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A strategy for communication between key agencies and members of the public during crisis situations

Deliverable Number: D3.3

Date	September 30, 2015
Due Date (according to DoW)	September 30, 2015
Dissemination level	PU

Grant Agreement No:	607665
Coordinator:	Anders Lönnermark at SP Sveriges Tekniska Forskningsinstitut (SP Technical Research Institute of Sweden)
Project acronym:	CascEff
Project title:	Modelling of dependencies and cascading effects for emergency management in crisis situations

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Executive Summary

Three case studies were explored in order to develop a communication strategy that could be employed by key agencies in conjunction with members of the public during incidents that had the potential to generate cascading effects:

1) The floods in South-West England (December 2013 - February 2014);
2) The thunderstorm that hit the Pukkelpop music festival in Belgium (18 August 2011); and
3) The rioting in the town of Haren, in the Netherlands (21 September 2012), after thousands of young people gathered for a local girl's birthday party advertised as 'Project X Haren'.

The strategy was based on information gathered through a review of the literature on the role of the media in emergency management, an exploration of the communication strategies deployed by key agencies in each of these case studies, and the key findings from a critical thematic analysis of 41 semi-structured interviews conducted with key stakeholders between December 2014 and May 2015.

SPEAK Guidelines

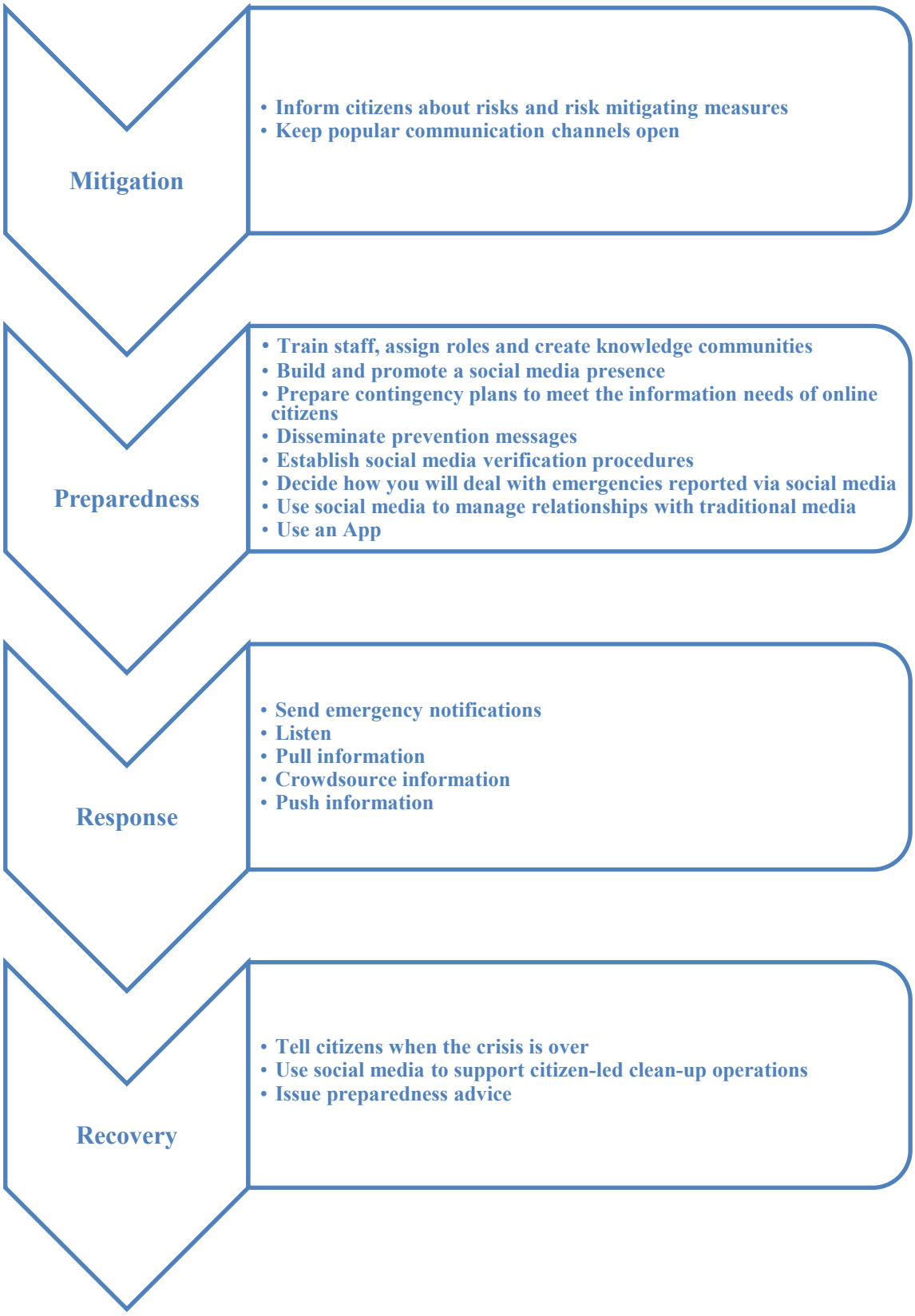
Five key guidelines for effective communication between blue light organisations and members of the public during crisis situations were identified. These guidelines, which we refer to as 'SPEAK' were:

1) **S**tudy the information-seeking behaviours of your audience before deciding upon which communication platforms to use during crisis situations;
2) **P**repare for the loss of critical infrastructure during such incidents by employing a communication mix that includes both traditional and digital media;
3) **E**ngage key stakeholders e.g. civil society organisations in order to ensure that the information shared with the general public is both accurate and consistent
4) **A**lways consider the ethical implications of using crowdsourced information obtained from social media sites; and
5) **K**nowledge gained from previous incidents should be used to inform future communication strategies.

These 'SPEAK' guidelines should be implemented by emergency managers at key stages of disasters (mitigation, preparedness, response and recovery) to help mitigate potential cascading effects.

Communication Strategy Flowchart

A communication flowchart (see below) was created to explore the communication tactics that are applicable during each of the four phases of a disaster (mitigation, preparedness, response and recovery).


Mitigation
• Inform citizens about risks and risk mitigating measures
• Keep popular communication channels open
Preparedness
• Train staff, assign roles and create knowledge communities
• Build and promote a social media presence
• Prepare contingency plans to meet the information needs of online citizens
• Disseminate prevention messages
• Establish social media verification procedures
• Decide how you will deal with emergencies reported via social media
• Use social media to manage relationships with traditional media
• Use an App
Response
• Send emergency notifications
• Listen
• Pull information
• Crowdsource information
• Push information
Recovery
• Tell citizens when the crisis is over
• Use social media to support citizen-led clean-up operations
• Issue preparedness advice

Nomenclature

asynchronous channels	communication channels characterised by separation of message exchange by time and space e.g. e-mail[1]
digital media	any media that are encoded in a machine-readable format and can be created, viewed, distributed, modified and preserved on computers
situational awareness	the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future[2]
social media	the collection of software that enables individuals and communities to gather, communicate, share and in some cases collaborate or play[3]
synchronous channels	communication channels which allow for message exchange in 'real time' e.g. telephone calls[4]
traditional media	media introduced before the advent of the internet that are for the purposes of mass communication e.g. billboards, magazines, newspapers, radio and television broadcasting[5]
user generated content	content that is contributed by social media users rather than journalists/editors[6]

Acknowledgements

We would like to thank all of our participants who agreed to be interviewed for this research.

1 Introduction

1.1 Task description

The communication strategy presented here is the result of research activities carried out under Task 3.5, which is part of Work Package 3 (WP3) - 'First responder tactics, human activities, interaction and behavior' and which focuses on 'Communication with the public and coordination between agencies' in particular. According to the Description of Work (DoW), Task 3.5 will:

> Develop a strategy and methodology for communication and coordination to help the human decision maker (the IC[7]) to mitigate cascading effects during crisis situations. The focus will be on how mainstream media organisations can contribute to public information and incident development during a crisis with cascading effects. This task will examine the respective media strategies used by decision makers and incident managers and consider how crises are presented in the media. Building on Task 3.2, the

[1] Verderber, K. S., Sellnow, D. D. & Verderber, R. F. (2015). *COMM ³*. Stamford, CT: Cengage Learning.
[2] Endsley, M. R. (1998). A comparative analysis of SAGAT and SART for evaluations of situation awareness. In Proceedings of the Human Factors and Ergonomics Society 42nd Annual Meeting (pp. 82-86). Santa Monica, CA: The Human Factors and Ergonomics Society.
[3] boyd, d. (2009). 'Social media is here to stay... now what?' Available at: http://www.danah.org/papers/talks/MSRTechFest2009.html (accessed 24 September 2015).
[4] Verderber, K. S., Sellnow, D. D. & Verderber, R. F. (2015). *COMM ³*. Stamford, CT: Cengage Learning.
[5] Lee, F. L.F., Leung, L., Qiu, J. L. & Chu, D. S. C. (2013). *Frontiers in new media research*. New York: Taylor & Francis.
[6] boyd, d. (2009). 'Social media is here to stay... now what?' Available at: http://www.danah.org/papers/talks/MSRTechFest2009.html (accessed 24 September 2015).
[7] IC is an abbreviation for Incident Commander.

information flows that emerge during crises will also be analysed in order to develop this communication strategy, with a particular emphasis on the potential use of social media to transmit information to key stakeholders and members of the public.

1.2 Deliverable description

This Deliverable (D3.3) associated with Task 3.5 is described in the DoW as:

> A strategy for communication between key agencies and members of the public during crisis situations including the use of social and traditional media channels in crisis scenarios: A flowchart describing the strategy for communication between key agencies and members of the public during crisis situations including the use of social and traditional media channels in crisis scenarios.

1.3 Approach

All incidents have the potential to escalate and, through cascading effects, evolve into something much greater than their initiating events might suggest. In CascEff, we have defined cascading effects as the *impacts* of an initiating event where:

1) System dependencies lead to impacts propagating to other systems;
2) The combined impacts of the propagated events are of greater consequences than the root impacts; and
3) Multiple stakeholders and/or responders are involved.

