulmonary function after exposure to the World Trade Center collapse in the New York City Fire Department. *Am J Respir Crit Care Med.* 2006;174(3):312-319.
43. de la Hoz RE, Shohet MR, Bienenfeld LA, Afilaka AA, Levin SM, Herbert R. Vocal cord dysfunction in former World Trade Center (WTC) rescue and recovery workers and volunteers. *Am J Ind Med.* 2008;51(3):161-165.
44. Herbert R, Moline J, Skloot G, et al. The World Trade Center disaster and the health of workers: five-year assessment of a unique medical screening program. *Environ Health Perspect.* 2006;114(12):1853-1858.
45. Izbicki G, Chavko R, Banauch GI, et al. World Trade Center "sarcoid-like" granulomatous pulmonary disease in New York City Fire Department rescue workers. *Chest.* 2007;131(5):1414-1423.
46. Lin S, Jones R, Reibman J, Bowers J, Fitzgerald EF, Hwang SA. Reported respiratory symptoms and adverse home conditions after 9/11 among residents living near the World Trade Center. *J Asthma.* 2007;44(4):325-332.
47. Mann JM, Sha KK, Kline G, Breuer FU, Miller A. World Trade Center dyspnea: bronchiolitis obliterans with functional improvement: a case report. *Am J Ind Med.* 2005;48(3):225-229.
48. Mendelson DS, Roggeveen M, Levin SM, Herbert R, de la Hoz RE. Air trapping detected on end-expiratory high-resolution computed tomography in symptomatic World Trade Center rescue and recovery workers. *J Occup Environ Med.* 2007;49(8):840-845.
49. Miller A. Sarcoidosis, firefighters sarcoidosis, and World Trade Center "sarcoid-like" granulomatous pulmonary disease [letter]. *Chest.* 2007;132(6):2053.
50. Moline J, Herbert R, Nguyen N. Health consequences of the September 11 World Trade Center attacks: a review. *Cancer Invest.* 2006;24(3):294-301.
51. Oppenheimer BW, Goldring RM, Herberg ME, et al. Distal airway function in symptomatic subjects with normal spirometry following World Trade Center dust exposure. *Chest.* 2007;132(4):1275-1282.
52. Prezant DJ. World Trade Center cough syndrome and its treatment. *Lung.* 2008;186(suppl 1):S94-S102.
53. Prezant DJ, Levin S, Kelly KJ, Aldrich TK. Upper and lower respiratory diseases after occupational and environmental disasters. *Mt Sinai J Med.* 2008;75(2):89-100.
54. Samet JM, Geyh AS, Utell MJ. The legacy of World Trade Center dust. *N Engl J Med.* 2007;356(22):2233-2236.
55. Szeinek J, Padilla M, de la Hoz RE. Potential for diffuse parenchymal lung disease after exposure at World Trade Center disaster site. *Mt Sinai J Med.* 2008;75(2):101-107.
56. Wheeler K, McKelvey W, Thorpe L, et al. Asthma diagnosed after 11 September 2001 among rescue and recovery workers: findings from the World Trade Center Health Registry. *Environ Health Perspect.* 2007;115(11):1584-1590.
57. Liu D, Tager IB, Balmes JR, Harrison RJ. The effect of smoke inhalation on lung function and airway responsiveness in wildland fire fighters. *Am Rev Respir Dis.* 1992;146(6):1469-1473.
58. Stefanidou M, Athanaselis S, Spiliopoulou C. Health impacts of fire smoke inhalation. *Inhal Toxicol.* 2008;20(8):761-766.
59. Bridgewater FH, Aspinall ET, Booth JP, et al. Team Echo: observations and lessons learned in the recovery phase of the 2004 Asian tsunami. *Prehosp Disaster Med.* 2006;21(1):s20-s25.
60. Chierakul W, Winothai W, Wattanawitunechai C, et al. Melioidosis in 6 tsunami survivors in southern Thailand. *Clin Infect Dis.* 2005;41(7):982-990.
61. Kongsangdao S, Bunnag S, Siriwiwattanakul N. Treatment of survivors after the tsunami. *N Engl J Med.* 2005;352(25):2654-2655.
62. Chen AC, Keith VM, Leong KJ, et al. Hurricane Katrina: prior trauma, poverty and health among Vietnamese-American survivors. *Int Nurs Rev.* 2007;54(4):324-331.
