



# Towards social resilience: A quantitative and qualitative survey on citizens' perception of social media in emergencies in Europe



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## ABSTRACT

Social media is increasingly being used during emergencies. Most available studies are focused on how citizens and/or authorities use these technologies in concrete events. However, larger quantitative studies with significant results on attitudes, needs and future plans of citizens in such events are not available - especially such of a comparative nature related to emergency services. As part of the EU project 'EmerGent' this article presents the findings of a survey of 1034 citizens across 30 European countries conducted between February and June 2015 to explore citizens' attitudes towards the use of social media for private purposes and in emergency situations. The article briefly compares these findings with a second survey conducted with 761 emergency service staff across 32 European countries from September to December 2014. The aim of the overall study is to discuss citizens' attitudes towards social media in emergencies in order to derive challenges and opportunities for social resilience.

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## 1. Introduction

A well-known definition sees social media as a “group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allows the creation and exchange of user-generated content” (Kaplan and Haenlein, 2010). In this context user-generated content refers to “the sum of all ways in which people make use of social media” and describes “the various forms of media content that are publicly available and created by end-users” (Kaplan and Haenlein, 2010). Currently the most common types of social media are Facebook with about 1.36 billion active users monthly, and the microblogging platform, Twitter, counting approximately 284 million active users monthly. YouTube (1 billion), WhatsApp (600 million), Google + (343 million), Instagram (300 million) and Tumblr (230 million) (Statista, 2015) also all have >100 million active users monthly and are widely distributed.

For at least one and a half decades social media has been used in emergencies: after 9/11, by way of example, wikis, created by ordinary citizens, were used to collect information about missing people (Palen and Liu, 2007). Subsequently, analysis of social media in disaster management, mainly in the USA, has become commonplace. Early studies included Murphy and Jennex (2006) who, following hurricane Katrina, looked at the use of PeopleFinder and ShelterFinder, and Palen and Liu (2007), who anticipated a future where ICT-supported

public participation would become regarded as both normal and valuable. Fewer studies covering the situation in Europe exist (Reuter et al., 2012).

In recent years, the use of social media has increased substantially and at the same time the nature of that use has shifted towards a more collaborative model. Based on the broader definition of *resilience* as the “ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions” (United Nations, 2009), more specific terms with overlapping meanings emerged: *cooperative resilience* (Reuter et al., 2016a) as the ability to overcome crises of cooperation with the help of adaptability to modified realities by means of cooperation technology, or *social resilience* as the “capacity of social groups and communities to recover from, or respond positively to, crises” (Maguire and Hagan, 2007). Social media can be understood as a key element in the accomplishing of social resilience. However, although we have a developing body of research which analyses use case with regard to the use of social media during emergencies, there is less work which deals with attitudinal factors, especially with regard to the attitudes of citizens in such contexts.

In this article, then, we seek to explore the attitudes of European citizens towards the use of social media in emergency situations. Based on the analysis of related work (Section 2), we describe the methodology of our survey (Section 3) and present its quantitative as well as qualitative results (Section 4). Following this, the findings are compared to a previously published survey on emergency service staff

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attitudes towards social media. The conclusion discusses social resilience as it pertains to social media in emergencies (Section 5).

## 2. Related work

This section summarizes the literature on the use of social media in emergencies, outlining the main themes of discussion hitherto (Section 2.1). We will then highlight the authorities' (Section 2.2) and subsequently citizens' (Section 2.3) perception of social media. Finally, we will clarify the research gap this study aimed to address (Section 2.4).

### 2.1. Social media in emergencies

The use of social media in emergencies has become a research agenda of its own to such an extent that the term, "Crisis informatics" is now commonplace. It "views emergency response as an expanded social system where information is disseminated within and between official and public channels and entities. Crisis informatics wrestles with methodological concerns as it strives to develop new theory and support sociologically informed development of both ICT and policy" (Palen et al., 2009, p. 3). This trend was predicted some years ago: "the role held by members of the public in disasters [...] is becoming more visible, active, and in possession of greater reach than ever seen before" (Palen and Liu, 2007). That is, the burgeoning research interest has been allied with a greater acceptance of social media use by those directly involved.

In the recent past, a number of studies have been published on social media in emergencies. Various special issues in international journals such as the *Transactions on Computer-Human Interaction* (Hiltz et al., 2011), *Computer Supported Cooperative Work* (Pipek et al., 2014) or *International Journal of Information Systems for Crisis Response and Management* (Reuter, 2015) as well as tracks at various conferences, such as *Information Systems for Crisis Response and Management* deal with this topic. Many studies focus on specific events such as the 2011 London riots (Denef et al., 2013), the 2012 hurricane Sandy (Hughes et al., 2014) or the 2013 European floods (Reuter et al., 2015a). These studies demonstrate the specific ways in which social media have responded to various crises.

