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People with disability and new disaster communications: access and the social media mash-up

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People with disability and new disaster communications: access and the social media mash-up

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This article explores how a lack of access to increasingly complex and overlapping digital communications platforms in times of disaster for people with disabilities has the potential to make already life-threatening situations considerably more dangerous. As we are increasingly coming to rely on a social media mash-up of digital platforms to assist in communications during disaster situations, the issue of accessibility for people with disabilities is as dire as if it was high ground during a tsunami or transport during a typhoon. The contemporary social media environment is characterised by a complex and overlapping network of complementary platforms, populated by user-generated content, where people communicate and exchange ideas. In this environment, YouTube videos are posted to Facebook and embedded in blogs, and Twitter is used to link to these other sites and is itself embedded in other platforms. These networks are increasingly supplementing and supplanting more traditional communication platforms, such as the television and radio, particularly in times of disaster. The concern of this paper is that the elements from which this mash-up of communications channels is made are not always accessible to people with disabilities. This evolving network of social media-based communication exposes the limits of existing Internet-based universal design.

Keywords: disability; new media; political and government communication; social media; disaster response

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Points of interest

- Social media presents itself as a mash-up of overlapping platforms: YouTube videos are posted to Facebook and embedded in blogs, and Twitter is used to link to these other sites and is itself embedded in other platforms. If any of these platforms are inaccessible then the whole mash-up is inaccessible.
- Social media is becoming an increasingly important way in which to communicate and participate, and is now often used in disaster communications.
- The vulnerability already experienced by people with disabilities in a disaster is compounded when inaccessible social media is used as an unofficial and official communications channel.
- To fully include people with disabilities, these platforms must be launched with access to each part of the network having universal design principles applied at the first instance of implementation.

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Introduction

In the introduction to the recent *Disability & Society* special issue on 'Disability, Global Contexts and Crises', Michele Moore (2013) notes that in disasters and global crises, people with disability are precariously placed; and argues that it is time to 'raise seldom heard voices of disabled people caught up' (741) in these zones. She further notes that while these voices are frequently missing due to discrimination, this is especially the case in global conflicts and crises. As Brigitte Rohwerder (2013) argues, people with disability experiencing conflict or crisis are disproportionately affected because they are treated as a low priority. The disproportionate impact is compounded by the nature of their impairments and the impact of a disabling society. Rohwerder calls for a reconsideration of practice and policy in light of the 'increased need and vulnerability' of people with disability. This paper calls for a similar reconsideration in light of the recent tendency to embrace social media as a mode of both official and unofficial communication during disaster and conflict.

As we have seen in the case of recent disasters including the 2011 Christchurch earthquakes in New Zealand, Hurricane Sandy in the United States in 2012 and the terrorist attack on Utøya Island in Norway in 2011, social media is becoming an increasingly important tool in disaster communications. In this light, the notion of accessibility in a disaster must be expanded to consider the online environment, especially as they have taken the form of mash-ups of different online social media platforms. We seek to extend Christensen et al.'s (2006) insight that best-practice accessibility is beneficial to everyone during a disaster to argue that best-practice accessibility be applied to the online world. Throughout this paper we explore both the potential of social media for people with disabilities, particularly in a disaster, but also some of the existing problems standing in the way of this potential. As Tim Berners-Lee (2013), creator of the World Wide Web, explained at the 2013 W3C Conference in Rio de Janeiro, the Web is 'half social, half technical'; people make decisions to exclude other people from participation.

Although we proceed from a social model of disability, it is important to note that disability cannot be conflated into one experience of social oppression in a disaster. Different impairments will have different impacts on a person's ability to negotiate disaster situations, and many physical impairments create significant problems – for example, it is hard to negotiate flood waters in a wheelchair. These cases can therefore challenge the traditional assumptions in the social model of disability that it is society which disables people (see Shakespeare 2006). Other impairments impact not just in the physical analogue world but also on people's ability to access communications and the Internet. This digital disability (see Ellis and Kent 2011; Goggin and Newell 2003) can also significantly impact on a person's ability to escape or survive in an emergency or disaster. In many cases these digital and analogue disabling circumstances will overlap for a particular individual. Being able to escape an impending disaster for people with disabilities is difficult already, but this is exacerbated further when people are unable to obtain current information and knowledge about what is happening.

