

ABSTRACT

An ongoing challenge for emergency, government, and community organisations is 'how can social media (social media) be best used to connect with people who may be considered more vulnerable during an emergency event?' This question has three key elements. First, when using the term vulnerable who might we be referring to? Second, how is social media being used by relevant organisations and vulnerable community members? Third, how might we better use social media to connect to the more vulnerable sections of the community? This paper reports on findings from recently completed research funded by Emergency Management Victoria. This research is unique in that it combines insights and perspectives from: interviews with emergency, government and community organisations; analysis of social media postings; and interviews and a survey of community members.

Our research noted that most organisations have developed a more nuanced perspective of the term vulnerable, one which takes account of contextual and temporal factors and recognises that all Victorians are periodically vulnerable. Interviews highlighted that organisations, community groups, and vulnerable sections of the community operate in a complex informational and social media landscape. Moreover, this landscape continues to develop with changing boundaries between actors, and organisations' evolving roles. Analysis of social media highlighted that the messaging was generic, with little content aimed at vulnerable sections of the community. The research also investigated how vulnerable people used social media during emergencies. Findings included a growing expectation from community members on the use of social media by emergency and government organisations and that community members increasingly prefer to obtain information from community groups on social media.

The research provides a range of suggestions to improve effective use of social media to better meet the needs of vulnerable persons during emergencies. These included the use of communities of practice, education of social media users, development of practice guidelines, standard setting, and monitoring.

Joining the dots: using social media to connect with more vulnerable Victorians during emergencies

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Introduction

Over the last 15 years use of social media) has rapidly expanded to the point that it is used by millions of Australians every day (Yellow 2018). For many people it is an important way of staying connected with friends, family, and the wider community, and for receiving and sharing news, media and commentary. In response to the growing proliferation of these platforms, organisations have developed increasingly sophisticated social media capability, enabling them to use this channel to communicate and interact with the broader community.

Social media is playing an increasing role in helping government, emergency response organisations (EROs), non-government organisations (NGOs), and community groups share information before, during, and after large scale emergency events. The growing ubiquity of social media means that these platforms are an important 'go to' source of information and communication channel for many Australians during emergencies.

Research has highlighted that community members who may be considered more vulnerable to large scale emergencies are disproportionately and adversely affected by these events (IFRC 2013). Vulnerability is defined broadly as referring to those whose circumstances create challenges to seeking, obtaining, or responding to information, or their ability to respond to the same information as the general population (Nick et al. 2009). This definition is purposely broad and reflects that vulnerability changes over time and is context dependent. Circa one in five (19%) Victorians believe they have limitations which may affect their ability to respond to an emergency (Hoy 2018).

This paper reports on research funded by Emergency Management Victoria (EMV) through the National Disaster Resilience Grant Scheme and addresses the question 'how can social media be best used to connect with people who may be considered more vulnerable during an emergency event?' To address this question the paper will consider three issues. The first is to consider the term vulnerable and who might we be referring to in using this term. The second is to assess how social media is currently being used by relevant organisations and vulnerable community members.

Table 1: Summary of the organisations and individuals interviewed during Phase 1.

| Organisation | Example organisation | No. of organisations | No. of interviewees |
|---|---|----------------------|---------------------|
| Government agencies | Central organising agency; fire and emergency services authority | 4 | 10 |
| EROs | Police; fire service | 3 | 8 |
| Local governments | Local councils | 5 | 9 |
| NGOs, CBOs, informal community groups | International NGO; locally focused community organisations; auxiliary response groups; local community groups | 14 | 14 |
| Non-traditional actors (platform-based) | Peer-to-peer accommodation, not-for-profit | 2 | 2 |
| Total | | 28 | 43 |

The third issue is how we might better use social media to connect to the more vulnerable sections of the community. In using the term social media we are referring to Web 2.0 platforms/mobile apps that allow for the creation and sharing of user-generated content.

Phase 1: organisational perspectives

We interviewed 43 people from 28 organisations (see Table 1). The interviewees and organisations were identified through the researchers' professional networks and complemented by a snowballing technique. A semi-structured interview focused on the organisation's role, how it shares information, the tools it used (with a focus on social media), how it reaches out to specific communities, and how it shares information with other organisations.