Such effects are particularly likely to occur during natural disasters and public order incidents.[8] Three case studies, which represent examples of such incidents, were explored in order to develop a communication strategy that could be employed by key agencies in conjunction with members of the public. The case studies are:

1) The floods in South-West England (December 2013 - February 2014);
2) The thunderstorm that hit the Pukkelpop music festival in Belgium (18 August 2011); and
3) The rioting in the town of Haren, in the Netherlands (21 September 2012), after thousands of young people gathered for a local girl's birthday party advertised as 'Project X Haren'.

The communication strategy presented below is based on information gathered through a review of the literature on the role of the media in crisis management, an exploration of the communication strategies deployed by key agencies in each of these case studies and the key findings from a critical thematic analysis of 41 semi-structured interviews conducted with key stakeholders between December 2014 and May 2015. Interviewees were selected on the basis of their experience in crisis communication and, in most cases, their direct involvement in the management of the three aforementioned crises (see Appendix 1). This ensured that the proposed strategy was informed not only by theory and practice, but also that it drew on relevant expertise from Belgium, the Netherlands and the United Kingdom (UK).

In line with the goals set out in the DoW, the communication strategy is primarily aimed at 'blue light' organisations, and in particular, those that regularly participate in crisis management, such as Police and Fire and Rescue Services. It can, however, also provide valuable insight for critical infrastructure providers who may be vulnerable to cascading effects from both human-made and natural disasters. In this way, it is intended to supplement existing

[8] Ekman, O. & Lange, D. (2015). *D1.2 Report of incident management in crisis*. CascEff project.

guidelines for effective communication during crisis situations, such as those developed by the COSMIC and iSAR+ projects (see Appendix 2 for more details).

This deliverable outlines a number of guidelines for effective communication between key agencies and members of the public during crisis situations. These inform the recommended communication practices for key stages of disasters (mitigation, preparedness, response and recovery) in the flowchart at the end of the report.

2 Guidelines for effective communication between key agencies and members of the public during crisis situations

Task 3.5 of CascEff identified five key guidelines for effective communication between blue light organisations and members of the public during crisis situations. These guidelines, which we refer to here as 'SPEAK' are:

1) **S**tudy the information-seeking behaviours of your audience before deciding upon which communication platforms to use during crisis situations;
2) **P**repare for the loss of critical infrastructure during such incidents by employing a communication mix that includes both traditional and digital media;
3) **E**ngage key stakeholders e.g. civil society organisations in order to ensure that the information shared with the general public is both accurate and consistent;
4) **A**lways consider the ethical implications of using crowdsourced information obtained from social media sites; and
5) **K**nowledge gained from previous incidents should be used to inform future communication strategies.

We contend that these 'SPEAK' guidelines should be implemented by emergency managers at key stages of disasters that have the potential to lead to cascading effects.[9]

2.1 Study the information-seeking behaviours of your audience before deciding upon which communication platforms to use during crisis situations

People tend to search for information about disasters when they perceive that these events are likely to directly threaten their own lives or property.[10] Such information 'needs' intuitively relate to how the course of the disaster will affect citizens (otherwise known as situational awareness), but also occur when individuals try to reach out to family and friends in order to check whether they are safe from harm.[11] Individuals may also search for information on which organisations are responsible for delivering disaster recovery missions in affected areas.[12] Previous research, which draws heavily on the uses and gratification theory of Blumler and

[9] Powell, J. W. & Rayner, J. (1952). *Progress notes: Disaster investigation*. Edgewood, Maryland: US Army Chemical Center, Chemical Corps Medical Laboratories.
[10] Westerman, D. & Spence, P. (2013). Social media as information source: Recency of updates and credibility of information. *Journal of Computer-Mediated Communication*, *19*, 17-183.
[11] Thelwall, M., & Stuart, D. (2007). RUOK? Blogging communication technologies during crises. *Journal of Computer-Mediated Communication*, *12*(2), 523-548.
[12] van Leuven, L. J. (2009). Optimizing citizen engagement during emergencies through use of web 2.0 technologies. Master's thesis. Available at: www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA497269 (accessed 1 September 2015).

Katz,[13] suggests that individuals turn to those media platforms that are perceived to satisfy their information 'needs' during crises.[14]

Social media sites such as Facebook and Twitter not only make it easier for citizens to follow breaking news in real-time, but also help bring together those communities that have experienced trauma due to a human-made or natural disaster.[15] Heavy social media users, such as those aged between 16 and 24 years old, are likely to perceive that these sites are more credible than traditional media as they provide crisis information that is not available elsewhere.[16] The frequency of updates available on social media may also provide advantages for emergency management communicators who wish to share accurate, real-time information with members of the public. The amplification and serial transmission of crisis messages can be encouraged through the 'retweet' function on the microblogging site Twitter. There has also been some evidence to suggest that citizens use these sites to search for information to corroborate warning messages before deciding how to act upon them.[17]

That is not to say that social media should automatically be viewed as the most effective mode of communication adopted by key stakeholders during the various stages of a disaster. As well as the persistence of the gap between those who are able to benefit from the internet and those who are not (also known as the digital divide), there remains some skepticism amongst users about the accuracy and trustworthiness of information posted online. Several studies have suggested that the general public continue to perceive traditional media such as newspapers to be more credible and trustworthy than online sources.[18]

While acknowledging the integral role of social media in 'spreading' crisis information, the social media mediated crisis communication (SMCC) model proposed by Yan Jin and colleagues acknowledges that traditional media, as well as offline social interactions, remain important components of crisis communication.[19] A more nuanced interpretation of this research suggests that while people are most likely to seek out familiar social networks in the aftermath of a disaster, the means by which they access these may ultimately depend on what media is available to them. Empirical data gathered from disasters such as Hurricane Sandy, which caused extensive damage in the New York and New Jersey regions after it made landfall on the eastern seaboard of the United States (US) in October 2012, suggested that new assemblages of what could be dubbed 'old and new media practices' were adopted by people in order to seek emotional support during these events. Residents in areas affected by Sandy used every method possible in order to obtain information, receiving news from peer networks, radio, television and social media sites such as Twitter.[20] This suggests that emergency management may require the use of multiple asynchronous *and* synchronous channels in order to communicate effectively with citizens in affected areas.

[13] Blumler, J. G. & Katz, E. (1974). *The Uses of Mass Communication*. Newbury Park, CA: Sage.
[14] Austin, L., Fisher, B. & Yan J. (2012). How audiences seek out crisis information: Exploring the social-mediated crisis communication model, *Journal of Applied Communication Research, 40*(2), 188-207.
[15] Murthy, D. (2012). *Twitter: Social communication in the Twitter Age.* Cambridge: Polity Press.
[16] Sutton, J., Palen, L. & Shklovki, I. (2008). Backchannels on the front lines: Emergent use of social media in the 2007 Southern California fires. *Proceedings of the 2008 Information Systems for Crisis Response and Management Conference (ISCRAM 2008),* Washington, D.C., pp. 624-631.
[17] Sutton, J., Spiro, E. S., Johnson, B., Fitzhugh, S., Gibson, B. & Butts, C.T. (2014). Warning tweets: serial transmission of messages during the warning phase of a disaster event. *Information, Communication & Society*, *17*(6), 765-787.
[18] Stephens, K. K., Barrett, A. K. & Mahometa, M. J. (2013). Organizational communication in emergencies: Using multiple channels and sources to combat noise and capture attention**.** *Human Communication Research*, *39*, 230-251.
[19] Jin, Y., Liu, B. F. & Austin, L. L. (2011). Examining the role of social media in effective crisis management: The effects of crisis origin, information form, and source on publics' crisis responses. *Communication Research*, *41*(1), 74-94.
[20] Burger, J., Gochfeld, M., Jeitner, C., Pittfield, T. & Donio, M. (2013). Trusted information sources used during and after Superstorm Sandy: TV and radio were used more often than social media. *Journal of Toxicology and Environmental Health, Part A: Current Issues*, *76*(20), 1138-1150.

We advocate a more strategic approach than this 'all-channel' model for those blue light organisations that directly communicate with the public during crisis situations. A pre-requisite for this communication strategy is the collection and analysis of data relating to the information-seeking behaviours of citizens. Specifically, this should include:

- An overview of the communication infrastructure that is available to residents of areas that are deemed to be vulnerable to human-made or natural disasters; and
- A detailed analysis of the types of media these residents use on a daily basis, with a specific focus on what platforms they would use to obtain situational awareness during disasters.

In terms of the former, there would appear to be a clear rationale for European emergency management communicators to use online media during crisis situations. The most recently available data (January 2015) shows that 81 percent of the population in Western Europe have access to the internet, compared to 58 percent in Eastern Europe and 42 percent of the world's population.[21] Social media consumption has also grown exponentially over the past decade, with an estimated 300 million active social media users across Europe at the start of 2014.[22]

Yet, the persistence of the digital divide militates against the adoption of crisis communication strategies that rely solely on digital media technologies. Recent studies have shown that only 40 percent of Europeans can be characterised as active social media users,[23] with 22.4 percent reporting that they do not use the internet at all.[24] Although the gap between rural and national internet penetration rates in European Union (EU) member states has decreased between 2010 and 2014 (from 12 to 8 percent[25]), there are still some geographical areas that have little to no internet connectivity. Such broadband 'blackspots' have implications for Police and Fire and Rescue Services situated in rural areas within the UK. For example, the Llanberis Mountain Service reported that the slow and unreliable internet connection in Snowdonia, North Wales (with speeds said to be below 1Mb/s) hindered their efforts to use digital media tools to locate injured mountaineers.[26] The most recent iteration of the UK digital communications infrastructure strategy has pledged to address these issues by rolling out superfast broadband to 95 percent of UK premises, as well as 4G mobile communications to 98 percent of population, by the end of 2017.[27] Nevertheless, emergency management communicators need to be aware of the communications infrastructure available to members of the public before deciding upon which platforms to use during crisis situations.

