THINK BRIEF

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HASHTAG STANDARDS FOR EMERGENCIES

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Background

As part of the ongoing close collaboration between OCHA and QCRI, regular conversations on how to improve crisis computing have taken place over the past few years. In May 2014, members of OCHA and QCRI met in Doha to discuss our ongoing efforts and recognized that it is clear that innovations in policy were equally important as innovations in humanitarian technology. Standardization of social media (and data) hashtags and the encouragement of enabling GPS during crisis were recognized as a policy piece that could have major impact on integrating big-crisis data into emergency response going forward. This think brief is the culmination of the research.

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KEY MESSAGES

- The public is using Twitter for real-time information exchange and for expressing emotional support during a variety of crises, such as wildfires,[1-3] earthquakes,[4-6] floods,[3,13] hurricanes,[21] political protests,[11,25-27] mass shootings,[15,17] and communicable-disease tracking.[31] By encouraging proactive standardization of hashtags, emergency responders may be able to reduce a big-data challenge and better leverage crowdsourced information for operational planning and response.

- Twitter is the primary social media platform discussed in this Think Brief. However, the use of hashtags has spread to other social media platforms, including Sina Weibo, Facebook, Google+ and Diaspora. As a result, the ideas behind hashtag standardization may have a much larger sphere of influence than just this one platform.

- Three hashtag standards are encouraged and discussed: early standardization of the disaster name (e.g., #Fay), how to report non-emergency needs (e.g., #PublicRep) and requesting emergency assistance (e.g., #911US).

- As well as standardizing hashtags, emergency response agencies should encourage the public to enable Global Positioning System (GPS) when tweeting during an emergency. This will provide highly detailed information to facilitate response.

- Non-governmental groups, national agencies and international organizations should discuss the potential added value of monitoring social media during emergencies. These groups need to agree who is establishing the standards for a given country or event, which agency disseminates these prescriptive messages, and who is collecting and validating the incoming crowdsourced reports.

- Additional efforts should be pursued regarding how to best link crowdsourced information into emergency response operations and logistics. If this information will be collected, the teams should be ready to act on it in a timely manner.

INTRODUCTION

In recent years, social media tools such as Facebook, Twitter, Instagram, YouTube and blogs have demonstrated significant value during emergencies as the "information currency of disasters".[6] These digital tools give affected communities a flexible information platform to share local knowledge,[9-12] transparently document efforts[2, 3, 5, 6, 9-11, 13-17] crowd-verify or eliminate false rumours,[5, 9, 17-22] and engage in two-way communication with formal emergency response agencies.[6, 13, 15, 23]

Twitter is currently the social media platform best suited for emergency response due to real-time posting, public feeds and asymmetric relations (one-to-many or non-reciprocal information exchange).[24] Facebook users comprise 82 per cent of the global social media market aged 16-64 outside of China, but privacy settings limit its use during a disaster.[28] Other social media tools are used for emergency preparedness and response (e.g., YouTube), but there is less evidence-based research supporting their uptake during a crisis.[13]

By having formal response agencies embrace social media platforms to augment traditional monitoring channels for large-scale, sudden-onset disasters (e.g., floods, hurricanes, tornadoes), response agencies are demonstrating willingness to engage with the public in real time[23, 29, 30] and empowering the public as community first responders.[10, 19, 29, 30] This paper aims to demonstrate the value of social media tools, such as Twitter, as situational awareness and emergency reporting platforms, and to advocate more effective information collection through effectively curating hashtags.

Case Study: Super Typhoon Haiyan, Philippines (November 2013)

Within the first 48 hours after Super Typhoon Haiyan's landfall, nearly 230,000 tweets were published internationally containing a situationally relevant hashtag. From those tweets, over 600 written messages and 180 images were identified containing actionable information for emergency response planning. These messages included evidence of affected areas, as well as logistics planning information such as road closures, downed power lines and shelter locations. Digital humanitarians from the Standby Volunteer Taskforce triangulated and published this information to live crisis maps to assist aid workers in-country, sometimes even before the responders reached the Philippines.[8]

WHAT IS TWITTER?

Twitter is a micro-blogging platform that allows users to send 140-character messages (tweets) to fellow users (followers) who subscribe to updates. All messages are posted to a public, searchable timeline unless the user opts out (estimated at 10 per cent).[32] Over time, the limited character count has forced Twitter syntax to become more structured. Tweet language now includes public one-to-one messages, retweets and hashtags.

