

CONVERGE Public Health and Disaster Research Annotated Bibliography

This annotated bibliography includes resources that bridge public health and hazards and disaster research by showcasing studies with important implications for public health practice, policy, systems, and equity. It is meant to complement the CONVERGE Public Health Implications of Hazards and Disaster Research Training Module. If you identify missing references, please send them to converge@colorado.edu, and we will add them to the list.

Citation

Adams, E. H., Scanlon, E., Callahan III, J. J., & Carney, M. T. (2010). Utilization of an incident command system for a public health threat: West Nile virus in Nassau County, New York, 2008. *Journal of Public Health Management and Practice*, 16(4), 309-315. <https://doi.org/10.1097/PHH.0B013E3181BB8392>

Abstract

The summer of 2008 in Nassau County, New York, was marked by a historic season of human West Nile virus illness and West Nile virus activity in mosquitoes. The commissioner of Health of the State of New York declared a public health threat, and a decision was made to use adulticide for mosquito control. In contrast to prior years, the Nassau County Department of Health utilized the Incident Command System (ICS) to coordinate a multidisciplinary and multidepartment response to this public health threat. Implementing the ICS ensured coordination and communication between multiple county departments and organizations in the community. The effective response demonstrated that a local health department can mobilize to meet the needs of a public health threat through the use of the ICS. Nassau County Department of Health learned that the ICS is ideal for complex, multidisciplinary operations because of its clear chain of command, transparent organization structure, and flexibility.

Citation

Adams, R. M., Evans, C., Wolkin, A., Thomas, T. & Peek, L. (2022). Social vulnerability and disasters: Development and evaluation of a CONVERGE training module for researchers and practitioners. *Forthcoming in Disaster Prevention and Management*.

Abstract

Purpose: Social vulnerability within the context of disaster management refers to the sociodemographic factors that influence one's capacity to anticipate, cope with, resist, and recover from disasters. Because disasters do not impact people equally, interdisciplinary researchers, public health practitioners, and emergency managers need training to meet the complex needs of socially vulnerable populations.

Design/Methodology/Approach: To address gaps in current education, the CONVERGE initiative, headquartered at the Natural Hazards Center at the University of Colorado Boulder, developed the Social Vulnerability and Disasters Training Module. This free online course draws on decades of research to examine the factors that influence social vulnerability to disasters. Examples of studies and evidence-based programs are included to illuminate common methods for studying social vulnerability and ways that research can guide practice. To evaluate the module, all trainees completed a pre- and post-training questionnaire.

Findings: Between July 2019 and January 2021, 651 people completed the module. Wilcoxon Signed Rank tests demonstrated a significant increase in self-rated knowledge, skills, and attitudes. Students, members of historically underrepresented populations, and those new or less experienced in the field, had the greatest increase.

Practical Implications: This training module can help diverse participants understand the specific needs of socially vulnerable populations to help reduce human suffering from disasters.

Originality: With the increasing demand for evidence-based practice and policy, the evaluation of this web-based training demonstrates the efficacy of online education to support professionals in conducting and translating research on social vulnerability to disasters.

Citation

Agency for Toxic Substances and Disease Registry. (2022). CDC/ATSDR Social Vulnerability Index. <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>

Abstract

N/A

Citation

American Public Health Association. (2021). What is public health? <https://www.apha.org/what-is-public-health>

Abstract

N/A

Citation

Beedasy, J., Petkova, E.P., Lackner, S., & Sury, J. (2021). Gulf Coast parents speak: Children's health in the aftermath of the Deepwater Horizon Oil Spill. *Environmental Hazards*, 20(3), 248-263. <https://doi.org/10.1080/17477891.2020.1772188>



Abstract

This paper examines the physical and mental health of children following the Deepwater Horizon oil spill (DHOS). A multi-stage sampling design was used to select households for inclusion in the study. Data were obtained from parental interviews (n = 720) in the harder-hit areas of Louisiana in the US Gulf Coast. Three out of five parents reported that their child had experienced physical health symptoms and nearly one third reported that their child had mental health issues since the oil spill. Both direct physical exposure and indirect economic exposure were found to be predictors of physical and mental health issues among the children. Our findings contribute to bridge the research gap on the impacts of the direct and indirect exposures of the DHOS on the health of children. The study underscores the importance of understanding the health and recovery trajectories of children and youth exposed to disasters. Knowledge gained from this study together with the emerging literature on the effect of the oil spill disaster on children can contribute towards more evidence-based public health policies and enhance the recovery of children and their families in the aftermath of disasters.

