Social media and the 2013 UK heat wave: opportunities and challenges for future events

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ABSTRACT

Studies examining the role of social media (SM) use in a crisis often examine the use of SM following a large-scale crisis requiring an immediate response. In contrast, this working paper examines the usefulness of SM during an extended crisis, in the form of a heat wave. Authors use the 2013 UK heat wave as a case study to examine how SM was used by different stakeholders during the event, what function(s) SM had, how it was engaged with by the online community and accordingly, what value it contributed to crisis management activities. Findings show that ultimately the nature of the crisis, particularly in relation to populations who are most likely to be vulnerable to its effects, plays an integral role to the value of SM in preparation and response activities.

Keywords

Heat wave, social media, response, preparedness and community.

INTRODUCTION

Extreme temperatures are a form of crisis that can affect the security of citizens. The Earth Policy Institute argues that although crises relating to extreme temperatures are not given as much attention as other types of crises, "heat waves are a silent killer, mostly affecting the elderly, the very young, or the chronically ill" (Bhattacharya, 2003). Accordingly, heat waves can be considered a crisis as they trigger health-related effects, thereby directly impacting the security of citizens, as well as impacting the environment and infrastructure. For instance, between July and August 2003, some European Member States (MS) experienced a heat wave with temperatures consistently above 40 Celsius, resulting in increased mortality and sizeable financial implications (BBC, 2003; Robine et al. 2007).

Past research tells us that social media (SM) is able to significantly contribute to crisis management efforts. Examples include: following the 2007 Virginia Tech shooting (Vieweg et al., 2008), the earthquake in Haiti in 2010 (Heinzelman and Waters, 2010), hurricane Sandy in 2012 (Yeomans, 2012) etc. As yet, little attention has been placed on the role of SM during an extreme temperature-related crisis, which may involve a more gradual impact and potentially requires less of an immediate response. This working paper seeks to examine the role of SM in responding to a heat wave during the summer of 2013 in the UK. Authors will briefly outline the methodology used to inform this study, before providing results and a discussion of the various challenges and opportunities for the use of SM to prepare for and respond to a heat wave.

METHODOLOGY

The findings of this paper are based on an (non-representative) exploratory, desk-based study of the use of different types of SM by UK authorities and organisations involved in providing warnings and crisis management services associated with the heat wave. Authors reviewed British policy documents and news articles relating to this and other heat waves to identify key stakeholders involved in preparation and response

activities including national weather forecasters, public health bodies, charities and critical infrastructure providers. They then examined local web pages of these stakeholders to identify and examine the types of SM used to gain a preliminary understanding of how they used different applications. Authors also examined observable interaction with SM by the wider community by identifying explicit evidence of community engagement (e.g., re-tweets, likes, comments, shares etc.). This study was not intended to be an in-depth analysis of the content of SM, but rather, a preliminary observation of stakeholder use and engagement with SM during a heat wave. As such, it is limited by the scope of stakeholders it was able to identify and examine, and thus the findings should be treated accordingly.

2013 UK HEAT WAVE

In July 2013 the UK experienced a heat wave that lasted approximately three weeks. In the UK, heat wave trigger levels vary by region, and in the South of England, temperatures of 32 degrees Celsius in London prompted a level three warning as temperatures reached that set level for three consecutive days (BBC, 2013a). Early estimates indicate that there may have been between 540-760 excess deaths in England and 60-100 excess deaths in Wales as a result of the rising temperatures (BBC News, 2013b). At the peak of the heat wave (17-23 July 2013), the dry temperatures led to storms which caused disruption for some transport service providers and disruption to power supplies in the east of England affecting power to homes, businesses, trains and the regional airport (BBC 2013c; BBC 2013d). In the UK, the threat posed by the heat wave was communicated via various sources, including, the broadcast media and in some cases, SMS, the Internet, e-mail and sometimes SM.

The use of social media in the 2103 UK heat wave

The use of SM was relatively light during the 2013 UK heat wave. Official response organisations and agencies are only beginning to use SM alongside more traditional communication mechanisms. Nevertheless, of those who did use SM, various functions were fulfilled. It was used by authorities, service organisations and charities to distribute messages about the event and its health implications and other effects via one-way communication, and it was used by service organisations as a form of two-way communication to collect information from the public about vulnerable individuals and power outages. However, as a tool for relaying information, SM appears to be less successful in distributing information among members of the public about the heat wave, as indicated by the number of "shares" and "re-tweets" these messages generated.

