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A review of the value of social media in countrywide disaster risk reduction public awareness strategies

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A REVIEW OF THE VALUE OF SOCIAL MEDIA IN COUNTRYWIDE DISASTER RISK REDUCTION PUBLIC AWARENESS STRATEGIES

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Introduction

Social media

Social media has become part of everyday life across the world. There are numerous definitions of social media in the literature all of which acknowledge its ability to create and enable information exchange. For example, Gupta and Brooks (2013) define social media as:

'All the devices and platforms that allow users globally to virtually create and share information with each other. "Platforms" are the virtual spaces that allow users to come together, and create and share information. "Devices" are the computing technologies that enable users to access the platform'. (Gupta and Brooks, 2013, p. 18)

Unlike the traditional media such as newspapers, social media manages the content of the conversation or interaction in the online environment and allows for spontaneous two-way and multiple dialogue. As Keim and Noji (2011) state, 'social media rely on peer-to-peer (P2P) networks that are collaborative, decentralised and community driven. They transform people from content consumers into content producers'.

Social media include blogs, discussion forums, chat rooms, wikis, apps, YouTube, Channels, LinkedIn, Facebook, and Twitter. Also, all crowdsourcing platforms are by definition social media platforms. Crowdsourcing is:

'The act of sourcing media from the crowd. It involves incentivizing users through a variety of means to provide the platform owners and others with intelligence and solutions.' (Gupta and Brooks, 2013, p. 27)

Social media emerged out of the Web 2.0 revolution, which was a set of features and applications that promoted interoperability, sharing, and multiple-way communication. Social media existed before Facebook in the form of MySpace and other platforms, but greatly expanded after 2004 when Facebook was launched.

One in four people on earth has started using some form of social media regularly (eMarketer, 2013). Facebook was by far the most popular social media site as at 2013 with over 800 million users worldwide. Twitter (the fastest growing social media site) was second with over 220 million users worldwide, then LinkedIn (100 million) and MySpace (80 million).

Map 1 helps to visualise the spatial distribution of social media activity, in this case across Europe. This is a map of geo-located tweets (blue dots) and Flickr pictures (red dots). White dots are locations that have been posted to both (Fast Company, 2011). Another excellent visualisation is through Tweetping www.tweetping.net.

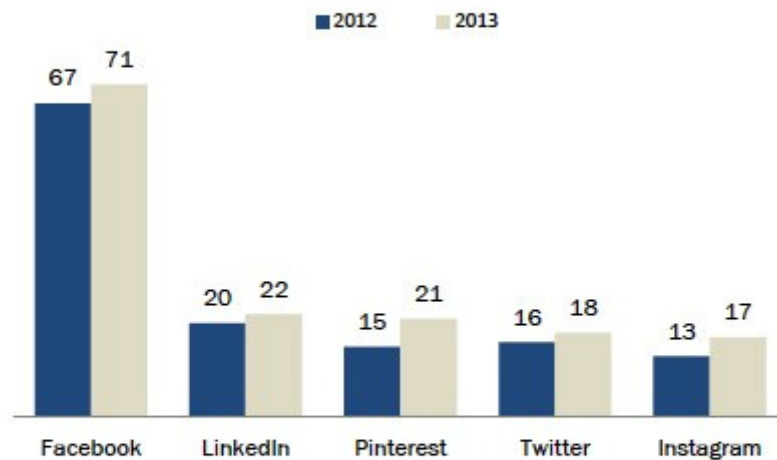
Chart 1 is based on a recent US survey (Duggan and Smith, 2014). It shows that Facebook remains the dominant player in the social networking space in that country. Some 71% of online adults are now Facebook users, a slight increase from the 67% of online adults who used Facebook as of late 2012. The research found that some 42% of online adults now use multiple social networking sites. There were significant differences in the use of social media across gender, ethnic background and age.



Map 1 : Spatial distribution of Twitter and Flickr across Europe (source: Fast Company, 2011)

Social media sites, 2012-2013

% of online adults who use the following social media websites, by year



Pew Research Center's Internet Project Tracking Surveys, 2012-2013. 2013 data collected August 07 -September 16, 2013. N=1,445 internet users ages 18+. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for results based on all internet users is +/- 2.9 percentage points.

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Chart 1 : % of online users who use main social media sites (source: Duggan and Smith, 2014)

According to social media monitors Social Bakers (www.socialbakers.com), huge growth in social media usage is occurring particularly in South America and south-east Asia. A major factor in this growth is the increasing worldwide access to the internet via smartphones, although this tends to be governed by wealth (Pew Research Center, 2014).