Citation

Brodie, M., Weltzien, E., Altman, D., Blendon, R. J., & Benson, J. M. (2006). Experiences of Hurricane Katrina evacuees in Houston shelters: Implications for future planning. *American Journal of Public Health, 96*(8), 1402-1408. <https://doi.org/10.2105/AJPH.2005.084475>

Abstract

Objectives: To shed light on how the public health community can promote the recovery of Hurricane Katrina victims and protect people in future disasters, we examined the experiences of evacuees housed in Houston area shelters 2 weeks after the hurricane.

Methods: A survey was conducted September 10 through 12, 2005, with 680 randomly selected respondents who were evacuated to Houston from the Gulf Coast as a result of Hurricane Katrina. Interviews were conducted in Red Cross shelters in the greater Houston area.

Results: Many evacuees suffered physical and emotional stress during the storm and its aftermath, including going without adequate food and water. In comparison with New Orleans and Louisiana residents overall, disproportionate numbers of this group were African American, had low incomes, and had no health insurance coverage. Many had chronic health conditions and relied heavily on the New Orleans public hospital system, which was destroyed in the storm.

Conclusions: Our results highlight the need for better plans for emergency communication and evacuation of low-income and disabled citizens in future disasters and shed light on choices facing policymakers in planning for the long-term health care needs of vulnerable populations.

Citation

Brunkard, J., Namulanda, G., & Ratard, R. (2008). Hurricane Katrina deaths, Louisiana, 2005. *Disaster Medicine and Public Health Preparedness, 2*(4), 215-223. <https://doi.org/10.1097/DMP.0b013e31818aaf55>



Abstract

Objective: Hurricane Katrina struck the US Gulf Coast on August 29, 2005, causing unprecedented damage to numerous communities in Louisiana and Mississippi. Our objectives were to verify, document, and characterize Katrina-related mortality in Louisiana and help identify strategies to reduce mortality in future disasters.

Methods: We assessed Hurricane Katrina mortality data sources received in 2007, including Louisiana and out-of-state death certificates for deaths occurring from August 27 to October 31, 2005, and the Disaster Mortuary Operational Response Team's confirmed victims' database. We calculated age-, race-, and sex-specific mortality rates for Orleans, St Bernard, and Jefferson Parishes, where 95% of Katrina victims resided and conducted stratified analyses by parish of residence to compare differences between observed proportions of victim demographic characteristics and expected values based on 2000 US Census data, using Pearson chi square and Fisher exact tests.

Results: We identified 971 Katrina-related deaths in Louisiana and 15 deaths among Katrina evacuees in other states. Drowning (40%), injury and trauma (25%), and heart conditions (11%) were the major causes of death among Louisiana victims. Forty-nine percent of victims were people 75 years old and older. Fifty-three percent of victims were men; 51% were black; and 42% were white. In Orleans Parish, the mortality rate among blacks was 1.7 to 4 times higher than that among whites for all people 18 years old and older. People 75 years old and older were significantly more likely to be storm victims ($P < .0001$).

Conclusions: Hurricane Katrina was the deadliest hurricane to strike the US Gulf Coast since 1928. Drowning was the major cause of death and people 75 years old and older were the most affected population cohort. Future disaster preparedness efforts must focus on evacuating and caring for vulnerable populations, including those in hospitals, long-term care facilities, and personal residences. Improving mortality reporting timeliness will enable response teams to provide appropriate interventions to these populations and to prepare and implement preventive measures before the next disaster.

Citation

Centers for Disease Control and Prevention. (2018). *Crisis & Emergency Risk Communication*.
<https://emergency.cdc.gov/cerc/index.asp>

Abstract

N/A

Citation

Centers for Disaster Control and Prevention. (2021). *Social determinants of health: Know what affects health*.
<https://www.cdc.gov/socialdeterminants/index.htm>

Abstract

N/A



Citation

Eisenman, D. P., Adams, R. M., & Rivard, H. (2016). Measuring outcomes in a community resilience program: A new metric for evaluating results at the household level. *PLoS currents*, 8. <http://currents.plos.org/disasters/index.html%3Fp=29158.html>

Abstract

Community resilience programs require metrics for evaluation but none exist for measuring outcomes at the household and neighborhood level.

Objectives: We develop and describe a new index, the LACCDR index of community resilience, to examine how resilience varied across communities at baseline, prior to implementation of the Los Angeles County Community Disaster Resilience Project (LACCDR).

Methods: We surveyed 4700 adult residents in the sixteen LACCDR communities in English, Spanish and Korean. Each of the survey domains were selected a priori as outcome indicators aligned to the theoretical levers of community resilience. Survey questions were drawn and adapted from published studies and national surveys.

