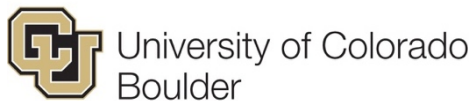




ANNOTATED BIBLIOGRAPHY

Emergency Alerts and Disability Access



University of Colorado
Boulder



First Published: October 2023 | Last Updated: October 2024

Overview

This annotated bibliography includes resources focused on populations with disabilities and disability access in emergency alert systems. This bibliography includes references published in the last 20 years (2003-2023), in English, and focused on the United States. This bibliography is meant to support the State of Colorado’s Inclusive Language Bill HB23-1237. These references were compiled through searching Web of Science, EBSCOhost, ProQuest, Google Scholar databases, and agency websites. Contact melissa.villarreal-1@outlook.com with questions.

ACADEMIC JOURNAL ARTICLES, MASTER’S THESES, AND DISSERTATIONS _____	3
AGENCY REPORTS AND STATEMENTS _____	11



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ACADEMIC JOURNAL ARTICLES, MASTER'S THESES, AND DISSERTATIONS

Citation

Bennett, D., LaForce, S., Touzet, C., and Chiodo, K. (2018). American sign language and emergency alerts: the relationship between language, disability, and accessible emergency messaging. *International Journal of Mass Emergencies and Disasters*, 36(1), 71-87. <https://doi.org/10.1177/028072701803600104>

Abstract

Emergency alert messages are not always completely accessible for people who are Deaf that rely on American Sign Language (ASL). ASL is a visual and conceptual language that has its own unique syntax and grammar. ASL has no roots in English and is the 3rd most taught foreign language in our colleges today. Not all individuals who are deaf rely on ASL for “clear and effective” communication. For many individuals who become hard-of-hearing or deaf later in life (late-deafened), closed captioning can provide accommodations. For individuals who are Deaf and rely on ASL as their primary language, closed captioning is not a useful means of communication because the information is being conveyed in a language most ASL users do not fully comprehend. Similarly, emergency alert messages delivered via SMS text or email can also present confusion to ASL users who may struggle to understand the written English messages. One size does not fit all; and in this case, English text as a sole means of communication is not entirely accessible for people who rely on ASL. This paper outlines the relationship between language, disability, and emergency messaging as learned from several research studies examining the accessibility of public alerts and warnings.

Citation

Bennett, D., Phillips, B.D., and Davis, E. (2017). The future of accessibility in disaster conditions: how wireless technologies will transform the life cycle of emergency management. *Futures*, 87, 122-132. <https://doi.org/10.1016/j.futures.2016.05.004>

Abstract

By describing a transformed life cycle of emergency management, this paper re-envision how emergency managers may prepare for, respond to, recover from, and mitigate against disaster impacts in the future. Additionally, this paper also reveals how the broader social, political, economic, and cultural levels must change to foment a culture of safety with and for people with disabilities. The authors use the framework to identify how future wireless technologies can empower people with disabilities with regards to individual (or household) emergency preparedness and in coping with the drastic life changes following a disaster.

Citation

Castro, V. (2022). Vulnerable populations and flooding: a bay area county public alert and warning case study [Master's thesis, San Jose State University]. SJSU ScholarWorks.

<https://doi.org/10.31979/etd.72cx-77nw>

Abstract

Public alert and warning systems are crucial tools that save lives and protect property in times of emergencies. In the past several decades, natural disasters have struck the nation, and effective public alerts and warnings were not disseminated to all impacted populations, calling into question the effectiveness of emergency communication systems (Wimberley, 2012). As an example, in 2012, when Hurricane Sandy hit the east coast, public alert and warning systems reached those who had access to technological devices. However, emergency managers and alerting authorities faced the challenge of alerting all groups, including the homeless and individuals with access and functional needs, who may not have access to traditional communication methods like television and radio broadcast stations, cell phones, or landlines. In addition, individuals who experience language barriers and limited English language proficiency struggle to fully understand public alerts (Wimberly, 2012).