This paper seeks to first highlight the difficulties experienced by people with disabilities in the analogue world in times of disaster, and then turns to how this initial disadvantage is further heightened by being excluded from communications channels, and the problems with the increasingly fragmented nature of this communications mash-up as the Internet plays an increasingly vital role in disaster

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communications and organisation. We start by addressing some tensions that exist between the conception of disability that comes from the social model of disability and the natural world. The paper then looks more closely at the experience of people with disabilities in times of disaster, when the potential inaccessibility of the natural world in particular can impact adversely on people with impairments, even in the face of normally appropriate socially constructed accommodation. Moving from the physical or analogue world to the digital, we examine the increasing role played by social media and the social media mash-up in times of disaster. Focus then shifts to how accessible these digital networks are for people with disabilities and the implications of a lack of access to these networks in a time of disaster.

Finally, the article concludes by looking at the potential temporarily able-bodied condition of everyone in a time of disaster, and the potential for adoption of universal design to help all people in these situations. There have been some positive moves to make communications more accessible for people with disabilities, but as this article highlights there is still much work to be done in this area. The paper draws on existing literature dealing with disaster response and communications, people with disability in disaster situations and access to digital communications for people with disabilities to highlight the importance of this deficit.

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Disability in a disaster

Disasters, whether of the natural world, acts of terrorism or major accidents, render everybody, disabled or not, vulnerable. However, this vulnerability is intensified for people with disabilities who must rely on inadequate services even in good times. Combining the extremes of weather, terrorism or accident and emergency with the heightened fight or flight emotion characteristic of people experiencing disasters, and people with disabilities can be simply left behind. The plight of people with disabilities during Hurricane Katrina is especially illustrative. Consider for example Benilda Caixetta, whose story was retold before congress by Marci Roth of the Spinal Cord Injury Association:

> [On August 29] Susan Daniels called me to enlist my help because her sister-in-law, a quadriplegic woman in New Orleans, had been unsuccessfully trying to evacuate to the Superdome for two days. … it was clear that this woman, Benilda Caixetta, was not being evacuated. I stayed on the phone with Benilda, for the most part of the day … She kept telling me she'd been calling for a ride to the Superdome since Saturday; but, despite promises, no one came. *The very same paratransit system that people can't rely on in good weather is what was being relied on in the evacuation* ... I was on the phone with Benilda when she told me, with panic in her voice "the water is rushing in." And then her phone went dead. We learned five days later that she had been found in her apartment dead, floating next to her wheelchair … *Benilda did not have to drown*. (Frieden 2006; emphasis added)

Following Katrina where Benilda and others with disabilities died, the United Nations Convention on the Rights of Persons with Disabilities outlined the states' responsibilities to people with disabilities in times of natural disaster:

> States Parties shall take, in accordance with their obligations under international law, including international humanitarian law and international human rights law, all necessary measures to ensure the protection and safety of persons with disabilities in situations of risk, including situations of armed conflict, humanitarian emergencies and the occurrence of natural disasters. (United Nations 2006)

Unfortunately this commitment is not always realised. There are a number of factors that work to make people with disabilities more vulnerable in emergency situations. Following the 2004 floods in Bangladesh, Handicap International (2005) produced a guide to highlight some of the issues that needed to be addressed for including people with disabilities in a disaster response from authorities. This report noted that in an emergency situation people with disabilities often became invisible and pointed to a lack of awareness as one of the major factors for people with disability missing out on vital information. As a result of inaccessible communication, questions such as 'What happened? What do I do? Where is my family?' are unanswered for people with disabilities, thus making them more vulnerable in disaster situations. As well as these communications difficulties, the report notes that people with disabilities are often excluded from disaster response efforts and particularly affected by changes in terrain resulting from disaster. Because of this inadequate physical accessibility, or loss or lack of mobility aids or appropriate assistance, people with disabilities are often deprived from rescue and evacuation services, relief access, safe location/adequate shelter, water and sanitation and other services.

These two examples of disaster situations also highlight the different challenges in disaster responses between different types and scales of disasters and between the countries in the Global North and Global South. However, both cases highlight the importance of communications in these situations, particularly for people with disabilities.

Recent special issues of *Disability & Society* have taken up these concerns to highlight the important intersections between disability and disasters and the ways disaster situations or conflicts further disable people that have impairments. While 'shifting frontiers and boundaries' were considered during 2011, in 2013 'global conflicts and crises' were explored. These special issues investigate the experience of people with disability during times of disaster and conflict in the context of the invisibility and vulnerability of people with disability (Miles 2013; Mirza 2011; Rohwerder 2013), the experience of refugees and those seeking to cross borders (Kim 2011; Mirza 2011; Soldatic 2013; Straimer 2011) and, finally, the importance of advocacy and increasing the voice of disabled people (Aldersey 2013; Arenas Conejo 2011; Burton, Sayrafi, and Srour 2013; Loja, Costa, and Menezes 2011; Munsaka and Charnley 2013; Wehbi 2011). However, the topic of the Internet and social media and their role in disaster communications is not addressed.