An individual username (Twitter handle) is referenced when addressing a message to a specific person by placing the "@" symbol before the handle (e.g., @UNOCHA). This allows users to engage in one-on-one conversations and targeted information exchange while publicly interacting. Retweets allow users to share and cite original authors. They are most commonly identified through the terms "RT" or "via" (e.g., RT @UNOCHA). Thematic or keyword classifiers (hashtags) allow researchers, emergency responders and digital volunteers to easily identify emerging topics or trending conversations (e.g., #CitizenRep). As of September 2013, Twitter alerts allowed specific emergency notifications to be pushed through SMS and delivered directly to a user's phone.[33]

WHY TWITTER?

Twitter is a robust information-sharing platform that often remains online when other media are no longer available. Voice calls may fail when cellular traffic is high (e.g., following a terror attack)[15] or when cell phone towers are not functioning (e.g., during a natural disaster). However, tweets may be sent through SMS or Internet connections, allowing messages to queue before being sent.[34] During the Arab Spring, Twitter was one of a few social media platforms viable during bandwidth restrictions.[27]

Some researchers studying the use of Twitter during emergency response assume a correlation between the severity of an event and the amount of digital chatter witnessed on the platform.[13, 35] However, even when only a small proportion of tweets are related to an emergency, the resulting influx of messages often exceeds human capacity to review and analyse in real time.[30, 36] As a result, there is a need to improve the signal-to-noise ratio, where the amount of actionable information gathered through Twitter becomes a higher percentage of all collected data.

There are two main ways to improve this ratio. Both methods ultimately build upon each other: in one sector agencies can train Twitter users to craft better messages, in another computer scientists can improve the algorithms used to extract emergency related information from existing tweets.[37] Currently, computer scientists are working on the algorithmic side to improve message analysis, but such technology takes time to perfect. By encouraging more structure in tweets, agencies can help support analyses and stave off big-data challenges.

HISTORY OF HASHTAG STANDARDIZATION

Hashtags allow researchers, emergency responders and affected community members to easily identify Twitter conversations related to a given topic. Typically, hashtags iteratively form as people join a digital conversation, and they sometimes evolve during an event.[1, 38] This tendency to categorize tweets helps responders identify conversations related to a given event (e.g., #CAR) or identify specific areas of need (e.g., #RescuePH). Numerous groups have tried to encourage hashtag standardization in the past, but there is no uniformity in the system. In 2012, Doug Handchard argued for the standardization of metadata by the International Telecommunications Union (ITU) or Internet Society.[39] In 2014, ITU published nine reports demonstrating innovative technology use for disaster response and encouraged standardization activities for disaster relief.[40] But none of these reports addressed the standardization needs in social media monitoring.[41]

Retweeting during the Haiti earthquake (2010)

Following the earthquake, health organizations in Port-au-Prince began using Twitter to request operational needs and provide situational updates.[42] These messages, although informative, were not directed to anyone. Instead, they mimicked "beaconing" or attention-seeking behaviour.[42] Many digital volunteers retweeted these messages hoping to expand the circle of knowledge, and therefore increase the likelihood of linking with an appropriate response agency. Across the globe, digital volunteers, such as those from Tufts University in Massachusetts, USA, collected emergency requests sent first through Twitter and later through SMS. These messages were geo-located and placed on a live Ushahidi crisis map to assist response agencies in rescue-and-delivery missions.[43]

This tendency to retweet is valuable for two reasons. First, researchers assume retweets are a form of peer-nominated recommendation.[3, 11, 38] Second, regardless of original follower size, retweeted messages tend to reach an average of over 1,000 followers.[44] As a result, retweets may be a valuable tool for identifying valuable response information. For groups leveraging machine-learning techniques, retweets can be algorithmically addressed. However, for people monitoring Twitter through small-scale sorting systems, such as TweetDeck or HootSuite, a large number of similarly written retweets may become confusing, especially when it comes to verifying the original author and validity of the message.[45] Furthermore, slightly altered duplicate messages may result in rescue workers returning to an area multiple times, believing message alterations are a new request for assistance as compared to a messaging error.[46]

#RescuePH

#RescuePH began in August 2012 as a private crowd-developed Twitter-classification system for Filipino flood victims, although it was significantly expanded through Government support. This platform enabled Filipino citizens to report needs and the Philippine Government to disseminate information directly to the public.[46] Figure 1 shows a Government-supported infographic depicting actively monitored hashtags and their uses. Specifically, request for rescue (#RescuePH), food and non-food items (#ReliefPH), flood location reporting (#FloodPH) and updates regarding initial requests (#Safenow) were all watched.[47] Other Twitter hashtags, such as #Walangpasok and #Prayforthephilippines, provided channels for citizens to exchange valuable local information and express community support without disrupting reporting systems.