While most studies considered specific incidents such as a flood, bushfire or hurricane (Choo & Nadarajah 2014; Tim et al. 2016), interviewees in our study were free to reflect on a range of incidents (Allen, Karanasios & Norman 2014). Interviewees reflected on larger scale emergencies that they vividly recollected, predominantly floods, bushfires and heatwaves. Importantly, the reflections accounted for incidents over time, covering multiple instances rather than a single snapshot of an event. Interviewees referred to a range of vulnerable groups such as older persons, socially and geographically isolated persons, recent migrant/refugee communities, and transient persons such as tourists. Interviews were conducted face-to-face or over the phone. One interviewee participated via email. Most interviews were audio-recorded with the permission of the interviewee, or comprehensive notes were taken, allowing the discussion to be reconstructed immediately after.

The interviews and notes were transcribed and entered into NVivo qualitative software for analysis. In total, 620 pages of qualitative data were analysed. Data collection and analysis were conducted simultaneously so understanding could emerge from the theoretical concepts and empirical content. Saturation point was reached when no new themes emerged from the data.

Our coding sequence followed the logic of open coding, axial coding, and selective coding, and the constant comparative method (Charmaz & Mitchell 2001). To ensure a systematic and reliable coding process, two authors analysed each

transcript; after analysis of each transcript we compared and contrasted codes to negotiate a consolidated yet evolving code book. Through multiple rounds of axial coding we identified relationships among the open codes. As our analysis developed, we applied selective coding to focus more on conceptual abstraction (or the 'story-line') based on our insights into the research (Charmaz & Mitchell 2001). This allowed us to manage the volume of data and constantly organise codes into a coherent structure. Alongside the analysis we compared our findings to the literature and this helped us create insights from our research.

In addition to the interviews, study participants were forthcoming with numerous additional materials regarding their work. Illustrative examples include both an NGO and local government disaster guide and preparation manual, and ERO and government strategic reports. These materials contributed to our understanding of organisational strategies and procedures.

Phase 2: social media analysis

In Phase 2 a qualitative review of social media content was undertaken to understand how social media is currently being used by relevant organisations and vulnerable community members. In particular, we were interested in whether organisations provide social media information that engages vulnerable groups or, rather, they focus on delivering general information to the wider population.

The social media analysis focused on Facebook posts with content related to extreme weather events. Data was collected from the public pages of 13 organisations based in Victoria. Three of these—Country Fire Authority (CFA), VicEmergency (EMV), and State Emergency Service (SES)—are state organisations dealing with emergency and extreme weather events. The other 10 organisations are local community groups from regional areas in Victoria. These local groups use their Facebook pages to share alerts on weather events with their members. Netvizz was used to extract data from public Facebook pages and groups for this research. A total of 1,864 posts was collected from the CFA, VicEmergency and SES Facebook pages (713, 828, and 323 posts respectively) for the period 03/01/2018 to 28/02/2018. Likewise, a total of 3,246 posts was collected from the 10 community groups. The Facebook content was filtered using a set of keywords potentially related to vulnerable populations.

The subset of posts containing the keywords were further analysed to identify the common patterns of target audience, content, message, language use, and structure. The social media analysis was undertaken to assess the degree to which specific messaging and information was targeting the more vulnerable sections of the community.

Phase 3: individual perspectives

This phase focused on community member accounts of how they accessed information during times of emergency. First, we undertook interviews and focus groups with individuals in Victoria. The purpose was to obtain an understanding of how different groups use social media in emergencies. The sampling process for individual interviews/focus groups occurred in two ways. First, we reached out to a range of community groups whose member bases constituted a base of vulnerable persons (e.g. Counsel of the Ageing). Second, participants were recruited by selecting from respondents to posters placed on community noticeboards and through the use of snowballing. We included a wide range of participants including persons aged over 60, with physical limitations as well as socially isolated people and travellers (identified in Phase 1 as a potential at-risk group). In total, 47 Victorian participants were included in two focus groups and individual interviews from mainly rural and regional areas, and a smaller number from metropolitan cities. Similar to Phase 1, a semi-structured interview protocol was used to guide the interviews and focus group sessions. The initial part of the interview sought demographic and background contextual information before asking participants questions about how they obtained information (including social media) during severe weather events or larger scale emergencies. There were also questions asking about the types of information sought and shared, and participant attitudes towards various information providers and channels. Most interviews were audio-recorded with the permission of the interviewee(s), or comprehensive notes were taken, allowing the discussion to be reconstructed immediately after. The simple interview protocol enabled straightforward coding of the transcripts to identify the current use patterns and attitudes towards social media. Analysis of the coding generated simple frequencies, respondent rankings of media channels usage, and preferences and sources for information.