The range of different emergency situations, and responses to them, has also produced attempts to categorize the use of social media: Reuter et al. (2012) distinguish between different scenarios of social media use in emergencies. They differentiate between two distinct groups, citizens (C) and authorities (A) (such as emergency services) and describe the resulting information flows in social media such as from authorities to citizens (A2C), from citizen to authorities (C2A) as well as the coordination of (voluntary) activities among citizens (C2C). Research regarding types of users active on social media began by identifying individual roles and proceeded with the development of role typologies. Hughes and Palen (2009) initially identified *information brokers* who collect information from different sources to help affected citizens. For Starbird and Palen (2011), the second step was to recognize the actions of *remote operators* as *digital volunteers* who progress from simple internet-based activities like retweeting or translating tweets to more complex ones, e.g. verifying or routing information. To further differentiate potential user roles, Reuter et al. (2013) suggest distinguishing between activities in the 'real' world as opposed to the 'virtual' world: real *emergent groups* (Stallings and Quarantelli, 1985), whose involvement usually takes the form of neighbourly help and work on-site, and virtual *digital volunteers* (Starbird and Palen, 2011), who originate from the internet and work mainly online. Another study suggests that (real) volunteer groups in emergencies will in the future be challenged to mature and improve according to these enhanced possibilities, so that "professional responders will begin to rely on data and products produced by digital volunteers" (Hughes and Tapia, 2015). Based on a timeline and qualitative analysis of information and help activities during the 2011 Super Outbreak,

Reuter et al. (2013) suggest a classification of Twitter users in different roles: *helper*, *reporter*, *retweeter*, *repeater* and *reader*. Kaufhold and Reuter (2016) additionally suggested the role of the *moderator*.

Across various studies of emergencies and disaster events, numerous positive and negative aspects of social media have been identified. Citizens can handle those activities that are unlikely to be done by official emergency services, e.g. recovering lost pets (White et al., 2014). Other aspects include the sometimes "chaotic" or disorganized work of volunteers (Valecha et al., 2013), the need for quality assessment (Reuter et al., 2015b) as well as the possible increase of task complexity and uncertainty for emergency services (Perng et al., 2013). In the following, the results of larger surveys on authorities and citizens' perception on social media are described.

### 2.2. Surveys on authorities' perception of social media

Reuter et al. (2016b) analysed the state of the art and found that previous research has shown that "volunteered individual reports, especially pictures, are of particular value" to emergency services (see also Ludwig et al., 2015). However, at the same time, other studies have shown that not all emergency responders make use of such data during disasters given the difficulties of receiving and filtering particularly large amounts of data in emergencies (Hughes and Palen, 2012). There are a few quantitative studies which provide evidence on this question, although most are from North America:

Firstly, this includes a comparative study published by the American National Emergency Management Association (NEMA) containing the results of a survey conducted in 2012 among members of emergency services from all 50 Federal States of the US (San et al., 2013). Although the respondents indicated a positive attitude towards social media in general and valued its suitability for information dissemination, 75% of them highlighted the requirement of verifying citizen-generated content, and questioned its credibility. The study also revealed that 85% of US authorities already use social media.

Secondly, a survey of 241 US emergency managers at the county level in 2014 shows that only about half of these agencies use social media (Plotnick et al., 2015). Most of them do not have any formal policies to guide their use. Of those who do have formal policies, about one quarter actually forbid the use of social media.

Thirdly, with over 500 participants, the annual study of the International Association of Chiefs of Police (IACP) about law enforcement's use of social media to report on "the current state of practice and the issues agencies are facing in regard to social media" (International Association of Chiefs of Police, 2015). This found that, comparing the first (International Association of Chiefs of Police, 2010) and last surveys, the agencies' use of social media increased from 81% (77% Facebook, 37% Twitter, 16% YouTube) to 96% (94% Facebook, 71% Twitter, 40% YouTube) and the number of social media policies increased from 35% to 78%.

Finally, Reuter et al. (2016a,b) describe their findings of a survey conducted as part of the EU project 'EmerGent' with 761 emergency service staff across 32 European countries from September to December 2014. They found that the majority of emergency services had positive attitudes towards social media. Social media is more used to share information (44%) than to receive messages (19%). An increase in use is expected (74%), even more for organizations already using it. However there is a huge gap between rhetoric and reality; thus, while 66% of emergency service staff indicated social media can be used to obtain an overview of the situation and to raise situational awareness, in fact only 23% have often or sometimes used social media sites for this purpose.

### 2.3. Surveys on citizens' perception on social media

Very few quantitative studies have been conducted where citizens have been asked about their perception of using social media in

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