In a study of 24 emerging and developing nations surveyed (Pew Research Center, 2014), the percentage of people who are online varies widely. In six nations, half or more use the internet, at least occasionally. In contrast, 25% or less go online in Indonesia (23%), Uganda (12%) and Pakistan (8%). Consistently, internet usage rates are higher among young people. In every nation surveyed, there are double digit age gaps between adults under age 30 and those 50 and older, and in 19 countries, the gap is more than 30 percentage points. According to the research, once people have access to the internet, they tend to use social media.

Social media and disasters

Social media has been used extensively in recent disasters by emergency managers, those people impacted and those others wanting more information. It has been particularly used to warn people, and help in the coordination of response and recovery.

Due to its recent emergence, social media has only had widespread use in disaster warning, response and recovery since 2010. It has played an important role during and after major disasters such as the 2010 Haiti earthquake (Yates and Paquette, 2011), 2011 Queensland floods in Australia (Bruns et. al., 2012), 2011 Christchurch earthquake in New Zealand (Bruns and Burgess, 2012), 2011 Japan earthquake and tsunami (Hjorth and Kim, 2011), 2012 Hurricane Sandy (Lotan, 2012) and Typhoon Haiyan that hit the Philippines in 2013.

Several books have been written on the topic of social media and emergency management including by White (2012), Crowe (2012) and Gupta and Brooks (2013).

Most emergency agencies around the world now use social media alongside traditional media (e.g. newspapers, television, community meetings) to communicate for warning, response and recovery. According to White (2012):

'Emergency management, on all levels and in all types of organizations, use social media....Each of these groups has a different set of goals and objectives where social media is leveraged as a set of solutions to fit the needs of that particular group'. (White, 2012, p. 9)

Emergency managers and other interested people and organisations have banded together to form worldwide social media communities of practice to share ideas and learnings about using social media for disasters (see www.sm4em.org). Teams of emergency managers and volunteers from around the world have joined together to provide social media services during and after disasters. These teams, known as Virtual Operations Support Teams (VOSTs):

'make use of new communication technologies and social media tools so that a team of trusted agents can lend support via the internet to those on-site who may otherwise be overwhelmed by the volume of data generated during a disaster.' (Reuter, 2012)

Of particular note is the use of social media in mapping to provide humanitarian rescue and relief.

'Crisis-mapping technology has emerged in the past five years as a tool to help humanitarian organizations deliver assistance to victims of civil conflicts and natural disasters. Crisis-mapping platforms display eyewitness reports submitted via e-mail, text message, and social media. The reports are then plotted on interactive maps, creating a geospatial record of events in real time.' (Meier, 2013)

A considerable proportion of people have used and are interested in using social media in emergencies and disasters, according to social research. For example, an American Red Cross study (American Red Cross, 2012) found that four in ten respondents would use social media to let loved ones know they are safe. Eight percent of all respondents have downloaded a smartphone app that could help in a disaster or emergency.

Twelve percent of survey respondents have used social media to share or obtain information during an emergency, disaster or severe weather event. The type of emergency information that they had sought and shared using social media is shown in Table 1.

| Information sought using social media | | Information shared using social media | |
|-----------------------------------------------------------|-----|-----------------------------------------------------|-----|
| Weather conditions or warnings | 79% | Weather conditions or warnings | 58% |
| Road or traffic conditions | 64% | Reassurance that they were safe | 55% |
| Damage caused by the event | 62% | Their feelings or emotions about what was happening | 55% |
| The location and status of loved ones | 56% | Their location | 45% |
| Information about how others are coping with the disaster | 49% | What actions they are taking to stay safe | 42% |

Table 1 : Ways in which people use social media in disasters (source: American Red Cross, 2012).

This paper

Disaster Risk Reduction (DRR) aims to reduce the damage caused by natural hazards like earthquakes, floods, droughts and cyclones, through an ethic of prevention (UNISDR, 2014).

The 10-year Hyogo Framework for Action (HFA) came out of the World Conference held in Kobe, Hyogo, Japan in January 2005. The HFA is the first plan to explain, describe and detail the work that is required from all different sectors and actors to reduce disaster losses. It was developed and agreed on with the many partners needed to reduce disaster risk - governments, international agencies, disaster experts and many others - bringing them into a common system of coordination.

The HFA outlines five priorities for action, and offers guiding principles and practical means for achieving disaster resilience. Its goal is to substantially reduce disaster losses by 2015 by building the resilience of nations and communities to disasters.