The #RescuePH program was initially very successful. However, with succeeding uses, high-profile Twitter users started promoting the response hashtags, resulting in needs requests becoming lost in numerous fan retweets.[46] Additionally, a small yet growing number of tweets were stating how a user "should" write an emergency request, rather than providing the types of information desired.[4, 48] Such problems related to @replies, retweet duplication and "how-to" tweeting are part of the reason why researchers are pushing for Government standardization of Twitter use during emergency response.[2, 21, 49, 50].

Figure 1: Infographic explaining hashtag use[47]

PROPOSED TWITTER STANDARDS IN EMERGENCIES

This paper aims to inform emergency response agencies about using Twitter during disasters and developing a hashtag system for large-scale emergency monitoring through Twitter. This social media-based hashtag system is not intended to replace current phone systems for emergency reporting, although it may lay the foundations for future expansion.

Encourage geo-location of tweets

People located in-country during a disaster provide the most tactile response information.[3, 11, 38] GPS capacity is the easiest way to transmit and identify this valuable information.[3] As part of emergency response agencies' informative messages, citizens should be encouraged to enable GPS when tweeting about a natural disaster. Alternative to GPS location, What3Words can also be used. This program exchanges longitude and latitude lines for three words (e.g., casual.wicket.partner) to help communicate location information.[51, 52]

Another possibility is for response agencies to discuss with Twitter about automatically asking users if they would like to enable GPS when posting from a natural-disaster-affected time zone, or else give the public the opportunity to decide the accuracy of geo-identification in a country, state, county, city, street or exact location. Twitter users generally understand the public nature of tweet feeds, but special consideration should be taken before encouraging or enabling GPS in areas under the control of repressive Governments or experiencing social unrest, or during times of war.[26]

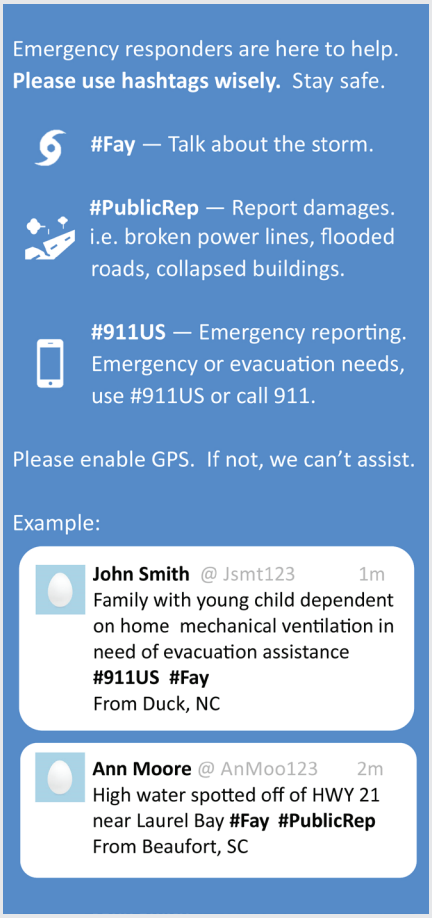


Figure 2: Sample infographic explaining hashtag use in emergencies

How to spread the message: Infographics

When promoting hashtag use for emergency response, agencies should encourage the use of infographics. This will allow Twitter users to easily retweet the important information without the 140-character limitation, and without disrupting the monitoring system by referencing to-be-monitored hashtags. These how-to infographics should be propagated using existing emergency response Twitter handles (e.g., @UNOCHA) while mentioning the specific disaster title hashtag (e.g., #Fay). Ideally a small amount of money would be set aside to promote the infographic through Twitter's "promoted trends" or announced in a free Twitter alert for time-sensitive evacuation information. Figure 2 shows an example infographic explaining emergency hashtag monitoring.