The findings from the interviews and focus groups were used to help develop questionnaire items. The survey aimed to identify the attitudes of vulnerable persons in Victoria towards the use of social media in extreme weather events. The term 'extreme weather events' was used in the survey rather than 'emergencies' as it is clearer to a general audience. We built on the interviews and focus group discussions and adapted the Reuter and Spielhofer (2017) survey instrument to generate descriptive statistics and to elicit reasons for respondents' answers. The survey was administered by Qualtrics (www.qualtrics.com). A link to the online survey was sent out to people residing in Victoria who report to have used social media to search or share information during an extreme weather event and who also identify as belonging to different vulnerable groups (i.e. over 60 years old, geographically or socially isolated, suffering from physical limitations and/or of low socioeconomic means). Only respondents who committed

to providing their best answers were eligible to complete the survey. The survey contained 34 questions.

We collected 215 survey responses from Victoria residents who reported they use social media to search or share information during an extreme weather event, and who also identify as belonging to different vulnerable groups (i.e., over 60 years old, geographically or socially isolated, suffering from physical limitations and/or of low socioeconomic means). A summary of the demographics for the survey participants is shown in Table 2.

Results

In this section the findings from the three phases of research are discussed.

Phase 1: organisational and community group interviews

Table 3 summarises the role of the organisations, how they address the informational needs of vulnerable persons, how specific information was, and the directional flow. While Table 3 presents the activities of organisations and groups as silos, clear interdependencies exist amongst them. Victoria's mandated Joint Standard Operating Procedure guides hierarchical flow of information from central government actors to EROs, local governments and filtering through to NGOs and CBOs and informal community groups. While Table 3 is indicative of an inherent top-down information hierarchy, more dynamic and two-way information flows mediated by social media (Reuter, Hughes & Kaufhold 2018) plays a significant role, so information flowed both ways.

Table 3 (column 3) indicates community-based organisations (CBOs), NGOs, and informal community groups provide more specific and contextual information. They followed a more organic approach to understanding the complexities of community response and the needs of vulnerable persons.

Framing vulnerability

There were a range of perspectives on vulnerability. Several interviewees highlighted the transient or temporary nature of vulnerability. This might be for a few days following hospitalisation. For some households, this may occur for the part of the day when the only car (and transport) for the family was unavailable because it had been driven to the primary income earner's work. Similarly, fast moving grass fires in peri-urban areas after school may mean that unsupervised school children are vulnerable until a parent or caregiver arrives home. Although the interviewees were conscious of the Department of Health and Human Services (DHHS) lead policy role for this issue, each set of interviewees offered slightly different perspectives. The framing of vulnerability by the interviewees was consistent with the recent Inspector General of Emergency Management's (IGEM) project on Victorian high risk communities. IGEM highlighted four main factors that limit an individual's or a household's ability to respond to an emergency, namely looking after children or pets, medical conditions, disability, and lack of mobility (Hoy 2018). One further point made by two interviewees was the observation that some community members were unable or unwilling to self-identify as vulnerable. An ERO identified the concern that

Table 2: Demographics of the Victorian residents who participated in the online survey (n = 215).

| Demographic factor | Criteria | Percent of participants |
|--|--|-------------------------|
| Identify as belonging to a vulnerable group (i.e., over 60 years old, geographically or socially isolated, suffering from physical limitations and/or of low socioeconomic means) | Identify as belonging to 1 group | 77.7% |
| | Identify as belonging to 2 groups | 15.7% |
| | Identify as belonging to 3 groups | 4.7% |
| | Identify as belonging to 4 groups | 1.9% |
| National background | Australian | 75.4% |
| | Asian | 9.3% |
| | European | 8.4% |
| | American | 2.3% |
| | African | 0.9% |
| | Other | 3.7% |
| Language | From an English speaking background | 74.9% |
| | From a non-English speaking background | 25.1% |
| Gender | Female | 54.0% |
| | Male | 45.6% |
| | Other | 0.4% |
| Highest level of education | High School | 33.5% |
| | Diploma | 20.5% |
| | Bachelor's Degree | 27.4% |
| | Postgraduate Degree | 14.4% |
| | Other | 4.2% |
| Household types | Lone-person households | 19.5% |
| | Families with children | 40.5% |
| | Families without children | 27.0% |
| | Other | 13.0% |
| Employment status | Full-time | 31.6% |
| | Part-time | 15.8% |
| | Casual | 7.4% |
| | Self-employed | 5.1% |
| | Pensioner | 5.1% |
| | Retired | 10.2% |
| | Homemaker | 7.4% |
| | Unemployed | 14.0% |
| | Other | 3.4% |
| Age | 18-20 | 6.0% |
| | 21-29 | 21.9% |
| | 30-39 | 30.7% |
| | 40-49 | 15.8% |
| | 50-59 | 7.4% |
| | 60-69 | 11.2% |
| | 70+ | 7.0% |