A number of organisations utilised SM as a form of one-way communication to distribute information about the heat wave and its potential health effects. In these cases, SM was increasingly considered alongside traditional forms of communication by authorities. Public Heath England primarily used e-mail, television and radio to issue heat wave warnings; furthermore the 2013 *Heatwave Plan for England* states that as of 2013, SM feeds by the Met Office would be used to supplement this information (Public Health England and NHS England, 2013). Examples of Tweets by the Met Office during this period include messages about the level of the threat, alerts for rain and other weather-related conditions (e.g., humidity and storms). The Met Office also used Facebook, Flickr, YouTube, Google+ and their blogs to distribute information, such as weather maps, temperature notifications and health-related warnings. The London Resilience Team, a central crisis management body, used their Twitter account to spread news about the temperatures and the availability of free water in particular locations. Other critical infrastructure and response organisations used SM similarly. Transport companies, such as Virgin Trains, publicised the disruption caused by heat-related storms. The British Red Cross (BRC) communicated heat wave-related information, particularly about staying cool and preventing dehydration. Finally, SM applications were used to share public health and safety information on the effects of the crisis by news organisations, such as the location of forest fires (BBC 2013e).

Other services and crisis response organisations used SM as a form of two-way communication to distribute information about the heat wave and to ask for information from the public. UK Power Networks, a British utility company, broadcasted and solicited information about power outages from members of the public, principally via Twitter. Upon receiving notifications from members of the public, the UK Power Networks routinely responded to them individually, engaging them in two-way communication. In addition, as part of their service to members of the public during a power cut, if people are unable to access the Internet through their Wi-Fi or have poor connectivity to data services, they set up a text message based system that enable individuals to receive text based updates in the event of a power cut. Whilst they also utilise a number of other SM applications (including Facebook, YouTube and LinkedIn), their use of SM to respond to enquiries seems to be conducted via Twitter only.

However, these organisations were relatively unsuccessful in using SM to amplify their messages. The Met

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Office has approximately 38,360 Facebook users following its feed; however, one Met Office health-related post received (only) 161 likes, 33 comments and 80 shares. While this illustrates some engagement with these posts by the affected community, the level of engagement appears to be extremely low considering the number of people who were likely to receive and could potentially share the information. The Met Office YouTube account fared similarly. The account has 5,419 subscribers and was used to publish videos relating to keeping safe in the sun. The following table outlines the low number of shares associated with these videos:

Table 1: The Met Office on YouTube during the 2013 UK heat wave

Video name	Date published	# of views	# of comments	# of shares
Cancer Research UK - Enjoy the sun safely	15 July	1174	1	1
Is the UK having a heat wave?	17 July	5786	41	6
Cancer Research UK - Sun safety tips	22 July	103	0	0
Cancer Research UK Top Tips - Applying sunscreen	22 July	187	0	0
Cancer Research UK Top Tips - The shadow rule	22 July	303	0	2
Heavy thundery showers to replace dry weather	22 July	8532	6	3
Lightning and rain from today's thunderstorms	23 July	4798	9	3

Other organisations were similarly unsuccessful. For example, an excerpt from the BRC Twitter feed indicates that there were very few re-tweets of their health-related messages (less than 15), despite them having 70,745 followers (at the time of writing). The UK Power Networks' message was only re-tweeted four times and the Virgin Trains messages were re-tweeted 19 and six times respectively. Furthermore, these feeds indicate that re-tweets were primarily from individuals rather than "information brokers" or influential organisations or individuals. One exception is the UK Power Networks message, which was re-tweeted by the Peterborough Telegraph, a regional newspaper. Some organisations, for example the BRC, also used the hashtag "#heatwave" to link their messages to other heat wave-related information, in an effort to disseminate crisis-related information more widely. However, this hashtag was similarly unsuccessful. Many private companies used it to advertise sunglasses, book reading lists, ice cream parlours, and other goods and services, while individuals used it to complain about the heat wave. The hashtag also included information about heat waves in other locations (e.g., Germany and the USA) making it difficult to use it to organise information about the events in the UK.

In comparison other recent crises have witnessed greater engagement with social media messages. The Boston Police department were already active on Twitter, yet saw their number of followers increase extensively; from 55,000 followers, to three hours after the attacks growing to 100,000 followers, and by the end of the ordeal, they had grown to having 300,000 followers (McKay, 2014). Extensive public engagement with Tweets from the Boston police department can be seen when considering the Tweet which indicated that those responsible for the attacks had been apprehended; in total the post received 137,207 retweets and 46,428 favorites (Boston Police Department, 2013). This may be a result of the nature of the crisis, as terrorism is often a particularly high profile event and is likely to attract a response from a wider portion of the population as a result of its newsworthiness. In the UK, the November - December 2012 UK floods also prompted more widespread engagement with social media than the 2013 heat wave. Reports from the South East regional twitter account for the Environment Agency revealed greater engagement with Twitter: The Agency issued 244 tweets in November about the flooding situation and 180 tweets in December, the number of followers to the @EnvAgencySE increased by 30% in November and by 20.5% in December. Furthermore, the agency was retweeted 653 times by local authorities, media, key partners and members of the public in November and 1,222 times in December. In addition, the agency was mentioned 156 times on Twitter in November and 249 times in December, including a mention from one of the members of parliament (MPs). Finally, the agency's website was reported to have been accessed more than 2,100 times from the South East Twitter account in December (Environmental Agency, 2013).