Proposed hashtags

Emergency response agencies should encourage the standardization of three types of hashtags during a crisis: a disaster name hashtag, a public reporting hashtag and an emergency response hashtag. Each hashtag is intended to fulfil a specific role, including ensuring the continuity of information; public tracking of needs, people and supplies; and providing a platform to facilitate direct assistance. The manner in which these three hashtags will interact for monitoring and reporting systems is discussed below.

Disaster title hashtag

Figure 3: Example BBCOS disaster title hashtag[53]

It is difficult to follow a conversation when people are discussing the same event but referencing it differently. Disaster title hashtag standardization is less about specific disaster names and more about establishing a structure early during an event to ensure continuity in information feeds.

News stations have been remarkably successful in encouraging early standardization of hashtags, especially during political events. For example, the 2012 US presidential debate (#debates) generated 10.3 million tweets during its 90-minute broadcast.[54] News stations encourage standardization because such a system enables real-time opinion polling. The intention is to use a similar approach for emergency response reporting and develop partnerships with Twitter as well as weather and news teams to publicly encourage such standardization.

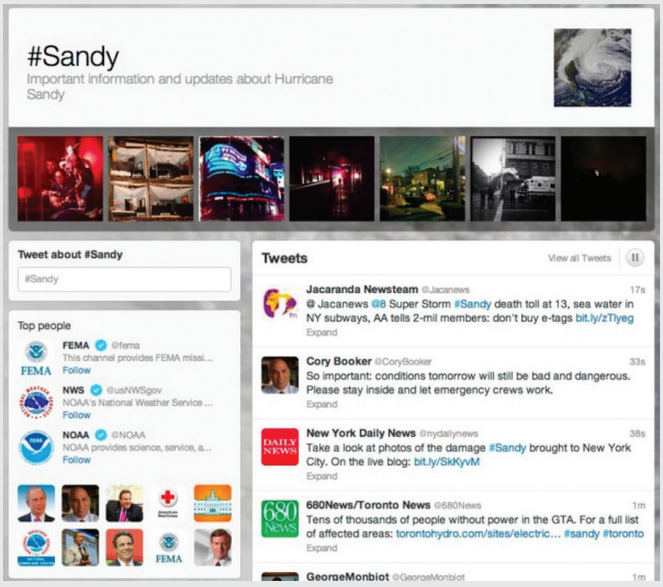


Figure 4: Hurricane Sandy (#Sandy) Hashtag Page[7]

Storm cycles that create hurricanes and cyclones are named prior to the storm. For these events, an official hashtag should be released at the same time as the storm announcement. For all other disaster types, it is unlikely that emergency response

agencies will be the first to tweet about it. As such, emergency response agencies should monitor the popular hashtag identifying a disaster, while trying to encourage a standard name. These hashtags may range in geographic area, from inter-continental (e.g., #Balkans-Floods), country (e.g., #YolandaPH), territory or state (e.g., #OKTornado), or at the local level (e.g., #ValleyFire). In July 2014, BBC Outside Source encouraged the standardization of Indian landslide tweets by releasing a proscriptive tweet (figure 3).[53]

In June 2012, Twitter introduced hashtag pages, in which the combination of editors and algorithms is used to identify, consolidate and showcase tweets associated with a given event. This platform was later used in October 2012 to help news reporters, response teams and the public have a better understanding of Hurricane Sandy's impact along the United States east coast. This platform showcases the potential for rapid hashtag curating, given a structured, single-input system. Figure 4 provides a glimpse of the Hashtag Page interface.[7]

Public reporting hashtag

Militaries view each soldier as a sensor. This same idea of valuing the eyes, ears and opinions of community members can be used to support humanitarian response.[1] Public reporting hashtags will allow emergency response agencies to collect non-emergency information, such as broken power lines, road closures, destroyed bridges, large-scale housing damage, population displacement or geographic spread (e.g., fire or flood). Currently, many tweets are sent with non-emergency planning in mind. However, this information can be quickly transformed to build maps of the environmental context where agencies and the affected communities are working. Emergency agencies can engage the public in relief efforts and improve logistical capacity by encouraging a public reporting hashtag, such as #iSee, #iReport, #PublicRep or #311US (culturally referenced hashtag, discussed below), while also educating the public on its use. When the public reports damages or requests through a GPS-enabled tweet,

Figure 5: Crowdsourced crisis map used to facilitate humanitarian logistics in the Philippines (2013)[55]

responders can more easily identify and verify the information, therefore supporting more timely response and facilitating recovery. Figure 5 shows an emergency response map built entirely from such crowdsourced information.[55]

Emergency response hashtag

Cell phone users will soon be able to send an SMS to a toll-free phone number.[56] For emergency reporting, this new technology could dramatically alter the way the public interacts with nation-based emergency response call centres. It does not take a large imaginary leap to see the potential move from SMS emergency calls to social media emergency calls. Hashtags could be one way to begin reporting emergencies through social media.