Results: Factor analysis demonstrated five separate factors composed from 18 items and explaining 46.7% of the variance. The factors were characterized as community engagement, emergency supplies, communication with neighbors, civic engagement, and collective efficacy. Baseline results for the 16 communities are provided.

Conclusions: We conclude that the LACCDR community resilience index can be used to measure resilience program outcomes at the neighborhood and household levels.

Citation

Glik, D. C. (2007). Risk communication for public health emergencies. *Annual Review of Public Health*, 28, 33-54. <https://doi.org/10.1146/annurev.publhealth.28.021406.144123>

Abstract

This review defines crisis risk communication, traces its origins to a number of applied fields, and then shows how basic principles have become incorporated into emergency preparedness and risk communication for public health. Literature from four different disciplines that inform crisis risk communications are reviewed. These are (a) environmental risk communication, (b) disaster management, (c) health promotion and communication, and (d) media and communication studies. Current curricula and training materials are briefly reviewed. Although this literature review suggests much progress has been made to incorporate and disseminate crisis risk communication principles into public health practice, and case studies suggest that public health workers have gained skills and experience, this emerging field still lacks in-depth evaluation of the effectiveness of event-specific crisis risk communication efforts.

Citation

Hahn, R. A., & Truman, B. I. (2015). Education improves public health and promotes health equity. *International Journal of Health Services*, 45(4), 657-678. <https://doi.org/10.1177/0020731415585986>



Abstract

This article describes a framework and empirical evidence to support the argument that educational programs and policies are crucial public health interventions. Concepts of education and health are developed and linked, and we review a wide range of empirical studies to clarify pathways of linkage and explore implications. Basic educational expertise and skills, including fundamental knowledge, reasoning ability, emotional self-regulation, and interactional abilities, are critical components of health. Moreover, education is a fundamental social determinant of health – an upstream cause of health. Programs that close gaps in educational outcomes between low-income or racial and ethnic minority populations and higher-income or majority populations are needed to promote health equity. Public health policy makers, health practitioners and educators, and departments of health and education can collaborate to implement educational programs and policies for which systematic evidence indicates clear public health benefits.

Citation

Hamideh, S., Sen, P., & Fischer, E. (2021). Wildfire impacts on education and healthcare: Paradise, California, after the Camp Fire. *Natural Hazards*, 1-35. <https://doi.org/10.1007/s11069-021-05057-1>

Abstract

The 2018 Camp Fire caused significant damages to the education and healthcare systems in the town of Paradise, CA. This paper presents the findings of a qualitative case study about disaster impacts and disparities, interdependencies, and recovery strategies of schools and hospitals in Paradise. Four major themes of findings emerged from the qualitative analysis of interviews with teachers, counselors, and administrators in Paradise education and healthcare systems and extensive archival research. First, complex and long-standing mental health challenges are the dominant impact on the educational system. Second, educational and healthcare impacts are shaped by social vulnerability. Third, educational and healthcare systems play a critical role for recovery of socially vulnerable groups due to the interconnectedness of community components. Fourth, adapting to new communication norms and technologies is effective for supporting educational and community recovery. Several specific recommendations are provided based on the findings for building back more resilient and equitable education and healthcare services.

Citation

Israilov, S., Krouss, M., Zaurova, M., Jalon, H. S., Conley, G., Shulman, P., ... & Cho, H. J. (2020). National outreach of telepalliative medicine volunteers for a New York City safety net system COVID-19 pandemic response. *Journal of Pain and Symptom Management*, 60(2), e14-e17. <https://doi.org/10.1016/j.jpainsymman.2020.05.026>

Abstract

The coronavirus disease 2019 surge in New York City created an increased demand for palliative care (PC) services. In staff-limited settings such as safety net systems, and amid growing reports of health care worker illness, leveraging help from less-affected areas around the country may provide an untapped source of support. A national social media outreach effort recruited 413 telepalliative medicine volunteers (TPMV). After expedited credentialing and onboarding of 67 TPMVs, a two-week pilot was initiated in partnership with



five public health hospitals without any previous existing telehealth structure. The volunteers completed 109 PC consults in the pilot period. Survey feedback from TPMVs and on-site PC providers was largely positive, with areas of improvement identified around electronic health record navigation and continuity of care. This was a successful, proof of concept, and quality improvement initiative leveraging TPMVs from across the nation for a PC pandemic response in a safety net system.