It is also important to study the media channels that are most frequently accessed by residents of areas likely to be affected by human-made and natural disasters. Clearly, it may be prudent for emergency management communicators to use 'tried and trusted' traditional media such as newspapers, radio, television, electronic billboards, text-to-speech phone calls, stewards and PA

[21] Kemp, S. (2015). *Digital, social and mobile worldwide in 2015.*Available at: http://wearesocial.net/blog/2015/01/digital-social-mobile-worldwide-2015/ (accessed 1 September 2015).
[22] Kemp, S. (2014). *European digital landscape*. Available at: http://wearesocial.net/blog/2014/02/social-digital-mobile-europe-2014/ (accessed 1 September 2015).
[23] Kemp, S. (2015). *Digital, social and mobile worldwide in 2015*. Available at: http://wearesocial.net/blog/2015/01/digital-social-mobile-worldwide-2015/ (accessed 1 September 2015).
[24] International Telecommunications Union. (2015). *ICT Facts and Figures: The World in 2015.* Available at: http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf (accessed 7 September 2015).
[25] European Commission (2015). *Digital Agenda Scorecard 2015.* Available at: http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=9929 (accessed 6 September 2015).
[26] Reisdorf, B. & Oostveen, A. (2015). A promised 'right' to fast internet rings hollow for millions stuck with 20th-century speeds. *The Conversation*, Science & Technology section, (accessed 10 September 2015).
[27] Department for Culture Media and Sport (2015). *The Digital Communications Infrastructure Strategy*. Available at: https://www.gov.uk/government/publications/the-digital-communications-infrastructure-strategy (accessed 10 September 2015).

systems[28] to disseminate information to the general public. However, a more strategic approach may be required which takes into account the sites that are used by members of the public during crisis situations. For the foreseeable future this is likely to revolve around the three most popular social media sites worldwide, namely Facebook, Twitter and YouTube.[29] Facebook, for example, has consistently come up as the most popular social media site in the UK[30], Belgium[31] and the Netherlands.[32] That is not to say that sites should be used for the dissemination of crisis information based solely upon their popularity. Rather, our interviewees extolled the virtues of using those social media sites that were most likely to facilitate public engagement with such content. Facebook was the preferred site in Belgium, whereas Twitter was perceived as the most effective tool for engaging the general public in both the Netherlands and the UK. Local variations in these trends were noted by several of the participants. For example, both Facebook and Twitter were used interchangeably by local Police Departments in Belgium, with no obvious explanation given for why one site was more effective than another in the context of crisis situations.

While it is beyond the scope of this report to fully explain these observations, we propose that key agencies should explore the information-seeking behaviours of their respective audiences before deciding upon which media channels should be used in the context of crisis situations. Such data will help emergency management communicators to develop a more strategic and efficient communication strategy to be deployed during such incidents. This should ideally be an annual activity in order to allow for changes in the communications infrastructure and the emergence of new media platforms that are popular amongst the target population.

Recommendations:

- Collect and analyse data on the local, regional and national communications infrastructure
- Identify the communication channels your target audience are able to access
- Identify the traditional and social media platforms that your target audience uses on a regular basis
- Review the available communications infrastructure and the information-seeking behaviours of your audience on an annual basis in order to inform future communication strategies

2.2 Prepare for the loss of critical infrastructure during such incidents by employing a communication mix that includes both traditional and digital media

A related concern for emergency management communicators is how to ensure that their communication strategies during crisis situations are not disrupted by ‘single points of failure’ within the communications infrastructure in disaster-affected areas. The review discussed above should help identify vulnerabilities in the communications infrastructure, as well as provide

[28] PA systems stands for public address systems - systems for electronic sound amplification and distribution comprised of a microphone, amplifier and loudspeakers and used to address large publics.
[29] Chaffey, D. (2015). Global social media research summary 2015. *Smart Insights*. Available at: http://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/ (accessed 6 September 2015).
[30] Ofcom (2014). *Adults' media use and attitudes report*. Available at: http://stakeholders.ofcom.org.uk/market-data-research/other/research-publications/adults/adults-media-lit-14/ (accessed 11 September 2015).
[31] BVLG (2015). *Belgian Social Media Monitor - augustus 2015*. Available at: http://bvlg.blogspot.be/2015/08/belgian-social-media-monitor-augustus.html (accessed 24 September 2015).
[32] telecompaper (2015). Facebook still most popular, but other social media growing. Available at: http://www.telecompaper.com/news/facebook-still-most-popular-but-other-social-media-growing--1065848 (accessed 10 September 2015).

valuable insight into the media channels used by citizens in areas likely to be affected by human-made or natural disasters. However, the consensus amongst our interviewees was that some form of network failure was inevitable and that such issues were best addressed through the use of a communication mix that involved both traditional and digital media.

Power outages and network failures may make it difficult for citizens to access crisis information via both traditional and social media platforms. The loss of electricity might make it difficult for citizens to access television news coverage of disasters. Mobile wireless communication networks and wifi connections may fail when too many users within the same geographical area attempt to log on to internet services using their smart phones. 'Patchy' internet connectivity was said to have impeded the emergency services who responded to both the Pukkelpop disaster and the Project X Haren riots. People might also experience difficulties with their own communication devices during such incidents. Our Belgian interviewees provided anecdotal evidence of how the heavy rain during the Pukkelpop disaster had damaged the smart phones of many of the festival-goers, thus denying them a form of access to their social networks after the storm that hit the festival site. Battery life might similarly be viewed as a potential point of failure that might prevent citizens from accessing crisis information.

The lack of technical infrastructure required in face-to-face communication, public meetings and the use of loudspeakers, might suggest that these more traditional communication channels are the most reliable way of ensuring that members of the public receive crisis-related information during power outages. These findings are corroborated by research on evacuation communication during human-made and natural disasters.[33] Yet doubts persist in relation to the efficacy of using these modes of communication during disasters that affect large populations, especially in rural areas. Our interviewees identified radio as a particularly effective and resilient communication channel that can reach large populations even in those circumstances where power supplies are disrupted. This finding was congruent with previous research into crisis communication during disasters. During Hurricane Sandy, for example, some New Jersey residents reported that they had used portable radios to obtain information about the course of events due to the disruption of power supply and communication networks in the region.[34]

Nevertheless, our interviewees emphasised the importance of using multiple traditional and digital media platforms (such as Apps, cell broadcast, e-mail bulletins, newspapers, text to speech calls, radio, SMS, social media and television), in order to reach as many people as possible during human-made or natural disasters. We propose that this communication mix should include not only media that are readily available and disaster-resilient, but also that are the most likely to be used by local residents to search for crisis information.

Recommendations:

- Study the vulnerabilities of communications infrastructure in areas likely to be affected by human-made and natural disasters
- Identify those communication channels that are likely to be particularly resilient during disasters e.g. radio
- Use a combination of both social and traditional media in order to reach as many local residents as possible
- Low-tech communication channels e.g. loudspeakers should still have an important role to play in the communication mix

[33] Amon, F., Lindström, J., Lindström, P., Lange, D., Lönnermark, A., Svensson, S., Ronchi, E., Uriz, F. N., Criel, X. & Reilly, P. (2015). *Effects of human activities on the progression and development of large scale crises*. CascEff project.
[34] Burger, J., Gochfeld, M., Jeitner, C., Pittfield, T. & Donio, M. (2013). Trusted information sources used during and after Superstorm Sandy: TV and radio were used more often than social media. *Journal of Toxicology and Environmental Health, Part A: Current Issues*, *76*(20), 1138-1150.

2.3 Engage key stakeholders in order to ensure that information shared with the general public is consistent

Top-down approaches towards Disaster Risk Reduction (DRR)[35] have gradually been replaced in countries such as the UK and the US by an emphasis on 'shared responsibility', whereby local communities are encouraged to play a more active role in preparing for and responding to disasters.[36] For example, organisations such as the American Federal Emergency Management Agency (FEMA) have used their official YouTube channel to provide US citizens with information on topics such as how to prepare a disaster kit and take appropriate action during an emergency.[37] Therefore, cooperation between emergency management communicators and key stakeholders, such as local politicians, critical infrastructure providers and civil society organisations, is essential in order to ensure the serial transmission of accurate information during crisis situations.[38] Previous studies have also shown how the repetition of the same information through multiple channels during emergencies can help communicate situational urgency to target audiences, thus making it more likely that they will take appropriate action to protect themselves and their families.[39] Conversely, the lack of message consistency from key stakeholders may contribute to the cascading effects of natural disasters and public order incidents. In the case of the Project X Haren riots, conflicting messages from the Mayor of Haren and other authorities about an alternative party being organised in the town were implicated as a direct contributor to the riots.

A pre-requisite for inter-agency cooperation is for each key stakeholder to understand their respective responsibilities during emergencies. European states typically call upon the same emergency services to deal with these incidents, namely Police, Fire and Rescue Services, Emergency Medical Services (EMS). However, there are often national variations in terms of whose responsibility it is to lead the response to these incidents and to decide what information should be shared with the general public. In Belgium, the Netherlands and the UK, for example, we can see that there are some differences in terms of the organisation of emergency management.

Civil protection services in Belgium are organised at the federal level and fall under the jurisdiction of the Minister of Home Affairs and the Directorate General for Civil Security. The Directorate is responsible for the coordination of a number of activities including the provision of legal advice for those involved in emergency management and providing disaster preparedness resources to citizens.[40] Nevertheless, the scale of the incident determines who is responsible for coordinating crisis management in Belgium (see Appendix 3, Figure 1 for an example of how national incidents are managed). The legal framework for emergency management is provided by the Royal Decrees of 31 January 2003 and 26 February 2006, which use a number of criteria, including the extent of the geographic impact of the incident, to indicate the level of crisis management that should be deployed in relation to both human-made and natural disasters. Small-scale incidents fall under the remit of the municipal authorities, which have overall responsibility for the fire brigades within their respective regions. When an

[35] Disaster risk reduction (DRR) is the concept and practice of reducing disaster risks through systematic efforts to analyse and reduce the causal factors of disasters (see UNISDR, http://www.unisdr.org/who-we-are/what-is-drr).
[36] Cabinet Office (2011). *National Framework on Community Resilience*. Cabinet Office, London.
[37] Dufty, N. (2011). *Using social media for natural disaster resilience*. Available at: http://works.bepress.com/neil_dufty/22 (accessed 10 June 2014).
[38] Sutton, J., Spiro, E. S., Johnson, B., Fitzhugh, S., Gibson, B. & Butts, C. T. (2014). Warning tweets: Serial transmission of messages during the warning phase of a disaster event. *Information, Communication & Society*, *17*(6), 765-787.
[39] Stephens, K. A. Barrett, A. K. & Mahometa, M. J. (2013). Organizational communication in emergencies: Using multiple channels and sources to combat noise and capture attention. *Human Communication Research*, *39*, 230-251.
[40] European Commission (2014). *Belgium - disaster management structure*. Available at: http://ec.europa.eu/echo/files/civil_protection/vademecum/be/2-be-1.html (accessed 10 September 2015).

incident affects more than one municipality the provincial authorities take overall responsibility of the coordination of the incident response and crisis management. The municipal and provincial authorities assemble in a Communal or Provincial Crisis Centre to coordinate the crisis management between the different multi-disciplinary agencies. The Mayor or Governor is the final responsible incident commander. Emergency response is coordinated at the federal level via the Home Affairs Crisis Centre if the provincial authorities are deemed to have insufficient resources to cope with the incident, it affects two or more of the ten Belgian provinces, or it concerns a nuclear or aviation incident. The Federal Centre brings together three bodies to deal with such incidents, namely the assessment, management and information cells. The latter consists of the spokespersons of each department involved in responding to the emergency, which decide upon what information should be disseminated to the population at the various stages of the incident.