Communications in a disaster

Communication is vital during disasters; people need information about what is happening and where to go. Disasters are typically characterised by 'high levels of information need and low levels of information availability' (Shklovski et al. 2010, 1228). Disasters turn the challenge of 'connecting people to required resources efficiently, effectively and promptly' into life and death (Jain 2013, 997). Communications technology has long been used in disaster relief, from the transistor radio, to broadcast television, to more recently mobile phone and the web. Perng et al. (2013) note the increasing importance of social media during disasters as people embrace self-organised mash-up style communications. Dabner (2011) has also observed the role that social media can play in effectively supporting information-sharing, communications and collaboration in a time of crisis. During Hurricane Katrina, cell phones and the Internet were used to obtain information not available in news media

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and also to connect with family and friends (Shklovski et al. 2010). Occurring in 2005, however, this disaster predated the current generation of the Web as it is characterised by social media. While the Internet was used as a source of information, 73% of this came from the web sites of mainstream news organisations. By contrast, in 2012 the response to Hurricane Sandy online featured the use of Twitter, Instagram and Facebook (Fraustino, Brooke, and Yan 2012).

Howe et al. (2013) argue that social media offers communities the power to organise themselves in disaster situations but caution that we – organisations, people, governments – may be ill prepared for this. In any case, the significance of social media is clear:

> Cloud computing and social media have contributed to the wealth of sharing information across the globe, emergency managers, NGOs, and governments alike are seeking similar information management benefits for disaster relief and humanitarian assistance. Numerous emergency managers have formed in these social networking worlds such as LinkedIn, Facebook, MySpace, YouTube, Flickr, Twitter, etc. (Howe et al. 2013, 233)

Whereas Gao, Barbier, and Goosby (2011) note problems with using social media during disasters, including uncoordinated relief organisations responding to the same emergency request, inaccurate information, and security concerns, the issue of disability access is largely absent from the discussion. Lord, Waterstone, and Stein (2009) caution that:

> all too often governments, humanitarian assistance agencies, and other policy makers fail to adopt a disability perspective in natural disaster humanitarian crises situations. With distressing frequency, the disability experience is either neglected completely or lost when cast among other vulnerable groups. (Lord, Waterstone, and Stein 2009, 71)

Hemingway and Priestly (2006) note that this leads to specific evacuation plans that have inaccessible warning information, a lack of accessible evacuation transport and a lack of backup systems. They also note that sometimes the actions of neighbours, staff and rescue workers also lead to discrimination in these critical times for people with disabilities. In a report exploring the response to the Katrina and Rita Hurricanes in 2005, the National Council on Disability noted that many people with disabilities were unable to be evacuated due to a lack of appropriate vehicles (Frieden 2006). Frieden (2006) also notes the problems with traditional communications for people with disabilities during these disasters: 'people with visual and hearing disabilities were unable to obtain necessary information pertinent to their safety because said communication did not comply with federal law'. Just as Roth argued before congress, they contend that facilities which are inadequate most of the time are deadly during disaster.

Social media and disaster response

Social media is a relatively new element in disaster communications and response and the role it plays in these circumstances is still developing and yet to reach its full potential. However, its use is increasing, both by people who find themselves in disaster situations and those organisations who respond to these situations. Perng et al. (2013) have observed 'The public – those directly affected, as well as bystanders and volunteers – have always participated in self organised mobilisation and coordination of resources in parallel to the official mobilisation of staff and

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equipment initiated by calls to alarm centres' (42). After the 11 September 2001 attacks on New York, boats on the Hudson river spontaneously began to evacuate people before many more responded to a coastguard request for assistance leading to the evacuation of nearly half a million people from Manhattan Island. This request was made over marine radio. Traditional broadcast media such as television and radio transmissions have always played a role in disaster management planning.

Whereas only 1% of people used the Internet to find out about the September 11 terrorist attacks (Fraustino, Brooke, and Yan 2012), since 2001 Perng et al. (2013) note that 'New forms of identifying, documenting and addressing needs for resources in different locations are emerging through crowdsourcing, self-organised "voluntweeting" and distributed collaboration during crisis' (41–42). Dabner (2011) has also observed the role that social media can play in effectively supporting information sharing, communications and collaboration in a time of crisis. Liang, Caverlee, and Mander (2013) have noted that with this ability to communicate also come potentially with the added affordance of accurate time stamping and GPS-style geocodes that allow better tracking of disaster situations in real time as they are occurring because each post contains information about the time of posting and the location from which it was posted.