particularly Baby Boomers will not align themselves with messaging that appears to be directed towards people with any level of frailty or vulnerability.

Connecting to vulnerable persons

The above difficulties around identifying and defining vulnerable persons illuminate the challenges organisations have in engaging them through social media and other means. We now turn to examining how social media is used to engage with vulnerable persons and how information flows throughout the landscape of organisations.

Government agencies, EROs and local government were acutely aware of the risk to vulnerable persons and had formulated strategies for engaging them using actors close to the communities. For this reason, there are strong links between government agencies and NGOs that work directly with vulnerable persons and undertake community engagement. Hence the main strategy remains to interact with more vulnerable people through intermediaries, which we refer to as “information brokers” (Hughes & Palen 2012). One government agency provided the example of targeting middle-

aged women because they are more likely to look after young children and older parents, both vulnerable during a heat event. These brokers then may engage more directly via social media. This was supported by analysis of how social media information was spread. Therefore these organisations, used social media to “tie into local trusted networks”, understanding where vulnerable persons are connected to the community. It may also involve social media campaigns that target persons who act as information brokers.

By doing so, government agencies, EROs and local governments provide a clear and consistent message, while delegating to citizens the roles translating, providing local knowledge and context, and sharing with vulnerable persons. This is critical because, in addition to the consistent message, it also helps address difficulties in framing multiple messages to different groups and getting individuals to act on them.

There is capability within these organisations to monitor social media and analyse big data in real time to understand community sentiment and better target specific parts of the community. However, these capabilities are not evenly spread across all organisations. There are still challenges around

resources to analyse social media streams and that adequate numbers of staff are dedicated to social media communication and initiatives.

Some local government, CBOs, and community groups interviewed expressed concerns around the limited social media capability that they had access to.

The NGOs, CBOs and informal community groups relied on top-down information, but adopted different strategies in using social media to reach out to their constituents, either directly or by making this information more relevant. They relied on information from government agencies, EROs and local government as well as from their constituents so information is updated more regularly, incorporates local knowledge, and tailored for different community group’s needs.

Phase 2: social media analysis

One of the questions the project sought to address was how social media is currently being used by relevant organisations

and vulnerable community members. Given that around one in five Victorians believe they have limitations which may affect their ability to respond to an emergency (Hoy 2018), how is social media being used to communicate with this significant section of the community? The social media analysis was undertaken to assess the degree to which specific messaging and information was targeting the more vulnerable sections of the community.

Analysis was undertaken for the posts on the Facebook pages (1,864 posts from the CFA, VicEmergency and SES; and 3,246 posts from 10 community groups) using keywords potentially related to vulnerable populations. This filtering retrieved a total of 35 posts from formal organisations, and 10 posts from community groups. Figure 1 illustrates one of the most frequent types of messages issued as a Facebook post by formal emergency organisations.

Similar messages were collected from the CFA, SES, and VicEmergency.