63. Phillips S. Current status of surge research. *Acad Emerg Med.* 2006;13(11):1103-1108.
64. *Altered Standards of Care in Mass Casualty Events: Bioterrorism and Other Public Health Emergencies.* AHRQ Publication No. 05-0043, April 2005. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.ahrq.gov/research/altstand/>.
65. Ahern M, Kovats RS, Wilkinson P, Few R, Matthies F. Global health impacts of floods: epidemiologic evidence. *Epidemiol Rev.* 2005;27(1):36-46.
66. Dominici F, Levy JI, Louis TA. Methodological challenges and contributions in disaster epidemiology. *Epidemiol Rev.* 2005;27(1):9-12.
67. Ebi KL, Schmier JK. A stitch in time: improving public health early warning systems for extreme weather events. *Epidemiol Rev.* 2005;27(1):115-121.
68. Noji EK. Disasters: introduction and state of the art. *Epidemiol Rev.* 2005;25(1):3-8.
69. Ramirez M, Peek-Asa C. Epidemiology of traumatic injuries from earthquakes. *Epidemiol Rev.* 2005;27(1):47-55.
70. Healthcare Research and Quality Act of 1999, Pub L No. 106-129, 113 Stat 1653.
71. Smedley BD, Stith AY, Nelson AR, eds; Institute of Medicine, Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care.* Washington, DC: National Academies Press; 2003.

72. Fowkes V, Blossom J, Anderson HK, Sandrock C. Emergency preparedness for health professionals in a statewide AHEC program: the first two years. *Acad Med.* 2007;82(8):781-787.
73. Payne JW. At risk before the storm struck: prior health disparities due to race, poverty multiply death, disease. *Washington Post.* September 13, 2005: <http://www.washingtonpost.com/wp-yn/content/article/2005/09/12/AR2005091201412.html>.
74. Aronoff M, Gunter V. Defining disaster: local constructions for recovery in the aftermath of chemical contamination. *Soc Probl.* 1992;39(4):345-365.
75. Baum A, Fleming I. Implications of psychological research on stress and technological accidents. *Am Psychol.* 1993;48(6):665-672.
76. Edwards MLK. An interdisciplinary perspective on disasters and stress: the promise of an ecological framework. *Sociol Forum.* 1998;13(1):115-132.
77. Appel SJ, Giger JN, Davidhizar RE. Opportunity cost: the impact of contextual risk factors on the cardiovascular health of low-income rural southern African American women. *J Cardiovasc Nurs.* 2005;20(5):315-324.
78. Eberhardt MS, Ingram D, Makuc D, et al. *Urban and Rural Health Chartbook.* Hyattsville, MD: National Center for Health Statistics; 2001.
79. Zuniga M, Anderson D, Alexander K. Heart disease and stroke in rural America: a literature review. In: *Rural Health People 2010: A Companion Document to Healthy People 2010.* Vol 2. College Station, TX: The Texas A&M University System Health Science Center, School of Rural Public Health, Southwest Rural Health Research Center; 2003.
80. Allan J, Ball P, Alston M. Developing sustainable models of rural health care: a community development approach. *Rural Remote Health.* 2007;7(4):818.
81. Armstrong BK, Gillespie JA, Leeder SR, Rubin GL, Russell LM. Challenges in health and health care for Australia. *Med J Aust.* 2007;187(9):485-489.
82. Asante AD, Zwi AB. Public-private partnerships and global health equity: prospects and challenges. *Indian J Med Ethics.* 2007;4(4):176-180.
83. Clucas DB, Carville KS, Connors C, Currie BJ, Carapetis JR, Andrews RM. Disease burden and health-care clinic attendances for young children in remote aboriginal communities of northern Australia. *Bull World Health Organ.* 2008;86(4):275-281.
84. Dart J. Australia's disturbing health disparities set Aboriginals apart. *Bull World Health Organ.* 2008;86(4):245-247.
85. Gill GF, Geraghty DP, Fitzgerald DG. Did general practice health assessments of older Australians improve equity. *Aust Health Rev.* 2008;32(3):488-493.
86. Johnstone MJ, Kanitsaki O. Ethnic aged discrimination and disparities in health and social care: a question of social justice. *Australas J Ageing.* 2008;27(3):110-115.