This lack of sharing and amplifying of heat wave-related information was likely due to the fact that heat waves largely impact older people, very young people and those with chronic health conditions, some of whom are least likely to be social media users. Therefore, the vast majority of people are not impacted by mid-level heat waves such as that experienced in the UK in 2013. For example, specific comments on the Met Office Facebook page included a general discussion of people enjoying the hot weather, as well as a comment that (sarcastically) questioned the use of warnings; "Do we really need warnings we survived without them before here's a clue if the sun is shining it could get hot you don't need to tell us". Similarly, the #Heatwave Twitter feed that included commercial, personal and international information may have been useful or at least innocuous to those enjoying the warm weather.

In contrast, organisations and charities related to vulnerable people might be expected to carry significantly

more information on the heat wave, particularly if they are looking to those using social media to pass on their messages. Yet, the Twitter accounts of major charities for older people were primarily silent on the heat wave, and these organisations did not seem to be well integrated into SM networks, nor were they particularly successful in encouraging others to relay their messages. For example, AgeUK, a major charity focused on older people, has a Twitter account, but had not authored any Tweets as of August 2013. AgeUK does, however, have a Facebook page, on which they posted information advising people to be vigilant for older family, friends and neighbours during this period. Unlike other SM messages, this AgeUK message, in particular, appears to be geared towards non-elderly people and encourages them to check on their neighbours (of who may be less likely to be using SM). The post received 86 likes and 76 comments, but does not appear to have been shared very widely given that AgeUK has over 27,000 followers who "like" their Facebook page. Furthermore, those who are vulnerable in heat waves, e.g., older people, disabled people, etc., tend not to be included in social media networks due to lack of resources, skills or interest. Specifically, according to the UK Office of National Statistics (2013), people aged 65-74 are the least likely demographic to use SM - 19% of 65-74 year olds use SM compared to 90% of 16-24 year olds. This suggests that the information about heat wave safety and vulnerability may not be reaching the correct individuals via SM and, that those who are being reached by such messages, and depended upon to pass them along, are not reading them as relevant to their situation and may not relay them to others. Such an effort to encourage communities to share information with each other appears to be somewhat under-developed. In order to maximise the audience of social media messages and to encourage individuals to share information both on and offline, there is a need for a partnership to be established between civil society organisations, authorities, response organisations and members of the public to develop a culture of sharing crisis related information to ensure the amplification of key messages amongst the community when preparing for and responding to a crisis.

Conclusion: Social media - a valuable tool in a heat wave?

In response to the heat wave, there are observable instances of SM being used by authorities and members of the public as forms of one-way and two-way communication. In these instances SM was used to publicise the heat wave, distribute health-related information, and, as a relay mechanism to share information among organisations and individuals. However, the relative lack of success in using SM to amplify the message raises a number of potential issues.

The level of SM use by sub-populations is relatively low among those that are most likely to be negatively affected during heat waves. This suggests that perhaps the continued use of more traditional media outlets remains appropriate to reach those vulnerable populations whom may not be using SM, especially during relatively minor heat waves. Instead, SM may be more appropriate for more severe heat waves (level four) that are likely to affect the general population.

Furthermore, this crisis indicates that those who use SM cannot be depended upon to share information that is not relevant to their individual situation. Instead, authorities and crisis response organisations must consider their audience, their message and their medium of communication when integrating SM into their communication strategy. If it is beneficial to engage with the population at large to amplify health-related information, it is essential that organisations consider their message delivery strategy so as to ensure that they appropriately gain the attention of those whom are not directly threatened and encourage them to further share their messages. This is especially true in relation to health threats associated with those that are most vulnerable and who are least likely to use SM. Consequently, there is a need for SM strategies that emphasise the need for partnerships across a vast range of stakeholders, all of whom are actively involved in preparing for, responding to and recovering from a crisis to ensure that key messages reach those most vulnerable to the effects of a particular type of crisis. Furthermore, it would be beneficial for organisations engaging with social media in their response strategies to provide case-related updates on the outcome of their social media campaigns, including metrics on user engagement to ensure lessons can be learned for future operations.

This case study suggests that a "one size fits all" approach to the use of SM in a crisis is inappropriate; rather, SM strategies need to be flexible and able to adapt to the wider situation. As such, further research is required to understand the type of crisis and the population that is most likely to be affected by that crisis, in order to fully examine the effectiveness of SM in contributing to crisis management. The use of quantitative case study based research has the potential to continue to help stakeholders to understand public interaction with social media during times of crisis, and therefore, the value of social media for crisis management. Although limited in time and funding, the present project will seek to work with stakeholders via a series of workshops, to further investigate their use of SM and the conscious choices made in the development of SM strategies in preparing for, responding to and recovering from a crisis.

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