Citation

Kishore, N., Marqués, D., Mahmud, A., Kiang, M. V., Rodriguez, I., Fuller, A., ... & Buckee, C. O. (2018). Mortality in Puerto Rico after Hurricane Maria. *New England Journal of Medicine*, 379(2), 162-170. <https://doi.org/10.1056/nejmsa1803972>

Abstract

Background: Quantifying the effect of natural disasters on society is critical for recovery of public health services and infrastructure. The death toll can be difficult to assess in the aftermath of a major disaster. In September 2017, Hurricane Maria caused massive infrastructural damage to Puerto Rico, but its effect on mortality remains contentious. The official death count is 64.

Methods: Using a representative, stratified sample, we surveyed 3299 randomly chosen households across Puerto Rico to produce an independent estimate of all-cause mortality after the hurricane. Respondents were asked about displacement, infrastructure loss, and causes of death. We calculated excess deaths by comparing our estimated post-hurricane mortality rate with official rates for the same period in 2016.

Results: From the survey data, we estimated a mortality rate of 14.3 deaths (95% confidence interval [CI], 9.8 to 18.9) per 1000 persons from September 20 through December 31, 2017. This rate yielded a total of 4645 excess deaths during this period (95% CI, 793 to 8498), equivalent to a 62% increase in the mortality rate as compared with the same period in 2016. However, this number is likely to be an underestimate because of survivor bias. The mortality rate remained high through the end of December 2017, and one third of the deaths were attributed to delayed or interrupted health care. Hurricane-related migration was substantial.

Conclusions: This household-based survey suggests that the number of excess deaths related to Hurricane Maria in Puerto Rico is more than 70 times the official estimate.

Citation

Landesman, L.Y., & Burke, R.V. (2017). *Landesman's public health management of disasters: The practice guide, 4th edition*. <https://doi.org/10.2105/9780875532806>

Abstract

N/A

Citation

Lehnert, E. A., Wilt, G., Flanagan, B., & Hallisey, E. (2020). Spatial exploration of the CDC's Social Vulnerability Index and heat-related health outcomes in Georgia. *International Journal of Disaster Risk Reduction*, 46, 101517. <https://doi.org/10.1016/j.ijdr.2020.101517>



Abstract

Heat-related illness, an environmental exposure-related outcome commonly treated in U.S. hospital emergency departments (ED), is likely to rise with increased incidence of heat events related to climate change. Few studies demonstrate the spatial and statistical relationship of social vulnerability and heat-related health outcomes. We explore relationships of Georgia county-level heat-related ED visits and mortality rates (2002–2008), with CDC's Social Vulnerability Index (CDC SVI). Bivariate Moran's I analysis revealed significant clustering of high SVI rank and high heat-related ED visit rates (0.211, $p < 0.001$) and high smoothed mortality rates (0.210, $p < 0.001$). Regression revealed that for each 10% increase in SVI ranking, ED visit rates significantly increased by a factor of 1.18 (95% CI = 1.17–1.19), and mortality rates significantly increased by a factor of 1.31 (95% CI = 1.16–1.47). CDC SVI values are spatially linked and significantly associated with heat-related ED visit, and mortality rates in Georgia.

Citation

Lindell, M. K., & Perry, R. W. (2004). Theoretical bases of risk communication. In *Communicating environmental risk in multiethnic communities* (pp. 25-65). Sage Publications.

Abstract

N/A

Citation

Michigan Civil Rights Commission. (2017). *The Flint Water Crisis: Systemic racism through the lens of Flint*. Michigan Department of Civil Rights. https://www.michigan.gov/documents/mdcr/VFlintCrisisRep-F-Edited3-13-17_554317_7.pdf

Abstract

N/A

Citation

Mileti, D. S., & Sorensen, J. H. (1990). *Communication of emergency public warnings: A social science perspective and state-of-the-art assessment* (No. ORNL-6609). Oak Ridge National Lab. <https://www.osti.gov/biblio/6137387-communication-emergency-public-warnings-social-science-perspective-state-art-assessment>

Abstract

More than 200 studies of warning systems and warning response were reviewed for this social science perspective and state-of-the-art assessment of communication of emergency public warnings. The major findings are as follows. First, variations in the nature and content of warnings have a large impact on whether or not the public heeds the warning. Relevant factors include the warning source; warning channel; the consistency, credibility, accuracy, and understandability of the message; and the warning frequency. Second,



characteristics of the population receiving the warning affect warning response. These include social characteristics such as gender, ethnicity and age, social setting characteristics such as stage of life or family context, psychological characteristics such as fatalism or risk perception, and knowledge characteristics such as experience or training. Third, many current myths about public response to emergency warning are at odds with knowledge derived from field investigations. Some of these myths include the "keep it simple" notion, the "cry wolf" syndrome, public panic and hysteria, and those concerning public willingness to respond to warnings. Finally, different methods of warning the public are not equally effective at providing an alert and notification in different physical and social settings. Most systems can provide a warning given three or more hours of available warning time. Special systems such as tone-alert radios are needed to provide rapid warning.