The United Nations Office for Disaster Risk Reduction (UNISDR) has issued a call for input papers as part of the development of the 2015 Global Assessment Report (GAR15). The GAR15 will be published prior to the World Conference on Disaster Risk Reduction in 2015, in which governments will adopt a successor framework to the HFA.

This input paper addresses Research Area 2, Priority for Action 3 – Core Indicator 4 from the HFA:

Countrywide public awareness strategy exists to stimulate a culture of disaster resilience, with outreach to urban and rural communities.

According to the UNISDR in its call for input papers, a countrywide public awareness strategy is:

A national, long-term plan of action with specific goals that organises the ways the general population is informed about disaster risk and the ways it can act to reduce its exposure to hazards.

As noted in the Introduction, social media has been extensively used for warning, response and recovery in recent disasters. However, this paper examines the current and potential value of social media in countrywide public awareness strategies that are implemented prior to disasters for prevention and preparedness.

Methodology

The review utilised three methods to scope and identify current examples of countrywide DRR public awareness strategies that use social media:

1. A literature search using the internet for peer-reviewed papers, reports and appropriate websites.
2. Requests for examples sent by email to over 30 experts in social media and emergency management from around the world.
3. Requests for examples sent to the #smem (social media for emergency management) community of practice on Twitter.

The examples were analysed for their 'value' using measures such as DRR awareness messages, usage rates and ease of integration with other media.

The potential value of social media in countrywide DRR public awareness strategies was assessed using a range of documents including books, papers, reports and other documents relevant to the topic. It is assessed in the discussion section.

Although the methodology focussed on 'prevention' (as per the definition of DRR above) awareness, it also looked at 'preparedness' awareness. This is because the boundaries between these two parts of the disaster 'cycle' are somewhat blurred in this instance. For example, the development of a family or business emergency management plan (promoted by many countrywide awareness strategies) may involve an awareness and assessment of hazard risk, as well as actions to prepare for an emergency.

Findings

The scoping methodology identified numerous examples of social media being used in countrywide DRR awareness strategies from around the world. Some of these examples are presented below as case studies.

Philippines (iCOMMIT)

There are about 30 million Facebook users and six million Twitter users in the Philippines. In late 2012, a social media campaign aimed at encouraging the public to help in reducing the risks posed by disasters was launched (Romero, 2012). The iCOMMIT campaign seeks to raise awareness and encourage action through sharing of views on how people can build safer communities.

Humanitarian groups Oxfam, Action Against Hunger, CARE Nederland, Plan International, Christian Aid, Handicap International, Coalition of Services of the Elderly and the European Commission Director General for Humanitarian Aid and Civil Protection led the launch.

According to Romero (2012), Gabriela Luz, humanitarian program officer of Oxfam, said they had opted to conduct an online campaign due to the popularity of social networking sites in the country. Luz said:

'It (online campaign) is an easy way to create awareness about disasters and to get people to post DRR (disaster risk reduction) commitments. Time and again, internet-based social media platforms have proven to be a powerful platform to mobilize collective action on important issues.' (Romero, 2012)

Internet users can support the campaign by stating what they intend to do to reduce disaster risks and promote awareness in vulnerable communities. Using social media platforms like Facebook, Twitter, Youtube, Instagram or Tumblr, users can make a commitment by writing: 'I commit to...' and then their short pledge.

The 'I Commit to DRR' campaign supports the International Day for Disaster Reduction theme 'Women and Girls, the [in]Visible Force of Resilience'. The campaign also advocates the participation of persons with disabilities and other vulnerable sectors in the crafting of policies.

An evaluation of the success of the iCOMMIT campaign, particularly in relation to 2013 Typhoon Haiyan/Yolanda, was not able to be located for this research.

Indonesia (several campaigns)

Of Indonesia's 240 million people, there are some 61 million internet users, many of whom access online content using mobile phones. According to Paris-based analyst group Semiocast, Indonesia was home to 29.4 million users of Twitter in July 2012, and more than two percent of all Tweets posted across the world in June 2012 came from the Indonesian capital Jakarta. Facebook has 64 million active users in Indonesia, making it one of the largest Facebooking countries in the world (IRIN, 2013).

There has been several DRR awareness campaigns conducted across Indonesia in the past few years using the large social media population.