A similar mix of both federal and municipal authorities is responsible for emergency management in the Netherlands. The latter are also expected to respond to emergencies at the local level, with the King's Commissioner for each Province taking ownership of emergency management when local authorities are unable to cope with the scale of the incident (see Appendix 3, Figure 2). Like in the Belgian system of crisis management, the Dutch Directorate General for Public Order and Safety and the Ministry of the Interior has overall responsibility for disaster preparedness and for the deployment of blue light organisations such as the fire brigades and Emergency Medical Services during national emergencies. Each respective Ministry creates a central command for incidents that fall under their jurisdiction, with the National Crisis Centre (NCC) functioning as a national coordination hub when disasters affect multiple policy areas.[41] The NCC is also responsible for providing information to those in disaster-affected areas via a range of media including brochures, news media and the crisis communication cells of relevant government ministries.

Finally, the UK Civil Contingencies Act (2004) requires Category 1 responders, such as local authorities, emergency services, the National Health Service (NHS), and the UK Environment Agency and Category 2 organisations, such as the transport and utility companies to work together to provide information and advice to the public about emergencies.[42] Both participate in Local Resilience Forums, bodies that were created to foster multi-agency cooperation for civil protection purposes in each police area within England and Wales. This sharing of responsibility between key stakeholders is also evident during major national emergencies where the Cabinet Office Briefing Rooms (COBR) are used to coordinate the recovery effort (see Appendix 3, Figure 3). Local Strategic Coordinating Groups and Local Tactical Coordination Groups play a key role in the operational response that is coordinated by the Civil Contingencies Committee, the UK cabinet committee chaired by the Home Secretary and supported by the Civil Contingencies Secretariat (CCS), to deal with human-made and natural disasters. It should be noted that the CCS has no such responsibility for civil emergency planning in Northern Ireland and Scotland, as this is a devolved matter that is administered at regional level by their respective government departments.

These disaster management structures illustrate the key role played by both local and national political actors in crisis management in Belgium, the Netherlands and the UK. Inter-agency cooperation at the local level is also important in order to ensure that real-time accurate information is shared between first responders and members of the public. For example, during the Pukkelpop festival disaster the municipal authorities were heavily criticised for their failure

[41] Kuipers, S. & Boin, A. (2014). *Crisis and Disaster Management in the Netherlands 2014*. Available at: http://www.preventionweb.net/files/Netherlands-country-report-2014.pdf (accessed 10 September 2015).
[42] Cabinet Office (2004). Civil Contingencies Act. Available at: http://www.legislation.gov.uk/ukpga/2004/36/pdfs/ukpgacs_20040036_en.pdf (accessed 10 September 2015).

to provide real-time crisis information during the incident.[43] A study of Twitter activity during the disaster revealed that there had been no tweets from official accounts as events unfolded.[44] The organisers of two Belgian music festivals confirmed that they organised regular face-to-face meetings with key stakeholders such as the Police or the local authorities' Safety Cell in order to discuss the communication strategies that would be deployed during their respective events. They had also piloted modes of communication, such as the use of mobile telecommunication devices e.g. 'walkie-talkies', in order to ensure that information could be relayed from any part of the festival site in the case of any disruption to the communications infrastructure. These meetings were also viewed as being important in building working relationships and trust between the various agencies that would be involved in these festivals. Hence it had been agreed the official social media accounts of both festivals would retweet messages from the Police and other 'blue light' organisations in the case of an incident.

Key stakeholders such as festival organisers, and 'blue light' organisations should also cultivate good relations with the news media in order to facilitate effective communication with citizens during crisis situations. Our interviewees confirmed that local BBC radio stations had played a vital role in providing critical information on the availability of medical supplies e.g. prescription drugs in the wake of the floods seen in South-West England between December 2013 and February 2014. A dedicated response team from the County Council was permitted to use the facilities at a BBC station, enabling them to provide assistance to callers from areas affected by the floods. There was also evidence to suggest that speculative and sensationalist media coverage of these incidents had the potential to increase the likelihood of violence and civil unrest. For example, local and national journalists in the Netherlands suggested that some popular entertainment programmes had encouraged thousands of young people to attend the Sweet Sixteen birthday party in Haren on 21 September 2012, which culminated in anti-social behaviour and disorder that later became known as the Project X Haren riots. While it is beyond the scope of this report to fully explore the role of the media during crisis situations, it was clear that greater cooperation between emergency management communicators and professional journalists might help address some of the deficiencies in media reporting of our three case studies.

Like Disaster Risk Reduction, responsibility for communication during crisis situations should be partly but perhaps not fully shared with civil society organisations in disaster-affected areas. Citizens can assist emergency management communicators in three specific ways, namely 1) the crowdsourcing and verification of crisis information, 2) the provision of emotional and material support to those affected by major incidents, and 3) participating in digital volunteer groups that bolster disaster response missions.

Incidents such as Hurricane Sandy have shown how key agencies can leverage the 'power of collective intelligence' via social media - members of the public shared critical information via sites such as Twitter and played a key role in correcting misinformation and dispelling rumours that had the potential to hinder efforts to restore order to affected areas.[45] Citizens can use social media to share eyewitness perspectives that help build situational awareness for those actors involved in emergency response, producing a form of 'socially produced accuracy' that reduces

[43] Mertens, P. (2012). How thunderstorms at Pukkelpop 2011 stimulated Belgium's use of social media for disaster response. Available at: http://repository.disaster20.eu/sites/default/files/Peter%20Mertens%202012%2011%2005_How%20Pukkelpop%20stimulated%20SMEM_D2.0%20Birmingham.pdf (accessed 1 September 2015).
[44] Terpstra, T., de Vries, A., Stronkman,R. & Paradies, G. L. (2012). Towards a realtime Twitter analysis during crises for operational crisis management. *Proceedings of the 9th International ISCRAM Conference*, Vancouver, Canada.

[45] Purohit, H., Castillo, C., Diaz, F., Sheth, A. & Meier, P. (2014). Emergency–relief coordination on social media: Automatically matching resource requests and offers. *First Monday*, *19*(1), DOI: http://dx.doi.org/10.5210/fm.v19i1.4848.

the possibility of cascading effects occurring in the aftermath of these incidents.[46] Hashtags can function as 'fire spaces'[47] in which data generated by residents of affected areas can be transformed into information that helps first responders allocate resources towards those communities that are most in need of assistance.[48] Emergency managers can use information-gathering platforms such as Coosto, Ushahidi and Twitcident to help them sift through the large volume of data available on these sites at each stage of the incident.

Social media can also be utilised by citizens to provide emotional and material support to citizens living in disaster-affected areas. During the floods in South-West England, for example, our interviewees confirmed that Council requests for assistance on sites such as Twitter had resulted in hundreds of volunteers helping deliver sandbags to private residences that were threatened by the floods in the region. Indeed, citizen-led social media campaigns such as #forageaid[49] and Flooding on the Levels Action Group (FLAG)[50] emerged during this period, providing financial support for affected communities and called for the dredging of the rivers to avoid future floods.

Citizens also used Twitter in Belgium to provide support to those who had fled the Pukkelpop festival disaster. One Twitter user (tweeter) began to connect festival-goers with the residents of the nearby town Hasselt via the #hasselthelpt hashtag. The hashtag mobilised Hasselt residents to offer them food, shelter and transportation.[51] This initiative spread to other nearby towns, with their offers for help promoted via eponymous hashtags like #antwerpenhelpt, #brusselhelpt and #genthelpt. Many also offered festival-goers the opportunity to use their internet connection to inform their families and friends that they were safe. Twitter hashtags like #ppok[52] and Facebook pages such as the Pukkelpop Safehouse page were used to connect these individuals with their loved ones, who had been unable to make contact with one another due to the pressure placed upon mobile telephone networks in the wake of the incident.[53]

Clearly, this empowerment of local communities to participate in disaster response has implications for the communication strategies of first responders and those key agencies involved in emergency response. It might increase the resilience of these communities to future disasters and encourage local citizens to fully participate in Disaster Risk Reduction alongside formal emergency management institutions. Yet, social media users typically disengage from these online groups once they have had their questions about the incident answered.[54] While citizen-led initiatives such as those outlined above add value to crisis communication, 'blue light' organisations look likely to retain their status as the most influential sources of information during such incidents for the foreseeable future.

[46] Vieweg, S., Palen, L., Liu, S. B., Hughes, A. L. & Sutton, J. (2008). Collective intelligence in disaster: An examination of the phenomenon in the aftermath of the 2007 Virginia Tech shootings. *Proceedings of the Information Systems for Crisis Response and Management Conference, ISCRAM* 2008.

[47] 'Fire spaces' refers to environments where connections among actors remain relatively stable while they add information to the network or modify it as content becomes highly mobile and sometimes unpredictable (see Law, J. & Mol, A. (2001). Situating technoscience: An inquiry into spatialities. *Society and Space*, *19*, 609-621.)

[48] Potts, L. (2014). *Social media in disaster response: how experience architects can build for participation*. New York: Routledge, Taylor & Francis Group.

[49] ITV (2015). Scheme which fed Somerset's flooded farm animals wants to become fully-fledged rapid-response charity. Available at: http://www.itv.com/news/west/2015-01-13/scheme-which-fed-somersets-flooded-farm-animals-wants-to-become-fully-fledged-rapid-response-charity/ (accessed 1 September 2015).

[50] http://www.flagsomerset.org.uk/Media.aspx

[51] de Vries, P., Galetzka, M. & Gutteling, J. (2014). Persuasion in the wild: Communication, technology, and event safety. *Persuasive Technology*, *8462*, 80-91.