Locally, emergency and disaster communications have also left some of the most vulnerable populations behind. In 2017, the Coyote Creek flood in Santa Clara County devastated the City of San José. The flooding disproportionately impacted several low-income communities and households with little English proficiency, and there was limited communication between the agencies involved and the communities affected (Wadsworth et al., 2017; Wadsworth and Koehn, 2017). A history of inadequate emergency communications and floodplain mismanagement, and a lack of communication between the City of San José and the Santa Clara Valley Water District, contributed to the disaster (Rogers, 2017), and in February 2017, two consecutive atmospheric rivers led to severe flooding. The Anderson Dam, which is a reservoir, not a flood control dam, - had reached capacity and began to overflow. This event forced 14,000 residents out of their homes, with little time to evacuate (Rogers, 2017). By July 2017, there were still an estimated 200 residents that had not been able to return to their homes and were living in temporary housing (Sykes, 2017). The flooding was particularly devastating in low-income Vietnamese and Hispanic households, and mobile home parks, where there were many senior citizens and/or people with limited English proficiency (Wadsworth et al., 2017; Wadsworth and Koehn, 2017). Improved emergency communications could have provided an opportunity to warn residents and provide notice about the evacuation in multiple languages, which could have potentially avoided the substantial property damage, and the emotional distress caused by prolonged displacement (Alexander, 2020; Sykes, 2017). Drawing from these disasters, this research analyzed how four Bay Area counties issue public warnings, with a particular focus on how they engaged vulnerable populations during crisis communication. By exploring this facet of crisis communication, this research proposes potential solutions to improve communication and engagement with vulnerable populations.

Citation

Cooper, A.C., Cooke, M.L., Takayama, K. et al. (2024). From alert to action: earthquake early warning and deaf communities. *Natural Hazards*. <https://doi-org.colorado.idm.oclc.org/10.1007/s11069-024-06719-6>

Abstract

Earthquake early warning (EEW) alerts may give people valuable seconds to take protective action, such as drop, cover and hold on, before earthquake shaking starts. In order for individuals to take protective action, they need to receive the alert, understand the alert message, and have enough contextual knowledge to take appropriate protective action. Deaf and hard of hearing (DHH+) persons do not have equitable access to earthquake information, warning systems, training, and participation in disaster decision-making at all levels. Despite international policies for emergency alerts to be accessible to people with disabilities, there are no research publications that specifically address the effectiveness of EEW alerts for DHH+ communities. Missed notifications and misunderstandings about elements of the EEW alert message can delay the response time of DHH+ persons. Furthermore, unequal access to earthquake drills and preparedness information can leave DHH+ persons with insufficient context to take protective action when receiving alerts. The existing gaps in effectiveness of the EEW alerts stem from language inequities for DHH+ persons in our schools, workplaces and families, which we analyze by applying linguistic anthropological and sociolinguistic frameworks to examine the nexus of DHH+ communities' languages and EEW messaging. To advance language equity in EEW alerting, inclusion of DHH+ communities can improve messaging and reduce misunderstandings so that DHH+ persons can quickly take protective action when they receive an alert.

Citation

Engelman, A.A. (2012). Addressing disparities in emergency communication with the deaf and hard-of-hearing: cultural competence and preparedness for first responders [Dissertation, University of California Berkeley]. UC Berkeley Electronic Theses and Dissertations. <https://escholarship.org/uc/item/4j843811>

Abstract

It is critically important to foster a resilient Deaf and hard-of-hearing (Deaf/HH) population empowered to act in a pre-event phase before and respond during and after critical large-scale public health emergencies. Standard all-hazards emergency preparedness risk & response communication efforts don't always reach people with barriers relating to literacy, language, culture or disability. This is a significant problem given that there is a growing body of evidence of higher risk during disasters for injury, death, property loss for 32 million Deaf/HH Americans and for 90 million Americans with low-literacy skills. It is beneficial to use a participatory, community-directed approach to improve all-hazards preparedness capacity for the Deaf/HH.