87. Smith JD, Margolis SA, Ayton J, et al. Defining remote medical practice: a consensus viewpoint of medical practitioners working and teaching in remote practice. *Med J Aust.* 2008;188(3):159-161.
88. Sweet M. Health care: for private profit or public good. *Aust Nurs J.* 2007;15(5):23-25.
89. How we can keep everyone in mind. *Health Serv J.* May 1, 2008(26):27.
90. Berkman L, Epstein AM. Beyond health care: socioeconomic status and health. *N Engl J Med.* 2008;358(23):2509-2510.
91. Crew N. Health inequalities: up to the mark in primary care. *Health Serv J.* June 12, 2008:28-29.
92. Crump H. Local targets are the way to fight inequality, MPs told. *Health Serv J.* April 10, 2008:12.
93. Elger BS. Towards equivalent health care of prisoners: European soft law and public health policy in Geneva. *J Public Health Policy.* 2008;29(2):192-206.
94. Evans R. Practices' minimum income is a guarantee of health inequity. *Health Serv J.* March 27, 2008:3.
95. Fervers B, Remy-Stockinger M, Mazeau-Woynar V, et al. CoCanCPG: coordination of cancer clinical practice in Europe. *Tumori.* 2008;94(2):154-159.
96. Francisci S, Gigli A, Gesano G, Folino-Gallo P. Decomposing differences in acute myocardial infarction fatality in Italian regions. *Health Care Manag Sci.* Jun 2008;11(2):111-120.
97. Green AR. The globalization of cross-cultural medical education and patient-centered care. *Bratisl Lek Listy.* 2008;109(5):238.
98. Haugejorden O, Klock KS, Astrom AN, Skaret E, Trovik TA. Socio-economic inequality in the self-reported number of natural teeth among Norwegian adults: an analytical study. *Community Dent Oral Epidemiol.* 2008;36(3):269-278.
99. Heuschmann PU, Grieve AP, Toschke AM, Rudd AG, Wolfe CD. Ethnic group disparities in 10-year trends in stroke incidence and vascular risk factors: the South London Stroke Register (SLSR). *Stroke.* 2008;39(8):2204-2210.
100. Hunter DJ. Health needs more than health care: the need for a new paradigm. *Eur J Public Health.* 2008;18(3):217-219.
101. Lumme S, Leyland AH, Keskimaki I. Multilevel modeling of regional variation in equity in health care. *Med Care.* 2008;46(9):976-983.
102. Mackenbach JP, Stirbu I, Roskam AJ, et al. Socioeconomic inequalities in health in 22 European countries. *N Engl J Med.* 2008;358(23):2468-2481.
103. Mackie P, Sim F. Water, water, everywhere, nor any drop to drink. *Public Health.* 2008;122(5):443-445.
104. Razum O, Altenhoner T, Breckenkamp J, Voigtlander S. Social epidemiology after the German reunification: East vs West or poor vs rich. *Int J Public Health.* 2008;53(1):13-22.
105. Stephenson J. Poll reveals chasm in care standards. *Health Serv J.* May 15, 2008:7.
106. Stephenson J. PCTs told to target London reforms at the vulnerable. *Health Serv J.* May 22, 2008:12.
107. Themessl-Huber M, Lazenbatt A, Taylor J. Overcoming health inequalities: a participative evaluation framework fit for the task. *J R Soc Promot Health.* 2008;128(3):117-122.
108. Winocour PH, Gosden C, Walton C, et al. Association of British Clinical Diabetologists (ABCD) and Diabetes-UK survey of specialist diabetes services in the UK, 2006, 1: the consultant physician perspective. *Diabet Med.* 2008;25(6):643-650.
109. Afek A. Utilization of healthcare services by groups in the Israeli population as a measurement reflecting equity in the healthcare system [in Hebrew]. *Harefuah.* 2008;147(4):309-310, 375, 374.
110. Anwar I, Sami M, Akhtar N, et al. Inequity in maternal health-care services: evidence from home-based skilled-birth-attendant programs in Bangladesh. *Bull World Health Organ.* 2008;86(4):252-259.
111. Baqui AH, Rosecrans AM, Williams EK, et al. NGO facilitation of a government community-based maternal and neonatal health programme in rural India: improvements in equity. *Health Policy Plan.* 2008;23(4):234-243.