[52] van Peteghem, D. & Caudron, J. (2012). Hoe het Pukkelpop-drama de echte kracht toont van sociale media, Available at: http://www.frankwatching.com/archive/2011/08/19/hoe-het-pukkelpop-drama-de-echte-kracht-toont-van-sociale-media/ (accessed 2 September 2015).

[53] https://www.facebook.com/pages/Pukkelpop-Safehouse-niet-Officieel/182836471784870

[54] Potts, L. (2014). *Social media in disaster response: how experience architects can build for participation*. New York: Routledge, Taylor & Francis Group.

During large-scale human-made or natural disasters, it may also be appropriate for key agencies to mobilise digital volunteers[55] to assist with the analysis of social media data. Several models for digital volunteer organisations exist including Virtual Operations Support Teams (VOST), the Standby Task Force (SBTF) and the Digital Humanitarian Network (DHNetwork).[56] In contrast to other organisations, VOST teams work by request and report directly to the organisation that requested their assistance. VOST teams function as a type of intermediary between citizens who use social media during crises and emergency management teams. While VOST teams have been very active in France and Spain over the past few years, they have often been considered ill-suited for the small-scale incidents that are typical within the EU and on a relatively regular basis. However, the model has been adapted in Belgium, where volunteer teams have been set up which consists of professionals rather than citizens and can be called on to help in smaller incidents as well. The SBTF - a global network of volunteers trained and ready to collaborate online in the immediate aftermath of a natural disaster[57] and the DHNetwork - a consortium of volunteer and technical communities[58] are more international. Consequently, some digital volunteer organisations may be more suitable to certain types of human-made and natural disasters than others (see Appendix 2 for further information on these digital volunteer organisations).

Recommendations:

- Be aware of the emergency management structure in your respective region
- Build good relationships with professional journalists and other key stakeholders in order to ensure message consistency
- Use social media to crowdsource crisis information and to empower local communities to share responsibility for its dissemination to the general public
- Consider the use of digital volunteers to analyse social media data during large-scale incidents

2.4 Always consider the ethical implications of using crowdsourced information obtained from social media

Key roles in emergency management such as that of the Public Information Officer (PIO) have become increasingly oriented towards the monitoring and evaluation of the user-generated content (UGC) discussed in the previous section.[59]

In particular, the crowdsourcing of crisis information via social media raises a number of ethical issues for PIOs in relation to the gathering, storage and sharing of UGC. Key agencies may, for example, ask members of the public to share their images of human-made or natural disasters via a dedicated hashtag on Twitter. Such information can help build situational awareness and contribute to response and recovery efforts. However, such requests may also inadvertently jeopardise the physical safety of citizens, as they put themselves at risk to capture this footage. Our research revealed that so-called ‘storm watchers’ were engaging in such hazardous activity in order to capture footage of the floods in the South-West of England. There was also video footage recorded by an eyewitness showing the collapse of the Chateau tent at the Pukkelpop

[55] By digital volunteers we refer primarily to volunteers who leverage new technologies to organise and assist in emergency response.
[56] Meier, P. (2014). *Digital humanitarians: How Big Data is changing the face of humanitarian response*. London: CRC Press.
[57] http://blog.standbytaskforce.com/
[58] http://digitalhumanitarians.com/about
[59] Hughes, A. L. & Palen, L. (2012). The evolving role of the Public Information Officer: An examination of social media in emergency management. *Journal of Homeland Security and Emergency Management*, *9*(1), DOI: 10.1515/1547-7355.1976.

festival that resulted in five fatalities.[60] In light of these incidents, we argue that emergency management communicators should be cognisant of the risk posed to citizens within disaster-affected areas when making requests for information via social media. It might even be appropriate in some circumstances for them to refrain from making such requests during extreme weather events such as thunderstorms that are likely to attract 'storm watchers'.

The second ethical dilemma relates to the potential harm that might arise from the use of UGC created during such incidents. While the Terms of Service (ToC) of platforms such as Twitter may make it clear to users that they should have no expectation of privacy in relation to their tweets, those that express anguish and distress during disasters may be re-traumatised if such content is recirculated by key agencies such as the Police and Fire and Rescue Services. It is also highly doubtful whether the verbatim reproduction of these comments is necessary in order to illustrate the key themes that emerged from social media discussions about such incidents.[61] While our interviewees tended to be aware of such ethical dilemmas, concerns continued to be raised about the ethical stances taken by key stakeholders during such incidents. For example, the news agency Belga was forced to apologise for publishing inaccurate and unverified information, obtained from social media, relating to the number of fatalities during the Pukkelpop disaster.[62]

We propose that such ethical dilemmas should be addressed through key agencies familiarising themselves with not only existing national and supranational regulations on data protection and online privacy, but also current academic writing on the ethics of social media research. In addition, these organisations should consider how best to inform members of the public about the potential breach of their privacy that might arise from their contributions to online groups that emerge during human-made or natural disasters.

Recommendations:

- Anonymise aggregate and validate data supplied by members of the public before sharing
- Remind members of the public that when recording incidents they need to ensure their safety first
- Consider what data you need from members of the pubic and whether the potential benefits from having it outweigh the potential costs involved in collecting it
- Only collect as much data as is needed for operational reasons e.g. to establish situational awareness
- Ensure that your use and storage of social media data complies with the relevant national regulations on data protection and EU privacy laws
- Inform members of the public about how the crowdsourced data will be used (and stored)

2.5 Knowledge gained from previous incidents should be used to inform future communication strategies

Our interviewees indicated that communication strategies for future incidents would be informed by lessons learnt from these three case studies. For example, the UK Environment Agency has begun to use 'hyper-local' Facebook pages to facilitate dialogue with local

[60] CBC (2011). Storm death toll at Belgium music fest rises to 5, Available at: http://www.cbc.ca/news/world/storm-death-toll-at-belgium-music-fest-rises-to-5-1.1109602 (accessed 2 September 2015).
[61] Reilly, P. (2014). The 'Battle of Stokes Croft' on YouTube: The development of an ethical stance for the study of online comments. *SAGE Cases in Methodology*, DOI**:** http://dx.doi.org/10.4135/9781446273050135092O9.
[62] Joye, S. (2013). *Drawing the thin line: Reflections on news media's use of user-generated content in reporting on a national disaster*. The Future of Humanitarian Reporting. London: City University London, pp. 23-28.

community groups such as FLAG about the dredging operations they had implemented to prevent future flooding in Cornwall and Devon. There was also some evidence to suggest that these key stakeholders had contingency plans for the loss of critical communication infrastructure. One of the Belgian festival organisers confirmed that they had strategically deployed large screens across the festival site in recent years in order to communicate with festival-goers who were unable to access wifi networks and mobile phone networks. This illustrated how emergency managers in Belgium, the Netherlands and the UK were constantly searching for ways to maximise the visibility of public safety messages in order to prevent cascading effects from major incidents.

We propose that the systematic review should focus on what elements of the communication strategy did and did not work during major incidents. It should include not only communication flows between the emergency services and the public, but also those between key agencies during such incidents. Each stakeholder should also consider the criteria by which they evaluate the success (or not) of communication strategies that could be deployed during such events. Clearly social media metrics might provide an insight into the reach of emergency messages issued on sites such as Twitter, as well as the role of citizens in the crowdsourcing and verification of crisis information. Such data should be triangulated alongside other metrics such as the number of telephone calls received by the emergency services and the traditional news media outlets used by citizens to obtain information on the incident.

A holistic approach towards crisis communication strategies might emerge from an official inquiry into the events under review. However, we propose that a shared responsibility approach towards communication during crisis situations is more likely to emerge through the organisation of workshops that bring together citizens and the emergency services to identify best practice. Hackathons, such as the one organised in the aftermath of the Project X Haren riots, might provide a suitable forum for engaging all relevant stakeholders in learning lessons from previous incidents. Nevertheless, it remains important that key lessons are identified and recommendations are implemented in order to address any obvious weaknesses in communication strategies deployed during such incidents.

Recommendations:

- All stakeholders should practice reflection (what went bad and what went well)
- Assess communication flows during incidents from multiple perspectives (e.g. from emergency services to members of the public)
- Consider what metrics (e.g. social media data) should be used to evaluate the reach of official emergency messages
- Consider organising a hackathon or an official enquiry to identify key lessons from incidents

3 Communication strategy flowchart

Below we present our strategy for communication between key agencies and members of the public during crisis situations. At each stage, emergency managers should pay attention to two aspects of language. First, there is the use of terminology in crisis communication. While this may be necessary in communication between agencies, it should not be assumed that all subscribe to the same definitions of key terms. Terminology databases, such as Firebrary, should therefore be consulted in order to avoid any misunderstandings between these organisations. The use of complex jargon should also be avoided in any communication with the general public. Second, there is the language that should be used in crisis communication. In countries such as Belgium, there may be a legal requirement for blue light organisations to communicate with the public in several languages that are commonly spoken in the region.

Therefore, emergency management communicators should familiarise themselves with the language proficiency of their target audiences and tailor their communication strategies accordingly. This communication strategy is informed by the 'SPEAK' guidelines and emergency management communicators should adhere to both during human-made and natural disasters.

Crises are typically divided into four phases: mitigation; preparedness; response; and recovery[63]. Following this convention, we draw on our three case studies to explore the communication tactics that are applicable during each of these four phases.

3.1 Mitigation[64]

Inform citizens about risks and risk mitigating measures: There may be specific known risks that exist in a local area that members of the public should be informed about. The UK Environmental Agency, for example, publishes a mitigation measures manual for dealing with flood risks and in the aftermath of the 2013/2014 floods in South-West England it kept informing members of the public about progress with river dredging activities.

Keep popular communication channels open: Citizens tend to use hashtags and 'fire spaces' in order to address information needs during crises and disasters. These communication channels also provide opportunities for key agencies to share advice and information on disaster-preparedness. As discussed earlier, the UK Environmental Agency has received very positive feedback from local residents for its use of a hyperlocal Facebook page to provide information on the dredging of rivers in the areas around the Somerset Levels and Moors. Key agencies should endeavour to use on and offline spaces in a similar fashion, engaging local communities at every stage of the disaster cycle.