This dissertation is in a three-paper format. Part I, a literature review, systematically examines all-hazards emergency communication access for the Deaf/HH during large-scale disasters with an eye towards maximizing emergency preparedness capacity within the Deaf community. The literature review does not simply examine lessons learned from any access issues that have been documented in previous disasters but also reviews the peer reviewed and gray literature (non-peer-reviewed literature, often non-published reports) to determine the need for interventions or systemic change on a policy-level. By identifying the scope and magnitude of the problem, this literature review is a stepping stone for Parts II and III, which aim to develop best practices for educational outreach and training for first responders.

Part II is a program evaluation utilizing mixed methods of a training program for law enforcement officers at the scene of domestic violence (DV) emergencies involving the Deaf/HH. A program evaluation of cultural competency training for the Deaf/HH has never been published, to my knowledge, despite several available trainings for first responders or medical professionals and students nationally (Appendix 1). Once trainings are developed, standardized and shown to be beneficial, they can be distributed to Deaf/HH audiences and/or first responders, which can sustain longer-term development efforts that might mitigate the impact of future emergencies or improve the quality of life/infrastructure on broader levels.

Part III is a qualitative exploration of barriers, attitudes, perceptions, and knowledge of law enforcement and first responders regarding working with the Deaf/HH in an emergency. Specific abstracts for each Part can be found in the corresponding section.

The closing section provides a summary of policy and legislative developments on a national level that are informed by Deaf/HH experts in emergency communication; these developments have implications for further research and practice to address disparities in emergency preparedness communication for the Deaf/HH.

Citation

Engelman, A., Ivey, S. L., Tseng, W., Dahrouge, D., Brune, J., & Neuhauser, L. (2013). Responding to the deaf in disasters: Establishing the need for systematic training for state-level emergency management agencies and community organizations. *BMC Health Services Research*, 13(1), 84. <https://doi.org/10.1186/1472-6963-13-84>

Abstract

Background: Deaf and hard-of-hearing (Deaf/HH) individuals have been underserved before and during emergencies. This paper will assess Deaf/HH related emergency preparedness training needs for state emergency management agencies and deaf-serving community-based organizations (CBOs).

Methods: Four approaches were used: 1) a literature review; 2) results from 50 key informant (KI) interviews from state and territorial-level emergency management and public health

agencies; 3) results from 14 KI interviews with deaf-serving CBOs in the San Francisco Bay Area; and 4) a pilot program evaluation of an emergency responder training serving the Deaf/HH in one urban community.

Results: Results from literature review and state and territorial level KIs indicate that there is a substantive gap in emergency preparedness training on serving Deaf/HH provided by state agencies. In addition, local KI interviews with 14 deaf-serving CBOs found gaps in training within deaf-serving CBOs. These gaps have implications for preparing for and responding to all-hazards emergencies including weather-related or earthquake-related natural disasters, terrorist attacks, and nuclear-chemical disasters.

Conclusion: Emergency preparedness trainings specific to responding to or promoting preparedness of the Deaf/ HH is rare, even for state agency personnel, and frequently lack standardization, evaluation, or institutionalization in emergency management infrastructure. This has significant policy and research implications. Similarly, CBOs are not adequately trained to serve the needs of their constituents.

Citation

Ivey, S. L., Tseng, W., Dahrouge, D., Engelman, A., Neuhauser, L., Huang, D., & Gurung, S. (2014). Assessment of State- and Territorial-Level Preparedness Capacity for Serving Deaf and Hard-of-Hearing Populations in Disasters. *Public Health Reports*, 129(2), 148–155. <https://doi.org/10.1177/003335491412900208>

Abstract

Objectives: Substantial evidence exists that emergency preparedness and response efforts are not effectively reaching populations with functional and access needs, especially barriers related to literacy, language, culture, or disabilities. More than 36 million Americans are Deaf or hard of hearing (Deaf/ HH). These groups experienced higher risks of injury, death, and property loss in recent disasters than the general public. We conducted a participatory research study to examine national recommendations on preparedness communication for the Deaf/HH.