Table 3: The role of different organisations in addressing vulnerable persons’ informational needs.

| Organisation | Focus on vulnerable communities | Information specificity and information flow |
|--|--|---|
| Government agencies | Provide information to wider community; some provision to engage the vulnerable specifically. | Broad scope, incident specific information. Emphasis of flow from agency to community. Some flow from community to agencies. |
| EROs | Provide information to wider community; some provision to engage the vulnerable specifically. | Broad scope, incident specific information. Emphasis of flow from government to ERO to community. Some flow from community to EROs. |
| Local governments | Identify the vulnerable and develop suitable communication and support activities. | District- or community-centric. Information flow largely from local government to community. Some flow from community to local government. |
| NGOs, CBOs, informal groups | Utilise local networks and connections to identify and support community member needs, including vulnerable persons. | Local community; combine information from official sources with localised content; sharing local knowledge/information; greater multi-directional information flow. Some members of CBO/NGOs may interact with local councils and attend municipal/ERO forums. Group members share knowledge and provide assistance to one another. These groups tend to operate closed (restricted) social media groups and telephone trees. |
| Non-traditional actors (platform-based) | Provide information to wider community; connect persons who need help. | Customer-centric; use largely government and ERO content to assist customers; or not providing guidance or information at all. |



Figure 1: Example of a Facebook post by an emergency organisation.

These organisations provided standard messages that highlight the need to check on immediate neighbours and vulnerable groups within families and communities. The 10 posts from community groups follow the same pattern ('look after', 'keep an eye', etc.). With the exception of people with heart/lung/asthma conditions (addressed using the first person) messages were targeted to the general population rather than to specific groups. This may be consistent with the expectation that social media content will be shared across networks and, perhaps more importantly, will be relayed offline to the relevant individuals. The task of filtering, adding context, and translating these messages was explicitly left to social media users as information brokers with a duty of care. In this regard, the fact that the posts tend to use similar and repetitive formulas across organisations and platforms ('look out', 'look after', etc.) may help to reinforce the message about the expected duty of care towards vulnerable groups (Poblet-Balcell, Karanasios & Cooper 2018).

Phase 3: individual perspectives

Focus groups and interviews were conducted with different vulnerable groups across Victoria, in total capturing the views of 47 persons—both users and non-users of social media. The four main themes identified from these interviews related to: social media use patterns, awareness of emergency services' use of social media and apps, trust and attitudes towards social media, and the important role of informal community networks and relationships. Discussion of each of these themes follows.

Consistent patterns of social media use were found for some demographic groups. Women tended to be greater users of social media and used it to improve and share their understanding potential threats. Many non-users of social media explained that they rely on users of social media for information and passing on up-to-date information. Some older individuals were very clear in their comments that they had no interest or desire to become users of social media.

Table 4: Key themes and findings from online survey of 215 Victorian social media users who identified as either being over 60 years old, geographically or socially isolated, suffering from physical limitations and/or of low socioeconomic means.

| Key themes | Findings |
|--|---|
| Use of social media and technology | <ul style="list-style-type: none"> The most used devices were smartphones (78%), laptops and desktops (66%), and tablets (31%). Regular mobile phones were used often by just under 1 in 5 respondents (19%). Other technologies used included gaming consoles (2%) and smart televisions (4%). Facebook was the most commonly used platform (70% using this platform 'often'). social media usage was on average higher for younger users and women. Women tended to show a more positive attitude towards the use of social media during an emergency. |
| Use of social media during an emergency or severe weather event | <ul style="list-style-type: none"> During an extreme weather event, 7% of respondents said they would spend the same amount of time on social media as they would during normal conditions, 38% would spend less time on social media, and 55% would spend more time on social media. The information searched for on social media was weather conditions or warnings (85% of respondents), damage caused by the event (66%), road or traffic conditions (65%), location of family or friends (55%), information about how others are coping (49%), what to do to keep safe (49%), and eyewitness photos or videos (47%). Almost two-thirds of respondents reported that they had received information about extreme weather events via social media indirectly. |
| Trust and attitudes towards social media as a reliable and helpful source of information | <ul style="list-style-type: none"> 61% of respondents said that they would not trust messages on social media, except for messages posted by official sources. Over 70% of respondents rated EROs and government agencies' social media as very or extremely helpful, and the third highest rated social media provider for these two categories (i.e., very or extremely helpful) was local groups (49%). 68% of respondents agreed that the information provided on social media by EROs meets their needs. 61% of respondents believed that their information needs during extreme weather events are very specific, with 50% preferring to use community groups on social media to obtain information because it is tailored to their needs. |
| Use of social media by EROs | <ul style="list-style-type: none"> 87% of respondents thought that it was important that EROs use social media. There was a mixture of responses to the question asking whether EROs should regularly monitor social media—75% said they should, 53% said they should expect a response within one hour, and 62% said emergency services were too busy to monitor social media during an emergency. |

Over the last eight years there has been significant investment by government organisations and EROs in the development of social media platforms and emergency apps. Interestingly, a common theme from interviews and focus groups was the low levels of knowledge of how emergency services use social media and tools such as the VicEmergency app.