3.2 Preparedness

Train staff, assign roles and create knowledge communities: Agencies should consider what roles key staff will play during crisis situations, with a specific emphasis on who has responsibility for the authorisation of messages to the public. Members of the communication team should also receive guidance on how to present information to the target audience via adequate multiple media channels in a clear and consistent fashion. This might be achieved through the creation of special interest groups (or 'knowledge communities') within the sector that allow individuals to share best practice in this area. There should also be contingency planning for large-scale incidents, which might place a huge strain on the resources of these teams as they try to answer each citizen query promptly.

Build and promote a social media presence: Social media can help build trust between citizens and the emergency services, particularly when social media sites are regularly updated and members of the public receive courteous and punctual responses to their online comments. In turn, these users are likely to come back to these sites to satisfy their information needs during crisis situations. The promotion of official social media accounts is vitally important in order to encourage members of the public to use these sites during crisis situations. There are a number of ways to do so, ranging from the strategic use of pre-existing hashtags on Twitter to the use of Facebook and YouTube advertisements to target certain audiences.

[63] Baird, M. E. (2010). The 'phases' of emergency management, Available at: http://www.vanderbilt.edu/vector/research/emmgtphases.pdf (accessed 29 September 2015).
[64] Under 'mitigation', defined as 'the action taken to eliminate or reduce the loss of life and property damage related to an event or crisis, particularly those that cannot be prevented' (see e.g. Emergency management program, Cornell University, https://emergency.cornell.edu/cuemp/#prevention) we consider two tactics related to a recurring, 'non-preventable' event - flooding.

Prepare contingency plans to meet the information needs of online citizens: There will be an inevitable increase in demand for information from members of the public during a crisis situation. Key agencies should prepare a contingency plan for how they will deal with this increased demand for information. Key tasks include: 1) assessing servers' abilities to respond to requests during episodes of increased traffic and ensuring that proper infrastructure is in place and web hosting is sufficiently scaled and 2) setting up a 'dark' website that can be made available to the public should the official website of an organisation crash due to an increase in the number of people who are trying to access it. This 'dark' website can be a version of the official site that is intentionally 'pared down' (e.g. stripped of non-essential images).

Disseminate prevention messages: A mix of communication channels should be used to inform members of the public about disaster-preparedness and the support services available to them should an incident occur in their particular area. This should include information about the different ways in which they can communicate with blue light organisations and other key agencies during such incidents. It may also be prudent to raise awareness about how disinformation and rumours might hinder the emergency response. The aim of these messages should be to reassure the public that adequate measures are in place should a human-made or natural disaster occur in their local area. Emergency services should also consider how best to disseminate these prevention messages to the general public. Automated messaging via platforms such as Hootsuite may be a viable alternative to having staff send messages manually via various media platforms. However, it should not be used during a crisis when members of the public seek reassurances from the Police and Fire and Rescue Services that their requests for help are being dealt with.

Establish social media verification procedures: As per the false rumours about fatalities during the Project X Haren riots, unverified information on social media can contribute to the cascading effects from public order incidents. Hence organisations need to verify crowdsourced information from social media before it can be used to build situational awareness. Verification and factchecking can be achieved, for example, through the cross-referencing of information obtained from sites such as Twitter with the observations of emergency services personnel and other members of the public who are attending the incident. Work is also currently being done to develop a methodology to identify disinformation and rumours on Twitter based upon the characteristics of tweets like language use, source use and history of posting behaviour.[65] However, for the foreseeable future, verification is likely to remain an activity that involves other social media users and the emergency services working together to check the veracity of information circulating online in the immediate aftermath of disasters.

Decide how you will deal with emergencies reported via social media: The floods in South-West England led to the emergency services receiving many requests for help from citizens via social media. For example, one member of the public who was unable to contact these services via telephone tweeted the local fire brigade to ask for assistance with moving medical gas. While all relevant agencies frequently remind the public to call rather than 'tweet' for help in the case of medical emergencies, it is still likely that such requests will continue to be made during future crisis situations. This presents emergency services personnel with a dilemma as to how to check the veracity of these reports. It may be prudent in some circumstances for tweeters to be reminded that they will need to provide further information via telephone in order for the emergency services to come to their assistance. Alternatively, citizens might be encouraged to use a specific hashtag in order to capture the attention of the emergency services. What is clear

[65] http://www.pheme.eu/

is that key agencies should agree the procedure for dealing with requests for assistance via social media in advance of these crisis situations.

Use social media to manage relationships with traditional media: The cultivation of good working relationships with professional journalists can help key agencies in their efforts to provide accurate information to citizens during crisis situations. News media organisations can help amplify messages sent by emergency services on social media through the retweeting of such content and sharing it on traditional platforms such as radio, television and newspapers. As discussed earlier in relation to the floods in South-West England, this can help mobilise volunteers to assist with tasks such as providing sandbags to homeowners trying to protect their properties from flooding.

Use an App: During crises, members of the public turn to familiar media channels in order to satisfy their information needs. However, Apps may have great potential for issuing public safety messages to members of the public during incidents such as the Pukkelpop disaster and the floods in South-West England. Both of these incidents led to the creation of dedicated Apps, such as 'I am OK' to assure family and friends of festival-goers that they were safe from harm. Apps use less bandwidth than other mobile phone functions such as SMS text messaging, which is an advantage in crisis situations where mobile phone networks may fail due to increased traffic. In the UK, for example, Apps have already been developed to enable citizens to report hate crimes and other incidents directly to the Police.[66] Therefore, emergency managers should explore possible synergies with App developers in order to further develop tools that could be deployed during major incidents. They should also work with the local news media and civil society organisations in order to promote these tools to the general public.

3.3 Response

Send emergency notifications: Emergency notifications can be sent to members of the public during crisis situations. For example, a citizen can sign up to receive Twitter Alerts from official accounts direct to their smart phones. These notifications are delivered via SMS or a push notification if using Twitter for iPhone or Android. The UK Environment Agency, for example, sends live flood alerts via Facebook and Twitter Alerts. There have also been Cell Broadcast trials in several European states. These Broadcasts allow messages to be delivered to citizens within a specific geographic location, even when load spikes lead to the failure of communication networks.

Listen: Social media provide opportunities for key agencies to listen to what citizens are saying about the incident. PIOs and other members of their communication team can respond directly to those social media users who express dissatisfaction with the emergency response. Listening on social media can also help emergency managers anticipate and mitigate cascading effects. However, the representativeness (or lack thereof) of social media users suggests that PIOs should verify these findings using other data sources before making any recommendations to emergency managers.

Pull information: Information can also be pulled from social media in order to build situational awareness in crisis situations. Keyword searches and the monitoring of hashtags can arguably provide as much insight into the evolution of an incident as messages received by the emergency services via their official social media accounts. It can also help identify civil society organisations that might be able to help mitigate cascading effects from public order incidents

[66] Dorset Police (2014). Police launch a new app to tackle hate crime, Available at: http://www.dorset.police.uk/default.aspx?page=7565 (accessed 10 September 2015).

such as Project X Haren. Although this form of data capture has been traditionally associated with the Police, European Fire and Rescue Services have also begun to engage in social media data collection and analysis. For example, Belgian Fire and Rescue Services are now able to access UGC, such as photographs, videos and tweets, en route to an incident courtesy of a digital tool. However, it is still essential that information pulled from social media is contextualised with reference to information received via other media channels.

Crowdsource information: Pulling information from social media can improve situational awareness, but information can also be purposefully crowdsourced from members of the public. The authorities can use a dedicated hashtag to encourage citizens to share specific types of images and eyewitness perspectives on relevant incidents. They can also ask members of the public to help them verify information received from other members of the public via social media or other communication channels.

Push information: Listening can also help inform what information should be pushed by emergency managers via various media channels. 'Push' information can quell rumours and disinformation and address the diverse information needs of citizens during crisis situations. Emergency management communicators should provide regular updates in order to prevent cascading effects occurring from citizens speculating about crisis situations. Even if no further information is available, it is advisable that key agencies explain why, rather than allow a communication vacuum to develop. Push information should be verified and cross-referenced with updates provided by other agencies in order to ensure message consistency. This will avoid a repeat of the events leading to the Project X Haren riot, during which conflicting messages from the Mayor of Haren and other authorities about an alternative party being organised in the town was said to have directly contributed to the violence. Social media should be deployed in order to push information during a crisis situation. Professional journalists should be invited to amplify these messages through sharing this content with their respective online social networks too. Although tweets are restricted to 140 characters, hyperlinks should be provided to websites that contain further information about the recovery efforts. It is important that information provided on an official website is clearly presented and directly addresses some of the issues identified through listening to citizens talking about these incidents online.

3.4 Recovery

Tell citizens when the crisis is over: Crises, such as the floods in South-West England, often have a devastating economic impact upon the affected areas. To mitigate the impact of the decline in tourism in the region in 2014, Cornwall Council launched an 'open for business' campaign via various communication channels (own website, traditional and social media, the Visit Cornwall website, tourism and travel magazines among others). Such campaigns are important not only in reviving tourism, but also in encouraging investment in disaster-affected areas.