Citation

National Response Team. (2007) *Unified command technical assistance document*. NRT Response Committee. <https://www.nrt.org/sites/2/files/UC%20TAD%201-26-07%20FINAL.pdf>

Abstract

N/A

Citation

Office of Disease Prevention and Health Promotion. (2021). *Healthy People 2030*. <https://health.gov/healthypeople>

Abstract

N/A

Citation

Paul, B. K., & Stimers, M. (2012). Exploring probable reasons for record fatalities: The case of 2011 Joplin, Missouri, Tornado. *Natural Hazards*, 64(2), 1511-1526. <https://doi.org/10.1007/s11069-012-0313-3>

Abstract

On the evening of 22 May 2011, an EF-5 tornado tore a path six miles long across Joplin, Missouri, USA, killing 162 people as it passed through the heart of the city. This tornado stands as the deadliest single tornado to hit the United States since modern recordkeeping began in 1950, surpassing the tornado of 8 June 1953 that claimed 116 lives in Flint, Michigan. The record number of deaths caused by the single tornado in Joplin was far higher than the average annual number of US tornado deaths over the last three decades. This study explores the reasons for the high number of fatalities caused by the 2011 Joplin tornado. Questionnaire surveys administered among tornado survivors and informal discussions with emergency management personnel and others suggest that five reasons are associated with the high number of tornado fatalities experienced in Joplin: (1) the sheer magnitude of this event; (2) its path through commercial and densely populated residential areas; (3) the relatively large size of damage area; (4) the physical characteristics of



affected homes in Joplin; and (5) the fact that some residents ignored tornado warnings. Several recommendations are offered, the implementation of which should reduce future tornado fatalities not only in Joplin, but elsewhere in the United States.

Citation

Paul, B. K., Stimers, M., & Caldas, M. (2015). Predictors of compliance with tornado warnings issued in Joplin, Missouri, in 2011. *Disasters*, 39(1), 108-124. <https://doi.org/10.1111/disa.12087>

Abstract

Joplin, a city in the southwest corner of Missouri, United States, suffered an EF-5 tornado in the late afternoon of 22 May 2011. This event, which claimed the lives of 162 people, represents the deadliest single tornado to strike the US since modern record-keeping began in 1950. This study examines the factors associated with responses to tornado warnings. Based on a post-tornado survey of survivors in Joplin, it reveals that tornado warnings were adequate and timely. Multivariate logistic regression identified four statistically significant determinants of compliance with tornado warnings: number of warning sources, whether respondents were at home when the tornado struck, past tornado experience, and gender. The findings suggest several recommendations, the implementation of which will further improve responses to tornado warnings.

Citation

Paulino, Y., Badowski, G., Chennaux, J., Guerrero, M., Cruz, C., King, R., & Panapasa, S. (2021). Calculating the Social Vulnerability Index for Guam. *Natural Hazards Center Public Health Grant Report Series*, 12. Boulder, CO: Natural Hazards Center, University of Colorado Boulder. <https://hazards.colorado.edu/public-health-disaster-research/calculating-the-social-vulnerability-index-for-guam>

Abstract

N/A

Citation

Plough, A., Fielding, J. E., Chandra, A., Williams, M., Eisenman, D., Wells, K. B., ... & Magaña, A. (2013). Building community disaster resilience: Perspectives from a large urban county department of public health. *American Journal of Public Health*, 103(7), 1190-1197. <https://doi.org/10.2105/AJPH.2013.301268>

Abstract

An emerging approach to public health emergency preparedness and response, community resilience encompasses individual preparedness as well as establishing a supportive social context in communities to withstand and recover from disasters. We examine why building community resilience has become a key component of national policy across multiple federal agencies and discuss the core principles embodied in community resilience theory—specifically, the focus on incorporating equity and social justice considerations in preparedness planning and response. We also examine the challenges of integrating community resilience with traditional public health practices and the importance of developing metrics for evaluation and strategic



planning purposes. Using the example of the Los Angeles County Community Disaster Resilience Project, we discuss our experience and perspective from a large urban county to better understand how to implement a community resilience framework in public health practice.