Ten years after the September 11 attacks in New York in 2011, another terrorist attack took place in Norway when Anders Breivik detonated a bomb in central Oslo that killed eight people before driving to Utøya Island where he shot and killed a further 69 people. In this case, social media played a prominent role in the response to the tragedy. Through Twitter and also direct SMS messages, boats on the Tyrifjorden Lake were able to respond to the attack and were present on the scene rescuing people from the water some 30 minutes before the police arrived at the island (Perng et al. 2013). In Oslo, Twitter was used to encourage people in the vicinity of the bomb attack to remove the passwords from their wifi networks to allow people to get around the congested mobile phone network through using the Internet and social media applications on smart phones and tablets (Perng et al. 2013). Earlier in 2007, in response to another shooting attack at the Virginia Polytechnic Institute and State University in the United States, mobile phones and Facebook were again used to communicate between people during the attack (Kavanaugh et al. 2011) and also in its aftermath to rapidly determine the number and identity of people injured and killed (Lang and Benbunan-Fich 2010).

Social media has also played a role in disasters that come from nature rather than human design. The role played by both Facebook and Twitter in the aftermath of the Christchurch earthquake in February 2011 has been acknowledged (Gallow 2011), as was its use in response to the earlier 2010 earthquake in Hatai. This earlier earthquake was significant in relation to communications because it was also the first time that the official disaster response from the United States utilised social networking tools as part of its formal communications (Yates and Paquette 2011). Unlike the earlier example on Hurricane Katrina, social media not only provides a platform for official communications, but also a place where those impacted by and involved in disasters have a voice and can collaborate.

When bush fires in the Australian state of Tasmania cut off the community living on the Tasman Peninsula, social media was used to coordinate donations and organise a number of private vessels to travel as a flotilla from the state's capital Hobart and provide food and other supplies to the people trapped there (Crawley 2013). The 'Tas Fires 2013. come together as a state and support those in need' Facebook

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page was used to coordinate volunteers, fundraising and other resources, including disability support, across that state in response to a number of catastrophic fires in the January period of that year. This demonstrates Latonero and Shklovski's (2011) observations of the 'blurring of intentions and communications between the individual and organisation is a central problematic in social media where private and public spheres often collide' (6). Fraustino, Brooke, and Yan (2012) note that not only is the public increasingly looking to social media for information in times of emergency and disasters, but they increasingly expect people responsible for emergency response to be active in these channels of communication.

Lang and Benbunan-Fich (2010) have also called for this use of social media to be better integrated with official disaster response communications. Within the United States a number of government agencies ranging from the Los Angeles Fire Department to the Federal Emergency Management Agency have begun to formally integrate elements of social media into their disaster communications strategies and planning (Latonero and Shklovski 2011).

The Internet has evolved from a place of simple, and generally accessible, HTML web pages into a more complex and overlapping environment of complementary platforms and networks, populated by user-generated content, where people communicate and exchange ideas. This communications mash-up is constantly evolving as social media and network trends change over time along with the equipment we use to access them. The changes are driven by changing fashion and industry rather than any predicable march of technology. However, the recent trend is for the different platforms to increasingly overlap. Rather than the more standalone earlier networks of Friendster and MySpace, the current social media ecology is a more complex and overlapping space. Previously a web application mash-up was a term that, borrowing from the phrase used to describe mixing different songs together, was used to describe how a single web site or page would embed a number of different services together to create a new hybrid service; however, increasingly this occurs 'on the fly' as different platforms overlap and embed within one another without the need for a third party. In this environment, YouTube videos are posted to Facebook and embedded in blogs, and Twitter is used to link to these other sites and is itself embedded in other platforms. This interlaced network of platforms and services, each overlapping and actively embedded within one another, creates a mash-up of communications. People experience this mash-up of social media across multiple platforms from desktop and laptop computers to smart phones and tablets. In addition, the way in which the Internet is accessed through these devices is growing more complex through overlapping networks of wifi, mobile phone signals and traditional cables. They are described as being in a state of perpetual beta, where a 'final' product is never completed, but rather they are seen in a constant state of development. In these circumstances, if one piece of this evolving mash-up is inaccessible then it affects people's ability to access all the other elements.