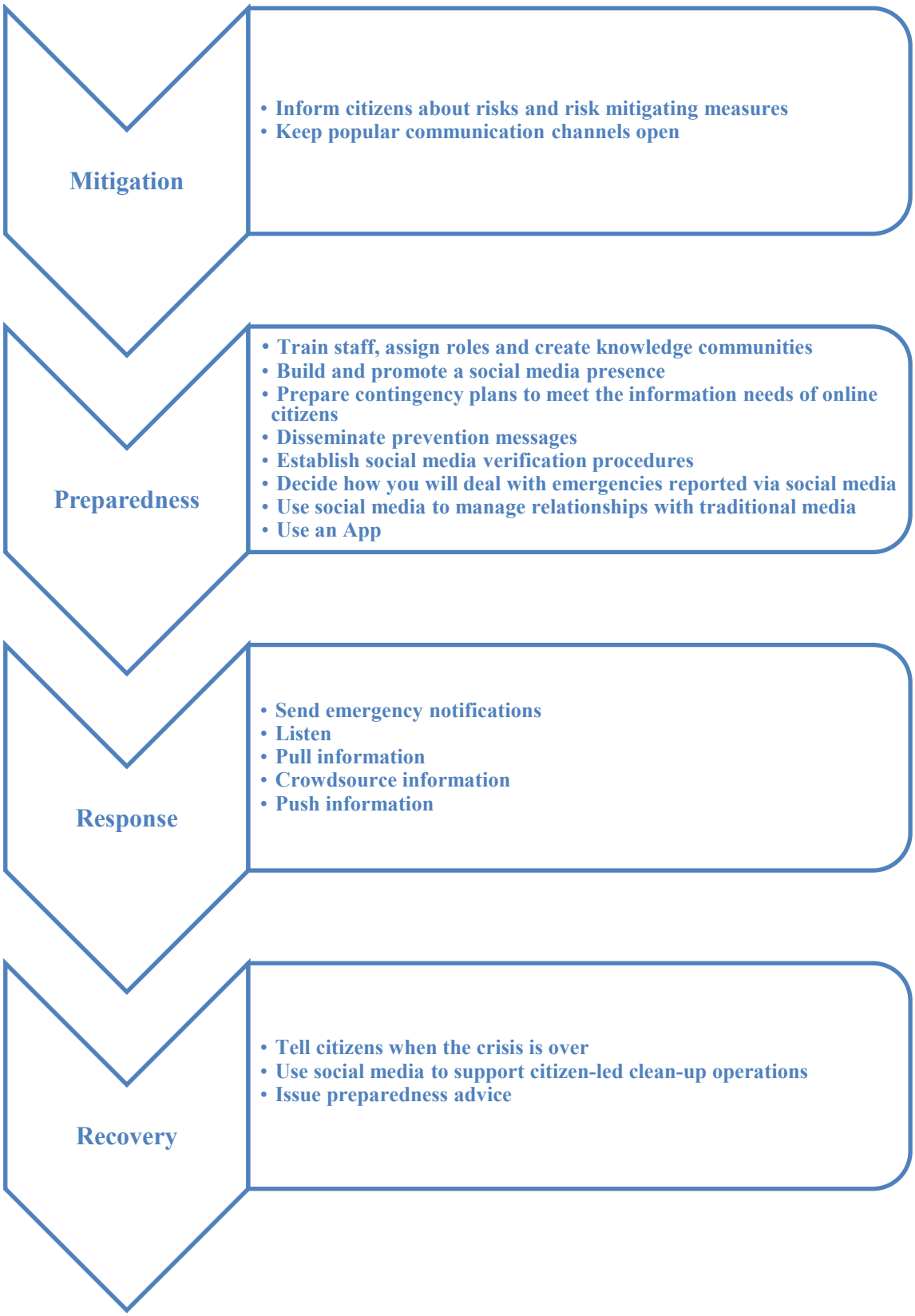
Use social media to support citizen-led clean-up operations: Members of the public can also use social media to organise recovery operations. For example, citizens began to repair the damage caused by the riots in Haren under the Project Clean X initiative. Key agencies should try to promote these initiatives through retweeting messages of support, as well as building relationships with participating civil society organisations

Issue preparedness advice: Key lessons from the incident should be recorded by emergency managers and used to inform future plans for emergency response. They should also consider issuing preparedness advice to local residents, who are likely to be receptive to such content given recent events. However, it is important not to overload citizens with information during a

period in which they may still be traumatised by the incident. It may be more appropriate to consult civil society organisations in order to establish what preparedness information should be disseminated at this stage.

The above communication tactics can be summarised in the communication strategy flowchart presented below.

Figure 1: Communication strategy flowchart



4 Conclusion

A communication mix of social media, traditional media and face-to-face meetings should ideally be employed at all stages of human-made or natural disasters. While it is misleading to suggest that there is a 'killer app' in terms of crisis communication, we would like to draw particular attention to the potential use of social media to correct rumours and disinformation, which have the potential to lead to cascading effects during these incidents. Sites such as Facebook and Twitter help key agencies build situational awareness through the crowdsourcing of crisis information, as well as pushing information that offers advice and reassurance to those affected by such incidents. They can also help empower local communities to share responsibility for certain aspects of crisis communication. Yet, the persistence of the digital divide illustrates the importance of using traditional media during crisis situations to communicate with the general public. Radio, television, newspapers and telephone calls remain important channels for those unable or unwilling to access new media technologies. Also, in the immediate aftermath of human-made or natural disasters, when there may be bandwidth limitations, traditional channels such as electronic billboards and PA systems may be more effective ways to communicate with members of the public. Emergency management communicators should therefore target those communication platforms that are most commonly used by residents in disaster-affected areas in order to maximise the reach of their content and which communication channels may be more resilient and effective in the immediate aftermath of a human-made or natural disaster. They should also collaborate with other emergency services and civil society organisations to ensure that these messages are clear, consistent and accurate.

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Appendix

Appendix 1: Interviews

We conducted 41 semi-structured interviews with people directly involved in one of our three case studies (the 2013/14 floods in South-West England, the 2011 Pukkelpop thunderstorm and the 2012 Project X Haren riots) and experts in crisis communication. Ethical approval for conducting these interviews was obtained from the University of Leicester Research Ethics Committee prior to contact being made with these interviewees.

We interviewed approximately ten individuals per case study. In each case, the composition of interviewees was: emergency services representatives; media representatives; representatives of other organizations whether private or public, which were involved in the emergency response; and members of the public, who were involved as App creators or hackathon participants. We also interviewed a group of about ten international experts. This includes practitioners from humanitarian organisations, academics prominent in the field of crisis communication, digital volunteers from several organisations as well as researchers who have worked on EU-funded projects with a similar focus.

Four different semi-structured interview schedules were developed and used to investigate questions around crisis communication as well as traditional and social media use for communication with members of the public. These reflect the different types of individuals who were approached: media representatives; App creators and hackathon participants; emergency services representatives and representatives of other organizations who were involved in the response; and experts.

The schedule was used as a means to stimulate discussion and dialogue between interviewer and interviewee, and although a core group of questions was asked, new questions and discussions often emerged through the interviews. A core group of questions was repeated in all four interview schedules. Interviewees from our expert group were also asked to comment on some of the themes that had been emerging from interviews conducted around the three cases.

Interviews were conducted using telephone, Skype or in person at various location in Belgium, England and the Netherlands between the end of December 2014 and the beginning of May 2015. They were analysed using the method of thematic analysis[67].

Appendix 2: Additional resources

This is a list of core additional resources, which can lead you to further materials.

<u>Social media for crisis communication</u>:

- Guidelines for the use of new media in crisis situations http://www.cosmic-project.eu/sites/default/files/Deliverables_D6.1.2_and_D6.2.2_Final_Guidelines_April_2015.pdf (COSMIC)
- Online and Mobile Communications for Crisis Response and Search and Rescue http://isar.i112.eu/downloads/files/D2271-iSARGuidelinesRoadmap.pdf (iSAR+)

<u>Social media analysis tools</u>:

[67] Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101.

- Comparative Review of Social Media Analysis Tools for Preparedness http://trilateralresearch.com/wp-content/uploads/2015/08/GDPC_SMAT_Short-Report-for-GDPC_Final.pdf

Verification:

- Verification Handbook http://verificationhandbook.com/

Hashtags:

- Hashtag standards for emergencies https://docs.unocha.org/sites/dms/Documents/TB%20012_Hashtag%20Standards.pdf

Ethics:

- Research using Social Media; Users' Views http://www.natcen.ac.uk/media/282288/p0639-research-using-social-media-report-final-190214.pdf

Digital volunteers:

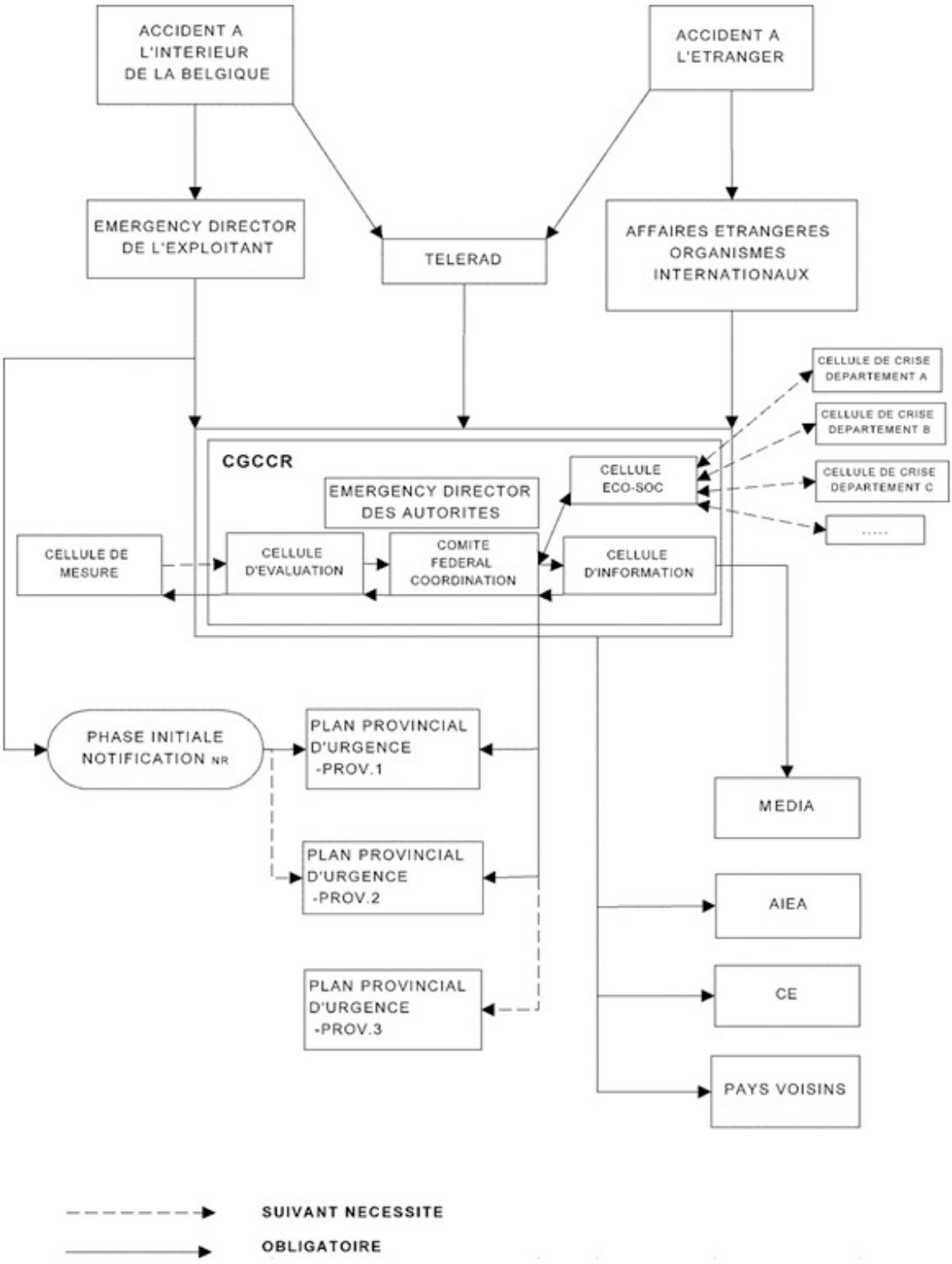
- VOST: http://sotechem.syr.edu/wp-content/uploads/2015/07/PAGES_EM_SocialMedia_7.13.pdf
- SBTF: http://blog.standbytaskforce.com/
- DHNetwork: http://digitalhumanitarians.com/about