Methods: We assessed whether previous recommendations regarding the Deaf/HH have been incorporated into state- and territorial-level emergency operations plans (EOPs), interviewed state- and territorial-level preparedness directors about capacity to serve the Deaf/HH, and proposed strategies to benefit Deaf/HH populations during emergencies. We analyzed 55 EOPs and 50 key informant (KI) interviews with state directors.

Results: Fifty-five percent of EOPs mentioned vulnerable populations; however, only 31% specifically mentioned Deaf/HH populations in their plan. Study findings indicated significant relationships among the following factors: a state-level KI's familiarity with communication issues for the Deaf/HH, making relay calls (i.e., calls to services to relay communication

between Deaf and hearing people), and whether the KI's department provides trainings about serving Deaf/HH populations in emergencies. We found significant associations between a state's percentage of Deaf/HH individuals and a KI's familiarity with Deaf/HH communication issues and provision by government of any disability services to Deaf/HH populations in emergencies. Further, we found significant relationships between KIs attending training on serving the Deaf/HH and familiarity with Deaf/HH communication issues, including how to make relay calls.

Conclusion: This study provides new knowledge that can help emergency agencies improve their preparedness training, planning, and capacity to serve Deaf/HH populations in emergencies

Citation

Morris, J.T., Mueller, J.L., and Jones, M.L. (2014). Use of social media during public emergencies by people with disabilities. *Western Journal of Emergency Medicine*, XV(5), 567-574.
10.5811/westjem.2014.4.21274

Abstract

Introduction: People with disabilities are generally more vulnerable during disasters and public emergencies than the general population. Physical, sensory and cognitive impairments may result in greater difficulty in receiving and understanding emergency alert information, and greater difficulty in taking appropriate action. The use of social media in the United States has grown considerably in recent years. This has generated increasing interest on the part of national, state and local jurisdictions in leveraging these channels to communicate public health and safety information. How and to what extent people with disabilities use social and other communications media during public emergencies can help public safety organizations understand the communication needs of the citizens in their jurisdictions, and plan their social media and other communications strategies accordingly. *Methods:* This article presents data from a survey on the use of social media and other communications media during public emergencies by people with disabilities conducted from November 1, 2012 through March 30, 2013. *Results:* The data presented here show four key results. First, levels of use of social media in general are high for people with disabilities, as well as for the general population. Second, use of social media during emergencies is still low for both groups. Third, levels of use of social media are not associated with income levels, but are significantly and strongly associated with age: younger people use social media at higher rates than older people in both groups ($p < 0.001$). Fourth, differences in the use of social media during emergencies across disability types are slight, with the exception of deaf and hard-of-hearing respondents, the former more likely to have used social media to receive ($p = 0.002$), verify ($p = 0.092$) and share ($p = 0.007$) emergency information. *Conclusion:* These last two results suggest that effective emergency communications strategies need to rely on multiple media types and channels to reach the entire community.

Citation

Mueller, J., Morris, J., and Jones, M. (2010). Accessibility of emergency communications to deaf citizens. *International Journal of Emergency Management*, 7(1), 41-46.

<https://doi.org/10.1504/IJEM.2010.032043>

Abstract

Since 2001, the Rehabilitation Engineering Research Center for Wireless Technologies (Wireless RERC) has taken an active role in promoting accessibility of emergency alerting systems for Americans with disabilities. Among federal government initiatives is a new rule that will take effect in 2010, requiring that emergency alerts be sent using Short Messaging Service (SMS) from all cell phone towers in areas affected by emergencies. This paper shares consumer input on wireless emergency communication via analysis of data gathered through the Survey of User Needs (SUNs) conducted by the Wireless RERC since 2001 and through focus groups conducted with deaf individuals.