Citation

Rose, D. A., Murthy, S., Brooks, J., & Bryant, J. (2017). The evolution of public health emergency management as a field of practice. *American Journal of Public Health, 107*(S2), S126-S133.
<https://doi.org/10.2105/AJPH.2017.303947>

Abstract

The health impacts of recent global infectious disease outbreaks and other disasters have demonstrated the importance of strengthening public health systems to better protect communities from naturally occurring and human-caused threats. Public health emergency management (PHEM) is an emergent field of practice that draws on specific sets of knowledge, techniques, and organizing principles necessary for the effective management of complex health events. We highlight how the nascent field of PHEM has evolved in recent years. We explore this development by first examining multiple sites of intersection between the fields of public health and emergency management. We then analyze 2 of the principal pillars on which PHEM was built: organizational and programmatic (i.e., industry) standards and the incident management system. This is followed by a sketch of the key domains, or functional areas, of PHEM and their application to the emergency management cycle. We conclude with some observations about PHEM in a global context and discuss how the field might continue to evolve. In recent years, the health impacts of infectious disease outbreaks, natural disasters, industrial and environmental catastrophes, and conflict have captured the world's attention and reinforced the importance of strengthening public health systems to better protect communities and populations from naturally occurring and human-caused threats. Various approaches and programs have been developed to address these needs in domestic and global contexts, including initiatives to strengthen public health preparedness and global health security. Although much has been written about these approaches, there are few reports on the interface between public health and emergency management—and even less about what we call “public health emergency management” (PHEM). PHEM is an emergent field of practice that draws on specific sets of knowledge, techniques, and organizing principles found in the fields of emergency management and public health that are necessary for the effective management of complex health events and emergencies with serious health impacts. Although concepts such as public health preparedness and global health security include significant components of PHEM, the various terms should not be conflated. We highlight some of the ways the nascent field of PHEM has evolved in recent years. We explore this development by first examining multiple sites of intersection between the fields of public health and emergency management. We then analyze 2 of the principal pillars on which PHEM has been built: organizational and programmatic (i.e., industry) standards and the incident management system (IMS). This is followed by a sketch of the key domains, or functional areas, of PHEM and their application to the emergency management cycle. We conclude with some observations about PHEM in a global context and discuss how the field might continue to evolve.



Citation

Rotkin-Ellman, M., Wong, K. K., & Solomon, G. M. (2012). Seafood contamination after the BP Gulf oil spill and risks to vulnerable populations: A critique of the FDA risk assessment. *Environmental Health Perspectives*, 120(2), 157-161. <https://doi.org/10.1289/ehp.1103695>

Abstract

Background: The BP oil spill of 2010 resulted in contamination of one of the most productive fisheries in the United States by polycyclic aromatic hydrocarbons (PAHs). PAHs, which can accumulate in seafood, are known carcinogens and developmental toxicants. In response to the oil spill, the U.S. Food and Drug Administration (FDA) developed risk criteria and established thresholds for allowable levels [levels of concern (LOCs)] of PAH contaminants in Gulf Coast seafood.

Objectives: We evaluated the degree to which the FDA's risk criteria adequately protect vulnerable Gulf Coast populations from cancer risk associated with PAHs in seafood.

Discussion: The FDA LOCs significantly underestimate risk from seafood contaminants among sensitive Gulf Coast populations by failing to *a*) account for the increased vulnerability of the developing fetus and child; *b*) use appropriate seafood consumption rates; *c*) include all relevant health end points; and *d*) incorporate health-protective estimates of exposure duration and acceptable risk. For benzo[*a*]pyrene and naphthalene, revised LOCs are between two and four orders of magnitude below the level set by the FDA. Comparison of measured levels of PAHs in Gulf seafood with the revised LOCs revealed that up to 53% of Gulf shrimp samples were above LOCs for pregnant women who are high-end seafood consumers.

Conclusions: FDA risk assessment methods should be updated to better reflect current risk assessment practices and to protect vulnerable populations such as pregnant women and children.

Citation

Ruckart, P. Z., Ettinger, A. S., Hanna-Attisha, M., Jones, N., Davis, S. I., & Breyse, P. N. (2019). The Flint Water Crisis: A coordinated public health emergency response and recovery initiative. *Journal of Public Health Management and Practice*, 25(Suppl 1, Lead Poisoning Prevention), S84–S90. <https://doi.org/10.1097/PHH.0000000000000871>

Abstract

Context: The City of Flint was already distressed because of decades of financial decline when an estimated 140 000 individuals were exposed to lead and other contaminants in drinking water. In April 2014, Flint's drinking water source was changed from Great Lakes' Lake Huron (which was provided by the Detroit Water and Sewerage Department) to the Flint River without necessary corrosion control treatment to prevent lead release from pipes and plumbing. Lead exposure can damage children's brains and nervous systems, lead to slow growth and development, and result in learning, behavior, hearing, and speech problems. After the involvement of concerned residents and independent researchers, Flint was reconnected to the Detroit water system on October 16, 2015. A federal emergency was declared in January 2016.