Emergency # + 2-letter country code

#911 + US = #911US (police, fire or ambulance in US)

#133 + AT = #133AT (Division-specific [police] in AT)

Why the two-letter country code?

The two-letter country code helps identify countries with identical emergency response numbers. For example, 999 is used in the United Kingdom, Saudi Arabia, Ghana, Malaysia and many other countries. Unless an additional identifier is attached to the phone number, it will be too geographically dispersed to be beneficial.

Figure 6: Country-level emergency response hashtag

Emergency reporting hashtags build on cultural norms and mimic country phone codes (e.g., #911US, figure 6).[50] This would create an episodic, needs-based system to supplement traditional phone centres for emergency reporting during large-scale events. The added value of social media emergency reporting would be when traditional phone lines are broken or unable to handle call volume. Many federal agencies fear that such a system would result in people reporting through social media outside of designated monitoring times.[57] This is a valid concern. However, as with the implementation of any new technology in the public service, it will take time and extensive promotion to ensure effective use. Logistically, this system could be led by the response coordination team and/or potentially be integrated into existing call centres.[58] Response to these requests should be divided along traditional geographic boundaries.

Figure 7 demonstrates the difference in design for public reporting hashtags compared with emergency response hashtags. Public reporting hashtags are intended to collect non-emergency information