- The Humanitarian OpenStreetMap (HOT) has launched a project in Indonesia to create a free world map, built entirely by volunteers with satellite technology to reduce communities' disaster risks. The project works with disaster managers and communities to build realistic disaster scenarios through InaSAFE, an 'open-source' impact-modelling software sponsored by and created in partnership with the Australian aid agency AusAid and the World Bank. More than 1,000,000 buildings in Indonesia have been mapped so far. HOT is helping to build the OpenStreetMap community in Indonesia. The team has created a website, www.openstreetmap.or.id, for which people can gather resources, read about what the OSM community is up to, and contact trainers for further support. This is an excellent example of a crowdsourcing project. (IRIN, 2013)
- Build Back Better campaign. After the 2009 Padang earthquake, The Australia-Indonesia Facility for Disaster Reduction mobilised an international engineering team to survey damaged buildings and find out why some had withstood the shaking but others collapsed. It found reinforced masonry buildings were much safer. Houses made from un-reinforced masonry were 10 times more likely to completely collapse - significant findings given more than 80 percent of people are killed during earthquakes by collapsing buildings. The findings led to a Build Back Better campaign, to encourage the 230,000 West Sumatrans to adopt simple, improved building techniques. The campaign aims to change behaviour by convincing householders to make informed decisions on the need for earthquake-resilient housing. It raises awareness through education materials, murals, community events and the media. This has included television and radio commercials, billboard and bus advertising, newspaper articles and talkback shows. Outdoor film nights were held in the worst-affected villages. The campaign is also online using the internet and social media to spread the information nationally, reaching many more Indonesians in vulnerable regions across the country. (Australia-Indonesia Facility for Disaster Reduction, 2012)
- Twitter Early Tsunami Warning System. The development and community awareness of early warning systems are an important part of DRR. Indonesia developed the national Tsunami Early Warning System (Ina TEWS), a comprehensive disaster information management system, which has been operated by the Meteorological, Climatological and Geophysical Agency of Indonesia (BMKG) since 2008. The Ina TEWS does not issue early tsunami warnings directly to the public or to the vulnerable high-risk local communities. However, it can issue early tsunami warnings to national-level and local-level government agencies and electronic media. The BMKG also adopted the use of social media channels, especially Twitter and Facebook since 2010 to inform the public directly with early earthquake warnings, early tsunamis warnings, and severe weather warnings.

In a study of recent tsunami warnings, Chatfield and Brajawidagda (2013) found that Twitter use by the BMKG for informing the public directly through its Twitter early tsunami warning system demonstrated public value as a viable complement, not a substitute, to Indonesia's Ina TEWS. This is in contrast to the conclusions of prior research that Twitter demonstrated its value as a viable substitute to traditional

public communication channels during the recent extreme natural disaster events. However, prior research did not focus on Twitter use for the interdependent disaster preparedness and response phase activities and functions such as early disaster warnings. The researchers add that:

'we draw on the concept of a comprehensive disaster management cycle to argue for the critical role of Twitter use for an early tsunami warning system in increasing citizen awareness of disaster hazards and risks and improving individual and community disaster preparedness. With the lead time of over 7 minutes the Twitter early tsunami warning system provides, the residents of the vulnerable communities can assess the situation and decide whether or not they should evacuate.' (Chatfield and Brajawidagda, 2013, p. 2059)

United States (Ready Campaign)

Launched in February 2003, 'Ready' is a national public service advertising campaign designed to educate and empower Americans to prepare for and respond to emergencies including natural and man-made disasters. The goal of the campaign is to get the public involved and ultimately to increase the level of basic preparedness across the nation.

According to the Federal Emergency Management Agency (FEMA) (2014), 'Ready' and its Spanish language version 'Listo' ask individuals to do three key things: (1) build an emergency supply kit, (2) make a family emergency plan and (3) be informed about the different types of emergencies that could occur and their appropriate responses.

'Ready' has been extended to include 'Ready Business' and 'Ready Kids'. There is a major component of the campaign that increases awareness of the variety of risks that Americans may face including hurricanes, floods, earthquakes, wildfires, tornadoes, home fires, blackouts and biological threats.

The campaign's messages have been distributed through television, radio, print, brochures, www.Ready.gov and www.Listo.gov web sites, toll-free phone lines, and partnerships with a wide variety of public and private sector organisations.

In recent years, 'Ready' has also been disseminated through social media with a presence on Twitter, Facebook and YouTube. It also has a blog and a FEMA Social Hub where it features current relevant social media conversations.

No relatively recent publically-available evaluation of 'Ready' including social media use was located in this research.

United Kingdom (Flood Group UK, Flood Awareness Wales)

With about 5.4 million properties in the UK at risk of flooding, there are several countrywide DRR awareness strategies relating to flooding.