Several of the interview questions probed on the topics of trust and attitudes towards social media as a reliable and helpful source of information. Interviewees expressed varying levels of trust in the veracity of the information on social media.

The final theme highlighted the important role of informal community networks and relationships. Interviewees emphasized the central role these networks and relationships played in helping people to make sense of potential emergencies. These relationships allowed people to develop more specific understanding of what was going on locally. Moreover, the knowledge base of these community networks was strengthened by connections into the local EROs, Victoria Police, and local and state government agencies.

The focus groups and individual interviews informed the design of an online survey. The online survey was completed by 215 Victorian social media users who identified as being either over 60 years old, geographically or socially isolated, suffering from physical limitations and/or of low socioeconomic means. The key findings from this survey clustered under four themes: use of social media and technology, use of social media during an emergency or severe weather event, trust and attitudes towards social media as a reliable and helpful source of information, and use of social media by EROs. Discussion of each theme follows and a summary of these findings is provided in Table 4.

Use of social media and technology

The survey found that the most used devices were smartphones (78%), laptops and desktops (66%), and tablets (31%). Regular mobile phones are used somewhat less with 19% respondents reporting that they used these devices 'often'. A small number of respondents noted using other technologies such as gaming consoles (2%) and smart televisions (4%). Facebook was the most commonly used social media platform, with 70% of respondents using this platform 'often'. Social media use was on average higher for younger respondents and women indicated a more positive attitude towards the use of social media during an emergency.

Use of social media during an emergency or severe weather event

Respondents varied in their reporting of whether they would use social media during an emergency. A small number reported the same level of social media usage (7%), slightly more than one-third (38%) reported they would use social media less, and just over half reported increased social media usage (55%). On balance this suggests that a greater proportion of respondents would tend to increase their use of social media during an emergency, although clearly some respondents would spend less time on social media. The most sought information on social media during an emergency was weather conditions or warnings (85%), damage caused by the event (66%), road or traffic conditions (65%), location of family or friends (55%), information about how others are coping

(49%), what to do to keep safe (49%), and eyewitness photos or videos (47%). This pattern of results suggests that social media is used to obtain information for multiple purposes including sensemaking, informing decision making, and checking on family and friends. One of the more interesting findings concerned the reach of social media. Almost two-thirds of respondents reported that they had received information about extreme weather events via social media indirectly.

Trust and attitudes towards social media as a reliable and helpful source of information

The survey suggested that the level of trust and attitudes towards social media was a more complex story and in some respects appeared slightly contradictory. Respondents were quite specific about their trust of social media sources, with 61% of respondents noting they would not trust messages on social media, except for those posted by official sources. Helpfulness ratings of ERO and government provided social media was high with 70% of respondents rating this as 'very' or 'extremely helpful'. Local community group social media was the third highest rated source for helpfulness with 49% rating it as very or extremely helpful. There was generally a positive view of EROs social media with 68% of respondents agreeing that the information provided by EROs met their needs. The survey highlighted that 61% of respondents believed they had very specific information needs during extreme weather events. Interestingly, 50% of respondents preferred to use community groups social media to obtain this information because it was tailored to their needs.

Use of social media by EROs

There was widely held belief (87% of respondents) that it was important for EROs to use social media. However, there were varying views on how attentive EROs should be in terms of monitoring and replying to queries on social media. Three-quarters (75%) of respondents said that EROs should monitor social media. Just over half of respondents (53%) said EROs should respond to queries on social media within one hour, and 62% said that the emergency services were too busy to respond to monitor social media during an emergency. The survey findings suggest that social media is now seen as a core activity for EROs.

Discussion: implications from this research

The three phases of research undertaken in this project each provide some important insight into how social media is used to inform more vulnerable Victorians. The organisational interviewees offered a quite nuanced description of vulnerability, recognising the importance of temporal and contextual factors. This perspective means that in essence all Victorians could periodically be vulnerable. The observation that circa 1 in 5 (19%) of Victorians believe they have limitations which may affect their ability to respond to an emergency underscores this point (Hoy 2018). However, it was also observed that some community members may not self-identify as vulnerable, and this has implications for the type of approach required to more fully engage the community in this discussion.