Program: The Centers for Disease Control and Prevention provided assistance and support for response and recovery efforts including coordinating effective health messaging; assessing lead exposure; providing guidance on blood lead screening protocols; and identifying and linking community members to appropriate follow-up services. In response to the crisis in Flint, Congress funded the Centers for Disease Control and



Prevention to establish a federal advisory committee; enhance Childhood Lead Poisoning Prevention Program activities; and support a voluntary Flint lead exposure registry. The registry, funded through a grant to Michigan State University, is designed to identify eligible participants and ensure robust registry data; monitor health, child development, service utilization, and ongoing lead exposure; improve service delivery to lead-exposed individuals; and coordinate with other community and federally funded programs in Flint. The registry is also collaborating to make Flint “lead-free” and to share best practices with other communities.

Discussion: The Flint water crisis highlights the need for improved risk communication strategies, and environmental health infrastructure, enhanced surveillance, and primary prevention to identify and respond to environmental threats to the public's health. Collecting data is important to facilitate action and decision making to prevent lead poisoning. Partnerships can help guide innovative strategies for primary lead prevention, raise awareness, extend outreach and communication efforts, and promote a shared sense of ownership.

Citation

Schnall, A. H., Roth, J. J., Ellis, B., Seger, K., Davis, M., & Ellis, E. M. (2019). Addressing community needs during the hurricane response and recovery efforts through Community Assessments for Public Health Emergency Response (CASPER)—United States Virgin Islands, 2017-2018. *Disaster Medicine and Public Health Preparedness*, 13(1), 53-62. <https://doi.org/10.1017/dmp.2019.6>

Abstract

Objectives: Two category 5 storms hit the US Virgin Islands (USVI) within 13 days of each other in September 2017. This caused an almost complete loss of power and devastated critical infrastructure such as the hospitals and airports.

Methods: The USVI Department of Health conducted 2 response Community Assessments for Public Health Emergency Response (CASPERs) in November 2017 and a recovery CASPER in February 2018. CASPER is a 2-stage cluster sampling method designed to provide household-based information about a community's needs in a timely, inexpensive, and representative manner.

Results: Almost 70% of homes were damaged or destroyed, 81.2% of homes still needed repair, and 10.4% of respondents felt their home was unsafe to live in approximately 5 months after the storms. Eighteen percent of individual respondents indicated that their mental health was “not good” for 14 or more days in the past month, a significant increase from 2016.

Conclusion: The CASPERs helped characterize the status and needs of residents after the devastating hurricanes and illustrate the evolving needs of the community and the progression of the recovery process. CASPER findings were shared with response and recovery partners to promote data-driven recovery efforts, improve the efficiency of the current response and recovery efforts, and strengthen emergency preparedness in USVI.



Citation

Segarra-Alméstica, E., Cordero-Nieves, Y., Cordero-Guzmán, H., Caballero-Cueto, J., Luciano-Montalvo, I., Martínez-Mejias, S., & Rivera-Rivera, H. (2021). The effect of school services disruptions on educational outcomes after consecutive disasters in Puerto Rico. *Natural Hazards Center Public Health Report Series, 2*. Boulder, CO: Natural Hazards Center, University of Colorado Boulder. <https://hazards.colorado.edu/public-health-disaster-research/the-effect-of-school-services-disruptions-on-educational-outcomes-after-consecutive-disasters-in-puerto-rico>

Abstract

N/A

Citation

Shoaf, K.I & Rottmann, S.J. (2000). Public health impact of disasters. *Australian Journal of Emergency Management*. <http://classic.austlii.edu.au/au/journals/AUJIEmMgmt/2000/41.pdf>

Abstract

N/A

Citation

Stone, K. W., Kintziger, K. W., Jagger, M. A., & Horney, J. A. (2021). Public health workforce burnout in the COVID-19 response in the US. *International Journal of Environmental Research and Public Health, 18*(8), 4369. <https://doi.org/10.3390/ijerph18084369>