Flood Group UK is a Facebook page established essentially for people that have been flooded or are at risk of being flooded. It contains information to help them to prepare for and recover from a flood. It is also a place where they can share their experiences of flooding.

This Facebook page was set up by the Environment Agency, Scottish Environment Protection

Agency (SEPA), Natural Resources Wales, National Flood Forum, Scottish Flood Forum, Rivers Agency of Northern Ireland and Cockermouth Flood Action Group. It provides awareness of the range of resources and education opportunities available to people including the online FloodAlerts Map and events.

One in six properties in Wales are at risk of flooding. The Environment Agency's 'Flood Awareness Wales' campaign (www.environment-agency.gov.uk/113810.aspx) aims to ensure that communities at risk of flooding know how to prepare and respond during a flood incident. It works with individuals, businesses, schools, farms and whole communities to raise awareness of flood risk and help people take actions to prepare for flooding.

The campaign encourages communities to develop community flood plans and individuals to prepare flood kits. People can ascertain their flood risks via the Flood Awareness Wales website. Latest news about the campaign is disseminated through social media including Twitter and Facebook. People can also sign up for Flood Alerts on Facebook.

No evaluations were located of either of the UK campaigns, although the Flood Group UK Facebook page had over 2,000 'likes'.

Australia (Victoria Summer Fire Campaign, Harden Up Protecting Queensland)

In Australia, most of the DRR awareness campaigns are delivered by state and territory emergency agencies. There are some programs such as FloodSafe and StormSafe that are used across several jurisdictions.

The Victorian Government implements a statewide Summer Fire Campaign which commences in November and finishes in February or March each year depending on the length of the fire season. The campaign includes the use of digital information channels (the FireReady app and VicEmergency website), social media (Twitter/Facebook) and advertisements on TV, radio, newspapers and digital channels encouraging people to leave early if fire threatens. The campaign is coordinated by the Department of Justice on behalf of several agencies including the Country Fire Authority (CFA), Victoria Police, Department of Environment and Primary Industries, Victoria State Emergency Service and the Metropolitan Fire Brigade.

The objectives of the campaign are to:

- Promote fire safety preparation and planning messages, particularly around the importance of leaving early
- Promote the importance of fire danger ratings and warnings
- Increase community awareness of fire risk in their local community
- Increase the number of people that leave early in the event of a fire.

Social media messages include:

- 'Leaving early is always your safest option in the event of a fire'
- 'Tomorrow is a high Fire Danger Rating day - know your trigger to leave'
- 'Know where to access fire warnings'

- 'Travelling? Check the fire danger ratings before you travel'
- 'Pack an emergency kit so you are ready to leave'
- 'If you live on the urban fringe of Melbourne you are still at risk from fire'
- 'Download the FireReady app and visit the VicEmergency website'.

These messages are rolled out through social media channels. There are 367,000 people who receive campaign messages by following the CFA Facebook page and Twitter feed. Messages are also delivered via the social media channels of Victorian Government departments and agencies as well as campaign partners including the Australian Football League Players Association, Melbourne Heart soccer club, Cricket Victoria and the Melbourne Renegades T20 team, as well as cross-denominational religious organisations. An indication of the interest in fires is found in Chart 2 which shows the number of total social media posts related to fire across the 2013-14 fire season in Victoria.