The organisational interviews highlighted the central role that government organisations and EROs played in providing core messaging and information through social media and other channels. These organisations worked hard to make sure they provided timely and sound information. However, this information was generally more generic and tended not to be targeted towards specific groups who may be considered more vulnerable.

A further insight was the multiple and complementary approaches used by organisations to interact with more vulnerable sections of the community. social media was used by government organisations and EROs to recruit and engage information brokers to reach people who may be more vulnerable, an approach previously identified by Hughes and Palen (2012). Local government, NGOs, community-based organisations, and informal groups made extensive use of informal networks to maintain contact and generate information most relevant to locals. Digital platforms are increasingly used to match people in need with others who can help (e.g. Ready2Help), mapping applications, and for crowdsourcing (Poblet et al. 2017). In particular community Facebook groups play a central role by blending official information from EROs and government with knowledge from local networks to provide more granular and contextualised information.

A final insight from the interviews were the variation in social media capability across organisations in the sector. The larger government departments interviewed tended to have greater social media capability and in some cases supplementary resources such as digital marketing expertise. At the local government and community-level, social media resources were more limited and in some instances very sparse. The recent development of virtual operation support teams (VOST) provides the potential opportunity for organisations to build greater surge capacity to resource social media monitoring and management during larger scale emergencies (McLennan et al. 2016).

The social media analysis highlighted that social media postings specifically targeting more vulnerable sections of the community were less common. Less than 1% of the Facebook posting reviewed targeted sections of the community who may be more vulnerable. Moreover, these postings tended to target brokers such as middle-aged women rather than the more vulnerable. The limited attention provided to more vulnerable sections of the community is consistent with other research undertaken in the sector (e.g. IFRC 2013).

The interviews, focus groups, and online survey highlighted a number of features of how people interact through technology and social media and some of their attitudes towards using social media platforms. Facebook is currently the most used social media platform in Victoria and this finding is consistent with other research (e.g. Yellow 2018). Smartphones, computers, and tablets were the most common technologies used. social media is used during emergencies to obtain information for various purposes including sensemaking, informing decision making, and checking on family and friends. On balance more community members are likely to use social media during a larger scale emergency although it is also important to note that some community members may spend less time on social media.

The reach of social media appears to be somewhat wider than direct users given that almost two-thirds of respondents

reported that they had received information about extreme weather events via social media indirectly. The level of trust and attitude towards social media was a slightly more complex story. Although there was a positive view of EROs' social media, half of respondents preferred to obtain information from their local community group's social media. These findings suggest that respondents value trustworthiness and tailored information and that perhaps local community groups as known actors with local understanding offer both of these. This pattern is similar to that identified by Bird et al. (2012) who noted that government websites and social media ranked higher for trustworthiness but community social media ranked higher for usefulness and timeliness.

The survey highlighted that ERO use of social media tends to be seen as core activity by users. However, there was some inconsistencies around the expectations of social media monitoring and response to social media queries by EROs. This mismatch between the use of social media by EROs and public expectation has previously been identified by Reuter et al. (2018).

The research identified three main sets of issues, which create both opportunities and challenges for the sector.

The nature of the information flows and roles of actors

There is a tension between the top-down model which emphasises clear and consistent information with the demand for information that is contextualised to individuals' needs. Almost 50% of the respondents surveyed noted that they preferred to use community groups' social media because it is tailored to meet their needs.

For vulnerable groups, a challenge is the balance between consistent/clear information and targeted information. The use of 'information brokers' is one strategy used to navigate this tension.

There is a need to better explain how all the actors fit in the emerging information landscape, in particular new actors such as organic community and volunteer groups, and extending organisations such as Facebook and other platform-based actors. There is also a need to understand how to utilise such organisations, groups and platforms during emergencies. Along with the growing convergence of actors, there is a parallel increase in complexity and thus divergent interpretations may take place. These may result in outcomes and behaviour that is difficult to predict.

Understanding that not all information channels are well suited to some sections of the community. These issues include when and how social media is used (and the related aspect of connectivity).