112. Bhat M. Access in India [letter]. *J Am Dent Assoc.* 2008;139(2):129-130.
113. Das A. Public-private partnerships for providing healthcare services. *Indian J Med Ethics.* 2007;4(4):174-175.
114. Gupta M, Thakur JS, Kumar R. Reproductive and child health inequities in Chandigarh Union Territory of India. *J Urban Health.* 2008;85(2):291-299.
115. Halder AK, Kabir M. Child mortality inequalities and linkage with sanitation facilities in Bangladesh. *J Health Popul Nutr.* 2008;26(1):64-73.
116. Halder AK, Saha UR, Kabir M. Inequalities in reproductive healthcare utilization: evidence from Bangladesh Demographic and Health Survey 2004. *World Health Popul.* 2007;9(2):48-63.
117. Roy K, Chaudhuri A. Influence of socioeconomic status, wealth and financial empowerment on gender differences in health and healthcare utilization in later life: evidence from India. *Soc Sci Med.* 2008;66(9):1951-1962.
118. Sathyamala C. Binayak Sen: redefining health care in an unjust society [editorial]. *Indian J Med Ethics.* 2007;4(3):104-105.
119. Tirosh A, Calderon-Margalit R, Mazar M, Stern Z. Differences in quality of diabetes care between Jews and Arabs in Jerusalem. *Am J Med Qual.* 2008;23(1):60-65.

120. Van Minh H, Ng N, Juvekar S, et al. Self-reported prevalence of chronic diseases and their relation to selected sociodemographic variables: a study in INDEPTH Asian sites, 2005. *Prev Chronic Dis*. 2008; 5(3):A86.
121. Antunes JL, Pegoretti T, de Andrade FP, Junqueira SR, Frazao P, Narvai PC. Ethnic disparities in the prevalence of dental caries and restorative dental treatment in Brazilian children. *Int Dent J*. 2003;53(1):7-12.
122. Baraldi AC, Daud ZP, Almeida AM, Gomes FA, Nakano AM. Adolescent pregnancy: a comparative study between mothers who use public and private health systems. *Rev Lat Am Enfermagem*. 2007;15(Spec No.):799-805.
123. Barata RB, de Almeida MF, Montero CV, da Silva ZP. Gender and health inequalities among adolescents and adults in Brazil, 1998. *Rev Panam Salud Publica*. 2007;21(5):320-327.
124. Blay SL, Fillenbaum GG, Andreoli SB, Gastal FL. Equity of access to outpatient care and hospitalization among older community residents in Brazil. *Med Care*. 2008;46(9):930-937.
125. Chaves SC, Vieira-da-Silva LM. Inequalities in oral health practices and social space: an exploratory qualitative study. *Health Policy*. 2008;86(1):119-128.
126. Etchegoyen G, Paganini JM. The relationship between socioeconomic factors and maternal and infant health programs in 13 Argentine provinces [in Spanish]. *Rev Panam Salud Publica*. 2007;21(4):223-230.
127. Gabardo MC, da Silva WJ, Moyses ST, Moyses SJ. Water fluoridation as a marker for sociodental inequalities. *Community Dent Oral Epidemiol*. 2008;36(2):103-107.
128. Lansky S, Franca E, Kawachi I. Social inequalities in perinatal mortality in Belo Horizonte, Brazil: the role of hospital care. *Am J Public Health*. 2007;97(5):867-873.
129. Matijasevich A, Victora CG, Barros AJ, et al. Widening ethnic disparities in infant mortality in southern Brazil: comparison of 3 birth cohorts. *Am J Public Health*. 2008;98(4):692-668.
130. Sena RR, Seixas CT, Silva KL. Practices in community health toward equity: contributions of Brazilian nursing. *ANS Adv Nurs Sci*. 2007; 30(4):343-352.
131. Torres Vigil I, Aday LA, De Lima L, Cleeland CS. What predicts the quality of advanced cancer care in Latin America? a look at five countries: Argentina, Brazil, Cuba, Mexico, and Peru. *J Pain Symptom Manage*. 2007;34(3):315-327.
132. Vargas LA, Veloso de Oliveira TF, Garbois JA. The right to health and environment in times of social exclusion. *Rev Lat Am Enfermagem*. 2007;15(Spec No.):850-856.