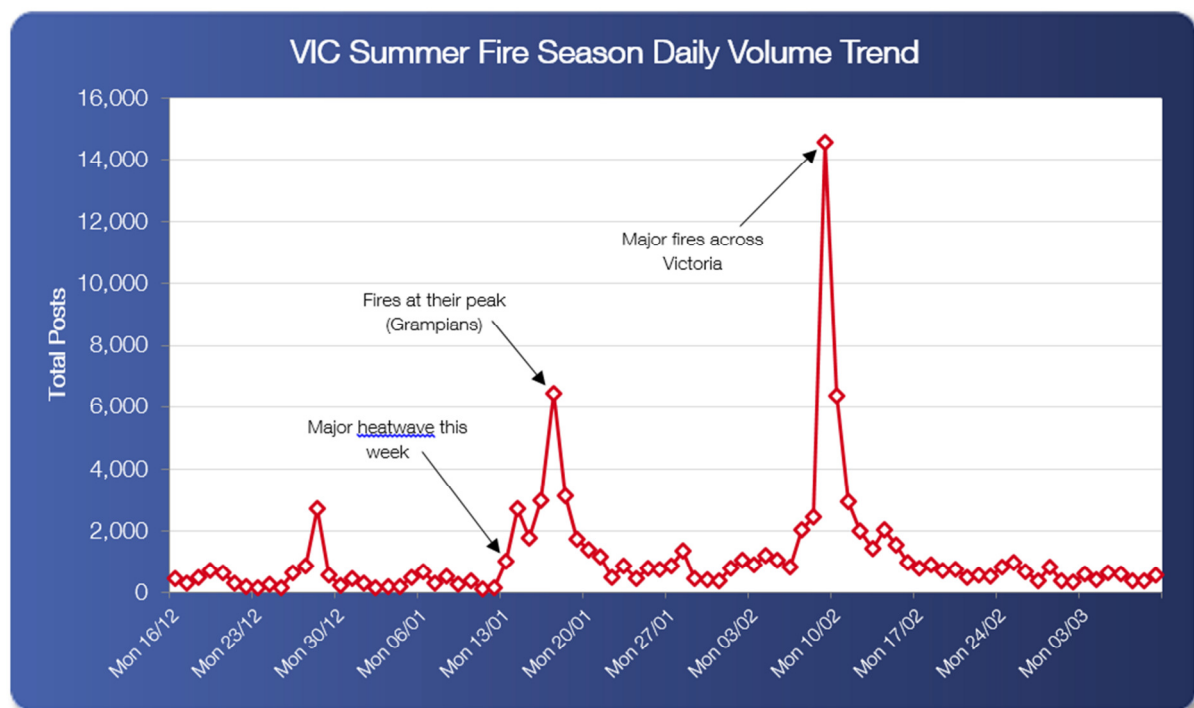


Chart 2 : Graph showing number of social media posts on the topic of fire over 2013-14 Victoria, Australia fire season

The Fire Ready app was the first Victorian Government emergency app and was launched in 2010. A new app was developed after usage outgrew capacity of the previous app. More than 560,000 users have downloaded the new app, which was designed to be easier to use, faster and more reliable and provide fire emergency information to users via a Google Maps interface and push notifications of warnings, Fire Danger Ratings and Total Fire Bans.

Green Cross Australia (GCA) is a national environmental organisation that helps Australians adapt to climate change in ways that embrace sustainability and community resilience. To achieve this, GCA works with respected business, research, community and government partners to enable Australians to take informed, practical action in response to climate change (Australian Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, 2013).

A string of recent extreme weather events over the past few years in the state of Queensland has highlighted the need for households, businesses and communities to be better prepared for extreme weather. In response, GCA developed and implemented 'Harden Up – Protecting Queensland'. This program is a statewide, web-based approach to building resilience in response to extreme weather hazards and risks.

The key project aim is to encourage Queenslanders to assess their vulnerability to key natural disaster hazards, and take practical action to become more self-reliant and resilient in the face of extreme weather events. The website is a neat use of online technology blending social and digital media.

Harden Up offers multiple chances for citizens to share how they are preparing. When users create their plan, they are asked to post what they have done to their social network. The 'tips' section is also designed for sharing; it was envisioned, in part, as a way for people who lived through major disasters to communicate what they learned.

This approach is based on the idea of 'communicating actionable risk' which involves emphasising the communication of preparedness actions (what to do about risk) rather than the risk itself (Wood et. al., 2012). It is also based on research showing that 'households are most likely to take steps to prepare themselves if they observe the preparations taken by others' (Wood et. al., 2012, p. 613).

Since launching in late 2011, the 'Harden Up – Protecting Queensland program' has seen over:

- 35,500 people access the website
- 155,000 pages of content viewed with visits lasting around five minutes on average
- 18,000 discrete actions have been taken to prepare for extreme weather in Queensland (Australian Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, 2013).

Summary of findings

From these case studies and other examples located, the following observations are made in terms of the nature and value of countrywide DRR public awareness strategies that use social media:

- Other than the case studies above, there were numerous government agencies and non-government organisations using Facebook and Twitter (as part of countrywide DRR public awareness strategies) to encourage people to develop an emergency plan for preparedness. Some also gave practical advice on preparing an emergency kit.
- As shown in the case studies, social media was either used as the sole method of dissemination (e.g. iCOMMIT) or in conjunction with traditional media.
- Social media was used for DRR public awareness strategies across a range of hazards including tsunamis, earthquakes, flood, bushfires/wildfires and for cross-hazard disaster resilience.
- Social media was used understandably in those countries with high internet and social media usage rates such as the Philippines, Indonesia, United States, United

Kingdom and Australia. There were several major countrywide DRR public awareness strategies identified, particularly in African and South American countries, that did not use social media (possibly due to relatively low social media usage rates).