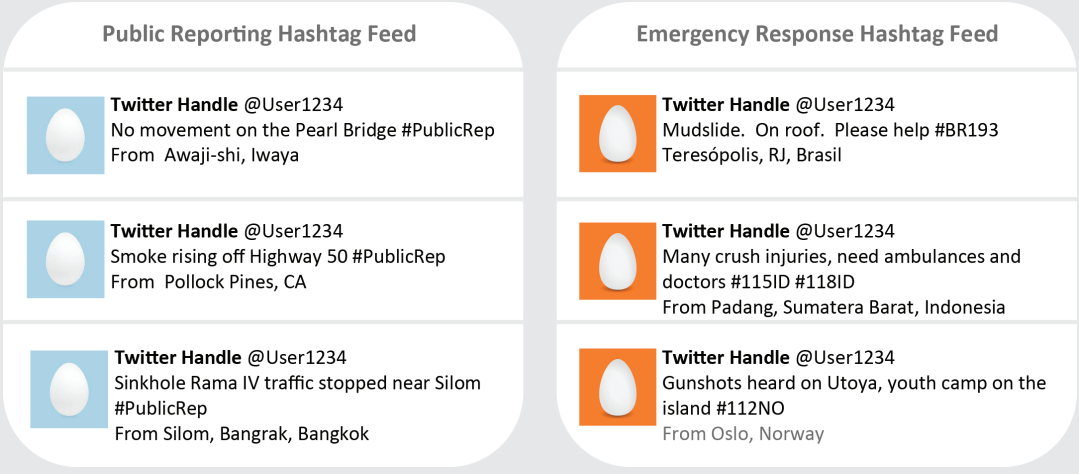


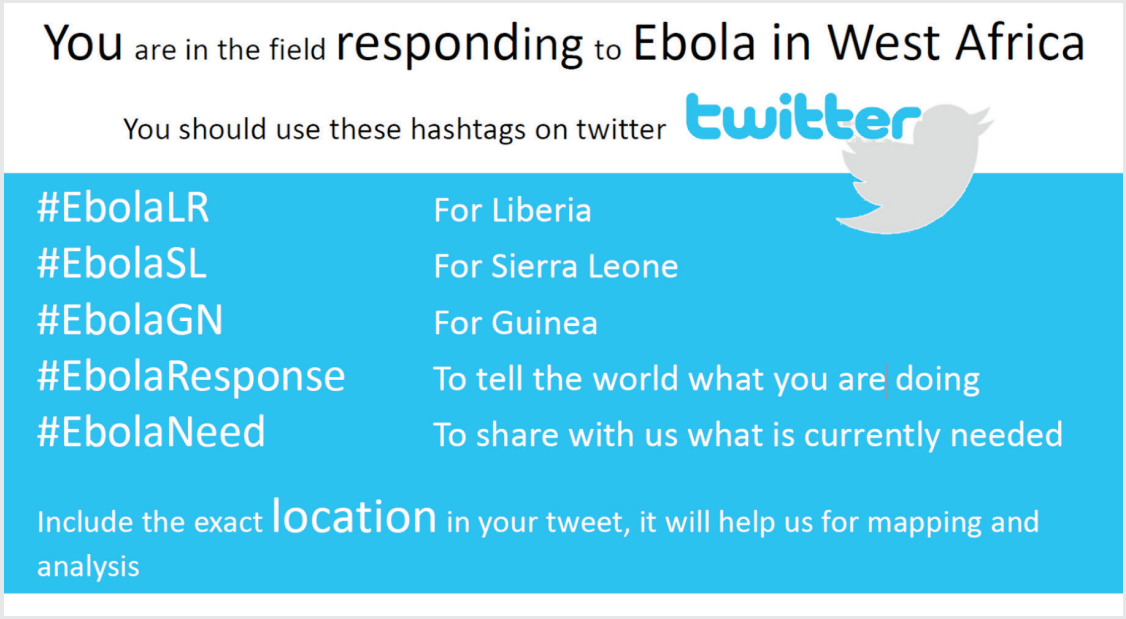
Figure 7: Example public reporting and emergency response hashtags

with the purpose of better facilitating situational awareness for those in-country. Emergency response hashtags are intended to elicit a response from police, fire, ambulance or search-and-rescue teams. Ultimately, the exact hashtag names are not as important as the length (the shorter the better), pre-disaster marketing[20, 59] and informing the public of the amount of resources dedicated to its monitoring (24-hour monitoring vs. supplemental resource).[9, 20, 38] The hashtags shown in this document are examples. Response agencies may adjust the specific titles as deemed appropriate.

In the media: Hashtag standards to support the Ebola response

Humanitarian IMO (@hum_IM) is a Twitter account that connects OCHA information management officers. It recently integrated the above-mentioned ideas to support the West Africa Ebola response (figure 8)[60]. #EbolaLR, #EbolaSL and #EbolaGN are examples of disaster-naming hashtag standards. #EbolaResponse and #EbolaNeed are examples of public reporting hashtag standards. The dissemination of this information is integrated into an infographic for easy sharing and to prevent the disruption of hashtag monitoring. The publication encourages the geo-location of the message, thus further enabling analyses.

Figure 8: Integrated Ebola example (disaster name hashtag, public reporting hashtag, infographic and GPS)



Limitations of a hashtag monitoring system

There are some limitations when promoting a hashtag monitoring system. First, introducing single-use or episodic hashtags that mimic a country's emergency phone system (e.g., #911US) may result in people trying to use Twitter over more traditional communication systems for small-scale emergencies. Although valid, it can be mitigated through public-education campaigns. Second, as with all social media campaigns, specific vulnerable people, such as the elderly, may not use the platform, therefore decreasing the generalizability of need request. However, this can be addressed through statistical analysis and understanding demographic characteristics.

CONCLUSION

Twitter and other similar social media platforms have the potential to supplement traditional information gathering and response reporting during large-scale emergencies. By monitoring highly propagated hashtags, including ones designated for non-emergency and emergency reporting, formal response agencies should be able to increase the proportion of actionable information gathered.

We recognize there are many limitations to such a system, but we also acknowledge that no monitoring system will be perfect in terms of low-cost, real-time analysis and high accuracy. This policy proposal serves as an additional resource to support response agencies in their efforts to better assist affected communities.

Ideas by themselves will not change anything; agencies at all levels should discuss the potential value of social media monitoring and report standardization. Additionally, specifics regarding who is responsible for information dissemination, report collection and response validation should be considered.

Lastly, why collect information if there is no system to implement requests? Agencies should go beyond information collection to ensure teams can act in a timely manner. These monitoring systems are remarkable, but significant steps need to be taken to ensure that information flows from the public to response agencies and back to the public through improved efforts.

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