133. Logue JN, Hansen H, Struening E. Emotional and physical distress following Hurricane Agnes in Wyoming Valley of Pennsylvania. *Public Health Rep*. 1979;94(6):495-502.
134. Ibrahim MA. Editorial: Unfortunate, but timely. *Epidemiol Rev*. 2005;27(1):1-2.
135. Dhara VR, Dhara R. The Union Carbide disaster in Bhopal: a review of health effects. *Arch Environ Health*. 2002;57(5):391-404.
136. Pachter L, Weller S, Baer R, et al. Variation in asthma beliefs and practices among mainland Puerto Ricans, Mexican-Americans, and Guatemalans. *J Asthma*. 2002;39(2):119-134.
137. Savitz DA, Oxman RT, Metzger KB, et al. Epidemiologic research on man-made disasters: strategies and implications of cohort definition for World Trade Center worker and volunteer surveillance program. *Mt Sinai J Med*. 2008;75(2):77-87.
138. Stepanova E, Karmaus W, Naboka M, et al. Exposure from the Chernobyl accident had adverse effects on erythrocytes, leukocytes, and platelets in children in the Narodichesky region, Ukraine: A 6-year follow-up study. *Environ Health*. 2008;7:21 doi:10.1186/1476-069X-7-21.
139. Adams RE, Boscarino JA, Galea S. Alcohol use, mental health status and psychological well-being 2 years after the World Trade Center attacks in New York City. *Am J Drug Alcohol Abuse*. 2006;32(2):203-224.
140. Adams RE, Boscarino JA, Galea S. Social and psychological resources and health outcomes after the World Trade Center disaster. *Soc Sci Med*. 2006;62(1):176-188.
141. Bromet EJ, Havenaar JM. Mental health consequences of disasters. In: Sartorius N, Gaebel W, Lopez-Ibor JJ, Maj M, eds. *Psychiatry in Society*. Wiley, Chichester; John Wiley & Sons, Ltd; 2002:241-261141.
142. Epstein R, Fullerton C, Ursano R. Posttraumatic stress disorder following an air disaster: a prospective study. *Am J Psychiatry*. 1998;155(7): 934-938.
143. Groenjian AK, Steinberg AM, Najarian LM, Fairbanks LA, Tashjian M, Pynoos RS. Prospective study of posttraumatic stress, anxiety, and depressive reactions after earthquake and political violence. *Am J Psychiatry*. 2000;157(6):911-916.
144. Herman D, Felton C, Susser E. Mental health needs in New York State following the September 11th attacks. *J Urban Health*. 2002;79(3): 322-331.
145. Kessler RC, Sonnega A, Bromet EJ, Hughes M, Nelson CB. Posttraumatic stress disorder in the National Comorbidity Survey. *Arch Gen Psychiatry*. 1995;52(12):1048-1060.
146. North CS, Hong BA, Suris A, Spitznagel EL. Distinguishing distress and psychopathology among survivors of the Oakland/Berkeley firestorm. *Psychiatry*. 2008;71(1):35-45.
147. North CS, Kawasaki A, Spitznagel EL, Hong BA. The course of PTSD, major depression, substance abuse, and somatization after a natural disaster. *J Nerv Ment Dis*. 2004;192(12):823-829.
148. North CS, McCutcheon V, Spitznagel EL, Smith EM. Three-year follow-up of survivors of a mass shooting episode. *J Urban Health*. 2002; 79(3):383-391.
149. North CS, Smith EM. Post-traumatic stress disorder in disaster survivors. *Compr Ther*. 1990;16(12):3-9.
150. Rubonis AV, Bickman L. Psychological impairment in the wake of disaster: the disaster-psychopathology relationship. *Psychol Bull*. 1991; 109(3):384-399.
151. Shore JH, Tatum EL, Vollmer WM. Psychiatric reactions to disaster: the Mount St. Helens experience. *Am J Psychiatry*. 1986;143(5):590-595.
152. Warheit GJ. *Disasters and Their Mental Health Consequences: Issues, Findings, and Future Trends*. New York, NY: Brunner/Mazel; 1988.
153. Robert T Stafford Disaster Relief and Emergency Assistance Act, Pub L No. 93-288, as amended, 42 USC §5121-5207, and Related Authorities.