- Although the HFA commenced in 2005, most of the use of social media in countrywide DRR public awareness strategies has occurred since 2010. Thus, it should be viewed as an emerging technology.

Several of the experts responded to research requests saying that they believed there is far more interest and activity by emergency agencies in the use of social media in response and recovery, than in DRR. They supported the need for more effort in using social media across all components of the disaster cycle.

It was difficult to assess the 'value' of social media using the measures described above due to lack of evaluation data. This issue is discussed below.

Discussion

There are some issues emanating from this research that warrant discussion. Also, it is pertinent to assess the potential value of social media in countrywide DRR public awareness strategies.

DRR messages versus warning messages

A few of the experts contacted raised the issue of potential conflict between DRR campaign messages and warning messages for those hazards that have a warning lead time. For example, a DRR bushfire/wildfire campaign message may be to 'leave and live' (i.e. evacuate early). However, the warning message during a fire may be to shelter-in-place, as evacuation routes had already been cut off. This issue should be managed by emergency agencies and clearly communicated to potentially impacted communities.

It should be noted that misinformation and control of messaging by emergency agencies when using social media (Lindsay, 2011) was viewed by the experts as much less of an issue with DRR campaigns than it is in emergency response and relief.

Evaluation

As noted previously, it was difficult to gauge the value of social media in countrywide DRR public awareness strategies due to lack of data. However, it appears that:

- Social media guided people to websites (e.g. Harden Up) which have had high usage rates and resulted in individual, family and community emergency or action plans being developed.
- There was considerable approval of the use of DRR social media sites (e.g. the number of likes for the Flood Group UK Facebook page).
- Apps (e.g. FireReady) appear to be popular forms of social media to prepare for disasters and for warnings.
- Social media may be a key warning communication method in an early warning system, particularly if there is a short warning time (e.g. Indonesia's Twitter Early Warning System).

Most of the experts that provided information concurred that although there is some formative and summative evaluation of social media use (e.g. usage) conducted, there is generally a lack of overall evaluation frameworks and processes in this emerging use of social media.

That is not to say that countrywide DRR public awareness strategies are not comprehensively evaluated. For example, in New Zealand the Ministry of Civil Defence and Emergency Management wishes to shift people's level of preparedness for disasters. The 'Get Ready Get Thru' social marketing campaign began in June 2006 and is comprehensively measured and evaluated each year. The objective of the evaluation is to 'measure New Zealand residents' disaster preparedness, and to assess the effectiveness of the campaign over time' (Colmar Brunton, 2013). 'Get Ready Get Thru' features a series of advertisements including on television and its website. Although there is a social media presence for 'Get Ready Get Thru', the value of this was not specifically measured in 2013.

Social media is starting to be evaluated in response and recovery. As Westbrook et. al. (2012) note:

'The community, volunteer organizations, and news organizations are currently embracing social media, but emergency management (EM) is slow to adopt and implement it on a full scale. One can understand this hesitation, given the lack of guidance and quality assurance. As EM officials and agencies begin to implement social media, several questions need to be answered such as:

- How do you know a social media strategy is working?*
 - What is considered social media success?*
 - Does it work better than past methods of communication and information sharing?'*
- (Westbrook et. al., 2012, p. 2)*

They add that:

'The full potential of continually utilizing social media can only be realized with ongoing formal studies and field studies evaluating over time series efforts. Social media is continuously changing. Constant updates to the technologies along with user preferences force us to remain current in our usage and study approach.' (Westbrook et. al., 2012, p. 9)

It is critical that the use of social media be evaluated across its range of uses across the whole of the disaster cycle.

Potential use

Although there is evidence that social media is being used for countrywide DRR public awareness strategies, the potential of this emerging technology should be assessed to guide future use.

Gupta and Brooks (2012) identified the platform types that currently can be used in disaster-related social media activities. The platform types include:

- Social networking. Enable users to create relationships and foster their networks. Examples are Facebook, Twitter, Google+ and LinkedIn.

- Media platforms. Emphasise and enable users to create (including upload) and share media with others. Examples are YouTube, Instagram, Flickr and Pinterest.
- Location-based platforms. Emphasise and provide users with various features based on their location in physical, real-world space. Examples include Foursquare, Find My Friends.
- Crowdsourcing platforms. Most crowdsourcing platforms collect information from users in a variety of formats and also display it and share it in a variety of formats. Examples include Ushahidi, Sahana and Crisismappers.
- Combination platforms. Provide users with various combinations of the above platforms. For example, Facebook has social networking, media, location-based and crowdsourcing functions.