Citation

Putkovich, K. (2013). Emergency warning for people with disabilities. *Journal of Emergency Management*, 11(3), 189-200. [10.5055/jem.2013.0137](https://doi.org/10.5055/jem.2013.0137)

Abstract

The intent of this article is to assess the current state of Emergency Warning capabilities in the United States and make recommendations on what needs to be done to cost effectively establish a National Emergency Warning System to best serve the people of the United States, including those with disabilities. As part of this assessment, terminology will be defined, existing systems will be examined, critical needs and functions will be explained, and recommendations made for a system to deliver emergency messages to those people immediately at risk from natural and human-caused disasters in a timely and effective manner, regardless of location or situational circumstance. The assessment will include the needs and available technologies for delivering emergency warnings to people with disabilities, which are generally little understood, poorly addressed, and often ignored

Citation

Sherman-Morris, K., Pechacek, T., Griffin, D. J., & Senkbeil, J. (2020). Tornado warning awareness, information needs and the barriers to protective action of individuals who are blind. *International Journal of Disaster Risk Reduction*, 50, 101709. ISSN 2212-4209.

<https://doi.org/10.1016/j.ijdrr.2020.101709>

Abstract

Individuals with disabilities are often vulnerable to the impacts of weather hazards, such as tornadoes. This is especially true in the Southeast where vulnerability to tornadoes is already heightened due to both physical and socioeconomic factors. To better understand and possibly reduce this vulnerability, we conducted interviews with 25 residents of Alabama, Louisiana, and Mississippi who are legally blind. The goal of the interviews was to understand how people who are blind receive and respond to tornado warnings. Participants were asked to discuss the sources they use for severe weather information, their likes and dislikes about the current warning system, warning elements that allow them to personalize the risk, and barriers in their ability to obtain warning information, assess risk, or respond to it. Results suggest that good verbal description or the lack of detailed verbal description were of the greatest importance in our participants' ability to effectively use warning information and act on it. This included audio for television warning crawls, and the level of description provided during severe weather coverage. Ample geographic description was important in their ability to personalize the threat. The greatest number of barriers were associated with the risk assessment phase; however, the single most common barrier mentioned by participants was that they would have no safe place to go during a tornado.

Citation

Waugh, W.L. (n.d.). Access to warnings by people with sensory disabilities: a review of the social science warning literature. http://ncamftp.wgbh.org/ncam-old-site/file_download/Warning_people_with_disabilities.pdf

Abstract

N/A

AGENCY REPORTS AND STATEMENTS

Citation

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Citation

Federal Communications Commission. (2022, December 6). Access to emergency information on television. <https://www.fcc.gov/consumers/guides/accessibility-emergency-information-television>

Citation

Federal Emergency Management Agency. (n.d.). Alerting people with disabilities and access and functional needs. <https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system/public/alerting-people-disabilities>

Citation

Intergovernmental Advisory Committee and Federal Communications Commission. (n.d.). *In the Matter of Multilingual Emergency Alerting*. <https://docs.fcc.gov/public/attachments/DOC-360696A3.pdf>

Citation

Kailes, J.I. (2015). *Tips for emergency use of mobile devices*. Disability Policy Consultant. <http://www.jik.com/Mobile%20Devices.pdf>

Citation

Kailes, J.I. (2020). *Checklist for integrating people with disabilities and others with access and functional needs into emergency preparedness, planning, response & recovery*. Disability Policy Consultant. <http://www.jik.com/plancklst.pdf>

Citation

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Citation

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Citation

Simmons, P. (2020, March 4). Making emergency alerts accessible for people with hearing disabilities. Rocky Mountain ADA Center. <https://rockymountainada.org/news/blog/making-emergency-alerts-accessible-people-hearing-disabilities>

Citation

World Association of Sign Language Interpreters and World Federation of the Deaf. (2015). *Communication during natural disasters and other mass emergencies for deaf people who use signed language*. <https://wfdeaf.org/news/resources/wasli-and-wfd-communication-during-natural-disasters-and-other-mass-emergencies-for-deaf-people-who-use-signed-language-january-2015/>