Without power, or in a transitory disaster environment, smart phones and tablets, and through them the different elements of the social media mash-up, are increasingly important avenues of communications. Like the portable radio that preceded them, smart phones and tablet computers operate on batteries independent of the main power grid and connect to wireless networks largely unaffected by their immediate physical surroundings. These devices also allow people to transmit as well as receive, and the social media mash-up then provides the access to the online venue for these interactions. As Lang and Benbunan-Fich (2010) observe, social

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media plays an important role in distributing information amongst members of the public; in a disaster, it allows the questions identified by Handicapped International (2005) 'What happened? What do I do? Where is my family?' to be answered, but unfortunately not always for the people with disabilities that this organisation had identified as needing the answers.

Elements that this mash-up of communications channel uses are not always accessible to people with disabilities. Twitter, for example, has been inaccessible to people with a vision impairment (Ellis and Kent 2010). In 2005 at the time of Hurricane Katrina, MySpace – the major social network at that time – was inaccessible for many people with disabilities. Similarly, Facebook, then only in its infancy, was also not accessible. When communication is a mash-up of different platforms, a link to one that is inaccessible makes the information conveyed worthless. In a time of disaster this omission is potentially life-threatening. As the social media mash-up becomes an increasingly important aspect of disaster communications, the inaccessibility of elements of this network take on even greater significance. The failure of communications to comply with accessibility requirements for disaster communications is a key element of this.

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Social media and accessibility

Tim Berners-Lee outlined his vision that the Web would be a powerful medium for people with disabilities by offering greater access to information and different modes of social inclusion at the 1997 W3C conference:

> The dream behind the Web is of a common information space in which we communicate by sharing information.
>
> The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect. (Berners-Lee 1997)

Since that time, 'the power of the Web' has been recognised in a number of areas, including communication during natural disasters. For example, at the 2013 W3C conference in Rio de Janeiro, a workshop on the use of social media during times of crisis, specifically natural disaster, was held for the second time. A number of potential problems were raised in the eight papers and two keynotes, such as non-professionals providing inaccurate information (Vukovic, Kumara, and Meier 2013); however, the issue of disability access was not raised. This is a significant oversight because people with disabilities are disproportionately represented amongst causalities in natural disasters (see Frieden 2006). This omission is a continuation of social constructions of disability that see systematic and institutional practices of exclusion placed on top of people that have impairments (Ellis and Kent 2011; Goggin and Newell 2002; Oliver 1996). While on one level the use of social media during natural disasters appears to be an effective realisation of Tim Berners-Lee's dream behind the Web, more effort needs to be taken to include people 'regardless of disability'.

Boudreau (2011) argues that whereas social media should be about people 'communicating, sharing, interacting, contributing, bonding [and] networking', the reality is that the most popular platforms such as LinkedIn, YouTube, Google+, Facebook and Twitter exclude people with disabilities from participating and '[could not] do any worse if they tried'. In spite of Twitter's 0% accessibility rating (Boudreau 2011), the micro blogging platform is frequently heralded as vital to

communications strategies in disaster situations (Grandoni 2012; Liu, Liu, and Li 2012; Robinson, Power, and Cameron 2013). Grandoni (2012) suggests tweeters adopt a particular strategy in order to get as much accurate information into the public realm of people who need it as possible. He recommends not linking to outside sites, using all of the 140 characters and including a photograph and a hashtag.[1] Power, Robinson, and Wise (2013) explain that governments are turning to Twitter as both an official and unofficial communications strategy:

> This use of social media provides a new communication channel to inform the public and also provides a mechanism for sourcing information from the community. Users can retweet or share an official message to 'spread the word' to their followers or friends. They can also send messages directly to the emergency services to provide local information, such as photos. (Power, Robinson, and Wise 2013)

Twitters' ability to play the role of organising other aspects of the mash-up through linking to photographs and videos and rapidly disseminating messages and through the use of different hashtags to organise these streams of information make it, along with Facebook, one of the key elements of the current social media mash-up. The relative inaccessible nature of this platform is particularly disturbing in this context.