Technology, practices and capabilities

There is a need to build effective internal capability within organisations to use social media, enact communication strategies for vulnerable persons on social media, as well as engage the volunteer base. While acknowledging the role of social media, there is unevenness in capability and resourcing. This is important because our study shows that 88% of individuals expect to use social media more in the future for emergencies. Other studies show that two-thirds of adults rely on social media for their news (Moon 2017). Our study also showed that expectations of

emergency services are likely to grow with 75% agreeing that emergency services should regularly monitor their social media sites to respond to requests and 52% expecting a response within an hour.

There have been rapid changes in technology and social media usage over the past 15 years. It is important that organisations are aware of which social media platforms vulnerable people are more likely to turn to, as well as the types of information they tend to seek and share. Our study showed that individuals use social media (73%) for emergency related information, which is only second to TV news (87%) and more than radio (61%).

There is a need to ensure social media complements traditional information and communication channels rather than substitutes them. This is important for segments of the population that do not use social media.

Particularly for NGOs, CBOs, and informal community-groups there is a need to put into place good practices to allow for local information sharing whilst accommodating top-down information.

There is a need to evaluate the effectiveness of current information and communication strategies; i.e., Are users engaging with it? How far does information travel through information brokers? In our study individuals considered the information sought from emergency response organisations and government agencies as either “extremely helpful” or “very helpful” (93% and 88% respectively). While this data shows that information provided directly by EROs is well received, this does not indicate whether the information positively influenced behaviour and does not capture how effective information brokers have been in reaching particular sections of the community. A second issue that arises from the increasing reliance on NGOs and community groups to translate and contextualise information from government and EROs is the need for some best practice guidelines (ideally co-designed) and training to support these groups to do this effectively.

Engaging at risk groups and vulnerability

In recent years there has been an increased focus on vulnerability and emergencies (DHHS 2018; MAV 2018; VCOSS 2018), however the term vulnerability was contested in our study. Consideration and future research are required to better understand when, why and how long people are vulnerable, as this is not part of the mainstream or social media discourse. Likewise, studies on social media use in emergencies tend to treat populations as homogenous rather than consider the use by at-risk groups.

There are three main strategies that can be used with social media to engage vulnerable communities. The first is the simplest and uses social media to broadcast emergency related information, advice and warnings. This approach is mainly used by government agencies and EROs. The second is using social media to crowdsource and thus tap into local knowledge, images and local updates. Local community groups make extensive use this approach although local government, NGOs and some community-facing parts of EROs use this approach too. The third is using social media to find and engage information brokers, trusted intermediaries for vulnerable persons. This approach is mainly used by government agencies and EROs.

There is a need to manage the challenge of effectively identifying vulnerable persons in light of the multifaceted and fluid nature of vulnerability. In our survey 62% individuals with a vulnerability used social media to share emergency information—tapping into groups well connected with their communities of practice could help spread the reach of relevant information.

Conclusion

Since the 2014 National Review of Emergency Warnings and Information (EMV 2014), ongoing changes in technology and the growth in social media use has continued at quite a pace. These developments create ongoing challenges and opportunities for all actors in the sector. Our research found that Victorian organisations were attune to the issue of risk and vulnerability for communities they serve. Moreover, many of these organisations were continuing to invest in and develop good social media capability.

An ongoing tension in the sector is between ensuring the provision of reliable and accurate information (albeit more generic), and information that is more granular and made relevant for a specific community. social media is enabling local communities to utilise reliable official information, but also to enhance this with local knowledge to create a shared information that is more meaningful and useful. These community networks help people to be part of a local network, sharing local knowledge and resources. This has become commonplace across Victoria.

The use of social media to engage information brokers appears to be a very useful strategy to reach more vulnerable community members. It is a simple way to help ensure community member susceptible to the negative effects of large scale emergencies or severe weather events can be supported. This approach could be further broadened to ensure that other sections of the community who may not traditionally be thought as vulnerable are reached through this strategy.

The recent development of VOSTs provides the opportunity for the sector to create surge capacity, enabling the application of additional and valuable social media capability during and post large-scale emergencies. However, the more effective use of VOSTs is likely to require further work by the sector to formalise this potential surge capacity and to ensure that these teams can appropriately coordinate and integrate their activities with other key actors. This may require more formal arrangements between government organisations/EROs and VOST groups and the development of an appropriate collaboration framework.

Individuals interviewed as part of this study highlight a growing expectation of more meaningful social media interaction with EROs and government agencies. These agencies will need carefully consider how they will respond to this growing demand.

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