Abstract

While the health impacts of the COVID-19 pandemic on frontline health care workers have been well described, the effects of the COVID-19 response on the U.S. public health workforce, which has been impacted by the prolonged public health response to the pandemic, has not been adequately characterized. A cross-sectional survey of public health professionals was conducted to assess mental and physical health, risk and protective factors for burnout, and short- and long-term career decisions during the pandemic response. The survey was completed online using the Qualtrics survey platform. Descriptive statistics and prevalence ratios (95% confidence intervals) were calculated. Among responses received from 23 August and 11 September 2020, 66.2% of public health workers reported burnout. Those with more work experience (1–4 vs. <1 years: prevalence ratio (PR) = 1.90, 95% confidence interval (CI) = 1.08–3.36; 5–9 vs. <1 years: PR = 1.89, CI = 1.07–3.34) or working in academic settings (vs. practice: PR = 1.31, CI = 1.08–1.58) were most likely to report burnout. As of September 2020, 23.6% fewer respondents planned to remain in the U.S. public health workforce for three or more years compared to their retrospectively reported January 2020 plans. A large-scale public health emergency response places unsustainable burdens on an already underfunded and understaffed public health workforce. Pandemic-related burnout threatens the U.S. public health workforce's future when many challenges related to the ongoing COVID-19 response remain unaddressed.



Citation

Storch, E. A., Shah, A., Salloum, A., Valles, N., Banu, S., Schneider, S. C., ... & Goodman, W. K. (2019). Psychiatric diagnoses and medications for Hurricane Harvey sheltered evacuees. *Community Mental Health Journal*, 55(7), 1099-1102. <https://doi.org/10.1007/s10597-019-00378-9>

Abstract

To report on the diagnosis of and pharmacological services provided to 229 evacuees of Hurricane Harvey housed within a large convention center. Retrospective chart review of services rendered. Evacuees were primarily adults who presented with varied diagnoses, most commonly mood, anxiety and/or psychotic disorders. There was significant need for medications and psychosocial support to address preexisting conditions, as well as emerging problems (e.g., insomnia). Individuals presenting for pharmacological services following natural disasters may require medications to continue ongoing care, and/or treatment for insomnia. Therapists can provide direct intervention as well as identify those in need of further evaluation/intervention. Providers should be prepared with a fully stocked pharmacy, accessible but confidential location, and a pre-established method of record keeping.

Citation

Thomas, D.S.K., Phillips, B.D., Lovekamp, W.E., & Fothergill, A. (2013). *Social vulnerability to disasters. 2nd Ed.* Routledge.

Abstract

N/A

Citation

U.S. Environmental Protection Agency. (2022). *Deepwater Horizon – BP Gulf of Mexico Oil Spill*. <https://www.epa.gov/enforcement/deepwater-horizon-bp-gulf-mexico-oil-spill>

Abstract

N/A

Citation

U.S. Food and Drug Administration. (2010). *Protocol for interpretation and use of sensory testing and analytical chemistry results for re-opening oil-impacted areas closed to seafood harvesting due to the Deepwater Horizon Oil Spill*. U.S. Food and Drug Administration. <https://www.fda.gov/food/food-safety-during-emergencies/protocol-interpretation-and-use-sensory-testing-and-analytical-chemistry-results-re-opening-oil>



Abstract

N/A

Citation

Wood, M. M., & Bourque, L. B. (2018). Morbidity and mortality associated with disasters. In *Handbook of disaster research* (pp. 357-383). Springer, Cham.

Abstract

N/A

Citation

Yebra-Pimentel, I., Fernández-González, R., Martínez-Carballo, E., & Simal-Gándara, J. (2015). A critical review about the health risk assessment of PAHs and their metabolites in foods. *Critical Reviews in Food Science and Nutrition*, 55(10), 1383-1405. <https://doi.org/10.1080/10408398.2012.697497>

Abstract

Polycyclic aromatic hydrocarbons (PAHs) are a family of toxicants that are ubiquitous in the environment. These contaminants generate considerable interest, because some of them are highly carcinogenic in laboratory animals and have been implicated in breast, lung, and colon cancers in humans. Dietary intake of PAHs constitutes a major source of exposure in humans. Factors affecting the accumulation of PAHs in the diet, their absorption following ingestion, and strategies to assess risk from exposure to these hydrocarbons following ingestion have received very little attention. This review, therefore, focuses on concentrations of PAHs in widely consumed dietary ingredients along with gastrointestinal absorption rates in humans. Metabolism and bioavailability of PAHs in animal models and the processes, which influence the disposition of these chemicals, are discussed. Finally, based on intake, disposition, and tumorigenesis data, the exposure risk to PAHs from diet is presented. This information is expected to provide a framework for refinements in risk assessment of PAHs.

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