People use numerous devices to access these social media platforms including desktop computers and laptops, gaming devices and smart televisions, tablets, smartphones and other mobile phones (that require access to mobile networks and not the internet). Understanding of the range of platforms and device available is critical to the future development of social media in countrywide DRR public awareness strategies, noting that technologies are rapidly changing.

White (2012, p. 46) states that 'social media should be used for a comprehensive emergency approach' including for mitigation (DRR). As noted previously, emergency agencies and emergency services organisations should ensure that social media use for awareness and learning is extended and coordinated across all the four phases of the disaster cycle.

Communities of Practice

Not only can social media use in DRR campaigns raise awareness, social media can easily form 'communities of practice' as suggested previously for #smem. It can also apply for groups of people interested in DRR in their local area or elsewhere.

According to Wenger (2006), 'communities of practice are groups of people who share a concern or passion for something they do and learn how to do it better as they interact regularly'.

Social capital broadly refers to the resources accumulated through the relationships among people (Coleman, 1988). 'There is consensus that social capital consists of resources embedded in social networks and social structure, which can be mobilized by actors' (Dynes, 2002).

Several researchers (e.g. Antoci et al, 2011; Ellison, Steinfield and Lampe, 2007) have assessed the value of social media in forming social capital. They found that social media have made it simpler to interact with others without the limitations geography and lack of time. 'Noting that contact through social media is asynchronous, they reference studies which show that such interactions are not necessarily of inferior quality compared to simultaneous, face-to-face, interactions' (Tibbitt, 2011). In addition to the preservation and possible improvement of existing ties, interaction through social media can foster the creation of new relations. It therefore can encourage and sustain learning communities (Tibbitt, 2011).

The importance of social capital in disasters has been well documented. For example, according to Schellong (2007), during and after a disaster 'social systems continue to operate while new ones emerge because they have greatest knowledge of the community, and because they need to initiate recovery themselves as many of their needs will not be met by outside agencies'. Haines, Hurlbert and Beggs (1996) found that disaster victims and their social networks mostly become resources that can be used in disaster recovery.

'High levels of social capital - more than such commonly referenced factors as socioeconomic conditions, population density, amount of damage or aid - serve as the core engine of recovery' (Aldrich, 2012, p. 15). Using qualitative and quantitative evidence, Aldrich proved this hypothesis to be correct for four disasters he studied around the world. 'Despite different time periods, cultures, government capacities, and levels of development, all four cases showed that areas with more social capital made effective and efficient recoveries from crises through coordinated efforts and cooperative activities' (Aldrich, 2012, p. 149).

Social media and learning

Dufty (2013) in a study of potential disaster resilience learning methods found that social media has applicability across three of the four broad domains of learning – cognitive, affective and social. This is more than other techniques used including the provision of information through traditional media.

However, it should be noted that raising people's risk awareness in DRR campaigns will not necessarily lead directly to appropriate preparedness, response and recovery behaviours. There is ample psychological research (Boura, 1998; Paton, 2006; Scolobig, De Marchi and Borga, 2012) showing that risk perception is only one factor in determining these behaviours.

Comments on the HFA indicator

As shown, there are numerous examples of social media use in countrywide DRR public awareness strategies. There is also potential for further use across the social media platforms using a variety of devices. Apart from raising awareness, the use of social media also has the benefits of forming social capital through communities of practice and stimulating learning in the three learning domains.

The use of social media has emerged toward the final life of the current HFA. With this in mind, the current HFA indicator (Research Area 2, Priority for Action 3 – Core Indicator 4) appears still apposite for the successor framework to the HFA, although recognition of the 'use of emerging technologies' should be included.

Conclusion

The general principle underpinning the HFA Thematic Research is that it is a retrospective review looking forward. In this spirit, this paper examined the value of social media in countrywide DRR public awareness strategies since 2005, the year of the commencement of the HFA.

This review found widespread use of social media in countrywide DRR public awareness strategies across the world, particularly since 2010. It provided case studies from five

countries and across several hazards. It observed that social media was most intensively used in those countries with high social media usage rates including Indonesia and the Philippines.

It appears that social media is 'underutilised' in countrywide DRR public awareness strategies and a greater understanding of its potential and benefits is required. This includes appreciation of the range of social media platforms and devices, coordination of social media across the disaster cycle, and the benefits of social media in forming communities of practice and in disaster resilience learning.

Acknowledgement of the value of social media in countrywide DRR public awareness strategies should be factored into the relevant indicator for the successor framework to the HFA.

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