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Taking universal design into user-generated content

Universal design seeks to include the greatest range of potential users for accessibility in the design process. When technology is designed in such a way that enables use by people with a wide range of different impairments it often benefits the broader population as well (Christensen et al. 2006). The example of wider stairways and good lighting benefitting both people with disabilities and those without during evacuations is an example of universal design. Curb cuts to aid wheelchair users also help many other people cross the street. However, those same curb cuts can be dangerous for people who are blind and need to use the curb to determine the edge of the street. This also applies online, where accessibility features designed to mitigate one type of impairment can be detrimental for another (Ellis and Kent 2011; Goggin and Newell 2002; Shakespeare 2006). However, unlike the curbing on the road, digital information can be presented in many different formats from text or audio through to touch through a Braille tablet, to suit the needs of different users. Inaccessibility should be an unnecessary choice in the digital context.

However, many of the component networks of the social media mash-up specifically lock the information in a particular format as part of the process of commercialising that information. Facebook needs to be able to sell its advertising to its users, and thus wants them to remain within the Facebook online environment; similarly YouTube will embed advertising in the videos uploaded to its service, as do photograph-sharing sites like Flickr. While providing the information in a particular format enables this commodification, it also works against the interest of Berners-Lee's aspiration for the level of access available for people with disabilities. In the perpetual beta of the social media mash-up these choices can limit the accessibility of the whole network. Beyond the physical constraints of the analogue world, these disabling features that prevent access are a choice made by those in charge of these platforms and supported by ableist assumptions in society.

Conclusions

Vukovic, Kumara, and Meier cautioned that:

> existing solutions fall short in enabling dedicated crowds to cope with the torrent of information from social media during mass disasters. How can we build scalable Web-systems, accommodating increasing amount of social Web data, and supporting growing volunteer crowds? (Vukovic, Kumara, and Meier 2013)

Perhaps a more immediate question should be that if this is the future of disaster communications, then how can we ensure that the mash-up of social media is accessible to everyone, especially those most at risk in times of disaster? The danger is that in a disaster the most vulnerable will be left uniformed, and with no voice. Only 15% of people with a disability are born with their impairment and the incidence of disability increases with age (Jaeger 2012). We are all only temporarily able bodied, a vulnerability that is highlighted in times of disaster.

There have been some positive changes recently for access to communications in disasters for people with disabilities. Lord, Waterstone, and Stein (2009) have noted that:

> … considering the disability experience and including persons with disabilities when planning disaster relief in the first instance minimizes human harm and reduces (re)development costs in the future. (Lord, Waterstone, and Stein 2009, 71)

Since Hurricane Katrina there have been some improvements in disaster communications for people with disabilities. As Frieden notes:

> the Weather Channel significantly increased the amount of programming that will be captioned and will also caption its emergency broadcasts that are sent to local areas affected by the dangerous weather conditions. (Frieden 2006)

Similarly in the United States, the National Center for Accessible Media has been commissioned to develop a set of standards to better present information for people with disabilities in the lead up to and during emergency situations (Frieden 2006). However, these areas are focused on making traditional media more accessible for people with disabilities.

While this is laudable, if belated, it also highlights the importance of ensuring that new media platforms and networks are accessible and the importance of universal design principles in every element of the online environment. There are regulations regarding the use and accessibility of traditional media in a disaster both for radio and television. This should also apply to accessibility and social media. A centralised network can be retrofitted for accessibility. A television network can be mandated to provide captioning for those with a hearing impairment (Media Access Australia 2012), Facebook has been reconfigured to work better with screen readers (Cahill and Hollier 2009). However, an evolving *ad hoc* network – a mash-up – is much harder to change once it is in place and in use, especially in an emergency.

Digital and analogue disability overlap, heightening the disadvantage experienced by people with disabilities; in a disaster situation this exclusion can be devastating. In these situations the disabling effect of the natural world can be difficult or in some cases impossible to overcome for people with disabilities. However, the second form of digital disability is the result of choices made by society, both in the technical and social aspects of the design and implementation of the Internet. Unlike much disability rights legislation, this cannot be incrementally improved over time.

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Ensuring that each of the changing elements of this mash-up are launched fully accessible, or as Wentz, Jaeger, and Lazer (2011) describe it 'born accessible', with access to each part of the network having universal design principles applied at the first instance of implementation is essential. As we increasingly are coming to rely on a mash-up of digital platforms, this necessary change in approach would not only allow people with disabilities to engage as full members of society in their everyday lives, but in times of disaster it would also serve to save lives. As this paper has shown, in communications during disaster situations the issue of accessibility especially for people with disabilities is as dire as if it was high ground during a tsunami or transport during a typhoon.

Disclosure statement

No potential conflict of interest was reported by the authors.

Note

1. A hashtag takes its name from the '#' character that precedes a note on the content of the message, providing a useful form of metadata to collate a number of posts on the same topic.

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