On Twitter, follow:

- #smem - SMEM is an abbreviation for 'social media in emergency management'. SMEM is an informal network of first responders, academics and others who aim to document and share social media best practices.
- #smemchat - a hashtag for SMEM chats on Twitter which occur every Friday at 12:30pm Eastern Time. Past #smemchat conversations can be viewed at www.SM4EM.org
- #crisiscomms - for general discussions about crisis communication
- #comderisque - equivalent of #crisiscomms in French
- #Krisenkommunikation - equivalent of #crisiscomms in German
- #VOST - VOST is an abbreviation for 'Virtual Operations Support Team'. Follow for conversations on social media for emergency management, digital volunteers and other related best practice, news and advice.
- #MSGU and #MSGUchat - equivalents of #smem and #smemchat in French.
- #RSGE - equivalent of #smem in Spanish.

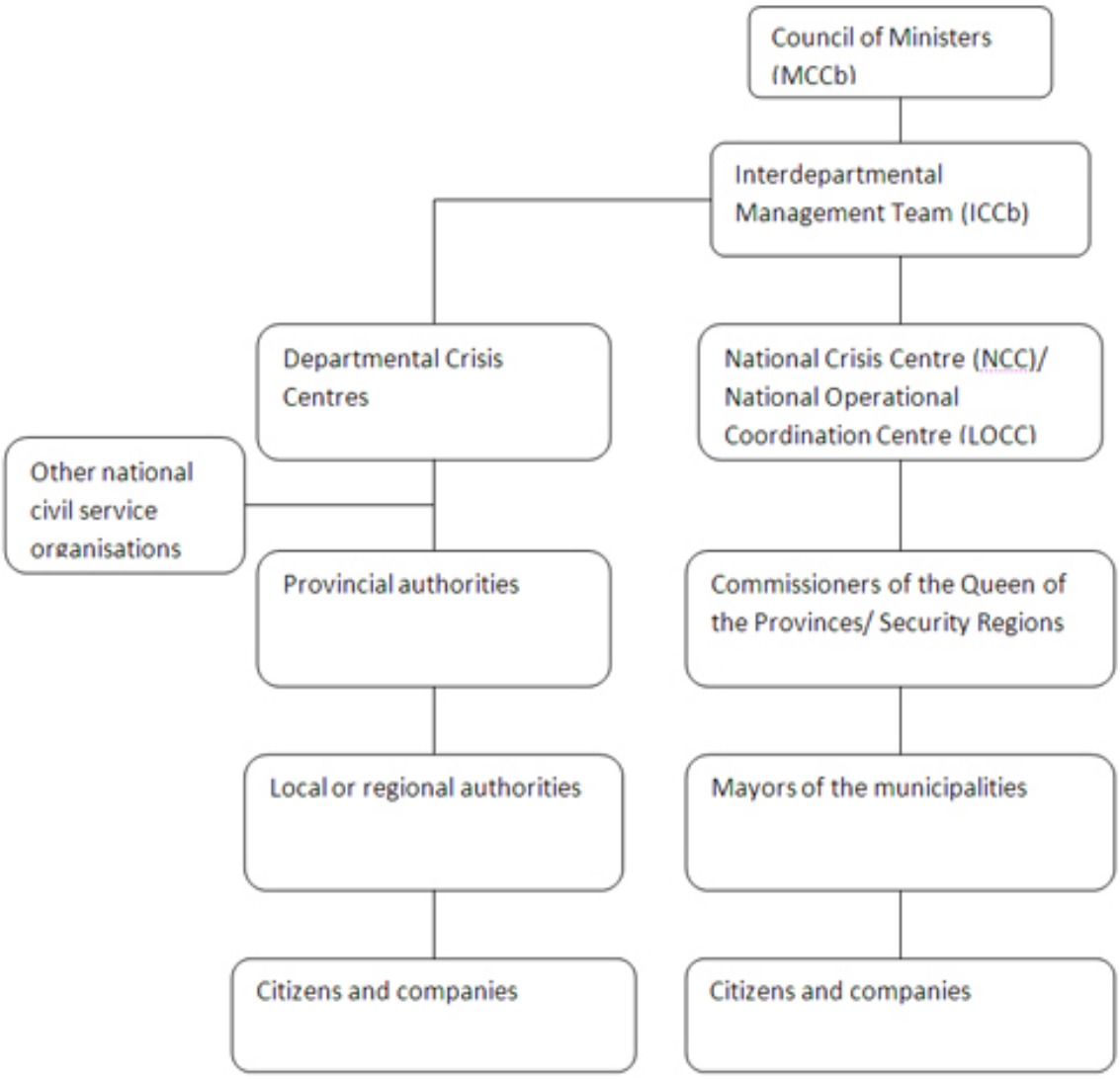
Appendix 3: National disaster response organisational charts

Figure 1: Belgium national disaster response organisational chart



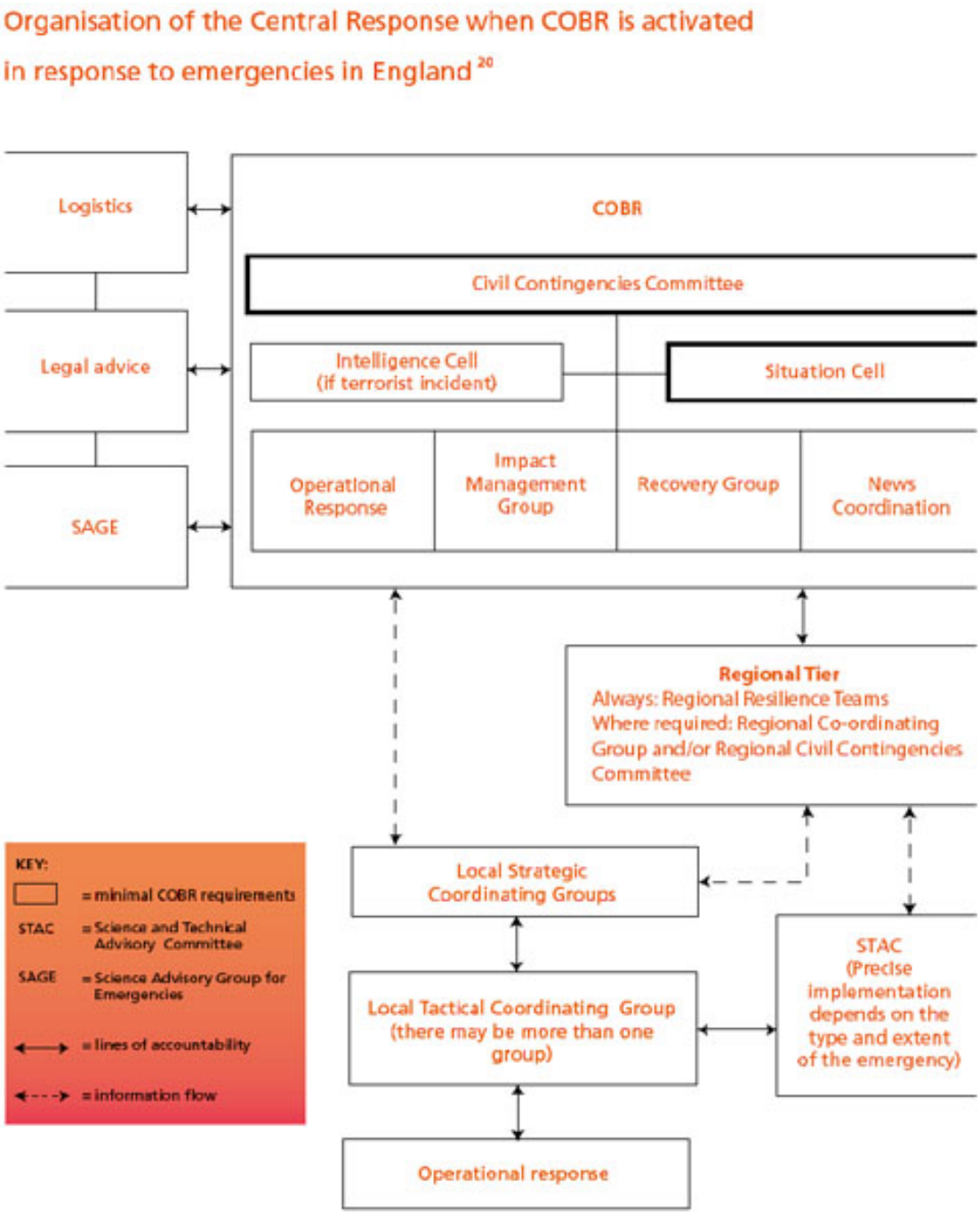
Source: European Commission (2014) Belgium - Disaster management structure (for nuclear incidents), available at: http://ec.europa.eu/echo/files/civil_protection/vademecum/be/2-be-1.html#orga (accessed 1 September 2015)

Figure 2: Netherlands national disaster response organisational chart



Source: European Commission (2014). Netherlands - Disaster management structure, available at: http://ec.europa.eu/echo/files/civil_protection/vademecum/nl/2-nl-1.html#orga (accessed 1 September 2015)

Figure 3: UK national disaster response organisational chart



Source: European Commission (2014). United Kingdom - Disaster management structure, available at: http://ec.europa.eu/echo/files/civil_protection/vademecum/uk/2-uk-1.html#orga, (accessed 1 September 2015).